

ShortWaveMagazine

Britain's  
best selling  
listening  
magazine

# SWM

October 2003  
£3.25

& Scanning Scene

## Broadcast

## Special

### Pirate Radio

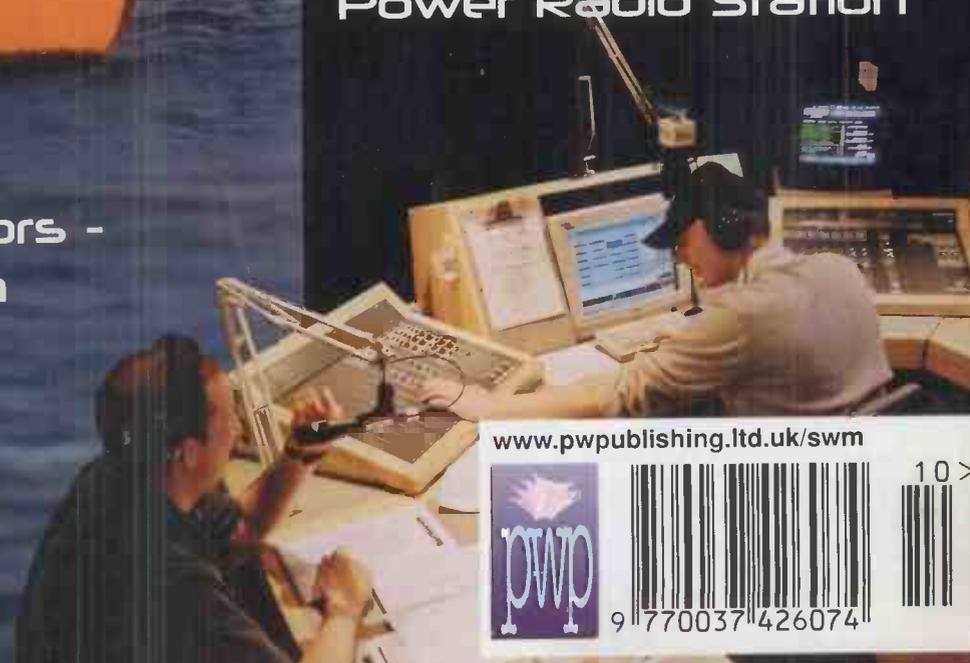
Reviewed - SGC's  
New DSP Speaker



Plus  
Running a Low  
Power Radio Station

Cable Connectors -  
How To Fit Them

Plus all those  
monitoring  
essentials



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- Memory Backup
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- NEW! Mains Adaptor
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- Memories: 200

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**BEARCAT UBC 780XLT**

A MUST HAVE for enthusiasts

- 500 channels
- 25-1300 MHz (with gaps)
- AM, FM, WFM



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PAY BY CHEQUES/SPREAD INTEREST FREE!

**BEARCAT UBC 278CLT**

Base Scanner with MW/FM Radio & Alarm Clock

- 25-956 MHz (with gaps)
- VHF Radio: 88-108MHz
- 100 Memories
- 20 Radio Presets



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- AM/FM/WFM
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- Selectable Attenuator
- Automatic Freq Sorting
- Supplied c/w earphone, case, belt clip, charger, rubber duck antenna



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SPORTCAT

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- 200 memories
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- Priority Channel
- Channel Lockout
- Scan Delay



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E60E

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- 50 Memories
- Programmable on/off
- Twin 12/24 hour clock/Timer
- Memory Scan
- Selectable input Attenuator
- Noise Blanker
- Size 238(W) x 93(H) x 243(D)
- Optional FM Unit - £33
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SAVE £177

### ICOM IC-R8500

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PRICE MATCH

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### ICOM IC-R5

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- AM, FM, WFM modes
- PC programmable
- 1250 memory channels
- Dynamic Memory Scan
- CTCSS & DTCSS Decoder
- Auto Squelch



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Active Antenna and/or Matcher for Receiver use only. A low loss antenna tuner suitable for random long wire, dipoles, Beveridges, Delta loops, inverted V's, Verticals, G5RV and most receiving antennas. Or use as a standalone active antenna.

- Frequency: 100kHz-30MHz



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Communications Receiver

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



PRICE MATCH

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### STEEPLETONE MBR747

Multiband Receiver

- Covers LW, MW and
- Shortwave (2.3 - 22MHz)
- Marine/Airband (108 - 175MHz)
- Battery/Mains



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DIGITAL WORLD BAND RADIO WITH RDS C.R.D.S

### ROBERTS R861

Worldband Radio

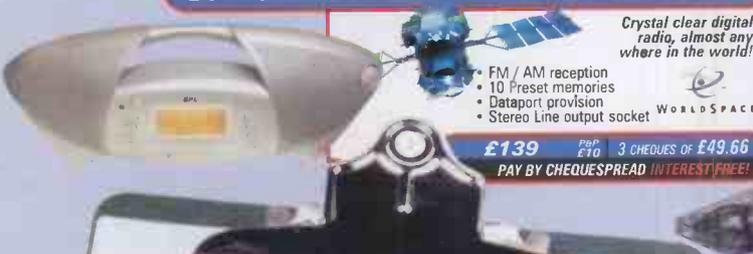
- Covers MW/LW/FM/SW
- SSB/CW reception on SW
- 307 presets
- Clock/alarm facilities
- Supplied with: Dual voltage AC supply, sw antenna, earphone, carrying case



WE STOCK THE COMPLETE RANGE OF ROBERTS RADIO!

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- 10 Preset memories
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## SCANMASTER Product sheet 2003

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- "N" Type connector
- length: 1mtr

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16 EL LOG PERIODIC DESIGN

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- Gain 11-13dBi
- "N" type connector
- 500W

**SCANMASTER DESKTOP**

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- Antenna contains:
  - 2 dipoles for Civil Band
  - 6 dipoles for Military Airband
  - Uses "N" Type connector

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how to find us



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9.30-5.30

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Ultimate lightweight scanner

- RX: 522kHz-999.995MHz
- AM WFM NFM
- Selectable scan modes
- 700 memories
- Audio descrambler
- Bug detector
- Selectable int./ext. antenna
- Internal or external supply
- Priority channel monitoring

with 8.33kHz for airband

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### ALINCO DJ-X3

- 100kHz-1300MHz
- AM/FM/WFM
- 700 memory channels
- Steps: 5/6.5/8.33/10/12.5/15/20/25/30/50/100kHz
- Bug detector
- Stereo FM (with headphones)
- Size: 56w x 102h x 23d mm
- Supplied c/w: 3 AA dry cell, battery case, carrying strap

with 8.33kHz for airband

£129.95 P&P £10 3 CHEQUES OF £46.65  
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### ALINCO DJ-X10E

Advanced featured scanning RX

- Receives: 100kHz - 2000MHz
- AM, WFM, NFM, SSB, CW
- 1200 memory channels
- Advanced scope
- Advanced scanning features
- Battery save facility
- Cloning facilities
- Built-in 24 hour clock
- Switchable attenuator

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### ALINCO DJ-X2000

Intelligent scanning receiver

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- Channel scope
- Bug detector

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- 100 channel memory
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- 6 hr recording, C90 cassette
- Voice activated recording, timed voice activated recording, remote switching of other equipment

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### POWEREX SPECIAL OFFER

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Please add £1.50 P&P

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- Power you scanner from these world beating powerful batteries
- Re-charge up to 1000 TIMES

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- Four independent charging controls
- Inc: 4xAA 1800mAh NiMH batteries.
- Car adaptor kit, Battery carrying case, Multi-Voltage adapter

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### SPECIAL OFFER!

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# nevada

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## Broadcast

- 13 Bandscan Europe
- 16 LM&S

## Features

# ILLICIT Broadcast Radio

### BROADCAST SPECIAL - Page 24

Martin Peters has been working hard researching for this year's Broadcast Special. Here he brings us a mini history of pirate radio broadcasting.

### 34 Blasted Onto The Air

Ian Liston-Smith describes getting a college radio station up and running...from the application, through solution and actually doing it! Read on and see how it's done.

### 39 SGC ADSP<sup>2</sup> Speaker - Reviewed

They say that mimicry is the highest form of compliment, Kevin Nice looks at the new d.s.p. noise reducing speaker from SGC that looks very familiar.

### 42 In The Ed's Shack

Ever got into a mess fitting coaxial plugs to cables? Kevin shows the right way to achieve making a successful connection.

### 73 SWM Club Listing

Are you alone with your radio interest? If you want to meet others with a radio passion, then look no further - use our comprehensive guide - which now includes International Radio Clubs on page 76.

## SWM Broadcast special



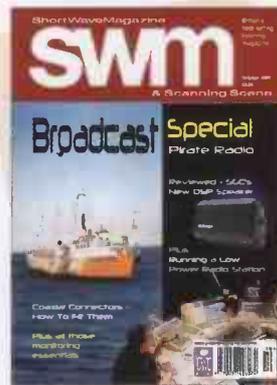
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# contents

## Regular Columns

Advertisers Index.....	78
Amateur Bands.....	67
Attention 123!.....	63
Bandscan Europe.....	13
Communiqué.....	9
Decode.....	56
DXTV.....	50
Editorial.....	6
Info In Orbit.....	59
LM&S.....	16
Order Form.....	78
Propagation Extra.....	53
Propagation Forecast.....	52
QSL.....	7
Rallies.....	11
Satellite TV News.....	54
Scanning.....	55
Sky High.....	46
SSB Utilities.....	49
SWM Book Store Catalogue.....	68
Trading Post.....	66



cover subject: Mebo II - home of RNI, who's 70s emissions kept the Editor awake until the early hours, instead of getting a good night's sleep ready for school!



52



58



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Share your thoughts

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## Coming Next Month

in SWM November 2003

● **FREE SCANNING SCENE EXTRA - 32 page magazine - featuring a massive £3000+ prize competition!**

- Lawrence Harris brings us his 'Info In Orbit' Special
- News, reviews and essential data from the world of listening
- Keep on top of the world of monitoring with SWM
- and much more...

\*contents subject to change

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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 £61 (UK) £74 (Europe) and £81 (rest of world), £94 (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.

### 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 £3.25 per article inc P&P. 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 **0870 224 7830**. 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 **0870 224 7850**. 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

### Hanging on!

A few weekends ago I travelled north, departing in the 'wee small hours' - 0100 to be precise, so that I could witness the demolition of the impressive half dozen lattice steel towers at the now unused BT I.f. site at Criggion in Powys, mid-Wales.

I had to leave so early as I'd been informed by local Stan Brown G4LU that the roads surrounding the site would be closed on safety grounds at 0700. It was essential I arrived in time to reconnoitre the site and select a suitable vantage point for the days activity. In any case, I relish driving at this time of the day, you can, and I did drive for hours and barely see another vehicle.

The towers were due to be felled by the use of explosive charges. The plan as I understood it was that the day's proceedings would commence at 0900 and be over by 1200 with the towers on the ground and the roads re-opened. So much for plans...

I arrived at Criggion at about 0600, which provided me with the opportunity to take some photos of the graceful towers still standing. With the tallest three guyed towers standing some 227m tall and the remaining self supporting three being 197m high it was an awesome site in the early morning light. There was a very eerie feeling as the unused site awaited its impending fate.

At my time of arrival there was just one member of the public trying to get to grips with his video camera to make his own recording of the scene from the soon to be closed highway.

The only other people in the immediate vicinity were the demolition staff and BT team. These two teams were nicely differentiated by the coloured tabards they were wearing, yellow for BT and orange for the demolition team.

During my wander around the extensive site, I was able to take some very interesting pictures of the mast from vantage points which had previously not be possible. I was able to see the charges that had been set on the tower legs in readiness for the days proceedings.

Inadvertently a security gate had been left open and I was able to access the area directly under the central self supporting tower which had once supported the antenna cable which ran up the hill about one kilometre to the south east.

This location provided me with some surreal shots before I was finally moved on by the wearer of an orange vest.

By now, I'd made my selection of vantage point and it was time to park-up and make the 300m ascent up to the ridge close to the trig point named Rodney's Pillar. This location proved to be ideal as the Criggion station was laid out ahead of me with the tips of the tallest tower a mere 103m below and about 500m in front.

I just hoped that my especially selected zoom lens would be up to the job. Fortunately it was, you can see the first success of the day on this page.

Although I had success with my mission, things didn't go to plan for the demolition chaps. The timetable for the day's proceeding went seriously adrift. From my remote observation point it was apparent that things were not going to plan. Men in dayglow vests of both colours were milling around site well

beyond the alleged start time and the explosives team were busy working on the southern most self-supporting tower up until 1200. The person who I had guessed was the head man for the day drove back and forth around the site in his red car consulting with the various groups.

Then, at about 1220, the klaxon sounded to indicate the charges were to be detonated on the tower nearest to me. Moments later a bright flash, a significant cloud of smoke and after the appropriate delay a very loud boom displayed that the two charges on the northern most guy bases had gone off! The, by this time, significant crowd, watched in anticipation of the slow fall of the tower, pulled inevitably towards the other two guys and groundwards. Would it fall in one piece, or break up during its compliance with gravity?

It didn't take long to realise that the tower stood defiant, resisting the effort to tumble it. I felt very glad indeed - I really wanted the towers to be preserved, but that would have been a costly option.

In the fifteen minutes that ensued, the tiny orange and yellow men on the ground had approached and examined the effect of the failed explosions. Word got to us via the safety

marshals amongst we spectators that there were going to be new bigger charges set. The marshals, who happened to be the staff of the quarry located at the base of the cliff we were atop, were enjoying proceedings immensely as they were clearly very familiar with



explosives as they are utilised in the quarries daily activities.

By the time a further hour and a half had passed, the new charges had been set and the area cleared. The klaxon was again sounded and the now familiar flash, smoke, bang sequence repeated. This time the desired effect was achieved. The tower, at first toppling slowly, accelerated groundward. Its initial graceful fall changed as it buckled about a third of the way up from the base. From this moment, its fall changed character, as the lower section hit the ground intact, the rest of the structure exploded as the energy wave ran along the ground in time with the steelwork hitting *terra firma*. Saddening, but very impressive. The first tower was down.

Unfortunately, prior commitments prevented me from seeing the other two similar towers fall that day. I did however, witness the failure of the first attempt at falling a self-supporting structure, again just not enough 'bang'!

### Wrong SSE Ad

I'm sorry to report that our advertisement department slipped up in last month's issue and used the wrong artwork for the SSE advert on page 63. This has lead to a fair bit of confusion for SSE's customers. The correct version of the advertisement can be found in the July issue of SWM.

11/4 73 Kevin

# QSL

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

topqsl

Is there something you want to get off your chest? Do you have a problem fellow readers can solve?

If so then drop a line to the Editor at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

## Dear Sir

Once again I find myself writing to your column in your excellent magazine. Two things have sprang to mind. The first is to thank you for featuring my letter as 'Top QSL' - I really was quite surprised and excited at the same time. The voucher came in handy - I bought the *RSGB Yearbook* with it and with the aid of that I am now sending QSL cards all over Europe.

The second thing was to try and get some information about the Wellbrook Loop Active Antenna and if it will indeed work on the bands I am interested in. Russel L. Clarke mentioned in his letter last month that he has an Icom IC-R75 like me, but I use a long wire (20m), it's quite close to the side of the house so once again we have the problem of location.

I wondered if the loop could improve my reception, i.e. 40m band. I have only had one American contact, as a listener most have been lucky that night.

I would be grateful to you or anyone else for some information on this subject. Also, thanks for a great magazine, only read first few pages and writing this letter. Hope to hear from you in next month's issue.

I'm really enjoying my new found hobby. I suppose the next step is to get a licence going and ring some clubs to get started. Can I finally just mention GWOGIH for his help the last few months.

**Mike Luxton  
Powys**

*Hello Mike, the use of an active loop such as the Wellbrook one may well help. But, it depends on the source of the noise you are suffering. I don't really have enough details of your set-up to comment further. Perhaps you'd like to provide some more details of whether you have an earth connected, if the noise is constant in level, continuous or otherwise. I can then help with suggestions. - Ed.*

## Dear Sir

I have had an Icom IC-R75 for a few years now, but being primarily interested in listening to broadcast stations, I feel that I probably bought the wrong receiver. I have seen plenty of comments regarding the lack of an effective synchronous detector. I know that a US firm called Kiwa Electronics will install upgrade modifications which are supposed to be highly effective in making this a good broadcast listener's radio.

I would like to purchase the upgrade bit from Kiwa, but am not sufficiently confident in my soldering attributes to tackle the job myself. Are you able to suggest any electronics companies in the UK who would be likely to agree to installing the Kiwa mods? Your

consideration of this matter would be greatly appreciated.

**Nick Maly  
Chacombe**

*Nick, I contacted Kiwa on your behalf regarding a UK agent who may be able to help with your requirement. Here's the reply I received.*

*"Kiwa does offer the R75 Sync Detector Module Upgrade and the Kiwa R75 Filter Module in kit form - complete fitting instructions are included. The R75 Audio Upgrades require surface mount technology work. The SMT components are extremely small and the p.c.b. tracks extremely fine. The installation of the audio upgrades is beyond the normal soldering skills of most, so we do not offer these in kit form. The installation also requires the correct soldering/desoldering equipment. The Audio Upgrades require the receiver be sent to Kiwa.*

*We no longer have any dealers/outlets either in the US or Europe. All sales are direct to Kiwa. Kind regards, Craig Siegenthaler, Kiwa Electronics, 503 7th. Avenue, NE Kasson, MN 55944 USA. Tel/FAX: 010-507 634 6134 E-mail: kiwa@wolfenet.com"*

*The only thing which occurs to me is that Icom UK may be able to help, failing that I suggest you contact Craig at Kiwa. My own experiences lead me to believe that the lack of a synchronous detector is not such a great handicap, as you can use u.s.b. or l.s.b. demodulation to similar effect, just as long as you have a stable receiver, which the R75 most certainly is. - Ed.*

## Dear Sir

I am sorry if Bill Semmers feels that s.w.l.s. are looked upon by licensed operators as 2nd class citizens. The hams I know certainly don't look down on s.w.l.s and we are always very pleased to receive a card from them. We also make a point of replying to all such cards, although please enclose a s.a.e. or equivalent if you want QSL direct.

Historically hams came from the ranks of s.w.l.s. although latterly more have come in either via CB or direct.

The RSGB accepts s.w.l.s, although not CBers (big drop off that), on equal terms with hams and they get their own listing in the callbook.

Sure, s.w.l.s are different from hams, for one thing their activity is 'passive' but the effort they can put into their hobby is no less than licensed operators put into theirs. So no, s.w.l.s are not some strange subspecies but just another facet of the fascinating world of radio communications.

**Les Featherstone G6UBM/M3UBM  
Kent**

## Dear Ed

I'm writing to inform you of a superb initiative by a commercial communications company. In a brilliant piece of re-cycling, Track Safe Telecom, a Cardiff based company, are making available decommissioned off-set dishes.

Track Safe Telecom are currently involved in removing 1800 1.2m commercial grade dishes from sites around the UK. The used dishes which are between two and eight years old are available on a collect only basis.

There may also be some fixing hardware available too, but this is dependant on the removal method - some decommissioning requires use of cutting equipment.

When Matt G7OBR and I visited a collection site in Shrewsbury, we were lucky enough to obtain some posts which could be adapted for ground mounting, together with the fixing head to attach to the dish.

My primary interest is the 2.4GHz downlink from AO-40 and since my current 0.6m dish doesn't give me the 'armchair copy' I'm looking for the Track Safe Telecom dish ideal. With the 1.2m dish, I can also use the 1.2GHz uplink to AO-40 with only a watt or two. Matt intends to try some EME on 10GHz.

A further application for which these dishes would be ideal, is the reception of weather satellite images from the geostationary satellites.

On behalf of the hobby, I would like to say a big thank you to Track Safe Telecom for this initiative. Why see good equipment go to costly waste disposal, when it can have a new lease of life in hobby radio.

Track Safe Telecom have a website [www.tracksafetelecom.co.uk](http://www.tracksafetelecom.co.uk) and can be contacted on: (0845) 1204571. **John Heath G7HIA**

*John, I've contacted Track Safe Telecom and it seems that anyone interested in this offer can collect from their Cardiff HQ or some other regional bases. A telephone call to Terry Gee should provide the best collection point for those interested. - Ed.*

# DISCOVER A WORLD OF INFORMATION & INTRIGUE

**WHAT'S HAPPENING ON THE STREETS AND BEYOND? - FIND OUT WITH AN ICOM RECEIVER!**

## IC-R3

• The ICOM IC-R3 is a compact and stylish handheld radio receiver with a 2" colour screen merging both radio and TV technologies into one product. You can watch terrestrial television, view video images or listen to broadcast bands. The Icom IC-R3 is guaranteed to open a whole new world of visual and listening pleasure.

## IC-R5

• The IC-R5's combination of small size, powerful performance and outstanding features will impress. Although compact to the extreme, the IC-R5 wideband receiver (0.150~1309.995MHz), covers virtually everything from AM broadcast to UHF TV audio. Every UK TV broadcast channel is programmed into the IC-R5. Listen to AM and FM radio stations, utility comms and much more. For the motor racing fan, the IC-R5 can put you so close to the asphalt that only the man on the track experiences more!

## IC-R10

• The ICOM R10 handheld receiver covers 0.5MHz~1300MHz in all-modes and boasts a real-time band scope function to make the finding of busy frequencies easy. The passband width of the scope is selectable. Voice-scan function (VSC) pauses scan when modulated signals are received.

## IC-PCR1000

• The explosive growth of the Internet has brought a wealth of information to PC users the world over. However, long before the Internet even existed, the airwaves have been filled with communications of all kinds - broadcast radio and television, Ham, special services and aviation to name just a few. The WindowsXP-compatible IC-PCR1000 is a versatile radio interface that lets you listen to this exciting world from your computer.

## IC-R75

• All-Mode 30kHz/60MHz-USB-LSB-CW-RTTY-AM-FM-S-AM! This superb receiver is designed to suit a range of market sectors from the demanding 'decoder' to the interested SWL. The IC-R75 incorporates Icom's leading-edge technology and offers a range of features that make it exceptional in many ways. It sets a new standard for performance and value, and will become a popular choice for SWLs everywhere.

## IC-R8500

• The IC-R8500 looks like, and handles like a classic HF receiver, but has the capability of receiving everything from 100kHz to 2.000GHz. It is easy to use and to get to know. The IC-R8500 does it all!

## LD-T17E TFT FLAT PANEL MONITOR

• How about going 'all-Icom'! High performance, innovative design and streamlined appearance ensure that the LD-T17E not only looks good and saves desktop space, but also reduces mains power consumption when compared with a normal CRT-type monitor of the same screen size. Other sizes soon to be available.



**VISIT YOUR LOCAL AUTHORIZED ICOM DEALER, TRY AN ICOM AND FIND OUT WHAT YOU'VE BEEN MISSING!**

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**Count on us!**

## 2003 Lightship Weekend

Once again the **Dundee Amateur Radio Club** took part in the International Lightship Activity Weekend, on 16 and 17 August, activating the North Carr Lightship station **GB2NCL** for the occasion. The station was set up in the lightship radio room, using the Club JST 100 transceiver, initially on 20m, using the dipole which is permanently installed at the aft end of the ship.

Operations on s.s.b. commenced at 0800, with good, although noisy, conditions. A goodly selection of Club members attended over the day, with most taking a spell on the mic. Many stations, including other lighthouses and lightships, mostly in Europe, were worked and innumerable pileups occurred as stations queued up to work them. Many old friends from previous years called in.

The opportunity was taken to test the refurbished 'beacon' antenna on the ship to allow operation of a second station on 7MHz. However, while the antenna could be made to load up satisfactorily, the high level of noise generated by the main station prohibited use of the two stations at the same time. So, for the whole of the weekend the club were restricted to single station operation.

A notable first for the Dundee ARC was 'pictures on the club website', at the North Carr, arranged by **Martin Higgins MM3AWM**, which the club were able to announce over the air!

The station was closed down at about 1500, with about 150 stations worked. Activity resumed on Sunday at 0800, this time with the Club IC-718, and on 7MHz s.s.b., with the 'beacon' antenna.

Reports received were good, indicating that the wire was radiating in a reasonable fashion. QRM levels were very high (as usual for 7MHz on Sunday morning!), but the club were again in great demand. Again a number of the Club operators took a spell at operating, including 'Introductory Licence' students.

However, at about 1400, conditions started to go down a bit and everyone had had enough. Another 'Lighthouse Activity Weekend' was over for **GB2NCL**! In all, about 250 stations were worked, mostly in the UK and Europe, although members did work one station in Alaska and one in Tunisia, of all places. Also noteworthy was a contact with a Finnish station, located north of the Arctic Circle, where the weather was "blue skies, sunny and temperature 23°C!".

Anyone interested in amateur radio can contact the club at [enquiries@dundee-amateur-radio.co.uk](mailto:enquiries@dundee-amateur-radio.co.uk) or check out their website at [www.dundee-amateur-radio.co.uk](http://www.dundee-amateur-radio.co.uk)

## Lightship Weekend Report

The weekend of Saturday 16 and Sunday 17 August was the International Lighthouse/Lightship Weekend for 2003 when 369 stations, a record, were established at lighthouses and lightships in 48 countries, another record. The official list of entrants can be found at [http://illw.net/2003\\_list.htm](http://illw.net/2003_list.htm). Next year the event will be from 0001 on Saturday 21 August until 2359 on Sunday 22 August 2004. Please note the new URL for the event: <http://illw.net>

## 50th Anniversary

**Radio Korea International (RKI)** celebrated its 50th anniversary by inaugurating satellite broadcasts with **World Radio Network**. The international radio voice of Korea, marked its 50th anniversary on Friday 15th August 2003 with the inauguration of satellite broadcasts for its daily English, French, German and Russian language programmes to reach new listeners around the world via World Radio Network (WRN), the London-based international broadcaster and transmission service provider.

Some of RKI's English language favourites that will be available to listeners via WRN include Seoul Report, the weekly interview show where guests give listeners a first-hand glimpse of the people from all walks of life who make up the fascinating diversity that is modern Korea, Korean Kaleidoscope, which examines the intricately-woven fabric of Korean society, and Korean Pop Interactive, which profiles Korean music, both cutting-edge pop music and golden oldies.

## GB2SCA On Air

The **Scarborough Special Events Group** operated as **GB2SCA** from Scarborough Lighthouse during the International Lighthouse Weekend in August. The event was very popular with licensed amateurs and listeners, with more than 200 direct cards being received in the week following the event.

This was the Group's last event for the 2003 season. Their programme of special events for 2004 will be published after the AGM in early April and will also be displayed on their web site [www.sseg.co.uk](http://www.sseg.co.uk)



Kevin G0NUP, Richard G0OII and Martyn G4JZO operating GB2SCA from Scarborough Lighthouse.

## FRARS Junk Sale

The **Flight Refuelling ARS** are holding a Tabletop Junk Sale on **26 October 2003** in the meeting room at Cobham Sports & Social Sportsground, Merley, Wimborne, Dorset, (off the A31). This is a mini junk-sale to dispose of lots of stuff left over from the Hamfest, with some rock-bottom prices. There's certain to be many bargains, so for more information, please visit [www.frars.org.uk](http://www.frars.org.uk)



The recent FRARS Hamfest.

## MD For A Day

**T**elecom Design Communications Ltd. (TDC), Basingstoke-based specialist electronic components distributor, hosted the winner of a competition held in April to become TDC's 'MD for a Day' on Wednesday 27 August taking over from Managing Director Jerry Sandys.

During a visit on the 29 April by the A Level Business Studies group from Bearwood College in Wokingham, students were given eight presentations of key areas in the business - Accounts, Management, Sales, Marketing, New Business Development, Logistics, IT and Technical. Richard Millerin, a student who has just completed his A Levels at Bearwood College in Wokingham and will be starting his BA (Hons) Business Management degree at University College in Worcester in September, won the title of 'MD For a Day' by answering correctly the most out of 40 questions about TDC.

Richard spent the morning with Jerry, enabling him to experience at first hand the workings of the business and an opportunity to ask some in-depth questions. Richard visited local printers - Turnergraphic to award a new printing contract to print TDC's 2004 Catalogue and met with TDC's Bank Manager - Kevin Jelley from Natwest Bank in Basingstoke for a working lunch. The afternoon consisted of further meetings including one with the Marketing team and a visit to local radio station Kestrel FM for a studio interview.

Jerry Sandys, Managing Director of TDC comments, "As part of TDC's ongoing commitment to showing local youngsters the opportunities available in the electronics industry we are delighted to welcome Richard back as our 'MD for the Day'. He has awarded a contract for the printing of our 2004 Catalogue, enjoyed lunch with our Bank Manager, been interviewed by Kestrel FM, not to mention Photocalls and a Marketing Meeting. Richard will however be the lucky one going home at five tonight whereas I will be travelling the three and a half hours up to our Lincoln office in preparation for a meeting tomorrow!"

Richard Millerin, TDC's Managing Director for a Day comments, "As my main ambition in life is to become a Managing Director of a company, and I have an expressed interest in telecommunication and wireless technologies, I am delighted to have been able to take over from Jerry for the day. I learnt a huge amount about the practical side of real business; rather than learning the much less exciting theory in a classroom!"



**Richard Millerin, TDC's MD for a Day enjoys life at the top!**

## Win A Icom Balloon Trip

If you have attended a Balloon Festival, Airshow or Fete, you may have seen a balloon with a huge Icom logo emblazoned on it. Well, Icom don't exactly own the balloon, but they have contributed towards the sponsorship of it.

**Merlin Balloons** is the current owner.



Based in Headstart, Merlin Balloons fly from various places in Kent, such as Headcorn Airfield, where they get a lot of reaction from fellow Aviation pilots because they all use Icom radios. Everyone simply knows it as the 'Icom Balloon'.

Merlin Balloons approached Icom UK's Sales & Marketing Director, Bob Stockley in the summer of 2001 with the idea of co-branding the balloon. Bob felt that it was such a good idea and that there was a great synergy between the Icom brand and the hobby of ballooning that Icom proceeded with the sponsorship. Since then, and despite restrictions imposed by the foot and mouth outbreak and increasing regulations places on commercial pilots, Merlin Balloons have logged more than 250 flights.

It is no coincidence that Merlin Balloons

## Mini 'Boom Box'

**A**s Goodmans launch their second DAB Digital Radio they now appeal to those concerned with maximising their space. The dual purpose GCD200 comes with high quality earphones that transform the laptop like stereo into a portable player.

Connect the pair of Active speakers and the mini-stereo is suddenly capable of maximum sound normally reserved for a 'Ghetto Blaster'. With its attractive size and weight, this little 'Boom Box' will sit in the smallest of corners or make the best travel companion.

Most European countries are now broadcasting in DAB enabling reception in crystal clear sound without fuzzy fading in and out. For those travelling outside the DAB reception area, the f.m./a.m. option means that radio is always available.

The size of a note pad, the GCD200 certainly fulfills today's demand for smaller technology. Features include: DAB digital radio - 10 presets; f.m./a.m. analogue radio - 20 presets; Top loading CD player - 20 track programmable, random or repeat play function; batteries and mains operated (batteries give seven hours CD playback/15 hours DAB Listening); Electronic volume control; Bass boost control. Both earphones and Active Speakers supplied.

The main unit's size is (closed) 155 x 220 x 33mm (DxWxH) and weight is 840g. Speaker size is 100 x 70 x 178mm (DxWxH) with a combined weight of 780g.

The GCD200 costs £169. If you wish to know more, contact Nevada on 0239-231 3090 or visit: [www.nevada-radios.co.uk](http://www.nevada-radios.co.uk) for more information.



**The Goodmans GCD200 Digital AM/FM Portable Mini Stereo.**

approached Icom for sponsorship. The company uses the IC-A3E as their standard handportable for aviation communications and the IC-A110 in its chase vehicle. So, if the thought of ballooning catches your imagination, visit Icom's website at [www.icomuk.co.uk](http://www.icomuk.co.uk) and you could win the chance of a flight for two people on the Icom balloon. Visit the competition section for more details.

# rallies

**October 12:** The Great Lumley Amateur Radio and Electronics Society are holding their rally at the Community Centre, Front Street, Great Lumley, Chester-le-Street, Co. Durham. Doors open 1030. This is the biggest and best rally in the North East! There will be free parking, plus easy access, good, inexpensive food and drink. There will be a flying display by Chester-le-Street Model Aircraft Club with a stand. Bring & Buy in two sections, radio, hobbies, electronics, computer, satellite and component stalls. Admission is £2. Free of charge for under 14s if accompanied by adult. More details from Nancy Bone on 0191-477 0036 (home) or (07990) 760920 (mobile) or E-mail: nancybone2001@yahoo.co.uk

**October 19:** The Blackwood & District Amateur Radio Society are holding their rally at the Newport Centre, Newport, one mile from Junction 25A of the M4 Junction 26 when travelling West to East. Doors open at

1045 (1030 for disabled visitors), admission is £1.50. There will be a free car park, Bring & Buy, Talk-in, trade stands, specialist interest groups, bar, catering, disabled facilities and a raffle. For more details contact D. Lewis GW6GW, 23 Gelligroes Road, Pontllanfraith, Blackwood, Gwent NP12 2JU.

**November 2:** The South Yorkshire Repeater Group presents its 13th Great Northern Hamfest at the Metrodome Leisure Complex, Queen Road, Bamsley, South Yorkshire. Doors open at 1000. The Leisure Complex is in the town centre, just five minutes walk from the train and bus stations - (follow the brown Metrodome signs from all directions). The venue is all on one level and has excellent disabled facilities. Features include all the usual trade stands, component and specialist interest groups with a large Bring & Buy. Admission is £2.50. More information from

Hamfest Manager Ernie Bailey G4LUE on (01226) 716339 or mobile (07787) 546515.

**November 9:** The Bishop Auckland Radio Amateurs Club (BARAC) 2003 Rally will take place at Spennymoor Leisure Centre. This venue is ideally suited for both trader and disabled as it boasts good parking and access to a large ground floor hall. There will be the usual radio, computer and electronics, plus a Bring & Buy stall as well as catering and bar facilities. Morse tests will be available on demand. Doors open 1100 (1030 for disabled visitors) and admission is just £1, under 14s free of charge with adult. Talk-in on S22. Mark G0GFG on (01388) 745353 or Brian G7OCK on (01388) 762678.

**November 16:** The Midland Amateur Radio Society are holding their 15th Radio & Computer Rally at King Edwards Grammar Camp Hill School, Vicarage Road, Kings

Heath, Birmingham. There will be trade stands, local clubs, special interest groups, large free car park, refreshments and a Bring & Buy stall. Doors open 1000 and admission is just £1. Trader information from Norman G8BHE on 0121-422 9787, mobile: (07808) 078003, E-mail: nlutteridge@aol.com or Peter G6DRN on 0121-443 1189 or mobile (07710) 963123.

**November 22:** The Rochdale & DARS are holding a traditional radio rally at St. Vincent de Paul Catholic Church Hall, Caldershaw Road, off the A680 Edenfield Road, approx two miles west of Rochdale. Follow the orange arrows from M62, J20. Open from 1015/1030 - admission just £1. There is ample free parking, plenty of

trade stands, a Bring & Buy stall and a large chat/refreshment area. Talk-in on S22. John G7OAI on (01706) 376204 evenings or E-mail: radars@mbc.co.uk Full details on website www.mbc.co.uk/RADARS

**November 23:** The RadioSport Communication and Computer Show is to take place at the Stevenage Leisure Centre, Lytton Way, Stevenage, Herts. Doors open 1000 and admission is £3. There will be a Bring & Buy, Talk-in, Morse tests, Morse assessments, catering, disabled facilities, special interest groups and car parking. More information from RadioSport on (01923) 893929 or visit www.radiosport.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.

We've recently had calls from disappointed readers who turned up to cancelled events due to not confirming!

## New Digital Link

**W**ood & Douglas Ltd., a leading independent British designer and manufacturer of specialist radio products, report a record year of supplying products for telemetry, broadcast and security applications. The split across sectors comprises 80% in telemetry and the balance divided between security and broadcast applications. However, it is expected that the security market will increase now that the company has started to ship its new dVMO digital video link.

A particular strength is that Wood & Douglas is one of the few British companies who can offer both design and manufacture in the UK. The Company is also able to supply standard or bespoke radio communication hardware and software at OEM module level through to complete end user products. A very significant percentage of Company resources are dedicated to the process of design and development. In fact, almost half the Company sales income is due to exports around the world with the USA as a key market.

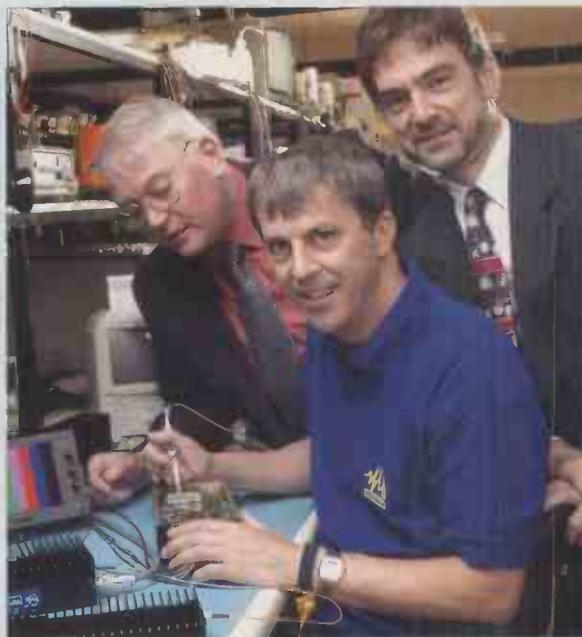
In addition, Wood & Douglas have now started to ship their new digital link to its first security customers in the United States. The dVMO (digital video for moving objects) designed for law enforcement and military applications uses digital video technology, dramatically improving performance over traditional analogue products. Benefits include superior digital image quality and the potential for multiple services. This allows for the joining and relaying of several images from different

cameras using multiplexed Transport Streams on the same spectrally efficient radio channel.

The link comprises the dVMO-T transmitter and the dVMO-R receiver and uses a data format that is derivative of DVB-T. COFDM modulation techniques together with an efficient MPEG CODEC provides high resistance to multipath reflections while achieving a very low encoding delay of only 50ms. This is ideal for real time control and monitoring applications.

COFDM excels where a large number of reflections are available to 'bounce' the radio signal around. This gives the capability to 'see round' corners. Traditional analogue radio signals in similar situations would suffer from cancellations or nulling effects with attendant massive picture disturbances. The dVMO therefore is ideal for use in complex city environments or for deriving images from the inside of buildings. This is often a key requisite for the emergency services where good quality video and sound information is needed from fixed and moving sources.

More information on [www.woodanddouglas.co.uk](http://www.woodanddouglas.co.uk)



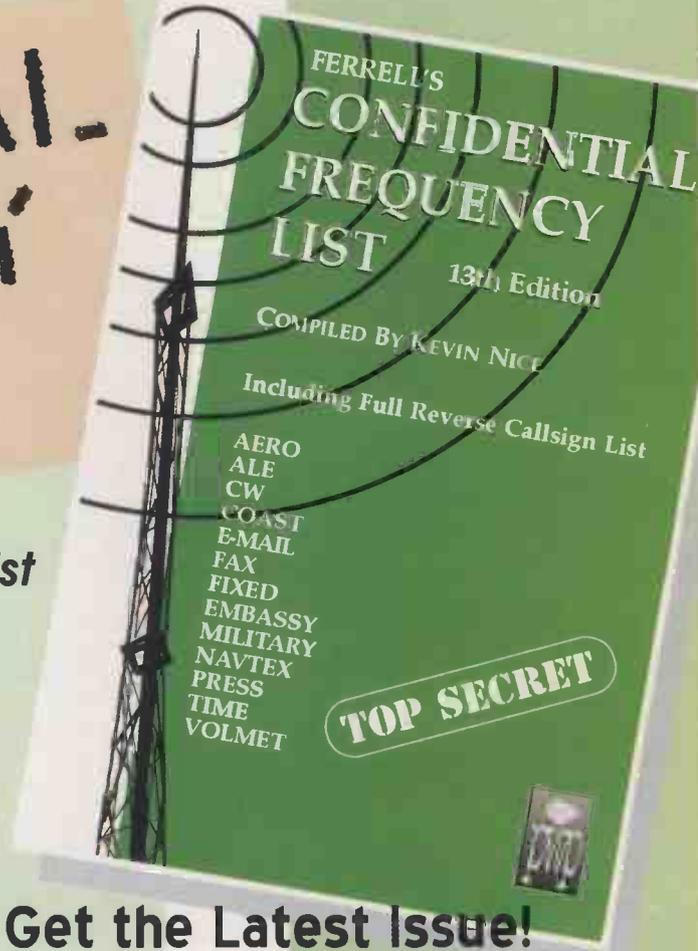
Alan Wood (right) Managing Director of Wood & Douglas with Peter Blakeborough (left) Marketing Director with their latest product - the new digital video link for moving objects.

Send your news and product information to us today!

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# Bandscan

Europe

● **Martin Peters** clo SWM Editorial Offices, Arrowsmith Court, Broadstone, Dorset BH18 8PW  
● **E-mail:** [marti.peters@pwpublishing.ltd.uk](mailto:marti.peters@pwpublishing.ltd.uk)

**W**ith the aid of an atlas, generously supplied by the organisers of the European Song Contest, a story from Israel.

The Voice of Peace, that bastion of offshore broadcasting from somewhere in the Mediterranean, is set to return on 28 November, this time from land-based facilities. An E-mail from **Mike Brand**, one of the organisers of the new venture, goes on to say that as well as this plan, which has the full backing of Abie Nathan, the station's original owner. There is an Israeli left wing/Palestinian group working on a similar project, based in Ramallah. This alternative station would be political.

Mike's aim is to pretty much recreate the sound of the original station, complete with jingles and station IDs. It will steer away from politics, concentrating instead on the music, "with a humanitarian slant".

The two groups met in August to try and thrash out a compromise, but at the time of writing, none had been found.

Undeterred, Mike's project is still on course for the November launch, which will include a grand opening in Rabin square, ten years to the day after Abie sailed the 'Peace Ship' just west of Tel Aviv and sank it. More, next time.

## On A High

It's been a pretty good year for lift conditions into Europe. Aided by the high-pressure systems, temperature inversions leading to ducting, and a sprinkling of Sporadic E openings, it's been a lively few weeks on the v.h.f./u.h.f. bands.

Identification of TV signals is greatly assisted by the presence of on-screen logos, and there's a handy resource on the Internet called Satlogo, primarily intended for the identification of satellite stations. A fair proportion of terrestrial stations also broadcast via satellite so this site is a useful one. There's a link to the Satlogo website and others relating to this month's column at [www.pwpublishing.ltd.uk/swm/bandscan/](http://www.pwpublishing.ltd.uk/swm/bandscan/)

As for v.h.f. radio, the widely adopted Radio Data System (RDS) is the godsend of DXers, because, given an interference-free signal, the station name is displayed on any RDS-equipped radio.

Driving to and from work the other day, I left the car radio on 87.6MHz and was rewarded with a strong signals from a Tunisian regional station in the morning and

the Swedish first programme that evening. I speak neither French nor Swedish, but was able to easily identify the broadcasts by making a note of the RDS display, then checking via the Internet and performing a simple *Google* search. Whilst I'm not aware of any on-line world-wide RDS listing, there are many who log their latest DX catches on the web, including the RDS codes, so you're almost certainly going to come up trumps.



The highlight of this year's v.h.f. DX activities has to be the reception of North American f.m. radio stations in the UK. Unfortunately, not by me. However, you can hear a recording of the audio via the links page.

## Moving East

To Germany, where in August, Berlin switched off its analogue terrestrial TV transmitters, making it the first area in Europe to rely solely on digital reception. Most households were only equipped for analogue reception and had to invest in set-top decoders.

Other German regions intend to introduce digital terrestrial TV next year and parliament has decreed that analogue broadcasting should be completely phased out by 2010.

Meanwhile, the board of RAI, Italy's public broadcaster, has given the go-ahead to terrestrial digital TV by bringing forward the upgrade of the national transmission network. The first frequencies for use by digital TV should be released any time now.

The Dutch authorities finally got their act together and brought to a conclusion a frequency allocation circus that ended with more than one radio station without a frequency.

One result of all this wheeler-dealing is that 1008kHz medium wave was put up for hire. The facility in Flevo has been snapped up by RadLon Media, a UK outfit who wish to relaunch the old Thames Estuary-based Radio London from the 'sixties.

A couple of tests in July revealed fairly disappointing reception in this country but the transmitter's antenna is to be reconfigured to serve these shores more favourably. Meanwhile, the station endeavours to raise in the order of £100,000 so it may be awhile before we see any action.

## Digital Radio

The rise and rise of digital radio appears set to

continue with the news that selected Tesco's and Sainsbury's stores are to sell DAB radios in the run-up to Christmas. The recent promotional campaign from the BBC and commercial radio stations has resulted in a dramatic rise in consumer awareness of digital



radio in the UK, and there are clear signs that it is finally entering the mass market. Let's hope that the massive purchasing power of

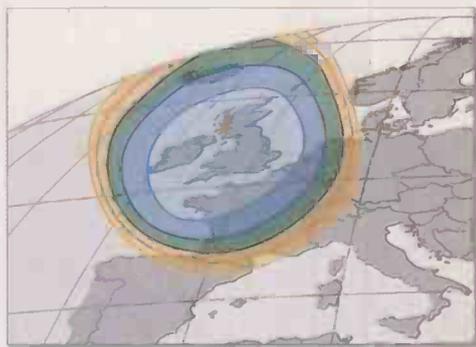
these stores will drive prices down.

Incidentally, the first sub-£100 personal DAB receiver has just hit the streets in the shape of the Perstel Bluenote - available from Dixons, who, by the way, report that half of all radio set sales are digital.

## Digital TV

As predicted, all BBC radio and TV services transferred to the *Astra 2D* satellite in July. The tighter, UK-focused beam offered by *2D* gave the corporation the opportunity to go free-to-air, thereby saving themselves millions of pounds in the annual encryption fees charged by Sky.

Former BBC viewers in the Benelux countries will have to trade-up to larger dishes, whilst those further afield will be cut off altogether. One crumb of comfort: Radios 2 and 4 have reverted to *Astra 2B*, enabling continental Europeans with even a modest dish to listen in.



The BBC now no longer has responsibility for issuing the free-to-air viewing cards, meaning that when they expire, ITV, Channel 4 and Channel 5 will disappear from the screens of those who only subscribe to the free-to-air services.

## Further East

Russkoye Mezhdunarodnoye Radio, or Russian International Radio, if you prefer, is a new station broadcasting out of facilities in St. Petersburg and Kaliningrad. The project, reportedly a joint venture between Voice of Russia and Russkoye Radio, launched mid-July.

The current schedule is 1200-1500 on 1143 and 1386kHz; 1500-1700 on 1143 and 1494kHz; 1800-1900 on 1143kHz, 5.985, 7.260 and 9.405MHz and finally, 1900-2100 as 1800-1900 plus 1215 and 1386kHz.

Now that the Christmas decorations are in the shops, have a great autumn!

### 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 lose 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 £6.00 p+p.



#### MINISCAN MOBILE

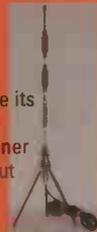
Freq TX: 144-146 430-440 Mhz  
Freq RX: 100-1300 Mhz Length: 300mm  
Spring loaded black stainless whip, 1" super strong magnetic mount, 4mtrs of mini hi-spec coax, terminated with a BNC. (Ideal for "low profile" scanning while for those with transceivers with wideband receive, its the perfect choice 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 erecting an external one).  
**Our Price £39.95** plus £6.00 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 lose 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: 25-1800 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 lose 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** plus £6.00 P+P.



#### MWA-HFMKII

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 III!  
*(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

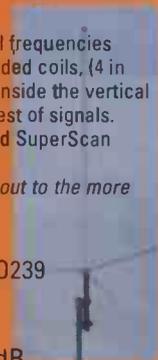
Freq RX: 25-2000 Mhz TX 144-146/430-440 Gain 2.0/4.0dB  
Length: 1000mm Socket: N-type.  
**Our Price £39.95**

#### 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 & Millitary Gain:3.0/6.0 dB  
Length:1000mm.

**Our Price £39.95** PLUS £6.00 P+P.

### AR-50

Freq:Civil & Millitary Gain:4.5/7.0 dB Length:1500mm.

**Our Price £59.95** PLUS £6.00 P+P.

(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.



## 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 upto 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 upto 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 upto 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 upto 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 !!! ★



## 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

### MLP62

Freq:50-1300 Mhz

Gain:10-12 dB

Length:3000mm

Con: N-Type

**Our Price £169.95**

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.



## 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 All (1.2mm wall)

SINGLE 1 1/4" .....£7.00

SET OF FOUR 1 1/4" .....£24.95

SINGLE 1 1/2" .....£10.00

SET OF FOUR 1 1/2" .....£34.95

SINGLE 2" .....£15.00

SET OF FOUR 2" .....£49.95

### CONNECTORS

PL259/9 .....£0.75 each

PL259/6 .....£0.75 each

PL259/7 for mini 8 .....£1.00 each

BNC (Screw Type) .....£1.00 each

BNC (Solder Type) .....£1.00 each

N TYPE for RG58 .....£2.50 each

N TYPE for RG213 .....£2.50 each

SO239 to BNC .....£1.50 each

PL259 to BNC .....£2.00 each

N TYPE to SO239 .....£3.00 each

### HI-SPEC COAX CABLE

RG58 6mm standard....£0.35 per mtr RG213 9mm mil spec ....£0.85 per mtr

RG58 6mm mil spec ....£0.60 per mtr RH200 9mm mil spec ....£1.10 per mtr

RF mini 8 7mm mil spec ....£0.85 per mtr (Phone for 100 mtr discount price)

## SOMETHING EXTRA

### UK SCANNING DIRECTORY

#### 8TH EDITION

The most comprehensive frequency list for the UK. It covers thousands of frequencies from 26Mhz to 1.8Ghz.

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### MRP-2000 (preamplifier)

Freq: 25-2000 Mhz Pwr: 9-15v input (battery not included). Gain: 14dB Complete with

joining lead with BNC (For use with any

passive antennas ie SuperScan

Sticks/Discones and with upto 14dB

gain, bring those lost signals to life !!!)

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MRP-137  
Weather Satellite  
Pre-amp with massive  
25dB gain! Into prices  
just £39.95



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## Long, Medium & Short Wave Bands

● **Brian Oddy** Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

Perhaps the first thing to mention is that British Summer Time (BST) ends on Saturday October 26. At midnight on that day all clocks in the UK must be put back one hour so that Greenwich Mean Time (GMT) will be displayed. For most purposes GMT is the same as Universal Time Co-ordinated (UTC), the time system adopted by the international short wave broadcasters. The times quoted in their transmission schedules, also those in this column, are in UTC. If you have a clock set to UTC beside your receiver **do not** alter it when the changeover from BST to GMT takes place.

Secondly, I must point out that many of the s.w. broadcasters are likely to introduce new transmission schedules at midnight on October 26 to allow for changes in propagation during the winter. If you use 'LM&S' as a guide while searching the s.w. bands and note any changes after that date please send the details to me at the above address for inclusion in the data. Please indicate the transmission frequency in Mega Hertz (MHz), the name of the broadcaster, if possible the language and destination; also the duration in UTC (=GMT).

Listeners:-  
(A) Bernard Curtis, Stalbridge.  
(B) Simon Hockenhull, E.Bristol.  
(C) Sheila Hughes, Morden.  
(D) Ernie Strong, Ramsey, Cambs.  
(E) Fred Wilmschurst, Northampton.

Long Wave Chart				
kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	D*
153	Donebach DLF	Germany	500	B,C*,D,E
162	Allouis	France	2000	C,D,E
171	Nador Med-1	Morocco	2000	D
171	B'shakovo etc	Russia	1200	B,D*,E
177	Oranienburg	Germany	500	B*,D,E
183	Saarlouis	Germany	2000	C,D,E
189	Gufuskalar	W.Iceland	150	B*,D*,E*
198	Drothwich BBC	UK	500	C,D,E
207	Munich DLF	Germany	500	B*,C*,D,E
207	Eidar	E.Iceland	100	D*
207	Azital	Morocco	800	B*,D
216	Roumoules RMC	S.France	1400	B,D,E
225	Polskie R-1	Poland	?	B*,C*,D,E
234	Beidweiler	Luxembourg	2000	C,D,E
243	Kalundborg	Denmark	300	B,C,D,E
252	Tipaza	Algeria	1500	B,C*,E
252	Clarkestown	Eire(RTE Test)	500	A*
261	Burg(R.Hopa)	Germany	85	D*
261	Chita	CIS	1000	B*
261	Taldom Moscow	Russia	2500	B*
270	Topolna	Czech Rep	1500	B*,C*,D,E
279	Sasnovy	Belarus	500	B*,C*,E*

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

### 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 July.

Some interesting conditions were observed early in the month by **Simon Hockenhull** (E.Bristol). At 0010UTC on the 9th he picked up a weak transmission on **261kHz** with classical music played on a flute. He says "It was too weak for Taldom and according to the *World Radio TV Handbook (WRTH)* it was outside its broadcast hours, so I have tentatively put it down to Chita in Siberia. At best the signal reached SINPO 24442". On the 12th, Simom heard at 0005UTC the Rikisutvarpid (RUV) outlet at Gufuskalar, W.Iceland on **189kHz** but the signal was weak and only reached SINPO 15432.

The Rikisutvarpid (RUV) outlets at Gufuskalar, W.Iceland on **189kHz** (300kW) and Eidar, E.Iceland on **207kHz** (100kW) were both heard late at night by **Ernie Strong** in Ramsey, Cambs. At best he rated them respectively 22332 at 2348UTC on the 14th and 22332 at 0025 on the 15th. Despite frequent checks Ernie was unable to hear Sasnovy on **279kHz**. Perhaps he was listening too late at night because the transmission was logged during the evening by some listeners - see below.

While searching the band during the morning of the 16th **Bernard Curtis** (Stalbridge) noticed at 1050UTC that the l.w. transmitter at Clarkestown, Eire had been powered for a test transmission on **252kHz**. The RTE-1 programme was relayed for about three hours and closed at approx 1400UTC. Bernard rated the transmission 55545.

A transmission from Sasnovy on **279kHz** was picked up during the evening on the 28th by **Sheila Hughes** in Morden. It rated 33333 at 2055UTC. Sasnovy was also mentioned in the report from **Fred Wilmschurst** in Northampton - he logged their transmission as 25454.

### Medium Wave Reports

The long hours of daylight during July did not deter some listeners from searching the band after dark for the sky waves from the m.w. stations in the Middle East, N.Africa, Europe and Scandinavia - see chart.

The conditions at night were found to be very variable by **Simon Hockenhull**. During

many nights there were poor conditions into central Europe and North Africa but exceptionally good conditions towards Spain. On the 4th he heard the Voice of America (VOA) on **1593kHz** at 2338UTC but could not find it listed. It peaked to SINPO 23332. During the evening of the 15th he heard the **1206kHz** transmission from Bordeaux being put off air by the dramatic storms which hit that part of France, causing much damage and the loss of some lives. The station struggled back to life towards the end of the evening.

An interesting log was compiled mainly during daylight by **Harry Richards** in Barton-on-Humber. He heard from Holland for the first time 'Arrow Classic Rock' via Lopic on **675kHz** and 'Radio 10 FM' via Trintelhaven on **1395kHz**.

Between 1100 and 1200UTC on the 22nd **Bernard Curtis** listened to a test transmission from Flevoland, Holland on **1008kHz**, radiated on behalf of an English company hoping to broadcast programmes in English from there to the UK. He says "Reception was not too good here. I could only hear it with the long wire or loop plugged in. In the future they hope to use a vertical antenna to make reception better over here".

During daylight, some listeners enjoyed searching for the ground waves from distant local radio stations.

An interesting log was compiled by **Richard Reynolds** in Guildford - see chart. He used two vari-cap tuned loops (1.5 by 0.6m and 1.0 by 1.0m) with his Sangean ATS-803A portables and searched the band mainly on the 30th from approx 0815 until 0945 and 1445 until 1535UTC. During the early morning of the 31st he picked up the ground waves from the ILR Capital Gold 0.1kW outlet at Littlebourne, Kent on **603kHz**, which he rated 34433 at 0745.

From W.London, **Bruce Watt** has informed me that ILR Liberty Radio, via transmitters in London on **963** and **972kHz**, is no longer in existence. Instead, those outlets now carry 'Club Asia'.

### Short Wave Reports

The 25MHz (11m) band remained silent here during July. It is not known if Radio France International (RFI) and/or Deutsche Welle (DW), Germany intend to use this band during the winter period commencing October 27 but all will be revealed when their transmission schedules are published!

Propagation in the 21MHz (13m) band was very unreliable throughout July. R.Australia's broadcast to Asia via Shepparton on **21.820** (Eng 0900-1400) seldom reached the UK. On July 26 it was logged as SINPO 22222 at 0938UTC by **Thomas Williams** in Truro but most mornings it was inaudible. During more favourable conditions one morning it was rated 43333 at 0910 by **David Hall** in Morpeth. An unidentified broadcaster has been using this frequency from 1030UTC. The musical ident just prior to 1030 is very strange - it sounds like a tune being played

- DXers:-**  
 (A) Jim Brown, Dreghorn, N.Ayrshire.  
 (B) Ian Evans, Ebbw Vale, Gwent.  
 (C) Stan Evans, Herstmonceux.  
 (D) Gerald Guest, Dudley.  
 (E) David Hall, Morpeth.  
 (F) Simon Hockenhill, E.Bristol.  
 (G) Robert Hughes, Liverpool.  
 (H) Ian Pakeman, Folkstone.  
 (I) Clare Pinder, Appleby.  
 (J) Vic Prier, Seaton.  
 (K) Richard Reynolds, Guildford.  
 (L) Thomas Williams, Truro.  
 (E) Fred Wilmshurst, Northampton.

### Tropical Bands Chart

MHz	Station	Country	UTC	DXer
3.200	TWR Manzini	Swaziland	2043	K
3.230	WYFR via Meyerton	S.Africa	2037	K
3.255	BBC via Meyerton	S.Africa	2120	J,K
3.300	V of Rev. Bujumb	Burundi	0155	K
3.320	SABC (RSG) Meyerton	S.Africa	2145	J,K
3.350	R.Ext.España	Costa Rica	0450	K
3.915	BBC via Kranji	Singapore	2109	E,J,L
3.955	R.Korea via Skelton	England	2100	F,H,I,J
3.955	R.Taipei via Skelton	England	1800	B,C,D,G,I
3.970	R.Korea via Skelton	England	2105	C
3.975	R.Budapest	Hungary	1905	C,G
3.985	VOIRI	Iran	2115	J
3.985	Nexus, Milan	Italy	1900	J
3.995	DVY via Julich?	Germany	2120	B,F,I,L
4.005	Vatican R.	Italy	2208	J,L
4.750	PBS Xinjng	China	2200	J
4.765	R.Rural, Santarem	Brazil	0215	E,K
4.770	FRCN Kaduna	Nigeria	2130	J,K
4.775	TWR Manzini	Swaziland	0409	K
4.800	CPBS 2 Beijing	China	2219	J,K,L
4.800	LNBS Moser	Lesotho	0412	K
4.805	R.Nac. Amazonas	Brazil	2255	E,K
4.820	R.Botswana, Gaborone	Botswana	2110	J,K
4.820	Xizang, Lhasa	China	2221	K,L
4.820	La Voz Evangelica	Honduras	2120	A

MHz	Station	Country	UTC	DXer
4.825	R.Cancao Nova	Brazil	2257	K
4.832	R.Litoral, La Ceiba	Honduras	0210	K
4.835	R.Tezulutlan, Coban	Guatemala	0239	E
4.835	RTM Bamako	Mali	2128	E,J,K
4.845	ORIM Nouakchott	Mauritania	2129	J,K
4.855	Por Um Mundo Melhor	Brazil	0213	K
4.860	AIR Delhi	India	1922	K
4.885	R.Clube do Para	Brazil	2205	E,J,K
4.890	RFI Paris	via Gabon	0414	K
4.905	Anhanguera	Brazil	0133	E
4.905	Xizang-Tb, Lhasa	China	2135	J
4.910	AIR Jaipur	India	2200	J
4.910	R.Zambia, Lusaka	Zambia	2231	E,K,L
4.915	R.Difusora, Macapa	Brazil	0250	E,K
4.915	GBC-1, Accra	Ghana	2100	J,K
4.920	AIR Chennai	India	2135	J
4.930	AIR Shimla	India	2140	J
4.935	R.Capixaba, Vitoria	Brazil	0446	K
4.950	R.Nacional, Mulvenos	Angola	0419	K
4.950	VOA via Sao Tome	Sao Tome	2005	G,L,K
4.960	VOA via Sao Tome	Sao Tome	0421	B,K
4.965	Christian Voice	Zambia	2130	J
4.985	R.Brazil Central	Brazil	2302	E,K
5.015	R.Brazil Tropical	Brazil	2115	J
5.025	R.Uganda, Kampala	Uganda	2200	J
5.030	R.Burkina	Burkina Faso	2145	J
5.047	R.Togo, Lome	Togo	2210	J

backwards! Please let me know if you have any information about this transmission.

Other occupants of this interesting band include R.Thailand via Udon Thani 21.795 (Eng to Eur 0530-0600), rated 44444 at 0530 by **Clare Pinder** in Appleby; BSKSA Riyadh 21.505 (Ar to N.Africa 0600-1500) 44434 at 0730 by **Vic Prier** in Seaton; R.Prague, Czech Rep 21.745 (Eng, Czech to W.Africa, S.Asia 0900-0957) 55434 at 0925 in Northampton; R.Pakistan, Islamabad 21.465 (Ur, Eng to Eur 0700-1010) 45544 at 0927 in E.Bristol; Swiss R. Int (SRI) via Sottens 21.770 (Eng, It, Ger, Fr to Near East, Africa 0830-1030) 44444 at 0830 by Gerald Guest in Dudley; R.Ext.España via Noblejas, Spain 21.570 (Sp to S.America 0800-1700) 24322 at 1042 by Rhoderick Illman in Oxted; Deutsch Welle (DW) via Wertachtal 21.790 (Ger to S/SE.Asia 1000-1400) 25222 at 1055 by Jim Brown in Dreghorn; UAE R.Dubai 21.605 (Ar, Eng to Eur 0600-1630) 34233 at 1143 by **Peter Pollard** in Rugby; R.Portugal Int, S.Gabriel 21.830 (Port to W.Africa 0700-1655, Sat/Sun) 44444 at 1200 in Truro; R.France Int (RFI) 21.620 (Eng to E.Africa, Indian Ocean 1200-1230) 44333 at 1205 in Stalbridge; BBC via Ascension Is 21.470 (Eng to S.Africa 1200-1900) 44333 at 1300 in Morden; BBC via

Cyprus 21.660 (Eng to E.Africa 1400-1700) 44444 at 1405 by **Stan Evans** in Herstmonceux.

In the 18MHz (15m) band the Voice of America (VOA) via Sri Lanka 19.010 (Dari to Afghanistan 1130-1230?) was rated 33333 at 1215 in Truro; Christian Science Herald via WSHB Cypress Creek 18.910 (Fr, Eng to E/S.Africa 1600?-2200?) 34233 at 1820 in Stalbridge; Family R, WYFR via Okeechobee FL, USA 18.980 (Eng to Eur 1800-2146) 33333 at 2126 in Truro; Family R, WYFR via Okeechobee FL, USA 18.930 (Eng to Eur, Africa 1800?-2200) 35544 at 2130 in Northampton.

The propagation conditions in the 17MHz (16m) band also varied from day-to-day. Reception over long distances proved to be very unreliable. Sometimes R.Australia's broadcast to E/SE.Asia via Shepparton on 17.750 (Eng 0030-0400, 0530-0800, 0830-0900, 0930-1100) reached the UK. It was rated 25422 at 0205 in E.Bristol & 22222 at 0938 in Truro.

Also noted in this band were Israel R. Jerusalem 17.535 (Heb to Eur, N.America 0500-0100), rated 45444 at 0750 in Seaton; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600), 34343 at 0803 in Rugby; Adventist World Radio (AWR) via

Moosbrunn, Austria 17.780 (Eng to W.Africa 0830-0900) 44444 at 0830 in Morden; Voice of Turkey, Ankara 17.830 (Eng to Eur 1230-1325) 55544 at 1315 in Northampton; R.Sweden 17.840 (Eng to N.America 1330-1400) 54444 at 1335 in Herstmonceux; R.Tashkent, Uzbekistan 17.775 (Eng to S/SE.Asia 1330-1400) 33432 at 1337 in Oxted; World Harvest R. (WHRA) via Greenbush, Maine, USA 17.650 (Eng to Africa 1300?-2300) 54445 at 1910 in Stalbridge; R.Nederlands via Bonaire, Ned.Antilles 17.605 (Eng to C/W.Africa 1830-2025) 33221 at 2022 by Ian Evans in Ebbw Vale; RCI via Sackville 17.870 (Eng to Eur, M.East, Africa 2000-2130) 55555 at 2112 in Dreghorn; RCI via Sackville 17.880 (Eng to E.USA, Caribbean 2200-2230) 34333 at 2225 by Ian Pakeman in Folkstone.

When the propagation conditions in the 15MHz (19m) band were favourable

- Listeners:-**  
 (A) Simon Hockenhill, E.Bristol.  
 (B) Sheila Hughes, Morden.  
 (C) Richard Reynolds, Guildford.  
 (D) Ernie Strong, Ramsey, Cambs.  
 (E) Bruce Watt, W.London  
 (F) Fred Wilmshurst, Northampton.

### Local Radio Chart

kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	A,B*,D,F
603	C.G.Litt'brne	I	0.10	C,D,F
630	R.Bedfordshire(SCR)	B	0.20	C,D,F
630	Asian Net via SCR	B	0.20	A
657	R.Clwyd	B	2.00	C
657	R.Cornwall	B	0.50	D
666	CI Gold 666, Exeter	I	0.34	A,C,D,F
666	R.York	B	0.80	D
729	BBC Essex	B	0.20	B,C,D,F
738	Hereford/Worcester	B	0.037	A,C,D,F
756	The Magic 756,Powys	I	0.63	A,D,F
765	BBC Essex	B	0.50	A,B,C,D,F
774	R.Kent	B	0.70	B,C,D,E
774	R.Leeds	B	0.50	D*
774	CI Gold 774, Glos	I	0.14	C*
792	CI Gold 792,Bedford	I	0.27	C,D,F
801	R.Devon	B	2.00	A,C,D
828	CI Gold 828, Luton	L	0.20	C,D,F
828	Magic 828, Leeds	I	0.12	D
837	Asian Net Leicester	B	0.45	A,B,C,D,E
855	R.Norfolk, Goswick	B	1.50	C,D
855	Sunshine 855,Luton	I	0.15	A,F
873	R.Norfolk, W.Lynn	B	0.30	C,D,F
936	Brunel CG, W.Wilts	I	1.10	C,F
936	Fresh AM, Hawes	I	1.00	D
945	CI Gold GEM, Derby	I	0.20	D,F
945	Capital G, Bexhill	I	0.75	C
954	CI Gold 954 via ?	I	?	D
954	CI Gold 954,Torquay	I	0.32	A
954	CI Gold 954,H'ford	I	0.16	A,F
963	Asian Club, Hackney	I	1.00	A,D,E,F
972	Asian Club,Southall	I	1.00	A,D,E,F
990	R.Devon, E.Devon	B	1.00	A,D*
990	CI.G. Wolverhampton	I	0.09	D,F
999	C.Gold GEM Not'ham	I	0.25	D,F
999	R.Solent	B	1.00	C
999	Valley R. Aberdare	I	0.300	A
1017	CI.G.WABC,Sh'rsire	I	0.70	A,D,F
1026	R.Cambridgeshire	B	0.50	C,D,F
1026	R.Jersey	B	1.00	A
1035	Mean Country 1035	I	1.00	D,F
1035	R.Sheffield	B	1.00	D
1035	R.Derby	B	1.20	D,F
1116	R.Guernsey	B	0.50	A,C
1116	Valley R. Ebbw Vale	I	0.50	A
1152	Cap.G 1152,Birm'ham	I	3.00	A,D*
1152	CI.G Amber, Norwich	I	0.83	D
1152	LBC 1152, London	I	23.50	F
1161	R.Bedfordshire(SCR)	B	0.10	D,F
1161	Magic 1161, Goxhill	I	0.35	D
1161	Southern Counties R.	B	1.00	B,C
1170	CI.G Amber, Ipswich	I	0.28	D
1170	Capital G,Portsm'th	I	0.50	A,C
1170	Swansea Snd,Swansea	I	0.58	A
1242	Capital G,Maldstone	I	0.32	C,D
1251	C.G Amber,Bury StEd	I	0.76	D
1260	SabrasSnd,Leicester	I	0.29	D,F
1278	CI Gold 1278,W York	I	0.43	D
1296	Radio XL,Birmingham	I	5.00	A,C,D,F
1305	Premier via ?	I	0.50	D,F
1323	Capital G,Southwick	I	0.50	C
1332	CI.Gold 1332,Pt'bo	I	0.60	D,F
1359	Breeze, Chelmsford	I	0.28	C,D
1359	CI Gold 1359, C'try	I	0.27	D,F
1368	R.Lincolnshire	B	2.00	D,F
1368	R.Southern Counties R.	B	0.50	B
1413	R.Glooucester via ?	B	?	F
1413	Premier via ?	I	0.50	D
1431	CI.Gold, Reading	I	0.14	A,C,D,F
1449	Asian Net,Gunthorpe	B	0.15	D,F
1458	R.Newcastle	B	2.00	D*
1458	Sunrise, London	I	50.00	D,F
1458	Asian Net, Langley	B	5.00	A,D,F
1485	CI.Gold, Newbury	I	1.00	A,C,F
1485	R.Humberside,(Hull)	B	1.00	D
1485	Southern Counties R.	B	1.00	B,C,F
1485	Southern Counties R.	B	1.00	B*,C,D*
1503	R.Stoke-on-Trent	B	1.00	B*,C,D*
1521	CI.Gold, Reigate	I	0.64	B,F
1530	R.Essex, Southend	B	0.15	D,F
1530	CI.Gold Worcester	I	0.52	A,B*
1548	Capital G, London	I	37.50	D,F
1557	CI.Gold 1557,N.hant	I	0.76	D,F
1557	Capital G, Sp'ton	I	0.50	C
1566	CountySnd,Guildford	I	0.50	A*,B,F
1566	SomersetSnd,Teurton	B	0.63	A
1584	R.Northingham	B	1.00	B*,D,F
1584	H/Worcs, Woolfgrton	B	0.50	A
1602	R.Worcs	B	0.25	A*,D

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

R.Australia's broadcasts were received in the UK on four frequencies from Shepparton: **15.230** (Eng to SE.Asia 2200-0000), rated SIO 333 at 2216 by Francis Hearne in N.Bristol; **15.415** (Eng to SE.Asia 2330-0900) 43333 at 0625 in Herstmonceux; **15.515** (Eng Australia, Asia 0200-0700) 43333 at 0630 in Herstmonceux; **15.240** (Eng to Pacific, Western N.America 0700-0900) 22222 at 0715 in Seaton.

Also mentioned in the reports were Vatican R. Italy **15.570** (Eng to Africa 0500-0530), rated 55555 at 0522 in Morpeth; Channel Africa via Meyerton, S.Africa **15.215** (Eng to Africa 0600-0630) 33333 at 0600 in Morden; Voice of Greece via Kavala **15.630** (Gr, Eng to Eur 0600-1000) 44434 at 0850 in Seaton; R.Bulgaria, Plovdiv **15.700** (Eng to Eur 1130-1200) 44444 at 1130 in Dudley; HCJB via Kununurra, Australia **15.390** (Eng to India, Indonesia 1230-1700) 32332 at 1449 in Ebbw Vale; VOA via Kavala, Greece? **15.205** (Eng to Eur, M.East, N.Africa 1500-1700) 34333 at 1501 in Oxted; Israel R, Jerusalem **15.640** (Eng, Fr to Eur, N.America 1630-1700) 54454 at 1630 by Robert Hughes in Liverpool; BSKSA Riyadh, Saudi Arabia **15.230** (Ar to C/W.Africa 1800-2300) 33333 at 1850 in Rugby; Voice of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 32333 at 2000 in Appleby; R.Ext.España via Noblejas, Spain **15.290**

(Eng to Eur 2000-2100) 55455 at 2040 in Folkestone; Voice of Nigeria via Ikorodu **15.120** (Eng to N.Africa, Eur 1900?-2300) 43334 at 2025 in Stalbridge; China R.Int via ? **15.110** (Eng to Eur 2130?-2200) 2222 at 2144 in Truro; DW via Rwanda **15.205** (Eng to W.Africa 2100-2157) 35544 at 2145 in Northampton; RAE Buenos Aires, Argentina **15.345** (Eng, It, Fr, Ger, Sp to Eur, N.Africa 1800-0000) 45433 at 2155 in Dregghorn; BBC via Ascension Is **15.400** (Eng to W.Africa 1500-2300) 35422 at 2224 in E.Bristol.

In the 13MHz (22m) band Family R. (WYFR) Okeechobee, USA **13.570** (Eng to Africa 0800-0900) was rated 25343 at 0853 in Northampton; Croatian R, Deanovec **13.830** (Cr to Eur) 34433 at 1051 in Oxted; R.Prague, Cech Rep **13.580** (Eng, Czech to N.Eur 1300-1357) 43344 at 1300 in Dudley; UAE R.Dubai **13.675** (Ar, Eng to Eur 0600-2045) 54433 at 1335 in Herstmonceux; R.Kuwait **13.620** (Ar to Eur, N.America 0930-1600) 44454 at 1530 in Liverpool; Voice of Vietnam, Hanoi **13.740** (Eng to C.Asia, Eur 1600-1630) 45333 at 1623 in Ebbw Vale; Swiss R.Int (SRI) via Julich, Germany **13.750** (It, Ar, Eng, Ger, Fr to Nr.East, Africa 1630-1815) 44434 at 1749 in E.Bristol; All India R. (AIR) via Bangalore **13.620** (Ar to Asia 1730-1945) 44434 at 1800 in Seaton; BBC via Rampisham, UK **13.745** (Russ to E.Eur 1700-2030) 55555 at 1815 in Stalbridge;

R.Damascus, Syria **13.610** (Eng to Eur 2005-2100) 444349 at 2025 in Folkestone; AFRTS via ? **13.855** (u.s.b. to ?) 45333 at 2145 in Dregghorn; R.Australia via Darwin **13.620** (Eng to SE.Asia 2200-0000) 44444 at 2225 in Truro.

Early risers in the UK may be able to receive R.New Zealand's broadcasts in the **11MHz (25m)** band. Their 100kW transmission on **11.820** (Eng to Pacific, Mid-West USA & Eur 0506-0705) was rated 33333 at 0605 in Herstmonceux. Later, R.Australia may be heard via Shepparton on **11.660** (Eng to E/SE.Asia 1330-1700). Their transmission was rated 33333 at 1420 in Truro.

Also received in the UK during the early morning were the BBC via Ascension Is **11.765** (Eng to W/C.Africa 0700-0800), noted as 45544 at 0725 in Northampton; World Harvest R. (WHRI) via Maine, USA **11.730** (Eng to Africa 0500-1000), rated 43334 at 0745 in Stalbridge; HCJB via Kununurra, Australia **11.770** Eng to S.Pacific 0700-1200) 23332 at 0900 in Morpeth; R.France Int, (RFI) via Issoudun **11.670** (Fr to C.Eur 0700-1030) 44444 at 0938 in Rugby.

- Listeners:-  
(A) Simon Hockenhill, E.Bristol.  
(B) Sheila Hughes, Morden.  
(C) Harry Richards, Barton-on-Humber.  
(D) Ernie Strong, Ramsey, Cambs.

## Medium Wave Chart

kHz	Station	Country	Power (kW)	Listener	kHz	Station	Country	Power (kW)	Listener
531	Ain Beida	Algeria	600/300	A*, D*					
531	RNES via ?	Spain	?	D*					
531	Beromunster	Switzerland	500	D*, E					
540	Wavre-Overijse(VRT)	Belgium	150/50	A, D*, E					
540	Sidi Bennour	Morocco	600	D*					
549	Les Trembles	Algeria	600	B*, D*					
549	Thurnau (DLF)	Germany	200	E*					
558	Espoo	Finland	50	D*					
558	RNES via ?	Spain	?	D*					
567	Tullamore(RTE1)	Eire	500	A, B, D*, E					
576	Muhlacker(SDR)	Germany	500	D*, E*					
576	Barcelona(RNES)	Spain	50	D*					
585	Paris(FIP)	France	8	D*					
585	Madrid(RNE1)	Spain	200	A*, D*, E*					
594	Frankfurt(HR)	Germany	1000/400	D*, E*					
594	Muge	Portugal	100	D*					
603	Sevilla(RNES)	Spain	50	D*					
603	Newcastle(BBC)	UK	?	D*					
612	Athlone(RTE2)	Eire	100	A, D*, E					
612	RNE1 via ?	Spain	10	D*					
612	Tallinn	Estonia	100	D*					
621	Wavre (RTBF)	Belgium	80	A, D*, E					
621	RNE1 via ?	Spain	10	D*					
630	Vigra	Norway	100	D*					
630	Tunis-Djedeida	Tunisia	600	D*					
639	Praha(Liblice)	Czech	1500	E*					
639	RNE1 via ?	Spain	?	A*, D*					
648	Orfordness(BBC)	UK	500	A, D*, E*					
657	Madrid(RNES)	Spain	20	D*, E*					
657	Wrexham(BBCWales)	UK	?	A, D*, E*					
666	Messkirch(Rohrd(SWF)	Germany	150	E*					
666	Lisboa	Portugal	135	D*					
675	Lopic(ArrowCLRock)	Holland	120	A, B, C, D*, E*					
684	Sevilla(RNE1)	Spain	500	D*, E*					
693	Droitwich(BBC)	UK	150	B, C, D*, E*					
702	TWR via Monte, Cario	Monaco	300	D*					
702	Presov	Slovakia	200	D*					
711	Rennes (R.Bleu)	France	300	A, D*, E*					
720	Langenberg	Germany	200	D*					
720	Lisnagarvey(BBC4)	N.Ireland	10	A*					
720	Crystal Palace BBC4	UK	0.75	A, D, E					
729	Cork(RTE1)	Eire	10	A*					
729	RNE1 via ?	Spain	?	A*, D*, E*					
738	Paris	France	4	D*					
738	Barcelona(RNE1)	Spain	500	D*, E*					
747	Flevo(NOS-1)	Holland	400	A, C, D*, E*					
756	Braunschweig(DLF)	Germany	800/200	A*, D*, E*					
765	Sottens	Switzerland	500	A*					
774	Abis	Egypt	500	D*					
774	RNE1 via ?	Spain	?	A*, D*, E*					
783	Leipzig(MDR)	Germany	100	D*, E*					
783	Barcelona (COPE)	Spain	50	A*, D*					
792	Limoges	France	300	A*, E*					
801	Munchen-Ismaning	Germany	300	D*					
801	Ajlun	Jordan	2000	D*					
810	Westerglen(BBCScot)	UK	100	A*, D*, E*					
819	Batra	Egypt	450	D*					
819	S.Sebastian(EI)	Spain	5	D*					
837	Nancy	France	200	A*, D*					
855	RNE1 via ?	Spain	?	D*					
864	Santah	Egypt	500	D*					
864	Paris	France	300	A, B, D*, E*					
873	Frankfurt(AFN)	Germany	150	C*, E*					
873	Zaragoza(SER)	Spain	20	E*					
882	Barcelona	Spain	20	D*					
882	Washford(BBCWales)	UK	100	B, D*, E					
891	Algiers	Algeria	600/300	A*, D*, E*					
891	Hulshberg	Netherlands	20	D*					
900	Milan	Italy	600	A*, E*					
900	COPE via ?	Spain	?	D*					
909	B'mans PK(BBC5)	UK	140	D*, E					
909	M'side Edgel(BBC5)	UK	200	C					
918	Domzale	Slovenja	600/100	D*, E*					
918	Madrid(R.Int)	Spain	20	A*, D*, E*					
927	Volventem	Belgium	300	D*, E*					
936	Bremen	Germany	100	D*, E*					
945	Toulouse	France	300	A*, D*, E*					
954	Brno (CRo2)	Czech Rep.	200	D*					
954	Madrid(CI)	Spain	20	D*, E*					
963	Pori	Finland	600	D*					
972	Hamburg(MDR)	Germany	100	A*, E*					
972	RNE1 via ?	Spain	?	D*					
981	Alger	Algeria	600/300	A*, D*					
990	Berlin	Germany	100	D*, E*					
990	R.Bilbao(SER)	Spain	10	D*					
999	Madrid(COPE)	Spain	50	D*, E*					
1008	SER via ?	Canaries/Spain	?	D*					
1008	Flevo(NOS-5)	Holland	400	D*, E*					
1017	Rheinsender(SWF)	Germany	600	A*, D*, E*					
1017	RNES via ?	Spain	?	D*					
1035	Milan	Italy	50	D*					
1035	Lisbon	Portugal	120	A*, E*					
1044	Dresden(MDR)	Germany	20	A*, D*, E*					
1044	S.Sebastian(SER)	Spain	10	D*					
1053	Talk Sport via ?	UK	?	C, D*, E					
1062	Kalundborg	Denmark	250	A*, E*					
1062	R.Uno via ?	Italy	?	D*					
1071	Bilbao(EI)	Spain	5	A*, D*, E*					
1071	Talk Sport via ?	UK	?	D*, E*					
1080	SER via ?	Spain	?	A*, D*, E*					
1089	Talk Sport via ?	UK	?	C, D*, E					
1098	Nitra(Jarok)	Slovakia	1500	D*, E*					
1098	RNES via ?	Spain	?	D*					
1107	Talk Sport via ?	UK	?	D*, E*					
1116	Bari	Italy	150	D*					
1116	Pontevedra(SER)	Spain	5	A*, D*, E*					
1125	La Louviere	Belgium	20	D					
1125	Deanovec	Croatia	100	D*, E*					
1125	El Beida	Libya	500	D*					
1125	RNES via ?	Spain	?	D*					
1125	Llandrindod Wells	UK	1	A, D					
1134	Zadar(Croatian R)	Croatia	600/1200	A*, D*, E*					
1143	Bolshakov(Mayak)	Russia	150	D*					
1143	COPE via ?	Spain	?	D*, E*					
1179	SER via ?	Spain	?	A*, D*					
1179	Solvesborg	Sweden	600	A*, C, E					
1188	Kuurne	Belgium	5	D*					
1188	Reichenbach(MDR)	Germany	5	D*					
1188	Marcal(VDA/RFE)	Hungary	500	C, E*					
1197	Munich(VDA)	Germany	300	C, E*					
1197	Virgin via ?	UK	?	A, D*, E					
1206	Bordeaux	France	100	A*, D*, E*					
1215	Virgin via ?	UK	?	D*, E*					
1224	Lelystad(The beat)	Holland	50	D					
1224	COPE via ?	Spain	?	D*					
1233	Virgin via ?	UK	?	A, D*, E					
1242	Marseille	France	150	A*					
1242	Virgin via ?	UK	?	D*					
1269	Neumunster(DLF)	Germany	600	E					
1269	COPE via ?	Spain	?	D*					
1278	Dublin/Cork(RTE2)	Eire	10	D*, E*					
1287	Lerida(SER)	Spain	10	D*, E*					
1296	Valencia(COPE)	Spain	10	E*					
1296	Orfordness(BBC)	UK	500	D*, E					
1314	Kvitsoy	Norway	1200	A*, C, D*, E					
1323	W'brunn(VOR)	Germany	800/150	D*, E*					
1332	Rome	Italy	300	D*, E*					
1341	Lisnagarvey(BBC)	N.Ireland	100	A*, D*, E*					
1341	Tarrasa(SER)	Spain	?	D*					
1359	Madrid(RNE-FS)	Spain	600	A*, D*					
1368	Foxdale(Marx R)	Is of Man	20	A*, B*, E*					
1377	Lille	France	300	A*, D*, E*					
1386	Bolshakovo	Russia	1200	A					
1395	Lopic (Biz Nieuwe)	Netherlands	120/40	A					
1404	Brest	France	20	A*, D*, E*					
1413	RNES via ?	Spain	?	D*					
1422	Alger	Algeria	50/25	D*					
1422	Heusweiler(DLF)	Germany	1200/600	A, C, D*, E*					
1440	Marnach(RTJ)	Luxembourg	1200	A, C					
1458	Filake	Albania	500	D*					
1458	Eilat	Israel	10	D*					
1467	Monte Carlo(TWR)	Monaco	1000/400	D*, E*					
1476	Wien-Bisamberg	Austria	600	A, D*, E*					
1485	SER via ?	Spain	?	D*					
1485	Alcoy(SER)	Spain	?	E*					
1494	Clermont-Ferrand	France	20	D*, E*					
1494	Krasnyy Bor	Russia	1200	D*					
1512	Volventem	Belgium	300	B, C, E*					
1521	Duba	Saudi Arabia	2000	D*					
1521	Castellon (SER)	Spain	?	D*					
1530	Vatican R	Italy	150/450	B*, E*					
1539	Mainflingen(Erf)	Germany	350/700	E*					
1539	SER via ?	Spain	?	D*					
1557	Nice	France	300	A*					
1593	Holzkirchen(VDA)	Germany	150	A*					
1602	Al Dakhla	Egypt	10	D*					
1602	Victoria(EI)	Spain	10	E*					

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

Later, R.Finland via Pori **11.755** (Fin to Eur, Russia, W.Africa 0700-?) was 44434 at 1316 in Oxted; R.Jordan via Al Karanah **11.690** (Eng to W.Eur 1100-1530) 33343 at 1510 in Liverpool; R.Bulgaria, Plovdiv **11.900** (Eng to Eur 1730-1800) 44334 at 1730 in Dudley; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 44533 at 1807 in E.Bristol; Israel R, Jerusalem **11.585** (Heb to Eur, N.America 1600-0330) 44423 at 1830 in Seaton; Israel R, Jerusalem **11.605** (Eng to Eur, N.America 1900-1930) 44333 at 1900 in Appleby; Voice of the Mediterranean via Russia **12.060** (Eng to Eur, N.Africa 1900-2000) 44433 at 1958 in Ebbw Vale; R.Canada Int (RCI) via UAE Dhabayya **12.015** (Eng to Eur, Africa, M.East 2000-2059) 44444 at 2000 in Morden; R.Japan via Ascension Is **11.855** (Eng to C.Africa 2100-2200) 44433 at 2100 in Dreghorn; R.Prague, Czech.Rep. **11.600** (Eng to N.America 2230-2257) 55444 at 2240 in Folkestone; R.Ukraine Int via Mykolayiv **12.040** (Eng to E.USA 0000-0100) SIO 222 at 0002 in N.Bristol.

R.New Zealand has also been reaching the UK in the **9MHz (31m)** band. During favourable conditions their transmission to Pacific areas on **9.885** (Eng 0706-1305) was rated 34333 at 0920 in Morpeth & 22111 at 0935 in Truro. Radio Australia's broadcasts were received in the UK on two frequencies from Shepparton: **9.475** (Eng to Asia 1330-1858), rated 34333 at 1547 in E.Bristol; **9.500** (Eng to Asia 1900-2130) 32222 at 1930 in Appleby.

Other broadcasters taking advantage of the propagation conditions in this band include R.Norway via Sveio **9.590** (Norw to Eur, W.Africa (0700-0730), rated 43343 at 0705 in Liverpool; R.Slovakia Int via Rimavska Sobota **9.440** (Eng to Australasia 0700-0730) 44444 at 0710 in Morden; AVR via Moosbrunn, Austria **9.775** (Eng to Eur 0730-0800) 45444 at 0754 in Ebbw Vale; R.Vilnius, Lithuania **9.710** (Eng to W.Eur 0830-0900) 45544 at 0852 in Northampton; Voice of Turkey, Ankara **9.460** (Turk to Eur, N.America 24 hrs) 34333 at 1034 in Oxted; R.Nederlands via Wertachtal, Germany **9.860** (Eng to Eur 1030-1225) 55555 at 1145 in Rugby; R.Polonia, Warsaw **9.525** (Eng to W.Eur 1200-1255) 43333 at 1215 in Herstmonceux; AIR via Aligarh **9.445** (Eng to W.Africa? 1745-1945) 54344 at 1805 in Stalbridge; BBC via Cyprus **9.410** (Eng to W.Eur 1600-2200) 44444 at 1900 in Seaton; R.Ext. Espana via Noblejas, Spain **9.570** (Eng to N & W.Africa 2000-2059 Mon-Fri; 2100-2159 Sat/Sun) 43232 at 2000 in Dudley; Voice of America (VOA) via Udon Thani, Thailand **9.705** (Eng to SE.Asia 2100-0000) 34343 at 2215 in Folkestone; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2245) 44444 at 2241 in Truro; R.Nederlands via Bonaire, Ned.Antilles **9.845** (Eng to N.America 2330-0525) SIO 333 at 2331 in N.Bristol.

Noted in the **7MHz (41m)** band were KTBN via Salt Lake City, USA **7.505** (Eng to N.America 0100-1500), rated 33333 at

0415 in Morpeth; BBC via Ascension Is **7.160** (Eng to C.Africa 0300-0700) 45333 at 0549 in Ebbw Vale; Family R. (WYFR) via Okeechobee FL, USA **7.355** (Eng to Eur 0600-0750) 43343 at 0635 in Liverpool; R.Japan via Woofferton, UK **7.230** (Eng to Eur 0500-0700) 55555 at 0650 in Herstmonceux; Vatican R, Italy **7.250** (It to Eur 1530-1600) 34344 at 1526 in Oxted; R.Polonia (Polish R), Warsaw **7.285** (Eng to Eur 1700-1800) 42233 at 1700 in Seaton; R.Nederlands via Madagascar **7.120** (Eng to Africa 1730-2025) 44333 at 1745 in Rugby; All India R. (AIR) via Bangalore **7.410** (Hind, Eng to Eur 1745-2230) 54445 at 1805 in Stalbridge; R.Slovakia Int. **7.345** (Eng to Eur 1830-1900) 35333 at 1842 in E.Bristol; R.Thailand, Udon Thani **7.155** (Eng to N.Eur 1900-2000) 43344 at 1900 in Dudley; R.Minsk, Belarus **7.210** (Eng to N.Eur 2030-2100, Tues/Thurs) 54444 at 2030 in Folkestone; R.Bulgaria, Sofia **7.500** (Various, Eng 2100-2200) 54444 at 2105 in Morden.

Many of the broadcasts in the **6MHz (49m)** band are intended for listeners in Europe. Some come from R.Japan via Skelton, UK **5.975** (Eng 0500-0600), rated 33233 at 0500 in Appleby; R.Vlaanderen Int (Belgium) via Germany **5.985** (Eng 0700-0730) 35544 at 0720 in Northampton; TWR Monaco via Germany **6.045** (Eng 0700-0815) 55445 at 0750 in Stalbridge; Croatian

R, Deanovec **6.165** (Cro 0400?-2300?) 24332 at 1050 in Oxted; R.Nederlands via Julich, Germany **6.045** (Eng 1030-1225) 55555 at 1115 in Herstmonceux; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 45344 at 1449 in Rugby; Sri Lanka BC via Skelton **6.010** (Eng 1900-2000) 54334 at 1906 in Ebbw Vale; R.Finland via Pori **6.120** (Fin, Sw 0500-2300) 54444 at 1935 in Liverpool; R.Canada Int via Skelton, UK **5.995** (Eng 2000-2100) 44444 at 2000 in Dudley; R.Japan via Skelton. UK **6.055** (Eng 2100-2200) 54444 at 2100 in Morden; R.Ukraine Int, Kiev **5.905** (Eng 2100-2200) 34433 at 2103 in Seaton; R.Canada Int via Horby, Sweden **5.850** (Eng 2000-2130) 55545 at 2120 in E.Bristol; Deutschland R, Berlin **6.005** (Ger 24hrs) 55444 at 2125 in Dreghorn; R.Austria via Moosbrunn **6.155** (Ger) SIO 444 at 2131 in N.Bristol; R.Sweden Int via Horby **6.065** (Eng 2230-2300) 55555 at 2240 in Folkestone.

A few of the broadcasts intended for other areas can also be received in the UK. Those mentioned in the reports came from the BBC via Antigua, W.Indies **5.975** (Eng to C & S.America 2100-0500), rated 54434 at 2345 in Stalbridge; WHRI South Bend, USA **5.745** (Eng to N.America 2000-1000) 35333 at 0141 in Ebbw Vale; R.Havana, Cuba **6.000** (Eng to N.America 0100-0500) 43333 at 0146 in Morpeth.

## Equipment Used - by LMS Correspondents

\$ August # September \* October

\$ # *	Jim Brown, Dreghorn, N.Ayrshire: Lowe HF-225 + AT-1000 a.t.u. + 30m wire.
\$ # *	Bernard Curtis, Stalbridge: Realistic DX400 + loop or r.w. in loft.
\$	Jim Edwards, Wigan: JRC NRD-535 or Drake R8E + 75m N/S wire on a block of flats.
\$ # *	Ian Evans, Ebbw Vale: Sangean ATS-818 + 11m indoor wire.
\$ # *	Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
#	Geraint Gill, while in Holyhead: Pioneer car radio with supplied car antenna.
\$ *	Gerald Guest, Dudley: Roberts RC818 + r.w.
\$ # *	David Hall, Morpeth: AOR AR7030 or Ten-Tec RX-350 + Global AT-2000 + 13m wire.
\$ # *	Francis Hearne, N.Bristol: Sharp WQT370 or Yaesu FRG-7 + r.w.
\$ # *	Simon Hockenhill, E.Bristol: Battery powered Roberts R876, R871 + built-in antennas or AKD HF3 + 4m wire in loft.
#	Simon Hockenhill, near Coverack, Cornwall: Battery powered Roberts R617 portable + outdoor long wire.
*	Robert Hughes, Liverpool: AOR AR7030 + 15m indoor wire or Drake R8E + RF Systems MTA on roof.
\$ # *	Sheila Hughes, Morden: Sony ICF-7600DS + home built loop or Panasonic DR48 + 16m inverted L.
\$ # *	Rhoderick Illman, Oxted: Kenwood R-5000 + r.w. or AN-1, Sony ICF-7600DS.
\$ #	Eddie McKeown, Newry: Grundig Yacht Boy 400 or Sangean ATS-818.
\$ # *	Ian Pakeman, Folkestone: Sangean ATS-818 + 7m wire or Sony ICF-SW7600GR.
\$	Fred Pallant, Storrington: Trio R-2000 + Howes CTU8 a.t.u. + r.w.
\$	John Parry, Larnaca, Cyprus: Realistic DX-394 + r.w.
\$ # *	Clare Pinder, Appleby: JRC NRD-525 + Yaesu FRT-7700 a.t.u. + r.w.
#	Clare Pinder, while in Seaton, Cornwall: Sony SW55 + r.w.
\$ # *	Peter Pollard, Rugby: Sony ICF-2001D + r.w.
\$ # *	Vic Prier, Seaton, Devon: Fairhaven RD500VX + Datong AD-270 active dipole with helical elements erected east/west inside indoor balcony.
\$ # *	Richard Reynolds, Guildford: Two Sangean ATS-803A + tuned loops or two helix antennas in loft.
# *	Harry Richards, Barton-upon-Humber: Grundig Satellit 700 + AD-270 or r.w. or Grundig Yacht Boy 400 or Matsui MR4099.
\$ # *	Ernie Strong, Ramsey, Cambs: AKD HF3 or Yaesu FRG-8800 + a.t.u. + 30m wire.
\$ # *	Bruce Watt, W.London: Not stated.
\$ *	Thomas Williams, Truro: Grundig Yacht Boy 400 or Yacht Boy 206 + r.w.
\$ # *	Fred Wilmschurst, Northampton: JRC NRD-525 + r.w. in loft.

# HAYDON

## Communications

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0.2 2000MHZ

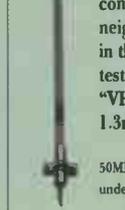
A high performance wideband discone offering superb performance from 0.2-2000MHz. Transmit range:- 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type socket. Supplied with mounting brackets. (N-plug & coax not supplied).

OUR PRICE £54.95 P&P £11.00

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.

### 50-2500MHz Covert appearance Q-TEK 55-2000

50-2500MHz Covert appearance



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).

50MHz-2.6GHz and under 1.3m long £49.95 DEL £11.00

### 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 £11.00

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 APOLLO 3000



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).

£59.95 P&P £6.00

### SUPER-GAINER RH-9090 (SMA)

SMA fitting

SMA 40cm flexible whip that is ideal as replacement.

OUR PRICE £26.95 P&P £1.50

### SUPER-GAINER RH-9000 (BNC)

BNC 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2GHz).

OUR PRICE £21.95 P&P £1.50

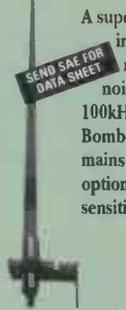
### DX-1 PRO (R.F. SYSTEMS)



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

### DX-10 (R.F. SYSTEMS)



SEND SAE FOR DATA SHEET

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 £11.00

### Q-TEK STEALTH SR-60



Superb, ready assembled wire antenna system. Not only is this end fed for ease of installation, it is also constructed from extremely high quality components. New 'plyweave' PVC coated wire makes this virtually invisible. It comes ready assembled including a 'noise filter system'. A 10m down lead with PL-259 is also fitted (both antenna & down lead are adjustable in length). Overall length 20mtrs (adjustable down to 6m).

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SIMPLY SLING UP AND LISTEN IN  
OUR PRICE £69.95 DEL £10.00

### 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.

SEND SAE FOR DATA SHEET  
ONLY £62.95 P&P £4.00

### MLB MARINE



The ideal antenna for yachting enthusiasts. 100kHz-30MHz. MLB supplied with stainless straps and 15 mtrs of cable. Fixes to stay wire.

OUR PRICE £69.95 P&P £6.50

### GLOBAL AT-2000



Deluxe SW ATU 0-30MHz. SO239 fittings.

ONLY £89.00

(Probably the best ATU around) P&P £6.00  
PL-259 to PL-259 patch lead (0.6m).....£5.99  
PL-259 to PL-259 patch lead (4m long).....£9.99  
BNC adaptors.....£3.95  
BNC to PL-259 patch lead .....£9.99

### MLBA (R.F. SYSTEMS)



Ready assembled wire antenna offering low noise reception on long, medium, short wave (100kHz-40MHz) adjustable from 6mts to 20mts long. Magnetically coupled transfer system ensures reduced static noise levels and allows unwanted build-up to leak harmlessly to earth without damaging the receiver. (Subject to recvr. being earthed).

£64.95 POST £5.00

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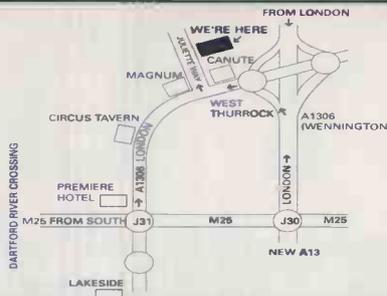
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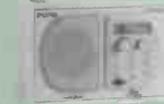


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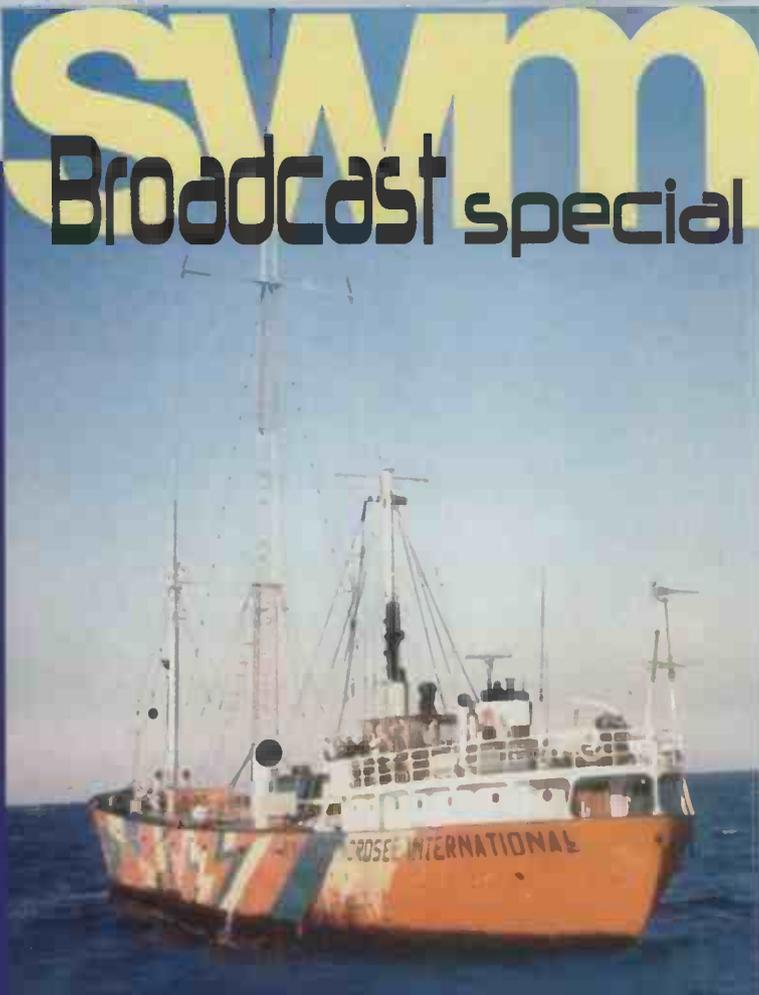
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# Broadcast special



**Martin Peters has been working hard researching for this year's Broadcast Special. Here he bring us a mini history of pirate radio broadcasting.**

© Theo Dencker.

# ILLICIT Broadcast

One of the more imaginative and exciting facets of broadcast radio over the years is that of pirate radio. If you're 45 years old or more and were resident in the UK during the sixties then you'd have been lucky enough to experience it all first hand.

This year's 'Broadcast Special' is a potted history of illicit broadcast radio, both offshore and land-based, at home and abroad. It's a rousing tale that's part inspirational but one whose darker side includes shady business deals, sabotage, death by drowning, and a fatal shooting.

So, why did offshore radio come into being? Governments throughout the world had always maintained an iron grip over their country's broadcasting infrastructure.

The chances of a private operator obtaining a licence was, in most regions, nil.

With networks being provided by government-approved entities, and tight controls by the record industry regarding the amount of contemporary music these stations could play, an alternative was sought. The answer was to broadcast from beyond territorial waters - in Britain's case, in excess of three miles from the coast.

The first ship to be converted for offshore broadcasting was in fact not a pirate but an official transmission facility owned by the US Information Agency and put to work as the Voice of America Sea borne Radio Station. The US Coast Guard Cutter *Courier* did not have permission to broadcast on the high seas and was only allowed to operate within the territorial waters of any given country when granted permission. In September 1951, the *Courier* anchored near Rhodes and broadcast VoA-produced material in 16 languages to the Eastern Bloc until taken out of service 1964.

Pirate offshore music radio kicked off in Scandinavia in 1958, first with Radio Mercury, broadcasting to Denmark on f.m., quickly followed by radios Nord and Syd, anchored off the Swedish coast.

Further south, the spring of 1960 saw the start of transmissions from Radio Veronica, broadcasting from the *Borkum Riff*, an ex German lightship, off the coast of Holland, and destined to remain on the air, bar the odd break, until August 1974.

## UK Offshore Radio - Radio Caroline

So, to 1960s Britain where the broadcasting scene was monopolised by the BBC. The Home, Light and Third Service offered spoken word, general entertainment and classical music to a nationwide audience.

There was virtually no outlet for modern-day pop music, save for the weekly airing of the Hit Parade each Sunday evening. Teenagers throughout the land tuned to Radio Luxembourg for their nightly fix of fun and frivolity, where

they listened in to an irreverent band of disc jockeys playing all the latest happenin'-sounds - a million miles from the staid presentation style characteristic of the BBC.

Luxembourg was the doyen of 'payola', with the major record labels buying programme slots, ensuring all their latest products were aired - and often. Who doesn't remember the hourly '208 PowerPlay' or Cuticura mildly medicated soap?

With the BBC playing only already successful records during the chart rundown, and Luxembourg on the payroll of the majors, there was little chance of exposure for new, unsigned artists.

Enter Ronan O'Rahilly, a young Irish entrepreneur, desperate to get the pop groups he managed onto the radio.



Radio Hauraki's *Tiri II* on the rocks in New Zealand.

REM Island.



Studio on board the *Ross Revenge* - Radio Caroline in the mid 80s

Radio Caroline from the *Ross Revenge* sporting the massive 100m tower.



After being turned down by both the BBC and Radio Luxembourg, O'Rahilly figured that the only way to get his artists onto the British airwaves was to open his own radio station. Encouraged by the success of Radio Veronica, off the coast of Holland, he raised enough money to finance the purchase of a Danish ex-passenger ferry, the *Frederica*.

The *Frederica* sailed to the port of Greenore, Ireland, where studios, generators and two 10 kilowatt transmitters were installed. Then in March 1964, once the 50 metre (165ft) radio mast was in place, the by now renamed MV *Caroline* set sail once more, this time to anchor off Felixstowe.

And so on Easter Sunday 1964, Radio Caroline took to the air on 1520kHz (announced as 199 metres) medium wave, spawning the first of a new generation of UK-based pirate offshore broadcasters.

Only a few weeks later she was joined by Radio Atlanta, broadcasting from the MV *Mi Amigo* on 1493kHz. As both stations were competing for the same audience, it made sense to merge operations, and on 2 July, Radio Atlanta closed down and commenced operations as Radio Caroline South. Meanwhile, MV *Caroline* headed for her new destination, broadcasting as she sailed. Caroline North dropped anchor in Ramsey Bay where she remained until 1968.

# st Radio

The stations enjoyed phenomenal success and attracted considerable backing from advertisers, eager to pedal their wares to a young radio audience. The organisation was run from prestigious offices in London's Mayfair.

Observing that running a commercial radio station was effectively a licence to print money, offshore stations sprang up and cashed in - Radio London (Big L), Radio Scotland and Radio City to name but three. The years 1964 to 1967 were offshore radio's golden era with 15 or more stations straddling the dial.

Radio Caroline South enjoyed a relatively trouble-free life until January 1966, when the *Mi Amigo* was caught in a Force 8 gale. The anchor chain broke and she drifted towards the coast, eventually grounding at Holland Haven,

near Frinton. The Coastguard's boat was unable to get near enough to rescue those on board, so later that night, all the DJs, engineers and crew were taken off by breeches buoy, none the worse for their experiences.

Not so, the *Mi Amigo*. Once refloated, she was towed to Holland and dry docked for urgent repairs. For a few months, Radio Syd lent their ship, the *Cheetah 2*, to the Caroline cause but transmissions were never that successful, and by April, the *Mi Amigo* was back with a new 50kW transmitter on board.

On August 15 1967 the British *Marine Offences Act* (MOA) came into force. Unable to outlaw broadcasting from the high seas, the act *did* make the supplying of a radio ship with provisions an offence. In addition, UK-based advertisers were prohibited from buying airtime from any of the illicit stations. It spelt the end for many stations including Radios London, Scotland, and 270. A month later the BBC launched Radio 1, the corporation's answer to the pirates.

Undeterred, the Carolines continued operations, tendered from Holland and Ireland, and taking advertising from mainland Europe. All went well until the following March 1968, when the *Mi Amigo* and the *Caroline* were boarded within hours of one another by Wijmsmuller, the company that had been tendering the ship. Citing non-payment of fees, the transmitters were disabled, the studios sealed, and the ships towed to Holland, to await their fate.

Fast forward to 1972, and whilst the *Caroline North* ship was sold for scrap, the *Mi Amigo* was auctioned to a group of enthusiasts claiming they intended to restore the ship to its former glory - including functioning generators, transmitter and studios - as a floating offshore radio museum.

In September, she left her moorings, but instead of going to England as declared, the ship anchored off the Dutch coast and began test transmissions. By Christmas the station was identifying as Radio Caroline, but they were to endure many rocky months ahead (literally) and storm damage before settling down to a routine broadcasting regime.

The Dutch passed their version of the *Marine Offences Act* in 1974 taking out Radios Veronica, North Sea and Atlantis. Caroline vowed once more to carry on, and the *Mi Amigo* headed for an anchorage off the Essex coast. Tendering was theoretically from Spain. However, 'pleasure boats' from the English coast made numerous trips to 'view' the ship.

Broadcasting continued until a severe storm in 1980, when the ship drifted onto a sandbank and sank. Thankfully, all those on board were safely transferred off the stricken vessel. Everything was lost to the North Sea, except

**Undeterred,  
the  
Carolines  
continued  
operations,  
tendered  
from  
Holland  
and Ireland,  
and taking  
advertising  
from  
mainland  
Europe**

# SWM Broadcast special

for the mast, which remained defiant for several years before it, too, succumbed to the elements.

Three years later, in a move that took many by surprise, a new ship, the *Ross Revenge*, appeared on the scene, marking the start of the final chapter in Radio Caroline's offshore history. The 68m (223ft) long ship sported a massive 91m (300ft) mast, which had to be counterbalanced with 300 tonnes of concrete ballast. Broadcasting on 963kHz, the station was easily received over most of Western Europe.

Despite a blockade, mounted by the Department of Trade and Industry (DTI), and competition from the popular Laser 558, Caroline continued to broadcast right up until November 1987, when another storm caused her colossal mast to crash spectacularly into the sea. Temporary antennas were rigged but the station's superior signal was never restored.

The final push from the authorities came in 1989, when the *Ross Revenge* was boarded by armed Dutch officials who silenced the station by destroying vital equipment. They left, taking other critical components with them in an attempt to keep the station off the air. Despite serious damage, a mixture of blind determination and faith maintained an on-air presence until 5 November 1990, when the transmitter was closed down for the last time.

The *Ross Revenge* remained out in the North Sea for an entire year while interested parties discussed what to do next. The decision was taken out of their hands when heavy seas landed the ship high and dry on a sand bank. The hull remained intact, and she was refloated and towed into Dover harbour.

Since the ship's return to inland waters, several short term RSLs have been hosted from the *Ross Revenge*, which has until recently been tied up at Queenborough on the River Swale in Kent. There were plans to move her to the mooring at Acorn Reach, near Rochester.

As for the radio station, apart from the RSLs, Caroline has been heard on short wave, courtesy of airtime hired from a number of operators - some legitimate; others, less so. Satellite and Internet delivery seem to be the way

forward, and the station can be heard on the web, via the Astra satellite system, and also on the WorldSpace *AfriStar* satellite.

## RNI

Most offshore radio stations have a chequered history. This is especially true of Radio North Sea International, a slick, professionally run pop music station broadcasting from the *Mebo II* on medium wave, short wave and v.h.f.

The station launched in February 1970 and almost immediately ran into trouble when it was discovered that their transmissions were interfering with the coastguard service. After several frequency changes, the British authorities took the unprecedented step of jamming the medium wave outlet. The station's reply was to broadcast anti-Labour messages ahead of the general election.

The *Mebo II's* next spot of trouble came when a tug, the *Huski* drew alongside and attempted to tow the ship back to port - an order sent out by someone who believed he had rights to the station. After meeting with a certain amount of resistance, the crew of the *Huski* made it clear they would attempt to trip the transmitter off the air by spraying the antenna with water, a move that would have almost certainly ended with loss of life. The threat wasn't followed through, and the tug eventually disappeared.

The popularity of the station had not escaped the notice of the Dutch government, which had hitherto been happy to turn a blind eye towards the activities of the established and much-loved Radio Veronica.

In what was seen as an altruistic move at the time, RNI announced its voluntary closure to protect Veronica's continued operation. In actual fact, Veronica alleged that they had paid RNI one million guilders to stay off the air until the Dutch government, once more, became indifferent to such matters. The deal included a stipulation that RNI would not to broadcast from the coast of Holland, or any Dutch-language programming.

In February 1971, RNI returned to the airwaves, off the Dutch coast - and later with Dutch programming. The deal



QSL card from Radio Northsea International.



Red Sands Fort. Home to Radio 390. © Rainer Knebel.

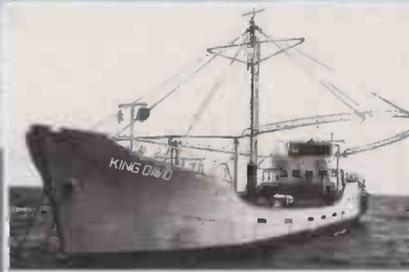
The *Mi Amigo* sinks in 1980. The mast was visible for years.





*Cheeta I* broadcasting Radio Syd, the first pirate radio station.

The *Mi Amigo*.



Capital Radio from the *King David* used a revolutionary ring antenna.



The *Caroline* - the original Radio Caroline ship.

had been broken. RNI said that they had offered back the money but were refused by Veronica.

Maybe no surprise, then, that the *Mebo II* was subject to attack in mid May by three assailants in a rubber dinghy, who drew up alongside one evening, climbed on board, started a fire in the engine room and retreated. The explosion that followed engulfed the stern of the ship and a major fire ensued. The blaze was brought under control a few hours later and broadcasting resumed.

The perpetrators were quickly arrested whereupon it transpired that they were under orders from two members of Veronica's management, not to cause damage or endanger life but to tow the *Mebo* back to port. In court all five were found guilty and each sentenced to one year in jail.

Broadcasting continued with the usual smatterings of breakdowns and storm damage, until August 1974 when the station closed due to the impending Dutch MOA.

Following RNI's closedown, the *Mebo II* sailed to a mooring near Rotterdam, where she remained for over two years. In January 1977 the ship set sail for Libya where her transmitters were pressed into service by relaying the state-run broadcasting service. Eventually, the vessel, renamed *El Fatah*, was used for target practice by the Libyan Navy, and in 1984 was sunk in the Gulf of Sidra.

Radio North Sea International has since broadcast from a converted light ship, the *LV18*, for three 28-day RSL transmissions. Despite the low power, one watt transmissions, the station was heard over most of southern England.

## The Forts

As an alternative to using ships as broadcasting platforms, many of the pirates turned their attention to a crop of wartime forts in the Thames Estuary.

The Maunsell sea forts were built at the Red Lion Wharf near Gravesend and towed out to sea on pontoons, which were then flooded, effectively embedding the forts on the sea floor. There were two varieties. Naval forts consisted of two hollow concrete pillars, seven metres across, straddled by a steel deck, and the Army forts, consisting of seven towers, each atop 20m high legs, and connected by catwalks. All were fitted with heavy anti-aircraft guns and some were equipped with radar.

The forts, all several kilometres out to sea, and abandoned by the government in 1956, afforded ready-made, relatively comfortable bases from which to broadcast. Some even contained working wartime generators on board, easily capable of powering the transmitters.

In May 1964, David Sutch, better known as Screaming Lord Sutch, and later as the leader of the Monster Raving

Looney Party, sailed out to Shivering Sands to set up the first fort-based offshore station. The technical quality of Radio Sutch left a lot to be desired with breaks in transmission not uncommon. Within a few months, station control was transferred to Lord Sutch's manager, Reg Calvert, and the name changed to Radio City.

Reg Calvert was later shot and killed during an exchange concerning allegedly unpaid fees for a new transmitter. This incident is thought to have speeded up the implementation of the *British Marine Offences Act*.

Radio Invicta, broadcasting from the Red Sands Fort, suffered a multiple tragedy when their supply boat sank with the loss of three lives. The forts were home to many other radio stations between 1964 and 1967 including Radios Essex, KING, Tower and 390, one of the most successful broadcasters, with an easy listening format and an impressive signal.

On a bizarre note, one family has actually made Fort Knock John their home. Following the demise of Radio Essex and Britain's Better Music Service, the manager behind the stations, Roy Bates, claimed ownership of the fort. He and his family took up permanent residence and proclaimed it the Principality of Sealand. The entity even issues its own stamps, money and passports.

During the seventies, a group of Radio Amateurs visited Knock John and operated as S1AD - I have the QSL card to prove it. Most of the forts are still standing, slowly rusting away as the years pass by.

Over on the other side of the channel, a purpose-built artificial island had been sunk into the sea floor off

***During the seventies, a group of Radio Amateurs visited Knock John and operated as S1AD - I have the QSL card to prove it. Most of the forts are still standing, slowly rusting away as the years pass by.***

Noordwijk, Holland. *REM Island*, looking not unlike a small-scale oil rig complete with heli-pad, began testing in the summer of 1964. The project called for a steady antenna platform as operations included a television station - TV Noordzee, broadcasting on channel E11 in Band III - as well as a medium wave radio outlet.

With reputedly a third of the Dutch population watching TV Noordzee, the government took steps to close it down, and in December of the same year, the island was raided and the stations taken off the air. *REM Island* remains intact, though, used as an offshore meteorological platform.

# Broadcast special

## Distinct Eras

There have been numerous offshore radio stations - too many to cover in detail - over the three distinct eras that make up the UK's offshore radio history. Between 1964 and 1967 was offshore's heyday, when the medium wave bristled with activity from 20 or more stations.

Following a period of inactivity, 1972 to 1974 will be remembered for Radio North Sea International, the return of Radio Caroline, and Radio Atlantis.

Caroline soldiered on alone until 1980.

The final phase - 1983 to 1987 belonged to Caroline from the *Ross Revenge* and *Laser 558*, a fast-paced pop music station featuring American presenters, broadcasting from the *MV Communicator*. Its success was such that it also attracted the attention of the British authorities.

The Department of Trade and Industry (DTI) commissioned a boat to intercept British-based supply vessels in a move intended to starve the station off the air. *Laser* finally bowed to pressure and closed in 1985, leaving Caroline to go it alone until its demise two years later.

The *Communicator* later sailed to Holland where, until recently, she relayed a legitimate Dutch service on 1224kHz.

## Israel

Aside from the North Sea, the other hotspot for offshore radio has been off the coast of Israel. In fact, Israel's offshore history now spans many more years than the UK scene ever did, and survives to this day.

Offshore radio came to the Mediterranean in 1973 when **Abie Nathan**, a peace activist, launched the Voice of Peace from his ship, the *MV Peace*. The ex-freighter, 1940-built *Cito*, was bought by Abie in 1968, and converted to a radio station in New York. Four years later transmissions began on 1539kHz from various anchorages in the eastern

Mediterranean, and after a shaky start and a couple of closures due to lack of funds, the Voice of Peace settled down to routine programming in English, Hebrew and Arabic in the mid-seventies. It was the only station at the time in that part of the world playing Western pop music and was highly popular with young people in Israel.

The impression the station wanted to give was one of neutrality, broadcasting from 'somewhere in the Mediterranean'. In actual fact, the ship was moored just off the Israeli coast for most of its broadcasting life and administered from offices in downtown Tel Aviv. Listeners were to be attracted away from their own homegrown stations, with their anti-Jewish or anti-Palestinian spin, and instead, listen to Peace Ship's mix of alternative music, interspersed with messages of love and peace. Most programmes were in English and originally, the station carried no news.

Big problem. People in the Middle East are extremely news-aware, and advertisers were reluctant to pay for airtime on a station that didn't have any. With no money to provide its own, independent service, eventually, and reluctantly, the news was lifted off Voice of Israel's Reshet Bet (Radio B) every hour, courtesy of an f.m. tuner in the studio.

In 1977, short wave test transmissions were made on 6.245MHz. These, and other sporadic tests in the 6MHz band, were never really successful and can be seen as no more than experimental. However, in 1980, a Harris 20kW stereo v.h.f. transmitter was installed, operating on 100MHz, boosting significantly the station's listening figures.

I was privileged to work for the organisation during 1980/81, when, if you were really unlucky, you could catch me on the air three times a day - presenting *Breakfast*, *Twilight Time*, a show for old crooners, and the *Classical Music Programme* "sponsored by El-Al, the Israeli airline". I can hear those jingles now!

Whilst I was out there we lost the original 50m high mast over the side during a Force 9 gale. The mast dated back to 1973 and had been donated by Radio North Sea. We sailed into Ashdod port, had another mast installed and tuned up with assistance from the army and government communications engineers.

Testing was carried out whilst docked, and we sailed back out to our anchorage, transmitters blasting away at full power, ready to take on the world. Just 12 days later we lost mast number two and it was decided not to fit a full-sized replacement, so the third incarnation was an altogether shorter affair, just high enough hold the f.m. antenna aloft. With the half-sized medium wave antenna, additional lengths of wire ran horizontally between the main and the forward mast.

During the eighties the Voice of Peace suffered a succession of failures and breakdowns. Funding for ongoing costs was not helped by advertisers turning to more reliable outlets from which to run their spots. Abie was provisionally given permission to broadcast from land, but even this proved unviable. At 1500 on 1 October 1993, the station fell silent for the last time. There were plans to convert the

Radio Caroline sticker - who still has one of these?



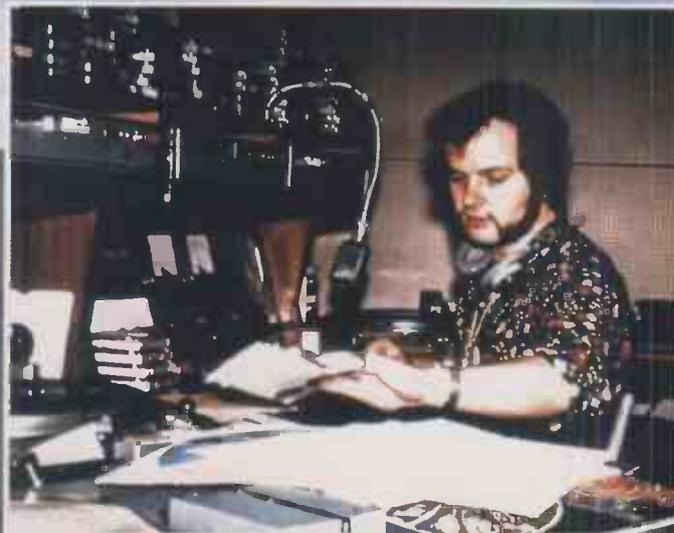
The Voice of Peace descends to her final resting place.

OFF-SHORE BROADCASTER Broadcasting under the name "Radio Caroline" a radio station on board a ship anchored outside British territorial waters is transmitting test programmes of light music from 0500-1700 daily on 1519 kc/s.

The log book from BBC Monitoring, spring 1964.



Fort Knock John.



The ubiquitous John Peel hosting his Radio 390 show.

© Rainer Knebel.

ship to a museum but the government prevaricated.

In his final publicity stunt, Abie had the ship's transmitters, generators and record library stripped out, then sailed Peace 24km west of Tel Aviv where the hull plugs were removed and water pumped onto the vessel. The Peace Ship now lies at the bottom of the Mediterranean.

You may have been surprised to learn about the Israeli government's willingness to turn a blind eye (and even offer assistance) to the Voice of Peace. This was also noted by a certain Paul Greenwald, who decided to set up an offshore TV station anchored off Israel.

In April 1981 the *Odelia* dropped anchor only a kilometre or so from the Peace Ship. Test transmissions commenced on u.h.f. ch58 and were well received in Tel Aviv. A few days later, the *Odelia* sailed into Ashdod port for supplies and was impounded, supposedly for being unseaworthy. When finally released, the port authorities were instructed not to assist the ship again in any way. She sailed back out to sea and broadcast programmes for a few months before sailing to Cyprus to take on more supplies. She never returned.

Israel's offshore radio stations - all eight of them - have come and gone, except for one, Arutz 7, the world's only remaining truly unofficial offshore broadcaster. With two a.m. and two f.m. frequencies in use, the ultra-orthodox Jewish station has had an almost continual presence since 1988. Despite occasional moves to silence the right wing station, Arutz 7 enjoys healthy audience figures and looks set to remain for years to come.

Other countries have had their brushes with offshore radio, most notably Radio Hauraki, which broadcast to New Zealand from 1966 until 1970, when it was awarded a land-based licence. The station now runs a string of f.m. and a.m. transmitters throughout the country. Belgium can lay claim to Radio Antwerpen and Radio Atlantis in 1962 and 1974, and the US enjoyed fleeting broadcasts from Radio Free America in 1973 and then again in 1987 from Radio New York International.

In 1993 Radio Brod took to the air from an ex-supply ship, renamed *Droit de Parole* (Freedom of Speech), after the French organisation that ran the station.

Staffed by a group of journalists, they broadcast to the former Yugoslavia from the Adriatic Sea and were subject to complaints from Serbian authorities, who, up until that time, enjoyed complete control over the media. When the station closed in the following year, the ship was sailed back to Marseille, where all the broadcasting equipment was

removed, and returned to the original owners.

So, what remains of the offshore radio era? Well, in Israel, Arutz 7 shows no signs of faltering. Elsewhere, pirate radio from the high seas is all but a memory.

Officially sanctioned offshore radio is still to be found, though. Radios Caroline, North Sea and London have all staged 28 day RSLs from various ship borne transmitters. A Northern Irish project, Pirates for Peace, is converting a small ship for official RSL-type use, and over in the USA, KKOL broadcasts from the *Coastal Ranger* with 1kW on 1300kHz from Seattle's Elliott Bay.

Finally, a land-based rebirth of Radio London, one of the most successful offshore pirates from the mid-sixties, seems likely, this time from Holland's 400kW facility in Flevoland, on 1008kHz. Listen out!

### UK Land-Based Pirates

It was in the early seventies that land-based pirate radio really began to flourish, mostly in London and on Merseyside. The offshore pirates had all but disappeared. Radio 1 and a handful of commercial local stations played it safe by playing only mainstream fare.

West London's Radio Jackie, on the air since 1969 was joined by a handful of regulars - Kaleidoscope, Invicta, Radio Free London and others. Most stations popped up on the medium wave each Sunday morning for a few hours and were raided regularly by the authorities, only to emerge once again, after a brief interlude. Pre-recorded programmes were played out from cassette to a modest transmitter, powered by car batteries and feeding a wire antenna strung up in a tree. In an effort to evade the authorities, at least one station broadcast sequentially from a number of alternative sites each week.

Over the years the operators became bolder, transmitting from private addresses, often for weeks at a time between raids. In 1984, Radio Sovereign, co-run by the late Crispian St. John, ran almost continuously for several months before being closed down. Sovereign's music format was the inspiration for the plethora of 'gold' stations that now reside on the medium wave throughout the country.

Is the UK's land-based scene dead and buried? Not at all. If you live in or around London or any of our population centres, the f.m. band is literally bursting with underground content. Some of these stations sound pretty amateurish, but hey, that's half of the attraction. Others can give the official completion a run for their money.

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## GLOBAL AT-2000 RECEIVER ATU



- 100kHz - 30MHz
- SO-239 socket
- Size: 150 x 67 x 146mm
- Weight 300g

**£89.95 B**

The AT-2000 one of the most popular receiver ATU's on the market. It covers 100kHz to 30MHz more than enough for most SW receivers. A deluxe feature is the 'Q' switch which adjusts the front-end selectivity to match the band and QRM conditions. The unit is passive, no power supply is necessary. Matches long wires, and coax systems.

## MFJ-8100K SW REGEN Rx KIT



Build your own SW receiver. Kit includes PCB, components, and metal case. Covers SW bands with gaps from 3.5MHz to 22MHz. Includes 80, 40, 30, 20, 17 & 15m amateur bands.

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\* Frequency range: A: 3.5-4.32, B: 5.95-7.4, C: 9.56-12.05, D: 13.21-16.5, E: 17.6-22MHz \* Modes: AM, CW, SSB \* Audio o/p 200mW into 8 Ohms \* Supply: 9V DC (PP3, not included) \* Size 180 x 60 x 150mm \* Weight 710g

## MFJ-1022 ACTIVE ANTENNA



- 300kHz - 200MHz
- Pwr: 9V batt / ext 9-18V DC
- Inc Telescopic whip
- SO-239 connector
- Size: 76 x 32 x 102mm

**£55.95 B**

The MFJ-1022 Active Antenna covers the HF to VHF bands. It easily plugs into your general coverage receiver or scanner. Handles strong signals and reduces intermod with low noise reception. Provided with a detachable telescopic antenna.

## MFJ-1026 NOISE CANCELLER



**£189.95 B**

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 All mode QRM eliminator including active antenna. Eliminates local electrical noise even before it reaches the antenna socket. This is achieved by a phasing technique which cancels noise, but lets the wanted signal through.

## WATSON HP-200 & HP-100



HP-200



HP-100

Superb headphones with tailored response for radio comms. Excellent sound proofing, can pull in the weak DX.  
 • Mono 8 Ohm 200-10,000Hz  
 • Padded ear pieces  
 • 3.5mm stereo plug  
 • 1/4" stereo adaptor

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Excellent lightweight comm headphones with tailored response for the modern transceiver or receiver.  
 • 8 Ohms 200-9,000Hz  
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*The headphones that cut out the ambient noise and let the signals through!*

These latest headphones reduce ambient noise dramatically, yet you can still hear external sounds! Two microphones pick up noise and are then fed to a differential amplifier which cancels the noise. It's all built into the headphone and requires just a single AA cell. Can be switched out and used as normal headphones as well.

The difference is dramatic!  
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## YUPITERU MVT-7100 "THE ONE & ONLY"



- 100kHz - 1650MHz Displayed
- NFM, WFM, USB, LSB, CW, AM
- 1000 memories
- 500 Pass channels
- 12 tuning steps
- 4xAA Ni-Cds / AC charger
- 12V DC cigar lead
- Telescopic Antenna
- Earpiece

**£229 B**

## YUPITERU MVT-7300 "COMPACT SIZE"



- 521kHz - 1320MHz
- NFB, WFM, NAM, WAM, USB, LSB, CW
- 1000 memories
- 500 Pass channels
- 16 tuning steps
- 8.33kHz airband spacing
- 3xAA Ni-Cds
- 12V DC/230V AC mains
- Telescopic Antenna

**£239 B**

## YUPITERU MVT-9000 mk2



- 530kHz - 2039MHz
- NFB, WFM, NAM, WAM, USB, LSB, CW
- 1000 memories
- 500 Pass channels
- 25 tuning steps
- Voice-reversed scrambled decoder
- 4xAA Ni-Cds
- 12V DC/230V AC mains
- Telescopic Antenna

**£369 B**

## AOR AR-8200 mk3



- 530kHz - 3000MHz
- WFM, NFM, SFM, WAM, AM, NAM, USB, LSB, CW
- 1000 memories
- 50 select scan channels
- Tuning steps programmable
- 8.33kHz airband spacing
- 4xAA Ni-MH
- Detachable MW bar antenna
- Telescopic Antenna

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- 400 memories
- 10 Priority channels
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- BNC Flexible Antenna
- Leatherette case
- Earphone

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## UNIDEN-BEARCAT UBC-280XLT



- 25 - 956MHz with gaps
- NFM, AM (Airband)
- 200 memories
- 10 Priority channels
- 5/12.5kHz channel steps
- 4.8V 800mAh Ni-Cd power pack
- AC Charger
- BNC Flexible Antenna
- Earphone

**£179.95 B**

## UNIDEN-BEARCAT UBC-220XLT



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

**£119 B**

## UNIDEN-BEARCAT UBC-120XLT



- 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

**£99 B**

## UNIDEN-BEARCAT UBC-60XLT-2



- 66 - 512MHz with gaps
- NFM
- 80 memories
- 1 Priority channel
- 5/12.5kHz channel steps
- Data skip (lockout channels)
- 4x AA cells (not provided)
- BNC Flexible Antenna
- Earphone

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- 8-15V DC ext.
- Telescopic Antenna

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**UNIDEN-BEARCAT UBC-780XLT**



- 25-1300MHz with gaps
- NFM, WFM, AM
- 500 memories
- Analogue Trunk Tracking
- Alphanumeric display
- Automatic Tape recorder option
- Antenna BNC
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**AOR AR-8600 II**



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- Optional slot card sockets

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- BNC Antenna connector
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**£309 B**

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**£440 C**

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- 153kHz-30MHz, 87.5-108MHz
- AM, SSB/CW, FM (Stereo)
- 45 Station preset memories
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The bhi 1042 Switch Box - No more swapping of wires. Allows up to six pieces of equipment to be connected to one bhi noise eliminating module/speaker or even a standard extension speaker.

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\* 6x inputs: 3x loaded (8 Ohms spkr level), 1x output (to spkr/module) \* Sockets 3.5mm mono Size \*c/w 2x 3.5mm mono - 3.5mm mono leads

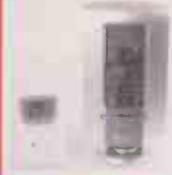
**MFJ-784B DSP FILTER**



**£259.95 B**

The MFJ-784B Tunable DSP filter automatically eliminates all heterodynes, random noise, white noise, impulse noise, static, ignition noise, power line interference, atmospheric noise etc. There are 16 factory pre-set filters to match all the popular modes which can be re-programmed by the user and saved.

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This professional wireless weather station is a high quality system that measures the indoor surrounding area and receives weather data from 3 outdoor sensors through 433MHz signal. \*Base receiver station \*3 Outdoor sensors: Thermo-hydro transmitter, Wind sensor, Rain Sensor \*PC program on CD-ROM \*RS-232 serial data transfer \*AC/DC power adaptor

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**GARMIN GPS-V DELUXE NEW**



Compact Handheld GPS with detailed street-level maps provided from MapSource City Select CD. Will automatically calculate a route and guide you to your destination with turn-by-turn directions and audible beeps to alert you to approaching turns. \*Size: 127x59x41mm \*Weight: 255g

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The MFJ-461 is a stand-alone pocket sized Morse code reader. Similar in size to the MFJ Morse tutors, all you do is hold it close to your receiver, and it instantly displays CW on the 32 character high contrast LCD. It has automatic speed tracking and a serial port. Truly pocket sized at 57 x 82.5 x 25.5mm and 158g.

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**£59.95 B**

**WDP-30 Short Wave Dipole**



**£49.95 B**

This new design from Watson gives you dipole performance across the entire short-wave bands. Unlike random wires, it reduces the background noise and pulls in the signals. And its small size means it will fit most gardens. Absolutely no adjustment required. 10m coax feeder included

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# Broadcast special

Radio Jackie is about to re-emerge on west London's airwaves on 107.8MHz, this time, all legal and above board.

Many stations are operated as a labour of love. Others, purely to make money from advertising and staging local raves.

It is also true to say that there is a sinister side to some of these outfits. Besides the threat of violence against those who would wish to gain access to station equipment or want to close them down, some are involved in other forms of crime, including drugs.

With the stakes so high, common practice is for the studio to be remote from the transmitter site and connected via a link. In the event of being tracked down by the authorities, only the transmitter and antenna will be put out of action and confiscated, leaving the studio equipment, music collection, and the perpetrators intact. The link can be v.h.f./u.h.f., at microwave - easy to do but difficult to detect - or infrared beam - more difficult still, to detect.

The main broadcast transmitter may or may not be under the protection of large males, with or without baseball bats. For these reasons, and the ever-tightening constraints of a limited government budget, many stations remain on the air, 24 hours-a-day, for a considerable time without hindrance.

A number of these broadcasters even have the wherewithal to broadcast RDS codes to your f.m. radio, sometimes running with their 'traffic flag' permanently enabled thereby hijacking any radios being driven into their service area.

The transmitters can be either home-made - with a huge

potential for causing interference to other users, including aircraft - bought off the shelf, or stolen. One particular local BBC station that shall remain nameless, has suffered the loss of its fill-in transmitter on more than one occasion.

Record companies never see a penny in royalties and of course the stations do not have to stump up for the licence fee. All this, to the deep annoyance of legitimate broadcasters who see these stations as unfair competition.

In reality, most of the pirates base their play list around minority-interest music so I can't honestly see listeners of Radio 2 tuning away in droves to the delights of 'Acid FM'. However, that 'Acid' and its contemporaries continue to attract listeners is an indication that this type of niche programming has its place.

Band II f.m. transmissions are easy to generate and the associated antennas very portable meaning very few pirates choose to broadcast on medium wave.

One area of the spectrum where you will find some clandestine activity is on short wave, especially around the 6.2-6.4MHz region each Sunday morning. All that gather here each week are hobby pirates, enjoying the buzz of evading the authorities, or simply having a ball, playing their kind of music, and showing off to a small but loyal audience.

## Irish Land Based Pirates

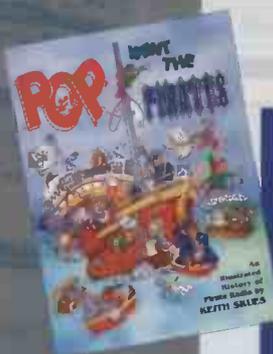
In the Irish republic, land-based piracy at one time reached epidemic proportions. Ireland had only one national radio station to its name, so it was only a matter of time before

The deck of RNI's ship *Mebo II*, showing the feed-through insulator taking the transmitter output up from the transmitter room through the deck and to the feeder then on to the mast/radiator.

© Theo Dencker.



**If you'd like to read more on the subject of Offshore Pirates, then you should consider obtaining a copy of *Pop Went The Pirates*, an illustrated history of pirate radio by Keith Skues, available from the SWM Book Store - see page 70 in this issue.**



hobby pirates materialized, safe in the knowledge that they would be free from government intervention, owing to a loophole in the country's broadcasting legislation.

During the late seventies the first serious operators moved in, boasting 24 hour schedules and slick presentation. One of the best remembered is Dublin's Sunshine Radio on 531kHz, launched in 1980 and operated by former Radio Caroline staff. Soon to follow, was Radio Nova on f.m. and 819kHz medium wave.

The stations remained on the air, unhindered by the authorities until 1983, when the Irish Department of Posts and Telecommunications closed them both down, citing interference to legitimate broadcasters and essential services. It turned out that the authorities had no right to take this action, and the stations were soon back on air.

On hearing the news of the government's failure to take effective action, a new wave of stations, big and small, joined the free-for-all. Prominent during the eighties were Magic103, Q102 and Energy 103.

Angry at it what it saw as unfair competition, state broadcaster RTE took to jamming the pirates despite a government order to refrain.

In 1988, with a newly elected government in place, the Communications Act became law. Intended to sound the death knell for the pirates, whilst clearing the way for the launch of a network of commercial stations, the act still included a loophole that enabled a number of pirates to carry on.

Ireland now has a relatively mature broadcasting system with a selection of national and local stations, but like most places outside London in the UK, very little catering for niche audiences. Scores of land-based pirates, successfully running their operations throughout the nineties to the present day bears testament to this.

Almost to present day. It was 20 May this year, 'Black Tuesday', that we witnessed a major clampdown by ComReg, the Irish communications regulator, against Dublin's pirate radio operators. As a result, the f.m. band there was devoid of all non-establishment broadcasts for the first time in twenty years. A couple of the stations have made it back on the air but it looks as though the authorities finally mean business.

In Holland, a not dissimilar move by the Dutch PTT is hitting land-based pirates hard in a series of raids and closures. In only a month, up to sixty stations were closed down recently and their equipment confiscated.

## Legacy

There is no doubt that offshore radio played a pivotal role in the evolution of broadcasting within Europe, the Middle East and New Zealand. The shock waves sent out from these ground-breaking stations stunned the hitherto blasé

authorities into providing a more inclusive radio service.

Programme providers, not the regulatory authorities, are now to blame for the lack of real choice on airwaves, pandering to advertisers' insatiable appetite for listeners.

There are those, inspired by offshore radio's golden era, that yearn for a return to those halcyon days. A project to refloat the *Peace Ship* and broadcast to the Middle East once more turned out to be an April Fool's caper. However, plans are on the drawing board to refurbish the *Communicator* for use again as a radio station. Meanwhile, Radio Caroline purists want to see the return of their station broadcasting from the *Ross Revenge*.

In truth, the magic of the pioneering spirit that drove offshore radio can never be fully recaptured. Prohibitive running costs, watertight laws and high penalties conspire to strangle any new project at birth. Best, then, to remember the age that gave us the pirates, appreciate their unique place in history, and the significant contribution they made to the broadcasting industry.

If you have access to the Internet, then you're in a position to tap into the hundreds of websites devoted to offshore radio. One of the very best is the Offshore Radio



Guide - a fine collection of watery wireless fare, including a comprehensive photo gallery of all the ships and forts ever used for the purpose of broadcasting, a history of each, and all the latest offshore news.

You can find a link to this and many other sites by checking into a page I've set up for you at <http://tinyurl.com/gt2d>

Shivering Sands fort, home to Radio City.  
© Rainer Knebel.

# BLASTED ONTO THE AIR!

**O**n 29 April 2002 a new station opened. There's nothing particularly special about that, until you read that volunteers played a significant part in its preparation. This feature describes some of the highs and lows in getting the station on the air.

The station in question is Reading College's 'Blast 1386', serving the students and staff of the college. The current Station Manager, **Bob Goertz**, approached the college Principal at the end of 2000 to suggest that a radio station would considerably benefit the students on the Media Studies and Broadcast Radio courses. This was agreed and an approach was made to the Radio Authority (RA) to grant a Long-term Restricted Service Licence (LRSL).

There are three types of LRSL licence available, and the

most suitable for the college was a low power a.m. licence. These are not to be confused with RSLs (Restricted Service Licences) which give a licence to broadcast for a maximum of 28 consecutive days (32 days in some cases) - although the technical characteristics for m.w. RSLs and m.w. LRSLs are the same. Full details of these licences are available from the RA website. Blast 1386 has a license that's granted for a maximum of five years, and to freely-radiate a transmission of one watt on medium wave.

## Power Limiting

A power limit of only one watt may at first sight appear severely limiting, but the primary purpose of an RSL or LRSL is to serve the immediate area around the transmitting site, not necessarily a whole town or village. But in fact the signal will not be as weak as may first appear. To halve the received signal strength, the power must be reduced to a quarter, so a one watt transmitter is only about three 'S'-points (20dB) weaker than a 100 watt transmitter at the same location.

After some discussions, the final frequency allocated to the college by the Radio Authority was 1386kHz. Many readers of *SWM* will recognise this as the channel used by



*The Inovonics 222 audio processor, and Phoenix Communications transmitter make a compact pair on the shelf.*



*The 'bottom end' of the inverted L antenna looking onto the metal-skinned roof area.*

*The vertical element is separated from the vertical support pole. The 'top' part of the inverted 'L' the goes off to the left out of shot.*



# Ian Liston-Smith describes getting a college radio station up and running...

## from the application, through solution and actually doing it!

the Voice of Russia with a listed power of 1200kW and providing, in the evening, a very strong signal across Europe. However, during the daytime the channel is perfectly clear in southeast England.

The RA allocates channels on the non-interfering basis to other UK users. It's just not practical to take into consideration night-time conditions too, and this is made clear in the RA documentation. The channels allocated for these types of station are: 1134, 1251, 1278, 1287, 1350, 1386, 1431, 1449kHz. To minimise (daytime) interference between stations the 're-use distance' for each frequency is at least 13km.

### Strictly Limited

The first decision to be made was on the type and location of the antenna. The RA strictly limits its height to 20m above ground, and to make best use of the available power and provide maximum ground wave signal, a vertical antenna is to be preferred. The antenna often chosen for an RSL or LRS is a base or centre loaded self-supporting 10m vertical pole and these can be installed by a number of professional companies.

The vertical antenna option was explored, but rejected on the grounds of cost and the fact that about 100m of trenching was required across newly landscaped grounds and a car park at the college. A roof-mounted vertical was not possible as much of the radiating pole would be above the maximum height limit.

The next option to explore was a 'T' antenna over a large flat single story college building, with the horizontal section supported by adjacent buildings at the maximum height of 20m. This was rejected on the grounds of visual impact. An unfortunate outcome, as such an antenna would have had a roughly omnidirectional radiation pattern and made efficient use of the one watt e.r.p.

Yet another option was to string the antenna vertically up the side of the main building. This idea was also abandoned

too as it would hinder window cleaning and its proximity to the building was likely to lead to EMC problems with telephones, etc.

Serious re-thinking was required - there were no open spaces that didn't have one or more of the drawbacks already described. Then we noticed a possible site for an inclined inverted-L at the back of the college offices and workshops. The college considered this to be a satisfactory location so we went ahead with some tests.

The base of the antenna was not at ground level, due to the obstruction it would cause, but on a wall adjacent to a flat roof about 7.5m above ground. The vertical section stretches to a pole mounted on a taller building about 10m away, but about 12m higher. The horizontal section of the inverted-L is supported over the flat roof of this higher structure.

### Far From Ideal

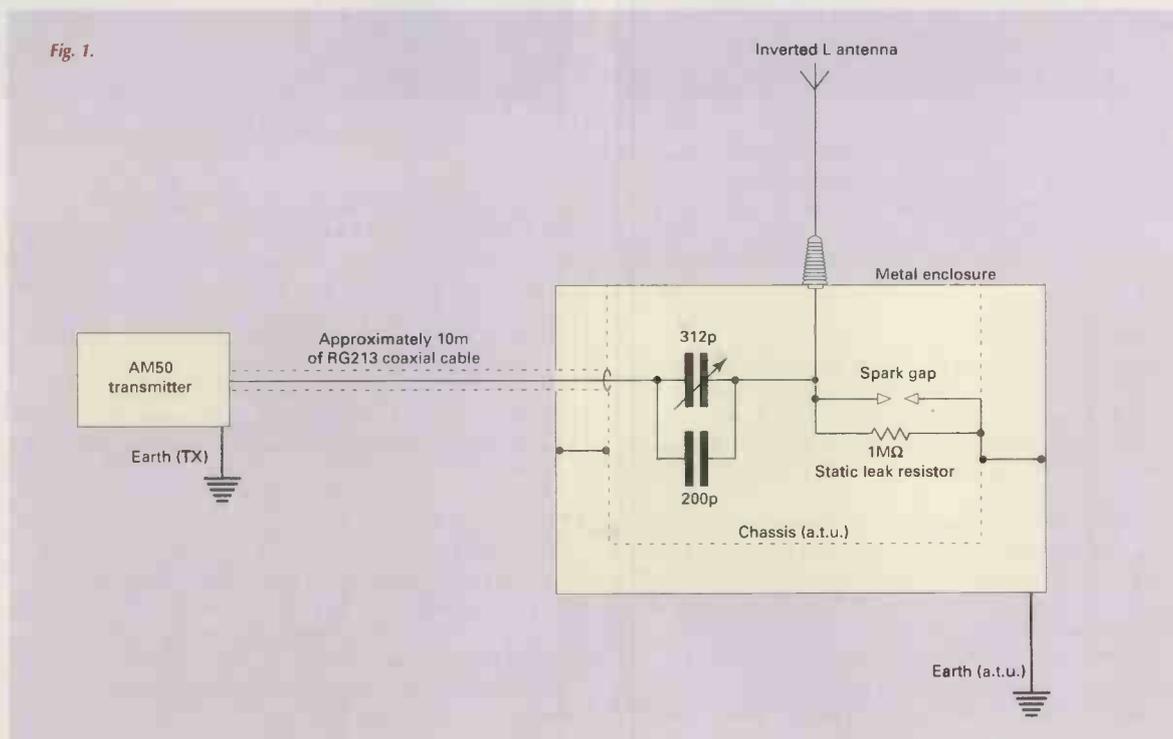
This location was far from ideal due to the proximity of college buildings and the slightly inclined nature of the vertical section, but it had one overriding advantage. New college offices adjacent to, and at the same height as



The spark gap fitted to protect against antenna static build-up. The static leak resistance is made up of two 470kΩ (each one of 4W dissipation) resistors.



The series capacitance is made up of a fixed value of 200pF and a vacuum variable unit. Perhaps it may seem like overkill for such a modest system, but it does work well.





An overall view of the matching unit in the metal security box mounted outside. The coaxial feed and antenna wire pass through base of the box.

the antenna's base had about 400m<sup>2</sup> of shiny new metal roof, all electrically bonded (for lightning protection) to an earthed steel framed building. A better earth plane couldn't be imagined!

The theoretical radiation pattern of an inverted-L is not quite omnidirectional, slightly favouring radiation from the 'elbow'. Nevertheless, radiation is predominantly vertically polarised which is important for best ground wave radiation at medium wave frequencies. However, this really depends upon the overall dimensions of the inverted-L and for best ground wave performance the greatest antenna current must be mainly in the vertical section.

Any radiation from the horizontal section is wasted as sky wave energy and, theoretically at least, could cause interference to other users of the frequency at night. Unfortunately the location of the antenna did not provide us with the luxury of allowing much adjustment in the vertical or horizontal lengths for maximum efficiency.

Once the RA gave us permission to carry out our preliminary tests, a temporary inverted-L antenna was strung up and connected to a low power transmitter running on

may a station of this type acknowledge this overspill, either on air, or in promotional publicity. In practice however, no one expects the signal to stop at the perimeter fence.

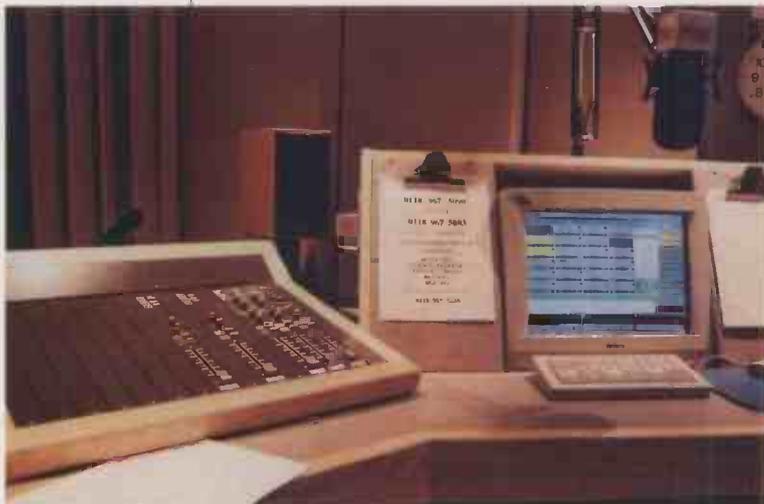
The RA documentation describing m.w. RSLs, (which have the same transmission constraints as an m.w. LRSL), overspill radiation, beyond the boundary is acknowledged. The coverage from the transmitter is described by the RA as being typically a 5-7km radius in rural areas and a 3km radius in urban areas.

### Field Strength

Calculations show that the distances suggested as typical, are those at which the field strength of a one watt e.r.p. transmitter would decline to 1mV/m over rural and urban terrain. Broadcasters apply the 1mV/m figure as the limit of an m.w. service area. It's therefore fair to assume that listeners within this range can adequately receive the station.

Tests of the inverted-L antenna had proved satisfactory and it was permanently installed on poles and insulators ready for the a.t.u. to be assembled. All the a.t.u. components were built into a weatherproof case, along with static protection and r.f. connectors. The length of the horizontal section was finally trimmed in conjunction with the a.t.u. an MFJ-259B antenna analyser (modified to work down to 1.3MHz) for minimum standing wave ratio (s.w.r.).

The a.t.u. circuit diagram shows how simple it is. The spark gap allows any significant sudden build-up of voltage from a nearby lightning strike to jump directly to earth. We considered using an ordinary engine spark plug here, and it



A presenter's viewpoint of the mixing and programme management console.

1386kHz. Various antenna tuning/matching (a.t.u.) configurations were tried, but the simplest one turned out to be the best, Fig. 1. It consisted of nothing more than a variable capacitor between the 50Ω coaxial cable centre conductor and the base of the inverted-L, while attaching the earthed roof to the cable braid via a thick conductor.

### Proved Promising

These initial tests proved promising. With an e.r.p. of under 200mW, the college campus was easily covered with a signal as strong as most of the national medium wave networks, though significantly less than the local Virgin and Classic Gold stations in Reading on 1233 and 1431kHz respectively.

Reading College is split across two sites around 1km apart. Although the LRSL is only intended to cover the main site, it wasn't unreasonable to hope that the one watt signal would give a satisfactory signal at the second site - even if this constituted what the RA describe as 'overspill'.

The limits on the radiated power set by the Radio Authority are necessary to restrict the overspill beyond the boundaries of the site the transmitter is intended to serve. The RA makes it quite clear that under no circumstances



David (left) and Liam (right), two presenters in the middle of a programme.

would probably have worked perfectly well. The capacitance between the contacts through the ceramic body was about 20pF. (I measured this in a motorcycle accessories shop and attracted some very odd looks from the proprietor and customers). How this capacitance may change during temperature extremes and its effect on s.w.r. was unknown so we dropped the idea.

The bleed resistance (actually two 470kΩ, four watt resistors in series) across the spark gap prevents any high voltages from building up on the antenna due to wind and rain static.

### High Voltage

From the photograph you can see that the capacitors are very high voltage types and are completely 'over the top' for a one-watt output! They were bought second-hand and turned out to be cheaper than buying new, more appropriately rated components. The glass vacuum variable has a limited range of 214 to 515pF.

Tests showed that minimum s.w.r. occurred at 512pF - a

bit too close to the limit for comfort. The two grey fixed capacitors to the right provide a combined capacitance of about 200pF and are wired across the vacuum variable. This enabled it to be used near the middle of its range with scope for any later adjustments.

Using high voltage capacitors inadvertently gives extra protection to the transmitter in the event of a nearby lightning strike. A professional installation like this is expected to run for 24 hours, seven days-a-week and no one is going to climb up to disconnect the antenna during a thunderstorm! Unfortunately neither the static leak resistor, spark gap nor high voltage capacitors will give any protection in the event of a direct strike!

The main transmitter is a Phoenix Communications AM5 - an earlier version of the Radica AM50 - and generally considered to be one of the best available for low power m.w. stations. It was purchased second-hand from a football RSL. The maximum power output of this transmitter is 50W.

To obtain an effective radiated power of one watt within the antenna constraints laid down by the RA, it is necessary to feed the antenna with much more than a watt to overcome the high losses associated with such a small antenna - some 20-30W being typical.

The time came to install this transmitter, connect it up to the a.t.u. via about 15m of RG-213 50Ω coaxial cable and see what happened. All went well initially when operating the transmitter in the low power setting when the s.w.r. safety cut-out is disabled. Unfortunately, when put to its normal setting the AM5 kept tripping off. The extra earthing at the transmitter via the coaxial cable sufficiently degraded

and cause distortion. On the other hand, quiet passages will be almost inaudible, especially where the signal is weak, and the processor then increases their volume to a more suitable level.

Secondly, the processor acts as a sort of graphic equaliser. Music contains a very wide range of audio frequencies, from approximately 10Hz to well over 15kHz. As the bandwidth of an a.m. signal is twice the highest modulating frequency, allowing the full range of audio frequencies would occupy at least 30kHz - over three medium wave channels! As the i.f. bandwidth in most medium wave radios is between 6 and 10kHz or so (in order to reject sideband splatter from adjacent 9kHz channels), the higher frequencies are stripped off in the receiver anyway.

### Modulating Frequencies

Unfortunately just stripping off modulating frequencies above 4.5kHz (to restrict the transmitted bandwidth to 9kHz) at the transmitter isn't the whole story. This would leave the modulation sounding rather 'flat' - emphasising the lack of treble. To overcome this, the processor should be set up to increase the treble at roughly 3 to 4kHz to make it sound 'brighter' and then cut it off steeply beyond that. Too much bass also degrades audio balance if there is not much treble.

Much of the actual audio balance, of course depends upon the i.f. bandwidth of individual receivers and their audio response. Should the a.m. station be set up to sound good on a small portable with limited bass response (where bass boost will be advantageous) or for car radios and other hi-fi systems where too much bass with the limited treble of an a.m. signal will sound dreadful?

It isn't possible to make an a.m. station sound good on all radios! After much consideration and listening tests, we think that audio quality of 'Blast 1386' is now adjusted for a reasonable compromise.

Another decision we took was to keep the compression down to a minimum. However, this approach requires the presenters to keep a close watch on the audio levels in the studio. It gives the sound a more 'open' and less fatiguing quality, at the expense of clarity under weak signal conditions. Since the station is only intended to be heard in and close to Reading College, this isn't a problem.



*Liam sorts out his afternoon's programme from his running list and crib sheets.*

the s.w.r. to operate the cut-out. A slight adjustment of the variable capacitor in the a.t.u. brought everything back to normal, with a final s.w.r. of about 1.3:1.

### Electrically Short

Incidentally, some electrically short antennas have a very narrow bandwidth. This has the effect of significantly reducing the power in the sidebands and causing the modulation to sound rather muffled. The 'Blast 1386' antenna bandwidth (where the s.w.r. rises to 2:1) is about 37kHz. Not too bad for a simple wire antenna on medium wave!

The college also acquired an Inovonics 222 audio processor, an essential item with a number of functions. Firstly it compresses the audio to reduce the dynamic range in order to keep the average modulation level high, but preventing over-modulation.

Without an audio processor, loud musical passages or over excited presenters may overmodulate the transmitter, causing the sidebands to splatter across adjacent channels

### Urban Terrain

The transmitter power was adjusted to give field strengths at various distances of what would be expected from a one watt e.r.p. signal over urban terrain. This eventually corresponded to a transmitter power of about 15W into the a.t.u. and antenna.

Daytime listening tests prior to the official launch revealed some surprising results. Monitoring was carried out within a radius of about 5km of the college. A fairly deep null to the south of the college was apparent, almost certainly caused by the concrete, brick and steel building absorbing a significant proportion of the signal in that direction. We always knew that the location of the antenna was far from ideal, but the absorption was probably more than expected. Nevertheless, the signal was quite satisfactory for its intended coverage so this is not a serious problem.

A potentially more serious setback was revealed during these tests. We began to get reports that the station was breaking through on some of the telephones in the college. That was something we were prepared for and expected to cure when, or if it occurred.

Not surprisingly the worst case was the 'phone nearest the

antenna. Changing it to a different type with better r.f. immunity cured the problem. This wasn't an option for the other affected 'phones so r.f. filters were sought. Attempting to track these things down was an unbelievably frustrating business.

After following numerous false leads, we never did get hold of a telephone r.f. filter. (They are no longer available from BT. So, if anyone knows who really does supply them now, please let us know. There is probably an unfulfilled demand for these all over the UK). In the end we resorted to winding the telephone leads through heavy clip-on ferrite blocks - far from elegant but the technique does work.



Over in the corner of the studio is a TV setup for teletext news service. This is an afternoon show in progress with the presenter hiding out of frame!

### Breakthrough Cured

Now we had the 'phone breakthrough cured, or at least brought to a tolerable level and no other problems were evident, so a launch date of 29 April 2002 was set and our first official transmission occurred at 0700 that day.

An early milestone for the Reading College radio network was the setting up of GoldenAir on 87.7MHz and relaying it via 'Blast 1386'. 'GoldenAir' was a three-day RSL from temporary studios in Bisham Abbey near Marlow where Berkshire Golden Youth were to celebrate the Queen's Golden Jubilee and her visit to Bisham Abbey.

Since Reading College has close links with Berkshire Golden Youth, a relay was an ideal way to let the students and staff of the college enjoy the activities prior to and during the Queen's visit on 10 May 2002.

The GoldenAir station's f.m. stereo transmitter and antenna used the facilities of a cell 'phone base station tower about 500m from the Abbey, linked by u.h.f. from the temporary studios. The 15W 'GoldenAir' transmitter fed a ground plane antenna mounted about 18m up the mast.

A vertically polarised 5-element Yagi antenna for reception of GoldenAir, was mounted on the college roof, about 16.5km from the actual transmission site. An f.m. tuner was pressed into service to receive the off-air signal on 87.7MHz and fed the 'Blast 1386' studio desk for retransmission on 1386kHz.

'GoldenAir's band II signal on 87.7MHz was not strong at Reading College, even with the roof mounted antenna. With Heathrow Airport not far away, 'GoldenAir's signal did suffer slight aircraft flutter occasionally. But despite this, the signal, when switched to mono, was more than adequate for retransmission on m.w.

Another RSL set up as part of the Reading College radio network was 'ShowTime' on 106.4MHz for the Royal County of Berkshire Show. This station successfully ran from 20 - 22 September 2002. Both of these stations are part of the continuing training for students, particularly for gaining experience in outside broadcasts.

### Operated Faultlessly

To date, the processor, transmitter, a.t.u. and antenna have all operated faultlessly through high winds, very wet, very warm and cold periods. However, we are actively trying to find ways of reducing the null to the south. Unfortunately the cramped nature of the site and adjacent houses makes this difficult.

For those interested in the professionally-installed studio (which was re-built and configured by transplan who also assisted with the erection of the antenna), the following list details the main industry standard equipment that the college station is currently using:

Two Tascam 501 MD minidisk recorders

Two Denon DN-C630 CD players

One Denon DRM-555 cassette player

Two AudioTechnica AT4033/8441 microphones

A Sonifex MX10 13-channel mixing desk

A Sonifex MXB-25PPM peak programme meter

All studio timings are run from a Rugby MSF clock. Very accurate time keeping in a broadcast studio is essential for counting up to the IRN news bulletins on the hour.

The jingles were professionally produced and the music play-out is accomplished by the PC-based *P-Squared Myriad* system (ver 2.6.14), currently holding more than 6000 tracks and used by over 100 full-time UK radio stations.

Since early August the station has been available live via the Internet at [www.reading-college.ac.uk](http://www.reading-college.ac.uk) - click on the 'Blast 1386' icon to listen. The station now also has its own very comprehensive website at [www.blast1386.com](http://www.blast1386.com)

One of the fascinating features of Internet radio is the ability of the 'net-caster' - via their audio streaming service - to monitor the number of listeners, their country and total listening hours. Blast 1386 for example, has listeners in 32 countries at the time of writing.

But what has made the station so popular amongst Reading's students and internet listeners? Well, this no doubt due to the high quality jingles and the 28 college-trained professional-sounding presenters together with the station's local news and interviews.

Although the Station Manager, Bob Goertz, has had a long career in radio and is the driving force behind the station, 'Blast 1386' is mainly operated by the students and serves the students and staff of the college. It describes itself roughly as a combination of 'Virgin Radio', 'Radio Two', 'Five Live' and 'Radio One'. Additionally it is influenced by and reflects student culture in the area.

Original programming from 0700 to 1900 consists of local and college news, the latest street sounds, chart hits and oldies with hourly news from IRN. Outside those times the WorldSpace Satellite Network has agreed to allow the station to relay 'Potion' as its sustaining service.

Lastly but by no means least, 'Blast 1386' enables the students to become familiar with professional equipment - an ideal training ground for those who wish to pursue a career in radio broadcasting. Something no doubt many of them will do.

### Related websites:

[www.reading-college.ac.uk](http://www.reading-college.ac.uk)

[www.blast1386.com](http://www.blast1386.com)

[www.radioauthority.org.uk](http://www.radioauthority.org.uk)

[www.kernowset.co.uk/blast.html](http://www.kernowset.co.uk/blast.html)

[www.dxradio.co.uk/lpam/blast.htm](http://www.dxradio.co.uk/lpam/blast.htm)

[www.dxradio.co.uk/lpam](http://www.dxradio.co.uk/lpam)

[www.radio-now.co.uk/news093.htm](http://www.radio-now.co.uk/news093.htm)

[www.transplan.fm](http://www.transplan.fm)

# SGC ADSP<sup>2</sup> Speaker



**They say that mimicry is the highest form of compliment, Kevin Nice looks at the new d.s.p. noise reducing speaker from SGC that looks very familiar.**

- **Product:** SGC ADSP<sup>2</sup> Speaker
- **Price:** £119 + £4P&P
- **Contact:** W&S PLC, 22 Main Road, Hockley, Essex SS5 4QS  
Tel: (01702) 206835  
Web: [www.wsplc.com](http://www.wsplc.com)

It's impossible not to draw comparisons with the bhi NES10-2 unit that graces my radio room. This is greatly helped by the choice of the USA based SGC to mount their new d.s.p. module, which is available for fitting inside of your favourite radio's case, in an external speaker box which bears more than a passing resemblance to the one used by their Sussex based rivals.

Noting the considerable success of bhi's very effective unit, I suspect that this is the first of the self contained d.s.p. speakers to appear in direct competition in an attempt to acquire some of the global share of the hobby and professional markets.

SGC have been in the communications business since 1971 when the company was formed by Don Stoner and Pierre Goral. Both whom brought extensive experience in design and construction of radio equipment. Don was known for his many publications in the field of amateur radio, and Pierre had become a leading expert in getting top performance out of h.f. systems.

The company was originally called Stoner-Goral Communications, but that was soon shortened to SGC. Today, Peirre Goral continues the company whilst Don Stoner has become semi-retired and is pursuing the advancement of amateur radio.

SGC exports more than 70% of its production to countries outside of the USA. SGC say that for nearly 26 years, the perfection of h.f. s.s.b. has been the focus and the life of the company.

Today, SGC are keen to promote that they are a prominent choice of leading corporations, governments, relief agencies, para-military organisations, mariners, aviators, explorers, radio amateurs, and scientists throughout the world.

This new self contained speaker, is based on SGC's add-on module the ADSP<sup>2</sup> which designed to fit inside commercial radios, either receivers or transceivers. As you can see in the pictures, the module has been carefully squeezed into the enclosure which rather oddly, is identical to that of the bhi offering. A little research showed that the enclosures are indeed sourced from the same vendor!

I was amused to see an idea which I last saw being used 20 odd years ago, the recycling of scrap p.c.b. material sawn up and utilised as mounts to retain the active p.c.b. modules within the case. Very creative and environmentally friendly.

## What's it Do?

As with all audio d.s.p. units, be they self contained, in-line modules, internally fitted items or computer sound card based affairs, the ADSP<sup>2</sup> takes the band of audio frequencies which have been processed by the receiver circuitry and digitises the analogue waveforms by sampling the audio energy at a suitably high rate. Once the audio has been transformed into digital data the dedicated digital signal processing device can apply its noise cancelling algorithms to this data stream. When the noise removal process is done, the data is fed through another conversion process to return it back into an analogue waveform that is used by the internal audio power amplifier to produce drive for the speaker coil to squash the air between its cone and the user's ears.

## Pretty Impressive

Making the ADSP<sup>2</sup> ready for use is simple enough, you just need to plug the 3.5mm mono jack plug into the audio output of your receiver and provide the unit with 10 to 15V d.c. via a supply that can provide up to 500mA. Usually, I take audio from my IC-R8500's 'Rec-Out' connector for decoding, recording and d.s.p. units such as this. But there was insufficient drive to spur the ADSP<sup>2</sup> into action, so I had to use the 'Ext LS' socket and run with muted audio from the set's own speaker.

The performance is pretty impressive and the ADSP<sup>2</sup> copes well with a wide range of signal types and modes. I found that during my period of use and evaluation there were a couple of areas where it seems to work a little too well. There is no doubt that the ADSP<sup>2</sup> reduces noise very effectively, but it works very hard in no signal situations to provide some quite significant audio artefacts, best described as a loud burbling come chirping sound.

I also found the processing algorithm to be pretty harsh. What I mean is, if you listen to say, JW's favourite test station Radio 4 on 198kHz, then the audio is very pleasant with the ADSP<sup>2</sup>'s top mounted push button used to extinguish both of the green l.e.d.s which hide behind the units front grill up at the top right. These l.e.d.s display the two levels of processing selected. Either 13dB (one l.e.d.), or 26dB (two l.e.d.s) of noise reduction. With neither illuminated, the d.s.p. circuitry is bypassed. I found that the sound quality dropped as I selected more noise reduction. Clearly, this is not really a fair test as there was no noise present on the R4 signal, but it shows what can happen.

I rather prefer the algorithm utilised by bhi's NES10-2, as when there's no signal present the unit makes little sound - unless the highest of the eight processing levels is selected. It's with this top level on the bhi unit that there is some evidence of R4 distortion, but it's never really necessary to go beyond level six.

## Conclusions

I found that the ADSP<sup>2</sup> unit performs well. It is very effective as a noise reducing add-on unit. It's use in either a mobile or fixed environment is simple to facilitate. The use of two l.e.d.s to display the unit's operating mode is very simple yet highly effective. The omission of a headphone socket is an area that should be addressed.



## Specifications:

Size:	112 x 65 x 55mm (wxhxd)
Weight:	300g
Audio Limits:	
Min. Input:	100mV r.m.s.
Max. Input:	5V r.m.s.
Max. Output:	9V r.m.s.
Power Output:	5W r.m.s.
Current Consumption:	
Idle:	110mA
Full out:	500mA
X1	X2
Noise Reduction:	13dB 26dB
Time Delay:	6.5ms 13ms
Tone Rejection:	-50dB -65dB
Filters:	(3dB Bandwidth)
Voice:	300-2100Hz
CW Wide:	400-900Hz
CW Narrow:	600-700Hz
Out of Band Rejection:	-45dB

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## HOT NEWS!

## New Radio from AOR!

## CALL FOR DETAILS

# In The Ed's Shack

**Have you ever got into a mess fitting coaxial plugs to cables? Kevin Nice shows the right way to make a successful connection.**

**H**ave you noticed, however many patch leads you have, you always need more? The problem just grows with every new item of equipment that's introduced into the shack, they all need interconnecting. Each new antenna has a feeder and this in turn requires connecting to one or more items of radio kit.

Good interconnections are essential for reliable performance, be they power or signal leads. For signal leads, specifically r.f. signal leads the effect of the quality of interconnections is a matter of extreme importance, increasingly so the higher in frequency you go.

I must get more questions about r.f. connectors and their use than any other single topic. So it's time then, that I covered the subject here.

## A Little History

As the use of radio grew, particularly in military applications, the need for standardised connectors grew. Good r.f. connectors require a few important criteria to be met. Most important, arguably, are ease of use, simplicity to manufacture, ease of assembly, reliability, low loss, low noise and low cost. All these criteria are relative to the application, but the 1930s saw the Amphenol company's engineers starting to design and produce standard r.f. connectors to fulfil the demands of the day.

Probably the oldest true coaxial connector in use is the PL-259 or u.h.f. coaxial connector, with the matching socket, the SO-239. These connectors were designed by a **E. Clark Quackenbusch** who worked for Amphenol back in the 1930s. This plug and socket connection does not really meet any standards regarding constant impedance and is certainly not reflection-free. This does not normally cause any

## Fitting A PL-259 Plug Onto Coaxial Cable

### Type 1, with a threaded clamp sleeve for the screen

Cut and carefully remove the various lengths of insulation shown here. Try to get the insulation from the inner conductor without nicking or cutting the inner conductor.

Unpick the screening braid and separate the strands then fold the screen braid back over the clamp sleeve and cut it to the length shown (along the plane 'C' - 'C'). When ready to be screwed into the main body there should be about 2mm of inner insulation showing.

Screw the clamp sleeve into the body of the plug as far as it will go. At this point you should be able to see the braiding through the small soldering holes in the waist of the plug. Take care to make sure that all the wires that make up the centre conductor go cleanly down the centre contact tubing without touching the main body of the plug.

Solder the screen braid to the body of the plug at the points marked 'A' and then cut the centre conductor short at point 'B' before soldering that also.

Screw the retaining cap down over the body of the plug and it is ready to be used.

### Type 2, with a screw thread to 'bite' and grip the screen

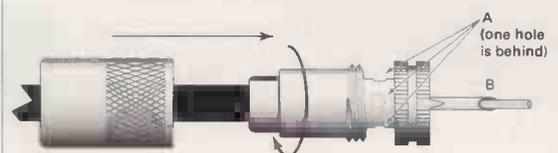
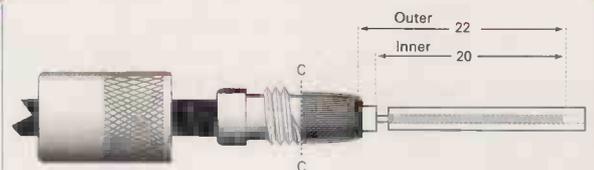
Cut off and carefully remove the various lengths shown here. Try to get the insulation from the inner conductor without nicking or cutting the inner conductor.

Sometimes, depending on the type of plug, the screen conductor must be folded back over the outer insulation to allow the internal thread to 'bite' into the screen. It is also an advantage to quickly tin the trimmed back section of screen before screwing it into the body of the plug.

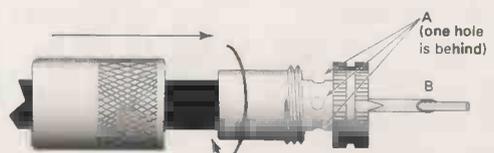
Screw the cable tightly into the rear of the plug until the screen can be seen through the small holes in the waist of the plug. Take care to make sure that all the wires that make up the centre conductor go cleanly down the centre contact tubing without touching the main body. Sometimes, depending on the type of plug, the screen conductor must be folded back over the outer insulation to allow the internal thread to 'bite' into the screen.

Solder the screening to the body of the plug at the points marked 'A' and then cut the inner short at point 'B' before soldering that also. Screw the retaining cap down over the body of the plug and it is ready to be used.

Type 1



Type 2



problems at lower frequencies, but above about 100MHz the mismatch can be a problem.

The highest frequency where this combination is generally used by radio amateurs and listeners is 145MHz.

It seems that up to the 1930s the feeder between antennas and the equipment was parallel wires, with spreaders and binding posts. When the first r.f. coaxial cable was marketed, the 'UHF connector' PL-259 was introduced.

The impedance of the coaxial media is determined by the ratio of the inner and outer diameters with a correction factor for the type of dielectric. This calculation gives the impedance of most PL-259s as roughly 30Ω, not ideal for use with a 50Ω cable!

During WW2, radar required a better connector and two designs followed. The first attempted to make a connector look like a section of 50Ω cable, this was designed by Paul Neill at the Bell Laboratories and known as the type-N connector. An Amphenol engineer Carl Concelman however, noticed that there was a small amount of inductance where the centre pins of the N-type connectors meet. By changing the position of the dielectric used to fill the connector, he was able to introduce some reactive cancellation and this type C connector allows it to be used well into the GHz region. Shortly after this, Neill and Concelman co-operated on the design of a miniature bayonet locking connector. This combined Neill's mechanical design with Concelman's reactive dielectric and his twist-on locking ring. The Bayonet Neill Concelman (BNC) connector had arrived.

Because of the noise generated by the BNC connectors under extreme vibration, Neill and Concelman worked on a

threaded version. The Threaded Neill Concelman (TNC) was developed in the late 1950s.

Lastly in this potted connector history lesson, comes the SMA connector, an acronym for SubMiniature version A. This connector was developed in the 1960s. The 50Ω SMA connector is a semi-precision, subminiature unit that provide excellent electrical performance from d.c. to 18GHz. These high-performance connectors are compact in size and mechanically have outstanding durability.

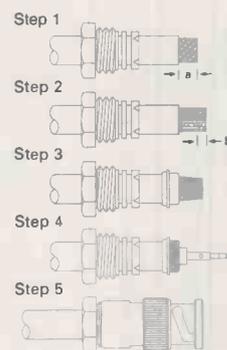
That covers the coaxial connectors that you'll find on most equipment used by readers of *Short Wave Magazine* I would hazard a guess that there aren't many using C-Type connectors, but please correct me if I'm wrong. If you feel I should mention more, likewise, please let me know.

It's my guess that the most common connector in use in the radio rooms of readers is either the PL-259 or perhaps the BNC, with the ever increasing move higher in frequency I imagine that there are many N-Type plugs required to be fitted to cables too. If you've been struggling to work out how to correctly fit any of these plugs to cables, then help is at hand. Following is a guide to help you ensure success.

Before moving on to the instructions, one word of advice. It is of paramount importance that you have a soldering iron that is capable of delivering heat to the connector body or tip quickly. The key is **quickly** as this both prevents melting of the cable's insulation and ensures a good soldered joint. There is no room for compromise here and you need a soldering iron of at least 50W and a minimum of a 5mm tip, which must not be pitted and is well tinned. I cannot stress enough that quick heat transfer is imperative for success.

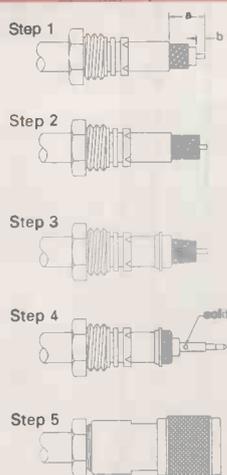
## Fitting A BNC Plug Onto Coaxial Cable

- Step 1.** Fit nut, washer (when supplied) and gasket over cable and strip outer insulation to dimension 8mm shown in table above.
- Step 2.** Comb out braid and fold out. Trim insulation from centre conductor to 3mm. Tin the centre conductor.
- Step 3.** Pull the braid wires forward and taper toward centre conductor. Place clamp over braid and push back against the outer insulation.
- Step 4.** Fold back braid wires as shown, trim to proper length, approximately 3.2mm long and form over clamp as shown. Braid wire should not extend beyond step of braid clamp. Solder contact to centre conductor, sliding bushing first (when supplied) over the centre conductor.
- Step 5.** Insert cable and parts into connector body. Make sure sharp edge of clamp seats properly in gasket. Tighten nut to approximately 1.7Nm (1.25ftlb).



## Fitting An N-Type Plug Onto Coaxial Cable

- Step 1.** Place nut, washer and gasket (with 'V' groove toward open end of cable) over cable, and cut off outer insulation to 9.9mm.
- Step 2.** Comb out braid and fold out. Remove centre insulation to expose centre conductor to 5.9mm.
- Step 3.** Pull braid wires forward and taper toward centre conductor. Place clamp over braid and push back against cable jacket.
- Step 4.** Fold back braid wires as shown, trim braid to proper length and form over clamp as shown. Tin centre conductor and solder on contact.
- Step 5.** Insert cable and parts into connector body. Make sure sharp edge of clamp seats properly in gasket. Tighten nut.



Please note that the examples given above relate to RG-58 cable. Dimensions may vary depending on the connector manufacturer.

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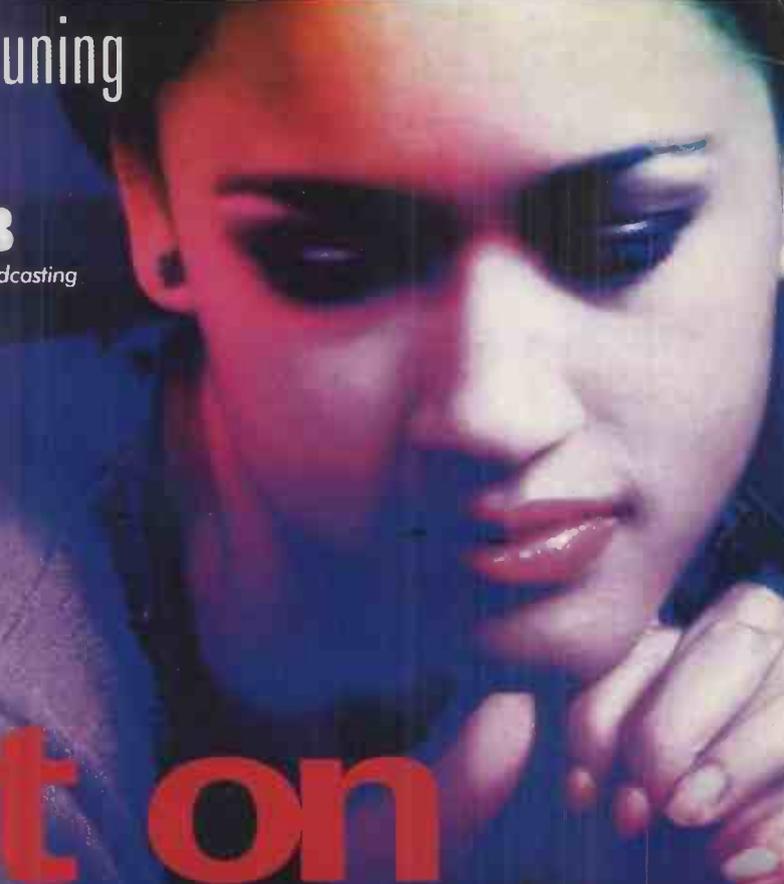
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**Y**ou just don't realise how much you rely on modern technology until it's not available! Most people reading this who operate a computer will have experienced a problem where it's out of operation for a day or two, but I am currently into my tenth day without a machine and I am tearing my hair out! Every engineer in the locality suddenly found their workload upped by 500% thanks to a machine virus and I couldn't get anyone to look at the computer for at least a week. My laptop was on holiday on the Norfolk Broads, (a friend borrowed it to write some speeches whilst on holiday), so I was left powerless and very frustrated.

Whilst downloading a new driver for my modem, I may have contracted the Blaster virus, although the symptoms did not follow the general pattern of that virus. Whatever caused it, when I re-booted the computer, Windows was not there, just a list of missing, or corrupt files and the system registry was a disaster area. Consequently, this month's offering is somewhat late and being written from memory on a strange computer as all my notes for the column were lost. The main data was safe but my notes directory was not backed up.

When you think that addresses, telephone numbers, my accounts, databases, digital photo's, magazine articles, etc. were all inaccessible, it's surprising how much reliance we put on these stupid machines - great when they work, but when they don't! If I ever get my hands on the sad individual who started the virus, an accident with a large pair of rusty scissors will take place.

Anyway, having now vented my anger, on with the column...

## Frequencies

I have had a letter and two E-mails from readers who have noted some frequency changes that may also have a distinct pattern to them. Firstly to confirm that the Buchan UK Air Defence frequency of 375.55 has replaced 354.5 as TAD 080. Wittering Approach Radar Director is now 374.925 this replaces 388.525. Link these changes in with: Lakenheath Ground moving from 397.975 to 231.425, Donna Nook Range changing from 387.675 to 340.150, Culdrose Radar changing from 388.0 to 262.775, Waddington Tower frequency 388.225 has been replaced by 370.125 plus Wittering Approach 374.925 has replaced 388.525.

As can be seen there appears to be a distinct pattern with frequencies being moved out of the 380.00 to 399.975MHz band, especially for allocations to airfields. Having said that, according to my records there are still quite a number of allocations in that band especially within UK and NATO tactical frequencies. So, it will be interesting to see if the trend to move frequencies continues.

One correspondent asks if the moves could be the start of a big change around, like there used to be in the seventies and eighties. I personally think that it's an unlikely scenario, the regular mass change around of UK u.h.f. frequencies that used to take place every five years during the Cold war appears to be a thing of the past. Although airfields were affected during those

big changes, they were primarily aimed at London and Scottish Military and in particular UK Air Defence Radar frequencies and their associated TADS.

There are still quite prominent frequencies allocated within this band such as Boscombe Down Tower on 386.7 so perhaps the changes are just a co-incidence rather than a move to free up the band noted above. Time will tell - With thanks to **Steve F**, **Dave P** and **Norman**.

## Concorde RIP?

I have had an E-mail from **Roger M**, who works for British Airways and comments on my recent item about Concorde (1969 - 2003?). He says that it is ironic that Concorde is now operating at close to maximum capacity as everyone who can afford it wants to fly on this sleek aircraft before it is retired (seats are being offered at a much reduced price). He also states that it's ironic that many of the VIPs who supported the aircraft for years, (a.k.a. people with lots of money), are now deserting Concorde for First Class on other aircraft types as they do not want to fly with the likes of you and I!

Roger also tells me that they have received numerous bids for the final resting place of the aircraft not only from some of the more obvious museums such as Duxford, Cosford and the Smithsonian but also from other sources such as USS *Intrepid* a retired aircraft carrier now permanently sited on the Hudson River in the USA. Now, siting it there would be an interesting logistics problem!

Sadly, further attempts by **Richard Branson** to keep the aircraft in service have perhaps not surprisingly failed. And so, by the time you read this the flying career of one of the worlds great aircraft may almost be at an end. The last





scheduled operational flight is due from New York to Heathrow on the 24 October 2003. There is however one last glimmer of hope, a feasibility study has been started to look into the possibility of keeping one aircraft airworthy for airshows, flypasts and other special occasions - let's hope that this is both a practical and viable option.

### Airline Callsigns

Correspondent Dave, who regularly visits Gatwick has passed on a couple of pieces of new callsign information. New airline EU Jet are using the three letter ATC code EUY and the callsign Euroairways, Maersk Air UK are now called DUO and are using the callsign FLYDUO the old callsign BLUESTAR apparently having been dropped. Another new airline FLYJET have been heard using the callsign ENVOY. He also asks why Heathrow's aircraft viewing area is still closed when the war in Iraq proper finished months ago. "If security is the primary reason for the continuing closure why are the viewing areas at the UK's two other largest airports at Gatwick and Manchester still open?" Good point Dave and thanks for the information.

### Bristol Balloons

Regular readers will know that my primary

aviation interest is military aviation but with my photographic hat on, I have photographed all sorts of other aircraft, including airliners, propliners and even balloons although I draw the line at Cessna 172s. I find balloons very colourful and highly photogenic subjects, so for the third year running I made a trip up the M5 to Ashton Court for the Balloon Fiesta. The past two years has seen strong winds and torrential rain in 2001 which turned the launch site into a quagmire. Plus more strong winds in 2002 meant many launches were cancelled over the these two years, (and always when I was there).

The weather for this year was almost perfect in the midst of the August heat wave and so, a trip to the special shapes launch and the nightglow on Thursday evening proved very entertaining and highly successful for photographs. We were up at 0515 as Friday morning dawned warm and bright but sadly the high pressure brought early morning mist and only one kilometre visibility.

As the balloons require a minimum of three kilometres to fly within Visual Flight Rules limitations, the mass launch was cancelled and because of work commitments, I could not stay for a later launch. So, once again, I failed to see the

mass launch. Frequencies reported to me as in use were 122.475/Balloon Common and one report on the Internet of 130.675. Whatever your aviation interests, anyone who has not been to this event should make the effort at least once as it's a highly entertaining.

And finally, due to the loss of my notes, (yes, I'll add that directory to my back-up in future), I will hold over the second part of my RIAT 2003 report until next month. Lastly, thanks to the people who sent in information and favourable comments about the C-135 article, glad you enjoyed it. It was good to see some civil airband information arriving in my postbox, something that has been lacking in recent months.

So, if you pick up new information such as civil callsigns don't forget to send it in to 'Sky High'. Because of my computer problems it is a slightly shorter column this month, but there are two pictures to compensate.

**Our first photo this month, shows one of the very colourful tailfin schemes at Fairford - a Belgium F-16, arriving during the appalling weather on Thursday. The second photo is from the Thursday Nightglow at the Bristol Balloon Fiesta.**

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Over the last few months I've been using the latest edition of the *Airwaves* frequency guide, which was published in April. Copies are available from specialist book shops, and also the SWM Book Store. This is the tenth edition since the original A4 sized newsletter in 1974, and now contains over 5,200 airband frequencies in the h.f., v.h.f. and u.h.f. airbands. This edition follows the format of previous ones, covering v.h.f. and u.h.f. frequencies first, then h.f. frequencies, and followed by ICAO airfield codes, UK SSR 'squawk' codes, and finishing with various maps and charts for UK airspace.

At the beginning it lists 'area' frequencies, various military and range frequencies and a long listing of air-to-air and air defence frequencies. The main part of the v.h.f./u.h.f. section lists everything in airfield name sequence, so if you know 'where' you're going, it's very easy to find all the relevant airband frequencies. Following this is a listing in frequency order, so if you find an active frequency you can quickly work out who is using it.

The h.f. section of *Airwaves* follows a similar pattern - it covers the major world air routes, then Airlines and company frequencies, followed by a large section covering military h.f.; this is then followed by an h.f. frequency listing covering all the h.f. frequencies mentioned in the previous sections. I find the h.f. sections in the book to be extremely useful, and throughout the year whenever I find any new h.f. frequencies I can insert them into the relevant section, usually using sticky note-pads. The incremental frequency listing is also very useful for finding out who may be using adjacent frequencies when you detect new or unknown signals.

The maps and charts in the book are also useful, especially if you listen to the NAT tracks. I always find it difficult to remember where the oceanic entry/exit points are (in terms of latitude and longitude), and referring to the maps while listening to an aircraft passing a position report allows me to work out which is the most likely routing they will take as they head into Europe. I know that people who regularly monitor the NAT tracks more than I do, will already know all these positions by heart, but I find it easier and more convenient to use the maps.

*Airwaves 2003* costs £9.95 and is available

from the SWM Book Store. Does anyone know of any similar frequency guides covering h.f., v.h.f. and u.h.f. For the past few years I have only seen *Airwaves* but I would like to try some of the others that must be out there somewhere. I am aware of a few which cover v.h.f. and u.h.f., but ones covering h.f. seem to be quite rare. If anyone knows of any more please get in touch.

## Monarch Airlines

A recent E-mail sent via the World Utility Network (WUN) Internet group provided some updated information concerning Monarch Airlines and their h.f. operations from Luton Airport. In response to a listeners request for more information Monarch listed details of their frequencies and equipment.

Monarch Airlines operate their own h.f.



radio system which is located at their main Operations Control centre at London Luton Airport. The callsign is 'Monarch Operations Luton'. They have a total of 13 company h.f. frequencies with 11.351MHz being the initial contact frequency (ICF). Their other frequencies are, 5.532, 6.556, 6.637, 8.936, 10.021, 10.027, 10.066, 11.363, 13.342, 17.916, 21.931 and 21.940MHz. Some of these will update the entry for Monarch Airlines in *Airwaves 2003*.

Monarch use a single rotary antenna and two fixed dipole antennas. Radio equipment includes a pair of Icom receivers (IC-R71E and IC-M700LK). For transmitters they use a Barrett 950 TX/RX and Baumberger Electronics BE993-150 SELCAL encoder. See the Web Watch panel for some Internet addresses which contains pictures and information for some of this equipment.

## Easyjet Luton

An E-mail from Simon Woods in the 'SWM Readers' group on the Internet a few weeks back posed a suitable question for this column, and as his question doesn't appear to have been answered I thought I would seize the chance to answer it here. Simon explained that he visited Luton Airport and noticed on the Easyjet offices a mast with what appeared to be an h.f. dipole antenna. Simon wanted to know if anyone knew of any valid h.f. frequencies for Easyjet Ops. This is quite an easy question to answer, and I thought it was worth repeating as I originally answered an almost identical question in early 2000, so it does pay to hang on to your old magazines!

Easyjet are known to use at least three h.f. frequencies at Luton, and they don't appear to have changed since my original report a few years ago. 'Easy Ops' have been heard on 11.363MHz (their primary frequency), 13.285MHz and also 21.931MHz. I would expect them to have a frequency lower down

in the h.f. bands, and I have seen reports that mention 8.840MHz, but I have not personally heard them. The first of the frequencies is quite an interesting and busy (at times) one, it's used by three different airlines, all with flights in and out of Luton Airport; as well as Easyjet it's also used by Monarch Airlines (see

elsewhere on this page for more details and Britannia Airways. You may also hear a 'slavic' language on this frequency at various times, this is almost certainly TAROM (Romanian Airlines).

Simon Wood also asked about v.h.f. 'operations' frequencies for Easyjet at Luton. Although this question is outside the subject matter of this column, I would suggest 131.775MHz and 136.8MHz (although I have also seen 131.4MHz listed).

## Web Watch

Monarch Airlines  
[www.monarch-airlines.com/whatwedo/index.asp](http://www.monarch-airlines.com/whatwedo/index.asp)

Photavia Press  
[www.photav.demon.co.uk](http://www.photav.demon.co.uk)

Barrett 950  
[www.candlinternational.uk.com/Barrett%20950.html](http://www.candlinternational.uk.com/Barrett%20950.html)  
[www.barrettcommunications.com.au/pages/950-transceiver.html](http://www.barrettcommunications.com.au/pages/950-transceiver.html)

BE 993-150 selcal encoder  
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July was another exceptional month as transatlantic TV and f.m. signals continued to invade the UK. Records were broken - let's hope the trend continues!

### Reception Reports

On 6 July, Syria on Channel E2 was already established by 0900 with intermittent weaker signals on E4. Reception was observed for over an hour by **Peter Chalkley** (Luton). At 1053, **Peter Barclay** (Sunderland) captured Jordan E3 with Arabic singing and dancing; by 1134 Arabic text was scrolling along the foot of the screen. On the same morning, **Simon Hockenull** (Bristol) identified Rumania on Channel R5 (93.25MHz) from either Gheorghieri 50kW or Barlad 50kW, the latter outlet being vertically-polarised. On the 8th, Simon received TVR-1 from the Cahul R1 transmitter in Moldova.

RTP-1 E4 (Valenca do Douro 50W) was seen on the 18th at 1906. Incidentally, the FuBK test card is still used by RTP. On the 19th, Peter Barclay and Vincent Richardson (Dolgarrog) monitored the Jordanian news on E3 until 1120. At 1427, Peter Barclay became aware of an Italian private station on Channel C, with an indecipherable logo in the lower-right of the screen.

By 2149 on the 18th, RUV (Iceland) had materialised on E4, with film credits followed by programme trailers. Peter also saw RUV on the 22nd at 1136 with trivia text pages. Simon Hockenull saw the Icelandic weather chart at 1930. On the 26th, Iran (IRIB-1) was resolved on E2 by Peter Barclay between 1046 and 1105. Belarus and the Ukraine were present at the time.

### Transatlantic Reception

**Roger Bunney** (Romsey) advises that on 1 July, **Hugh Cocks** (Algarve) received transatlantic

Spanish-speaking broadcasts on Channels A2, A3 and A4. Puerto Rico A2 was identified during the evening of the 3rd, making it the fifth consecutive night of transatlantic reception.

*Six News* describes a DXpedition to St. Pierre, an island near Nova Scotia (Newfoundland). From 10 June European video buzz was detectable everyday. In the USA, Scandinavian E2 stations such as Varanger (Norway) have been identified on a regular basis. Armed with a newly-acquired D-100 DXTV Converter, **Mike Bugaj** (Enfield, CT, USA) resolved European pictures on Channel E2.

In Europe, transatlantic openings on 50MHz (6m) have occurred at least 35 times. Traditionally, transatlantic reception is expected towards midnight but this season openings have been experienced almost any time of the day. **John Faulkner** (Sutton-in-Ashfield), **Tim Bucknall** (Congleton), **David Hamilton** (Cumnock), **Cyril Willis** (King's Lynn), **Paul Logan** (Linaska, Northern Ireland) and **Janpeter van Dijk** (Netherlands) were among the lucky ones who detected transatlantic TV and f.m. carriers many times throughout the month.

On the 6th, TV carriers were evident on Channels A2 to A5 between 2000 and 2200 and also the following evening just before midnight. On the 8th, signals were detected in the Netherlands. Mid-afternoon reception occurred on the 9th and again on the 17th when Cyril Willis clocked up at least 13 TV carriers on A2, A3 and A4. One A3 carrier is thought to have been from Venezuela. More transatlantic signals were evident on the 19th, 21st, 22nd and 23rd.

### Japanese Path

At around 0900 on the 20th, a 6m opening bridged Europe and Japan, during which David Hamilton discovered a carrier at 46.250MHz which is the nominal frequency for Channel 0 TV in Australia. However, the offset does not

match any known station still operating on this channel. Later in the day, A2 video reached the Baltic area.

### Chinese Stations

**Lt. Col. Rana Roy** (Northern India) reports Dubai E2 and UAE (Abu Dhabi) E3 most days between 0600 and 1815 (local time). These were often accompanied by an unidentified Arabic station on E3 which had a logo in the top-left with white Arabic text on a red band. Russian and CIS stations on R1 and R2 were also seen. Later in the month, Chinese stations CCTV-1 and CCTV-4 emerged on Channel C1 (49.75MHz).

### Tropospheric Reception

Improving conditions on the 14th, produced a glut of Swedish, German and Dutch u.h.f. stations for **Peter Barclay**. **George Garden** (Edinburgh) received excellent colour pictures from NRK-2 and TV Norge at u.h.f. during the early hours, in addition to Norwegian f.m. stations NRK P1-5 from Halden, Bergen and Gulen.

### Mystery Channel

On the 23rd, Stephen Michie (Bristol) once again received the mystery Ukrainian transmitter on 57.75MHz. This non-standard System D frequency is only officially allocated in China (Channel C2). Perhaps this is the same signal that John Faulkner encountered the previous month?

An 'e' logo seen on Channel R2 by Peter Barber (Coventry) and Tom Crane (Hawkehill) originates from 'TV Epa', Kiev, which time-shares with the 'Inter' network.

### Service Information

Hungary: The main TV service has ditched its 'm1' identity in favour of 'mtv'. Meanwhile, Moldova now identifies as 'm1'.

Russia: Beware of the Russian ex-ORT network (now known as 'Pervyy Kanaal') as their new logo is a striped '1' and is very similar to that of YT-1 Ukraine!

Latvia & Lithuania: These two countries appear to be causing confusion. Lithuania is identifying as 'L1' this season and not LRT. Peter Barber (Coventry) describes the 'L1' logo as a trapezium formed by the 'L' and the '1'. In Latvia, the Kuldiga R1 transmitter airs its second-network, which is aptly named LTV-7! Both countries have supposedly converted to PAL but Gordon Still (Ruislip) has resolved LTV-1 (Latvia) on R3 from Riga in SECAM.



Fig. 1: The Chinese 'CCTV' test card. Photo supplied by Bertrand Prince (France).

Fig. 2: The Chinese 'JSTV-2' test card received in Japan by Kazunori Watanabe via Sporadic-E.

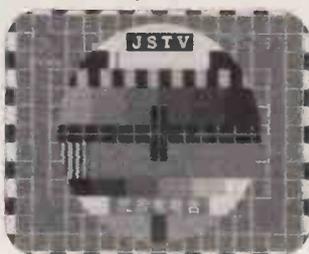


Fig. 3: The BBC Bat's Wings Identification Symbol which was first transmitted 50 years ago in December 1953. The BBC knew how to design Idents in those far-off days!

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# Propagation

Forecasts

- Jacques D'Avignon VE3V9A
- E-mail: Jacques@pwpublishing.ltd.uk

## 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.

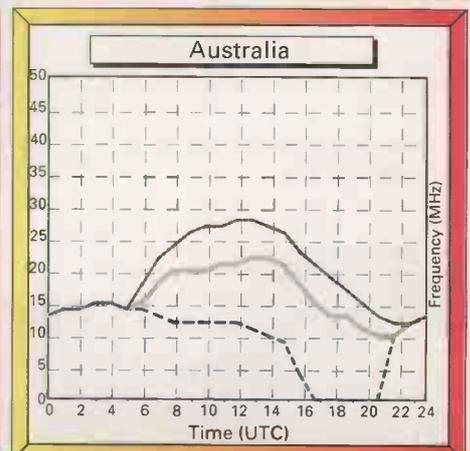
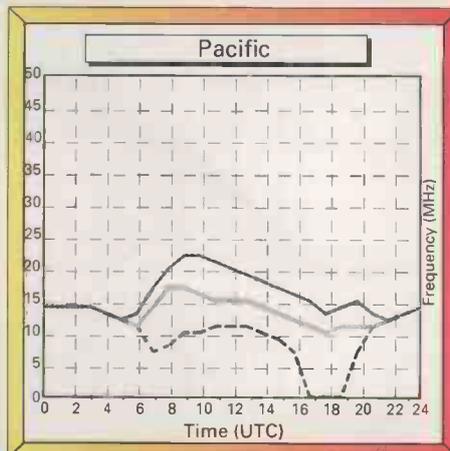
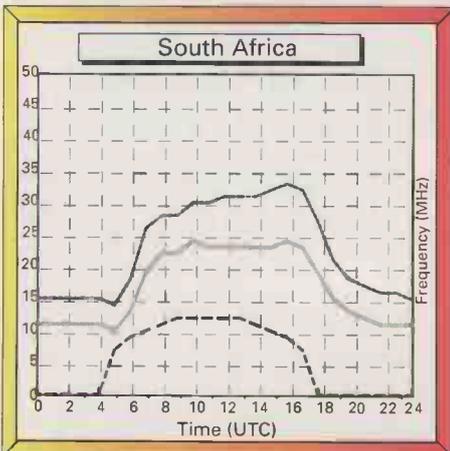
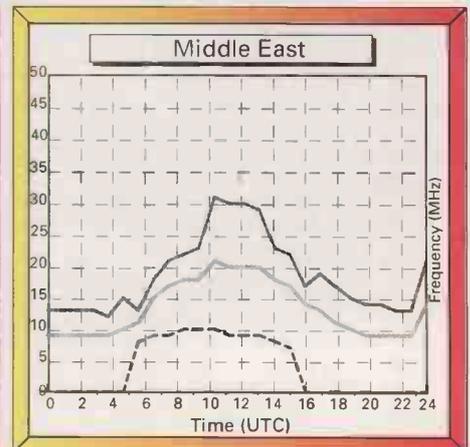
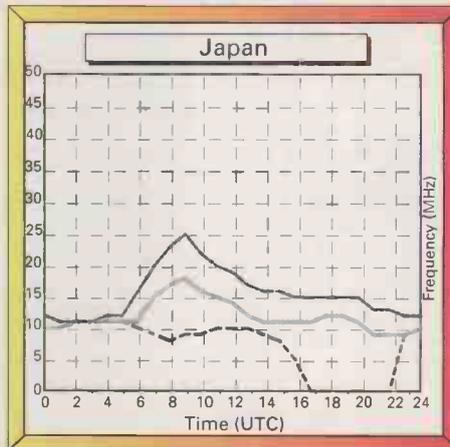
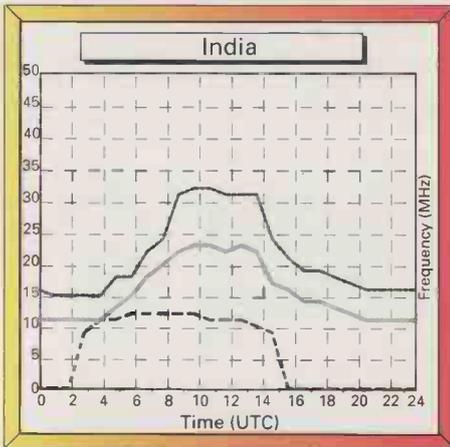
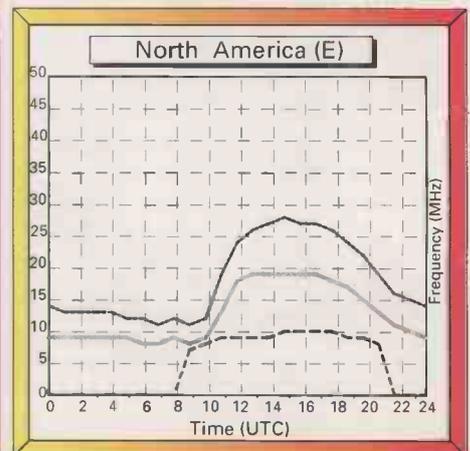
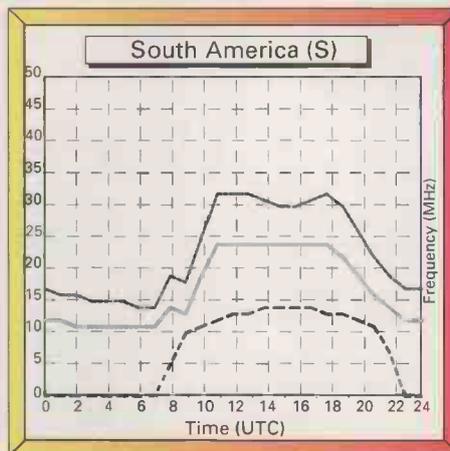
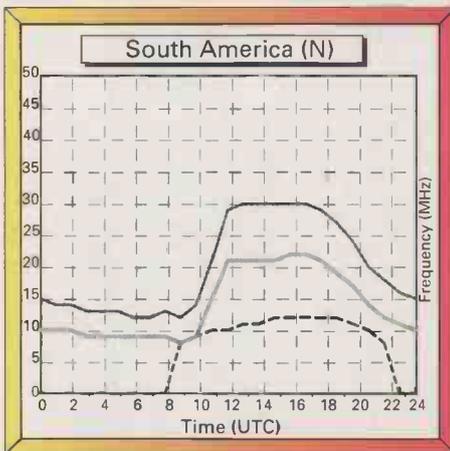
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

October 2003  
Circuits to London



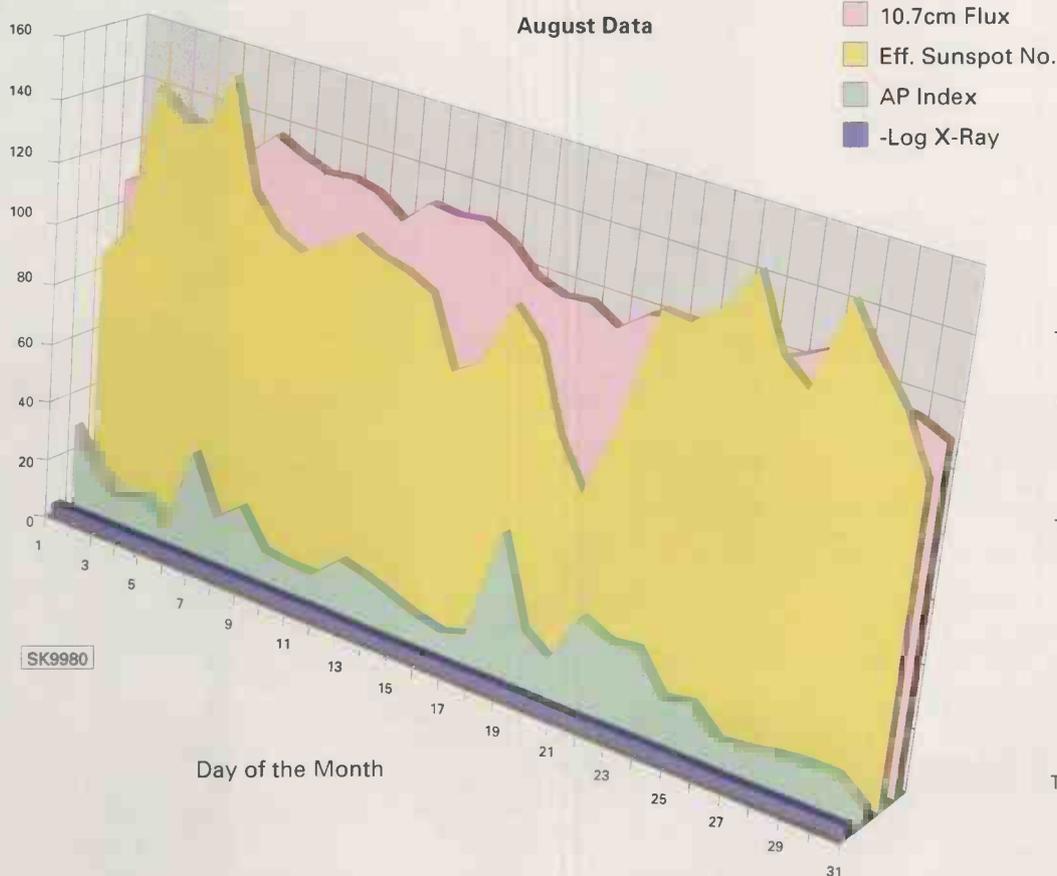
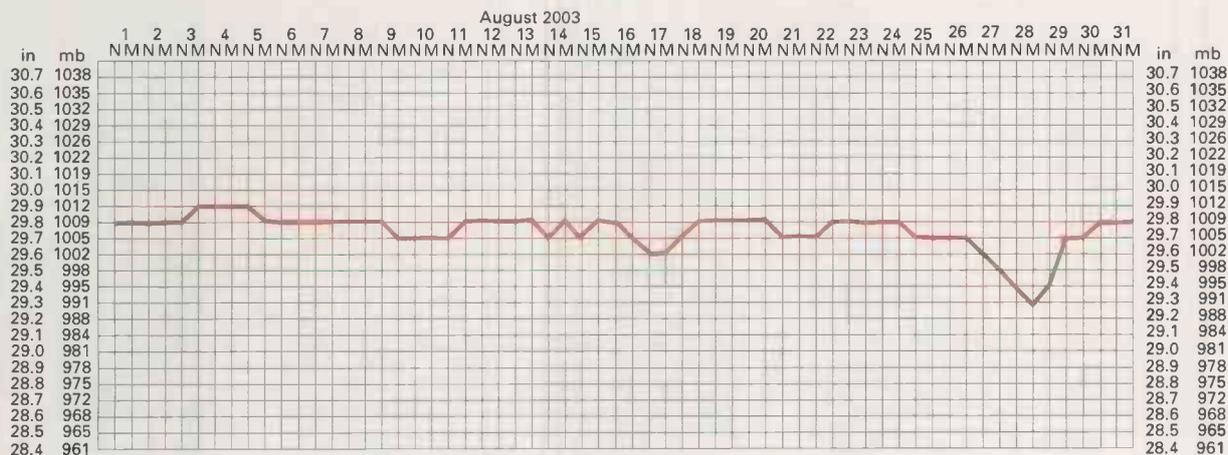
SK9979

# Propagation

Extra

- Kevin Nice G7TCM3SWM,  
SWM Editorial Offices, Broadstone
- E-mail: kevin.nice@pwpublishing.ltd.uk

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

# Satellite

TV News

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

The weekend of 9/10 August the recent heatwave produced record high temperatures August, Prince Charles and Camilla were attending the Mey Highland Games at Caithness in the far north of Scotland. This event featured essentially Scottish traditional games on a very informal basis such as tossing the caber, tug-of-war and an unusual weight throwing feature. The latter competition involved swinging and throwing a large weight upwards over the athlete's head attempting to clear a form of jumping bar - taking care the weight didn't return to earth on said athlete's head! A good time was had by all the whole affair was satellite downlinked via the *Eutelsat W1*, 10°E UP4/APTN lease, 10.970GHz-V (SR 4167 + FEC 5/6).

Previously, North Korean footage had been seen over *W1* but it now seems to be a more common transmission. Sunday 3 August and the Israeli 'SATLINK' feeder carried what appeared to be the end of the North Korean main TV channel's programmes and closedown sequence out of Pyongyang (1330). A roller caption with Chinese script at programme end, followed with a fluttering flag (star in circle) and onto colour bars. The time corresponds with their TV closedown. The carrier remained at after 1400 hours an APTN feed was fed out of Jerusalem and another from Ramallah. Signal strength was marginal just above threshold with the onset of freezing and pixellation. 'SATLINK' appeared at 12.741GHz-V (5632+3/4), slightly higher in frequency than reported in July. The same day I 'found' a new Turkish news agency linking over *W1* @ 11.594GHz-V (3777+5/6) - 'CIHAN HABER AJANSI' (CIHAN NEWS AGENCY) transmitting footage of floods and other Turkish news, uplinking out of Istanbul. Curiously on several occasions in early August *Europe\*Star-1* @ 45°E a strong carrier has been present over several days - 12.678GHz-V (6109+3/4) identifying as 'SERVICE 1' - no video was seen, checking on the RSD revealed uplink equipment in use was 'NDS NETWORK' origination confirmed a TV feeder. I wondered if this could have been out of Iraq as Roy Carman (Dorking) had noted 12.686GHz-V (5632+3/4) running 'Reuters Baghdad' end July over 45°E during a gun battle as witness from a hotel roof in downtown Baghdad. Perhaps the uplink gear is left operational on-site for other potential broadcast customers.

*Telecom 2D* has often been mentioned as the home of Granada-land TV companies (Meridian, Anglia, Harlech) feeding lines into their evening news programmes - Meridian of course were very active with their Cowes, IoW yachting coverage nightly 4-8 August over 12.580GHz-H (5632+3/4) over the 'BT TES-43' truck. Unfortunately, news isn't always good and 22 July found TES-43 down at Littlehampton Quay, West Sussex. Three divers had been offshore exploring a wreck, one surfaced but a companion rose to the surface too quickly and died of the 'bends', a 2nd was brought ashore and airlifted by helicopter to Haslar, Gosport though he later died. The Meridian truck provided live pictures from the quayside updating viewers on the local tragedy and recording a report for playing later that evening. Meridian's 'BT TES-43' leased truck has been testing with MPEG 4:2:2 during week commencing 11 August, hopefully this will not be adopted by the other Granada news trucks! Checking *Telecom 2D* higher up, found a clutch of regional TV feeds for French TV channels which seem to use the 12.600-12.750GHz-H part of the band running SRs 4214 or 6289 (FEC unknown). It's unusual to log a new satellite but at the end July the 'UKRAINE WORLD' feeder over *Express-1AR* was found. It was a weak signal at 11.609GHz-V (3750+3/4), there are programmes fed over this frequency though signal levels appear marginal. I have had no success to date in locating a footprint for the Ku downlinks for *Express-1AR* from the usual websites and have now tried NASA - several Russian sources proved inconclusive!

*Eutelsat 2F3* nominally out at 21.5°W can be difficult to

find as it's drifting now within a 3° inclined orbit, so twice a day it passes through the actual 21.5° Clarke Belt slot so is visible by not inclined tracking dishes for a few hours a day only. Alan Richards (Nottingham) found 2F3 on 9 August at 11.014GHz-H (5632+3/4) feeding pictures over UKI-784 from a steam rally at Knowle Hill, Reading. Female reporter decides to present her piece from 'Mr. Rawlins Horse Carousel' as it spins round and round, unfortunately, the studio suddenly delays report for two and a half minutes and with the item itself running for nearly five minutes, said reporter and cameraman spend nearly eight minutes going round-and-round and up-and-down!

*Atlantic Bird-1* @ 12.5°W still seems to have problems with its downlinks dying from time-to-time though it's been impossible to find an official answer to queries over the health of the bird! This satellite can often carry regional output from parts of the USA not seen on other satellites. August 9th and Alan Richards spots a report from a farmstead at Crawford, Texas where US President Bush is vacationing. End of feed and colour bars are identified 'DNW90WS 15:49 AUG 05 MINI-3 #10014' - odd as Alan points out it was one day, one hour and 40 minutes out! The feed at the bottom end of Ku - 10.980GHz-H (3300+3/4). It's worth checking the Globecast bouquet on this sat - 11.104GHz-H (20145+3/4) at the weekends to find much American sport. Usually car racing is seen on Channel 2 (of 3) and in the *Indy 500* series the *Michigan Indy 400* was carried from the Michigan International Speedway, Brooklyn on 27 July. The following Sunday the Indy championships had moved to St. Louis. The Michigan race featured dramatic pictures from on-car cameras including the lead chaser car which lost control, spun and restarted in the third to last lap, his recovery was incredible and he won by a car length!

*Le Tour de France* is one of the major French outside broadcasts of the year and produces amazing pictures of each day's racing from the flat central plains to the mountains, often from heli-cams and moto-cams. Interesting though to note that a Dutch OB sat uplinker was also lurking this year. 'STOLKVIDEO HOL-47' appeared over *Eutelsat W2*, 16°E feeding live programme inserts into the Dutch 'N.TV' channel from a French town 'somewhere'...12.555GHz-H (5632+3/4). A few days earlier Jeffrey Archer was released from Hollesley Bay Open Prison at 0800, *Sky News* were there to witness the event with live feed over *W2* on their often used slot of 12.525GHz-H (5632+3/4 - 'UKI-784 C1.4.2.'). And a quick review of the 3rd week in July Grand Prix coverage ex-Silverstone, as seen by satellite 'feed' enthusiasts - covering both the preparations for and the actual race itself...*Eutelsat W1* @ 10°E carried 'F1-Backup' 11.085-V (9597+3/4), 'FUJI-Enc' (encrypted) 11.101-V (13333+7/8).

I heard from Dave Dyson (Accrington) an old friend who has been using a SkyStar-2 board for MPEG 4:2:2 reception in recent times via his computer with great success, apparently the Mkl board is a "little insensitive" but a Mkl1 board with improved performance has just been introduced. Though Iraqi TV (Iraqi Satellite Channel) is still off the air, Dave noted 'Iraqi Media Network' on *W1*, 10°E, 11.100GHz-H SR 2792 (FEC ?) with service ident 'IMN SNG 1'.

And finally, from Toze Cardoso (Portugal) a 'strange report'...he was scanning over *Hispasat 30°W* July 28th around 1815 and found a signal @ 11.590GHz-V running SR5632 and checking found 'VITEL IRL 015', an outside broadcast feed of greyhound racing from Shelbourne Park in Ireland - normally the 'dog feed' is linked via *Telsat 11* @ 37.5°W. Toze quickly called a friend 'employed in the broadcast linking field' over the unusual sighting but at about 1828 the greyhound feed disappeared over 30°W, at 1840 the dogs feed re-appeared on the usual *Telsat 11* 11.596GHz-V slot. Very odd! The suggestion is that the VITEL uplinkers had selected the wrong satellite that night check <http://feedlandia.no.sapo.pt/feedl.html>



After the Iranian Siamese twins tragic separation, Globecast carried an interview with an American Siamese twin (AB-1, *Atlantic Bird-1*).



Prince Charles checks the readiness of the tug-of-war team at the Mey Highland Games (*Eut-1*, *Eutelsat W1*).



Meridian VTR clock for Cowes Week with sat receiver overlay and service ident (*Telecom 2D*).



'KUKA', colour bars preceded a German football match (*Eut-1*).



Threshold signal strength from North Korea - Pyongyang TV close-down (*Eut-1*).



The US Justice Department announce a major crack down on drug smugglers, particularly Mexico, the team is presented to the press (AB-1).



The Michigan Indy 400 race, live pix from car-cam (AB-1)



The UK sat linking company 'SisLINK' have sat-trucks based in several European countries (*Eut-1*).

# Scanning

Scene

- **Dave Roerts** c/o SWM Editorial Offices, Broadstone
- **E-mail** scanning@pwpublishing.ltd.uk

**T**errorists have always been crafty but now it seems that they are getting craftier. Those of us who travel by air and carry radio kit have become used to the security staff identifying asking us to show it working or take out the batteries, remove the battery case or whatever. In my experience this procedure has always been carried out by the security staff with good humour and, let's face it, with the traveller's personal welfare in mind. I mean the security guy isn't going to get on the plane so he's doing it for my benefit, right!

It seems, however, that some Islamic terror groups have worked on effective explosive devices that are completely encased within electronic equipment. The bomb being designed so as to be totally concealed within a camera, mobile 'phone, radio or whatever. The big difference is that these units will still function while harbouring their additional components. Multi-band radios were specifically mentioned in the warning about devices of this type and it's a safe bet that radio scanner users can expect some close questioning at airport security. For the foreseeable future it would probably be a good idea not to take your radio with you should you travel by air and instead buy a suitable radio on arrival at your destination, maybe either selling it before departure or mailing it back to home shores at the end of your stay.

The authorities are also tightening up on the use of scanning receiver usage in the United States. Traditionally a very open society, the US has had to rethink many of its security strategies in the wake of the mass murders of September 11 2001. As a result the law enforcers in America are now taking much more notice of scanner users. For instance in New York it's an offence to have a scanning receiver capable of receiving police frequencies in your vehicle unless it's secured in a locked container or the trunk (that's the boot for those of us in the UK).

In any case don't even think of taking your scanner to the USA if it covers 800 and 900MHz. Mobile 'phones are still analogue in America and there is a specific ban on receivers that pick up these frequencies. It seems that US law agencies are about to become much more vigorous in their enforcement of the letter of the law as far as it relates to scanner usage. Having an amateur radio licence does exempt you from some parts of the legislation but my understanding

is that the exemption only applies if you are a US Citizen with a US Amateur Radio Licence. So the bottom line is that it isn't worth the trouble!

## Satellite TV Growth

Television studios are popping up at every industrial estate these days. The growth in the popularity of satellite television has resulted in a mass of small operators whose main purpose is to part poor mugs like us from our cash. It seems that at every hour of the day you can turn on the TV and see someone knocking out strange looking bits of metal that, with application, will turn your rather misshapen lump into a body fit for *Baywatch*. All these little studios are heaving with radio kit. They use radio mics but I'm told that the most amusing traffic can be monitored at 462MHz.

The easiest thing to do would be to scan 462 to 463MHz in 6.25kHz steps if your scanner will allow it. If there's a studio handy then you'll be sure to hear the in-house nattering and I'm told that it's well worth it for the humour factor. To fully appreciate the whole package it's advisable to watch their TV channel at the same time. Does anyone remember the 2m TV talk-back amateur channel that operated during the evenings in the London area during the eighties?

I have heard that Naval Bomb Disposal vehicles are using marine v.h.f. band to natter to each other while they are on the road. If you spot them try listening to 156.400 as they have been known to use this frequency while in convoy, so to speak.

## Yupiteru Query

An interesting query now from Bryan who writes that some while ago he bought a Yupiteru MVT-3300 from an established dealer in the UK.

Although perfectly happy with the set he's become aware that it is a straightforward '3300 and not a '3300EU and wonders

whether it could be a grey import... More interesting is the fact that printed above the number one key on the pad is the word BUSTER. Now this MVT-3300 seems to operate normally and there is no reference to the BUSTER function in the handbook. It doesn't seem to be any form of descrambler and hitting the key with every conceivable permutation of key/function holds doesn't seem to enable any hidden function or operation.

Bryan is stymied, me too. So, has anyone any ideas please? Here's a photo of the errant unit - although you've probably seen a '3300 before, just viewing the BUSTER button may ring a bell.

## Irish Listening

Does anyone ever travel to the Republic of Ireland? Now I bet that listening to the police in the Republic is as illegal there as it is in the UK? It seems that the u.h.f. system that they use has base stations between 455 & 455.825MHz. Input frequencies are 14MHz higher. On v.h.f. the police in Eire are between 164.025 and 164.400 at the moment with the mobiles in the 159MHz region.

Although TETRA is coming to the Dublin area it seems that much local activity on the 455MHz band part is on 455.825, 455.800, 455.775, 455.750, 455.725 and 455.700MHz. Having said that a general scan at 455MHz should reveal items of some interest to the curious listener. The Garda also use 84.025 - 84.2625MHz around the country with mobile frequencies about 10MHz lower. The fire and ambulance service are also on 84MHz, so I guess low band is popular over there. All these frequencies are narrow f.m. and although the Garda make very good use

of mobile 'phones having cut a special deal with a service provider there's usually something interesting to monitor.

Should you find yourself in Dublin, using a scanner may be a healthier option than turning your liver to rock by quaffing gallons of Guinness. For those who will not be travelling there, the signals, are at times audible on the north west coast of the UK.

## Peversill Purchases

Finally, I have been getting a few mails and notes from folks who have made purchases from Pervisell who advertise here and in *Practical Wireless*. It seems that even if you only spend a few pounds on decoding equipment or software Ali and Adam at Peversill will

spend considerable time talking you through any problems. Thanks fellers from Andrew, Pete, John and the others.



# Decode

- Mike Richards G4WNC, 49 Cloughs Road, Ringwood, Hants BH24 1UU
- E-mail [decode@pwpublishing.ltd.uk](mailto:decode@pwpublishing.ltd.uk) Web site <http://www.mikespage.btinternet.co.uk>

Now that the summer holidays are well and truly forgotten, it's time to get into some serious decoding! This month I will be taking a close look at the common ARQ-E transmission that can be found throughout the h.f. bands and give you a few tips on how to recognise signals simply by their baud rate!

## ARQ-E

Despite this system being a bit ancient, it is still in regular use by many h.f. operators. Originally devised and implemented by Siemens, the main users today are the French Military, Italian Diplo and German government. Most of these links are not terribly exciting as they sit at idle for most of the time but do occasionally burst into life. Take a look at the ARQ-E frequency list in the last Decode for an up-to-date frequency list so you can see the large number of active

frequencies. If you do take a listen you will notice that all the ARQ signals sound very different from a standard RTTY signal. There are two reasons for the different sound 1) ARQ generally uses higher baud rates up to 288 baud and 2) ARQ is a synchronous transmission system.

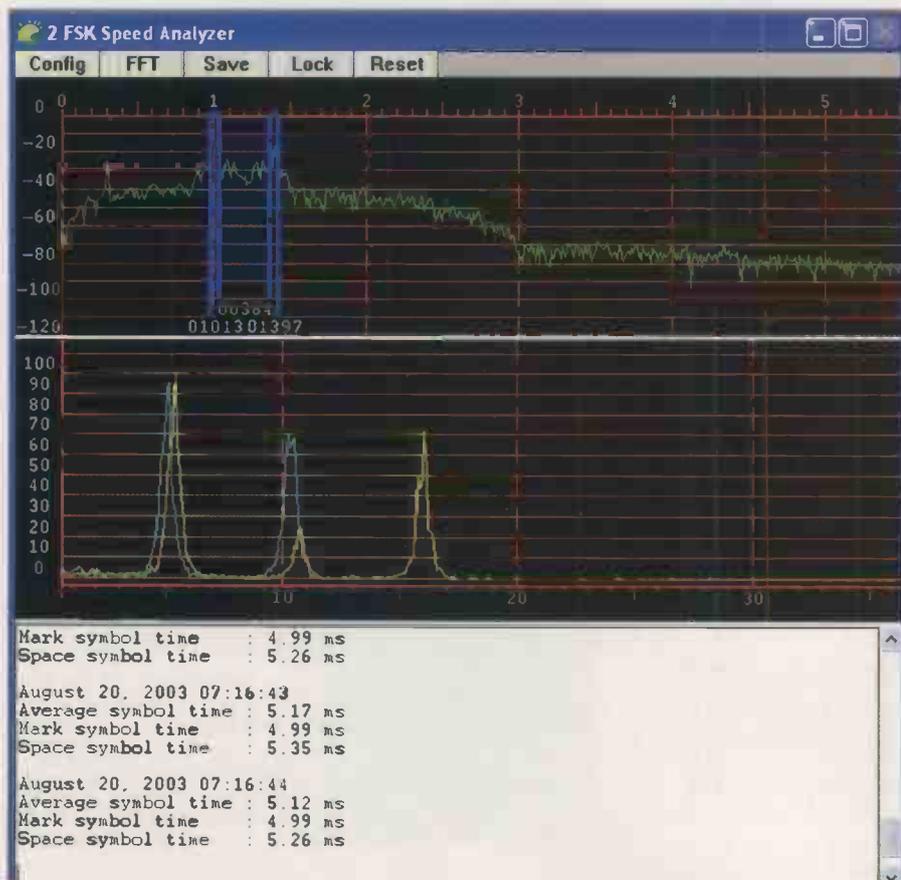
Let's take a look at the difference between asynchronous RTTY and synchronous ARQ. If you can recall previous tutorials of mine you may remember that each RTTY character is very much self-contained, i.e. there is a start bit followed by the five data bits that make up the character and then one or one and a half stops bits to denote the end of the character. This is wonderfully neat system that fitted well with the early days of telegraph where there could be long pauses between transmissions. From an engineering point of view you can see the neatness of wrapping each character in such a way as to make it very easy to spot the start and finish.

Once telegraph became an established system there were strong commercial drives to increase automation and deliver ever more efficient and reliable data systems. ARQ-E and ARQ-E3 were an early response to this demand by Siemens. It is a great tribute to their design expertise that these systems remain in use today when so many have disappeared. The secret to success in telegraph systems is usually in the code used to carry the data. The Siemens system shows its RTTY roots by using the standard telegraph alphabet at the core of the system. This Telegraph alphabet goes under many names including Baudot, Murray and its true name - the International Telegraph Alphabet No2 or, more commonly, ITA2.

Siemens stuck to the original ITA2 so that their system could handle standard telegraph traffic more easily. In a practical system the ITA2 telegraph traffic could be accepted and just a couple of extra characters added to make the special code used for ARQ-E. As I mentioned earlier the ARQ system uses synchronous transmission which means there are no gaps with a steady Mark sent as in RTTY. In practice this means the system has to generate its own signal to send in the gaps! This is achieved with the introduction of two new idle characters - alpha and beta. These are sent whenever there is no data available for the link. Let's now take a look at the way in which the ITA2 code is supplemented to make the new ARQ code. We will deal with ARQ-E for this part of the tutorial. The ARQ-E alphabet is exactly the same as ITA2 except for the addition of two new elements. One is added at the start and is used to indicate whether the character that follows is traffic or a control signal. This first character would be a space/logic '0' to indicate traffic or mark/logic '1' for a control signal. The second extra element is added at the end of the ITA2 character and provides a really clever error detection system. This final element is known as a polarity bit and its value is chosen to make sure that every character contains an odd number of stop or zero bits. Here's an example using the letter A to show how the new ARQ-E 7 unit's code is built.

The ITA2 code for A is 11000. As this is a traffic character an extra logic 0 is added at the start giving 011000. The final element must therefore be a logic 1 to ensure an odd number of 1s in the completed character - thus an ARQ-E letter A becomes 0110001.

Let's now take a look at the error detection and correction system. One of the failings of the original RTTY system was its vulnerability to



Typical ARQ-E spectrum Analysis using SkySweeper Pro.

errors due to noise or interference. This vulnerability was a major problem for those that wanted to develop automated systems so all manner of error detection and correction systems were developed. Most of these involved wrapping each character in such a way that a damaged character could easily be detected. The ARQ-E system is dead simple and we've already touched on the secret. The magic lays in that final element that's added to each transmitted character. This ensures that every character contains an odd number of 1s. At the receiving end, each decoded character is checked to make sure it has this special pattern - any that don't are assumed to have been corrupted.

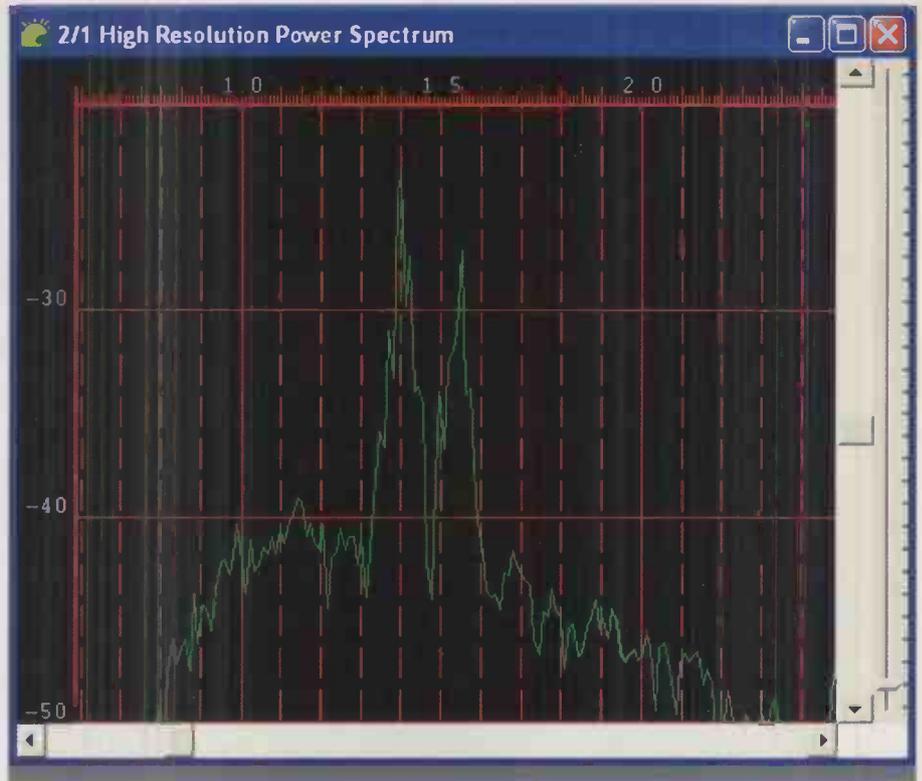
Detecting errors is one thing, but not a lot of use unless you have a way to get the damaged text re-sent. With ARQ-E the error handling is dealt with by a special Repeat Request (RQ) character that is used by the receiving station. At this point I ought to mention that the ARQ-E system uses two h.f. frequencies one for the each station thus making it a full duplex system, i.e. it can send in both directions at the same time.

When an error is detected the station that received the error sends the RQ character back to the originator. That immediately causes printed output to cease and the transmitting station then repeats the last 3, 4 or 7 characters. If this is received without problems the error is corrected and the transmission continues as normal. The number of characters repeated is dependant on the character repetition cycle (CRC) of the systems in use at the time. As the repeated characters are prefixed by a control character, the actual CRC is 4, 5 or 8. When you're trying to receive an ARQ-E system this is one of the key parameters you need. The system itself indicates the repetition cycle in use by inverting the final character of the cycle.

That's about it for ARQ-E. There are a number of variants of this system and I will run through those in a later column. To get you started here are a few ARQ-E systems you can try:

### ARQ-E Freq List

MHz	Speed	CRC
3.1665	85.7	4
3.8585	85.7	4
4.7980	85.7	4
4.9440	85.7	4
5.0950	184.6	8
5.2840	85.7	4
8.0310	184.6	8
8.1050	184.6	8
9.2492	46.2	4
10.6260	184.6	8
14.6690	184.6	8
19.2167	96	8



### Data State Table

If you've looked through a few frequency lists or other books covering data transmission you may have come across the confusion that surrounds the names given to the two possible states of a digital signal. In computing signals are usually talked of as being logic 1's or 0's whereas old time RTTY uses marks and spaces to describe the two states. There are lots more names and associations so I thought I'd put together a table showing how they all link together.

Mark	Space
Higher frequency	Lower frequency
FAX white	FAX black
Logic 0	Logic 1
A	Z
B	Y
Tape Un-perforated	Tape Perforated

### Signal Analysis - Baud Rate

Finally for this month, I thought I'd remind readers of one of the most useful signal analysis techniques - analysis by baud rate. It is a simple fact of most h.f. data systems that the majority of modes are characterised by unique baud rate combinations and if you put that together with the characteristics you can detect by ear you really can tie signals down

pretty quickly. Lets just start with the groups you can identify by ear.

**Asynchronous** - these are systems like RTTY and very rarely ASCII that have a continuous transmission, i.e. not bursts like packet but the data 'warbles' are erratic. There aren't a lot of these around but those that are all operate on 50, 75 or 100 baud. If you do find an ASCII signal you may find it using 110 or 300 baud.

**Synchronous** - This applies to signals like the ARQ-E I've described earlier. These have a continuous warble with only minor changes in sound between idling and sending data. **Data Blocks** - Two systems here 1) the regular pulsing data signals like SITOR, AMTOR, PACTOR and 2) The sporadic packet like signals such as HFDL and ACARS plus packet (AX25) itself.

**Multi-Tone** - Finally we have the multi-tone systems that use a number of tones rather than the simple two tone system used by the signals I've covered so far. The best way to learn the difference between the groups is to take a listen to some at the WUN site using the following link:  
[www.wunclub.com/sounds/index.html](http://www.wunclub.com/sounds/index.html)

Once you've mastered this you can use speed analysis to try and pin-point the exact mode. Below are a few unique combinations to illustrate the technique.

### Example Signal Matrix

Signal Group	Baud Rate	Likely Signal
Synchronous	64	ARQ-E, ARQ-N or ARQ-E3
Synchronous	86	ARQ-E, ARQ-E3
Synchronous Block	192	SI-ARQ
Synchronous Block	125	DUP-ARQ
Synchronous Block	50	ARTOR

**Next month I'll take you through a few techniques that can be used to measure the baud rate of a variety of data signals.**



# Info<sup>in</sup> Orbit

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**S**pectacular temperatures, spectacular fires, algal blooms - and all visible to the persistent eyes of the weather satellites (WXSATs). For those whose idea of an interesting evening is to sit and watch television, perhaps I can introduce you to the fascinating hobby that thousands of people all over the world pursue: monitoring and decoding the WXSATs. It is not the most expensive hobby in the world.

This column provides the first opportunity for me to publish some of the new *MSG-1* LRIT FSD images, all courtesy of EUMETSAT. Yes, *METEOSAT* Second Generation (*MSG-1*) started the first Foreign Satellite Data (FSD) re-transmissions within the Low Rate Information Transmission (LRIT) service. In a nutshell - excellent!

## MSG-1 Foreign Satellite Data

It is not easy to compare the new FSD images with the associated WEFAX images transmitted by *METEOSAT-7* that they will



Fig. 1: *METEOSAT-7* WEFAX LZ format *GOES-12* 6 August 1500 visible-light.



Fig. 2: *METEOSAT-7* PDUS *GOES-12* 6 August 1200 visible-light (©EUMETSAT 2003).

replace. *METEOSAT-7* provides foreign satellite data in two forms: low resolution WEFAX images on one channel, and PDUS and some WEFAX images on the other. *MSG-1* operates differently. There is no WEFAX equivalent with FSD images; instead, full disc, higher resolution images are being transmitted - and more of them!

I received my first WEFAX image in the late 1980s, using a home-made dish and a Microwave Modules down-converter. *METEOSAT* WEFAX images are available from both *METEOSAT* channels, and can be switched by software. **Figure 1** shows a typical 'foreign' (non-*METEOSAT*) satellite - *GOES-12* - WEFAX transmission. Images from *GOES-12* and other foreign satellites are included in the schedule of transmissions on the PDUS (Primary Data User Station) channel. The WEFAX transmissions from these satellites are infrequent and in sectors - but welcome none-the-less. Current transmissions include *GOES-east* (*GOES-12*) with one

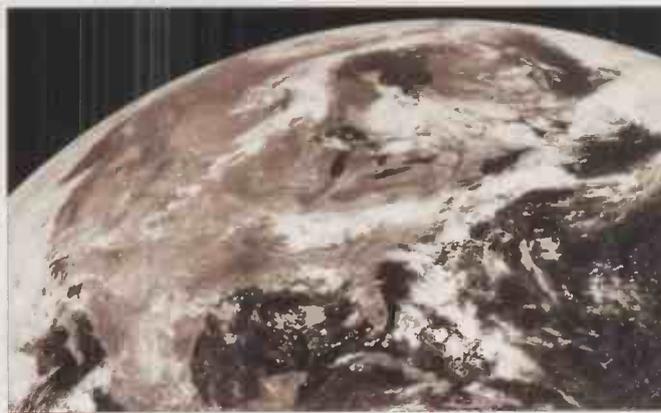


Fig. 3: *METEOSAT-8* (*MSG-1*) LRIT *GOES-12* image (©EUMETSAT 2003) - see text.

visible-light section and two infra-red, *GOES-9* (in the *GMS* location) providing two infra-red images.

A few years later (circa 1992) I installed a PDUS system and was enthralled with the superb images - I wish I had retained more of them, but floppy disk space was at a premium then, and my hard drive was only 20MB! Currently, PDUS images include 'GOES-west' (*GOES-10*), 'GOES-east' (*GOES-12*), IODC (Indian Ocean *METEOSAT-5*) and *GMS* (currently replaced by *GOES-9*). These continue to be transmitted as full-disc images from *METEOSAT-7*.

When *MSG-1* started transmitting HRIT (High Rate Information Transmission) trial data at the end of April 2003, we witnessed the start of the future of digital weather satellite transmissions. The trial transmissions

continue. LRIT (Low Rate Information Transmission) started in July, and we waited patiently for the inclusion of *GOES* and other data. First transmissions came in late July, but I could not decode them because, as far as I understand, EUMETSAT had not issued the exact format or sample data for the software writers to analyse. I contacted EUMETSAT about this, to ask whether there had been a problem deriving it, but, unusually, they declined to discuss the matter. A few days later, when software writer David Taylor had some real data to work with, the *MSG-1* software was quickly modified and the files accumulated during the previous days could finally be processed.

LRIT is reduced resolution HRIT data (just as WEFAX is reduced resolution PDUS), and although at one time it was our goal to receive LRIT, the advent of the 'alternative transmission mode' (*MSG-1* data via the *HotBird* satellite television data stream) has changed our situation. We can now receive HRIT and LRIT on the same hardware; the main advantage of LRIT now, is the inclusion of images taken by foreign WXSATs.

The Foreign Satellite Data service includes transmissions of three-hourly images in all three principal wavebands (visible-light, infra-red and water vapour), in loss-less JPG format, approximately 80 minutes after they are produced.

*GOES-E*: visible 0.55µm, water vapour 6.8µm and infra-red 10.7µm every 180 minutes

*GOES-W*: same as above

*GMS/MTSAT* (currently *GOES-9*): similar frequencies to above.

*MET-5* (IODC): three bands every 180 minutes.

Note that *METEOSAT-5* (IODC) images are scheduled for inclusion in the FSD stream by the time this is published.

**Figure 3** shows just a part of one of the early transmissions; *GOES-12* (east) at 1800 on 29 July showing the visible-light scan. Rather than

reproduce the whole disc, I selected the continent of North America, where much is seen cloud-free. The Great Lakes are almost clear of cloud, as is California. The colour balance is not yet correct. I am just starting to prepare a review of *GeoSatSignal-4*, the software that combines these and other images to produce effective colour composites - and much more.

The *GOES-9* geostationary WXSAT was moved (drifted) to longitude 204°W to replace *GMS-5*, the Japanese WXSAT, itself due to be replaced by the next generation *MT-SAT*. With launch of *MT-SAT* delayed, *GOES-9* has been 'loaned' to complete the geostationary constellation and provide regular imaging over Australia and Japan. **Figure 4** is the *GOES-9* visible-light re-transmission from *MSG-1* in the LRIT sequence. Typhoon 11W (*Etau*) was located over the East China Sea, and can be seen in the upper, illuminated part



Fig. 4: GOES-9 re-transmission 8 August from MSG-1 showing typhoon 11W (image © EUMETSAT 2003)

of this image. Australia is under evening sunshine at lower centre. *Etau* has been moving north-to-north-eastward with maximum sustained winds estimated at 110kt.

### MSG-1 Transmission News

A new version of the document listed as *EUMETCast Technical Description, EUM TD 15, Issue 3*, is available on the EUMETSAT website. This is the 'bible' for those just setting up their *HotBird-6/MSG-1* reception system. From the main site, select *publications* and find the *technical and scientific documentation*. It is very readable and explains the settings required for reception - see [www.eumetsat.de](http://www.eumetsat.de)

This latest version includes introductory information on the availability of EUMETCast in C-band. The C-band dissemination trials are scheduled to begin in September 2003, with an operational service planned to commence in November 2003.

### Blooming Sea

Like many others who look over the collection of WXSAT images received each day, there is much of interest to see in almost all of the pictures; we are, however, going to miss some features! Fortunately there are two organisations that do a very good job of identifying interesting weather or significant events, and they maintain mailing lists to which we can subscribe without charge. I receive daily E-mail from the **Operational Significant Event Imagery team (OSEI)** - [www.osei.noaa.gov](http://www.osei.noaa.gov), and a weekly notice from the **Earth Observatory** - <http://earthobservatory.nasa.gov>

In late July I received an E-mail from the Earth Observatory noting the presence of a huge algal bloom in the Barents Sea. They described the feature: The Barents Sea north of Norway was awash in colourful swirls of blue and green on 19 July 2003. This spectacular display of colour reveals the biological richness of these cold, nutrient-rich waters - a bloom of tiny marine plants called phytoplankton. The colours can be produced by a variety of pigments, including chlorophyll, that the plants use to harness sunlight for photosynthesis. The brightest blue colour is sometimes the result of a kind of phytoplankton called a coccolithophore that has a calcium carbonate (chalk) covering.



Fig. 5: NOAA-15 19 July 1709 a.p.t. visible-light from Simon Kennedy.



Fig. 7: MSG-1 3 August at 1100 from David Taylor - image © EUMETSAT.

This chalky covering is bright white, and mixes with the blue reflection off the water to produce brilliant hues.

Near the coast, the reflection coming back to the spacecraft may be mixed with sediment and other organic matter churned up by tides or washed out to sea by rivers. The influx of nutrients that comes from the outflow of rivers is one reason why phytoplankton blooms are common in coastal areas. Another reason is



Fig. 6: NOAA-16 19 July 0924 h.r.p.t. from Ferdinand Valk.

that coastal areas are often areas where cold water from deep in the ocean wells up to the surface and displaces surface waters that may have become depleted of nutrients by the growth of a previous generation of marine plants.

I checked back into my archive of raw h.r.p.t. (high resolution picture transmission) images and found that I had captured that very pass - but that trees and bushes cut off the region north of Norway! Following my request to the rig-l mailing list for images of this region, I received an a.p.t. image from NOAA-15 - see Fig. 5 - from **Simon Kennedy**, and an h.r.p.t. image from **Ferdinand Valk**, both of whom have better north-eastern horizons than mine. The more eastern pass of NOAA-16 had captured the bloom perfectly. Ferdinand's picture shows the bloom to the same extent as the one published by NASA.

### Fires Highlighted By MSG-1 Images

As fires swept across several countries, MSG-1

monitors have had the opportunity to test different channel combinations for fire detection capability. David Taylor sent me Fig. 7, an early August image from MSG-1 made with *GeoSatSignal* (beta version). He explains: "In addition to using channels 2 (visible) and 9 (thermal), I have used channel 4 (3.9mm) which is sensitive to higher temperatures than channel 9, to show a fire-detection capability. The brightness content of the image is taken from channel 2, and the colour of the image from the temperature derived from channel 9 as a green-brown variation. Overlaid on the basic image are red regions where the channel 4 signal indicates a local hot-spot. The fires in Portugal show up very clearly, as does (I think) a smoke haze from the fires drifting northward."

### French Fires

I was delighted to hear again from **Peter Schoen** of Helmbrechts in Germany. Peter has often sent some excellent, high quality printed images in the past, but recently decided to improve his h.r.p.t. receiving station, and this has taken his attention for several months. Peter explains: "Firstly I set up a new outdoor unit with a bigger dish (1.5m) and stronger mounting made of high-grade steel - see Fig. 8. All were assembled on a higher location for a better horizon.

Additionally I provided the dish with heating facilities for the wintertime. As you know the



Fig. 8: Peter's new dish and mounting.

can be compared with Fig. 7.

Lee Carberry has built his a.p.t. receiver using the RX2 kit from RIG (Remote Imaging Group).

He told me that he put a lot of hard work into building it, and was grateful for "some excellent help from Ray Godden" when he was doing some of the wiring. One of his first pictures received on the new system was Fig. 12. The image was received in Stockton-on-Tees using a crossed dipole in the loft, though Lee plans to build a quadrifilar helix (QFH). Lee recorded the pass as a sound (wav) file using the program WXSAT, and then ran it



Fig. 11: NOAA-12 6 August 1635 Portuguese fires - from Peter Schoen.

because I am using a crossed dipole mounted in the loft and would normally expect to lose the signal around the Bay of Biscay."

I did not envy Kevin Hughes his August holiday in Spain! With record temperatures in Britain, and having fair skin, Marion and I



Fig. 9: NOAA-14 16 June (before the fires) from Peter Schoen.

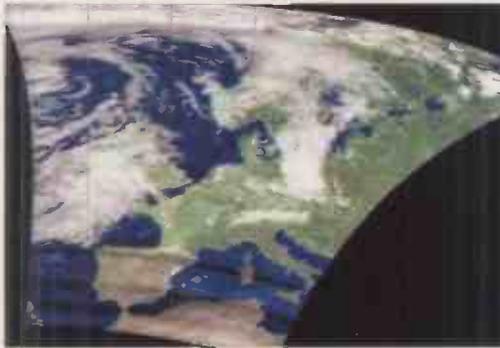


Fig. 12: NOAA-17 28 July 1035 from Lee Carberry.



Fig. 13: NOAA-17 4 August 1117.

dish must be in the safety position and therefore will be out of reach."

Peter has decided that building the Rob Alblas decoder (within the Dutch WXSAT group *Werkgroup Kunstmanen*) will be his next project. Interestingly, Peter chose sections of processed images from NOAA-14 to send me. NOAA-14 has serious problems with synchronisation, resulting in many images being almost unusable. As I showed in last month's column, sections of the images received are usable. Peter sent two image sections from NOAA-14, one captured on 16 June showing the southern French coast before the great fire, and the other captured on 3 August showing the damage caused by the fire. The pictures show the south-eastern corner of France, and Corsica, the island across the Ligurian Sea. The aftermath of the fires in Portugal can be seen in Fig. 11 which



Fig. 10: NOAA-14 3 August (after the fires) from Peter Schoen.

through the sound file decoding program *WXTOIMG* using the 'MSA multi-spectral analysis' tool that produces the false colour and an overlay map. Lee adds "I was really amazed to see North Africa on the image

prefer to keep well out of the sun, even if it is too hot for a siesta! Just before leaving, Kevin sent me his latest from NOAA-17, Fig. 13, received on 4 August in Tamworth.

## Frequencies

The recent status of the WXSATs has remained the same for some time. Of the polar WXSATs, Only NOAA WXSATs are currently operational, and we are unlikely to see any new Russian WXSATs for some time. NOAA-14's imaging system has a synchronisation fault that usually affects the h.r.p.t. images.

### a.p.t.

NOAA-12 and NOAA-15 transmit a.p.t. on 137.50MHz  
 NOAA-17 transmit a.p.t. on 137.62MHz  
 during overlap periods, NOAA-12's a.p.t. may be switched off.

### 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 FENGYUN-1D transmit on 1700.5MHz

WEFAX: METEOSAT-7 (geostationary) transmits WEFAX on 1691 and 1694.5MHz, and Primary Data on 1691.0MHz.

### HRIT-LRIT-FSD

HotBird-6 located at 13°E, on transponder 129: 11.096GHz

*Credits: All pictures received from NOAA satellites are published by courtesy NOAA. Images from MSG-1 are published courtesy EUMETSAT.*

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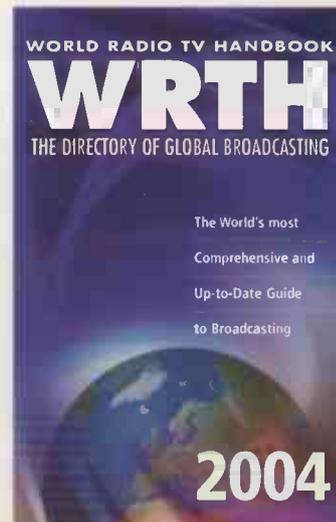
The 2003 edition of the World Radio TV Handbook is a shiny new volume, and this is not only because of what you see when you first look at it, but also because of what you find in its informative and up-to-date contents. *Adrian Peterson, AWR Wavescan*

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*Radio Netherlands Media Network*

An excellent, well-presented publication again and always within finger-tip range of my receiver.

*R.S., UK*



# Attn' 123

● **Enigma** 17-21 Chapel Street, Bradford, West Yorkshire BD1 5DT Fax: (01274) 77004  
● **E-mail** [enigma@pwpublishing.ltd.uk](mailto:enigma@pwpublishing.ltd.uk)

**R**eader, John Kletsy of Boston Spa has recently asked for an explanation on what is meant by the term Decode Key (or Decryption Key/DK) which is often used in descriptions of Numbers Stations. First of all, not all such transmissions have decode keys, but most probably do. I say probably because they can be present in disguised form and then they are impossible to recognise.

There are various types and they are applied in different ways, but all provide the intended recipient/s with crucial information on decoding the message. The majority of messages sent by numbers stations make use of One-Time-Pad (OTP) encryption, whereby one or more pages of a tiny book (containing thousands of random five-figure groups) are used to decode a particular message, after which the pages involved (usually made of inflammable acetate) are burnt.

Depending on the station, DKs may be sent before the message only, or both before and after, or disguised within a particular group of the message itself. Some of the more types of DKs are as follows.

## Standard Decode Keys

Standard Decode Keys, used by many stations, nearly always consist of a **three-figure** group which refers to a page number on a OTP. A pad of say 30 pages wouldn't normally have them numbered from 1 to 30, instead they'd be numbered non-consecutively, yet in numerical order, e.g. the first page may be 087, the second maybe 102, the third 119, etc. At any one time, each agent run by the station would have his/her unique OTP with its own unique page numbers chosen randomly out of 999. Pages would not necessarily be used in order but according to the DK transmitted at the time. In the above example, a particular agent's first message may have 119 as DK, so the third page would be the first to be used and destroyed.

So, what happens if the message is longer than the number of groups on the page? In this case either a dual-message is sent, each with its own different DK, or a special operational group is inserted into the message indicating the next page to be used. For example, it may be hidden in a group preceded by a 'stutter group' such as 33333. Another alternative would be to dedicate a proportion of pages for longer

messages, where two or three pages may share the same DK.

One group of stations, the Russian family **lb** use both three and four-figure DKs. As a general rule four-figure DKs are used with the longer messages, very roughly over 70-100 groups, but exceptions are quite common, and it's still unclear why this family alone uses these two variations.

Some stations are very conservative in message length, and never send more than a fixed maximum number of groups, so the problem of 'overshooting' a page never arises.

## Co-ordinate Positioning Indicator

The Co-ordinate Positioning Indicator is a **two-figure** group (01 to 99) in which the first figure represents a particular vertical column, and the second figure represents a particular horizontal row in a grid of 100 (10 x 10) five-figure groups. The DK identifies the 'start group' for decryption. For example, if the DK is 36, the decryption of the message would start with the group found in the third column and sixth row. Such DK's can apply to any of the 100 groups, so for example, a 30 group message headed by a DK of 97 would mean that decryption began with the 97th group on the grid, continued to the 100th and then the remaining 26 groups would continue from the beginning - group 01 on the grid. The Czech family **IXa** are the main users of this system.

## Message Serial Numbers

Message Serial Numbers are usually a three-figure number which always increases consecutively with sendings. The most well known group to use this system is **Family XV** (M13 etc). Here each schedule counts its messages in strict numerical order. As most of its schedules are regular (monthly) we can count back and calculate the year and month when the first message was sent, and thus the age of the schedule. Most are now running in the 200s. As the same message is sent for a whole month, the same DK applies throughout.

Presumably these DKs refer to consecutive and unbroken page numbers of a OTP. Different schedules starting in the same month of the same year naturally share the same DK, however the particular recipients allocated to those schedules would be using totally different OTPs (apart from their page numbering).

## Disguised DKs

Several stations never send discrete groups which can be identified as DKs - just as some never send discrete Group Counts. You can never be sure whether these systems use DKs, but its most likely they do, but are disguised within the message itself. For example, they may typically be incorporated within a group early and/or late in the message (most likely the first and/or last). Such a group, 25176, may consist of a two random 'fillers', say 25 and a DK, 176. There is no way of knowing.

Swedish Rhapsody, **G2** and its new incarnation, **E23**, send a **five-figure** 'header' group preceding each message, which probably conceals a DK and possibly more besides. In the past, other stations have used such groups. Both the CIA and MI6 send no obvious DKs but they are probably there all the same.

## No DK

Mossad's **M10** which uses an all-letter system uses no DKs in the usual sense. Its messages are probably encrypted by using a version of the Vigenere system, its key would be a phrase or sentence memorised previously by the intended recipient. Again each recipient would have a different key, and these would be changed at intervals. On the other hand, words from a book, any book, previously agreed upon, may be used, say the top line from a different page each time, or starting at a particular letter according to the date of the month.

There are no limits to ingenuity where ciphers are concerned, but complexity (which is intended to increase security) must be sensibly balanced with ease of use and freedom of error. Other stations which send no obvious DKs may either not use them (may simply use consecutive pages of a OTP, or not use OTPs at all), conceal them or use an encryption system of a very different nature - such as **Family XIII**.

## M39

Please send in any loggings of the **M39** station, a member of **Czech Family IXc**. It has never been a very active station, and operates no fixed schedules, however, when it does appear it may stay around for a few days. It consists of a **three-figure** ID followed by a random **five-figure** group (this sent three times) the whole being repeated for a few minutes and then different sets of similar groups follow at intervals (although the **three-figure** group is sometimes the same). Rapid dashes are often sent between these cycles, but often these are replaced by periods of silence (up to 10 minutes has been known).

Medium speed auto-keying, and a short zero (dash) are used. Heard during daylight hours especially, on two parallel frequencies, M39 has been logged on 4.026, 4.137, 4.534, 4.616, 4.755, 4.825, 5.005, 5.017, 5.027, 5.040, 5.047, 5.085, 5.110, 5.137, 5.195, 5.200, 5.284, 5.293, 5.300, 5.313, 5.340, 5.502, 5.508, 5.530, 5.554, 5.560, 5.560, 5.565, 5.584, 5.737, 6.690, 6.887, 6.936 and 7.540MHz.

# RADIOWORLD

**AOR**



**AR5000**



**AR3000A**

**ICOM**



**PCR1000**



**£549.00**

## Model

## Description

**£ RRP inc VAT**

- 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. **£1345.00**
- AR5000+3** High performance base receiver with three enhanced options factory fitted: noise blanker, synchronous AM, automatic frequency control. **£1499.00**
- 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**
- AR8200 MkIII 3** New advanced wide band all mode hand-held receiver with enhanced microprocessor facilities, slot card options available, multi-function display. **£365.00**
- ICOM R5** 0.1300mhz Handie. Fits in the palm of your hand. AM/FM, FM Narrow - 450 memory channels. Comes with nicads & charger. **£159.00**
- IC R8500** 100kHz - 2GHz Continuous. All mode no gaps. 1000 Memories. 4IF band widths. Excellent all round for the professional listener **£1179.00**
- IC-R75E** 0-60MHz. High Stability receiver circuit 100 DB Dynamic range. Twin bandpass Tuning. Optional digital processor. Best selling receiver **£599.00**

**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.

**PCR 1000 £329.00 + XP software inclusive**  
**PCR 100 £229.00 (SAME SPEC WITHOUT SSB)**

## UNIDEN

66-88, 137-144, 144-148, 148-174, 406-420, 420-450, 450-470, 470-512MHz

**UBC-60-2XLT**

66-88, 108-174, 406-512MHz

**UBC-120-XLT**

66-88, 108-174, 806-906MHz

**UBC-220-XLT**

25-88, 108-174, 406-512, 806-906MHz

**UBC-280-XLT**

25-550MHz and 760-1300MHz

**UBC-3000-XLT**

25-88, 108-137, 137-174, 406-512, 806-906MHz

**UBC-278-CLT**

25-1300MHz

**UBC-780-XLT**

UBC-60-2XLT .....	£74.95
UBC-120-XLT .....	£119.00
UBC-220-XLT .....	£145.00
UBC-280-XLT .....	£169.00
UBC-3000-XLT .....	£179.00
UBC-278-CLT .....	£149.00
UBC-780-XLT .....	£299.00

## GRE

**PSR-255**  
 26-54, 66-88, 137-174, 380-512MHz  
**£84.95**



**PSR-216**  
 66-88, 108-137, 137-174, 380-512, 806-906MHz  
**£119.95**



**PSR-214**  
 66-88, 137-174, 380-512MHz  
**£84.95**

**PSR-225**  
 225-1300MHz  
**£249.95**

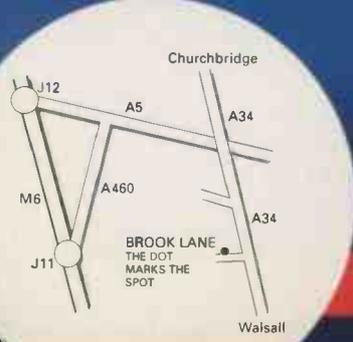


## MAYCOM

66-174MHz and 420-47MHz  
**FR-100 ..... £99.95**

## TRIDENT

100kHz-2149MHz  
**TRX-200..... £199.95**



**We accept all major plastic!!!**



There is NO CH

# YUPITERU

## YUPITERU MVT 9000 EU

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



- 531 kHz - 2039 Mhz
- 1000 memory channels
- All modes: W-FM, FM, N-AM, AM, LSB, USB, CW
- Multiple scanning steps 50Hz - 125kHz
- Alpha numeric display
- Band scope with marker function for direct access to displayed frequencies
- Duplex receive capability - hear split frequency signals easily with VFOs
- 20 search bands
- Fast tune facility gives 10 times function for quick tuning
- Built-in ferrite rod antenna for AM broadcast reception
- OP90 Soft Case

**£329.00**

## YUPITERU MVT 3300EU

An exciting new handheld packed with features - but at a price you can afford! The receiver has "breathtaking performance" ensuring this set is destined to be a number one seller



**£159.95**

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

## YUPITERU MVT 7100 EU

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



**£199.00**

- 530kHz - 1650mhz
- AM/FM/WFM/SSB/CW
- 1000 Memories
- C/W N/Cads & charger
- OP51 Soft Case £17.95 + £2 p&p

## MAPSOURCER GPS

RWP **£325.00**



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.

## GARMIN STREET PILOT DELUXE

**£849.00**



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

## GARMIN GPS12 RWP £149.00

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 satellites fast and stays locked on, even under extreme conditions. These units may be tough on the outside, but their operations are easy and logical.

## BEARCAT UBC-780XLT TRUNKTRACKER



**£299.00**

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



## AOR AR8600 MKII



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

**£649.00**

Excluding power supply

## ICOM £369.00

### ICOM IC-R3

The only scanner with built-in TV!



- PACKED FULL OF FEATURES
- Excellent for surveillance

## ROBERTS £309

- 0-30MHz
- HF receiver
- Airband
- VHF
- Large easy to use base/portable
- Suitable for all ages



**£549.00**

## ROBERTS £309

Multi-band digital PLL  
preset stereo world radio.

- High specification, easy to use
- 54 preset stations
- 5 tuning methods
- LCD display for all important functions
- Dual time display
- Standby function
- Clock/alarm
- Snooze function
- Adjustable 59 minute sleep timer
- Power supply battery (6V power)
- FM stereo on external socket
- 3.5mm stereo headphone socket
- AM wide-narrow filter
- MW switched tuning steps

**£79.99**

## USED EQUIPMENT

MAKE	MODEL	PRICE
ALINCO	DJ-X10 WIDE BAND RECEIVER	£275
ALINCO	DJ-X2000 SCANNER	£375
ALINCO	DJ-X3 SCANNER	£99
ALINCO	DJ-X2 HANDHELD SCANNER	£99
AOR	AR-2800 SCANNER	£140
AOR	AR-3000 WIDE RECEIVER	£450
AOR	AR-3000A WIDE RECEIVER	£475
AOR	AR-3030 HF RECEIVER	£399
AOR	AR-5000 TOP CLASS RECEIVER	£999
AOR	AR-7030 TOP RECEIVER	£550
AOR	AR-8000 WIDE BAND RECEIVER	£199
AOR	AR-8200 WIDE BAND RECEIVER	£230
AOR	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 MILLENNIUM	£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 MINTI 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-5000 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
YAESU	FRG-8800 RECEIVER	£285
YAESU	FRG-8800 RECEIVER INCLUDES CONVERTER	£399
YAESU	FRG-9600 RECEIVER	£200
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YAESU	VR-5000 TOP RANGE SCANNER RECEIVER	£450
YAESU	VR-500 HANDHELD SCANNER	£149
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
YUPITERU	MVT-7100 HANDHELD SCANNER 500KHZ - 1650 MHZ	£140



# Amateur

Bands

- **Clive Hardy** SWM, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
- **E-mail** [clive@pwpublishing.ltd.uk](mailto:clive@pwpublishing.ltd.uk)

There seems to have been a little flurry of interest generated by the G5IJ antenna featured by Roy Walker G0TAK in the August 2002 issue of *Practical Wireless*. It's akin to a design presented in *RadCom* and simply put, is a long wire connected to coaxial feeder via a transformer. It's one of those designs which some theorists dismiss, but somehow practice confounds theory.

I've got a commercial variation of the antenna and the same type was used at G3SWM in May. Used with an auto antenna tuning unit at both stations the antenna seems to work pretty well. The huge advantage of the design is that there are no counterpoise or earthing requirements, effectively it's just one length of wire. From a mechanical point of view it's an easy antenna to put up.

As an ongoing experiment and purely for receiving I've put a 20 metre long G5IJ antenna in my garden a couple of metres above ground to see how it performs. Crucially, I've used a much smaller toroid core in the transformer. My version of the PW design uses the same 27 turns of enamel coated wire, but of 26s.w.g. on a T80-2 core. The inner of the coaxial cable is attached to one end of the winding and 13 turns of thin coaxial cable are wound onto core over the initial winding. Where the wound-on coaxial cable meets the start of its winding the outer covering is cut back and the exposed braid is soldered to the joint between the inner and the start of the first winding - see Fig.1.

Intended for indoor use, the whole thing is fitted onto a plastic mount (Fig. 2) with connections between the transformer, coaxial cable, and 20 metres of antenna wire made via a terminal block. When connected to my Yaesu FT-840 the general impression is that it's about two 'S' points down on the main

antenna, but this may be more to do with its lower height than anything else.

## Amateur Licences

Just in case you missed it, the big Amateur Radio news is the removal of any sort of Morse test from the Amateur Radio exams for the UK, so now there are no separate A and B class licences. This means that, apart from the Foundation M3 callsigns, all G and M prefix Amateur callsigns are Full licences with access to all Amateur Bands.

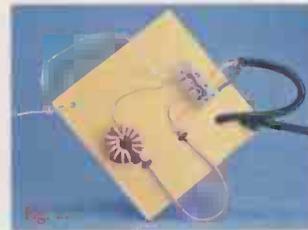
The two prefix calls are Intermediate licences with similar band access but a lower power allowance. In order to get the maximum use from the M3 series of callsigns, holders of ex-B class licences who also hold Foundation licences will be encouraged by the Radiocommunications Agency to relinquish their redundant M3 calls so that the calls are available for re-

issue.

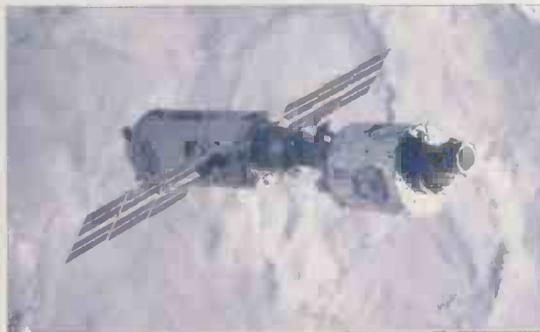
## DXpeditions

Spaniards, **Elmo, Vicente, and Victor** with German **Franz** will be active from Annobon Island off Gabon in the Gulf of Guinea, Africa for a fortnight from 27 September with the calls **3C0A, 3C0V, 3C0R and 3C0F** respectively. Operating on 1.8 to 50MHz using c.w. and other data modes including SSTV, as well as the usual s.s.b., they hope to have at least two stations on the air. Visit [cayuco@telefonica.net](mailto:cayuco@telefonica.net) for more details.

An all German expedition should be operating from Tubuai in the southern Pacific Austral Islands until the 3 October having started on 18 September. Callsigns could be FO/own call/A and the use of beams and linear amplifiers from 3.5 to 50MHz should



Listen out for the German Amateurs operating as XZ7A from Tubuai this month (NASA pic from ISS).



Radio Amateurs aboard the International Space Station have held QSOs with British Schools recently. (NASA pic)

ensure good signals, with operation on all the usual modes.

Seven German Amateurs will be active as XZ7A from Myanmar (previously Burma) between 30 September and 17 October. They'll be operating four stations at two different locations. One in the country's capital Yangon, the other somewhere on the coast. Activity will be on voice, data, c.w., and SSTV from 1.8 to 50MHz with the emphasis on the lower frequencies.

If conditions are right you might just catch **Giovanni IZ2DPX** on 50 or 145MHz using the long call **IS0/IZ2DPX/P** on Stintino, Sardinia, where he'll be until the 27 September. Subscribers who get SWM those few days before it hits the shops might also find him as **IM0/IZ2DPX/P** on Maddalena Island north of Sardinia until the 24 September.

## Examination Blues

Despite being under RSGB control since January, the administration of the Intermediate Licence Examination still seems to be suffering teething problems. Explanations for the glitches vary depending on their source, but the bottom line is that it's harder work than it need be getting to sit the exam.

An idea of the problem can be gauged by monitoring the latest callsigns on the Radio Licensing website. It's clear that the rate of issue of Intermediate Licences is very much slower, to the point of being almost static, compared to that for either of the other licence classes. This bottleneck is making it difficult for Amateurs to progress along the

licence chain, and won't do anything to help the hobby grow. Organising an examination, whilst a little more complex than buying a round of drinks, is hardly rocket science! Let's hope things are sorted out by the time the National Society starts to administer the Full

Amateur Licence exam next year so that everything runs like well oiled clockwork.

## ISS & Schools Share The Air

I hope some of you managed to hear the Amateurs on the *International Space Station (ISS)* using 145.800MHz to talk to a couple of British schools on the 6 & 8th August. Transmissions from the ISS can usually be heard with quite modest equipment and a hand-held used outdoors with its supplied antenna.

An indoor dipole sufficed for me to hear **Ed Lu KC5WKY** talking to pupils about the pictures of London he'd taken from space. Two more Amateurs, **Alex Kaleri U8MIR** and Britain's **Mike Foale KB5UAC** are going up in mid-October to replace the present occupants, **Yuri Malenchenko RK3DUP** and **Ed**, who have been aboard the ISS since April.

## On The Way Out? - Computer Bits

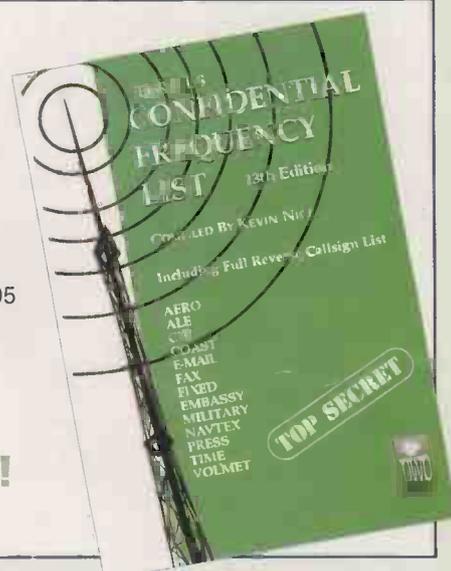
A nice tour around at my local Wimborne Hamfest and car boot sale in August resulted in me discovering that for the first time in a few years there was considerably more radio gear for sale than computer bits. I wonder if there could there be a change in direction in the wind.

## new additions

### *Ferrell's Confidential Frequency List*

This, the 13th Edition of *Ferrell's Confidential Frequency List* has been massively updated. As ever, included is a full callsign listing for h.f. utility stations from 1.605 to 30MHz. Including listings for Aero, ALE, CW, Coastal, HF E-Mail, FAX, Military, NAVTEX and VOLMET to name but a few, this really is one book every utility monitoring enthusiast should own, put simply it is the definite h.f. utility guide. Available **now** for **£21.50 plus £1.50 P&P UK, £2.75 P&P overseas.**

**Don't Miss Out - Place your order today!**



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AIRBAND RADIO HANDBOOK (Haynes) .....	190	£12.99	ABRHB
AIR TRAFFIC CONTROL (abc) 8th Edition .....	112	£9.99	ATC8
CALLSIGN 2003 (Photavia) .....	144	£9.95	CAL23
CIVIL AIRCRAFT MARKINGS (abc) .....	384	£7.99	CIVAIR
DIRECTORY OF AIRCRAFT SELCALLS (Seldec) .....	234	£12.95	DASC
FLIGHT ROUTINGS 2003 Williams .....	180	£8.95	FR23
MILITARY AIRCRAFT MARKINGS 2003 (abc) .....	224	£7.99	MILAIR
NORTH ATLANTIC ROUTE CHART (US Dept.Transport FAA) .....	740 x 520mm	£9.00	NAROUT

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SHORTWAVE RECEIVERS PAST & PRESENT 3rd Edition F. Osterman .....	450	£25.95	SWRXPP
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FAX & RTTY WEATHER REPORTS Philip Mitchell .....	88	£11.50	FXTWR
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# STORAGE

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ARRL ANTENNA BOOK 19th Edition .....	732	£24.00	RRAB19
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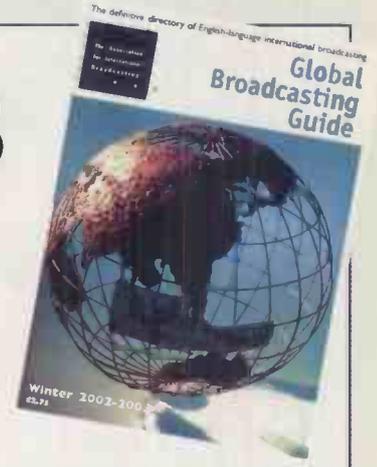
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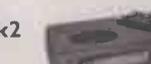
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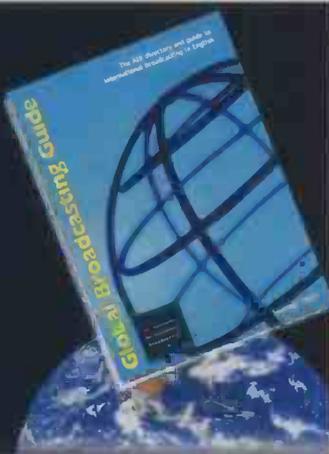
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# SWM UK Radio Club Listing

If you want to meet with others with a radio passion, this guide will help you make contact with fellow enthusiasts in your area!

## NORTH WEST

### CHESHIRE

**CHESTER & DRS, G3GIZ.** Meets at the Burley Hall, Waverton, Chester. Details from Bob Campbell G4OMI. Tel: (01244) 378699.

**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 Horse Bowling Club, Abbey Road, Macclesfield. Details from Mrs Hazel Parrott.

**MID CHESHIRE ARS, G3ZTT.** Meets at the Cobbrook Village Hall, Cotebrook Nr. Torporley, Cheshire. Details from Niall Reilly G0VKO.

**NORTH CHESHIRE RC, G0BAA.** Meets at the Morley Green Club, Moberley Road, Wilmslow, Cheshire. Details from Jill Gourley G0OZJ. Tel: 0161-485 5036.

**RADIO OFFICERS ARS, MOROA.** Details from Mr J. Bell G0QMM.

**UKFM GROUP WESTERN, GB3MP.** Meets at the Morley Green Club, Moberley Road, Wilmslow, 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 G0RPG. Tel: (01925) 762722.

**WIDNES & RUNCORN ARC, G0FWR.** Meets at the Scout Hut, Castle Road, Halton Castle, Runcorn, Cheshire. Details from Martin Tust G4LQC. Tel: (01928) 714843.

### CUMBRIA

**CARLISLE & DARS, G4ARS.** Meets at the Morton Community Centre, Wigton Road, Carlisle. Details from Mr J.A. Ennis G3WVA. Tel: (01228) 27463.

**EDEN VALLEY RS, G0ANT.** Meets at the BBC Club, Penrith. Details from John Roze G0VMP. Tel: (01931) 71642L.

**FURNESS ARS, G4ARF.** 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 G3OAG. Tel: 0161-881 1850.

**DOUGLAS VALLEY ARS, G3BPK.** Meets at the Wigan Sea Cadet HQ, Training Ship Sceptre, Brookhouse Terrace, of 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 G3HRG. Tel: 0161-773 7859.

**THE MANCHESTER WIRELESS SOCIETY, G5MS.** Meets at the Simpson Memorial Community Hall, Moston Lane, Moston, Manchester. Details from Ian M0IPR. Tel: 0161-288 730 or visit www.g5ms.com

**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 (RDARS), G0RCC.** Meets at the Barnfield & Fieldhouse, Cricket Club, Barnfield Village. Details from John Cannell G7OAI. Tel: (01706) 376204.

**SOUTH MANCHESTER RAD & COMP CL, G3FVA.** Meets at the Sale Cricket Club, Dawe Road, Sale, Cheshire. Details from Chris Ward G4HON. Tel: 0161-483 5174.

**STOCKPORT RS, G6UQ, G8SRS.** Meets at the T.S. Hawkins, Stockport Sea Cadets HQ, Pearmill Ind. Est., Stockport Road, West House, Lower Breduary, Stockport. Details from David Simcock M1AMT. Tel: 0161-456 7832.

**TRAFFORD ARC, G0TRC, G1TRC.** Meets at the Watch House, Cruising Club, Canal Bank, Stretford, Manchester M32 8WE. Details from Roger May G4YLQ. Tel: (01457) 866575.

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

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

**WIGAN & DARC, G0HRW.** Details from Mr D.H. Barkley G0OPI. Tel: (01942) 237162.

### ISLE OF MAN

**ISLE OF MAN ARS, G3FLH.** Meets in the Sea Cadets Hall, Tromode Road, Tromode, Douglas. Details from Dave Walton M0BXX. Tel: (01624) 816308.

### LANCASHIRE

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

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

**DARWEN ARC, G4JS.** Meets at the Darwen Catholic Club, Wellington Fold, Darwen, Lancashire. Details from Len Jackson G0NFJ.

**RISTS OW CLUB, G0IPK.** 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 Trimpell Sports & Social Club, Dumas Lane, Morecambe, Lancs. Details from Brian Watson G0RDH. Tel: (01524) 424522.

**PRESTON ARS, G3KUE.** Meets at the Lonsdale Club, Fulwood Hill Lane, Fulwood, Preston. Details from Eric Eastwood G1WCQ. Tel: (01772) 686708.

**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, Rossendale, Lancs BB4 8EW. Details from Ken Slaughter. Tel: (01706) 830306.

**THORNTON CLEVELEYS ARS, G4ATH.** Meets at the Frank Townsend Centre, Beach Road, Thornton Clevelleys, Lancs. Details from Mr J.E. Duddington G4BHF. Tel: (01253) 853554.

### MERSEYSIDE

**LIVERPOOL & DARS, G3AHD.** Meets at the Churchill Conservative Club, Church Road, Wavertree, Liverpool L15. Details from David G. Parr G3DYE.

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

**SOUTHPORT & DARC, G2OA.** Meets at St Marks Church Hall, Scarsbrook, Lancs. Details from Don Atkins M1BLU.

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

**WIRRAL ARS, G3NWR, M1JARC.** Meets at the Club Room, Ivy Farm, Arrowe 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 & DARC, G4XXG.** Meets at the Billingham Community Centre, Billingham. Details from David J. London G0VGB. Tel: (01642) 896395.

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

**\*GREAT LUMLEY AR & ES, G4EJZ.** Meets at the Community Centre, Great Lumley, Chester-le-Street, Co. Durham. Details from Nancy Bone G7UUR. Tel: 0191-477 0036, mobile (07990) 760920.

**PETERLEE RADIO CLUB, G0KVV.** Details from Andrew Pennell G0NSK.

### HUMBERSIDE

**EAST YORKSHIRE ARS, G0EOR.** 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, G3CNC.** 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, Alwick Road, Hornsea, North Humberside. Details from Jeff Southwell G4IGY. Tel: (01964) 533331.

**HULL & DARS, G3AMW.** Meets at the SWL Centre, Club Room, Gothland Close, Walton 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 M1EFC.

### NORTH YORKSHIRE

**DARLEY ARC, G0FOS.**

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

**QUEEN MARY ARC, G6QM.** Meets at Blaze Field, Pateley Bridge, 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 YO12 2TJ. Details from Mr D.P. Tipper G3JBR. Tel: (01723) 377296.

**SCARBOROUGH SE GRP, G0XOO.** Details from Roy Clayton G4SSH. Tel: (01723) 862924.

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

**YORK ARS, G3HWM.** Meets at the Guppy's Enterprise Club, 17 Nunney Lane, York. Details from Keith Cass G3WVO. Tel: (01904) 422084.

**YORK RADIO CLUB (AMATEUR) G4VRC.** Meets at the Bishopthorpe Radio Club, Bishopthorpe Main Street, York. Details from Gareth Foster G1DRG. Tel: (01904) 421392.

### NORTHUMBERLAND

**NORTHUMBRIA ARC, G4AAX.** Meets at the Old Telephone Exchange, Cresswell Road, Ellington, Morpeth, Northumberland. Details from Mr D. Stansfield G0EUV. Tel: (01670) 513026.

### SOUTH YORKSHIRE

**FINNINGLEY ARS, G7HAH.** Details from John Fennell G4HOY. Tel: (01427) 872522.

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

**MCKBOROUGH & DARS, G4BTS.** Meets at the Harrop Hall, Mexborough, South Yorks. Details from Mr R.T. Sheppard G0SKS. Tel: (01709) 586329.

**SHEFFIELD ARC, G0INF.** NRAE/RAE turbine provided. Meets at the Sheffield University Staff Club, 197 Brook Hill, Sheffield. Details from Mrs Irene Glossop G0SFH.

### TYNE & WEAR

**HOUGHTON LE SPRING ARC, G3NMD.** Meets at the Durnire Royal British Legion, Durnire, Fencehouses, Tyne & Wear DH4 6LJ. Details from Foster Aungles G0ABF. Tel: 0191-584 4673.

**SOUTH TYNESIDE ARS, G0XWQ.** 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 G0SBN.

**TYNESIDE ARS, G3ZQM.** Meets at the St Teresa's Club, 200B Heaton Road, Newcastle-upon-Tyne NE6 5HP. Details from Mr J. Pockersgill G0OZG. 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.

**HAUFPA & DARS, G2UG.** Details from Mr S.P. Ortmayer 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, Yarmouth (Horsforth), RUFG Groups, Brownbeane Lane, Horsforth, Leeds LS18 5HB. Details from Mr E. Howden G0IBU.

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

**OTLEY ARS, G3XNO.** Meets at The RA0B Club, Westgate, Otley, West Yorkshire. Details from Jack Worsnop G0SWN. Tel: (01274) 636197.

**PONTEFRAC & DARC, G3FVQ.** 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, Mirfield, West Yorkshire. Details from Mr J.R. Wide G0FOI. Tel: (01274) 875038.

**WAKEFIELD & DARS, G3WRS.** Meets at the Ossett Community Centre, Prospect Road, Ossett, W. Yorks. Details from Ian Roberts. Tel: (01294) 216502.

**WAKEFIELD RPRTR GP, G0KNR.** Details from Mike Charlton G60XZ.

### MIDLANDS

#### BEDFORDSHIRE

**DUNSTABLE DOWNS RC, G4DDC.** Meets at the Chews 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, Ampthill, Shefford, Beds. Details from John West. Tel: (01462) 812739.

**ST SWITHUN'S ARC, M0AJV.** Meets at St. Swithun's Church, Rectory Rooms, Sandy, Beds. Details from Kelynn Darton G0WDD. Tel: (01767) 683179.

### CAMBRIDGESHIRE

**CAMBRIDGE & DARC, G2XV.** Meets at the Coleridge Community College, Redegund Road, Cambridge. Details from Ron Huntsman G3KBR. Tel: (01223) 501712.

**DUNFORD ARS, G82IWM.** Meets at Building 177, Imperial War Museum, Dunford Airfield, Carnos. Details from Mrs B.I. Pope. Tel: (01279) 656149.

**GTR PETERBOROUGH ARS, G4EHW.** Meets at the 6th Form Building, Stanground College, Farce Road, Fletton, Peterborough. Details from Alan D. Ralph G8XLH.

**HUNTINGDONSHIRE ARS, G0HSR.** Meets at the Medway Centre, Medway Road, Huntingdon. Details from David Leech G7DUJ. Tel: (01480) 431333.

**MARCH & DRAS, G3PMH.** Meets at the British Legion Club, Rockwood 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, G4PQL, G8NED.** Meets at RAFA Club, Old Market, Wisbech. Details from Alan Bridgeland M0DDU. 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 Horsley Woodhouse and Woodside). Details from Peter Russell M0AQJ.

**MOUNT ST. MARY'S ARC, G4MSM.** Meets at the Collage, Spinkhill, Sheffield. Details from Rev. P. McArdie 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, Avaston, Derby. Details from William F. Smith G7PJJ.

**STH DERBYS & ASHBY W ARG, G0SRC.** Meets at the Moira Repton Centre, 17 Ashby Road, Moira, Swadincote, Derbyshire DE12 6DJ. Details from Mrs B. Wailey. Tel: (01283) 768822.

**STH NORMANTON, ALFRETON & DARC, G0CPO.** Meets at the New St. Community Centre, New Street, South Normanton, Derbyshire. Details from Peter Gething M0CQL. Tel: 0115-955 5766.

### GLOUCESTERSHIRE

**CHELTENHAM AR ASSN, G5BK.** Meets at the Prestbury Library, Prestbury, Cheltenham. Details from Ivan Wilson G4BGW. 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.

**SMITHS INDUSTRIES RS, G4MEN.** Meets at the Sports & Social Club, Evesham Road, Bishops Cleeve, Cheltenham GL52 4SF. Details from A.J. Hooper G3JMF.

**STROUD RS, G4SRS.** Meets at the Minchampton Youth Centre, Nr. Stroud. Details from Mr S.G. Spencer G3ILO.

**WHITE NOISE LISTENING G0WNL.** Details from Adrian Deane G7KGC.

### HEREFORD & WORCESTER

**BROMSGROVE & DARS, G3VGG.** Meets at the Avoncroft Arts Centre, Bromsgrove, Worcs. Details from Mr J.R.F. Burford G4OAZ.

**BROMSGROVE ARS, G4TUI.** Meets at the Likely End WMC, Bromsgrove, Worcs. Details from Barry Taylor G0ITP. Tel: (01527) 542266.

**DROTWOCH ARC, G4PVO.** Meets in the Community Hall, Drotwich Spa, Worcs. Details from Hector Wragge M1BUV. Tel: (01905) 794399.

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

**KIDDERMINSTER & DARS, G0KRC.** Meets at the Sutton Arms, Sutton Park Road, Kidderminster, Worcs. Details from Mr A.W. Saunders G0OZB. Tel: (01293) 400172.

**MALVERN HILLS ARC, G4MHC.** Meets on the second Tuesday of the month at the Town Club, Great Malvern. Details from Mike G3TGD. Tel: (01905) 830752, E-mail: mike@alenson.fsnet.co.uk

**REDDITCH RC, G4ACZ.** Meets at the WRFS Centre, Ludlow Road, Redditch, Worcs. Details from Mr R.J. Mutton G3EVT. Tel: (01789) 762041.

**VALE OF EVESHAM ARC, G0ERA.** Meets at the BBC Club, High Street, Evesham, Worcs. Details from Mr A.C. Lindsay G4NRD. Tel: (01386) 41508.

### LEICESTERSHIRE

**1F ATC, G7MCD.** Details from Sqn. Cmdr. Adrian Upping G1WZQ.

**BEAUMANOR ARC, G3BMR.**

**DEMONTFORT UNIVERSITY, G3SDC.** Open to past & present students. Details from Mr R.G. Titterton. Tel: 0116-257 7059.

**HINKLEY AR & ES, G3VLG.** Meets at the United Services Club, St. Mary's Road, Hinkley, Details from Mr R.A. Bennett G8BFF. Tel: (01455) 846493.

**LEICESTER RS, G3LRS.** Meets at Gireos Cottage, Groby Road, Leicester LE19 9QJ. Details from Mr S.P. Hay G3HYH. Tel: 0116-224 2598.

**LOUGHBOROUGH & DARC, G3RAL.** Meets at Hind Leys College, Shepshed, Loughborough, Leics. Details from Chris Walter G1ETZ. Tel: (01509) 504319.

**MELTON MOWBRAY ARS, G4FOX.** Meets at the St. John Ambulance Hall, Asfordby Hill, Melton Mowbray, Leics. Details from Mr R. Winters G3NVK. Tel: (01664) 63369.

**NATIONAL SPACE CENTRE ARS, M1NSC.** Details from Mr J. Heath G7HFA.

**TAMWORTH ARS, G8TRS.** Details from Mr A.I. Dyson G0HUW. Tel: (01827) 830437.

**WELLAND VALLEY ARS, G4WVR.** Meets at The Village Hall, The Green, Great Bowden, Leics. Details from The Secretary.

### LINCOLNSHIRE

**FIVE BELLS GROUP, G4SVY.** Details from Mr B.K. Tattrill G4ODA.

**GRANTHAM RC, G0GRC.** Meets at the Kontak Social Club, Barrowby Road, Grantham, Lincs. Details from The Secretary. Tel: (

Coningsby. Details from Peter Hanson G0NWX.

RAF WADDINGTON ARC, GORAF. Meets at Pyewee Inn, Fossebank, Saalby 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) 752112.

## NORTHANTS

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

MID NORTHANTS ARX EXP, GOING. Details from Lionel Parker G4CLA.

NORTHAMPTON RC, G3GWB. Meets at The British Timken, Social & Athletic Club, Cotswold Avenue, Duston, Northampton. Details from Norman Miller G0GBZ. Tel: (01327) 349188.

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

PARALLEL LINES CG, G4LIP. Details from Mr P.S. Lidsay G4CLA.

## NOTTINGHAMSHIRE

ARC OF NOTTINGHAM, G3ERW. Meets at the Haywood Road Community Association, Haywood Road, Mapperley Road, Nottingham NG3 6AD. Details from Ron Hague G4XOU. Tel: 0115-919 9177.

DUKIES ARS, G4XTL. Meets at Ambleside Community Centre, Ambleside, New Ollerton, Notts. Details from Colin Foster G7DCE.

HUCKNALL ROLLS ROYCE ARC, G5RR. Meets at the Hucknall Rolls Royce Sports & Social Club, Watnall Road, Hucknall, Nottingham. Details from Mr P. Hart G4J5V.

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, G8ICQ. Meets at the GPT Sports Ground, Beeston, Nottinghamshire. Details from Chris Archer G4VFK. Tel: 0115-943 3387.

SOUTH NOTTS ARC, G0OAU. Meets at the Fairham Community College, Farmborough Road, Clifton, Nottingham NG11 9AE. Details from Gary Bishop G0WUG. Tel: (01509) 672846.

WORKSOP ARS, G3RCV. 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, G4ORA. Meets at The Sweeney Hall Hotel, Sweeney, Oswestry. Details from Ant Astley G4OAJA. Tel: (01691) 850545.

SALOP ARS, G3SR1, M1AXW. Meets at the Telespot Club, Railway Lane, Abbey Forgeate, Shrewsbury. Details from John Bumford G0GTN. Tel: (01743) 249943. E-mail: john.bumford@virgin.net

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 Staphell Institute, Main Street, Staphell, Burton-on-Trent, Staffs. Details from Mr M.W. Cotton G4HBY.

CANNOCK CHASE ARS, G6SW. Meets at the Four Crosses Inn, Watling Street, Hatherton, Cannock. Details from Arnold Matthews G3FZW. Tel: (01543) 262495.

CHAD RC, G4CAR. Meets at the Swinfen Officer's Club, Swinfen, Lichfield, Staffs. Details from Bernard Jayne G8BFL. 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 Woods, 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 G4DH0. Tel: (01782) 638901.

SUTTON COLDFIELD RS, G3RSC. Meets at the Rugby Club, Walmley Road, Sutton Coldfield, West Midlands. Details from Paul G. Turner G7MWD. Tel: 0121-350 4263.

## WARWICKSHIRE

AVON VALLEY AREA, MORAD. Details from Mr Peter Bradham G0WJX. Tel: (01905) 724531.

MID WARWICKSHIRE ARS, G3UDN. Meets at the St. John Ambulance HQ, 61 Emcote 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, Tiddington, Stratford-upon-Avon, Warwks. Details from Ron Horsley G0MRH. Tel: (07970) 148204.

## WEST MIDLANDS

ALDRIDGE & BARR BEACON ARC, G0NEQ. Meets at the Aldridge Central Hall Community Centre, Middlemore Lane, Aldridge WS9 8AN. Details from Mr C.J. Baker G0NQL. Tel: (01922) 636162.

COVENTRY ARS, G2ASF. Meets at the Binley Church Hall, Bnlnkrow 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 G4LVA. Tel: (01384) 277925.

HILLCREST ARS, G0SPM. Meets at The College, Simms Lane, Netherton, Dudley, West Midlands. Details from Stuart Viney. Tel: (01384) 232457.

KYNOCH R & TNS, G3HPF. Meets at the Club Workshop, IM Ltd., Sportsfield, Perry Barr, Birmingham. Details from Mr G. Nicholls. Tel: (01922) 635376.

MIDLAND ARS, G3MAR. Meets at Unit 22, 60 Regent Place, Hockley, Birmingham (jewelry junction). Details from John A. Crane G0LAL. Tel: 0121-628 7632.

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

SIERRA HOTEL ARCG, G0OBS. Details from Warwick M. Hall G4WVH.

SOULHULL ARS, G3GEI. Meets at The Shirley Centre, 274 Stratford Road, Shirley, Solihull, West Midlands. Details from Paul Gaslin G8AAY. Tel: 0121-783 2996.

SOUTH BIRMINGHAM RS, G3OHM. Meets at Hamstead House, Fairfax Road, West Heath, Birmingham. Details from The SBRS Secretary.

STOURBRIDGE & DRS, G6OI, 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 2884.

WEST MIDLANDS POLICE ARC, G0COP, G1WMP. Details from Steven Jones G6LRJ.

WILLENHALL & DARS, 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 Brick Maker's Arms, Mount Pleasant, Brierley Hill, West Midlands. Details from Alan Evans G1PKZ.

## LONDON & CENTRAL BERKSHIRE

ARBOFIELD ARC, G3IHH. Details from Mrs E.W. Harding 2E1AUJ.

BRACKNELL AEC, G4BRA. Meets at the Coopers Hill Community Centre, Bagshot Road, Bracknell, Berks. Details from John Ellerton G3NCN.

BURNHAM BECHES RC, G3WVR. Meets at the Farmham Common Village Hall, Victoria Road, Farmham Common, Bucks. Details from Mrs Eileen Chislett G6ELL. Tel: (01628) 625720.

MAIDENHEAD & DARC, G3WVK. Meets at the Red Cross Hall, The Crescent, Maidenhead, Berkshire. Details from Neil Savin G0SVN. Tel: (01628) 626210.

NEWBURGH & DARS, G5XV. Meets at the Rugby Club, Monk's Lane, Newburgh. Details from Mark Slade M0CUK. Tel: (01488) 638985.

READING ARC, G3ULT. Meets at the Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading. Details from Marnoch 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 G0DFC.

CHESHAM & DARS, G3MDG, G1MDG. Meets at the White Hill Centre, Chesham, Bucks. Details from Mr T.J. Thirwell G0VFW. Tel: (01442) 632169.

CHILTERN ARC, G3CAR. Details from Roy Page G4VAN. Tel: (01494) 534216.

MILTON KEYNES ARS, G3HUI. Meets at Bletchley Park Museum (The Green Room, B Block Annex), Wilton Avenue, Bletchley, Milton Keynes. Details from Mrs J. Battersby M1EPL (Secretary) on (01908) 565636 or Frank Collins M0RPM (Chairman) on (01234) 713148

MILTON KEYNES SCOUT ARS, G0S/MK. Meets at The James, M.K. Scout Campsite, Cosgrove. Details from Mr P.A. Orchard G0RYZ. Tel: (01908) 648186.

## GREATER LONDON

ADDISCOMBE ARC, G4ALE. Meets at the Lion Inn, Pavsons Road, Croxley. Details from Mr Q.G. Collier G3WVR. Tel: 0208-653 6948.

BARKING R & ES, G3XBF. Meets at the Parkside Community Centre. Details from Bill Chewter G0IQK. 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 Mycenae Road, London SE3 7SE. Details from Mr J. Veaney G7BKH.

CRYSTAL PALACE & DRC, G3VCP. Meets at the All Saints Church, Parish Rooms, Beulah Hill, London. Details from Bob Bums G30OU. Tel: (01737) 552170.

DARENTH VALLEY RADIO, G0KDV. Meets at the Crookenhill Village Hall, Swanley, Kent. Details from Mr K.W. Halls G6VJG. Tel: (01322) 663022.

ECHFORD ARS, G3JUES. Meets at The Community Centre, St. Martin's Court, Kingston Crescent, Ashford, Middlesex. Details from Robin Hewes G3TRD. Tel: (01784) 456513.

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

HAVERING & DARS, G4HRC. Meets at the Fairlytes Arts Centre, 51 Billet Lane, Hornchurch, Essex.

RS OF HARROW, G3EFX. Meets at the Harrow Arts Centre, Uxbridge Road, Hatch End, Middlesex. Details from Mr C. Friel 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 Christy G0KHC. Tel: 0208-504 2831.

MITCHAM & DISTRICT ARS. Meets at the ATC Hut, Commodore West, Mitcham, Surrey CR4 4HB. 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. Terry 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 ARG, G0MIN. Meets at the Whitton Community Centre, Percy Road, Whitton. Details from Ian Claobn G0OFN. 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 ARTS, G7RHH, G0VWH. Meets at the Guide Meeting Rooms (next to the Royal British Legion), Queensway, Hemel Hempstead. Details from Ian Hamilton G0TCD. Tel: (01442) 211925.

HODDSDON RADIO CLUB, G0TSN. Meets at the Rye Park Conservative Club, Rye Road, Hoddesdon, Herts. Details from Don Platt G3JNJ. Tel: 0208-292 3678.

MIMRAM CONTEST GP, M0ABC. Details from Alan Holsworth G80U. Tel: (01707) 392950.

RADIO SCOUTING TEAM, G6BRST. Meets at Tolmers Scout Camp, Tolmers Road, Cluffley, Herts ENG 4JS. Details from Mill Lvens G2CKB. Tel: (01992) 558493.

STEVENAGE & DARS, G3SAD. Meets at the Stevenage Day Centre, Chells 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 Crane G3PMF. Tel: (01923) 262180.

WELWYN & HATFIELD ARC, G3WGO. 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 G4APL.

COLDSDON AMATEUR TRANS. SOC, G4FUR. Meets at St. Swithuns Church Hall, Crowlands Road, Purley, Surrey. Details from Andy Briers G0KZT. Tel: (01737) 552139.

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

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

GUILDFORD & DRS, G6GS. Meets at the Guildford Model Engineers HQ, Stoke Park, Guildford, Surrey. Details from Stella Whitbourn G0SWE.

KINGSTON & DARS, G3KIN. Details from Mrs Mary Ashdown G0BOV.

REIGATE ATS, G5UK, 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, Gander Green Lane, Sutton, Surrey. Details from John Putterock G0BWA. Tel: 0208-644 9945.

THAMES VALLEY ARTS, G3TVS. Meets at the Thames Ditton Library, Watts Road, Gigg Hill, Thames Ditton, Surrey. Details from Cdr J. Pejler G3ENI. Tel: (01843) 284279.

WIMBLEDON & DARS, G3WVM. 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. Fellington.

CROWBOROUGH DARS, G0CRW. Meets at the Plough & Horses, Walshes Road, Jarvis Road. Details from Mrs M. Clark. Tel: (01892) 663666.

EAST SUSSEX AMATEUR TV GROUP, RS178475 was G83VX. Details from Keith Ellis G8HGM. Tel: (01323) 720220.

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

THE ORZ ARG OF SUSSEX, G83VX. Meets at the Coach Station, Watling Road, Eastbourne. Details from Stuart Constable M0CHW. Tel: (01435) 863020.

## HAMPSHIRE

ANDOVER ARC, G0ARC. Meets at the Village Hall, Widham, Andover, Hants. Details from Mr R.S. Coleman G0WYD.

BASINGSTOKE ARC, G3TCR, G8YJN. Meets at the GEMS Social Club, Luster Road, Basingstoke, Hants. Details from Bob Brown M0CJJ.

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

HIGHFIELD PARK RC, G4WD. Meets at Highfield Park RC, National Air Traffic Service, Highfield Park, Heckfield, Hants RG27 0LD. Tel: (01734) 225019.

HORNDEN & DARC, G4FB5. Meets at Loveland Village Hall, Loveland Lane, Loveland, Hants. Details from Stuart Swain G0FYX. Tel: (01705) 472846.

ITCHEN VALLEY ARC, G0IVR. Meets at the Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh, Hants. Details from Sheila Williams G0VNI. Tel: (01703) 813827.

SONY BROADCAST ARC, G4SZC. Accredited C&G RAE centre. Meets at Sony Sports & Social Club, Prestley 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, Newbiglane Lane, Fareham, Hants PO14 1AS. Details from Mr W.S. Blyth G0PPH. Tel: (01329) 232386.

THREE COUNTIES ARC, G4WVR. Meets at the Bramshott Parish Inst. & Club, Headley Road, Liphook, Hants. Details from Damian Kamm G7RFV. Tel: (01428) 724456.

WATERSIDE ARS, G4YJN. 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 Cent, Newnham Road, Binstead, Isle of Wight. Details from Mr Penody.

ISLE OF WIGHT RS, G3SKY. Meets at The Old Cafe, Whiteciff Bay, Holiday Park, Bembridge. Details from Alan Reeves G4ZTF. 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, G3PA. Meets at the Social Club, Harwell Laboratory, Didcot, Oxon. Tel: (01235) 223250.

OXFORD & DARS, G5LO. Meets at the Grove House Club, George Street, Summertown, Oxford. Details from Mr D. Walker G3BLS. Tel: (01865) 247311.

VALS OF WHITE HORSE ARS, G5PR, G4WVH, G6WVH. Meets at The Fox, Steventon. Details from Ian White G3SEK. Tel: (01235) 531559.

## WEST SUSSEX

CHICHESTER ARC, G2NM. Meets at the St. Pancras Hall, Chichester. Details from Graham Swann G0W5D.

CRAWLEY ARC, G3WSC. Meets at the Tilgate Forest Rec. Centre, Hut 18, 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 Alistair Watt G3ZBU. Tel: (01403) 253432.

MID SUSSEX ARS, G3ZMS. 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.

WORTHING & DARC, G3WOR. Meets at the Lancing Parish Hall, South Street, Lancing, West Sussex.

WORTHING & DISTRICT VIDEO RG, G83VR. Details from the Treasurer. Tel: (01903) 211919 (w).

## WILTSHIRE

CHIPPENHAM & DARS, G3VRE. Meets at the Sea Cadet HQ, Chippennham. Details from Jon Ainge G4LZJ. Tel: (01249) 462610.

SWINDON & DARC, G3FEC. Meets at the Eastcott Community Centre, Savenake St, Swindon. Details from Den Forrest M0ACM.

TROWBRIDGE & DARC, G2BOY. Meets at the Southwick Village Hall, Southwick, Trowbridge, Wils. Details from Ian Carter G0GRI. Tel: (01225) 864698.

SOUTH WEST & CHANNEL ISLANDS AVON

BRISTOL ARC, G3TAD. Meets at the Lodgeside Club, Lodge Road, Kingswood, Bristol. Details from Dave Benrey G7BYN.

GORDANO ARC, G6GRG. Meets at The Ship, Redcliffe Bay, Portsmouth, Avon. Details from Mr R.T. White G8SPC. Tel: (01705) 87400L.

NORTH BRISTOL ARC, G4GCT. Meets at the Self Help Enterprise, 7 Braemar Close, Northville, Bristol. Details from David Coxon G0GHM. Tel: (01275) 94048.

SEVERNSIDE TV GROUP, G83ZZ. Meets at NBARC, Filton, Bristol. Details from Paul Stevenson G8YWM. Tel: 0117-965 5361.

SHIREHAMPTON ARC, G4AHG. Meets at the TS Enterprise Sea Cadet Unit, Station Road, Shirehampton. Details from Mr R.G. Ford G4GTD. Tel: 0117-985 6253.

SOUTH BRISTOL ARC, G4WAV. Meets at the Whitchurch Folk House, East Dundry Road, Bristol. Details from Mr L.F. Baker. Tel: (01275) 834282.

TORNBURY & SOUTH GLOS ARC, G4ABC. Meets at the United Reform Church Hall, Rock Street, Thornbury, Bristol. Details from Stan Greenhill G0RYM. Tel: (01454) 413177.

WESTON-SUPER-MARE RS, G4W5M. Meets at the Woodspring Hotel, High Street, Worle, Weston-Super-Mare. Details from Stephen Cole G3YOL. Tel: (01934) 843144.

## CORNWALL & SCILLY IS

CORNISH RAC, G4CRC. Meets at the Penan-ar-Worthal Village Hall, Penarwell, Nr Truro, Cornwall. Details from Mrs Cheryl Hammett 2E1ADJ. Tel: (01726) 882758.

NEWQUAY & DARS, G4ADV. Meets at the Treviglas School, Newquay. Details from Mrs Maggie Reed G0KEM. Tel: (01726) 882752.

POLDHU ARC, G82GM. Meets at the Club House, Poldhu Cove, Mullion, Cornwall TR12 7JB. Details from Mrs Carolyn Rule M0ADA. Tel: (01326) 240144.

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 G3YBC.

EXMOUTH ARC, GOXRC. Meets at The Scout Hut, Marpool Hill, Exmouth.

NORMAN LOCKYER OBSERVATORY ARG, GOAXC. Meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth. Details from Ron Hanson G0NOC. Tel: (01395) 515349.

NTE (PAIGNTON) ARS, GOOSH. Meets at Paignton Community College, Upper School, Waterleat Road, Paignton. Details from Rod Maude G05WM. Tel: (01803) 521066.

SOUTH DEVON ARC, G4SSD. Meets at the Hillhead, Kingswear, Devon. Details from John May G0CBB. Tel: (01803) 522995.

TORBAY ARS, G3NUA. Meets at the Highweek Family & Social Club, Highweek, Newton Abbot, Devon. Details from John Olway G3RMA. Tel: (01803) 556425.

UNIVERSITY OF PLYMOUTH ARS, GOUOP. Details from Aian Santillo G0XAW.

## DORSET

BLACKMORE VALE ARS, G4RBV. Meets at Shaftesbury Club for Young People, Coppice Street, Shaftesbury, Dorset SP7 8PF. Details from Mr A. Marriott G0GFL. Tel: (01258) 860741.

BOURNEMOUTH RS, 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. Harris G7WSN. Tel: (01202) 484892.

FLIGHT REFUELLING ARS, G4RFR. Meets at the Flight Refuelling Social Club, Merley, Wimborne, Dorset. Details from Martin Axon 2E1DFZ. Tel: (01202) 693334.

POOLE RS, G4PRS. Meets at the Bournemouth & Poole C.F.E. Constitution Hill Site, Poole, Dorset. Details from Phil Mayer G0KKL. Tel: (01202) 700903.

PORTLAND ARC, GOVOP/G7VQP. Meets at Clifton Hotel, Grove Road, Portland. Details from Kerry Morris G1WK. Tel: (01305) 788591.

SOUTH DORSET RS, G3SDS. Meets at the Church Hall, Chickering, Weymouth, Dorset. Details from John Rose M0BQO. Tel: (01305) 832057.

SWANAGE & PURBECK ARC, M0BLJ. Meets at Kings Arms, Langton Matravers, Dorset. Details from Peter Wakefield M1WCH/M3WCH. Tel: (01929) 424413.

WESSEX AMATEUR WIRELESS CLUB, G1WAW. Details from Ken Powell G1NGC. Tel: (01202) 549376.

## JERSEY

JERSEY ARS, G3DVC. Meets at the German Signal Station, Rue Baai, La Moye, St. Brelade, Details from Mrs Anne Mourant M0BJU. Tel: (01534) 734948.

## SOMERSET

PRESTON COMMUNITY SCHOOL ARC, G0PCS. Details from Craig Douglas G0HDD. Tel: (01935) 71131.

TAUNTON & DARS, G3XZW. Meets at The Memorial Hall, Taunton. Details from David Rosewam 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. Fingerhut G0ENW. Tel: (01963) 370506.

YEovil & DARC, G3CMH, G8YEO. Meets at the British Red Cross HQ, 72 Grove Avenue, Yeovil, Somerset. Details from George Davis G3IC0. Tel: (01935) 425669.

## ESSEX

BRAINTREE & DISTRICT AMATEUR RADIO SOCIETY, G4JGX. 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@g0mwt.org.uk

CLACTON RADIO CLUB, G3CRC. Details from Mr D. Fitzpatrick M0CHI.

COLCHESTER ARS, G3VCO. Meets at the Colchester Institute, Sheepen Road, Colchester. Details from Frank R. Howe G3FUJ. 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 Brackstone G7UFF. Tel: (01279) 832700. FAX: (01279) 864973.

HARWICH ARIG, G0GRH. Meets at the Park Pavilion, Barrack Lane, Harwich. Details from Eugene Kraft G4FTP.

LOUGHTON & EPPING FOREST ARS, G4ONP. Details from Marc Litchman G0T0C. Tel: 0208-502 1645/(07803) 023501.

SOUTH ESSEX ARS, G4RSE. Meets at the Padlocks, Long Road, Canvey Island, Essex. Details from Mrs Betty Maynard G6LLU. Tel: (01268) 695474.

SOUTHEND & DRC, G5QK. Meets at the Alexandra Yacht Club, Clifton Parade, Southend-on-Sea, Essex. Details from Alan Radley G0TMM. Tel: (01268) 741229.

STANFORD-LE-HOPE & DARC, G4SLH. Meets at the St Joseph Parish Rooms, Scratton 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, Rock Avenue, Gillingham, Kent. Details from Mr T.M. Wheeler G7MIM.

CRAY VALLEY RS, G3RCV, G1RCV. Meets at the Progress Hall, Admiral Seymour Road, Etham, 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. Jim Calms M1BKJ. Tel: (01304) 852773.

EAST KENT RADIO SOCIETY, G0EKR. Meets at St Bartholomew's Church Hall, Heme Bay, Details from Paul Nicholson G3VJF. Tel: (01227) 743070, FAX: (01227) 742288.

HASTINGS ELEC. & RC, G6HH, G1HHH, 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.

HOVE COUNTIES ATV GRP, G6HCT. Meets at the Birfield Club, Birfield (near M4/J10). Details from Mr A. Brooker G4VZ.

MAIDSTONE YMCA ARS, G3TRF. Meets at YMCA Sports Centre, Melrose Close, Maidstone, Kent. Details from Colin Wilson G0VAR. Tel: (01622) 736636.

MEDWAY ARTS, G5MW, G8MWA. Meets at Tunbury Hall, Catkin Close, Tunbury Avenue, Walderdale, Chatham. Details from Mr J. Hale G3FTH.

NORTH KENT RS, G4CW. Meets at The Pop-in-Parlour, Graham Road, Bexleyheath, Kent. Details from Mr A.V. Fibbens G5MLQ. 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, G0OKE. Meets at The Five Wents Memorial Hall, Swanley/Hextable Road. Details from Ken M3CA. Tel: 0208-306 3544.

WEST KENT ARS, G3WKs. Meets at the St. Marks School Hall, Tunbridge Wells, Kent. Details from Malcolm Sheppard G4PVG. Tel: (01892) 652272.

## NORFOLK

ANGIA TELEVISION ARS, G0TXV. Meets at Anglia TV, Norwich NR1 3JG. 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. Blesford 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 ARG, G8ZMC. Details from Tony Smith G4FAL. E-mail: g4fal@connectfree.co.uk

## SUFFOLK

BURY ST. EDMUNDS ARS, G2T0. Meets at the Culford School, Culford, 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: (01728) 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 Lydiate 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 Cornard, Sudbury, Suffolk. Details from Bryan Pantou G1TWW.

SUFFOLK DATA GROUP, G8TMM. Details from Peter Fryke G8HUE. Tel: (01473) 631313.

## NORTH WALES

### CLWYD

CORNWY VALLEY ARC, G6WTM. Meets at the Studio, Penrhos Road, Colwyn Bay, Clwyd. Details from Mr R.W. Evans G6WPMC. Tel: (01745) 855068.

HALKYN & DARS, G6W3HRG. Details from Mr D. Austin G6JXH.

NORTH WALES RS, G6WNWR. Meets at the Old YMCA, Queen's Drive, Colwyn Bay, Clwyd. Details from Ted Shipton G6WDSJ. Tel: (01745) 336939.

WREXHAM ARS, G6WMM. Meets at the Community Centre, Manselwyn Road, Wrexham. Details from Mr P. Moran G1WNER.

### GWYNEDD

MEIRION ARS, G64LZP. Meets at the Royal Ship Hotel, Gogleuau, Gwynedd. Details from Gervase Chavasse G64URJ. Tel: (01341) 421028.

PORTHMADOG & DARS, G6W0MI. Meets at The Yacht Club, The Harbour, Porthmadog, Gwynedd. Details from Mr G. Cadwalladr M0VDFV.

THE DRAGON ARC, G64ATTA. Meets at the Ebenezer Church Hall, Lon Foel Graig, Llanfyllpwll, Isle of Anglesey. Details from Stewart-Roe G6OET. Tel: (01248) 362229.

## POWYS

POWYS ARC, G64HVN. Meets at the ATC HQ, Park Lane,

Newtown, Powys. Details from Mrs Jean Brown 2W1CEZ. Tel: (01686) 640814.

## SOUTH WALES

### DYFED

ABERPORTH YMCA, G64SZV. Meets at the Hut B17, The Airfield, Aberport. Details from Mr G. Caruthur G64HGJ. Tel: (01239) 811205.

ABERSYSTWYTH & DARS, G6W0ARA. Meets at the Scout Hut, Plasconwy Avenue, Aberystwyth. Details from John Woodward G6WIDK. Tel: (01970) 890657.

CARMARTHEN ARS, G64YCT. Meets at The Aelwyd Care Home, Carmarthenshire County Council, Tregynwr Road, Llangunor, Carmarthen SA31 3BS. Details from Mr W.D. Hughes G64ZXL. Tel: (01267) 231359.

CLEDDAU ARS, G6W0SYG. Details from Trevor Perry G64XQK. Tel: (01646) 600725.

LLANELLI ARS, G6W0EQZ. Meets in The Furnace Community Hall, Furnace Square, Llanelli. Details from Roy Jones G6W0JKZ. Tel: (01554) 820207.

PEMBROKESHORE RS, G6W0EJE. Meets at Furzy Park Community Centre, Furzy Park, Haverfordwest, Pembrokeshire. Details from Ian M. Jones M0WOCAB. Tel: (01437) 763028.

### GWENT

ABERGAVENNY RS, G64GFL. Meets at the Hill Residential College, Pen-y-Found, Abergavenny, Gwent. Details from Glyn Hughes G6W0QY. Tel: (01633) 483186.

BLACKWOOD & DARS, G6W6GW. Meets at the Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Details from John Evans G6W8TI. Tel: (01495) 225178.

EBBW VALE COLLEGE RS, G6W0IIV. 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, G64EZW. Meets at the Brynllas Community Centre, Brynllas Road, Newport, Gwent. Details from Paul Nicholls.

PONTYPOOL ARS, G6W3RNH. Meets at the Settlement, Rockhill Road, Pontypool, Gwent. Details from Graham Smith G6W00LZ.

## MID-GLAMORGAN

BRIDGEND & DARC, G64ALNP. Meets at the Club Brynmenyn, Brynmenyn, 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 G6W0RVC.

MID GLAMORGAN ARC, M0WOCNA. Meets at Aberkenfig Sports & Social Club. Details from Mervyn Carey G6W4SE. Tel: (01656) 734668.

## SOUTH GLAMORGAN

BARRY ARS, G6W3VKL. Meets at Sully Sports & Leisure Club, South Road, Sully, S. Glamorgan. Details from Richard Wiltmore G64BVJ. Tel: (01446) 738756.

HIGHFIELDS ARC, G64LFO. 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, Margam, Port Talbot, West Glamorgan. Details from Mr J. Chincock M0W0AGE.

SWANSEA ARS, G6W4CC. Meets at the Applied Sciences Building, Swansea University. Details from David Williams G64BNU. Tel: (01792) 519046.

## SCOTLAND WEST & WESTERN ISLES

### CENTRAL REGION

FALKIRK & DARS, G6M0FRC. Details from Scott Waterall G6M0KBU.

STIRLING & DARS, G6M6NX. Meets at Banchath Industrial Estate, Throsk, Nr. Stirling. Details from John Shury G6W0AZC. Tel: (01324) 824709.

### DUMFRIES & GALLOWAY

WIGTOWNSHIRE ARC, G64RIV. Meets at the Aird Unit, Stranraer Academy, Stranraer, (entrance from Cairnpoll Road). Details from Neil Macdonald G64LQS.

### STRATHCLYDE

AYR ARC, G6W0AYR. Meets at the Ctidal Leisure Centre, Ayr. Details from Peter Sturgeon M0M0BQP.

CENTRAL SCOTLAND FM GROUP, R53872B. Details from Thomas Stalker G671ZU. Tel: (01698) 816793.

DALRY ARC, M0OARG. Meets at The Turf, In Dalry Court, Hill Street, Dalry. Details from Alex McKeeman M0OABM. Tel: (01294) 823295.

DUNOON & DARS, G6M0COD. Meets at the Edward Street Community Centre, Edward Street, Dunoon. Details from A.B. Horton G6M0BUL. Tel: (01369) 840217.

HELENSBURGH ARC, G64HEL. Details from G. Capstick G6W0AF. Tel: (01436) 675922.

INVERCLYDE ARC, G6M0GKN. Meets at the Cardwell Bar, Cardwell Road, Gourock, Strathclyde. Details from Andrew Givens G6M3YOR. Tel: (01475) 638226.

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## AMSAT-UK (GOAUK)

Information from Jim Heck G3WGM, Badgers, Letton Close, Blandford, Dorset BH11 7SS. E-mail: [g3wgm@amsat.org](mailto:g3wgm@amsat.org) or visit [www.uk.amsat.org](http://www.uk.amsat.org)

## British Amateur Radio Teledata Group (BARTG - G4ATG, GB2ATG)

Contact Membership Secretary Andrew Thomas G8GNI, M5AEX, Dame School House, 103 High Street, Stony Stratford, Buckinghamshire MK11 1AT, E-mail: [members@bartg.demon.co.uk](mailto:members@bartg.demon.co.uk) or visit [www.bartg.demon.co.uk](http://www.bartg.demon.co.uk)

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## British DX Club (BDXC-UK)

Enquiries to Club Secretary Colin Wright, 126 Bargery Road, London SE6 2LR. E-mail: [secretary@bdxc.org.uk](mailto:secretary@bdxc.org.uk) or visit [www.bdxc.org.uk](http://www.bdxc.org.uk)



## Danish Shortwave Club

Information from Treasurer Bent Nielsen, Egekrogen 14, DK-3500 Vaerloese, Denmark or visit [www.dswci.org](http://www.dswci.org)

## International Listeners' Association (RS88763)

Details from Trevor Morgan GW40XB, 1 Jersey Street, Haford, Swansea SA1 2HF. E-mail: [gw40xb@net.ntl.com](mailto:gw40xb@net.ntl.com)

## International Short Wave League (ISWL - G4BJC)

Information from Honorary Secretary Bill Mackie,



G9137/G4AIE 23 College Park, Horncastle, Lincolnshire LN9 6RE. E-mail: [bill.mackie@zetnet.co.uk](mailto:bill.mackie@zetnet.co.uk) or visit [www.iswl.org.uk](http://www.iswl.org.uk)

## Military Wireless Amateur Radio Society (GOPTZ)

Further details from John Taylor-Cram, 7 Hart Plain Avenue, Cowplain, Waterlooville, Hampshire PO8 8RP. Tel: 0239-225 0463.

## Radio Amateurs Invalid and Blind Club (RAIBC - G4IBC, G80IBC, GB1IBC)

Enquiries to Honorary Treasurer/Membership Secretary Mrs Shelagh Chambers, 78 Durley Avenue, Pinner, Middlesex HA5 1JH. Tel: 0208-868 2516.

## Radio Amateur Old Timers' Association

Enquiries to Membership Secretary Ted Rule, G3FEW, 15 Norwich Road, Lenwade, Norwich, NR9 5SH, O1603 872309, E-mail: [edit@raota.fsnet.co.uk](mailto:edit@raota.fsnet.co.uk) or visit <http://go.to/raota>

## Remote Imaging Group (RS88803)

Further details from the Membership

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## Royal Air Force Amateur Radio Society (RAFARS - G8FC, G8RAF)

Details from the Administrator, HQ RAFARS, RAF Cosford, Wolverhampton WV7 3EX. Tel: (01902) 372722, E-mail: [administrator@rafars.org](mailto:administrator@rafars.org)



## Royal Navy Amateur Radio Society (RNARS - GB3RN, G3CRS, G1BZU)

Enquiries to Secretary Philip Manning G1LKJ/M3LKJ, 1 Waverley Gardens, Ash Vale, Surrey GU12 5JP. Tel: (01252) 334929, E-mail: [g1lkj@amsat.org](mailto:g1lkj@amsat.org) or visit [www.rnars.org.uk](http://www.rnars.org.uk)

## Royal Signals Amateur Radio Society (RSARS - G4RS)

More information from General Secretary, HQ RSARS, Cole Block, Blandford Camp, Dorset DT1 8RH. Tel: (01258) 482814, E-mail: [gensec@rsars.org.uk](mailto:gensec@rsars.org.uk) or visit [www.rsars.org.uk](http://www.rsars.org.uk)

## The Medium Wave Circle

Details from c/o C. Rooms, 59 Moat Lane, Luton LU3 1UU. E-mail: [contact@mwcircle.org](mailto:contact@mwcircle.org)

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- Kenwood's latest offering - the TH-K2E 144MHz hand-held is put to the test by Katherine Taylor 2E1HFX



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**Connector to Rx** PL type delivered as standard. Other standards can be fitted on request

**Gain** 10dB +/-0.2dBs

**Intercept Point** +50dBm IP 3rd order (10MHz/12V)

**DC power supply** 11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)

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**Dimensions** 115cm total length. Antenna tube 50mm x 160mm

**Ideal for base stations**



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**Noise figure** 6dB -2100MHz  
1.5-2dB -1000MHz  
1.8-2.5dB -1500MHz  
2.5-4dB -2000MHz

**3rd order IP** +38dBm typical  
PdB = + 22dBm

**Output impedance** 50-75 ohms coaxial

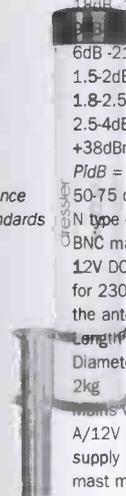
**Connector standards** N type connector at the antenna.  
BNC male connector to the receiver

**Power supply** 12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna

**Dimensions** Length 150mm.  
Diameter 90mm

**Weight** 2kg

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## ADVERTISERS INDEX

Air Supply	72	Pervisell Ltd	72
AOR (UK) Ltd	79	Photavia Press	72
Association for International Broadcasting	72	Practical Wireless	76
bhl	51	QSL Communications	58
Celebrity Communications	77	Radio Active	48
Computer Aided Technology	51	Radioworld	64, 65
Electrovalue	58	Roberts Radio	80
Ferrells Confidential Frequency List	12	Sycom	72
Haydon Communications	20, 21, 22, 23	Ten-Tec	58
Icom (UK) Ltd	8	The Shortwave Shop	72
Leeds Amateur Radio	72	Timesstep Weather Systems	58
Link 77	58	Waters & Stanton	30, 31
Martin Lynch & Sons	40, 41	Wellbrook Communications	48
Moonraker	14, 15	Wintadio	51
Nevada	2, 3, 44, 45	WRTH	62

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