shortwave magazine

Optoelectronics OPTOCOM Put To The Test

Airband SPECIAL

GODFREY MANNING, BOB BALL AND COLIN GOODALL EXPLAIN HOW THINGS ARE LOOKING UP ON AIRBAND

IF YOUR COVER-MOUNTED CD IS NOT HERE PLEASE TELL YOUR NEWSAGENT

BRITAIN'S BEST RADIO MAGAZINE
APRIL 1999 £3.99

9 770037 426999 04>

ALINCO DJ-X10E

wideband scanning receiver

packed for action!

JUST LOOK AT THESE FEATURES!

- **RECEIVES** 100kHz - 2000MHz
- **MULTI MODE RECEPTION** AM - WFM - NFM - SSB - CW
- **1200 MEMORY CHANNELS**
- **CHANNEL SCOPE SPECTRUM ANALYSER** that allows monitoring of 40 channels at a glance
- **CHANNEL SCOPE PEAK SEARCH** During searches you can tune in the strongest signal displayed on the channel scope
- **ADVANCED SCANNING FEATURES** that allow selection of these types of scanning:
  - *Programmed Scan (up to 10 groups)*
  - *Programmed Memory Scan*
  - *Any Memory Scan*
  - *Mode Scan (not found on many scanners!)*
  - *VFO search*
  - *Dual VFO search*
  - *Band encursion scan*
  - *Priority scan*
  - *Any channel skip scan*
- **USER FRIENDLY FEATURES** Help messages - Personalised Channel names - Memory cloning - Auto memory write scan - Beginner/Expert Mode - Memory Tune Mode
- **LARGE CLEAR ILLUMINATED DISPLAY** with switchable backlight for easier use at night
- **TIMER FUNCTIONS** With auto ON/OFF facility
- **BATTERY SAVE FACILITY** For extended use
- **SQUELCH CONTROL** Fully adjustable and switchable squelch control
- **STYLISH CABINET WITH LARGE SPEAKER** For clear sound quality
- **A SUPER SENSITIVE RECEIVER**
- **DUAL VFOs**
- **FACILITIES FOR CLONING ANOTHER SET**
- **BUILT IN 24 HOUR CLOCK**
- **DISPLAY - CONTRAST - CONTROL**
- **LOW BATTERY ALARM**
- **SWITCHABLE ATTENUATOR**
- **SELECTABLE CONTROL BEEP TONE**
- **KEYPAD LOCK CONTROL**

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

SPECIFICATIONS

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

OPTIONAL EXTRAS

EBP-33N....Small size 650mAH NiCad...£39.95
EBP-34N....Long life 1200mAH NiCad...£49.95
ESC-29.....Standard Soft Case.....£14.95
EBC-6.....Mobile Mounting Bracket.....£12.95
EME-6.....Earphone.....£10.95

£295.00

£8.00 post & packing

THE ALINCO DJ-X10 IS AVAILABLE FROM SELECTED TANDY STORES, YOUR LOCAL DEALER OR DIRECT FROM:-

NEVADA®
DISTRIBUTION DIVISION

UK Distributors for Alinco products

tel: **01705 662145** fax: **01705 690626**

• 189 LONDON ROAD • NORTH END • PORTSMOUTH • HANTS • PO2 9AE

• *e-mail:* info@nevada.co.uk • *website:* http://www.nevada.co.uk

Bearcat

BEST VALUE!

UBC 120XLT

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

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

£129.95 £8 p&p

UBC 220XLT

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

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

£149.95 £8 p&p

UBC 3000XLT

Uniden's top of the range scanner has 400 channel near continuous channel coverage from 25 to 1300MHz. New TWIN TURBO search and scan allow high speed scanning or searching to give lightning quick results. The set is packed with new features:

- 25 - 550, 760 - 1300 MHz
- AM/FM/WFM 400 memory channels
- TURBO SCAN 100 Ch/Second
- TURBO SEARCH 300 St/Second
- Automatic Frequency Storage
- Selectable Attenuator
- Automatic Frequency Sorting Data Skip
- Delay Key Channel Count Key
- Supplied complete with earphone, case, belt clip, charger and rubber duck antenna

£189.00 £8 p&p

£249.00 £8 p&p

UBC 9000XLT

High performance, virtually continuous coverage scanner with a large, clear display and easy to use controls. The set is packed with features - ideal for the serious enthusiast. It may be used at home or mobile. For unattended operation the 9000XLT has an automatic tape recorder ON/OFF and tape output feature.

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

UBC 60XLT-1

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

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

£79.95 £8 p&p

UBC 860XLT

AIRBAND BASE SCANNER

A stylish low profile base scanner with TURBO SCAN and TURBO SEARCH facility. Covers CIVIL AIRBAND, MARINE, POLICE, CELLULAR ***and more!***

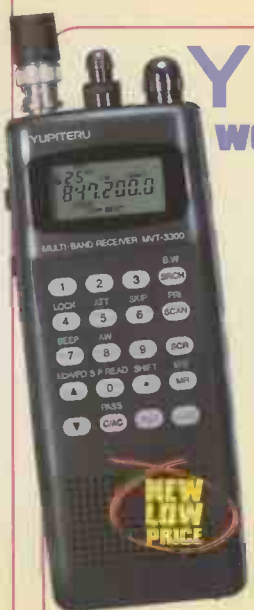
- 66 - 956 MHz (with gaps)
- 100 memories
- Auto Squelch
- Priority Channel
- Unique Data Skip
- Scan Delay

£129.95 £8 p&p

new from **Bearcat**

YUPITERU *probably the*

WORLD'S BEST SCANNER RANGE



YUPITERU MVT 3300EU

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

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

£149.95 £8 p&p

YUPITERU MVT 7100 EU

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

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

£199.95 £8 p&p

YUPITERU MVT 9000 EU

Yupiteru's flagship model, with a range exceeding 2000MHz, a real time bandscope, twin VFO receiver, and a host of other features. EU version is especially designated by Yupiteru for the UK and Europe.

£369.00 £8 p&p

We are proud to be authorised by YUPITERU *Japan*

TO DISTRIBUTE THEIR SCANNERS IN THE UNITED KINGDOM

NEW LOWER PRICES on all YUPITERU models!

• Friendly expert advice • Large Stocks • Same Day Despatch

UK Distributors for Bearcat and Yupiteru products

We are one of Europe's largest Scanner Specialists

WE SUPPLY DEALERS THROUGHOUT THE WORLD

DEALERS!

for further details contact

Phil Jeffery

in our TRADE DEPARTMENT

Phone: Intl (0044) 1705 698113

Fax: Intl (0044) 1705 690626

APRIL 1999 Issue

short wave

BROADCAST

Airband Special Feature

COVER SUBJECT

In The Cockpit, Godfrey Explains

Picture courtesy of British Airways

SWM Author Info

To provide you with a ready reference here are the contact details of all our regualr authors.

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

All At Sea
John Hodgkinson, c/o *SWM* Editorial Offices. E-mail: aas@pwpublishing.ltd.uk

Amatuer Bands
Paul Essery GW3KFE, PO Box 4, Newtown, Powys SY16 1ZZ. E-mail: gw3kfe@pwpublishing.ltd.uk

Attention 123!
Enigma, 17-21 Chapel Street, Bradford, West Yorkshire DB1 5DT.

Bandscan

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

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

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

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

DXTV
Keith Hamer and Garry Smith, 17 Collingham Gardens, Derby DE2 [illegible]S

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

LM&S and Maritime Beacons
Brian Oddy G3FEX, Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS.

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

Off The Record
Andy Cadier, 28 Romney Avenue, Folkstone, Kent CT20 3QJ

Propagation
Jacques d'Avignon VE3[illegible]A E-mail: jacques@pwpublishing.ltd.uk

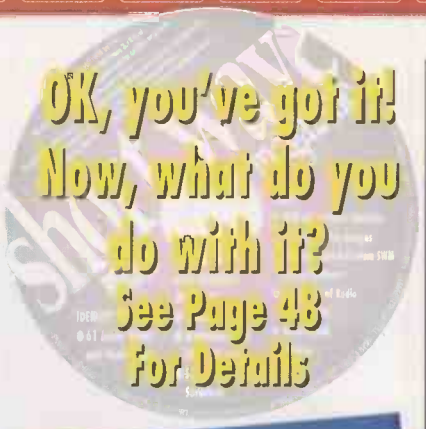
Satellite TV News
Roger Bunney, 35 Grayling Mead, Fishlake, Romsey, Hampshire SO51 7RU.

Scanning
Faris Raouf, c/o *SWM* Editorial Offices. E-mail: scanning@pwpublishing.ltd.uk

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

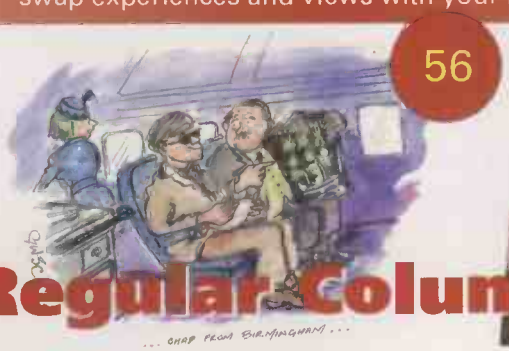
SSB Utilities
Graham Tanner, 64 Attlee Road, Hayes, Middlesex UB4 9JE. E-mail: ssb.utils@pwpublishing.ltd.uk

magazine



Other Features

Have you joined the *SWM* Readers' Internet mailing list? It's easy, just send an E-mail to **swm_readers-on@pwpublishing.ltd.uk** then you can swap experiences and views with your fellow readers.



Regular Columns

Vol. 57 Issue 04 April 1999
ISSN 0037-4261
ON SALE MARCH 25
Next issue on sale April 22

EDITOR:
Kevin Nice, G7TZC, BRS95787

NEWS AND PRODUCTION EDITOR:
Zoë Shortland

EDITORIAL ASSISTANT:
Alison Frith

ART DIRECTOR:
Steve Hunt

ART EDITOR:
John Kitching

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

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

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

ADVERTISEMENT DEPARTMENT
(Broadstone)
ADVERTISING SALES:
Chris Steadman MBIM

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

ADVERTISEMENT MANAGER:
Roger Hall G4TNT
PO Box 948, London SW6 2DS
Telephone: 0171-731 6222
Facsimile: 0171-384 1031
Mobile: (0585) 851385

SWM Services

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

Components For *SWM* Projects
In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, **Badger Boards, 12 Hazelhurst Road, Castle Bromwich, Birmingham B36 0BH, Tel: 0121-681 4168.** A small catalogue containing components, projects and p.c.b.s is available, free, to anyone sending **Roy** or **Sue Martin** an s.s.a.e.

Photocopies & Back Issues
We have a selection of back issues, covering the past three years of *SWM*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *SWM* are £2.99 each and photocopies are £2 99 per article.
Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.
A complete review listing for *SWM/PW* is also available from the Editorial Offices for £1 inc P&P.

Placing An Order
Orders for back numbers, binders and items from our Book Store should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, AMEX or Visa) are also welcome by telephone to Broadstone **(01202) 659930**. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Broadstone **(01202) 659950**. The E-mail address is **bookstore@pwpublishing.ltd.uk**

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

ed's comments

Here at last! The CD you really can't have missed stuck to the cover has finally arrived in its finished form. Now I can finally get some sleep - no kidding - in the week leading up to the finalisation of this issue I seemed to have begun behaving as though I were a Junior House Man learning his (or her) craft. In other words, not sleeping more than a few stolen hours here and there. It has been very hard work from conception to end - I just hope you all think it's worth it.

It has been one hell of a gestation, I can tell you. Producing a disk that breaks the mould as far as cover mounted discs go - well for, radio magazines anyway.

More data on this than your average cover mount, that's for sure.

One you've had a good explore let me know what material you'd like on the next CD? If you have any ideas I'll be happy to listen, so drop me a note, thanks.

VFM

Comments about price and value seem to have been the major topic of our newly established *SWM* Readers' Internet mailing list. There was a flurry of activity as last month's issue was read. Quite a few requests were for my comments on the debate. I did not reply, due to the workload I've just mentioned above and I had already stated the case in last month's 'Ed's Comments'. In any event, the reasoned majority brought out the realistic view on the cover price rise.

One person who mailed me directly and mentioned it on the 'list seems to be under the impression that we operate in a non-commercial environment and that somehow we can hold prices indefinitely against a background of ever increasing costs. Be aware, PW Publishing Ltd., our publisher, employs a significant number of people, and is therefore responsible for their livelihood. If magazine cover prices don't keep pace with inflation and increases of material costs, then we will go out of business. Unfortunately, to imagine that prices will not increase in today's world economy, is somewhat Utopian.

When you relate the cost of *SWM* to other daily consumables say; beer, petrol, cigarettes, that we pay for pretty much without question doesn't that put the new £2.99 cover price into perspective?

The majority of you seem to be of the opinion that *SWM* represents outstanding value for money. In my opinion also it does, at a pint and a half of my favourite ale, and I intend to make sure that's how it continues too!

Communicating

You won't miss the fact that the format of the CD navigation system is based on the hypertext format used by the Internet's world wide web. Mainly because of the ease that this format allows for cross platform compatibility - sorry for all the 'buzz' phrases.

Those of you who aren't familiar with the Internet probably won't know what I'm talking about. To you, I suggest that it could well be the time to investigate. There is masses of radio related info out there, just check out the links on the CD. Now that you can drop into Dixons or Tesco and get free Internet accounts, the whole thing gets more and more affordable. With a used Pentium 90 machine costing less than £100 you really have only the 'phone costs to keep an eye on. If those costs are prohibitive and you just want E-mail and other text based services then you can get away with DOS and a fast 386! And they seem to be free.

Roberts Winners

The results of our Roberts Radio competition from December and January issues are now available. The winner of the first Prize, the R881 portable is, **David Linsay** of the Wirral. The two runners-up are **David Kennedy** of Salisbury and **J McKinney** of Co Down, Northern Ireland, both winning a Roberts *Sportsman* personal radio. Well done to the winners. Your prizes will be with you soon, probably before you read this.

Cut Price Post

Trading Post that is. I have received several requests to review the charges that apply to 'Trading Post' readers' ads. I have considered these requests carefully and here's what I've done. The price, if you are a subscriber, is now free and if you're not, its now £2 less at £4 so it does pay to ask.

The reasoning behind this reduction, but not across the board free ads is; it is important to reward the loyalty of our subscribers, but I don't want to get into a 'damage' scenario with nothing but page after page of junk advertised. The aim is to maintain a good level of quality ads that pertain to radio. Fair?

Don't forget the cover price reverts to the normal price of £2.99 next month.

73

Kevin Nice

Dear Sir
I am writing in reply to Brian D. Williams, South Wales, February '99 issue.

There is no mystery to the signals he is receiving on 31MHz, this is the 'new' cordless 'phone frequency allocation introduced in 1997. The new frequency allocations extend from 31 - 39MHz, and the reason that he is receiving the signals with such strength is that the range of the 'new' 'phones is approximately three times greater than the old 1.6MHz units. Brian may also hear digital tones within this frequency band as many of the new 'phones are of the DECT (Digitally Enhanced Cordless Telephone) variety, and as such cannot be listened to by conventional means.

All the very best to everyone at *SWM*, thanks for a great publication.
Vy 73
Mike Swift
Co. Durham

Dear Sir
Keith Hamer and Garry Smith have done a great job in assembling a lot of disparate material into a single article. One could, however, make the following amendments.

France abandoned her 180-line system long before the Germans occupied Paris, in fact it was in 1937, when the 455-line system was introduced. There are reports of programmes being received by some DXers on Britain's south coast. Vision was positive modulation both before and after German occupation, allowing in fact a standard British receiver near Beachy Head to eavesdrop on the enemy transmissions during the war.

Other countries were also working with television before the war. Our 405-line system was adopted also in the Netherlands and Czechoslovakia, 441 lines were used in France from 1944 until 1956 (not "the early 1950s"), Germany 1938-1944, Italy in 1939, the USA, as well as experimentally in the USSR and Japan. It was also selected for Finland's proposed service, for which the transmitter tower and cameras were built, but opening had to be cancelled because of the war. The USA used 441 lines (with 60 fields) from the late 1930s-1940; the 525-line standard was ratified in 1941.

Finally, the two test cards on page 45 described as monoscopic are not derived from monoscopes; Germany used slide scanners and later electronic pattern generators but not monoscope cameras.
Andy Emmerson
405 Alive Magazine.

Keith Hamer & Garry Smith's reply:
Thanks Andy for the additional information concerning early TV systems. We remember seeing references to the USA 441-line standard in a TV graphics book during our Tech. days in the Seventies!

France also had many low-power u.h.f. repeaters playing the 1st programme on 819 lines. These were classed as 'System L with 819 lines scanning'. The transmissions were in monochrome.

The German 'Telefunken T05' test cards were, of course, monochrome but not derived from monoscopes as Andy points out. The term 'monoscopic' should really only be applied to test cards generated by a monoscopic tube. However, the term is often used by enthusiasts to refer to any test card which is not generated electronically. The EBU Bar and the Chessboard test pattern were electronically generated. Some test cards were actually printed on a thick type of card and placed in front of a camera system. We have some Australian examples of these 'scanner cards' in our extensive collection of world-wide television test cards. A BBC Test Card in the collection is mounted on a rigid sheet of 5mm-thick plastic.

Examples of archive test cards (originally generated from monoscope tubes, transparency scanners, opaque photographs or from electronic/digital generators) are featured every month in the 'DXTV' column. Readers interested in test cards (past and present), identification captions, BBC Test Card music, Trade Test Transmissions and archive television in general, may like to know the quarterly magazine called TV Graphics Review *features articles on these topics, together with rare photographs. Further details are available by sending an s.a.e. to:* ***HS Publications, 7 Epping Close, Mackworth Estate, Derby DE22 4HR.***

Dear Sir
I have just started my new hobby of scanning. For a Christmas present my wife bought me a Realistic hand-held scanner (PRO-26), 200 channel. As soon as I read the booklet that came with it describing what I could listen to that was it, I was hooked.

TOP QSL

I decided to invest in a discone antenna, which we erected on top of my roof. I connected it to my scanner and decided to listen to the air frequencies. I managed to channel in about 100 channels, into my scanner, which I thought was great. But, on the military frequencies, I've not had any success. On the civilian side I can hear three or four channels, where I can hear both sides of the conversation. On all the other channels all I can hear is just one side of the conversation, and that's always the pilot. If I turn the squelch right down I can hear a very faint voice of the tower control with a lot of background noise.

I have written away to some of the dealers, i.e. Nevada and Waters & Stanton, asking their advice, and all they send me is a letter stating that I would be better off using a pre-amp, as this would bring in those weak signals and stop the background noise. Being new to this hobby, I am trying to collect all the information about scanning I can get. So, I thought I would buy *Short Wave Magazine*, in which I saw the article on scanning. So, I am appealing to you or your readers for some help on this matter. Hope you can help.
A. Jennings
Yorkshire

This is a common problem with airband listening. Aircraft flying at many thousands of feet have a clear 'line of sight' view of your antenna (and vice versa*). So you are able to pick up signals v.h.f. and u.h.f. from much longer distances than they would normally be expected at these frequencies, except for 'lift' conditions that is. The ground station that aircraft are in QSO with are just that,* ***ground*** *stations. For them, normal v.h.f. propagation expectations apply. -* ***Ed.***

Dear Sir
As a long time short wave listener, also retired, I agree with every word of Frank's letter (*SWM* Jan). I have now 14 licensed amateurs who have not replied to my request for a QSL card, JY1 among them! I always send an s.a.e. or an IRC, which at 60p each are not cheap. Some are very good, like Ivor VE3JMP, who sent my IRC back to be used for another contact.

Also, I've heard an amateur who, after calling CQ, has dealt with over 20 replies to his call and not once given his callsign, and again after a lengthy conversation some sign off without giving their callsigns. As Frank says, we're only s.w.l.s and don't matter.
Ernest J. Marrowe
Grimsby

Dear Sir
I must say that I do not agree with the assumption made by Mr Carr in his article on 'Modelling Antennas'. In it he states the speed of light in free space to be some 300,000,000ms^{-1}: Oh no it isn't! The correct value should be 299,792,458ms^{-1}; with of course some slight uncertainty as to the value of the final digit.

The figure Mr Carr states, is the one that people who are too bone idle to move the cursors of their slide rules a gnat's whisker to the left of the three, use in their calculations.

I expect Mr Carr also takes liberties as to the value of the acceleration due to gravity. Preferring to use 10ms^{-2}, instead of the correct 9.80665ms^{-2}. Clearly the use of these new-fangled digital calculating engines has addled the poor chap's brain. Yours with tongue firmly in cheek.
Peter Czerwinski
Sheffield

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

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

Your News

Don't forget to keep sending me information on your new products, (*photographs a definite must!*), as soon as details are released, together with any information on Open Days, Special Offers, New Catalogues and general items of news. Remember, mentions are **free**, so don't delay, send off your news today!

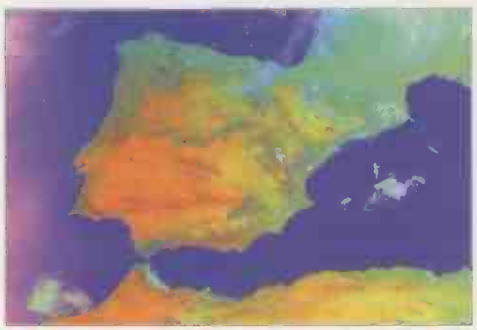
ON THE MOVE

Multicomm 2000 have moved to **Unit 4, 17-E Little End Road, Eaton Socon, Cambs PE19 3JH, Tel: (01480) 406770, FAX: (01480) 216456.**

HRPT FOR WINDOWS

Timestep, well-known manufacturers of equipment for receiving live images from weather satellites, have recently launched their latest *Windows* product. *HRPT for Windows* is a powerful new system for resolving the high resolution (1.1km) digital images from *NOAA-12*, *-14* and *-15* and is completely *Windows 95*, *98* and *NT* compatible.

The package is highly automated: automatic scheduling eliminates the need to predict start times and automatic channel switching allows continuous unattended reception of the three satellites. Element updates are easily available by automatic Internet connection.



NOAA HRPT of Spain.

Dave Crawley of Timestep says "Over the last eight years we've listened to our customers, potential customers, our competitors and our competitors' customers, and we believe that this is by far the best HRPT software there is!".

HRPT (High Resolution Picture Transmission) is digital data from the *NOAA* polar orbiting satellites. Timestep also produce hardware and software for receiving standard analogue APT (Automatic Picture Transmission) from all polar orbiting satellites, for *Meteosat*, *GOES* and other geo-stationary satellites.

NOAA HRPT of Italy.

If you would like more information, write to **PO Box 2001, Newmarket CB8 8XB, Tel: (01440) 820040, FAX: (01440) 820181**, E-mail: **sales@time-step.com** or check out their web site at: **http://www.time-step.com**

SPECIAL EVENT

The **Dover Radio Club**, in conjunction with the **East Kent Radio Society**, the **Hilderstone Radio Club**, the **East Kent Amateur Television Group**, the **Barry ARS** and the **Radioclub - F5KBM** of Wimereux, France, is organising a series of events to celebrate the centenary of Guglielmo Marconi's first cross channel radio transmission of the 27th March 1899.

On Saturday 27th March 1999, it is hoped to operate a Special Event Station at the South Foreland Lighthouse to celebrate this event, using the special call **GB100SFL**. Also, between Thursday 22nd and Sunday 25th April 1999, the Dover Club are responding to the Wimereux Club's request to celebrate the centenary of both the original Wimereux to South Foreland radio transmission (of 27th March 1899) and the original Dover (town) to Wimereux in September 1899. The clubs mentioned above are participating in this event, which will include amateur television links between Wimereux and the Kent venues.

More information from **Hugh Barton G0WWQ, Special Events Co-ordinator, 137 Markland Road, Dover, Kent CT17 9NL** or E-mail at **hughburt@clara.net**

ICOM'S NEW APPOINTMENTS

Icom (UK) Ltd. is strengthening its marketing and sales division with the appointment of **Ian Lockyer** as Marketing Assistant and **Wendy Dagnall** as HAM Sales Assistant. Ian's responsibilities will include support for Icom's full range of marketing activities. Wendy will be instrumental in helping to further develop, as well as consolidate the HAM sales division.

Wendy & Ian join Icom UK.

Dale Blackman, Marketing Manager for Icom UK, said "Ian and Wendy's appointments reflect the rate at which Icom is expanding. They will be a vital part of our marketing and sales team and we expect to see great things from them in the future".

SUNNY SEYCHELLES

Geoff and **Gwyneth Bolton**, both in their early 60s, left their home in Camberley, Surrey, at the end of February, for the heat and humidity of Seychelles. Geoff Bolton has accepted the post of Assistant Director at FEBA Radio's Seychelles station.

Geoff and Gwyneth are active Christians. During a prayer time together using Feba's prayer bulletin, the prayer request for the day was about the urgent need for an Assistant Director in Seychelles. "You could do that job, Geoff," said Gwyneth. This set the ball rolling, and feeling they both still had a lot to give, they contacted Feba.

Of his new role supporting Feba's Seychelles Director Hugh Barton, Geoff says "All my career has been spent in the secular world and it will be challenging to apply my skills in a Christian environment. Above all, is the knowledge that my work will have a direct effect on the proclamation of the Gospel. Reaching the lost for the Lord Jesus is something that is a thrill to be able to do, even late in life".

NEW WAB-10

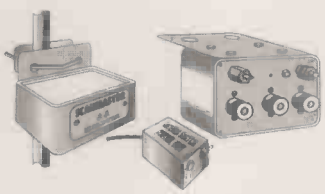
Waters & Stanton PLC are pleased to announce the introduction of a new airband receiver, the WAB-10. This receiver is dedicated to the v.h.f. a.m. airband and covers 108-140MHz. Features include true a.m. reception on the v.h.f. airband, digital readout in 25kHz steps, 10 programmable memory channels, band scanning, keypad lock, electronic up-down tuning, telescopic antenna, external 'phone socket, low current consumption, and it is powered by two AA cells.

The radio also offers reception of f.m. broadcast band (with stereo reception when used with optional headphones) and the medium wave band. Stocks will be available towards the end of March and the introductory price is £39.95 inclusive of VAT. The radio will be available from a number of specialists suppliers. Alternatively, the radio can be purchased direct from Waters & Stanton PLC at **Spa House, 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835/204965, FAX: (01702) 205843.**

NEW HF-2

The HF-2 Remote Coaxial Antenna has been manufactured in the UK. The switch uses a 10A low loss relay, fibreglass PCB and teflon low-loss SO-239 sockets or N-type sockets, depending on the version.

The HF-2 is ideal for scanning and short wave enthusiasts where two antennas may be fed from just one coaxial cable. It is available for frequencies up to 1.5GHz. The unit may also be used with a transmitter on frequencies up to 440MHz.



The HF-2 requires 12V d.c. for its operation, the d.c. input of the unit has been fully decoupled by the use of a high quality feed through and filter network ensure no r.f. pick up on the d.c. cable when used with a transceiver. The HF-2 also comes complete with mast fixing clamps and remote switching box.

There are two versions: SO-239 sockets at £39.95 and the N-type sockets, £42. Available from **Nevada** at **189 London Road, North End, Portsmouth PO2 9AW, Tel: (01705) 662145, FAX: (01705) 690626.**

NEW QUAD-BAND HAND-HELD

Icom (UK) Ltd. are pleased to announce the launch of its latest f.m. hand-held transceiver into the amateur radio market, the IC-T81E. This extremely powerful, ultra compact transceiver is set to have a strong impact on the UK amateur market.

The IC-T81E gives full transmit coverage on 50, 144, 430MHz and 1.2GHz and has a multi-band receiver operating in a.m., f.m. and w.f.m. modes. Although its water resistant body measures only 58 (w) by 106 (h) by 28.5mm (d), the IC-T81E's p.a. circuit delivers 5W on 6, 2m and 70cm and 1W on 23cm, pushing performance standards even further.

Packed with the usual features, including narrow f.m. capability on 2m and CTCSS, in addition the IC-T81E has an automatic squelch system, which adjusted the squelch threshold to help receive weaker signals. RIT and VXO functions are also available for operation on 1200MHz to compensate for other operators frequency errors.

Simple operation is as important to Icom designers as features and specifications, and to this end, the IC-T81E incorporates a new 'joy stick' style multi control. Many functions can be adjusted via this intuitive interface, including frequency band, a.f. level, scan start/direction, Menu/Set mode selection, RIT/VXO settings and 1750Hz tone output.

This radio is built to last, being manufactured to the same high standards as Icom's commercial products, and in addition, the IC-T81E shares many accessories with the IC-T8E dual-band hand-held, minimising upgrade costs. With 100 memories, ten scan-edge pairs and one call channel for each band, the IC-T81E makes frequency management simple.

The IC-T81E is now available for £399.99 inc. VAT. Icom can be contacted direct at **Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742.**

MONTHLY MEETING

The monthly meeting of the **Bangor & District Amateur Radio Society** will be held on Wednesday April 7th at 2000, at the Clandeboye Lodge Hotel, Bangor. A talk on p.s.u.s will be given and a constructor's contest held. Visiting club members are most welcome to attend. Contact **Roy GI0WVN** on **(01247) 460716** for more information.

BRISTOL CLUB NIGHT

Members of the **Bristol RSGB Group** meet on the last Monday of the month, except Bank Holidays, at 1930 at the Avon Combined Services Club, 31 St Paul's Road, Clifton, Bristol 8. Visitors to the meetings will be most welcome. RSGB membership is not essential to attend.

More information about the club's activities can be obtained from **Martyn Philipps G3RFX, 17 Richmond Hill, Clifton, Bristol BS8 1BA, Tel: 0117-973 6419,** E-mail: **g3rfx@compuserve.com** or visit the club's web site at **http://ourworld.compuserve.com/homepages/g3rfx**

Send your news to Zoë Shortland at the Editorial Offices

rallies

Attention Please!

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

March 28: The 10th Magnum Radio & Computer Rally will be held at the Magnum Leisure Centre, Harbourside, Irvine, Scotland. Doors open 1100. This rally is organised by the Cunninghame & DARC. More information from **William Gebbie** on **(01560) 321009**.

April 18: The Lough Erne Amateur Radio Club will be holding their 18th rally at Killyhevlin Hotel, Enniskillen (Northern Ireland) at 12 noon. Attractions include the usual interesting variety of traders and the no charge Bring & Buy. **Kieran GI7NET** on **(01365) 348063** day or **(01365) 327133** evenings.

April 18: The 13th Rainham Radio Rally has moved to a new date, but, still at the same venue, which is The Rainham School for Girls, Derwent Way, Rainham, Kent ME8 0BX. Doors open 1000 (0930 for disabled visitors and Bring & Buy). Admission is £2 (under 14s go free). There will be all the regular traders, plus a few new ones. Many special interest groups will also be represented. Plenty of off road parking and hot and cold snacks will also be available. **Martin** on **(01634) 365980** any reasonable time.

April 18: The Cambridgeshire Repeater Group are holding their annual rally at Bottisham Village College, Bottisham, which is six miles east of Cambridge. Access is via A14 and A1303. There is a large hall with a car boot sale, Bring & Buy and the Group's renowned auction of radio and electronic equipment. Doors open 1030 and admission is just £1. Refreshments will be available. Talk-in on S22. **Paul Dyke G0LUC** on **(01462) 683574**.

April 18: The Yeovil Amateur Radio Club are holding their 15th QRP Convention at Digby Hall, Hound Street, Sherborne, Dorset from 0900 to 1700. There will be interesting lectures, trade stands, a Bring & Buy and refreshments. Talk-in will be on S22. Entrance fee is £2. Further details from **Mike G7SDD** on **(01935) 814612**.

April 24: A Marconi Birthday Exhibition will be held at the National Wireless Museum, on the Isle of Wight. Open from 1100 until 1700 with free entry and parking. More details from **Douglas G3KPO** on **(01983) 567665**.

May 3: The Dartmoor Radio Rally is to be held at Pannier Market, Tavistock, Devon. This new location has much more space for traders and visitors, with access for disabled too. There is plenty of free public car parking within five minutes walking distance.

Continued on page 9...

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

COMPUTER EXHIBITION

Business & Industrial Trade Fairs Ltd. are pleased to announce that **The International Computer Infrastructure Technology Exhibition** for China (China Computer Infrastructure for short) is to be held between **October 20-23 1999** at the Dalian Xinghai Convention & Exhibition Centre, Dalian. This event is the first ever to be dedicated to promote China's computer infrastructure development.

More information from **Mr Louis Leung** or **Ms Joanne Li** of **Business & Industrial Trade Fairs Ltd., Unit 1223, HITEC, 1 Trademart Drive, Kowloon Bay, Kowloon, Hong Kong,** E-mail: **computer@bitf.com.hk**

SIGNAL SUCCESS

Radio amateurs created a new world record when they re-enacted the first ever ship-to-shore radio message in the world from the same locations - the South Goodwin lightship and the South Foreland lighthouse - used when the original message was sent a century previously by Guglielmo Marconi himself.

Previous achievement records were smashed during the event, organised by The National Trust and sponsored by Marconi Communications, when more than 5000 messages were sent and received from enthusiasts all over the world over the four day period from 19-22nd December.

One of the operators, **Richard Mortimore GW4BVJ** single-handedly made a total of 2043 contacts in Morse code and to ensure that he broke the previous record, he remained at his Morse key for 24 hours non-stop on the last day.

Norfolk Island, some 17000km away in the south west Pacific Ocean, was the destination of his furthest link up. Radio amateurs are not numerous among the 2000 odd inhabitants of this one time penal colony but contact was made successfully with **Kirsty Smith VK9NL** and her husband **Jim VK9NS**.

Four other operators - **Glyn Jones GW0ANA**, **Brian Brown GW0PUP**, **Robert Alford MW1COE** and **Philip King MW1DHF**, all members of the Barry ARS - together made nearly 3000 spoken contacts on single sideband radio, taking the total number of hook ups over the 5000 mark. Self declared 'Marconiphiles', they used a self-built replica of Marconi's transmitter *(no spark transmissions I hope - **Ed.**)* to send messages to other amateurs world-wide and entered the spirit of the occasion by wearing period Victorian costume.

History was repeated in other ways as well. Not only did the radio operator aboard the South Goodwin lightship send precisely the same message as Marconi's assistant George Kemp did 100 years previously, he also suffered the same acute seasickness! The rough weather was the only unfavourable element in the whole of the re-enactment, but fortunately it was not as bad as 100 years previously, when high seas prevented Kemp from leaving the vessel and returning to shore until 9th January.

Radio pioneer Guglielmo Marconi.

Mike Parton, Managing Director of Marconi Communications, said "We congratulate the radio operators, for their achievement and their superb re-enactment of Marconi's first demonstration that radio could assist ships at sea. At the same time we pay tribute to the magnificent co-operation of the National Trust and Trinity House.

"It's a timely reminder that milestones are still being made 100 years on from Marconi's first radio link up from ship-to-shore. That same tradition of achievement is alive today, with our brand new range of TETRA radio equipment demonstrating Marconi Communications' continuing commitment to state-of-the-art technology".

ENHANCED WEBSITE

The **London Radio Service** (LRS), the radio news and programmes syndicator produced by Associated Press Television News (APTN), on behalf of the British Foreign and Commonwealth Office, has unveiled its enhanced website **http://www.lrs.co.uk**

The website was originally launched in November 1997, since when radio broadcasters have been able to access LRS's daily news bulletins in the Real Audio format in English, Arabic, Spanish and Portuguese. Russian language news was added in August 1998.

LRS has consulted extensively with client broadcasters who regularly use the site to obtain the latest news from London. Many asked for the news bulletins to be downloaded as individual stories in the .wav file format as well as Real Audio. This .wav facility is now available to radio broadcasters on the LRS website in five language news services, and the facility also allows individual news stories to be imported directly into the digital audio systems of clients broadcasters.

Tim Ayris, LRS's Marketing Officer commented "We felt this was a logical development for our website. This review has also allowed us to enhance other areas of the website. We've even added some photographs of the LRS production team!" Excerpts from each of LRS's weekly programmes are now also available in Real Audio, giving potential client broadcasters a flavour of the programmes before they decide to take them on a regular basis.

Broadcasters without access to the Internet can still obtain LRS's news stories by 'phoning AudioTex, LRS's new storage system on the following dedicated numbers:

English News	**+44 171 412 1000**
Arabic News	**+44 171 412 1001**
Spanish News	**+44 171 412 1002**
Portuguese News	**+44 171 412 1003**
Russian News	**+44 171 412 1004**

London Radio Service is used by thousands of broadcasters in more than 125 countries. Clients include national public service broadcasters, large commercial networks, private stations and international broadcasters.

UNIQUE NEWS SERVICE

London based international broadcaster **World Radio Network** is on the air to German speaking Europe - and will be well into the next Millennium. That's the clear message from the five year old award-winning radio service that has been broadcasting WRN3, its 24 hour-a-day German language channel to Austria, Germany and Switzerland since August 1997.

WRN3 is a unique news based service that covers Europe like no other radio station. And with international news from leading broadcasters, such as Radio France Internationale, WRN3 is a unique global source of current affairs for today's radio listeners.

"At a time when other broadcasters are cutting back, World Radio Network is increasing its reach", says Simon Spanswick, Director of Corporate Affairs at WRN. "Our German language service has been acclaimed by listeners across Europe - and much

RADIO & TVDX NEWS

There's a new national commercial TV network likely to open soon in Estonia. Known as TV5+, it may either establish itself as a 4th national terrestrial commercial

further afield, thanks to its world-wide relay live on the Internet. We offer a unique mix of radio services to listeners and we will be building on the successful foundations of WRN3 with a range of additional quality programming for listeners".

WRN3 is available for rebroadcast on local f.m. and a.m. radio stations, meeting the need of stations that want European and international news without the heavy investment in their own newsgathering operations. WRN3 complements WRN1, the English language service, that is available across Europe, the Middle East, Africa, Asia, the Pacific and North America. There are also extensive rebroadcasting arrangements that further increase the WRN1 audience including nation-wide relays in South Africa and Canada, plus city-wide services in Australia and the USA.

More information from WRN at **Wyvil Court, Wyvil Road, London SW8 2TG, Tel: 0171-896 9000, FAX: 0171-896 9007.**

Test card 1938 style received in New York from Alexandra Palace, London ch.B1 during sunspot maximum - F2 layer propagation (RCA Labs, NY).

The RETMA test card at the end of an RCA Victor filmed commercial circa early 1950s (RCA Victor, NY).

channel, or could possibly replace one of the already operational networks - TV1, TV3 and Kanal Kaks - the latter two stations' licence comes up for renewal late Summer '99. The Dutch broadcaster SBS opened a 2nd channel 'NET 5' on March 1st, which is described as a 'quality commercial' channel, and intends using many UK made TV series plus films and 'soaps'. 'NET 5' hopes to exploit the general public dissatisfaction with the Veronica and RTL channels.

European Antennas have designed a new circular antenna for use in tunnels. The new antenna resembles a compact drum measuring 420mm wide and is wideband covering 400MHz - 2GHz with a 4-7dBi circular gain. The single point fixing antenna is 'an effective and low cost alternative to leaky feeders' and has circular rather than linear polarisation.

Following the success of the TV-12 Isle of Wight RSL-TV station ex Rowridge ch.E54, Solent City Television has now been awarded an RSL TV licence based in Southampton and operating on a 24 hour basis. The new TV station hopes to open October '99, offering local news and programming, financed by advertising and local sponsorship. The transmission channel isn't yet known.

By Autumn '99 a 3rd mobile 'phone network should be open in the Czech Republic. The successful bidder will be expected to take onboard a foreign partner who has experience of mobile networking. The existing two Czech operators are prohibited from applying for the new licence.

Elsewhere in Eastern Europe, St. Petersburg, Russia will have a new TETRA radio system installed in their underground railway. This will enable all 230 trains, hand-helds and 60 multiple carrier base stations to communicate with each other. And Motorola is installing additional GSM transmitters around Moscow and along the main route to the Sheremetiievo Airport.

The new wideband antenna from European Antennas Ltd. designed for tunnel operation over the 400MHz - 2GHz spectrum.

Autumn '99 will also open an upgrade to the Moscow outer ring road and new GSM installations will appear in parts of central, Northern Russia, and the Urals as the systems expands across the country.

Good news from **Aerial Techniques** with their new catalogue fresh from the press and available now at £1.50 including postage (UK). The publication covers all types of antennas, from Band 1 TVDXing through to wideband u.h.f. and satellite antennas. Amplifiers, clamps, filters, combiners, masts and all sorts of antenna essentials are available, plus multi standard TVs, VCRs and standards converters. The catalogue is ideal as a general reference guide for availability of TV receiving equipment. Contact Aerial Techniques at **11 Kent Road Parkstone, Poole, Dorset BH12 2EH, Tel: (01202) 738232.**

NEW TRIODES

Svetlana Electron Devices Inc. is proud to introduce two new triodes to its expanding line of plug-compatible power tubes. Svetlana brings superb Russian quality to the very popular 3CX800A7 and 8874/3CX 400A7 tube types.

Svetlana are proud to introduce two new triodes, the 3CX800A7 and the 8874/3CX400A7.

Svetlana manufactures these popular, high-performance triodes as exact drop in replacements. The Svetlana 3CX800A7 will be available this summer, and the Svetlana 8874/3CX400A7 is now available from their stocking distributors world-wide.

For more information contact **Headquarters, 8200 South Memorial Parkway, Huntsville AL35802**, or **Marketing & Engineering, 3000 Alpine Road, Portola Valley CA 94028.**

Send your news to Zoë Shortland at the Editorial Offices

There will be trade stands, Bring & Buy, and refreshments, etc. Doors open 1030, with a talk-in on S22. There are beautiful views over Dartmoor, ideal for picnics, so why not take the family. **Ron G7LLG** on **(01822) 852586**.

May 9: The Drayton Manor Radio & Computer Rally is to be held at Drayton Manor Park, Fazeley, Tamworth, Staffs on the A4091. The main traders will be in four marquees with a large outside trader's flea market. There will also be a Bring & Buy stall, local clubs and special interest stands. Open from 1000 onwards. Trader information from **Norman** on **0121-422 9787**, other information from **Peter G6DRN** on **0121-443 1189** evenings please.

May 16: The Ripon & DARS are pleased to announce that the Northern Mobile Rally will take place at the Great Yorkshire Showground. There will be all the usual stalls, talk-in, Bring & Buy, free car park, disabled access, etc. Details on **(01765) 640229** or E-mail: **gerald@bronco.co.uk**

May 16: The Mid Ulster Amateur Radio Club Rally will be held at the Silverwood Hotel, Lurgan, Co. Armagh. Doors open from to the public from 12 noon. Traders will have access from 0900. **Jim Lappin GI0OND** on **(01762) 851179**.

May 16: The Dunstable Downs Radio Club will be hold their 16th Annual National Radio Car Boot Sale at Stockwood Country Park, Luton, Bedfordshire. Doors open 0900 till 1500. Talk-in on S22. For a booking form to be sent please write to **DDRC, PO Box 4053, Dunstable, Beds LU5 5ZJ** enclosing an s.a.e., FAX enquiries to **(01525) 383898** or E-mail: **ddrc@magstripe.demon.co.uk**

May 23: The Three Counties Radio & Computer Rally is to take place at the Perdiswell Leisure Centre, Bilford Road, Worcester. Full restaurant services from 0700, licensed bar from 1100. All traders in two adjoining halls, easy access to the halls (ground level) and convenient parking for traders. There will also be free parking for 900 cars and coaches. Being close to the City Centre, wives and children can spend a pleasant day in historic Worcester sightseeing, shopping, etc. **William E. Cotton G4PQZ** on **(01905) 773181**, for FAX please ring first.

May 30: The Plymouth Amateur Radio Society are holding their rally at the usual venue, which is at the Plymouth College of Further Education, Kings Road, Devonport, Plymouth. Doors open 1030 till 1430 and admission is just £1. There will be the usual traders, plus Morse testing on demand. The venue is large and spacious with ample free car parking. The display halls have plenty of room for visitors to mingle and browse. There is also a large canteen serving freshly cooked light meals and snacks at reasonable prices. Plymouth City Centre, the Hoe and many major attractions are close by for the family. Signposting will be from the Manadon Junction on the A38 Devon Expressway and there will also be a talk-in on S22. More information on **(01752) 662051** during office hours.

Lowe Electronics Ltd

JRC NRD545

The latest model in the JRC range, the new NRD 545, which is their first receiver using DSP (Digital Signal Processing) from the IF stages onwards.
The DSP enables a wide choice of digitally implemented filters to be provided, together with IF shift and continuously variable passband width. The combination of these facilities gives the NRD 545 a level of performance than has previously been unheard of in a receiver costing less than £10,000. Every equipment reviewer that has had the opportunity to try the NRD 545 to date has been amazed at the performance that JRC engineers have managed to cram into this small box.

PLUS FREE NVA 319 SPEAKER WORTH £199.00

Lowe Price **£1595.00** Carriage £10.00

ALSO AVAILABLE: CHE199 WIDE BAND CONVERTER £299.00

GPS

GPSIII
£299.00 + P&P

GPSII+
£229.00 + P&P

GPSI2XL
£229.00 + P&P

GPS12
£149.00 + P&P

GPS12CX
£279.00 + P&P

SECOND HAND BARGAINS CHANGE DAILY

HF150	from	£295.00	ICR72	from	£575.00
HF225	from	£325.00	R537S	from	£20.00
NRD535	from	£995.00	WIN108	from	£85.00
HF250	from	£375.00	PRO44	from	£75.00

ALL WITH 3 MONTHS WARRANTY

Lowe Electronics Ltd

LSB/USB/AM/ WBFM/ NBFM Reception
1000 memory channels
High sensitivity Signal Strength Meter
Illuminated keypad
High speed search & scan functions
User friendly Battery save function

£199.00
MVT7100

Low cost with advanced features
Scans up to 40 channels or 50 steps per second
Switchable FM/ AM

£139.00
MVT3300

Superb receiver for more advanced users or beginners
Extended frequency coverage of up to 2039MHz
Bandscope

£369.00
MVT9000

AM/Narrow FM, Wide FM/USB/ LSB/CW
Computer compatibility
Wide frequency coverage 500kHz to 1900MHz

£299.00
AOR8000

Lowest priced full coverage scanner available today.
400 memory channels
0.495 - 1309.995MHz with no gaps!
AM, FM, WFM
CTCSS decode
Clear display backlit for night time use
Powered by 2 AA cells

£139.00
IC-R2

All mode receive
1000 memories
Band scope
Wide frequency coverage 500kHz to 2040MHz no gaps

£369.00
AR8200

How do they cram so many features into such a small package?

Wide-band: 500kHz to 1310MHz with no gaps

£139.00
IC-R2

AIRMASTER 2000
89.95 + 3.00 p&p

Britain's largest selection of scanners and radio accessories
If you don't see what you're looking for in our advert, please call and we'll try to help

Discones £49.95 + p&p
Lowe Airband Antenna £29.95 + p&p
NEW UHF military vertical £39.95 + p&p
WBANT - mobile antenna £19.95 + p&p
LAC1 Window mount £14.98 + p&p

POOLEY'S FLIGHT GUIDE 1997

Lowe Price **£5.00**
plus £2.00 postage

Lowe Electronics Ltd

Chesterfield Road, Matlock
Derbyshire, DE4 5LE
Telephone (General Enquiries) 01629 580800,
Fax 01629 580020

Orders 01629 580800

Email: info@lowe.co.uk
URL: http://www.lowe.co.uk

Showroom opening hours are 9.30am to 5pm Mon-Fri and 10am to 4pm on Sat, but check with our local branches as times may vary

Branches
Bristol & Wales, 79 Gloucester Road, Patchway, Bristol BS12 5QJ,
Tel 0117 931 5263 Fax 0117 931 5270
North East, Unit 18B, Airport Industrial Estate, Newcastle, NE3 2EF,
Tel 0191 214 5424, Fax 0191 214 0761, Email info@lowenewc.demon.co.uk

■ Peter Shore, c/o *SWM* EDITORIAL OFFICES, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW.
■ E-MAIL: peter.shore@pwpublishing.ltd.uk

Bandscan Europe

Is there a future for international broadcasting delivered by short wave in Europe? It is looking increasingly as though the answer, before too long, will be a definite 'no'. On February 10, BBC World Service announced its Three Year Plan which moves 12 of the 40-plus language services broadcast from Bush House into the multimedia world by the year 2002. Internet delivery is now assuming greater importance for the World Service.

At the same time, it revealed that the English-language output is to be split into two distinct services. One, BBC World Service News, will consist of rolling news. The other, World Service Plus, will comprise the 'general' programmes that listeners around the world have come to enjoy. Both of these new services will be carried via satellite and on the Internet, with the aim of making the programmes more useful to local stations that rebroadcast World Service.

And there was the long-expected announcement about the future of the German Service, which I predicted in my last column would be severely trimmed and staff numbers cut. I was wrong. The entire German Service, which celebrated its 60th anniversary last September, will close. In fact, by the time this edition of *SWM* is published, the final transmission will have been made: on Friday March 26 at 1630UTC - a special hour-long 'phone-in programme. Because of BBC redundancy procedures, German Service staff will be paid until August.

The Three Year Plan places increased emphasis on f.m. rebroadcasting and the Internet, and suggests that use of short wave is going to be reduced. "We're not pulling out of short wave altogether or even in any substantial amount," says Caroline Thompson, Deputy Chief Executive of BBC World Service. "We still expect that in five years' time two-thirds of our audience will come from short wave. We are looking at reducing short wave where we have lots of frequencies and we have a lot of short wave frequencies for western Europe which we think are not covering the area very efficiently. So it's not a question of removing them altogether, it's a question of looking at which ones are covering (the region) most effectively rather than simply having a large number of them."

Summer Frequency Schedule

At the time I'm writing this column, the new summer frequency schedule has not been published by BBC World Service. Check out the BBC World Service website, if you have an Internet connection, for the frequency data, on **www.bbc.co.uk/worldservice**

Radio France Internationale in Paris has stopped its daily English-language broadcast to North America on short wave. The 1200UTC programme was on the air until the end of December 1998; now only French-language programmes are beamed to the continent on short wave.

Another broadcaster is concentrating on local rebroadcasting rather than short wave to reach listeners; Radio Free Europe has stopped using short wave for its Estonian-language broadcasts. The station is now relying entirely on local f.m. rebroadcasting deals.

Radio Moldova International has been appealing for listeners to help save the station. Moldova is on the air with English at 0330 and 0430 to the Americas on 7.50MHz and to Europe at 2200 and 2300UTC on 7.52MHz. All programmes are 30 minutes. The station has asked listeners to write to it, and to the External Affairs Ministry. Radio Moldova International is at **Str. Miorita 1, 277028, Chisinau, Moldova**, and the Ministry is at **31st August Street 80, Chisinau, Moldova**.

I reported in the January edition that RTBF, the French-language public broadcaster in Belgium, was to return to short wave. The station is on the air via German short wave transmitters. Tune in at: 0400-0600 on 9.49MHz (only 0530-0600 at weekends), 0600-0810 on 17.65MHz (until 1100 Saturdays and 0915 Sundays), 1100-1315 on 21.565MHz (1100-1215 Saturdays and 1200-1215 Sundays), and 1600-1810, on 13.82MHz (only 1700-1810 Saturdays). RTBF's web address is **www.rtbf.be**

The short wave transmitter at Fredrikstad on the Norwegian coast, which closed down some years ago, has been reportedly sold to Africa No 1 in Gabon. The transmitter has apparently been dismantled, and shipped to the African station for spare parts. Some parts of older transmitters have been placed in the NRK museum.

More programmes for listeners in English, Albanian, Arabic, Bulgarian, French, German, Greek, Hungarian, Russian and Spanish from Radio Yugoslavia, plus a brand new service in Italian. Still no official schedule from the Belgrade-based station, but keep an eye on **www.beograd.com/radioyu/**

Budget Cuts

Deutsche Welle, Germany's international broadcaster, is facing budget cuts of around DM40m (£13 million). The Berlin studio of Deutsche Welle - where DW TV is based - is likely to close, according to German press reports. Also the new Ukrainian service, which was to go on the air on February 1 this year, has now been postponed indefinitely. Deutsche Welle is likely to make the biggest cuts in its world-wide TV operation that broadcasts in German, English and Spanish.

In mid-January, Deutsche Welle started to use an Albanian medium wave transmitter on 1458kHz to reach listeners in Serbia and Albania. Each evening from 2100 to 2115GMT there is Serbian language programming followed by a 15-minute programme in Albanian.

In the January 'Bandscan', I reported about Radio Netherlands after a story was sent to me by one of my media contacts in Holland. Jonathan Marks, Director of Programmes at Radio Netherlands, wrote to *SWM* correcting the story; "Radio Netherlands has not been overspending. We close 1998 right on target. Our mission is to reach clearly defined groups of listeners living abroad by the most relevant means. This proves to be a carefully chosen balance between Internet, radio and television. Within our radio services, we are always looking to find the most effective balance between short wave, medium wave and satellite services."

Jonathan goes on; "BVN-TV (the television service for expatriates) is a joint venture between Radio Netherlands and our colleagues from the domestic service - NOS. There is no resentment, since our domestic colleagues have been involved from the start. In the meantime, colleagues in Belgium have also joined this successful project."

I am happy to put the record straight and wish Radio Netherlands well for the future - particularly since the programmes they broadcast are some of the most interesting on short wave today - and I've often mentioned them in this column!

Until next month, good listening across Europe.

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

BROADCAST

LM&S

During the coming months, an increasing number of sunspots will appear on the Sun. They will enhance the Ionosphere and result in improved reception in the broadcast bands between 15 & 25MHz, which will open earlier and close later. However, there may well be some disturbed periods!

Some experts predict that the peak of the present sunspot cycle, the 23rd since continuous sunspot observations began in 1749, will be reached by the middle of next year, but others believe towards the end of 2000 to be more likely.

WARNING: NEVER LOOK AT THE SUN THROUGH BINOCULARS OR A TELESCOPE!

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 January.

Most of the channels in this band are shared, but it is seldom possible to receive more than one of the occupants clearly unless unusual circumstances arise. **Ernie Strong** (Ramsey, Cambs) encountered just such a situation one night in January - the transmission from Kalundborg, Denmark on **243kHz** faded for about 10 minutes and enabled him to hear the co-channel TRT outlet at Erzurum, Turkey at SINPO 22232.

After the 2000kW transmission from Saarlouis on **183kHz** had closed down at night, **Simon Hockenhull** (E.Bristol) could sometimes hear music on **189kHz**, broadcast by Rikisutvarpid in Iceland. At best, the 300kW transmission from Gufuskalar, W.Iceland, rated SINPO 25342 at 0220UTC.

Medium Wave Reports

Very few of the broadcasts from m.w. stations in E.Canada and E.USA reached the UK at night during January. Checks by **David Edwardson** (Wallsend) revealed that 0300UTC was a likely time, but he was unable to identify any of those which he received.

Over in Co.Down, **Robert Connolly** (Kilkeel) had some success during two nights. On the 10th he picked up a broadcast from CKVO in Clarenville, NF on **710kHz**, which he rated SINPO 32222 at 0230UTC. Slightly better reception from CKVO was noted at 0150 on the 18th, when their transmission peaked 33222. At 0200 he heard CHAM in Hamilton, NB on **820**, which he noted as 22222. There were no other reports.

In contrast, the sky waves from quite a few of the m.w. stations in the Middle East, Africa, Europe and Scandinavia reached the UK at night - see chart.

During daylight, the ground waves from some local radio stations travelled considerable distances - see chart. Whilst searching the band in Gt.Bookham, **Brian Keyte** was surprised to hear ILR Gemini AM on **666kHz** and **954kHz** using the ident 'Westward Radio' on both frequencies. This change was also reported by **Tom Winzor** in Plymouth.

Short Wave Reports

So far only R.Budapest has been taking advantage of the propagation conditions prevailing in the **25MHz (11m)** band but some other broadcasters may do so from March 28, when their new schedules commence. R.Budapest's broadcast to Australia on **25.700** (Hung 1100-1200) was rated 25444 at 1058 by **Mike Casey** in Manchester; 33333 at 1110 by **Bernard Curtis** in Stalbridge; 45434 at 1120 in E.Bristol; 35433 at 1156 by **Eddie McKeown** in Newry.

In contrast there is much activity in the **21MHz (13m)** band. During the morning UAER, Abu Dhabi **21.630** (Ar to Far East 0400?-1600) was rated 45334 at 0810 by **Frank Miles** in SW.London; DW via Kigali, Rwanda **21.560** (Ger to Africa 0800-0955) 44444 at 0940 by **Ernest Wiles** while in Tenerife; R.Austria Int, Moosbrunn **21.765** (Eng to Australasia 0930-1000) 44434 at 0940 by **Vic Prior** in Colyton; UAER, Dubai **21.605** (Eng to Eur 1030-1100) 32232 at 1043 by **Martin Venner** in St.Austell; R.Budapest, Hungary **21.560** (Hung to Australia 1100-1200) 43333 at 1103 by **Rhoderick Illman** in Oxted; BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to SE.Asia 0900-1200) 34333 at 1127 by **Peter Pollard** in Rugby; RAI Rome **21.520** (It to Africa 0600-1300) 45534 at 1135 in E.Bristol.

After mid-day R.Ukraine Int **21.510** (Eng to Australia 1200-1300 was rated 44344 at 1215 by **Sheila Hughes** in Morden; R.Prague, Czech Rep **21.745** (Eng to S.Asia 1230-1257) 45554 at 1230 in Newry; Channel Africa via Meyerton, S.Africa **21.530** (Eng to Africa 1300-1455? Sat/Sun) 35433 at 1300 by **Ross Lockley** in Galashiels; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.] to N/S.America 1200-1600) 33333 at 1330 in Kilkeel; RAI Rome **21.520** (It [Football Commentary] to Africa 1340-1700 Sun) 45554 at 1340 in Wallsend; also **21.535** (It [Football Com] to S.America 1340-1700 Sun) 35553 at 1340 in Wallsend; R.Vlaanderen Int, Belgium **21.510** (Du to C.Africa 1400-1700 Sun) 22222 at 1400 by **Thomas Williams** in Truro; BBC via Cyprus **21.470** (Eng to Africa 1400-1700) 45454 at 1405 by **Robert Hughes** in Liverpool; R.For Peace Int, Costa Rica **21.460** (Eng [u.s.b] to Americas) 24343 at 1407 by **Darren Beasley** in Bridgwater; BBC via Cyprus **21.490** (Eng to E.Africa 1400-1500) 35333 at 1407 by **Fred Wilmshurst** in Northampton; BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) 43333 at 1410 by **Stan Evans** in Herstmonceux; REE via Noblejas **21.700** (Sp to S.America 1200-1800) SIO 444 at 1412 by **John Eaton** in Woking; R.Sweden, Stockholm **21.810** (Eng to N/C.America 1430-1500) 44444 at 1443 by **Vera Brindley** in Woodhall Spa; BBC via Ascension Is **21.490** (Eng to Africa 1500-1645) SIO 323 at 1500 by **Tom Smyth** in Co.Fermanagh; WYFR via Okeechobee, USA **21.525** (Eng, Fr, Port to Eur, Africa 1600-2000) 33333 at 1630 in Stalbridge; Voz Christiana, Chile **21.500** (Sp to N.America 1100-?) 35333 at 1830 by **Martin Goodey** in St.Mary's, Isles of Scilly.

The new **18MHz (15m)** band is being used by R.Norway Int. to reach listeners in N.America on **18.950** (Norw 1100-1130), rated 35434 at 1115 in Manchester; also in Asia (Norw 1200-1230) 45544 at 1216 in St.Mary's, IoS. RNI then relays R.Denmark to Asia on **18.950** (Da 1230-1300), noted as 45433 at 1240 in Northampton. Christian Science Broadcasting is also active in this band. Their transmission from WSHB Cypress Creek, USA on **18.910** (Fr, Eng to C.Africa 1600-1900?) was 33233 at 1655 in Stalbridge.

Good reception from some areas has been noted in the **17MHz (16m)** band. During the morning R.Australia via Shepparton **17.750** (Eng to Asia 0600-0900) was rated 32223 at 0800 by **Gerald Guest** in Dudley; R.Austria Int via Moosbrunn **17.615** (Eng to Asia 0930-1000) 44444 at 0932 by **Tony Hall** in Freshwater Bay, IoW; R.Pakistan, Islamabad **17.835** (Ur to Eur 0800-1100) 45544 at 1020 in St.Mary's, IoS; R.Prague, Czech Rep **17.485** (Eng to W.Africa 1000-1030) 45544 at 1030 in Colyton; DW via Rwanda **17.800** (Eng to Africa 1100-1150) 35354 at 1144 in Manchester; SRI via Sottens **17.815** (Eng, Ger, Fr, It to Far East, SE.Asia 1100-1330) 25333 at 1120 in Bridgwater; Israel R, Jerusalem **17.535** (Fr, Eng to Eur, N.America 1100-1135) 33233 at 1130 by **Clare Pinder** in Appleby; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) 35433 at 1130 in E.Bristol.

After mid-day R.Sweden, Stockholm **17.870** (Eng to N.America 1230-1300) was 54444 at 1243 in Plymouth; R.Bulgaria, Sofia **17.500** (Eng to Eur 1200-1300) 44444 at 1245 in Morden; R.Romania Int **17.745** (Eng to Eur 1300-1356) 45544 at 1323 in Northampton; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1100, 1200-1600) 33443 at 1325 in Kilkeel; R.Finland **17.660** (Fin,

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	H*,J
153	Donebach DLF	Germany	500	A,B,D*,E*,F,G,H*,J,K
162	Allouis	France	2000	A,B,D,F,G,I,J,K
162	Agri	Turkey	1000	J*
171	Nador Medi-1	Morocco	2000	A*,B*,J*
171	B'shakovo etc	Russia	1200	A,B,E*,F,J*
171	Lvov	Ukraine	500	D*,J*
171	Sasnovy	Belarus	1000	J*
177	Dranienburg	Germany	500	A,B,D*,E*,F,G,H*,I,J,K
183	Saarlouis	Germany	2000	A,B,D,E*,F,G,H*,I,J*,K
189	Gufuskalar	W.Iceland	150	C*
198	Droitwich BBC	UK	500	A,B,D*,G,I,J,K
207	Munich DLF	Germany	500	A,B,C*,D*,E*,F,G,H* I,J,K*
207	Azilal	Morocco	800	H*,J*
216	Roumoules RMC	S.France	1400	A,E*,D*,F,G,H*,I,J*,K
225	Raszyn Resv	Poland	?	A,B,C*,D*,F,G*,H*,J*,K*
234	Beidweiler	Luxembourg	2000	A,D,F,G,H*,J*,K
243	Kalundborg	Denmark	300	A,C,D*,E*,F,G,H*,J,K
243	Erzurum	Turkey	200	J*
252	Tipaza	Algeria	1500	A*,D*,H*
252	Atlantic 252	Eire	500	A,B,D*,F,G,H*,I,J,K
261	Burg(R.Ropa)	Germany	85	A*,B,E*,F,G,H*,J*,K*
261	Taldom Moscow	Russia	2500	J*
270	Topolna	Czech Rep	1500	A*,D*,E*,F,G*,H*,J*,K
279	Sasnovy	Belarus	500	A*,D*,E*,G* H*,J,K*
279	Yekaterinburg	Siberia	150	J*

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

Listeners:-
(A) Martin Dale, Stockport.
(B) John Eaton, Woking.
(C) Simon Hockenhull, E.Bristol.
(D) Sheila Hughes, Morden.
(E) Rhoderick Illman, Oxted.
(F) Frank Miles, SW London.
(G) George Millmore, Wootton, IoW.
(H) Fred Pallant, Storrington.
(I) Tom Smyth, Co.Fermanagh.
(J) Ernie Strong, Ramsey, Cambs.
(K) Fred Wilmshurst, Northampton.

Eng to N.America 1300-1400) 55555 at 1335 in Herstmonceux; REE via Noblejas? **17.755** (Sp to S.America 0900-1900) 33323 at 1414 in SW.London; BBC via Antigua, W.Indies **17.840** (Eng to S/C.America 1400-1700) 32122 at 1415 in Liverpool; BBC via Skelton, UK **17.705** (Eng to Eur, Africa 0900-1515) SIO 333 at 1417 in Woking; Channel Africa via Meyerton **17.895** (Eng to W.Africa 1300-1455 Sat/Sun) 34553 at 1420 by **John Parry** in Larnaca, Cyprus; Israel R, Jerusalem **17.535** (Eng to Eur, N.America 1500-1530) 44344 at 1517 in Woodhall Spa; R.Canada Int via Sackville **17.820** (Russ to C/E.Eur 1600-1659) 44444 at 1630 in Stalbridge; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 44444 at 1642 in St.Austell & 33333 at 1700 in Tenerife; Channel Africa via Meyerton **17.860** (Eng to W.Africa 1700-1730) 35443 at 1705 in Newry; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0730-2100) 33333 at 1915 in Rugby; WYFR Okeechobee, USA 17.555 (Eng to Eur 1900-1945) 33333 at 1930 by **David Hall** in Morpeth.

Although the conditions in the higher frequency bands are improving the **15MHz (19m)** band still has much to offer the listener. Mentioned in the reports were the BBC via Skelton & Rampisham, UK **15.565** (Eng to Russia, Eur 0600-1700), rated 55444 at 0605 in SW.London; R.Kuwait via Sulabiyah **15.110** (Eng to SE.Asia 0500-0800) 34333 at 0700 in Morden; BBC via Ascension Is **15.400** (Eng to Africa 0800-1130) SIO 444 at 0800 in Co.Fermanagh; R.Australia via Shepparton **15.415** (Eng to Asia 0100-0400, 0600-0900) 24552 at 0800 in Larnaca, Cyprus & 25322 at 0845 in E.Bristol; Voice of Russia **15.470** (Eng to Australia, New Zealand 0600-1000) 32222 at 0950 in Stalbridge; Voice of Armenia, Yerevan **15.270** (Eng to Eur 1000-1030 Sun) 54544 at 1015 in St.Mary's, IoS; Voice of Nigeria via Ikorodu **15.120** (Eng to W.Africa 0500?-1100) 54444 at 1030 in Herstmonceux; Israel R, Jerusalem **15.640** (Eng to Eur, N.America 1130-1135) 44344 at 1130 in Appleby.

During the afternoon RFI via Allouis? **15.195** (Eng to Eur, Africa 1200-1300) was 55444 at 1200 in Galashiels; R.Bulgaria, Sofia **15.700** (Eng to Eur 1200-1300) 54444 at 1200 in Plymouth; BBC via Nakhon Sawan, Thailand **15.310** (Eng to Asia 1100-1400) SIO 433 at 1216 in Woking; Voice of Greece, Athens **15.630** (Eng to Eur, N.America 1240-1250) 35233 at 1241 in Newry; BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 0300-0815, 0900-1100, 1400-1700) 44454 at 1420 in Liverpool; R.Sweden **15.240** (Eng to N.America 1430-1500) 43344 at 1445 in Tenerife; RCI via Sines, Portugal **15.325** (Eng to Eur, M.East, Africa 1430-1500) 44444 at 1449 in Woodhall Spa; BSKSA Riyadh **15.170** (Fr to Africa? ?-1555) 44444 at 1500 by **Bill Griffith** in W.London; R.Algiers Int, via Bouchaoui **15.160** (Eng to Eur, M.East, N.Africa 1600-1700) 44444 at 1615 in Manchester.

Later, WEWN via Vandiver, USA **15.745** (Eng to Eur 1000-2200) was 44444 at 1701 in St.Austell; R.Japan via Moyabi, Gabon **15.355** (Eng to Africa 1700-1800) 32442 at 1730 in Bridgwater; VOA via Greece? **15.205** (Eng to M.East, Asia 1530-1800) SIO 333 at 1731 by **Francis Hearne** in N.Bristol; VOA via Botswana? **15.445** (Eng to Africa 1600-1800) 44344 at 1744 in Freshwater Bay, IoW; R.Nederlands via Bonaire, Ned.Antilles **15.315** (Eng to Africa 1830-2025) 35444 at 1845 in Northampton; DW via Rwanda? **15.135** (Eng to Africa 1900-1950) 24333 at 1931 by **Fred Pallant** in Storrington; RNB Brazil **15.265** (Eng, Ger to Eur 1800-2050) 33243 at 1945 in Rugby; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200) 34433 at 1945 in Colyton; RAE Buenos Aires, Argentina **15.345** (Sp to S.America?) 34433 at 2020 in Oxted; HCJB Quito, Ecuador **15.115** (Eng to Eur 1900-2200) 44444 at 2050 in Morpeth.

The **13MHz (22m)** band has much to offer too! Received before noon were R.Austria Int via Moosbrunn **13.730** (Eng to Eur 0830-0900), rated SIO 444 at 0848 in N.Bristol; SRI via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030) 44433 at 0835 in Herstmonceux & 55555 at 0940 in Tenerife; R.Ukraine Int, Kiev **13.590** (Uk to Eur 0700-1800) 44333 at 1016 in Oxted; R.Vlaanderen Int, Belgium **13.745** (Eng to Eur?, N.America? 1130-1200) 45333 at 1135 in Northampton.

During the afternoon Austria Int via Moosbrunn **13.730** (Ger, Eng to Eur, N.America 1200-1300) was 44444 at 1238 in Plymouth; R.Kuwait via Kabd **13.620** (Ar to Eur, N.America 0930-1605) 43343 at 1312 in Woking; RCI via Sackville **13.650** (Eng to USA, Caribbean 1300-1500) 23442 at 1325 in Manchester; UAER, Dubai **13.675** (Eng to Eur 1330-1355) 45544 at 1335 in Wallsend; AIR via Bangalore **13.710** (Eng to SE.Asia 1330-1500) 33333 at 1345 in Kilkeel; Vatican R, Italy **13.765** (Eng to Asia, Pacific 1345-1405) SIO 333 at 1345 in Co.Fermanagh & 44554 at 1350 in Larnaca, Cyprus; R.Sweden **13.740** (Eng to Pacific, Asia 1430-1500) 44444 at 1432 in Freshwater Bay; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0000) 34333 at 1530 in Bridgwater; BBC via Skelton, UK 13.660 (Ar to N.Africa 1200-1800) 43343 at 1540 in Liverpool.

Later, R.Bulgaria 13.800 (Sp to S.Eur 1700-1800) was rated SIO 555 at 1750 by **Philip Rambaut** in Macclesfield; WEWN Vandiver, USA **13.615** (Eng to N.America 1600-2200?) 44343 at 1757 in Newry; WHRI via Noblesville, USA **13.760** (Eng to E.USA, Eur 1600-2100) 34433 at 1845 in Colyton; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 2000-2200) 44334 at 2030 in Rugby; R.Havana Cuba **13.720** (Eng to Eur 2030-2130) 33443 at 2055 in Morpeth; VOA via Selebi-Phikwe, Botswana **13.710** (Eng to Africa 1600-2130?) 33323 at 2100 in Stalbridge.

Noted in the **11MHz (25m)** band during the morning were WYFR via Okeechobee, USA **11.550** (Eng to Eur, Africa 0500-0600), rated 33333 at 0545 in Plymouth; RCI via Skelton, UK **11.905** (Eng, Fr to Eur 0600-0700) 33453 at 0615 in Larnaca, Cyprus; R.Finland via Pori **11.755** (Fin to Eur 0700-1000) SIO 555 at 0805 in SW.London; R.Australia via Shepparton **11.880** (Eng to Asia 0900-1100) 23542 at 0908 in Manchester; BBC via Masirah, Oman **11.760** (Eng to Africa 0300-0800, 0900-1400) 45433 at 1004 in Northampton; AWR via KSDA Agat, Guam **11.660** (Chin to China 1100-1200) 44334 at 1129 in Oxted; R.Prague, Czech Rep **11.640** (Eng to N.Eur 1130-1157) 33222 at 1130 in Appleby.

During the afternoon R.Yugoslavia **11.835** (Eng to Australia 1330-1400) was 43443 at 1345 in Kilkeel; R.Australia via Shepparton **11.660** (Eng to Asia 1330-1700) 33333 at 1405 in Stalbridge; REE via Noblejas **12.035** (Sp to Eur 0700-1700) 55555 at 1405 in Liverpool; RCI via Sines **11.915** (Eng, Fr to Eur, Africa 1430-1600) 55555 at 1456 in Bridgwater; R.Nederlands via Madagascar **12.090** (Eng to S.Asia 1430-1625) 44444 at 1527 in St.Austell; WWCR Nashville, USA **12.160** (Eng to N.America, Eur

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	B,E*,F,G,H,J,K,L
585	R.Solway	B	2.00	A
603	Capital G,Litt'brne	I	0.10	D,G,F,H,J,K,L
630	R.Bedfordshire(3CR)	B	0.20	B,C,D*,F,H,J,K,L
630	R.Cornwall	B	2.00	A,H,I
657	R.Clwyd	B	2.00	A,H,J
657	R.Cornwall	B	0.50	A,H,M
666	Westward R, Exeter	I	0.34	C,F,H,J,L
666	R.York	B	0.80	A,F,J,K
729	BBC Essex	B	0.20	B,F,H,J,K,L
738	Hereford/Worcester	B	0.037	A,B,C,F,J,K,L
756	R.Cumbria	B	1.00	A
756	The Magic 756 Powys	I	0.63	B,F,J,K,L
765	BBC Essex	B	0.50	B,D*,F,G*,H,J,K,L
774	R.Kent	B	0.70	F,H,J,L
774	R.Leeds	B	0.50	A,B,K
774	Cl.Gold 774, Glos	I	0.14	B,F,K
792	Cl.Gold 792,Bedford	I	0.27	B,F,J,K,L
792	R.Foyle	B	1.00	A
801	R.Devon & Dorset	B	2.00	A,C,F,H,J,J
828	Cl.Gold 828, Luton	I	0.20	F,J,L
828	Magic 828, Leeds	I	0.12	B
828	Asian Netwk Sedgley	B	0.20	B,K
828	2CR CG, Bournemouth	I	0.27	H
828	Townland R, Ulster		0.80	A
837	R.Cumbria/Furness	B	1.50	A
837	Asian Netwk Leics	B	0.45	B,D*,F,H,J,K,L
855	R.Devon & Dorset	B	1.00	A,H,M
855	R.Lancashire	B	1.50	A,B,K
855	R.Norfolk, Postwick	B	1.50	F,J,K
855	Sunshine 855,Ludlow	I	0.15	B,F,K*,L
873	R.Norfolk, W.Lynn	B	0.30	B,F,H,J,K,L
936	Brunel CG, W.Wilts	I	0.18	F,H,J,L
936	Yks Dales R, Hawes		1.00	A,B,F*
945	Cl.Gold GEM, Derby		0.20	A,B,J,K,L
945	Capital G, Bexhill		0.75	D,F,H,J
954	Westward R, Torquay	I	0.32	F,H,M
954	Cl.Gold 954, H'ford	I	0.16	B,C,F,J,K,L
963	Asian Sd, E.Lancs		0.80	A,B,K
963	Liberty R, Hackney		1.00	F,H,J,L
972	Liberty R, Southall		1.00	B,F,J,K,L
990	R.Devon, E.Devon	B	1.00	A,F,H
990	Magic AM,Doncaster	I	0.25	B,J
990	Cl.G, Wolverhampton	I	0.09	B,F,K,L
999	C.Gold GEM Nott'ham	I	0.25	B,F,J,K,L
999	Red Rose 9-99 P'stn		0.80	A,B
999	R.Solent	B	1.00	F,H
1017	Cl.G, Shrewsbury	I	0.70	A,B,F,K,L
1026	R.Cambridgeshire	B	0.50	B,F,J,K,L
1026	Downtown R, Belfast	I	1.70	A,I
1026	R.Jersey	B	1.00	F,H
1035	RTL Country 1035	I	1.00	F,H,J,L
1035	R.Sheffield	B	1.00	B,K
1035	Sound 2, Aberdeen	I	0.78	A,F*
1116	R.Derby	B	1.20	B,F,J,K,L
1116	R.Guernsey	B	0.50	F,H
1116	Valley R, Ebbw Vale	I	0.50	C
1152	Cl.G Amber, Norwich	I	0.83	J
1152	LBC 1152 AM	I	23.50	F,H,J,L
1152	Pic'ly 1152,Manch'r	I	1.50	A,B
1152	PlymSnd AM,Plymouth	I	0.32	M
1152	Xtra-AM,Birmingham	I	3.00	K
1161	R.Bedfordshire(3CR)	B	0.10	F,J,L
1161	Brunel Cl.G Swindon	I	0.16	F,H
1161	Magic AM,Humberside	I	0.35	A,B,F
1161	Southern Counties R	B	1.00	D,F,H
1161	Tay AM, Dundee	I	1.40	F*
1170	GNR, Stockton	I	0.32	A
1170	Capital G,Portsm'th	I	0.50	D,F,H
1170	Signal 2,Stoke-on-T	I	0.20	B,K
1170	1170AM,High Wycombe	I	0.25	D,F,L
1242	Capital G,Maidstone		0.32	D,F,H
1251	C.G Amber, Bury StEd		0.76	A,B,F,J,L
1260	Brunel CG, Bristol	I	1.60	H
1260	Marcher G, Wrexham	I	0.64	B
1260	SabrasSnd,Leicester	I	0.29	B,J,K,L
1260	R.York	B	0.50	A
1278	Cl.Gold 1278 W.York	I	0.43	B,J
1296	Radio XL,Birmingham	I	5.00	A,B,F,H,J,J,K,L
1305	Magic AM,Barnsley	I	0.15	A,B
1305	Premier via ?	I	0.50	F,H,J,K,L
1323	Capital G,Southwick	I	0.50	D,F,H
1323	SomersetSnd,Bristol	B	0.63	I
1332	Premier, Battersea	I	1.00	F,H
1332	Cl.Gold 1332,Pt'bo	I	0.60	A,B,J,K,L
1359	The Breeze,Chelms'g	I	0.28	F
1359	Cl.Gold 1359, C'try	I	0.27	B,F,J,K,L
1359	R.Solent	B	0.85	H,J
1368	R.Lincolnshire	B	2.00	B,F,J,K,L
1368	Southern Counties R	B	0.50	D,F,H
1368	Wiltshire Sound	B	0.10	H
1377	Asian Sd, Rochdale	I	0.10	B
1413	R.Gloucester via ?	B	?	C,J,K,L
1413	Premier via ?	I	0.50	F,H,J
1413	Yks Dales R,Skipton	I	0.10	A,B,J
1431	The Breeze,Southend	I	0.35	A,F,J
1431	Cl.Gold, Reading	I	0.14	C,D,F,H,J,L
1449	R.Peterboro/Cambs	B	0.15	A,B,J,K,L
1458	R.Cumbria	B	0.50	A
1458	R.Devon & Dorset	B	2.00	A,H
1458	1458 Lite AM Manch'	I	5.00	B
1458	Sunrise, London	I	50.00	C*,F,H,J,L
1458	Asian Netwk Langley	B	5.00	K
1476	CountySnd,Guildford	I	0.50	C*,D*,F,H,J,L
1485	Cl.Gold, Newbury	I	1.00	C,D,F,J,L
1485	R.Humberside (Hull)	B	1.00	B,J
1485	R.Merseyside	B	1.20	A,B,H,J,K
1485	Southern Counties R	B	1.00	D,F,H
1503	R.Stoke-on-Trent	B	1.00	A,B,C*,D*,F,H,J,K,L
1521	Heartbeat 1521AM NI	I	0.50	A,I
1521	Fame 1521, Reigate	I	0.64	F,H,K,L
1530	R.Essex, Southend	B	0.15	F,H,J
1530	Cl.Gold W.Yorks	I	0.74	A,B,J
1530	Cl.Gold Worcester	I	0.52	F,H,K,L
1548	R.Bristol	B	5.00	H
1548	Capital G, London		97.50	F,H,J
1548	Magic AM,Merseyside	I	4.40	A,B,I,K
1557	R.Lancashire	B	0.25	A,B
1557	Cl.Gold 1557,N.hant	I	0.76	F,J,K,L
1557	Capital G, Sp'ton	I	0.50	F,H
1584	London Turkish R	I	0.20	F,H,J
1584	R.Nottingham	B	1.00	B,F,K
1584	R.Shropshire	B	0.50	A,F
1602	R.Kent	B	0.25	F,H,J

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

Listeners:-

(A) Robert Connolly, Kilkeel.
(B) Martin Dale, Stockport.
(C) Simon Hockenhull, E.Bristol.
(D) Sheila Hughes, Morden.
(E) Rhoderick Illman, Oxted.
(F) Brian Keyte, Bookham.
(G) Frank Miles, SW London.
(H) George Millmore, Wootton, IoW.
(I) Tom Smyth, Co.Fermanagh.
(J) Ernie Strong, Ramsey, Cambs.
(K) Andy Thompson, Lichfield.
(L) Fred Wilmshurst, Northampton.
(M) Tom Winzor, Plymouth.

1400-2200) 43444 at 1600 in W.London; R.Pakistan, Islamabad **11.570** (Eng to M.East 1600-1630) 44344 at 1618 in Freshwater Bay, IoW.

Later, R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) was SIO 333 at 1704 in N.Bristol; AWR via KSDA Agat, Guam **12.130** (Eng to Africa 1730-1800) 44243 at 1730 in Newry; R.New Zealand Int **11.675** (Eng to Pacific 1650-1950 Mon-Fri, 1855-1958 Sat/Sun)) 43444 at 1755 in St.Mary's, IoS; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 54444 at 1800 by **Robert Shacklock** in Westwood, Notts; Voice of Greece, Athens **12.105** (Gr, Eng to Eur, N.America? 1800-1900?) SIO 333 at 1800 in Macclesfield; AIR via Bangalore **11.620** (Eng, Hin to Eur 1745-2230) 33443 at 1930 in Colyton; R.Nederlands via Flevo **11.655** (Eng to Africa 1830-2025) 44544 at 1943 in Woking; BBC via Ascension Is **12.095** (Eng to S.America 2000-0200) 25433 at 0055 in E.Bristol.

The occupants of the **9MHz (31m)** band before noon include R.Havana, Cuba **9.830** (Eng [u.s.b] to N.America 0100-0700), rated 33223 at 0534 in St.Austell; WYFR Okeechobee, USA **9.985** (Eng to Eur, Africa 0400-0800) 45554 at 0600 in Larnaca, Cyprus; R.Finland via Pori **9.840** (Eng to SW.Eur 0730-0800) 55544 at 0755 in Herstmonceux; BBC via Skelton, UK **9.410** (Eng to Eur, N/C.Africa 0400-2200) 44444 at 0800 in Tenerife; R.New Zealand Int **9.700** (Eng to Pacific areas 0707-1015) 35543 at 0802 in Wallsend; R.Mediterranee Int, Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0100) SIO 444 at 1009 in Macclesfield; Swiss R.Int via Lenk? **9.535** (Eng, Ger, Fr, It to SW.Eur 1100-1330) 33333 at 1100 in Appleby; R.Nederlands via Wertachtal **9.855** (Eng to Eur 1130-1325) SIO 333 at 1131 in N.Bristol; R.Vlaanderen Int, Belgium **9.925** (Eng to Eur, M.East 1130-1200) 45444 at 1130 in Freshwater Bay, IoW.

Later they include AWR via KSDA Guam **9.385** (Eng, Hin?), rated 24222 at 1432 in Newry; R.Budapest, Hungary **9.840** (Hung to Eur 1400-1500 Sun) 44433 at 1432 in Oxted; Israel R, Jerusalem **9.390** (Heb [Home Sce relay] to Eur, N.America 1500-2200?) 44444 at 1900 in Colyton; BSKSA via Riyadh **9.870** (Ar to N.Africa 1800-2300) 44554 at 1900 in Liverpool; R.Australia via Shepparton **9.500** (Eng to Asia, Pacific 1600?-2130) 33333 at 2030 in Truro; R.Thailand, Udon Thani **9.535** (Eng, Ger to Eur 1900-2100) 55544 at 2035 in St.Mary's, IoS; RCI via ? **9.770** (Eng to Eur, Africa 2100-2200) 44444 at 2100 in Dudley; AIR via Bangalore **9.950** (Eng to Eur 2045-2230) 33323 at 2105 in Stalbridge; Voice of Armenia, Yerevan **9.965** (Eng to Eur, USA 2115-2145) 44433 at 2115 in Morden; BBC via Kranji,

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
531	Ain Beida	Algeria	600/300	A*,D*,J*
531	Torshavn	Faeroe Is.	100	E
531	Berg	Germany	20	G,K
531	RNE5 via ?	Spain	?	A*,K*
531	Beromunster	Switzerland	500	G,J,K,L
540	Wavre	Belgium	150/50	A*,B,D*,F,G,J,K,L
540	Sidi Bennour	Morocco	600	A*,G*,J*
540	Vitoria(EI)	Spain	10	D*
549	Les Trembles	Algeria	600	A*,G*,J*
549	Thurnau (DLF)	Germany	200	A*,G,J,L
558	Espoo	Finland	100	G*
558	RNE5 via ?	Spain	?	A*,J*
567	Tullamore(RTE1)	Eire	500	A*,B,D*,E,G,I,J,K,L,M
567	RNE5 via ?	Spain	?	A*,G*
576	Muhlacker(SDR)	Germany	500	D*,J
576	Riga	Latvia	500	J*
576	Barcelona(RNE5)	Spain	50	A*,G*,J*
585	Paris(FIP)	France	8	G,J
585	Madrid(RNE1)	Spain	200	A*,B*,G*,J,K,L*
585	Dumfries(BBCScot)	UK	2	I,K
594	Frankfurt(HR)	Germany	1000/400	A*,G*,J,L
594	Oujda-1	Morocco	100	G*
594	Muge	Portugal	100	A*
603	Lyon	France	300	B,J*,K
603	Sevilla(RNE5)	Spain	50	A*,G*
603	Newcastle(BBC)	UK	2	E,K
612	Athlone(RTE2)	Eire	100	A*,B,E,G,I,J,K,L
612	RNE1 via ?	Spain	10	A*,G*
612	Tallinn	Estonia	100	J*
621	Wavre	Belgium	80	A*,E,G,J,K,L
621	RNE1 via ?	Spain	10	J*
621	Barcelona(OCR)	Spain	50	A*
630	Vigra	Norway	100	A*,G*
630	Tunis-Djedeida	Tunisia	600	A*,G*
639	Praha(Liblice)	Czech.	1500	A*,G*,K
639	RNE1 via ?	Spain	?	A*,G*,J
648	RNE1 via ?	Spain	10	A*
648	Orfordness(BBC)	UK	500	E,F*,G,J,K,L
648	Kharkiv	Ukraine	150	G*
657	Napoli	Italy	120	F*
657	Madrid(RNE5)	Spain	20	A*,G*
657	Wrexham(BBCWales)	UK	2	B,E,J,K,L
666	Messkirch Rohrd(SWF)	Germany	150	A*
666	Sitkunai(R Vilnius)	Lithuania	500	J*,K
666	Lisboa	Portugal	135	G*
675	Lopic(R10 Gold)	Holland	120	A*,B,C*,F*,G,J,K,L*
684	Sevilla(RNE1)	Spain	500	A*,B*
684	Avala(Beograd-1)	Yugoslavia	2000	A*,G*
693	Droitwich(BBC)	UK	150	F,G,J,K,L,M
693	Enniskillen(BBC)	UK	1	I
702	Flensburg(NDR)	Germany	5	G*,A*
702	Presov	Slovakia.	200	J*
711	Rennes 1	France	300	B,F*,G,J,K,L
711	Laayoune	Morocco	600	A*,G*
720	Langenberg	Germany	200	A*,J*
720	Lisnagarvey(BBC4)	N.Ireland	10	G,I,K
720	Norte	Portugal	100	B*
720	Lots Rd,Ldn(BBC4)	UK	0.5	E,F*,G,J,L
729	Cork(RTE1)	Eire	10	A*,G,J
729	RNE1 via ?	Spain	?	A*,D*,G*,J*,L*
738	Paris	France	4	G
738	Barcelona(RNE1)	Spain	500	A*,B*,G*,J*
747	Flevo(Hilv2)	Holland	400	A*,F*,G,J,K,L
756	Braunschweig(DLF)	Germany	800/200	A*,G*,J,K
756	Bilbao(EI)	Spain	5	A*,G*,J*
756	Redruth(BBC)	UK	2	G
765	Sottens	Switzerland	500	A*,C*,G*,31*
774	Enniskillen(BBC)	N.Ireland	1	I
774	RNE1 via ?	Spain	?	A*,G*,J,K*,L
774	Plymouth(BBC)	UK	1	M
783	Leipzig(MDR)	Germany	100	A*,D*,F*,G*,J,K*
792	Limoges	France	300	A*,C*,F*,G,L*
792	Lingen(NDR)	Germany	5	D*
792	Sevilla(SER)	Spain	20	A*,G*
792	Londonderry(BBC)	UK	1	I
801	Munchen-Ismaning	Germany	300	G*,J*,K
801	RNE1 via ?	Spain	?	A*,G*
810	Volgograd	Russia	150	G*
810	Madrid(SER)	Spain	20	A*
810	Westerglen(BBCScot)	UK	100	A*,D*,E,F*,G*,I,J,K,L*
819	Batra	Egypt	450	A*,G*,J*
819	S.Sebastian(EI)	Spain	5	A*,G*
828	Rotterdam	Holland	20	A*
828	Barcelona(SER)	Spain	50	A*
837	Nancy	France	200	B
837	Amchit	Lebanon	100	J*
837	COPE via ?	Spain	?	A*,C*,G*,J*
846	Rome	Italy	1200	A*,D*,G*,J*,K*
855	RNE1 via ?	Spain	?	A*,B*,G*,J*,K*
864	Santah	Egypt	500	A*,G*
864	Paris	France	300	A*,B*,G,J,K,L
864	Socuellamos(RNE1)	Spain	2	A*,J*
873	Frankfurt(AFN)	Germany	150	A*,E,G*,K*
873	Zaragoza(SER)	Spain	20	A*,G*
873	Enniskillen(R.UI)	UK	1	I
882	COPE via ?	Spain	?	G*,J*
882	Washford(BBCWales)	UK	100	A*,D*,E,G,J,K,L
891	Algiers	Algeria	600/300	A*,B*,D*,G*,J*
891	Huisberg	Netherlands	20	A*,G*,K
900	Brno(CRo2)	Czech Rep	25	G*
900	Milan	Italy	600	A*,B*,G*,J*
909	Lisnagarvey(BBC)	N.Ireland	10	I
909	B'mans Pk(BBC)	UK	140	G,J,K,L
918	Domzale	Slovenia	600/100	A*,D*,G*,K*
918	Madrid(R.Int)	Spain	20	A*,G*,J*
927	Wolvertem	Belgium	300	A*,G,J,K,L
936	Bremen	Germany	100	A*,D*,G*,K
936	RNE5 via ?	Spain	?	A*
945	Toulouse	France	300	A*,B
954	Brno (CRo2)	Czech Rep.	200	A*,G*
954	Madrid(CI)	Spain	20	A*,G*,J*
963	Pori	Finland	600	A*,B,G*,H*,J*
963	Tir Chonaill	Eire	10	I
972	Hamburg(NDR)	Germany	300	A*,B,G*,I,J*,K
972	RNE1 via ?	Spain	?	A*
981	Alger	Algeria	600/300	A*,B*,G*,J*,L*
981	Megara	Greece	200	J*
990	Berlin	Germany	300	G*,J*
990	R.Bilbao(SER)	Spain	10	A*,G*,J*
990	Tywyn(BBC)	UK	1	E
999	Madrid(COPE)	Spain	50	A*,B*
1008	Flevo(Hilv-5)	Holland	400	A*,G,J,L*
1017	Rheinsender(SWF)	Germany	600	A*,B,G*,J*
1017	RNE5 via ?	Spain	?	G*,J*
1026	SER via ?	Spain	?	A*
1035	Tallinn	Estonia	500	A*,G*
1035	Lisbon(Prog3)	Portugal	120	B*
1044	Dresden(MDR)	Germany	20	G*
1044	Sebaa-Aioun	Morocco	300	G*
1044	S.Sebastian(SER)	Spain	10	A*,J*
1053	Talk R.UK via ?	UK	?	G,J,K,L
1062	Kalundborg	Denmark	250	A*,B,G*,L*
1062	R.Uno via ?	Italy	?	J*
1071	R.France via ?	France	?	G*
1071	Bilbao(EI)	Spain	5	A*,J*
1071	Talk Radio UK via ?	UK	?	J*,K,L
1080	SER via ?	Spain	?	A*,G*,J*
1089	Talk Radio UK via ?	UK	?	G,I,J,K,L
1098	Nitra(Jarok)	Slovakia	1500	A*,G*,J*
1098	RNE5 via ?	Spain	?	A*
1107	AFN via ?	Germany	10	B
1107	RNE5 via ?	Spain	?	A*
1107	Talk R.UK via ?	UK	?	G,J,K,L
1116	Bari	Italy	150	C*,J*
1116	Pontevedra(SER)	Spain	5	A*
1125	La Louviere	Belgium	20	G*,L*
1125	Deanovec	Croatia	100	B
1125	RNE5 via ?	Spain	?	A*,G*
1125	Llandrindod Wells	UK	1	E,I
1134	COPE via ?	Spain	2	A*,G*,J*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	A*,B,G*,J,L*
1143	AFN via ?	Germany	1	A*
1143	COPE via ?	Spain	2	A*
1152	RNE5 via ?	Spain	10	A*
1161	Ain-Salah	Algeria	5	G*
1179	SER via ?	Spain	?	A*,J*
1179	Solvesborg	Sweden	600	A*,B,G*,I,J,K,L*
1188	Kuurne	Belgium	5	A*,G*
1188	Szolnok	Hungary	135	G*,L*
1197	Munich(VOA)	Germany	300	A*
1197	Virgin via ?	UK	?	G,I,J,K,L
1206	Bordeaux	France	100	B*
1215	Virgin via ?	UK	?	G,I,J,K,L,M
1224	Lelystad	Holland	50	A*
1224	COPE via ?	Spain	?	J*
1233	Liege	Belgium	5	A*,G*
1233	Virgin via ?	UK	?	I,J,K,L
1242	Marseille	France	150	B*
1242	Virgin via ?	UK	?	J,K
1251	Huisberg	Netherlands	10	A*,G*
1251	Dubai	UAE	600	G*
1260	SER via ?	Spain	?	A*,G*
1269	Neumunster(OLF)	Germany	600	A*,G*,L*
1278	Strasbourg	France	300	B*
1278	Dublin/Cork(RTE2)	Eire	10	A*,E,G*,I,J,K,L*
1287	RFE via ?	Czech Rep	400	A*,G*,L*
1287	Lerida(SER)	Spain	10	A*,J
1296	Valencia(COPE)	Spain	10	A*,J*
1296	Orfordness(BBC)	UK	500	E
1305	RNE5 via ?	Spain	?	A*,G*,J*
1314	Kvitsoy	Norway	1200	A*,B,C*,G,J,K,L
1323	W'brunn (V.Russia)	Germany	1000/150	A*,C,H,K*,L*
1332	Rome	Italy	300	A*,C*,G*,J*,K,L*
1341	Lisnagarvey(BBC)	N.Ireland	100	A*,B*,C,E,G,I,J,K
1341	Tarrasa(SER)	Spain	2	A*
1350	Cesvaine/Kuldiga	Latvia	50	G*,J
1359	Madrid(RNE-FS)	Spain	600	G*
1368	Foxdale(Manx R)	I.O.M.	20	A*,C*,E,G*,K
1377	Lille	France	300	A*,B*,G,J,K,L
1386	Bolshakovo	Russia	2500	A*,B*,C*,I,J*,K*,L*
1395	Fllake	Albania	1000	J*
1395	TWR via Fllake	Albania	500	C*
1395	Lopic	Netherlands	120/40	A*,G,I,J,K,L*
1404	Brest	France	20	A*,G,J*,K,L*
1413	RNE5 via ?	Spain	?	A*,J*
1422	Heusweiler(DLF)	Germany	1200/600	A*,G*,I,J,K*,L*
1440	Marnach(RTL)	Luxembourg	1200	A*,C*,G,J,K*,L*
1449	Redmoss(BBC)	UK	2	B*,G*,K
1467	Monte Carlo(TWR)	Monaco	1000/400	G*,J,K*,L*
1476	Wien-Bisamberg	Austria	600	A*,B*,C*,J*,K*,L*
1485	SER via ?	Spain	?	A*,J*
1494	Clermont-Ferrand	France	20	A*,B*,C*,G*,K*
1494	St.Petersburg	Russia	1200	A*,B*,G*,H*,J*,K*,L*
1503	RNE5 via ?	Spain	?	A*,G*
1512	Wolvertem	Belgium	300	A*,C*,G*,H,J,K,L*
1521	Kosice(Cizatice)	Slovakia	600	G*
1521	Duba	Saudi Arabia	2000	G*,J*
1530	Vatican R	Italy	150/450	A*,G*,J,K*,L*
1539	Mainflingen(ERF)	Germany	350(700)	A*,G*,I,J*,K*,L*
1539	SER via ?	Spain	?	J*
1557	Kaunas (R.Vilnius)	Lithuania	75	K*
1566	Sfax	Tunisia	1200	J*
1575	SER via ?	Spain	5	A*,B*,G*,J*,K*
1584	SER via ?	Spain	2	A*,B*
1593	Holzkirchen(VOA)	Germany	150	A*,G*,K*,L*
1593	Dnipropetrovsk	Ukraine	5	J*
1602	Vitoria(EI)	Spain	10	A*,G*,J*,K*
1611	Vatican R	Italy	15	A*,E,K*

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

Listeners:-
(A) Darren Beasley, Bridgwater.
(B) Simon Hockenhull, E.Bristol.
(C) Sheila Hughes, Morden.
(D) Rhoderick Illman, Oxted.
(E) Brian Keyte, Gt.Bookham.
(F) Frank Miles, SW London.
(G) George Millmore, Wootton IoW.
(H) Clare Pinder, while in Appleby.
(I) Tom Smyth, Co.Fermanagh
(J) Ernie Strong, Ramsey, Cambs.
(K) Andy Thompson, Lichfield.
(L) Fred Wilmshurst, Northampton.
(M) Tom Winzor, Plymouth.

Waters & Stanton PLC

22, main Road, Hockley,(Nr Southend) Essex. SS5 4QS
Shop hours 9am - 5.30pm Monday . - Saturday
Web Site www.waters-and-stanton.co.uk
e-mail Sales@wsplc.demon.co.uk

General 01702 206835 / 204965
Trade 01702 203353
Fax 01702 205843

VISA MasterCard

ISO 9002 REGISTERED FIRM

Order Line
Freephone 0500 73 73 88

Open-Day Madness

Sunday 30th May. The day when we sell at trade price on many items. Also the day of the UK's biggest sea-front air display, just ten minutes away. More details next month.

There are many claims made by our competitors, but only at Waters & Stanton do you get the benefit of:

Public Limited Company	Financially Sound
ISO-9002	Guaranteed Standards
Lowest UK Prices	No need to shop around
Price match	Nobody beats our Value
Genuine UK Stock	Full Manufacturer's backup
10-Day Approval	No Risk to You
4 Service Engineers	To give you Fast Service
Friendly Service	We don't just shift boxes!

The complete Guide to Ham Radio Equipment. 240 printed pages just £3.95 post paid.

ICOM 500kHz - 1309 MHz

Part Exchange Welcome

IC-R2 Scanner £139.95

AM FM & WFM
400 Memories
25 Band Edges
30 Ch, per sec.
Multiple Steps
Requires 2 x AA
Very Sensitive
58(W) x 88(H) mm

At last a true performance scanner that fits in the shirt pocket, yet performes to professional standards.

New AR-8200 Scanner

Read AOR's Advert
Then Check OUR PRICE!

£379.95

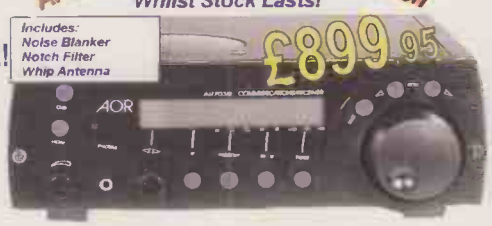
* 100kHz - 2040MHz
* Includes 8.33kHz steps
* 7 modes inc. FM AM SSB
* Super Narrow FM for 12.5kHz
* 1000 Memories
* Auto "birdie" cancellation
* Optional Plug-in Memory cards
* Preselector VHF Front-end
* Improved short wave reception
* Pug-in MW Bar Antenna
* Scan rate 37ch per second.

AR-7030 PLUS Anniversary Edition

Whilst Stock Lasts!

Includes:
Noise Blanker
Notch Filter
Whip Antenna

£899.95



*0 - 32MHz * SSB CW AM FM Data * AM Synchronous * 100 Memories * 4 filters fitted * Switched Pre-amp * Passband tuning * Enhanced AGC * Noise spike compression * Six level attenuator * Bar S-meter * AC adaptor included*

AR-7030 Standard model £694.95

Upgraded Fairhaven RD-500VX

20kHz - 1.75GHz ~~£899.95~~ £799

The new upgraded Fairhaven RD-500VX, now with ectended memories, offers you wide band coverage on all modes SSB - CW - FM AM. The enormous memory capacity and alphanumeric display enables you to build up a very comprehensive data base of stations.

24 Hour Digital WallClock £34.95

+ Temperature & Date

* 265mm diameter
* 24/12 hours LCD
* 55mm digits
* date - day - month
* Celsius / Fahrenheit
* 2 x AAA cells

In Stock NOW!

ICOM ICR-8500 £1549

* 100kHz - 2GHz
* SSB CW FM WFM AM
* 1000 Memories
* 4 IF Bandwidths
* Alphanumeric display
* Analogue S-meter
* RS-232 interface
* IF shift & Audio filter
* Keypad entry option
* Min tuning step 10Hz
* 12v DC supply
* Windows software £49.95

ICOM IC-R10 £295

* 500kHz - 1300MHz
* NFM, WFM, AM, SSB
* 14 tuning steps
* 1000 Memories
* Multi scan modes
* Real-time band scope
* Noise blanker
* bypass memories
* Inc. Ni-cad & Charger

PRICE MATCH

Save £80!

WATSON QS-300 Desk Stand £19.95

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

NEXcell NiMH Batteries

AA= 1.35Ah!

Ideal for scanners & Hungry Digital Cameras

Amazing capacity, no memory effect and re-charge up to 500 times. **Packs of 4 x AA £9.95** (AAA available same price).
Maching charger for both types £9.95
Starter Kit comprising 4 cells plus charger - £18.95

Short Wave International Frequency handbook

Complete list of frequencies with station details, callsigns, times and locations. Military, Aviation & Marine. Thouands of entries - not padded out with old data. A must for any listeners shack. Find all those interesting stations you never knw were there! Money-back guarantee. **£12.95**

WPR-2 Transforms your scanner's Short Wave performance

WATSON £39.95

* 500kHz - 30MHz
* 6 Bands
* SO-239 input/output
* Size 84 x 55 x 60mm

No scanner works well on short wave when you simply connect a long wire to the antenna socket. All you hear is mush and a few of the very strong signals. Connect this unit between your antenna wire and your scanner. Then adjust it for best response and hear signals you never new existed!! Full money-back warranty

WAT-2 Short Wave ATU 500kHz to 30MHz

WATSON £49.95

* 500kHz - 30MHz
* 6 Band Positions
* "Q" Control
* Long wire systems
* Coax feed systems
* SO-239 output
* Size 84x55x60mm

We can supply any ham radio item - phone for deal

Counter Revolution

Lowest Prices
Top Performance

FC-130 **£79.95**

- 10MHz - 3GHz
- Impedance 50 Ohms
- LCD Readout
- 8-digit Display
- BNC whip antenna
- Black anodised case
- Internal-Nicads
- AC Charger
- 9V DC 300mA
- 68 x 80 x 31mm
- Range 100-300ft

Super Searcher

Reaction Tunes Your Scanner
10Hz - 3GHz
Includes Ni-cad, AC charger and telescopic antenna

Receiver not included

£99.95

Use it alone as a conventional frequency counter with a range of up to 300ft or link it to a suitable receiver (AR-8000, AR-8200 or IC-R10), for instant auto-tune of your receiver to the frequency the counter has locked on to. The new low price makes this a really attractive deal. You'll need to purchase a matching data lead (which we can supply) to link the counter to your receiver

ICOM PCR-1000

+ FREE ACARS Software and Frequency Guide - worth £20!

10kHz to 1300MHz SSB FM AM computer receiver. The remote black box plugs directly into your PC. Because it can be positioned remotely from the PC, their is no problem with interference. The is the next generation of receivers - here now! Its performance knocked our socks off.

Yupiteru MVT-7100

100kHz - 1650MHz

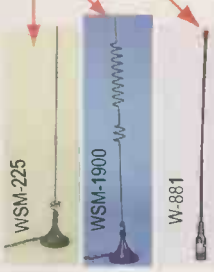
£Phone!!

PRICE MATCH

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

Scanning Antennas

Mobile Handy Aeronautical, Marine Emergency Services



W-881 Super gainer
25 - 1900MHz BNC
41cm long £19.95

WSM-1900 Mobile
Mini magnet antenna
25 - 1900MHz plus cable
fitted BNC £22.95

WSM-225 Airband Mobile
Mini magnet antenna
VHF/UHF airband plus
cable fitted BNC £22.95

WATSON Hunter Counter

NEW

£59.95

Displays the frequency of nearby radio transmissions in an instant. Ideal for use with scanners

- 10MHz-3GHz
- 8 Digit Display
- Battery Save
- Hold button
- 6hr batt. life
- Ni-cads
- Charger
- Antenna

Radio Controlled Weather Centre

Radio Controlled Clock, Weather Trend, Remote Wireless Temperature Sensor Barometer + Much More

£69.95

- 3-channel Temp (C or F)
- Forecast, Trend, Memory
- Clock (MSF Rugby)
- Barometer
- Day, Date, Month
- Alarm & Zone Time
- Low Batt. Indicator
- Clear LCD readout
- Requires 4 x AA cells
- 182 x 133 x 28mm

This unit will grace any radio room. At last you have accurate time and a full weather report without stepping outside. The remote outside sensor sends data back up to 75ft away. Two optional additional remote sensors can also be purchased.

Yupiteru MVT-9000

£Phone!!

OUR VERSION WINS THE AWARD!

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

Buy from us and be confident of legal UK stock, the latest software update, PLUS our back-up service which others can only envy!

Grundig Yacht Boy YB-400PE

AM FM SSB CW
520kHz - 30MHz + Broadcast FM Stereo
Requires 4 x AA cells (not supplied)

The latest version released by Grundig features complete short wave coverage of AM and SSB. 40 station memories allow you to store your favourite frequencies and you have the choice of internal whip antenna or external wire. Direct entry frequency makes for fast operation and we even give you a universal AC adaptor.

Radio Controlled Clock

RM-913 **£19.95**

Locked to Rugby
Ideal shack clock
Time Day & Date
Second time Zone
2 Alarm times
2-minute crescendo alarm
Low battery indicator
Requires 2 x AAA cells
Size 110 x 86 x 42mm

Offered at an amzing price, this radio controlled clock will always be right! It automatically locks to the Rugby standard time signal. Ideal for radio rooms.

Yaesu FRG-100

50kHz - 30MHz Receiver

Lowest UK Price! Phone

New Sun Visor Speaker

£19.95 Fits easily onto sun visor.
Supplied with 5m or cable fitted 3.5mm plug

NEW

QS-400 Mobile Mount

£9.95

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

NEW

WMM-1 Multimode Modem

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

WATSON **£69.95**

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1924	B,C,H
2.325	ABC Tennant Creek	Australia	1926	B,C,H
2.485	ABC Katherine	Australia	2115	B,C
2.560	Xinjiang BS, Urumqi	China	2323	C
3.210	REE via Costa Rica	Costa Rica	0117	A
3.220	R.Kara, Lome	Togo	2020	B
3.255	BBC via Meyerton	S.Africa	1856	B,P
3.270	Namibian BC,Windhoek	Namibia	0428	B,F
3.290	Voice of Guyana	Guyana	0440	F
3.290	Namibian BC,Windhoek	Namibia	0015	B
3.315	AIR Bhopal	India	0032	R
3.316	SLBS Goderich	Sierra Leone	1942	K
3.320	SABC (RSG) Meyerton	S.Africa	2015	B,H
3.335	CBS Taipei	Taiwan	2211	C,H
3.345	AIR Jaipur	India	1725	B,K,R
3.356	R.Botswana	Gabarone	2005	H
3.365	GBC R-2	Ghana	1940	A,K,P
3.365	AIR Delhi	India	1728	K
3.915	BBC via Kranji	Singapore	2114	B,C,G,H,J,N,P,T
3.950	Qinghai PBS, Xining	China	2300	C
3.955	BBC via Skelton	England	2115	A,C,H,N,P,Q,S,T
3.960	Xinjiang PBS, Urumqi	China	0044	B,C,P,R
3.965	RFI Paris	France	2105	A,C,P,T
3.970	R.Korea via Skelton	England	2200	A,B,M
3.975	R.Budapest	Hungary	2110	A,B,G,H,M,N,O,P,T
3.985	Nexus, Milan	Italy	1950	B,P,Q,T
3.995	DW via Julich	Germany	2125	A,B,C,H,N,O,P,R,T
4.005	Vatican R.	Italy	2111	A,B,H,P,T
4.035	Xizang PBS, Lhasa	Tibet	0050	R
4.460	CPBS 1, Beijing	China	2207	P
4.750	Xizang BS, Lhasa	China	0013	J,P
4.755	R.Educ CP Grande	Brazil	2356	A,B,R
4.760	AIR Port Blair	India	0040	B,F
4.770	FRCN Kaduna	Nigeria	2049	A,B,C,F,H,I,K,O,P,S,T
4.775	R.Liberal, Belem	Brazil	0708	A
4.775	AIR Imphal	India	0045	B
4.777	R.Gabon, Libreville	Gabon	2035	B
4.783	RTM Bamako	Mali	2111	A
4.790	AIR Itanagar	India	0016	B,C,J
4.790	Azad Kashmir R.	Pakistan	1644	A,B,K,P
4.800	AIR Hyderabad	India	0140	K,P,R
4.815	R.Difusora, Londrina	Brazil	0025	B,C
4.815	R.diff TV Burkina	Ouagadougou	0542	A
4.820	E.Prov.Huila	Angola	2322	C
4.820	R.Botswana, Gaberone	Botswana	0443	F,O
4.820	AIR Calcutta	India	1747	C,K
4.820	Xizang, Lhasa	Tibet	2334	C,P
4.830	R.Tachira	Venezuela	0104	A,C,R
4.832	R.Reloj	Costa Rica	0815	D
4.835	RTM Bamako	Mali	2046	A,B,F,H,J,K,O,P
4.840	AIR Bombay	India	0019	B,F,J,K,P,R
4.845	ORTM Nouakchott	Mauritania	2046	K
4.850	R.Yaounde	Cameroon	0020	B,J
4.850	CNR 1	China	0115	R
4.850	AIR Kohima	India	0020	A,B,E,J,P
4.860	AIR Delhi	India	1810	A,B,E,K,P,R
4.865	PBS Lanzhou	China	2257	L,P
4.870	R.Cotonou	Benin	0514	A
4.880	AIR Lucknow	India	0120	R
4.885	R.Clube do Para	Brazil	0702	A
4.885	R.Difusora Acreana	Brazil	0050	B
4.885	KBC East Sce Nairobi	Kenya	1811	K
4.890	RFI Paris	via Gabon	0445	A,F
4.895	AIR Kurseong	India	1537	A
4.895	Pakistan BC	Pakistan	1649	F,J,K,R
4.905	R.Relogio Federal	Brazil	0130	R
4.905	Ecos del Orinoco	Colombia	0133	R
4.910	Tennant Creek	Australia	2141	K
4.915	R.Anhanguera	Brazil	2209	A,K
4.915	GBC-1, Accra	Ghana	2050	A,B
4.915	KBC Cent Sce Nairobi	Kenya	1817	P
4.920	R.Quito, Quito	Ecuador	0446	A,F,R
4.920	AIR Chennai	India	1650	B,K,P
4.925	R.Difusora Taubate	Brazil	2030	F
4.930	R.Internacional	Honduras	2350	A,R
4.930	AIR Shimla	India	1705	A,L
4.940	AIR Guwahati	India	0023	B,J,K,L,P,R
4.940	SLBC (Eng.Comm.Svce)	Sri Lanka	0035	B
4.945	R.Illimani, La Paz	Bolivia	0034	R
4.950	AIR Srinagar	India	0123	A,E,G,K,P
4.950	VOA via Sao Tome	Sao Tome	2000	C,H,K,M,P,T
4.955	R.Nac. de Colombia	Colombia	0024	A,B,C,F,R
4.960	VOA via Sao Tome	Sao Tome	0310	B
4.960	Hanoi 2	Vietnam	2300	P
4.965	Christian Voice	Zambia	1937	A,K
4.975	R.Uganda, Kampala	Uganda	1951	B,K,R
4.980	PBS Xinjiang, Urumqi	China	0027	A,C,F,L,P
4.980	Ecos del Torbes	Venezuela	0016	A,B,C,H,J,K,P,R
4.985	R.Brazil Central	Brazil	0034	A,C,K,R
4.990	R.Ancash, Huaraz	Peru	0044	R
5.005	R.Nepal, Kathmandu	Nepal	0044	B,R
5.009	R.TV Malagasy	Madagascar	1815	E
5.010	AIR Thiruvuram	India	0041	A,B,R
5.020	PBS Jiangxi Nanchang	China	2311	P
5.020	Xizang-Tb, Lhasa	China	2038	K
5.020	La V du Sahel,Niamey	Niger	2009	C,F
5.025	ABC Katherine	Australia	2142	K
5.025	R.Parakou	Benin	0055	R
5.025	R.Rebelde, Habana	Cuba	2300	A,B,H,I
5.025	R.Uganda, Kampala	Uganda	2023	C
5.030	RTM Kuching	Sarawak	2136	K
5.035	R.Bangui	C.Africa	2002	C
5.040	PBS Fujian, Fuzhou	China	2213	A,C,P
5.040	L.V. de Yopal	Colombia	0515	F
5.047	R.Togo, Lome	Togo	2215	A,C,F,J,K
5.050	Guangxi FBS, Nanning	China	2300	E
5.050	Haixia 1,V of Strait	China	2305	H
5.050	AIR Aizawl	India	0315	B,J,P
5.050	R.Tanzania	Tanzania	2035	A,J,K,P
5.055	Faro del Caribe	Costa Rica	0905	I
5.060	PBS Xinjiang, Urumqi	China	2304	P
5.075	Caracol Bogata	Colombia	0521	A,F
5.100	R.Liberia, Totota	Liberia	2036	A,K
5.320	CNR 1	China	2217	P

DXers:-

(A) Michael Casey, Manchester.
(B) Robert Connolly, Kilkeel.
(C) John Eaton, Woking.
(D) David Edwardson, Wallsend.
(E) Bill Griffith, W.London.
(F) David Hall, Morpeth.
(G) Simon Hockenhull, E.Bristol.
(H) Robert Hughes, Liverpool.
(I) Rhoderick Illman, Oxted.
(J) Eddie McKeown, Newry.
(K) Fred Pallant, Storrington.
(L) John Parry, Larnaca, Cyprus.
(M) Clare Pinder, while in Appleby.
(N) Peter Pollard, Rugby.
(O) Vic Prier, Colyton.
(P) Robert Shacklock, Westwood, Notts.
(Q) Tom Smyth, Co.Fermanagh.
(R) Ernie Strong, Ramsey, Cambs.
(S) Martin Venner, St. Austell.
(T) Fred Wilmshurst, Northampton.

Singapore **9.740** (Eng to Asia, Australia 1800-2200) 55444 at 2117 in Woking; SRI via Sottens **9.885** (Fr, Ger, It, Sp to S.America 2200-0000) SIO 555 at 2210 in SW.London; Voice of Turkey, Ankara **9.655** (Eng to Eur, N.America 2300-0000) SIO 444 at 2300 in Rugby; Swiss R.Int via Montsinery, Fr.Guiana **9.905** (Ger, Sp, Fr, It, Eng to C/N.America 0030-0500) 34443 at 0120 in Kilkeel.

Despite the congestion in the **7MHz (41m)** band many of the broadcasts to Europe can be received well. Among those noted were WYFR via Okeechobee, USA **7.355** (Eng 0600-0800, also to Africa), rated 44444 at 0615 in St.Austell; Christian Science BC via WSHB **7.535** (Various 0400-1000) 44444 at 0830 in Tenerife; AWR via Forli, Italy **7.230** (Eng 0930-1000) 44334 at 0930 in Morden; Voice of Russia **7.440** (Eng [WS] 1500-1600) SIO 222 at 1500 in Co,Fermanagh; Voice of Vietnam via Russia? **7.440** (Eng 1800-1830) SIO 444 at 1800 in Macclesfield; AIR via Bangalore **7.410** (Hi, Eng 1745-2230) 44444 at 1808 in Woodhall Spa; Voice of Greece, Athens **7.450** (Gr, Eng 1800-2050) 44334 at 1910 in Colyton; RAI Rome **7.120** (Eng 1935-1955) 34333 at 1940 in E.Bristol; Voice of Israel, Jerusalem **7.465** (Eng 2000-2025) 44444 at 2000 in Appleby; Voice of the Mediterranean, Malta via Russia **7.440** (Eng 2000-2100) 43343 at 2035 in Liverpool; R.Bulgaria, Sofia **7.535** (Eng 2000-2100) 54444 at 2036 in Plymouth; R.Romania Int, Bucharest **7.195** (Eng 2100-2156) 43433 at 2100 in Galashiels; Polish R, Warsaw **7.285** (Eng 2030-2128) 55555 at 2115 in Rugby; R.Prague, Czech Rep. **7.345** (Eng 2100-2127, also to N.America) SIO 444 at 2116 in N.Bristol; RCI via Skelton, UK **7.235** (Fr, Eng 2000-2230) 54333 at 2126 in Freshwater Bay; BBC via Skelton, UK **7.325** (Eng 2000-2200) 45433 at 2138 in Northampton; China R.Int via Russia **7.170** (Eng 2200-2257) 54554 at 2212 in Bridgwater; R.Budapest, Hungary **7.250** (Eng 2200-2230) 44444 at 2217 in Newry; R.Tirana, Albania **7.160** (Eng 2230-2300) 54454 at 2230 in Westwood, Notts.

Also noted were R.Conakry, Guinea **7.120** (Fr, Various 0555-0800, 1200-0000), rated 44444 at 0715 in St.Mary's, IoS; WJCR Upton, USA **7.490** (Eng to E.USA 24hrs) 33323 at 0945 in Stalbridge; WEWN Vandiver, USA **7.465** (Eng to N.America 1000-1200) 45344 at 1140 in Manchester; China R, Int **7.405** (Eng to N.America 1400-1557) 32332 at 1410 in Kilkeel; QBS Doha, Qatar **7.210** (Ar to M.East 1705-2130) 54554 at 1800 in W.London; WHRI Noblesville USA **7.315** (Eng to C.America 0000-1000) 33232 at 0018 in Oxted.

In the **6MHz (49m)** band Sri Lanka BC via Skelton, UK **6.010** (Eng to Eur 1900-2000 Sun) was 43543 at 1916 in Bridgwater; RCI via Sackville **5.960** (Eng, Fr to USA, Caribbean 2230-0100) SIO 212 at 2300 in Co.Fermanagh; WEWN Birmingham, USA **5.825** (Eng to N.America 2200-0500) 44444 at 2301 in St.Austell; R.Nederlands via Bonaire, Ned.Antilles **6.165** (Eng to N.America 2330-0128) 44444 at 2324 in Northampton; BBC via Antigua, W.Indies **5.975** (Eng to C/N.America 2100-0800) 43433 at 0010 in E.Bristol; R.Habana, Cuba **6.000** (Eng to N.America 0100-0500) 44444 at 0115 in Kilkeel; R.Taipei via WYFR Okeechobee, USA **5.950** (Eng to N.America 0200-0300) 35445 at 0213 in Manchester.

LIST OF EQUIPMENT USED

LM&S for $ February, # March, * April '99 columns

$ # * Darren Beasley, Bridgwater: Yaesu FRG-100 + a.t.u. + 15m wire.
# Adam Birchenhall, Coalville: Philips D2935.
$ # * Vera Brindley, Woodhall Spa: Sangean ATS-803A + r.w.
$ # * Michael Casey, Manchester: Roberts RC828 + Howes CTU9 a.t.u. + 60m helical loop.
$ # * Robert Connolly, Kilkeel: JRC NRD-525 + Timewave DSP9+ filter + Datong AD370.
$ # Martin Cowin, Kirkby Stephen: Hitachi TRK-5854E + built-in whip.
$ # * Bernard Curtis, Stalbridge: Realistic DX-400 + r.w. in loft.
$ # * Martin Dale, Stockport: Grundig Satellit 3000 + a.t.u. + r.w.
$ # * John Eaton, Woking: JRC NRD-345 + Datong AD270 or a.t.u. + r.w.
$ # * David Edwardson, Wallsend: Trio R-600 + 22m long trap dipole or 2.5m X 2.5m fixed loop.
$ # * Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
$ # * Martin Goodey, St.Mary's, Isles of Scilly: AOR AR7030 + 25m wire.
* Bill Griffith, W.London: JRC NRD-535 + 25m wire.
$ # * Gerald Guest, Dudley: Roberts RC818 + r.w.
$ # * David Hall, Morpeth: AOR AR7030 + Global AT-2000 + 13m wire.
# * Tony Hall, Freshwater Bay, IoW: Yaesu FRG-7 + 13m wire or RF.B45
$ Paul Hawkins, Cinderford: Trio R-1000 + 1.5m X 1.5m loop.
$ # * Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
$ Brian Heath, Stapleton: JRC NRD-535 + Balun + 23m wire.
$ # * Simon Hockenhull, E.Bristol: Roberts R817, R617, ITT Colt or Bush TR130.
$ # * Robert Hughes, Liverpool: Lowe HF-225 Europa + PR-150 or AOR AR7030 + 15m indoor wire or Drake R8E + RF Systems MTA on roof.
$ # * Sheila Hughes, Morden: Sony ICF-7600DS + loop; Panasonic DR48 + 15m invert L.
$ # * Rhoderick Illman, Oxted: Kenwood R-5000 + r.w. or AN-1, Sony ICF-7600DS.
$ # * Brian Keyte, Gt.Bookham: AOR AR7030 + loop or a.t.u. + r.w.
$ # * Ross Lockley, Galashiels: Realistic DX-300 + a.t.u. + 40m wire or Sangean ATS-803A.
$ # * Eddie McKeown, Newry: Tatung TMR 7602 or Sangean ATS-818.
$ * Frank Miles, SW.London: Kenwood R-5000 + a.t.u. or Balun + 30m wire.
$ # * George Millmore, Wootton, I.o.W: Racal RA17L + v.l.f. converter + loop or Sangean ATS-803A + loop.
$ # * Fred Pallant, Storrington: Trio R-2000 + Howes CTU8 a.t.u. + r.w.
$ # * John Parry, Larnaca, Cyprus: Realistic DX-394 + r.w.
$ # * Clair Pinder, while in Appleby: JRC NRD-525 + a.t.u. + r.w or Sony ICF SW55.
$ # * Peter Pollard, Rugby: Sony ICF-2001D + r.w.
$ # * Vic Prier, Colyton: RCA AR88LF or Redifon R551N + Datong AT270 or Capco RMA1, RMA2 loops.
$ # * Philip Rambaut, Macclesfield: Int.Marine Radio R.700M + r.w.
$ # Harry Richards, Barton-upon-Humber: Grundig Satellit 700 + AD270 or r.w. or Grundig Yacht Boy 400 or Matsui MR4099.
$ # * Robert Shacklock, Westwood, Notts; Realistic DX-394 or Yaesu FRG-7 + a.t.u. + 30m wire in loft.
$ # John Slater, Scalloway, Shetland: Lowe HF-150 + a.t.u. + 20m wire.
$ # * Tom Smyth, Co.Fermanagh: Sangean ATS-803A or Morphy Richards R191.
$ # * Ernie Strong, Ramsey (Cambs): AKD HF3 + Watson Balun or Cirkit a.t.u. + 31m wire or loop.
# * Andy Thompson, Lichfield: Realistic DX-394 + a.t.u. + 4m vertical wire
$ # Phil Townsend, London: Lowe HF-225 + preselector + r.w. or loop.
$ # * Martin Venner, St.Austell: Philips D2999 or Matsui MR4099 or Yupiteru MVT-7100 + Global AT-1000 + 30m wire.
$ Ernest Wiles, while in Malta: AKD Target HF3 + r.w. in Hotel bedroom.
* Ernest Wiles, while in Tenerife: AKD Target HF3 + r.w. in Hotel bedroom.
$ # * Thomas Williams, Truro: Gundig Yacht Boy 206 or Sharp 5454 + r.w.
$ # * Fred Wilmshurst, Northampton: Icom IC-R70 + Global AT-1000 + r.w. in loft.
$ # * Tom Winzor, Plymouth: Kenwood R-2000 + Datong active antenna.

■ ANDY CADIER, 28 ROMNEY AVENUE, FOLKESTONE, KENT CT20 3QJ

Off The Record

Thanks to **Harry Richards**, this month we are taking a look at just one of several British Government pirate stations. To be truthful, I suspect the government are able to licence any official or unofficial activity in a time of crisis. During WWII, we as a nation were fighting for our very survival, so it is no small wonder that Britain retaliated in the propaganda war. The enemy had Lord Haw-Haw (William Joyce), who broadcast anti-British propaganda via the powerful transmitters of Radio Luxembourg, but British m.w. radio could not be received clearly in Germany.

From May 1941, Sefton Delmer had become the organiser for the UK's black propaganda effort. The Political Warfare Executive, as it was known, ran a station called Gustav Siegfried Eins, which was a branch of the German Army Signals. The transmissions did not, of course, come from Germany, but from Wavendon in Bedfordshire. This service finally ended after a staged raid in October 1942, when the supposed Gestapo burst in and machine-gunned the operator live on air, complete with shouts of "Schweinhund!" In essence, bigger and better things were about to happen.

By this time Harold Robin, a brilliant radio technician working for the Secret Intelligence Service wireless operations, had been sent to the USA to purchase a transmitter capable of reaching Germany on medium wave. He came back after spending £165000 on what became known as Aspidistra (after the Gracie Fields song). This was actually a massive 600kW transmitter, then the most powerful transmitter in the world. This was installed in an elaborate underground bunker at King's Standing, near Crowborough in Sussex. Aspidistra was eventually shared with the BBC, however the clandestine operations continued. During air raids the Germans used to shut down broadcasting stations, in case their signals served as a radio beacon for allied bombers. Harold Robin used Aspidistra, from a studio in Milton Bryan in Bedfordshire, to very cleverly take over these frequencies within seconds of the German station going off air. Misleading advice was given to listeners who were clearly unaware of this deception. The enemy retaliated by warning their listeners about the British impostor, however Aspidistra responded by also warning them about enemy deceit, and then broadcast the 'official' announcements of the Reich Authority.

After the war, Harold Robin became chief engineer to the Diplomatic Wireless Service, but his Crowborough transmitter continued to be used for BBC Europe. Sadly Harold Robin died a few months ago, however when the transmitter site was closed during September 1982, he was there to switch off Aspidistra for the very last time. The underground transmitter hall still exists, and is partially used for radio relay equipment for the Sussex Police.

Southend-On-Sea

The Radio Caroline ship *Ross Revenge* is all set for a 14 week summer season at Southend Pier. The vessel will be berthed near the pier head and open to visitors, who will be able to view the marine and broadcasting facilities. About 300000 people visit the pier each season, most travelling on the electric train for the 2km ride to the far end. In recent years, parts of the pier have fallen into relative disrepair, following some serious fire damage in 1976 and 1995. The Radio Caroline visit is intended to create a new attraction of mutual benefit to both Caroline and Southend Borough Council.

For me, Southend Pier had some fond memories, as I worked for a short time on the offshore station Radio Essex based on a fort off the Essex coast during 1966. The tender, a boat called *Kestrel*, was based at Leigh-On-Sea down a narrow muddy creek, so to save time the radio staff were dropped off on the pier. I somehow doubt I will still be pursued by those adolescent females, seeking autographs, and still wearing those 'Kiss me quick, squeeze me slowly' hats (dreaming again!). Radio Caroline are planning an RSL licence for at least some of this 14 week period. Peter Moore, their station manager, was originally trying for a licence for each weekend, however the Radio Authority are unsure if this concession only applies to the coverage and promotion of regular sporting fixtures. Why sport should have preferential treatment over entertainment and education, I have no idea. If you decide to visit the ship, you may like to confirm the details with Radio Caroline before embarking on any marathon trip. You can write to **Radio Caroline**, at **426 Archway Road, Highgate, London N6 4JH**, or hit their web site at **www.radiocaroline.co.uk**

Bits & Pieces

Eurotunnel, who currently have the licence for Channel Travel Radio, have been unwilling to provide their service all along the M20 and A20 to the port of Dover, as specified in their original licence. This has led to a mutual agreement between themselves and the Radio Authority to curtail their present licence and re-advertise it, presumably under different conditions. The present situation must suit Eurotunnel very well. Even though they are required to broadcast shipping information, their broadcasts can only be heard on a 25km approach to the channel tunnel, and at that point reception abruptly ceases. The present station is being run by contractors, Radio Services Ltd., and the licence is due to expire on 31 July 2000.

The satellite station European Klassic Rock ceased broadcasting at the beginning of January. This has also brought an end to the Radio Caroline broadcasts that EKR had been airing on Sundays. Caroline have also discontinued their s.w. relay on 6.940MHz, also on Sundays. I found this difficult to receive due to a nearby utility station, however another relay service is being sought.

The Radio Authority are now issuing 1W (8 year RSL) m.w. licences to institutions like hospitals, colleges and universities. These are being issued on a first come first served basis.

The Silly Season

We seem to have one of these every year, and only rarely do these projects see the light of day. The Dutch have a longwave radio project called 'Delta 171', which they intend to broadcast to the UK and most of Europe using a mighty 2MW transmitter. The company have the necessary licences and frequency clearance, but have met a stumbling block from environmentalists over the siting and radiation from their proposed transmitting site. Clearly Holland is a crowded place, and not many of the inhabitants are exactly happy at living so close to huge antennas that radiate so much power. Now Delta 171 are proposing to place the antennas in international waters outside the Dutch Government's jurisdiction, where the environmental issues would cease to be a problem. Now we all know that you can't feed the antennas from 19km away, so the transmitters would have to be out at sea as well. Then there is the question of a power supply. To produce sufficient current, you would need a small power station and a continuous supply of fuel.

The environmentalists are now concerned over the health of fish living in an area of very high r.f. field strengths. The joke is that Holland is a signatory to an international convention, which prohibits broadcasting from the high seas. If the Dutch really are able to licence the use of transmitting facilities on a man-made structure in international waters, it would certainly create a very interesting precedent. A station broadcasting to Britain in English from the high seas certainly breaks the Marine Offences Broadcasting Act (1967), but would not contravene the 1990 Broadcasting Act, which would allow the British authorities to forcefully close it down.

Holland would not be alone in their exploitation and use of structures on the seabed, as Glasgow based Natural Power are in consultation with several district councils along the Kent coast. They propose to erect several wind farms, using giant turbines almost 100m in height. Suggested sites include areas off Margate, Ramsgate and (you won't believe this) the Goodwin Sands. Apart from the Goodwins, this area is the shipping equivalent to the M25.

MW Pirates

Bob Marsh, writing from Bexleyheath, says he has heard Radio Free London on 819kHz, using 25W, with reports from as far away as Southampton, Cambridge and France. The London station Radio Argus are suggesting they don't really want DXers to listen for a few moments and then write for a QSL card. As most ordinary listeners have pre-set stations tuned into their radios, the likelihood of them having many listeners is extremely remote. Surely it is only us DXers that actually tune around vacant channels seeking unexpected signals?

Wireless Waffle

Keith Knight has been in touch, we are both members of the British DX Club Tape Circle, and he sent me some complimentary copies of his monthly *Wireless Waffle* magazine. The contents reflect the name very well; visiting the realms of nostalgia as well as informing us of what is happening behind the scenes, mainly of the British broadcasting industry. Obviously Keith also watches the '60s police series 'Heartbeat' on ITV, and remarks that a sign in Mr Blaketon's Post Office advertises a combined TV and Radio licence for just £6. Further details are available from **29 Sunningdale Avenue, Eastcote, Ruislip, Middlesex HA4 9SS**.

Short Wave Pirates

I used to keep a frequency list of s.w. pirate activity; alas the demand for these became so great I just could not keep it all up-to-date. For a subscription SRS News will FAX, E-mail, or post you a copy every Monday evening. They also publish a magazine called *Pirate Connections*, which is all in English. Details are available from the **Swedish Report Service, Ostra Porten 29, 442 54 Ytterby, Sweden**. Finally, it has been a nice surprise to hear Radio Stella and Weekend Music Radio from Scotland on 3.910 and 3.945MHz, after a very long absence.

In The Cockpit

Godfrey Manning G4GLM gives us the low-down on the various radios and instruments found in a modern cockpit.

When flying, the pilot of a typical aircraft has two sorts of radios to tune: communications (com) and navigation (nav) sets. There are also some fixed-frequency radio aids. This article explains the various radios and instruments found in a modern cockpit, as illustrated by the photographs. My grateful thanks to British Aerospace Regional Aircraft (Woodford) for allowing publication of these pictures of the 146.

I've chosen this typical four-jet transport aircraft as the subject. Some, even many, examples of the same sort of equipment are also to be found in the better-equipped light aircraft. Regardless of aircraft type, the principles remain the same. Each description here refers to a numbered item on the illustrations (numbers in brackets).

The picture **Fig. 1** shows an overall view and **Fig. 2** is part of the central pedestal; you can match this to **Fig. 1** as both show the row **(16)** of four throttle levers (white, engraved with numbers 1-4). Throttles control the engine power. The captain's (left side) instruments are shown, in more detail, see **Fig. 3**. I will describe the radio equipment in detail and then finish by orientating you around the rest of the cockpit.

Com & Nav

To communicate with Air Traffic Control the pilot selects the required frequency on the com set. There are usually two v.h.f. transceivers and longer-range aircraft may have one or more h.f. sets **(13)**. In each case, the tuning is by turning knobs. The most likely arrangement on v.h.f. is a pair of concentric knobs, the outer for MHz and the inner for the kHz part of the frequency. The actual selection comes up on a display in a window, often similar to the average enthusiast's scanner! You can just see the v.h.f. com sets in the photo **(1)**.

Because there are at least two sets for transmitting, even more to be listened to (when nav is taken into account), the pilot needs a means of selecting the one that's required. Listening to all the sounds mixing at once in the headset would be confusing! The station box **(2)** serves this purpose. Note that **Fig. 2** shows a station box. The aircraft in **Fig. 1** is fitted out slightly differently and its station boxes are tucked out of sight by the pilot's outboard knees.

Each receiver (plus the intercom between the pilots and also the interphone to the cabin attendant and the ground engineer) can be turned off or on and have its volume adjusted. When tuning in a navigation beacon, it is only necessary to listen quickly to check that it is being correctly received. If it is, then its callsign will be heard in Morse (not dead yet!). Then the pilot would stop monitoring that receiver, leaving it connected (silently) to the navigation instruments.

It is also necessary to select which transmitter the pilot's microphone is connected to. The station box has an array of switches and volume knobs for all of these purposes.

The sets labelled nav **(3)** are only part of the story, restricted to v.h.f. I'll describe other sorts of radio navigation aids later.

VOR/LOC

Just like any other technical subject, aviation has its share of recognised abbreviations. The nav sets tune in v.h.f. omni-directional radio range (v.o.r.) beacons when navigating *en route* along airways. Alternatively, they select the instrument landing system localiser (i.l.s. loc) when approaching a runway. In fact, two more settings also happen automatically.

Let's start with v.o.r. These beacons can be thought of as sitting at the hub of a wheel. Imagine, then, spokes radiating out from the hub in all directions. The simplest description is if there are 360 spokes, one for each degree found on a magnetic compass. Each spoke is known as a radial and is numbered according to its direction.

The horizontal situation indicator (h.s.i.) displays the aircraft's location compared to one radial **(4)**. The particular radial to display is set by the course knob **(5)**. Looking at **Fig. 3**, the h.s.i. is dominated by a standard compass display (the aircraft is heading north). In the centre of the display is an aircraft symbol, that's us! All instruments view the outside world as seen from the aircraft. It looks as though the aircraft is still and the world is moving past the window.

The orange line, broken into three parts, is the radial. In **Fig. 3** the radial touches the 340° mark on the compass card. That's the selected radial. To fly away from the beacon on a track of 340° requires us to fly along this radial. So, where is it?

The central part of the line is seen, separately, ahead of the aircraft symbol. The aircraft is not yet on the selected radial. In fact we need to continue to fly ahead in order to meet up with (intercept) the radial. As this happens, the central part of the line will move down the display until it falls into place and joins up with the other, outer, two pieces of the line. When we cross the radial we must then turn left in order actually to fly along it.

A localiser is shown in the same way except that there is just one radial. Imagine that **Fig. 3** shows the aircraft approaching a runway orientated along 340° or, as we say, runway 34. When the three parts of the orange line join up,

we are on the extended centreline of the runway and, in our case, would need to turn slightly left so as to come in to land.

The nav receiver knows whether to tune in an i.l.s. or a v.o.r. according to frequency. All lie at 50kHz intervals in the 108-118MHz band but some frequencies are for v.o.r. beacons and others exclusively for localisers.

DME & Glideslope

I haven't forgotten that two more settings happen automatically. Again, v.o.r. first. There are often distance measuring equipment (d.m.e.) beacons sited at the same place as v.o.r. ground stations but on different frequencies. Luckily, if the v.o.r. is tuned in then there is only one possible frequency on which its associated d.m.e. can be.

The nav radio has this information built in so the pilot doesn't need to even know that this automatic tuning has taken place. If a d.m.e. is available then the pilot is rewarded with a display that looks like a car's odometer **(6)**. This simply tallies the number of nautical miles between the aircraft and the beacon.

The other automatic setting belongs to the i.l.s. Again, once the localiser has been tuned in, the corresponding glideslope (glidepath) is received too. This beacon projects a radio beam upwards from the runway threshold. If the pilot descends the aircraft along this gently sloping beam, the aircraft will eventually come down to ground level on the runway. The h.s.i. **(4)** has an extra pointer **(7)** built in to its right side and this is repeated on another instrument **(8)**, the flight director.

In **Fig. 3** the glideslope (yellow pointer) is slightly above the aircraft (thin line in the middle of the scale). Flying the

Fig. 1: General view BAe 146 cockpit.

aircraft ahead and level will allow us to intercept with the glideslope, during which time the yellow pointer will drop slightly until it meets the central line. To keep it there, we must push the nose down and descend.

Other Beacons

There's another compass instrument **(9)** called a radio magnetic indicator (r.m.i.). As well as repeating the compass heading as on the h.s.i. **(4)** there are two pointers. These simply point to where a beacon is. In **Fig. 3**, the v.o.r. shown by the single-broken-line pointer is over our right shoulder. Spot the error? Yes, the compass headings on the r.m.i. and h.s.i. in **Fig. 3** disagree by 10° so better report that to the engineers as a defect!

I said vaguely that the r.m.i. points to where a beacon is. In fact there are two separate beacons that can be tuned in. I've just mentioned v.o.r. in the above example. There are also beacons that are not in the v.h.f. airband.

The older sort of beacon, still very much in existence, is the non-directional beacon (n.d.b.), and these are found close to the medium wave broadcast band. They are tuned in by a dedicated receiver **(10)**. They're non-directional in the sense that they can be received equally well from any direction. The automatic direction finder (a.d.f.) operates the r.m.i. pointer so as to display in which direction the beacon lies. And that's it. No fancy radials. Just a pointer.

Other Radio Nav

There are other radio sets that help the pilot but, being on fixed frequencies, don't involve any tuning. I expect you've heard of radar, and **(11)** is the display produced by the radar on board the aircraft. It looks forward from the nose and any nasty storm-clouds appear as bright echos that you'd best avoid.

Another, ground-based, radar is used by controllers to locate the positions of aircraft. This is made easier if the aircraft can transmit a nice strong signal that appears clearly on the controller's screen. The transponder does that. Even better, it can send a code-number at the controller's request and this is selected on another dial **(12)**. If the controller is unsure which aircraft is which, then one particular flight is instructed to set a chosen code. This code then appears next to the correct blip on the radar screen.

On some approaches you won't be lucky enough to find an i.l.s. glideslope (or even an i.l.s. at all!). Another clue to help the pilot land smoothly is an indication of actual height off the ground. The radio altimeter **(14)** displays this. The measurement is made by bouncing a radio beam from the aircraft to the ground and back again - timing the delay before the return echo arrives. As the speed of radio waves is known, the distance travelled can be deduced.

Many i.l.s. approaches also have marker beacons. These are spaced out along the approach and, if you fly directly over one, you know that you're still on course. All transmit on 75MHz with an amplitude modulated tone. The most distant from the runway, the outer marker, transmits Morse dashes at a low pitch (400Hz). A blue light (all lights clustered together, **(15)**) flashes in time to the Morse. Next comes the middle marker (alternating dots and dashes at higher pitch, 1300Hz, with an amber light). High-speed aircraft made the inner marker obsolete (Morse dots at 3000Hz triggering a white light).

Cockpit Orientation

Above the pilot's head is a roof panel **(17)**. This contains switches and some gauges that are needed when operating the aircraft's systems. On board are electrical generators for

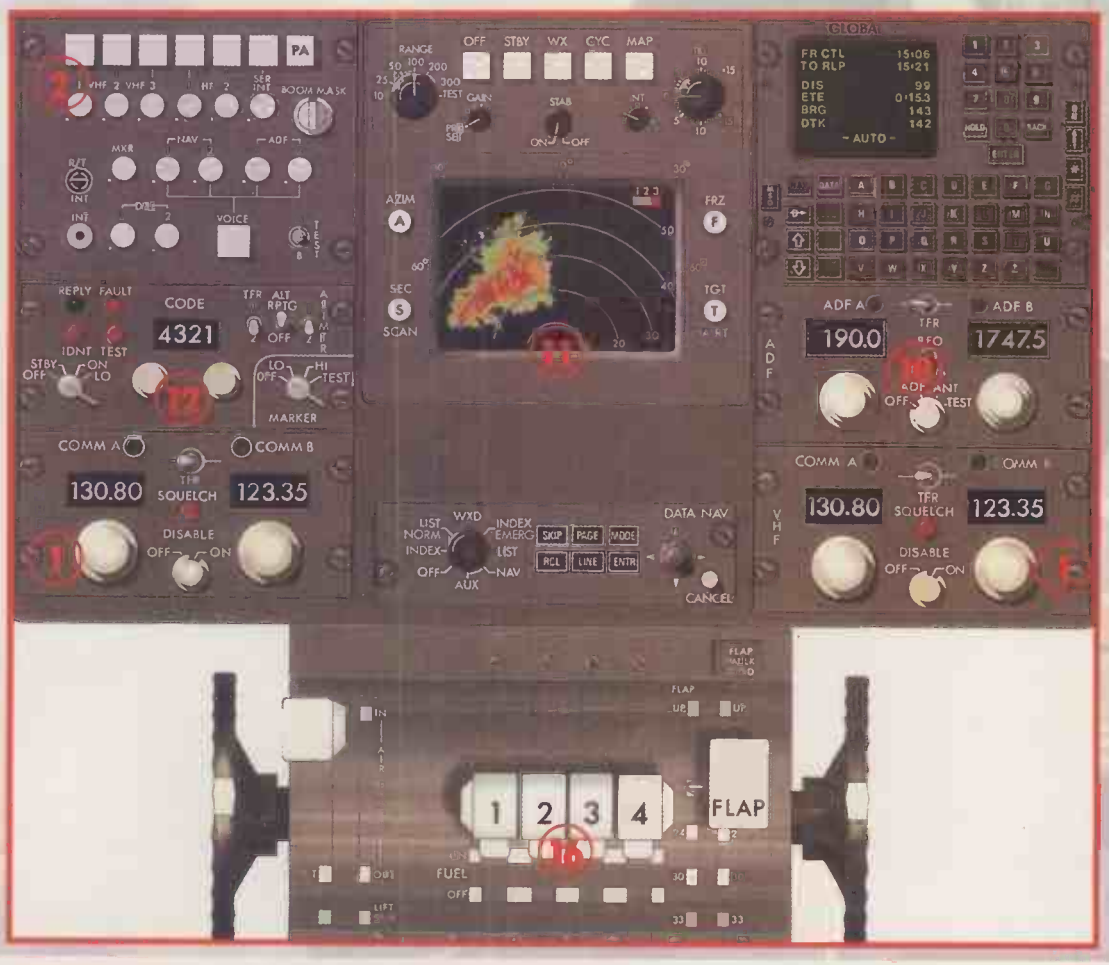


Fig. 2: Centre pedestal (seen from above).

Fig. 3: Captain's instrument panel.

a.c. power, d.c. batteries, pneumatic supplies for cabin air pressurisation, fuel pipes connecting the various tanks to the engines, hydraulic systems to work the brakes, undercarriage, etc., heaters to prevent ice building up on critical places such as the wings, an auxiliary power unit to generate electricity when the engines are switched off while on the ground, engine starters - and there's even a switch to put the "Fasten seat belts" sign on! Now you know why the roof panel looks so crowded.

Fortunately, the switches are set according to a checklist so the pilot isn't expected to remember them all. This is done when starting up and shutting down the aircraft. Also, various settings are called for at certain stages of flight; for example, anti-icing on when about to descend through cloud. In emergency, these settings may require alteration; for example, switching on an alternative fuel pump if the main one fails. Any failures come up on the illuminated warning captions **(19)** in the central instrument panel. Perhaps the most frightening is an engine fire, requiring triggering of the appropriate fire extinguisher handle in the roof panel **(18)**.

Flight instruments show altitude **(20)**, rate of climb/descent **(21)** and airspeed **(22)**. The flight director **(8)** is dominated by a picture of the horizon - blue sky above a dark ground. In **Fig. 3** the aircraft symbol is level with the horizon but banked right (the horizon seems to lean to the left as viewed from inside the aircraft). In case of failure there is also a standby horizon **(23)**. Centrally is a bank of instruments, one column for each engine, showing temperatures, pressures and speeds of rotation **(24)**.

I hope, when you read my 'Airband' column each month in this magazine, that the above description helps you to visualise what goes on up there in the cockpit. My Museum contains examples of many instruments and you are welcome to make an appointment to visit by ringing **0181-958 5113** (reasonable hours, 0900-2100 please).

Abbreviations

h.f.	high frequency
Hz	hertz
kHz	kilohertz
MHz	megahertz
v.h.f.	very high frequency

■ GODFREY MANNING G4GLM , C/O THE GODFREY MANNING AIRCRAFT MUSEUM, 63 THE DRIVE, EDGWARE, MIDDLESEX HA8 8PS

Airband

I have pleasure in announcing the winner of the Airband Christmas Quiz. In the January edition I printed a photo of a signboard seen on an airfield. All entrants correctly identified it as a taxiway holding point leading to a runway.

The left half of the sign showed the letter G in yellow on black, with a square yellow border. The right half was the figure 18 in white on red, no border.

Entries were received from **Stephen Dobson** (Shrewsbury), **Andrew Green** (Barnsley), **Les Griffiths** (Sheffield), **Nigel Haslop** (Cambridge), **Malcolm Joyce** (Dublin), **Jack McAulay** (Livingston), **Richard Parker** (Colchester), **Peter Rasmussen** (Bodmin), **Julian Rose M1DHH** (Thatcham) and **John Waller** (Malmesbury). Unfortunately **Donald Hawkins** (Cheltenham) missed the deadline. Your answer wasn't quite on target, anyway, Donald; I hope the details below will help you.

Taxiways are nowadays designated by letter. The photo could have been taken from an aircraft on taxiway G (Golf in the phonetic alphabet). In fact, the type of signboard in the photo indicates a holding point. Conveniently, the only hold on taxiway Golf is this one, prior to entering the runway whose number (18) is also shown on the board.

Had there been two holds on the taxiway, then they would have been numbered such as G1 and G2. The runway numbering is calculated by the runway's magnetic heading, close to 180° in this case, and dropping the final digit so as to arrive at 18.

A radio call from Ground Movement Control might be: "Shortwave 499, hold at Golf, after the departing Cessna line up runway 18".

There were hardly any misconceptions in the answers and those that I did spot were fairly minor. Taking the answers that were 100% correct I used my discretion to pick out the one that presented the information in the most clear and complete style. The winner, then, is Julian Rose and I've asked our kindly Editor to arrange some sort of '(sur)prize?!' as recognition. Thanks to all who entered, I hope you found it of interest.

Receiver Hardware

We had the builders in and they insisted on playing their radio. It was Radio 1 (98.2MHz) that they tuned in and so it came as a surprise (to them) that they could hear aircraft. The location is under the Bovingdon arrival for Heathrow and No.1 Director handles aircraft here on 119.725MHz.

Sounds like image reception to me. The two frequencies are separated by 119.725-98.2 = 21.525MHz. Half this is precisely 10.7625MHz, close to the i.f. found in many receivers. It also assumes the local oscillator to be running at a frequency above that of the wanted signal.

Repeating the calculation with exactly 10.7 as the i.f. gives 98.2 + (2 x 10.7) = 119.6 which is close. Remember too that a broadcast Band II radio is not selective, channels are spaced at 200kHz and deviation is 75kHz. Not surprising that these sets are 'leaky' where strong interfering transmissions are concerned!

You will have spotted that aircraft transmissions are still amplitude modulated, whereas the broadcast band is on f.m. I can't be sure as to exactly how airband speech is resolved in this case, but it only takes a circuit to have a small departure from linearity for this effect to occur and spoil the listener's enjoyment. Aircraft: one, builders: nil.

In The Air

What airways might bring high-level traffic over Nigel Haslop's native Cambridge? Reference to a radio-navigation chart shows UW550 running south-west to north-east. Going south to north is UL613. One-way airways, Daventry to Clacton, are (U)B317, about north-west to south-east.

I am left wondering, though, if much of the traffic is not on airways but is, rather, being radar-vectored through the new Clacton sectors. I covered these in January on page 74 (*back issues available* - **Ed**). Let me know if you want the information repeated, Nigel.

More on the ground than in the air, controllers use the phrase "Expedite" in its conventional dictionary sense. It means 'Don't delay'. Example: 'Expedite vacating the runway' if another aircraft, wanting to land, is close behind. The CAA publish approved phraseology in *CAP 413 Radiotelephony Manual* and Andrew Green might find this helpful in explaining other radio jargon.

Another useful publication, in the view of Andrew, is *Pooley's Flight Guide*. I rate it as on the expensive side, but it has the advantage of portraying a map layout of all recognised civil aerodromes.

Follow-Ups

In the May 1998 'Airband' (page 86, Local News) the possibility of a new SID for Luton was raised. In the July issue (page 73, Frequency & Operational News) the Olney SID was introduced. I now have further details. If anyone wants the full instructions for this SID then write in and I'll do my best to summarise them here.

These routings are designed to satisfy three objectives. Firstly, safety; avoiding high terrain, for instance. Secondly, noise abatement; the routes deviate to avoid flying low over built-up areas. Finally, practicality; it must be possible to navigate the departure and join airways without getting in the way of traffic controlled by other airports.

Stampe SV4.
Christine Mlynek

Olney is the end point of the new procedure. On reaching Olney (33nm distant from the Brookman's Park v.o.r. on the 318° radial) the aircraft is handed off to London Airways 119.775MHz. Other Luton departures are via Clacton, Compton and Dover.

Another aspect of marine liaison frequencies (last month's 'Airband') concerns seaplanes/flying boats/amphibians. A tragic accident to a Catalina was reported in the AAIB *Bulletin* 1/99 page 2. Relevant radio information is that the aircraft was equipped with a marine v.h.f. radio working Southampton Vessel Traffic Services on Channel 12 (156.6MHz f.m.).

Also in March I covered Scottish Airways frequencies. There's a new one to add to the list: 126.925MHz when directed by a.t.c.

Looking back to February, I tried to locate the LGS n.d.b. for **Keith Seddon** (Chapel en le Frith). Now **Ken Holliday** (Norwich) has found this beacon on the LOGGS oil/gas rig just south-east of the DOGGA reporting point on B1. My edition of the RAF *En Route Supplement* puts it on 420kHz, close to Keith's reported 418. Well (no pun!) spotted, Ken.

Grumman AA5 Cheetah.
Christine Mlynek

Again referring to February, the subject of car insurance on aerodromes came up. **David Morris** (Poole) is an insurance broker who feels that I am quite correct to draw this to your attention. If your

Continued on page 30...

HAYDON COMMUNICATIONS

★ ★ MAIL ORDER: 0181-951 5781/2 ★ ★

SCANNERS

AOR AR8200

The latest all mode innovation in handies. There's too many features to list.

£349.00

AR8000	Wideband scanning receiver	£259.00
SC-8200	Soft case for AR8200	£19.99
SC-8000	Soft case for AR8000	£19.99
ABF-125	Airband filter	£29.00

ICOM IC-R2

Miniature wideband hand-held scanner covers 0.5-1300MHz (AM, FM/WFM).

~~£139.00~~ We've sold 100s

MVT-7100EU

Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad/car charger/charger/antenna.

SPECIAL OFFER **£179.95**

Soft case for 7100EU £19.99

MVT-9000

The ultimate handheld scanner on the market. Covers 530kHz-2039MHz (all mode). In our opinion it outperforms any other handheld on the market. Includes nicad/car charger/charger/antenna.

ONLY **£315.00**

Soft case for MVT-9000	£19.99
Icom IC-R10	our price £259.00
Alinco X-10	our price £249.00

SW RECEIVERS

★★★★★ STAR BUY ★★★★★

REALISTIC DX-394

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

SPECIAL OFFER **£99.95** P&P £10 *Send SAE for review*

★★★★★★★★★★★★★★★★★★★★★★★★

AOR AR7030 PLUS

Third anniversary special edition. Buy one this month and get a UPNB7030 notch filter & noise blanker & telescopic antenna free of charge.

ONLY **£879.00** Deposit £99.00 & 36 x £28.30 p/m

AR7030 award winning comms receiver £679.00

YAESU FRG-100

Brilliant short wave receiver. Outperforms any other receiver in its price bracket.

ONLY **£419.00** + FREE PSU WORTH £45

Target HF-3M Budget communications receiver £159.95

ICOM PCR-1000

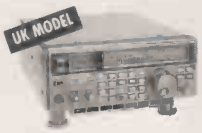
~~£349.00~~

ONLY **£249.00**

OR £299.95 WITH DSP FITTED

UT-106 DSP filter for PCR-1000.....£79.95

COMMUNICATION RECEIVERS



AR-5000

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

OUR PRICE **£1125.00** OR 36 x £34.48 p/m

ICOM IC-8500

WE'LL BEAT ANY PRICE OBTAINED BY A GENUINE ICOM (UK) DEALER BY UP TO £100.

NOW THAT'S WHAT I CALL VALUE FOR MONEY!

AR-3000A

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

ONLY **£599.00** OR 36 x £18.14 p/m

AOR ARD-2 ACARS Navtex Decoder	£269.00
AOR SDU5000 Spectrum display unit	£599.00

FAIRHAVEN RD-500VX+

Great valve wideband communications receiver

ONLY **£725.00** Deposit £75.00 & 36 x £23.59 p/m

THE SHORTWAVE SPECIALIST

SONY SW-100E

Award winning miniature portable SW receiver. Its performance is brilliant for its size. The best short wave receiver for under £250.

RRP ~~£220~~.

SALE PRICE **£149.95**

AN-100A	Active antenna for SW-100E	£54.95
AN-1	SW active antenna	£69.95

Data Interface for receiving CW/Baudot/ASCII/Amtor/ARQ/FEC/Sitor A/B/Navtex, Weather Fax, and Slowscan TV.

£39.95 P+P £2.

Including:- interface and software connects to RS-232/ 3.5mm lead connects to receiver (no external power needed).

SONY SW-55E

Superb quality portable SW receiver with 125 presets. 100Hz step tuning for shortwave. Includes compact antenna, stereo headphones and carry case. RRP ~~£299.95~~.

SALE PRICE **£235.00**

ATS-818	Award winning portable SW receiver	£119.95
Roberts R-861	Portable SW receiver with RDS	£169.00
Roberts R-828	SW portable with built-in cassette	£159.95

LOMBARD TRICITY CHARGE CARDS ACCEPTED. LOW RATE FINANCE FROM 19.9% APR

Why not visit our web site? www.haydon-comms.co.uk

LONDON SHOWROOM
132 High St., Edgware
Middx. HA8 7EL.
Tel: 0181-951 5781/2.
Fax: 0181-951 5782
Open Mon-Fri 9.30-5.30pm. Sat 9.30-2pm

"WE OFFER PRICES OTHERS RARELY MATCH"

WE ONLY SUPPLY OFFICIAL UK STOCK.

NOW THAT'S EXCEEDINGLY GOOD VALUE!

W. MIDLANDS SHOWROOM
Unit 1, Canal View Ind. Est., Brettel Lane, Brierley Hill, W. Mids. DY5 3LQ
Open Mon-Fri 9.30-5pm. Sat 9.30-2pm

ALL PHONED ENQUIRIES TO LONDON BRANCH

HAYDON COMMUNICATIONS

★★ MAIL ORDER: 0181-951 5781/2 ★★

SCANNING ACCESSORIES

RECHARGEABLE ALKALINE CELLS

Starter kit includes charger & 4 x AA cells. **£13.99** + £2 P&P.

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

Extra cells available @
8 x AA pack £10.99
4 x AA pack £5.99
4 x AAA £6.25

Rechargeable Alkaline. No memory effects. 1.5V cells. 3 x capacity of nicads.
NO QUIBBLE WARRANTY

SCANMASTER SP-55

OUR BEST SELLER

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

Superb value **£59.95** P&P £3.50

POLICE STYLE HOLSTER "HHC-2"

Matches all handhelds can be worn on the belt or attached to the quick release body holster.

£22.95 P&P £1

EP-300

Deluxe over the ear earpiece.

20 PIECES ONLY **£9.95** + P&P £1

MA-339

Mobile holder for handhelds

15 PIECES ONLY **£4.99** + P&P £2

QS-200 ..... Air vent holder ..... £9.99 P&P £2

QS-300

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

ONLY **£19.95** P&P £2

Q-TEK HF INDUCTIVE INTERFACE

Allows the connection of any HF antenna to any scanner that has a BNC connector. Simply connect the long wire antenna to the push terminal on the top of the interface and attach to your scanner in place of your existing antenna.

ONLY **£14.95** P&P £1

NEW Q-TEK HF MINITUNE

Superb quality short wave ATU. Ideal for scanners. Out performs any other tuner of its size. 100kHz-30MHz. BNC input/output. Connect to a long wire and you'll notice the difference.

10 PIECES ONLY **£34.95** P&P £3.50

LONDON SHOWROOM
132 High St., Edgware
Middx HA8 7EL.
Tel: 0181-951 5781/2.
Fax: 0181-951 5782
Open Mon-Fri 9.30-5.30pm. Sat 9.30-2pm

SCANNING ANTENNAS

Q-TEK APOLLO 2000MkII

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

ONLY **£49.95** P&P £5

Comments from John Griffiths

I have to say that I'm not a fan of indoor antennas like this as earlier desk mounted antennas tended to look like a mad scientist invention. However, I was suprised by the quality of constuction of this piece of equipment and it appears to be up to the job it is designed to do. Without getting technical, the Apollo 2000 claims to be able to cover 0-1650MHz. I used it between 108-400MHz approx and was surprised by what it was able to do. It produced clean copy and there was good reproduction with very little breakthrough.

NEW Q-TEK D.C. 2000

A high performance wideband antenna offering superb performance from 25-2000MHz. Transmit range:- 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type connector. Supplied with mounting brackets.

OUR PRICE **£54.95** P&P £8.50

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 - my usual haunt - into all manner of areas that previously have been less than good here due to my location!

★★★★ BULK PURCHASE ★★★★

★ WIDEBAND SCANNING DISCONE ★

★ Receives 25-1300MHz ★ Transmits 27, 144, 220, 440, 900, 1290MHz ★ Max applicable power 60W CB/200W VHF/UHF ★ Gain 7dB ★ PL-259 connection. RRP ~~£49.95~~.

SPECIAL OFFER **£25.00** £6 P&P

★★★★★★★★★★★★★★★★★★★★★★

AIR-44

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

£69.95 P&P £8.50

AIR-33 (As above) 1m long. Gain 3/6dB. £44.95 P&P £5

DB-32

A miniature wideband antenna. Receives 30 - 1200MHz. BNC fitting only 1.5" long. It's superb (for its size).

RRP **£29.95** P & P £1.

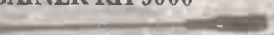
TSA-6671 BNC magmount £22.95

REGULAR-GAINER RH-770

21cm flexible whip that is ideal as replacement

OUR PRICE **£14.95** P&P £1

SUPER-GAINER RH-9000



40cm flexible model for the ultimate in gain.

OUR PRICE **£19.95** P&P £1

COPPER ANTENNA WIRE (All 50mtr rolls)

Enamelled	£12.95 P&P £5
Hard drawn	£13.95 P&P £5
Multi-Stranded (Grey PVC)	£9.95 P&P £5
Extra H/duty (Clear coated)	£30.00 P&P £5
Flexweave (H/duty)	£30.00 P&P £5
Flexweave H/duty (20 mtrs)	£15.95 P&P £5
Flexweave (PVC coated 20 mtrs)	£18.95 P&P £5
Flexweave (PVC coated 50 mtrs)	£40.00 P&P £5

GARMIN PRODUCTS

HURRY, LIMITED STOCK

GARMIN GPS-III

The latest hand-held GPS with a pre-loaded map of Europe.

SALE **£279.95**

Soft case for GPS-III £20.00

NEW

GPS-12 NAVIGATOR

(now with 24 hour battery life) 12 channel receiver. Includes:- UTM, ordanance survey, waterproof to IPX-7 standard).

SALE PRICE **£129.95**

GPS-12XL	(Includes Europe C.P.D.)	£209.95
GPS-II	New version	£245.00
Cigar power lead		£20.00
Optional active magmount antenna		£39.95

UK Scanning Directory 6th Edition

New UK Scanning Directory (6th edition). 25-1.8GHz.

£18.50 (P&P £2.50).

INTERFERENCE – STOP IT!

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

Plastic teeth prevent it from sliding on cable. Simply snap close onto cable and job is done! (Will fit large coax).

BULK PURCHASE hence **2 for £5**

(P&P £2.50). HURRY – LIMITED STOCK

Q-TEK "WSK-100"

Weather station picture & fax reception kit includes:

a) A 2 element crossed dipole for receiving weather satellite pictures live from orbit
b) A long wire HF antenna for receiving weather fax pictures
c) Free software for your PC. No interface needed (uses your PC's sound card)
d) Requires scanner or receiver

ONLY **£44.95**

Del £8.50

Q-TEK LW-2

The ultimate in high quality long wire antenna kits. Complete ready to go wire antenna that should last forever – don't forget you get what you pay for! (0-30MHz) length - adjustable up to 150ft.

£39.95 P&P £5.

(All parts - high quality and replaceable)

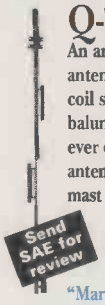
W. MIDLANDS SHOWROOM
Unit 1, Canal View Ind. Est., Brettel Lane, Brierley Hill, W. Mids. DY5 3LQ
Open Mon-Fri 9.30-5pm. Sat 9.30-2pm

ALL PHONED ENQUIRIES TO LONDON BRANCH

ONE OF THE ONLY INDEPENDENT COMPANIES STILL AROUND TODAY THAT IS STILL GROWING
WATCH THIS SPACE FOR MORE INFO.

RECOMMENDATION AND PRICE ARE TWO GOOD REASONS WHY YOU SHOULD BUY FROM US!

HF ACCESSORIES



Q-TEK HF-30

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

Send SAE for review

ONLY **£84.95** (DEL £10.00)

SUPERB HF SHORTWAVE ANTENNA

"Mario Gongolsky" – Freelance journalist for German magazines – brief comments after testing HF-30 . . . *your HF-30 kept all the promises you have made. Smooth reception on a suprisingly low noise level. The HF-30 suppled a very clear signal to the receiver. Continuous good performance throughout the whole frequency range.*

NEW SP–1 SPYWIRE

Ideal for any receiver. Receives all short wave bands. All mode, no ATU required. Built in balun. SO239 connection. **£29.95** + £3 P&P

Vectronics AT100

Active SW antenna

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

SUPERB VALUE **£69.95** P&P £4

(includes pre-selector)

NEW Q-TEK BALUN

Short wave magnetic long wire adaptor for any short wave receiver. Simply screw onto receiver & connect the wire via supplied screw terminal. (It's brilliant).

PL-259 ONLY **£22.95** P&P £1

GLOBAL AT2000

Deluxe SW ATU 0-30MHz. SO239 fittings.

ONLY **£85.00** P&P £4

(Probably the best ATU around)

HOWES CT-U9 SW ATU with built-in balun.

SO239 fittings.

ONLY **£69.95** P&P £4

CT-U8 SW ATU.....£49.95 P&P £4

AN-71 PORTABLE ANTENNA

1.8-30MHz unwinds to 28ft. Supplied with clip adaptor. Winds back in seconds. Great for portable use, indoors etc. Connects to any receiver.

OUR PRICE **£9.95** P&P £1

SPECIAL OFFERS

NISSEI HS-8000

Miniature wideband scanning antenna with magmount.

RRP £24.99.

ONLY **£10.00** P&P £3.

SANGEAN ANT-60

Portable SW reel antenna. Connects to a 3.5mm jack or clips onto your telescopic antenna. ~~£14.99~~.

ONLY **£7.99** P&P £1

★★★★ STAR BUY ★★★★

A 30ft six section 2" dia aircraft grade aluminium mast set. ~~£70.00~~ ONLY **£35.00** P&P £10

GUY WIRE KITS	P&P £6
Standard kits (complete with 100' wire)	£23.95
Heavy duty kits (complete with 100' wire)	£26.95
MAST HEAD PULLEY Easy to fit pulley with mast clamp (up to 2")	only £7.50 P&P £1.50
Mast base plate (2")	£12.50

QUALITY USED EQUIPMENT

AOR AR7030

Immaculate condition.

ONLY **£499.95**

AOR AR5000	Immaculate condition	£899.95
Drake SW-8	As new	£349.95
HF-225 (Europa)	As new	£299.95
HF-150	VGC	£199.95
AR7030	As new	£549.95
R-2000	With VHF	£379.95
R-1000	VGC	£199.95
AR3000A	As new	£549.95
MVT-8000	As new	£199.95
AR8000	VGC	£189.95
Opto Scout	As new	£199.95
PRO-46	VGC	£99.95
MVT-7200	As new	£199.95
DX-392	SW portable with cassette	£129.95
PCR-1000	As new	£219.95
GPSIII	Ex-demo	£299.95
AR8200	Unwanted gift	£319.95

FINANCE EXAMPLE

£599.00. Deposit £99.00. 36 x £18.14 p/m.

APR 19.9%

FREQUENCY COUNTERS

OPTO MINI SCOUT

10MHz-1.4GHz frequency counter with bargraph and "reaction tune" caperbility (incls nicads and charger).

ONLY **£165.00** *With free case worth £14.99.*

Techtoyz micro counter	£89.95
Techtoyz D.T.M.F. decoder	£89.95
Optional antenna for micro counter	£8.99
R-11 nearfield receiver (30MHz-2GHz)	£249.00
Xplorer surveillance receiver	£799.00
Opto Lynx PC interface	£129.00
Optotrakker new low price	£249.00

REACTION TUNE COMBOS

Mini Scout + AR8200

Complete with lead ALL FOR **£519.00**

Mini Scout + AR8000 (all leads/mods included).....£449.00

Scout MkII + AR8200

Full Scout with reaction lead

£689.00

Scout MkII + AR8000 (lead modification included).....£599.00

LOW PRICED COUNTER. HUNTER

(10MHz-3GHz) includes nicads/charger and antenna.

£59.95 + FREE CASE

PAY AS YOU GO MOBILE PHONES

MOTOROLA AM-3180

★ No contract to sign ★ Calling line identity ★ Text messaging service ★ No bills or commitment ★ Off peak call - from 5p per minute ★ Vodaphone. ONLY **£99.95**

MOTOROLA C-520

★ No yearly contract ★ No bills or monthly charges ★ Just talk vouchers from as little as £5 ★ Calls cost as little as 25p per minute. ONLY **£99.95**

MOTOROLA A-130

★ Vodaphone ★ No monthly bills - just pay in advance as required ★ Simply buy top-up cards. Choose the tariff that suits you - either 5p per minute off peak and 60p per minute - or 40p per minute at all times. ONLY **£59.95**

ERICSSON GA-628

★ No contract to sign ★ Calling line identity ★ Text messaging service ★ No bills or commitment ★ Off peak calls - just 5p per minute ★ Vodafone. ONLY **£119.95**

Abbreviations

AAIB	Air Accidents Investigation Branch
AIP	*Aeronautical Information Publication*
ATC	Air Traffic Control
ATZ	Aerodrome Traffic Zone
CAA	Civil Aviation Authority
f.m.	frequency modulation
i.f.	intermediate frequency
kHz	kilohertz
MHz	megahertz
n.d.b.	non-directional beacon
nm	nautical miles
SID	Standard Instrument Departure
STAR	Standard Terminal Arrival Route
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range

car is on part of an aerodrome shared by aircraft, the insurance might be invalid. This happens even if no aircraft is anywhere near when an accident occurs, e.g. if you run over a pedestrian.

Sonic booms are excluded from all insurance because a Government compensation scheme reimburses any damage.

Frequency & Operational News

Thanks to **Martin Sutton** (CAA) for keeping us supplied with *AIP* amendments. I also note that reporting points are listed in section ENR 4-3-1 of the *AIP* which, being expensive, is best consulted at your local aerodrome or flying club - with their permission, of course. If you need the location of any particular point, write to me and I'll print it here for all to share.

Aerodromes. A new reporting point, PEDIG, appears on the STARs shown in **Table 1**. The designators changed because of this addition. PEDIG is about 10nm SW of the Lichfield n.d.b. Kemble's a.t.z. has been reinstated, presumably parachuting activity has started again.

Airspace Restrictions. R032 Parkhurst is withdrawn and new ones appear in **Table 2**. Frankland/Durham is the new name for R432.

Airways. East of Lambourne, part of B29 is renamed G29. In the North Sea are many new airways. L74 runs RAPON to TOPPA; Y802 from DOMIN to TOPPA; UY800 Newcastle to SOMIT; UY804 Newcastle to DIMES; UY806 from FINDO to DODSI. UN591 east of Aberdeen is re-routed DODSI, DIMES, BUNIT, PELOM, AMIBA. UY802 is the new name for UW532.

New reporting points, mainly as a result of the above, are AMIBA, BUNIT, DIMES, DODSI, DOMIN, GOKAT, LORLA, PELOM, RAPIT, RAPON, SOMIT, XIDIL.

Airways deleted are UW534, UW538 and UW550. Reporting points deleted are BOLTA, EMJEE, ROLLS, ROYCE, SINGA.

Table 1: Revised STARs.

Aerodrome	Old STAR	New STAR
London/City	ALKIN 1L	ALKIN 2L
London/City	ALKIN 1M	ALKIN 2M
Luton	LOREL 1F	LOREL 2F
Luton	LOREL 1G	LOREL 2G
Stansted	LOREL 1F	LOREL 2F
Stansted	LOREL 1G	LOREL 2G

Beacons. A new n.d.b. is LSH at Lashenden/Headcorn on 340kHz and being low powered presents a challenge to followers of propagation.

I haven't covered the new airways in greater detail because of lack of space. If anyone needs this information then write in and I'll give it priority in the following month's 'Airband'. When enquiring about anything you see here, always state in which issue you read it.

All letters and information received up to February 10 have been included. The next three deadlines (for topical information) are April 6, May 10 and June 7. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

Reader Offer

Table 2: New restricted areas.

Number	Location
R151	High Down
R152	Bristol
R214	Woodhill
R318	Altcourse
R319	Manchester
R320	Doncaster
R321	Wakefield

From where can you buy CAA publications or *Pooley's*? Sources are listed on my *Airband Factsheet* which is free if you send a pre-paid self-addressed envelope (to hold two A4 sheets) to the Broadstone Editorial Offices but **not** to me as I don't have a photocopier!

I don't know of any airband clubs that I could recommend to Andrew. There is the International Listeners' Association (1 Jersey Street, Hafod, Swansea SA1 2HF) but this organisation caters for all interests and aviation only makes a small contribution to their regular newsletter *Just Listening*.

HF Aeronau
The Easter

Bob Ball brings us a fascinating and the associated

It is hoped that this article will help readers understand the h.f. radio traffic over the Eastern seaboard of North America. It is relatively easy to monitor Gander and New York radios from the UK, especially at the Eastern extremes of their areas, but following the flights as they near their destinations is not always so straightforward.

There are numerous publications on the market that provide vast amounts of information on h.f. aeronautical traffic, the majority of it regarding the North Atlantic routes is extremely accurate, but for other areas, the information is at best extremely outdated and at worst woefully inaccurate. A lot of publications just trot out ITU information, and whilst this might give some indication of where to begin, this too is usually very out-of-date, the ITU still lists stations like Baghdad on h.f., for instance.

The Real World

The following reports on what is actually happening in the real world, and not just rehashing previously published information. All the following information was noted on an oil tanker trading between the Gulf of Mexico and Gabon during August and September 1998.

The area off the Eastern seaboard of America is officially listed as the Caribbean (CAR) Major World Air Route, however, the station controlling the traffic we are interested in this article, New York ARINC, can hardly be described as being located there! The area is bounded by:-

West	East coast of America and Canada
North	Moncton and Gander FIRs (Flight Information Regions)
East	60°W
South	San Juan and Miami FIRs

The official lists show a whole multitude of stations listed for the Caribbean, New York just being one of them. However, on the frequencies listed below, New York is the only station which is normally heard. On one occasion, Piarco was heard calling a KLM flight on 6.577, but that was only because they had lost contact on 8.855.

Most of the stations in the Caribbean use 8.918 to back up their v.h.f. coverage during the day and though English is used, Spanish is the predominant language. New York usually monitors 8.918 and will answer a flight there, giving a SELCAL check if that is all that is needed. However, if the flight is proceeding into New York's airspace, they will normally be directed to one of the frequencies listed below.

itical Traffic Over n American Seaboard

first hand insight to the day to day workings of air traffic comms from a 'state side perspective.

There are three groups, or families, of frequencies, namely:

A	B	C
2.887	3.455	5.550
6.577	6.586	8.846
11.396	11.330	

At least one US Department of Defence Chart labels 2.887 as CAR-A and 3.455 as CAR-B, so for the sake of convenience for this article, we will refer to the groups as such. In addition to these, 8.918, 11.387, 13.297 and 17.907 can be monitored.

Stations calling on these last four frequencies are normally directed to one of the three groups listed above, although occasionally aircraft might be sent to 13.297 or 17.907 if radio conditions do not favour the lower frequencies. Obviously as we progress through the solar cycle these higher frequencies will come into play more frequently.

These transmitters are connected to antennas which have some directivity as one flight was having trouble communicating with New York on the North Atlantic frequencies at 70°W when they called back on one of the Caribbean channels, they were told that they could not maintain watch there as the transmitter employed antennas that were beamed to the South and would have poor coverage as the flight progressed further East.

Same Frequencies

This 'project' started as it appeared that whilst New York radio handled all the traffic in the area, certain flights always appeared on the same group of frequencies, and after a while a pattern emerged. Basically, flights were allocated to a frequency depending on which airway they were on.

CAR-A frequencies are used for the following routes:

* A300, A523, A632, B24, B891 & G432
* Direct routes from PISAX and GRANN to 60°W

CAR-B frequencies are used for the following routes:

* A554, A637, A699, A700, B646, G446, R512, R513, R514, R763,
* From the Eastern limit of v.h.f. coverage of Bermuda to 60°W

The third set, 8.846 and 5.550, are generally used as the secondary frequencies for CAR-A and CAR-B. Aircraft that call in on 8.846 or 5.550 are either sent to the primary in use for their route, or are told to stay where they are and use what should have been their primary as the backup, it very much depends on the individual operator.

If the CAR-A or CAR-B primaries are getting overloaded, then it is quite common for the operators to send some flights to 8.846 or 5.550. Aircraft calling in on the 'wrong' primary are normally sent to where they should be. It is not unusual for flights on G446 or R763 to use this third set as their primary.

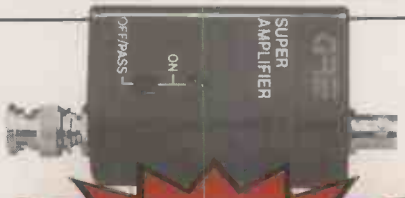
In Contact

To give some idea of how long aircraft are in contact with New York, it takes roughly two hours to get from CHAMP to KRAFT on A300, so when New York decides to move frequency, aircraft are left where they are already

SRP TRADING

1686 Bristol Road South, Rednal, Birmingham B45 9TZ

YUPITERU MVT-7100
£199.95 + P&P



FREE Wideband Preamp worth £49.99 with most handheld scanners

BEARCAT UBC-220XLT
£149.95 + P&P

AOR AR-8200
£349.95 + P&P

BEARCAT UBC-3000XLT
£189.95 + P&P

COMMTEL COM-214
£129.95 + P&P

ICOM IC-R2
~~£139.00~~ + P&P

TRIDENT TR-2000
£149.95 + P&P

AOR AR-8000
£269.95 + P&P

YUPITERU MVT-9000
£319.95 + P&P

BASE STATION SPECTACULAR

DX-394 Shortwave Communications Receiver
150kHz to 30MHz AM, USB, LSB, CW digital receiver with 160 memories
~~£199.99~~ **£99.99** + P&P.

PRO-2045 Base Scanner
200 channel AM/FM (switchable) scanner. Covers 66 to 1000MHz (with gaps)
~~£199.99~~ **£129.99** + P&P.

PRO-2042 Base Scanner
1000 channel AM/FM/WFM (switchable) scanner. Covers 25 to 520MHz and 760 to 1300MHz
~~£299.99~~ **£149.99** + P&P.

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

Call Rod (G8SUP), Richard (G60RA) or Mary (M0BMH) on

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

established or they are told to make their next call on the new channel, they are never SELCALed solely to change frequency.

In the local mornings, New York makes the move from 6.577 to 11.396 around 1200 normally, though on occasions this may be as early as 1015. The incoming primary may be monitored for some time before it is actually brought into use and flights calling there may be directed to 6.577.

In the local evenings, New York generally starts using 6.577 from around 2100, though on occasions the move can be as early as 1930 or as late as 2300. The incoming frequency is often monitored before it is actually brought into use and aircraft can be sent to 11.396. This latter frequency is generally monitored for at least a couple of hours after 6.577 has been introduced as the primary for the CAR-A frequencies and this can be as late as 0030.

From around 0100, 2.887 can be used as the secondary, earlier on in the year this frequency was used throughout the night as the CAR-A primary, but this practice seems to have been dropped, at least for now.

New York makes the transition from 6.586 to 11.330 in the morning around 1100, though there may be occurrences of an hour's latitude on this. Generally, New York moves the CAR-B primary down in frequency about an hour earlier than that used for CAR-A. 6.586 can be used as early as 1900, but it is more normal for the move to be made at about 2100.

As with the CAR-A frequencies, the outgoing primary of 11.330 can be monitored for at least two hours after 6.586 has been introduced. Earlier in the year, 3.455 was used as the overnight primary, but presently this channel is only used as the secondary. One evening an operator moved all the traffic from 6.586 to 5.520 for no apparent reason, this channel is not usually used by New York and appears to be a one off.

The morning change of backup frequency from 5.550 to 8.846 usually occurs about the same time as the move in the CAR-A channel, about 1200. New York normally moves its backup frequency in the evening, normally around 0100, though 8.846 has still been in use as late as 0230 on some occasions.

Flights into the San Juan FIR from points to the North are sent to 134.3 at KRAFT or GRANN and 125.0 at PISAX, a few flights to South America cross 23°30N at 61°04W and are also sent to 125.0. In the opposite direction, all the flights from the San Juan FIR are sent to the CAR-A frequencies and additionally Northbound flights on B891 generally make their first h.f. call at WATRS.

Flights out of the Caribbean towards Europe do not usually follow airways and are routed direct from GRANN or PISAX to 60°W, generally South of about 30°N. At 60°W they are then transferred to the NAT-A and NAT-E frequencies, depending on their routing. The allocation of flights to these routes is somewhat arbitrary and varies from one operator to the next, though the dividing line is often around 30°N.

Flights entering the Caribbean from New York's airspace to places like Antigua and Barbados call Piarco on 123.7 at 18°N if within v.h.f. range and 8.855 if not.

Busiest Route

Airway A300 is generally the busiest of the routes from San Juan and flights stay on the same CAR-A frequency until they reach CHAMP, where they are told to call New York on 132.15. The first call Southbound is normally at HOLMA, and then flights report at KRAFT before being sent to 134.3. The other reporting points are non-compulsory and are rarely used.

Flights on the other three routes out of San Juan's FIR; A632, G432 & A523, are told to call New York on 128.5 (very occasionally 119.1) at LOPPS, MOFFY or PRUIT respectively, all of which are 180nm out of Bermuda, out the other side they report back on the same h.f. frequency at ELTIN, TARGA or GABES.

The flights are then told to call New York at 132.15 at CHAMP or FLANN, or 125.92 at SLATN for flights into the Boston area. The reporting points at DANER, CREEQ, CLXTN and AKERS are non-compulsory on these routes. Southbound flights use 129.9 for contact with New York until they make their first report on h.f.

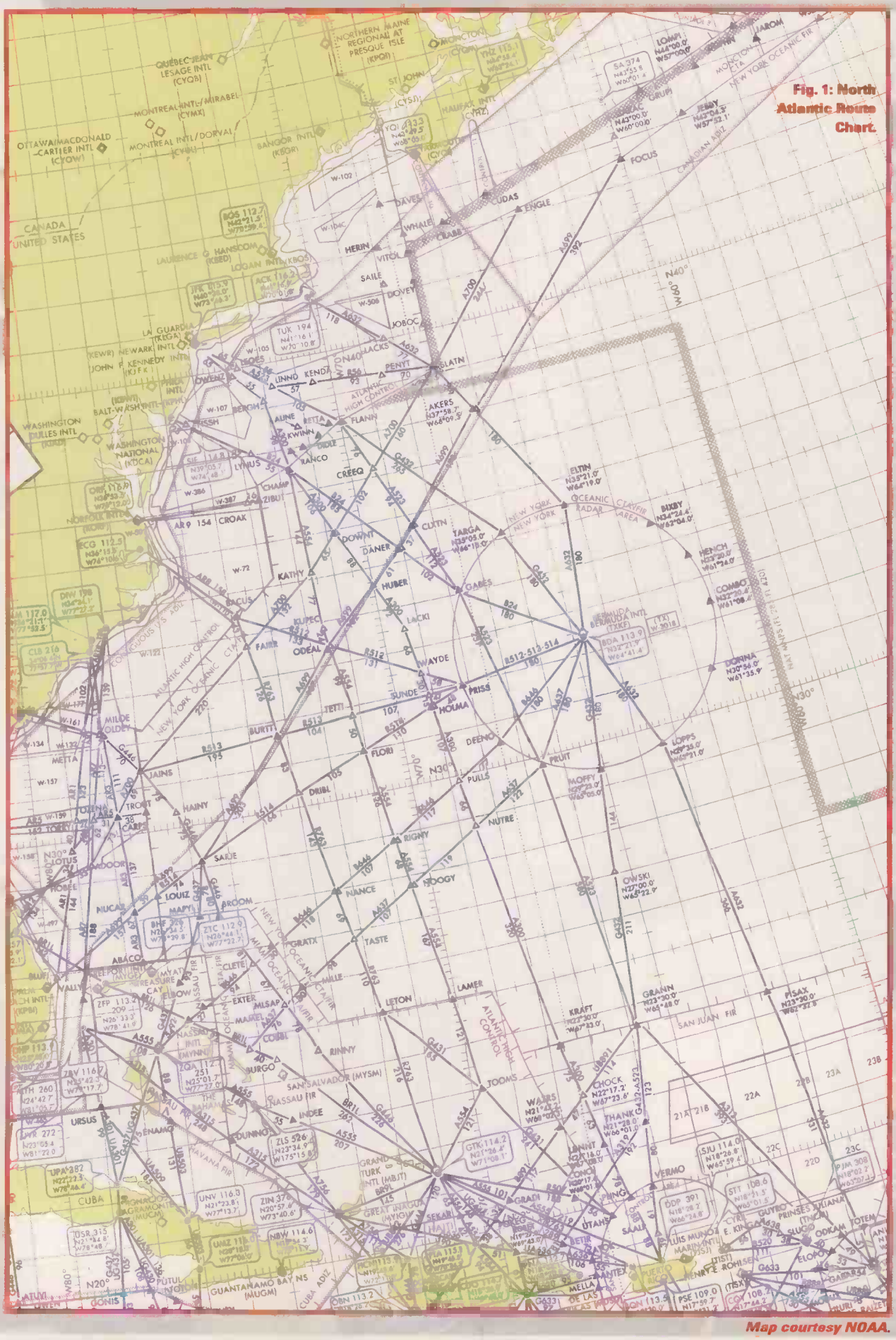
Flights crossing into Miami's FIR at LAMER and LETON are sent to Miami on 132.3 as they proceed South towards Grand Turk or San Juan. In the opposite direction, aircraft call New York on 132.15 at CHAMP on A554, on R763 flights call Washington at BACUS, 133.82 for low altitudes and 127.42 for high ones. The only other compulsory point on A554 is at FLORI and on R763 they are at NANCE and BURTT.

The other South-North route of interest is G446, flights Southbound call Miami on 134.2 at BROOM and Northbound they call Jackonsville on 135.05 at JAINS, the non-compulsory point at HAINY is rarely reported.

Remaining Routes

The remaining routes are used by flights from the Caribbean and cities in Southeastern America towards Europe, because of historical ties a lot of these go to Madrid. Due to changing weather conditions, the routes of flights can, and do, change on a day to day basis.

Southwestbound flights that pass within 180nm of Bermuda make their last report on North Atlantic frequencies at 60°W, where they are told to call New York on 128.5 when 180nm out, and are then in turn told to call on the CAR-B frequencies 180nm out the other side of Bermuda. Flights generally leave the Western side of this area via the reporting



Map courtesy NOAA.

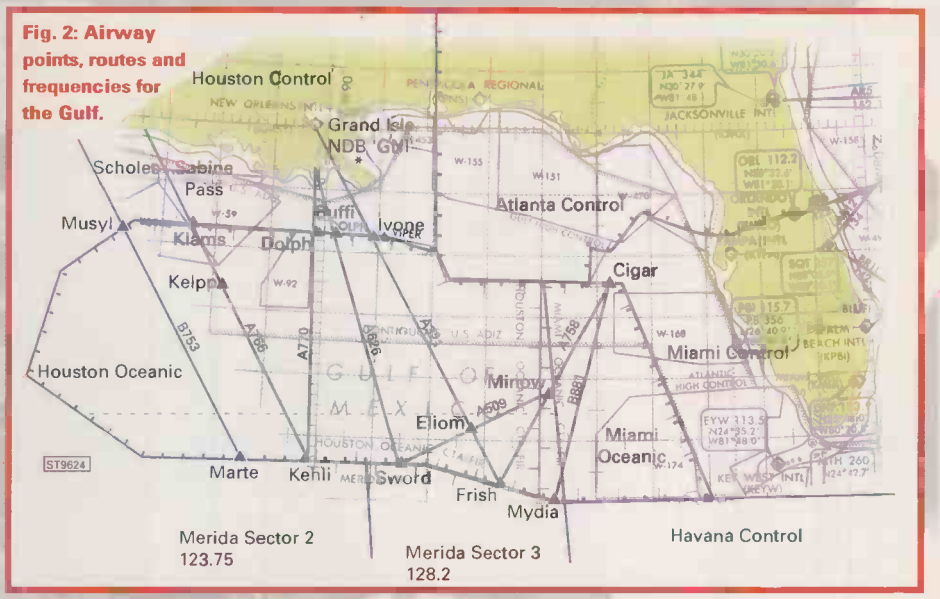
points, but out the Eastern side flights can be sent direct to 60°W.

Of these routes, A637 is generally the lightest used, NOOGY is the only compulsory point before flights call Miami on 127.22 at MILLE. Airway B646 is often used by flights into and out of Cuba, flights only have to report at RIGNY before calling Miami on 134.2 at GRATX.

Airways R512 and R513 are rarely used, on R512 the only compulsory point is at ODEAL and then flights call Washington at BACUS as detailed above. On R513 BURTT is the only point that needs a report and then flights call Jacksonville on 135.05 at JAINS.

The remaining three routes carry the brunt of the traffic to and from Europe. HOLMA and DRIBL are non-compulsory on R514 and flights call Miami on 135.07 at LOUIZ, though recently they have been instructed to use 119.82 as an alternative. On extremely rare occasions aircraft can be sent direct from PRISS to ADOOR and are then told to call Jackonsville on 134.85 when abeam of TROUT.

Fig. 2: Airway points, routes and frequencies for the Gulf.



Reporting Points

The only compulsory reporting points on A699 are FOCUS, AKERS, CLXTN, BURTT, SARJE and LOUIZ, but frequently the other points are reported as well, especially CLXTN. Southbound flights call Miami on 135.07 at LOUIZ if continuing along A699 or on 134.2 at MAPYL if using G437.

In the opposite direction when reporting at AKERS flights are told to call Gander on 133.95 about ten minutes before FOCUS. Some flights leave A699 at AKERS and head East into the Atlantic, these are told to call Gander at 41°N. Flights inbound from Europe are generally left on North Atlantic frequencies until CLXTN.

Flights on A700 only have JAINS, DOWNT, SLATN and ENGLE as compulsory points, but invariably all points are reported. Aircraft call Jacksonville on 135.05 at JAINS when Southbound and when Northbound reporting at DOWNT they are told to call New York on 129.9 at SLATN and then Moncton on 128.37 at ENGLE.

Gulf Of Mexico

As well as the area off the Eastern Coast of America, New York is also responsible for traffic in the Gulf of Mexico which is outside the range of v.h.f. coverage of Houston Control, see **Fig. 2**. The FIR between Houston and Merida (Mexico) runs along 24°30N in the area we are interested in and New York Radio handles traffic between here and 25°30N, a distance of only 96km. Normally this will be done on 130.7, but if aircraft are unable to make contact on this frequency then one of the h.f. channels will be used, usually 11.396 or 6.577.

When crossing 86°W on A509, A758 or B881, aircraft call Miami on 133.9 and when crossing 25°30N on A321, A626 or A770 they call Houston on 135.775 and when crossing 25°30N on A766 or B753 they call Houston on 132.65. When Southbound aircraft call Merida on 123.75 at KEHLI or on 128.3 at SWORD, FRISH or MYDIA.

A700	A699	R512	R513	R514	B646
ENGLE	FOCUS	BACUS	JAINS	LOUIZ	GRATX
SLATN	AKERS	ODEAL	BURTT	SARJE	NANCE
CREEQ	CLXTN	WAYDE	TETTI	DRIBL	RIGNY
DOWNT	DANER	PRISS	SUNDE	FLORI	PULLS
KATHY	HUBER		PRISS	HOLMA	DEENO
FAIRR	ODEAL			PRISS	
JAINS	BURTT				
	SARJE				
	LOUIZ				

A632	G432	A523	A300	B24	A637
PISAX	GRANN	GRANN	KRAFT	GABES	MILLE
LOPPS	OWSKI	PRUIT	NUTRE	DANER	TASTE
ELTIN	MOFFY	GABES	PULLS	CHAMP	NOOGY
AKERS	TARGA	CLXTN	HOLMA		NUTRE
SLATN	FLANN	FLANN	DUNDE		
			WAYDE		
			LACKI		
			HUBER		
			DOWNT		
			CHAMP		

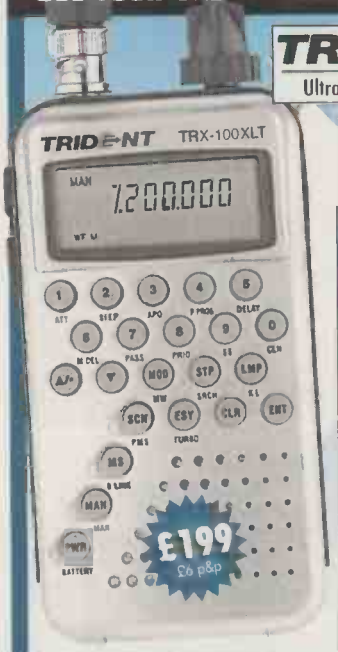
NEVADA

SHORTWAVE & SCANNING SPECIALISTS

USE YOUR CREDIT CARD FOR SAME DAY DESPATCH!

TRIDENT TR100 XLT

Ultra Wideband Scanner with Computer Interface



A BRAND NEW attractively styled scanner packed with features. The TR100 XLT continuously covers 100kHz to 2200MHz receiving NFM, WFM and AM modes.

Features:-

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

GO ANYWHERE SCANNER!

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

OPTIONAL SOFTWARE AVAILABLE FOR CLONING

As ICOM MAIN DEALERS we have bought a BULK SHIPMENT - ready for immediate despatch!

AR 8200

- 530kHz-2040MHz
- All Mode inc 8.33kHz AM
- 1000 Memories
- Plus LOTS MORE!

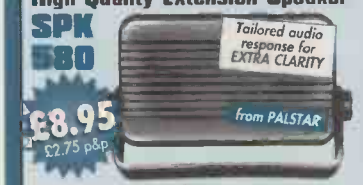
£369 £8 p&p

WE CARRY THE FULL RANGE OF ACCESSORIES!

CT8200	CTCSS	£59.90
EM8200	External Memory	£49.90
RU8200	Record/Play Back	£49.90
TE8200	Tone Eliminator	£49.90
VI8200	Voice Inverter	£34.90
CC8200	Computer lead with free PC Windows Software & protocol listing on CD-ROM	£49.90
OS8200	ACC Connector + free end lead	£69.90
RT8200	Reaction Tune Lead for Opto Scout	£12.90
CR8200	Tape interface & Lead	£20.26
CO8200	Clone data lead	£34.90
SC8200	Clear plastic soft case	£30.00
SC8200P	Leatherette padded soft case	£17.95

High Quality Extension Speaker

SPK 880



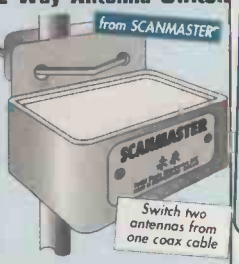
£8.95 £2.75 p&p

IDEAL FOR SCANNERS, SW RECEIVERS, COMMUNICATIONS RX, HANDHELDS ETC.

- 5W Output
- Mounting Bracket & Screws
- 2mtr Connecting Lead & 3.5mm jack plug

Remote 2 Way Antenna Switch

HF2



FREQUENCY: 0 - 475MHz

PL259 £39.95 £2.75 p&p

'N' TYPE £41.00 £2.75 p&p

COMMTEL 510

A POCKET SIZED SCANNER!

- 100kHz -1300MHz
- AM/FM/WFM
- Selectable Channel Steps
- 400 memories
- Dual Watch
- Uses 2 AA Batteries (not supplied)

AR 8000

- All Mode: FM, WFM, SSB, CW, AM
- 500kHz-1900MHz
- Computer Control
- Data Clone
- 1000 Memories
- C/W NiCads & charger

£269 £8 p&p

STILL THE No 1 SELLER!

DOUBLE DISCONE

SCANMASTER DD 1300

A high performance wideband antenna

- 25-1300MHz

£59.95 £6 p&p

WIDEBAND 16 ELEMENT BEAM

SCANMASTER LP 1300

- 105 - 1300MHz
- 11 - 13dBi Gain
- 15dB Front/Back

£99

2-in-1 COMPLETE ANTENNA SYSTEM for HF, VHF, UHF

SCANMASTER SW2 PLUS

- 2 outdoor/indoor HF wire antennas
- VHF - UHF Indoor Antenna
- Ground plane for improved VHF and UHF reception
- Earth wire

£24.95 £4.75 p&p

USED EQUIPMENT

ALL SAFETY TESTED & GUARANTEED FOR 3 MONTHS

SHORTWAVE RECEIVERS

AKD TARGET HF-3	HF Receiver	115.00
DRAKE R8E	HF Receivers	499.00
DRAKE SW2	HF 100kW - 30MHz - ex demo	439.00
ICOM ICR 7000	Wideband Receiver	599.00
ICOM R72	+ Batt pack & Filters	499.00
KENWOOD R2000	VHF/HF RX + VHF Converter	325.00
LOWE HF 225	+ Extras	395.00
MATSUI 220	Shortwave Receiver	39.00
REALISTIC DX394	HF Receiver	125.00
ROBERTS B61	SW + VHF/FM RX	129.00
SANGEAN ATS 803A	Shortwave Receiver	99.00
SONY ICFSW55	Shortwave Receiver	145.00

SCANNING RECEIVERS

AOR AR 800E	H/H 75 - 950MHz	99.00
AOR AR 900	Handie Scanner	120.00
AOR AR 8200	H/H Scanner - LATEST!	295.00
BEARCAT UBC 200XLT	H/H Scanner	125.00
BEARCAT UBC 760XLT	Base Scanner	99.00
BLACK JAGUAR Mk II	Handheld Scanner	69.00
COMMTEL COM 101	Base Scanner	75.00
NETSET PRO 46	H/H Scanner	125.00
TRIDENT TR 4000	Handheld	199.00
YUPITERU MVT8000	Base Scanner	165.00
YUPITERU MVT9000	H/held- EX DEMO	299.00
YUPITERU VT125ii	Handheld Scanner	99.00

NEW ITEMS ARRIVING EVERY DAY - PLEASE CALL!

AEA FAX III

A SOFTWARE PACKAGE THAT ALLOWS RECEPTION OF:

- WEATHERFAX
- MORSE CODE
- RTTY
- NAVTEX

~~£99~~ £79 inc p&p

- Fax database inc
- On screen tuning
- Receives while you're away
- Manipulate images after they are received
- NO AMATEUR LICENCE OR TNC NEEDED!

THIS MONTHS SPECIAL

ALL YOU NEED IS AN SSB RECEIVER & A PC.

PERSONAL NAVIGATOR

- Satellite navigation (with use of GPS)
- Full colour digital maps
- The Good Pub Guide
- The Good Guide to Britain
- Egon Ronay Guide • Gazeteer Database
- Route Planning • Postcode Database • Petrol Stations

An electric road atlas of Great Britain combined with a host of databases

SPECIAL ~~£119~~ £99 £4.75 P&P

01705 662145

email: info@nevada.co.uk

website: http://www.nevada.co.uk

• 189 London Rd • North End • Portsmouth • Hants • PO2 9AE

30th ANNIVERSARY NEVADA 1969 1999

after 30 SUCCESSFUL YEARS we're not just box shifters!

WE OFFER: ● THE BEST ADVICE! ● THE BEST PRICES! ● THE FASTEST DELIVERY! ● OUR OWN SERVICE DEPARTMENT!

BUY WITH CONFIDENCE FROM THE NEVADA TEAM!

profile

JOHN G7WGI

For more than 18 years John has been our resident Scanner specialist - he's even written his own books! He'll be pleased to advise on your choice of Scanner or Short Wave Receiver.

profile

LLOYD G1JAR

Lloyd is our resident Data, Scanner, and Computer Software expert - if you have a query on any aspect of scanners & digital comms he's your man.

profile

MICK G0ABB

Mick has used and played with just about every Short Wave Receiver and antenna on the market! He's an active Radio Amateur.

profile

GRAHAM G8HVY

After 20 years in the business, there's not much Graham doesn't know about Short Wave, Scanners and Antennas - he will be pleased to help.

profile

JOHN CANTRELL

John runs the Admin side of our Spares and Service Dept. If you're looking for a battery pack, spare part, or repair, he's your man.

NEW!

THE LATEST HOT RECEIVER FROM ICOM

IC-R75

£699 £8 p&p

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

NEVADA WILL BE ONE OF THE FIRST to stock this radio!

PRICE MATCH

ICOM R8500

~~£1549~~ £1548 £8 p&p

YES, we've got them IN STOCK!

This receiver is everything we hoped it would be, covering 100kHz - 2GHz and lots of features including computer control.

PAY BY 3 POST DATED CHEQUES! £516 each

ICOM PCR 1000

STILL AT A SPECIAL PRICE WHILE STOCKS LAST

COMPUTER RADIO SYSTEM

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

£249 £8 p&p

PCR OPTION DSP UNIT UT 106...£59.95 £2.75 p&p

PCR 100

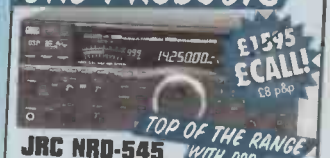
NEW FROM ICOM

LOW COST PC CONTROLLABLE RECEIVER

- 500kHz -1.3GHz
- AM/FM/WFM
- 1000 memories
- Bandscope
- Tane Squelch

£199 £8 p&p

JRC PRODUCTS



£1595 £CALL! £8 p&p

TOP OF THE RANGE WITH DSP

JRC NRD-545

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

VHF CONVERTER 30 - 2000MHz £199

NVA 319 Extension speaker for NRD-545 Receiver....£159 £8 p&p

JRC ST3 Headphanes
A real quality pair of headphones designed for communications receivers
£69.95 £4.95 p&p

YAESU FRG 100

PRICE MATCH

£429 £8 p&p

INCLUDES FREE FM OPTION worth £33

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

2 OF THE BEST

portable radios from SANGEAN

SANGEAN ATS818

If you're looking for a really good no nonsense portable SW receiver that covers SSB - this set represents UNBEATABLE VALUE FOR MONEY!

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

~~£149~~ £129 £8 p&p

SANGEAN ATS909

ULTRA COMPACT DIGITAL MULTIBAND RADIO WITH SSB

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

~~£200~~ £169 £8 p&p

NEW! ROPEX

WIDEBAND ACTIVE ANTENNBA

Covers: 20kHz - 130MHz (receives the new 136kHz Band). Ideal for indoor, loft or outdoor use. Suitable for Sconners & Shortwave Receivers

£39.95 £3 p&p

SPECIAL PURCHASE

GRUNDIG YACHTBOY 500 WORLD RECEIVER

£139 £8 p&p

- Covers:
  1.6kHz-30MHz .....SW
  513kHz-1611kHz ...MW
  150kHz-353kHz.....LW
  87.5-108MHz.....FM STEREO
- Modes: AM/FM/SSB
- Radio Data System
- 40 Station Memory
- Dual Alarm Clock
- Supplied c/w Leatherette Carrying case, mains adaptor

SAVE MONEY ON OPTOELECTRONIC

OPTO CUB

Handheld Frequency Counter
- 1MHz - 2.8GHz
- Auto Capture
- 9 digit display

FOR CHARGER ADD £8.95

~~£129.95~~ £99 £6 p&p

MINI SCOUT

~~£169~~ £135 £6 p&p

OPTO R11

NEARFIELD TEST RECEIVER
Sweeps 30MHz to 2GHz in less than one second. Can lock onto a 5W UHF signal at 500ft. Listen to the signal on the built in speaker & display the general band and transmit frequency.

~~£369.95~~ £259 £6 p&p

LIMITED QUANTITY AT THIS PRICE!

FOR CHARGER ADD £8.95

- Reaction Tunes AR8000, AR8000, ICOM R7000, R7100, R8500, R10
- Locks on to signal in less than 1 second & auto tunes radio to freq
- 10MHz - 1.4GHz operation
- Lock on to 5W UHF signal from 250 ft
- 16 Bargraph for signal strength reading
- NiCads, Antenna included

GPS III

PRICE MATCH

- Ability to zoom in & out
- Weighs 255g
- Can be dash mounted for use in a vehicle or boat.

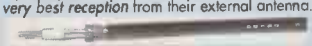
£339 £6 p&p

ACCESSORIES

GPS III Mounting Bracket.....£23.50
GPS III Swivel Mounting Bracket.....£17.62

LOW LOSS COAX CABLE

We've imported these super low loss cables especially for scanner enthusiasts who want the very best reception from their external antenna.



JAPANESE 5D-FB

Dia 8.1mm (Good to 3000MHz).....85p/MTR
BNC Plug for 5D-FB.....£3.75
PL 259 Plug for 5D-FB.....£1.40
N Type for 5D-FB.....£3.95

SIVA RH100

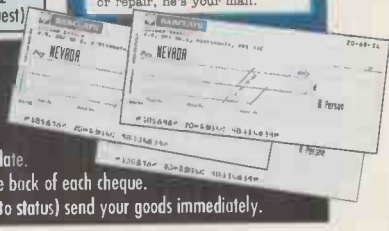
Dia 9.7mm 1.3dB loss (10mtr @ 1000MHz .....95p/MTR (p&p on request)

IT'S EASY TO PAY!

USE YOUR CREDIT CARD FOR SAME DAY DESPATCH!

- by three post dated cheques

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



Will 8.33kHz Ever Happen?

Colin Goodall brings us up to date on the introduction of 8.33kHz channel spacing in the v.h.f. airband.

The likelihood of congestion in the v.h.f. airband was first discussed at a meeting of the International Civil Aviation Organisation (ICAO) in 1990. A committee was set up to consider the implications, and from statistical data it was found that a severe shortage of v.h.f. communications capacity was likely in Europe, particularly around the airports of London, Amsterdam, Frankfurt and Paris, the upper airspace of these areas being most affected. It has been predicted that within an area of 1000km centred on 50°N06°E, upper airspace communications will be completely saturated. This would of course lead to extensive delays and/or a reduction in flights.

Recommendation

Back in March 1995, the ICAO made a recommendation that in order to alleviate the v.h.f. airband frequency congestion, channels should be reduced from 25kHz spacing down to 8.33kHz spacing.

The main beneficiary of this agreement is European airspace, but the requirement to operate 8.33 will not be confined only to traffic operating wholly in that airspace. All aircraft operating into European airspace will be required to have radios that will tune to the new frequencies. This means of course that aircraft from outside Europe (e.g. the USA) must be equipped with 8.33, even though in the rest of the world it will not be used. Should an aircraft enter European airspace and not be equipped with 8.33, then routing and/or flight level restrictions will be imposed.

The original date for introduction of 8.33 was 1 January 1998. The revised date was 1 January 1999, but as each of the European Aviation Authorities adopts the regulations, differences can and will emerge. Whilst 1.1.99 looked achievable, the UK CAA is not likely to introduce 8.33 until the year 2000. This may be affected by the introduction of the new ATC centre at Southampton.

Generally it is expected that 8.33 will be used at flight level 245 and above with the existing 25kHz spacing at flight levels below FL245. This obviously requires a method of distinguishing between 118.000 when below FL245, and 118.000 when above FL245. **Table 1** shows the names that will be used for each of the channels for both 25 and 8.33 spacing.

So if you are flying at FL240, you will be told to contact Control on 118.0, but if you are flying at FL260, you will be told to contact Control on 118.005. Both refer to the actual frequency of 118.000.

Frequency Names

Frequency names within the 8.33 regime will sound completely different to anything we have previously heard. To transfer to 118.0083 actual frequency, you will be told to call "one one eight decimal zero one zero" (118.010, which is the new name), and that is what you will tune on your panel in front of you. That assumes that the panel and the radio in your aircraft have had the necessary conversion undertaken.

As you know, in commercial aircraft the panel in front of the crew on the flight deck is not actually the radio, see *page 23 for a cabin layout of a BA146* - **Ed.** The radio is rack mounted somewhere else on the flight deck or even beneath the flight deck. So to enable the crew to easily and quickly select these new frequencies requires a method of selecting and transmitting the data from the panel to the radio.

Such methods exist now, but mostly have been built to cater for six digits only. In future they must cater for seven digits, and to achieve this it may be necessary to install extra wiring between the panel and the rack, and even a new panel if the current model only displays five digits and will be required in future to display six digits.

On the more modern aircraft where h.f. data links and voice protection systems are in operation as part of the transceiver, the changes are even more complex and may

require new panels, new software, new processor boards and new motherboards. Just to make things even more difficult, in some instances, where an existing electromechanical display is replaced by a new electronic display, then a new power supply of 28V d.c. will also need to be provided.

Should you have a panel that selects both v.h.f. and h.f. frequencies, then up to five additional wires may need to be installed between the panel and the rack.

You can imagine the costs and time needed to do this on a fleet of planes. That assumes that the existing radio is capable of tuning to e.g. 118.0583. If the existing radio cannot tune to 8.33, then it means either a modification kit from the manufacturer, or a new radio. New radios for aircraft do not come cheap.

The new channel spacing requires radios to operate on a total of 2,280 channels in the band 117.975 - 137.000. The lowest assignable channel will be centred on 118.000MHz for 25kHz spacing and 117.9916 for 8.33kHz spacing.

Frequencies Protected

Certain frequencies will be protected and will maintain a 25kHz spacing. These include the emergency channels of 121.500 and 123.100. The list of frequencies is:- 121.425 - 121.575; 123.075 - 123.125 and 136.500 - 136.975, plus the current ACARS frequencies in use around the world.

The ability to operate offset frequencies will not be allowed within the 8.33 regime. Currently where a frequency is radiated by more than one antenna, then offset frequency operation is used to avoid interference effects in the aircraft. For example, the frequency 127.075 is used on one antenna and 127.080 and 127.070 are used at other antennas. This will not be allowed with 8.33.

All of the changes set out above could be overtaken by the introduction of digital radios which can tune any frequency you like. These are being developed and tested now and are likely to be available in the early part of the next century. Airline operators are suspicious that expensive and labour intensive changes being made now could be outdated by the year 2004.

Airport Congestion

This type of problem is not new. The Microwave Landing System, hailed as the answer to airport congestion, has been dropped in the USA but is still being pursued in Europe. London Heathrow has a working MLS installation and Gatwick is to have one installed very soon. Trials are being undertaken with a modified British Airways 757 at LHR.

GPS has come of age and is now deemed safe enough to be used for area navigation and soon will be used for approach and landing in the USA. Here in the UK it is unlikely that the CAA will certificate GPS for precision approach and landing (e.g. CAT III).

The adoption of Basic Area Navigation systems (BRNav) is another improvement that allows aircraft to fly on routes other than where VOR/DME beacons currently happen to be. Existing craft with Flight Management Systems and GPS navigation can and do now follow the new RNAV routes but to update a plane without such equipment can cost well in excess of £100000.

Add together TCAS 2, Mode S transponders, 8.33kHz spacing, BRNav, MLS and GPS and you have problems of costs and implementation timescales.

Table 1:

25kHz spacing	Channel Name
118.0000	118.000
118.0250	118.020
118.0500	118.050
118.0750	118.070
118.1000	118.100
8.33kHz spacing	**Channel Name**
118.0000	118.005
118.0083	118.010
118.0166	118.015
118.0250	118.030
118.0333	118.035
118.0416	118.040
118.0500	118.055
118.0583	118.060
118.0666	118.065
118.0750	118.080
118.0833	118.085
118.0916	118.090
118.1000	118.105
and so on....	

New Equipment

Currently new equipment is being developed that will cater for ILS, GPS and MLS all in one box. This is called a Multi Mode Receiver (MMR) and it is expected that it will soon be available on all new aircraft as they are delivered.

Only recently an aircraft crossing the Irish Sea on route to Cardiff on reporting to London Control was told he could now go direct to 16km final at Cardiff. The reply was to the effect that the plane did not have a computer or GPS fitted and was not therefore, capable of that manoeuvre. Direct flying rather than following beacons saves money; to achieve the savings you first have to spend money, though.

Have you checked your radio yet? Try to tune to 118.0583. It will probably be sufficient to tune to 118.0585, but even that may not be possible on some radios. Even if your radio will accept the new frequencies, it is unlikely that it will scan in 8.33kHz steps. The only answer will be to enter the exact frequencies into the memories and use memory scan in future. It could mean that you will need to consider a further financial outlay in order to keep up with the current developments in air transport. It's not only the airlines who are affected!

With special thanks to DW for his help researching this article.

The LITTLE Black Box with BIG Performance!

Computer Not Included

Includes Trakkstar Software

OPTOCOM SETS THE STANDARD.....

Combining a high speed, high performance receiver, Motorola®/LTR Trunking, and full featured decoding.

CHECK OUT THESE FEATURES

- High speed triple conversion GRE receiver board (50 channels per second)
- Track Motorola 400MHz, 500MHz, 800MHz, and 900MHz systems, as well as conventional frequencies, simultaneously
- Decode CTCSS, DCS, LTR, DTMF, and Motorola talk group ID
- Reaction Tune with the Scout Frequency Recorder
- Built-in Data Slicer Circuit for decoding of FSK programs
- Software and hardware controlled volume and squelch
- Download up to 28 different frequencies or one Talk Group ID for scanning without the computer
- Supplied with the all NEW TRAKKSTAR software from ScanStar
- Trunk Track LTR systems
- Scans conventional frequencies from 25-520, 760-1300MHz

Flexibility

Built-in data slicer circuit for decoding of popular FSK programs.

Portability

For use without the computer, download up to 28 different frequencies or one talk group ID for mobile applications.

CC50 Carry Case
Holds OptoCom & Laptop Computer

OPTOELECTRONICS®

5821 NE 14th Avenue • Ft. Lauderdale, FL • 33334

www.optoelectronics.com

OPTOCOM supplied with Software, Antenna & Cables. Operates under Windows 3.1, 3.11, 95, and 98

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

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

WATERS & STANTON ELECTRONICS
22 Main Rd. • Hockley • Essex • SS5 4QS
Telephone: (01702) 206835 Fax: (01702) 205843

MADE IN U.S.A.

Optoelectronics Optocom Review

The life of a journalist is full of its ups and downs. When a deadline is looming and I still have thousands of words to write about what can be an endless stream of boring products, I always find myself wondering why I bother chaining myself to a computer all day, and life in a more mundane profession starts to be come increasingly attractive. On the other hand, when my job allows me to get my hands on a particularly exciting and interesting product, I wonder why I'd ever want to do anything else.

Luckily for me, Optoelectronics' Optocom most definitely falls into the latter category, this state-of-the-art collection of electronics combining a high quality wide coverage computer-controlled receiver, made by a company called GRE, and what is effectively the innards of Optoelectronics' OptoTrakker in one compact black box. The end result is a product that, with the assistance of a PC, can not only receive just about every interesting transmission you can think of, but can also decode CTCSS, DCS and DTMF codes, not to mention being able to track LTR, Motorola and, with some optional software, EDACS, trunked transmissions. The Optocom also has a number of other features up its sleeve, which I'll get to a bit later.

What's In The Box

The Optocom package consists of the Optocom itself, a printed manual, a serial cable, a simple telescopic antenna, a 90° BNC adapter, a power supply unit, a manual, a copy of Signal Intelligence's *TrakkStar* trunk tracking software, plus some utilities, additional software and some extra documentation on floppy disk.

The Optocom itself is housed in a sturdy metal case that oozes quality in a way that all the photographs I've seen of the product just can't convey. Its front panel is the location for two rotary controls, one for setting the squelch level and the other for setting the volume, the settings for both of which can be over-ridden through software.

There is also a 3.5mm headphone socket here which, when used, disables the Optocom's internal speaker, and also three l.e.d.s; a red one marked Power, a green one marked Data, and an amber one marked Squelch. The function of the Power l.e.d. is pretty self-evident, while the Data l.e.d. illuminates whenever the Optocom is communicating with the host PC via its serial port, and the Squelch l.e.d. illuminates to tell you a signal has been received at a level high enough to open up the squelch circuit.

Turning to the rear of the case, you'll find a rather impressive array of connectors and switches. From right to left there is a small power switch, a 9-pin serial port, a coaxial power input socket, a 3.5mm CI-5 socket, a 3.5mm external speaker socket, another 3.5mm CI-5 socket, a phono-type tape audio output connector, a stereo 3.5mm audio in/out socket, yet another CI-5 socket, this one a 2.5mm type, a second 2.5mm socket, this one labelled Tape Pause, a BNC antenna socket and, finally, an attenuation switch through which you can enable a 10dB attenuator on the Optocom's r.f. input.

Many of these connectors don't need any explanation, but a few do. The dual 3.5mm CI-5 sockets are there to allow the Optocom to be daisy-chained with other CI-5 (a fully-compatible enhancement to the Icom CI-V interface standard)-compatible products, while the 2.5mm CI-5 socket is additionally fitted simply to allow the Optocom to be used with Reaction Tune-compatible products like the Optoelectronics Scout range. But I've left the best to last - the audio in/out socket provide receiver discriminator output to the tip of an inserted 3.5mm plug, while the ring connection brings audio back in. This allows the Optocom to be used with an external decoder unit if necessary, a very useful feature indeed.

Talking of upgrades, hidden inside the Optocom's case is a NUDEM (Nearly Universal Data Demodulator) card slot. This is designed to allow you to add third party hardware decoders to be fitted. As yet no such products are available, though it is very nice to know it is there.

A final hardware feature well worth mentioning is the fact that the Optocom features a built-in data slicer circuit, allowing FSK data to be decoded by third party software. Word has it that this feature will be supported by a soon to be released version of the *Trunker* trunk tracking software.

Last month he was 'Scouting About' with the new Mini Scout, this month Faris Raouf puts the new Optocom from Optoelectronics through its paces.

Continued on page 44

Feature packed radio receivers to expand your horizons fro

AOR *is a radio receiver manufacturer, this is our business expertise, designed by speci*

AR7030 High dynamic range, short wave receiver 0 - 32 MHz. ***£799***
AR7030 PLUS Enhanced version, fitted with narrow AM filter, optical encoder, features CPU with 400 memory channels and alpha-tag, optimised components for highest performance. ***£949***
*Awarded **five stars** "Editor's Choice" in **Passport to World Band Radio 1999** (for the third year in succession). Interestingly, none of the newly arrived DSP competitors achieve five stars.*

The **AR5000** is a true base receiver, high performance, top quality build and true wide coverage all mode receive from 10kHz to 2600MHz. The "+3" version offers even more with synchronous AM, AFC and Noise Blanker. Popular with government agencies throughout the world.

The enhanced AR5000+3 has been **awarded 4-stars** by **Passport to World Band Radio'99**...
"Front-end selectivity, image rejection, IF rejection, weak-signal sensitivity, AGC threshold and frequency stability all superior".
"Unlike virtually every other receiver we have tested over the past 21 years, the frequency readout is unfailingly accurate to the nearest Hertz. This should make the AR5000+3 of exceptional interest to broadcast engineers".

Voted **best wide band receiver** by the readers of the German "**Funk**" magazine.

Chris Lorek **HRT**...
"Throughout the wide frequency range, the receiver was adequately sensitive, especially so at the upper end, with good overall strong signal handling characteristics."
AR5000 ***£1345***
AR5000+3 ***£1574***

The **AR3000A** is evolution at its very best. Wide band all mode receiver, 100kHz to 2036MHz high performance, RS232 port as standard. Respected best seller with over 70,000 sold world-wide, used daily by the military and government.
AR3000A ***£699***
AR3000A ***PLUS***
with enhanced facilities ***£799***

PC Windows software is available for all items on this page (less aerials of course, software for the SDU5500 is currently under development). Visit our web site for information, demos and full versions of some packages free... or call by phone to discuss your requirements.

m LW - MW - HF - VHF - UHF : Base, Mobile, Hand-portable

*lists for the enthusiast - leading to products which bring **you** more features & facilities.*

AOR

AR8200 all mode hand portable receiver 500kHz to 2040MHz. Features the new 8.33kHz airband channel spacing (correctly implemented). Optional slot cards available for CTCSS, External memory etc. Computer port for hands-off control & management (requires optional CC8200 interface lead). ***Free supporting software*** available from the AOR internet site. **£399**

AR8000 all mode hand portable receiver 500kHz to 1900MHz. Dot matrix display, a real trendsetter. Computer / reaction tune port and many features. **AR8000 £299**

ARD2 portable ACARS + NAVTEX decoder and display unit, can be operated from internal batteries or external d.c. supply. An RS232 port expands capabilities, ***free supporting software*** from the AOR web site. **£295**

SDU5500 Spectrum Display Unit for use with a companion radio receiver such as the AOR AR5000/+3, AR3000A, ICOM R7100, R8500, R9000 or other receivers with an IF output close to 10.7MHz. **£799**

455 kHz filters

MF500 Collins 500 Hz mechanical CW filter (displays around 700 Hz in AR7030)	69.95	2.00
CFJ455K8 Murata 1.0 kHz data filter (displays around 1.5 kHz Hz in AR7030	39.99	2.00
XTAL2.4 Quality 2.4 kHz crystal filter for AR7030 (FL124 daughter board recommended for fitting)	99.95	2.00
MF2.5 Collins 2.5 kHz mechanical SSB filter	69.95	2.00
CFK455J Murata 3.0 kHz metal cased filter (displays around 3.8 kHz in AR7030)	29.99	2.00
CFK455I Murata 4.0 kHz metal cased filter (displays around 4.7 kHz in AR7030)	29.99	2.00
MF4 Collins 4.0 kHz AM mechanical filter	69.95	2.00
MF6 Collins 6.0 kHz AM mechanical filter	69.95	2.00

AR7030 options

PLUS retro upgrades Performance upgrades to the AR7030, please phone for details	TEL	
FL124 Daughter board for fitting up to three crystal filters to the AR7030	24.99	2.00
BP123 Internal rechargeable battery and charge circuit for the AR7030	99.99	6.00
NB7030 Enhanced multi-option - audio notch filter, noise blanker and features CPU for alpha-tag memories, additional memories, enhanced timer	198.00	5.00
UPNB7030 Enhanced upgrade NB7030 for those who already have the features CPU fitted or are adding the NB7030 to the AR7030 PLUS	163.00	5.00
FPU7030 "Features CPU" for the AR7030 as supplied with the NB7030 option.	69.00	2.00
SM7030 Service information comprising circuits, layout, block diagram, service alignment disk & lead	39.95	3.00
RS232-7030 Programmers information (10 pages in WORD format) disk & printout (File supplied on SM7030 disk as standard)	3.00	free!
IR7030 Spare infrared remote control unit	14.99	2.00

AR5000 options

AS5000 4 way external aerial switch	89.00	3.50
CT5000 Internal CTCSS unit	79.00	3.00
DS8000 Voice inverter unit (analogue	69.00	3.00
CR5000 Tape recording lead for the AR5000	16.95	1.50

AR3000A options

MM1 Mobile mounting bracket for the AR3000A, will also fit the AR3000, AR2002 and AR2001	16.95	2.50
CR400 Tape recorder lead	16.95	1.50

Hand held receiver options

AR8200

SC8200 Clear plastic case for the AR8200	17.95	1.50
SC8200P Soft padded grey leatherette case for the AR8200	19.95	1.50
EM8200 External memory slot card	49.90	3.00
VI8200 Voice inverter slot card (analogue)	49.90	3.00
RU8200 Record / playback slot card	49.90	3.00
CT8200 CTCSS slot card	59.90	3.00
TE8200 Tone eliminator slot card	34.90	3.00
CR8200 Tape record lead	34.90	3.00
CC8200 Computer control lead (with built-in level shift), supplied with PC software on CD-ROM	69.90	3.00
OS8200 AUX moulded connector with approx 1m of multi cable (for discriminator out etc)	12.90	1.50
RT8200 Reaction Tune lead for Scout	20.26	1.50
CO8200 Clone lead (made to order in the UK workshop using two OS8200 leads)	30.00	1.50

AR8000

SC8000 Soft case for the AR8000	17.95	1.50
CU8232 Remote data interface for clone and RS232 control of the AR8000 / AR2700	89.00	3.00
CR8000 Tape interface for AR8000	44.90	3.00
SAC8000 Lead and rear slotted battery cover for the AR8000 to enable operation with the OPTO SCOUT V3.1 without modification to the receiver	24.95	1.50
SLOT-8000 Slotted replacement battery cover for the AR8000 receiver, ideal for CU8232 or OPTO CX12A	4.95	1.50
DS8000 Voice inverter unit (analogue)	69.00	3.00
4AA Set of four 700mAh high capacity "AA" NiCads for the AR8000 & similar	16.00	2.00

AR2700

SC2700 Soft case for the AR2700, special price for stock clearance	5.00	1.50
IF-ADP Interface adaptor for the early AR2700 (with 4-pin connector, made to order)	5.00	1.50

AR2000

SC2000 Replacement soft case for the AR2000 /1000 (also suitable for Fair Mate HP100, 200, 2000 etc)	6.00	1.50
EP2000 Replacement earphone for the AR2000 /1000/ 8000 & similar models (3.5mm plug)	1.90	1.50

AR1500

SC1500 Replacement soft case for the AR1500, also suitable for AR900	5.50	1.50
BP1500EX Additional NiCad pack for the AR1500EX Has 3-PIN connector (not for AR1500/E)	19.50	2.00
BP1500 Additional NiCad pack for the AR1500/E. Has 2-PIN connector (not for AR1500EX). Also fits AR900	19.50	2.00
DC1500EX Replacement dry battery case for AR1500EX (4 x AAA). Has a 3-PIN connector (Not for the AR1500/E)	3.20	1.50
DC1500 Replacement dry battery case for AR1500/E (4 x AAA). Has a 2-PIN connector (Not for the AR1500EX)	3.20	1.50

Power leads

DC2000 Spare 12V DC lead for the AR8000 etc Fitted with cigar lighter plug	6.00	1.50
DC3000 12V DC lead for the AR5000, AR3030, AR3000A etc	6.00 *	1.50

* If you wish to have a cigar plug fitted, add £2.00 extra

DC5500 Optional 12V DC lead with in-line fuse for the SDU5500 and ARD-2	6.20	1.50

Audio leads & connectors

CR400 Ready made tape recorder lead for the AR7030, AR3030, AR3000A	16.95	1.50
CR5000 Tape recording lead for the AR5000	16.95	1.50
CR8000 Tape interface for AR8000	44.90	3.00
CR8200 Tape record lead for AR8200	34.90	3.00
8DIN 8 way din plug for AR7030 AUX socket	2.50	1.50
8MINI 8 pin ACC1 mini din plug for AR5000	2.80	1.50
8LMINI 8 pin ACC1 mini din plug with free end lead for AR5000	4.95	1.50

Aerials & accessories

DA3000 16 element discone aerial specifically designed to match the AR3000 receiver - of course it is suitable for other similar coverage receivers. Usable coverage is 25 MHz to 2,000 MHz (2 GHz). Supplied with 15m of coaxial cable and terminated in a BNC plug	89.95	5.00
SA7000 Twin element ultra wide band receive aerial 30 kHz to 2,000 MHz (2 GHz). Supplied with 15m of coaxial cable and terminated in a BNC plug	129.00	3.50
LA320 Shortwave table-top active loop aerial 1.6 - 15 MHz fitted with coax lead and BNC plug	139.00	3.50
320L Element 0.2 - 0.54 MHz for above (Carriage free when ordered with LA320)	36.00	2.50
320M Element 0.54 - 1.6 MHz for above (Carriage free when ordered with LA320)	36.00	2.50
MA500 VHF-UHF mobile whip aerial on magnetic base. Supplied with about 4m of coax & BNC plug	64.00	3.50
AS5000 External aerial switching unit for the AR5000	89.00	3.50
DA900 Flexible wide band whip aerial 245mm in length, black BNC plug. Popular with ALL makes such as AOR, Yupiteru etc	12.95	1.50
TW500 Telescopic whip aerial 625mm in length, BNC plug. Ideal for the "edge" in VHF listening while hand portable. BNC plug	14.95	2.00
RA2001 Right-angled telescopic aerial terminated in a BNC plug as used with the AR3000A 13.60		2.00
TW7030 Telescopic whip on right-angled PL259 (for shortwave use), suitable for the AR7030 and other short wave receivers	12.95	2.00
ABF125 VHF Airband filter 108-136 MHz to improve strong signal handling especially of hand-held receivers. BNC male & female for straight forward connection	28.50	2.00

An extract from the retail price list is presented here. Prices include VAT @ 17.5%. The right hand column indicates postage charge for items ordered individually, please enquire for multiple items.

Detailed leaflets are available for main items upon request.

AOR (UK) LTD 4E East Mill, Bridgefoot, Belper, Derbyshire, DE56 2UA England

AOR® **Tel: 01773 880788** Fax: 01773 880780

info@aor.co.uk www.demon.co.uk/aor **E&OE**

Manufacturer's Specifications

Frequency Range:	25-520, 760-1300MHz (non US models) 25-520, 760-823.995, 849.005-868.995, 894.005-1300MHz (Cellular blocked US models)
Sensitivity:	a.m. (20dB N/S with 60% modulation) 2µV @ 25-520, 760-1000MHz 5µV @ 1000.005-1300MHz n.b.f.m. (20dB N/S at 3kHz deviation) 0.5µV @ 25-520, 760-1000MHz 3µV @ 1000.005-1300MHz w.b.f.m. (30dB N/S at 22.5kHz deviation) 3µV @ 25-520, 760-1000MHz 10µV @ 1000.005-1300MHz
Selectivity:	a.m. -6dB at ±6kHz, -50dB at ±12kHz n.b.f.m. -6dB at ±10kHz, -50dB at ±20kHz a.m. -6dB at ±150kHz, -50dB at ±300kHz
Scanning Rate:	≤65 ch/s
IF Rejection:	612MHz at 70MHz (n.b.f.m.) / 60dB 612MHz at 1000MHz (n.b.f.m.) / 60dB
Squelch Sensitivity:	a.m./n.b.f.m. Threshold 0.5µV @ 25-520, 760-1000MHz 3µV @ 1000.005-1300MHz a.m./n.b.f.m. Tight 25dB@ 25-520, 760-1000MHz 20dB @ 1000.005-1300MHz w.b.f.m. Threshold 3µV @ 25-520, 760-1000MHz 15µV @ 1000.005-1300MHz w.b.f.m. Tight 40dB @ 25-520, 760-1000MHz 40dB @ 1000.005-1300MHz
Antenna Impedance:	50Ω

Setup

Setting the Optocom up is as simple as can be. In terms of hardware, all you have to do is attach the Optocom to your PC via the supplied serial cable, plug in the power supply, and attach the telescopic antenna. Since the antenna doesn't hinge, and the BNC connector on the Optocom points out of the back of the unit, you'll need to attach the 90° BNC adapter to the unit's antenna input and then attach the antenna onto this if you want, as most people will, to receive vertically polarised transmissions.

It is worth noting at this point that although the telescopic antenna provided is perfectly serviceable, and works fine for local transmissions, you would be well advised to opt for a more sophisticated antenna in order to pick up more distant transmissions. Personally, I used a Watson Super-Gainer, which I normally use with a hand-held scanner, though other options may suit you better, including attaching a roof-top antenna to the Optocom.

Software

At this point, turning on the Optocom won't result in you being able to hear anything other than band noise, unless you happen to live somewhere where you can receive a transmission on 162.55MHz - the frequency the Optocom tunes to by default - as in order to do anything useful you'll first need to install some control software on your PC. Three separate programs are provided for this purpose on floppy disk.

The first is a *DOS* program, though it will also work in *Windows* if you are lucky, and is simply called *optocom.exe*. This basic but still usable program allows you to tune the Optocom to any of the frequencies it supports, set its receive mode, and see if it has picked up and decoded any audible or sub-audible tones. It also provides a few additional features, the most important of which is its ability to enable or disable the Optocom's OS535 emulation mode. This feature is vital because Optoelectronics doesn't itself provide any fully-featured control panel application for use with the Optocom other than *optocom.exe*. In other words, you don't get the all-singing, all dancing Windows-based control panel application you would with products such as Icom's IC-PCR1000. You are, however, supplied with an unregistered, slightly time-limited shareware package from Ben Saladino called *Radio Manager*, a Windows-based control program you can also download from the Internet. It supports a number of scanners and receivers including the OS535 interface but, because it is so new, not the Optocom itself when not in OS535 emulation mode.

I'm afraid I wasn't impressed with *Radio Manager*, not because it lacked features, but because I found its user interface was a little eccentric. However, because one or two other control programs supporting the OS535 (and undoubtedly soon the Optocom in its native mode too) are also out there, if you buy an Optocom and find you agree with my sentiments about *Radio Manager*, you'll be able to download one of these instead, one of which will hopefully be more to your liking.

Of course, not everyone will want such a control panel application, and indeed if all you want to do is hunt for interesting frequencies or track trunked networks, then you'll find that the third program supplied with the Optocom, *TrakkStar*, will do everything you need.

TrakkStar is the same program supplied with Optoelectronics' OptoTrakker trunk tracking decoder, which I reviewed a few months ago, and is basically a cut down version of a more fully-featured package called *ScanStar Deluxe*. The features provided by *TrakkStar* will be adequate for most users, but I'd suggest visiting the ScanStar web site - **www.scanstar.com** - to check the differences between the two, as you find it will be worth paying to upgrade.

TrakkStar's main aim is to allow you to use the Optocom (or an OptoTrakker with a separate receiver) to track LTR and Motorola Type I, II and hybrid trunked networks (it does not support MPT 1327/1343). Rather than decode a Motorola-type trunked network's control channel, something the Optocom cannot do by itself, *TrakkStar* simply makes

use of the Optocom's ability to decode what's known as a Talkgroup ID. These are transmitted as sub-audible tones along with an audible voice transmission on this type of trunked network, and are normally unique to each group of users on the network and therefore can be used to track a particular set of users.

All you need to do in order to trunk track is determine which frequencies a particular trunked network uses and then program these into *TrakkStar*. The program then makes the Optocom scan through these until it detects a Talkgroup ID. If you've set *TrakkStar* to 'ID Open' mode, it will stop the scanning and let you listen to every transmission from every group of users on the network. If you deselect this option, *TrakkStar* will only stop scanning when it comes across a transmission from a list of one or more user-definable Talkgroup i.d.s.

Monitoring LTR trunked networks works in the same way, though as I said in my review of the OptoTrakker, while I know of several Motorola Type I/II trunked networks (they are used mainly by the emergency services), I don't know of any LTR trunked networks in the UK.

Additional features provided by *TrakkStar* include the ability to scan in user definable step sizes between two user-set frequencies, not to mention being able to do this, scan through a user-defined set of non-trunked frequencies and follow trunked networks all at the same time. You can also transfer up to 100 frequencies from *TrakkStar* into a special memory area within the Optocom, which can then scan through itself automatically, even when disconnected from its host PC.

If you want to track EDACS trunked networks, and again I'm unaware of any of these in the UK, you'll need some additional software called *E-Trax*, which costs about $75.

By the time you read this, an additional software package for use with the Optocom may well have been added to the three already mentioned. Rather than being designed for use with a PC, this one is designed to run on a 3Com US Robotics Palm Pilot and offers frequency management and scanning facilities.

In Use

So far, so good - the Optocom is a very powerful device on paper, but what about in practice? Well, when used just as a plain receiver, it works fine, and seemed very sensitive too. As you can see from its specifications, however, unlike some modern receivers it has a gap in its frequency coverage, and doesn't support h.f. (Incidentally, if you are one of our North American readers, you'll also find that Optocoms sold in the US are also Cellular Blocked). Most people will feel that there's little of interest in the missing frequency segment, myself included, so this won't matter much.

But while the Optocom makes a good wide-coverage receiver, it makes a superb scanner and trunk tracker. One of the main reasons it is so good at both these of these tasks is the high speed at which it can scan through frequencies. This is mainly a result of its control circuitry incorporating what Optoelectronics call Pipeline Tuning, which basically allows the next frequency to be listened to, to be sent to the Optocom before it is actually needed, unlike the normal case where the next frequency isn't sent until the transmission on the current frequency has stopped transmitting and the squelch closed.

Since it takes a finite time for frequencies to be transmitted from the PC to a receiver, Pipeline Tuning greatly speeds up the scanning process compared to a receiver without this feature. The end result of using this technology is that, on paper, the Optocom can scan at a rate of up to 65 frequencies per second, a high rate indeed. I wasn't able to ascertain how fast it scanned in practice, but it certainly seemed extremely quick, and made scanning with this product an absolute pleasure.

Its high scan speed also helps make its Trunk tracking capabilities excellent too, and unlike the case when I trunk track using my OptoTrakker and Icom IC-R8500, I found that I missed almost no conversation segments at all with the Optocom, and that talkgroup i.d.s. were always decoded instantly rather than taking up to a second or so.

Bottom Line

If I didn't already own an OptoTrakker and a very nice receiver, I'd definitely be thinking seriously about buying an Optocom, which does everything its manufacturer says it will very effectively indeed. For times when it is to be used for receiving non-trunked transmission, I do feel it should be supplied with a fully-featured *Windows* based control panel application, however, as this would tip the balance and make it a superb product instead of merely an excellent one.

Thanks to **Optoelectronics**, and their ever-helpful UK distributors **Waters and Stanton** (Tel: 01702 206835), for the loan of the Optocom used in this review.

SWM

"It does everything its manufacturer says it will very effectively indeed."

New products for 1999 from ICOM who else?

Icom ICR-8500

M&S PHONE

A desktop "full size" receiver that covers all frequencies ranging from 100kHz-2000MHz. All mode including SSB, the ICR-8500 is the only choice if you require top grade performance on all frequencies.

PHONE FOR THE LATEST SPECIAL OFFER PRICE ON THIS PRODUCT.

Icom IC-R75E

At last a short-wave receiver with DSP - for a sensible price. Excellent display and superb audio from this exciting new receiver.

- All mode
- 30Hz-60MHz
- Syncro AM
- Twin Pass Band Tuning
- Full range of filters available
- Optional Speech board (UT-102)

RRP £699.
ZERO DEPOSIT and 38 x £25 p/m.
FREE DSP UT-106 module with every IC-R75 ordered during this month.

If you want DSP in a receiver and can't quite afford the NRD-545 then maybe you should study the new IC-R75 from Icom. Available this spring, this fantastic new short-wave receiver is a real must for the enthusiastic listener. PC Control, 30kHz-30MHz, DSP, Twin PassBand tuning, crisp sharp audio, make this a delight to use. Deposits are now being taken for March/April delivery.

Icom IC-PCR1000

Every month Icom U.K. receive almost 1000 pieces of this excellent product. Every month 1000 customers buy the entire stock. That's why some of you who have telephoned an order through have patiently waited a week or so for more stock to arrive. Good news! ML&S have increased their order quota and now have more stock available than ever. Just connect to your Windows 95/98 PC, plug in the supplied antenna and monitor 1000kHz-1300MHz, all mode instantly.

M&S £299.95

RRP £349 + £79.95 for the DSP UT-106. ML&S £ 299.95 for both or £18.44 deposit & 11 x £28 p/m.

Icom IC-PCR100

The same as its big brother the PCR-1000, but excluding SSB & DSP. Just plug this very small black box into your Win 95/98 PC and you have an instant 10kHz-1300MHz FM/WBFM & AM receiver.

RRP £249.95
ML&S £199 incl.
FREE DELIVERY.
Introductory offer only.
Whilst stocks last.

Icom ICR-10E

For the ICR-2E owner who wants a little more performance and features. SSB and PC control are available. 500kHz-1300MHz.

RRP £299. ML&S £259 including free Air Band guide and delivery.

M&S £259

IC-R2E

A tiny pocket scanner that you can take anywhere. Easy to use and recommended by both my scanner experts. Now includes CTCSS tone scan and a free air band scanning directory.

ML&S Price £139.95, free postage and Air Band Scanning Directory.

M&S £139.95

TEL: 0181 - 566 1120

M&S MARTIN LYNCH & SONS

140-142 NORTHFIELD AVENUE, EALING, LONDON W13 9SB

OPEN SIX DAYS A WEEK - 9.30 - 6.00

JOIN WAB NOW

The Worked All Britain Awards Group offers a comprehensive programme of awards based on the Ordanance Survey maps of the UK. Awards are open to all licensed amateurs and short wave listeners. No QSL cards required. For further details visit the WAB Website at http://www.users.zetnet.co.uk/glntw/wab/htm Or contact Brian Morris G4KSO, QTHR.

TEL: 0181 - 566 1120 | FAX: 0181 - 566 1207 | CUSTOMER CARE: 0181 - 566 0 566 | Web site: MLandS.co.uk | e-mail: sales@

2-DAY EASTER EKEND SALE

AOR 3000A

A very compact desk/mobile all mode receiver covering 100kHz-2000MHz. Ideal for hobby/commercial applications.

RRP £699 or NO DEPOSIT & NOTHING to pay until August 1999, then 38 x £25 p/m.

ML&S £699

AOR AR-5000

A superb follow on from the very popular AR-3000A, the new AR-5000 has already found its way into many government listening stations throughout the world. Covering an unbelievable 10kHz-2600MHz, all mode capability and PC control. Available in two specifications; the standard "A" and the +3, offering AFC, Sync AM and noise blanker.

ML&S £1299

AR5000 RRP £1345 ML Price £1299 or £5.17 deposit & NOTHING to pay until August 1999, then 58 x £35 p/m.

AR5000+3 RRP £1574 ML Price £1499 or £5.28 deposit & NOTHING to pay until August 1999, then 59 x £40 p/m.

SDU-5500

An all new Spectrum Display unit that features a high resolution white & blue screen which can show a full 10MHz bandwidth anywhere between the 10kHz-2600MHz range of the AR5000. The unit may also be connected to a PC, downloading the display data for detailed analysis.

RRP £799 or £1 deposit & NOTHING to pay until August 1999, then 46 x £25 p/m

ML&S £799

AR-8200 "package"

Probably the best selling hand held scanner of 1998, the new AR-8200 will continue the trend throughout 1999. Still the only receiver to offer 8.33kHz step size for the new airband frequencies, its little wonder AOR are THE receiver design specialists. We have put together a package deal to save you money and wet your appetite!

AR8200 "package" + CC8200 PC Control software & lead + SC8200 case.

ML&S £CALL

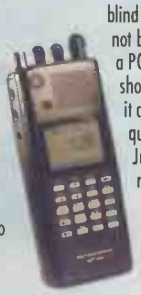
RRP £486.85 ML Price £469 or £11.86 deposit & NOTHING to pay until August 1999, then 22 x £25 p/m. (AR-8200 by itself £call)

MVT-7100

Been around so long its growing a beard! 530kHz-1650MHz, all mode.

Only £199.95

MVT-9000



When this first came over to the U.K. we thought EEK!! They've left the PC interface off!! Hasn't made a blind bit of difference though. You might not be able to control this scanner from a PC (who bloomin' well cares) but it shows the others where to get off when it comes to performance. And build quality. And ease of use. And.. and! Just ask Graeme or Jez our TWO resident Scanner junkies!

Only £339

or £34.15 deposit and 12 x £28 p/m

Yaesu FRG-100

Starting in Short-wave listening and want a receiver that retains its value and is respected in the world of Radio? Enter the FRG-100. 30-kHz-30MHz, SSB/CW & AM, FM optional.

RRP £479 ML&S £399, or £13.08 deposit & 18 x £25 p/m

ML&S £399

JRC NRD-545DSP Receiver

ML&S SPECIAL

PLUS FREE MATCHING JRC NVA-319 BASE SPEAKER WITH FILTERS - WORTH £200!

If you actually take a look around at the receiver market and compare with fifteen years ago I'm sure you will notice there isn't quite the choice of equipment available today. Never mind. With startling performers like the new NRD-545 who cares? A summary? John Wilson paid the ultimate tribute, saying:

The NRD-545 would be welcome in any listener's station. It is a sheer delight to use, well proportioned and with very pleasing styling and appearance.' Nuff said then. I appreciate that £1595 is a lot of money but then the best never came cheap.

RRP £1595 + £199 (NRD-545 & Speaker) ML&S price £1599 for both, or £90.48 deposit & NOTHING to pay until August 1999, then 60 x £40 p/m.

Kenwood TS-570DGE-RX

For those who would like a top range receiver but like the layout and feel of a transceiver, the new "DGE" specification of the TS-570 with enhanced DSP features should not be passed by. ML&S disconnect the transmit capability, making the unit safe for receive only use. Ask for a copy of the John Wilson review. Don't forget the optional SSB narrow filter and matching SP23 speaker. They really do make a difference!

RRP £999

£56.17 deposit & then 60 x £25 p/m.

ML&S £999

New at ML&S

dressler active antennas

The full range of dressler antennas are now available from ML&S.

ARA 40

Technical performance

Frequency range	40kHz-40MHz at full performance 40MHz-108MHz 2.3dB gain
Output impedance	50-75 ohm coaxial
Connector to Rx	PL comes as the standard. Other standards can be fitted upon request
Gain	5dB +/-0.2dBs
Intercept Point	+45dBm IP 3rd order (10MHz/12V)
DC power supply	11.5-13 volt DC at 70mA typ. (230V mains adaptor for 12V DC is supplied with the antenna)
Mast diameter	30-50mm can be fitted
Dimensions	**ARA40** 115cm total length with glassfibre whip. Antenna tube 40mm x 140mm **ARA40 TEL** 125cm total length with telescopic whip extended. 45cm minmum length. Antenna tube 40mm x 140mm **Ideal for portable radio**

£139

ARA 60

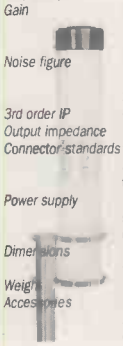
Technical performance

Frequency range	40kHz-60MHz (full performance) 60-120MHz 2-3dB less gain
Output impedance	50-75 ohm coaxial
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)
Mast diameter	30-50mm can be fitted
Dimensions	115cm total length. Antenna tube 50mm x 160mm **Ideal for base stations**

£169

ARA 2000

Technical performance



Frequency range	50-2000MHz
Output impedance	50-75 ohms coaxial
Gain	19dB -1000MHz 18dB -1400MHz 16dB -2000MHz
Noise figure	1.5-2dB -1000MHz 1.8-2.5dB -1500MHz 2.5-4dB -2000MHz
3rd order IP	+35dB typical
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 450mm. Diameter 90mm
Weight	2kg
Accessories	Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 12m coaxial cable and mast mounting clamps

£169

This outstanding range is ideal for use with all base station receivers, the ICR-8500, AR-5000, PCR-1000, NRD-545, FRG-100 & more! Beautifully constructed and designed in Germany - we are pleased to be appointed for this range of products.

A SHORT WAVE RADIO BUDGET PLAN - THAT WORKS!!!

The Martin Lynch & Sons SWL "Budget Plan"

A simple solution to spreading the cost of buying equipment without huge deposits and massive monthly payments. We can even buy your part exchange for CASH and you can still walk out with a new NRD545 for under £50! (Actually £47.94)!

Take a closer look at the ML&S A.R. Budget Plan - many of you already have. Call the sales desk today for any product listed in this magazine. If its available and approved by my buyers the Sales team will quote you a monthly repayment package suited to you.

DON'T FORGET!!

You can pay off the loan much quicker if you like and even send a lump sum one month if you wish. Trade-in your old gear or add to the minimum deposit, reducing the amount of monthly repayments. You tell us what you can afford per month and we'll tell you the deposit you require.

Just call for an instant quotation!*

** Budget Plan requirements: Full time employement (or disabled/retired), over 18 and below 71, Current bank account (or building society). For instant finance please ensure you have UK driving licence and cheque guarantee/credit card or Electricity/Gas/BT bill with your current name and address. Finance subject to status.* ***APR 21.9%.***

FINANCE EXAMPLE

All examples do not include P&P.

Cash Price	Deposit	53 Months@	Total Credit	APR
£1295	£30.40	£35.00	£1885.40	21.9%

Written quotations available on request

MLandS.co.uk

Martin Lynch can also offer finance terms up to 60 months. Deposits from a minimum of £25. We welcome your part exchange against any new (or used!) product, provided its clean and in good working order. Call the Sales Desk today. APR: 21.9%. Payment protection is also available up to 36 months. All units are brand new and boxed and offered with full manufacturers RTB warranty. All prices quoted for cash/cheque or Switch/Delta card. No additional charges for credit cards. Martin Lynch is a licensed credit broker. Full written details are available on request. Finance is subject to status. E&OE. £10 p&p on all major items.

The First Ever SWM

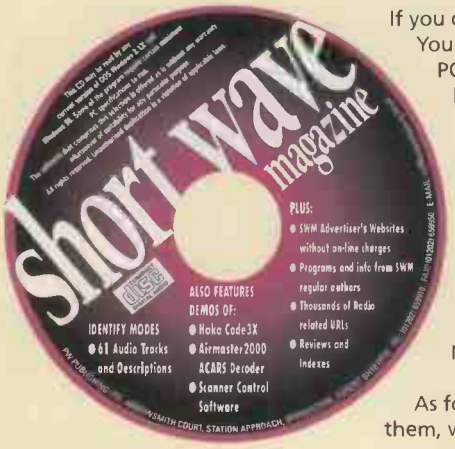
Just what do you do with it now? This useful radio resource is provided as a tool for you keep and enjoy far into the future.

To enjoy the benefits of the CD and read some of the files thereon you'll need to be able to view HTML files. We have used this format as it allows PCs, Unix (and clones) and Macintosh machines to easily use the info. *Windows 95* users will be aware that a browser is shipped as standard with the operation system. So if it's not loaded on your machine you'll need to install it.

For *Windows 3.1x* users we have included a copy of the installer for *Microsoft's Internet Explorer* on the CD. You will find it in the /BROWSERS/WIN31 subdirector. It's the file called SETUP.EXE.

Though all the programs contained on the disk are written for 80x86 or Pentium based hardware. That is they require *DOS* or *Windows 3.1x* and in some cases Windows 95.

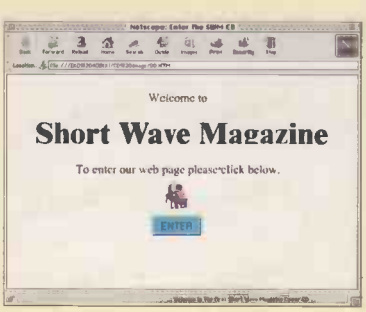
As well as programs and HTML formatted files, we have also included some 26 radio reviews, in Adobe's *Acrobat* format, from the years 1997 and 1998. Included on the CD are *Acrobat Reader* installers for both *Windows 3.1x* and *Windows 95*. They are located in the subdirectory /ACROBAT.



If you don't use *Windows* at all, don't panic. You don't have to have a *Windows* based PC ,or even a PC at all. You can still benefit from this invaluable radio disc.

We have included over 30 minutes of digital data mode sound samples, similar to some on offer commercially for over £50. The samples are available to be played on a standard audio CD player. A listing, explaining what each track is, is included elsewhere on this page. Now how's that alone for value?

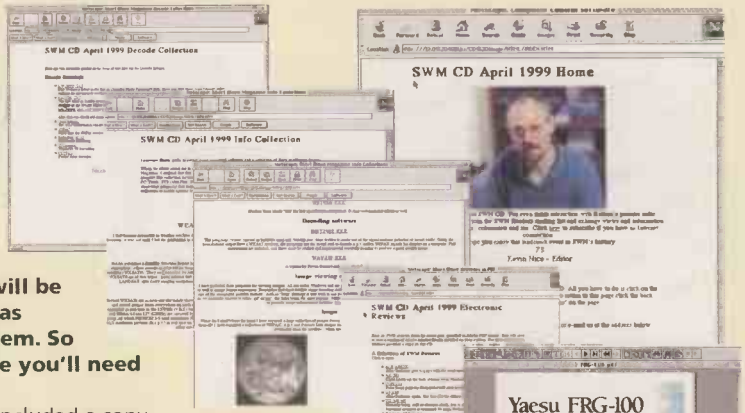
As for the rest of the contents, all 478Mb of them, well that breaks down as follows.



The navigation around the disk is make up of HTML pages viewable with the aforementioned browser - to get going and start investigating the disk you need to open the file GO.HTM in the root directory of the CD. From there it's up to you what you do next - though I do suggest you click on the blue button.

When you arrive at the CD 'Home Page', you will see the main areas to visit as per these catagories:

- **Electronic Reviews from *SWM* past** - 26 PDF format reprinted reviews from the past two years of *SWM*.
- ***SWM* Sound Collection** - .WAV format sound samples
- **Past *SWM* Indexes** - Electronic Indexes for 1997 & 1998 (click to see the rieviews that are present on disc



- ***SWM* Authors** - Pages from some regular *SWM* authors. Includes software, images and information.
- **Radio Spectrum Guide** - a comprehensive guide to radio spectrum use.
- ***SWM* CD Advertiser Sites** - Check out a selection of *SWM* advertisers' Websites without having Internet access!
- **Over 4000 Radio URLs courtesy of K1DWU** - Radio resourses on the Internet. Click the one you want to see, and off you go. (Assuming you have Internet access).
- **Software Demos** - Try the following;

Airmaster 2000 - ACARS
Hoka *Code3x* - Decoder
Hoka *Code3-Gold* User Manual - full user manual.
Alinco DJX10 Computer control
JavScan8K
Radio Manager
ScanCat Gold for *Windows*
*Scan*Star*

SWM Cover Mount CD

Track	Description
1	242-096 1750Hz centre frequency, CCIR242, two channel 96 baud. A = Idle, B = traffic.
2	242-192 1700Hz centre frequency, CCIR242, four channel 192 baud, All channels on idle. 1:4 RC.
3	342-100 1750Hz centre frequency, CCIR342-2 two channel 100 baud. A = traffic, B = traffic.
4	476AT 1750Hz centre frequency, SITOR ARQ. Both IRS and ISS stations on same frequency. (Two amateurs in QSO).
5	476FEC 2210Hz centre frequency, SITOR FEC.
6	476IDLE 1750Hz centre frequency, SITOR FEC. Idle Beta signal.
7	476IRS 1750Hz centre frequency, SITOR ARQ in IRS mode.
8	476SLIP 1750Hz centre frequency, SITOR ARQ coast station callslip for 'OST'
9	476START 1750Hz centre frequency, SITOR FEC, 100 baud. Idle Beta then traffic. (Rogaland Radio with NAVTEX on 518kHz).
10	476TFC 2210Hz centre frequency, 100 baud SITOR ARQ in ISS mode sending traffic.
11	ACARS VHF commercial Aeronautical AGA data system.
12	ARQ6-90 2210Hz centre frequency, 200 baud, SITOR-like ARQ. Six character blocks, two stations on same frequency. (French Diplo).
13	ARQE-3 1750Hz centre frequency, 100 baud ARQ-E3 1:8 RC on idle signal.
14	ARQE-8 2210Hz centre frequency, 96 baud ARQ-E 1:8 RC (Italian Diplo).
15	ARQN8 2210Hz centre frequency, 1:8 RC. Italian Diplo.
16	ARQS5 2210Hz centre frequency, 96 baud ARQ-S five character blocks. (Indonesian Diplo).
17	ARQS5IRQ 2210Hz centre frequency, 96 baud ARQ-S five character blocks now in IRS mode.
18	ARQS6 2210Hz centre frequency, 96 baud ARQ-S six character blocks, Austrian Diplo.
19	ARQS6IRQ 2210Hz centre frequency, 96 baud ARQ-S six character blocks now in IRS mode.
20	ARQSWE22 1750Hz centre frequency, 100 baud Swedish Diplo ARQ in 22 character block mode.
21	AUTOSPC1 2210Hz centre frequency, 102.75 baud AUTOSPEC with 1:50 interleave. Idles then traffic. (Rou Diplo).
22	AUTOSPC2 2210Hz centre frequency, 102.75 baud AUTOSPEC with 1:50 interleave. End of traffic, then idles. (Rou Diplo).
23	AUTOSPC3 1750Hz centre frequency, 68.5 baud AUTOSPEC with 1:10 interleave. Idles.
24	CABS VHF Taxi Data despatching system.
25	COQ13 1130Hz centre frequency, 13.33 baud, 13-tone Coquelet with French language text. (Algerian Diplo).
26	COQ8 2210Hz centre frequency, 26.67 baud, 8/13-tone Coquelet which auto-switches between 13 and 8 tones and ITA2 latin and Arabic keyboards). (Algerian Diplo) This example is of some hand keyed traffic mixed with idles.
27	CROWD36 1080Hz centre frequency, 40 baud Crowd36 in traffic and crypto. (Russian Diplo).
28	FAX1 2210Hz centre frequency, b/w picture, shift 300Hz, 120r.p.m., IOC576 (Offenbach).
29	FAX2 2210Hz centre frequency, analog, shift 300Hz 120r.p.m., IOC576 (Offenbach satellite picture).
30	FAX3 2400Hz sub-carrier f.m. satellite picture. Monitored on 1691MHz from METEOSAT. IOC 267, 240r.p.m.
31	FAX4 2400Hz sub-carrier f.m. satellite picture. Monitored on 137.5MHz. NOAA. IOC576, 120r.p.m.
32	FEC-A 2210Hz centre frequency, 144 baud, first idling, then traffic.
33	FEC-S 1700Hz centre frequency. 96 baud, On traffic. (Indonesian Diplo).
34	GTOR1 2210Hz centre frequency, amateur G-TOR sending traffic - note the long data packets.
35	GTOR2 2210Hz centre frequency, amateur G-TOR sending traffic - note varying length data packets.
36	HCARQ 1700Hz centre frequency, HC-ARQ. No longer heard as previous users now switched to PACTOR (ICRC).
37	HELL 800Hz centre frequency, Hellscreiber. (Amateur QSO)
38	HNGFEC1 2210Hz centre frequency, 100.1 baud, idles then traffic. (Hng Diplo).
39	HNGFEC2 2210Hz centre frequency, 100.1 baud, end of traffic then idles. (Hng Diplo).
40	ITA2_45 2100Hz centre frequency, 45.45 baud amateur ITA2 Baudot RTTY. Hand sent.
41	ITA2_50 1700Hz centre frequency, 50 baud ITA2 Baudot RTTY. Meteo.
42	ITA2_75 1700Hz centre frequency, 75 baud ITA2 Baudot RTTY. Press.
43	LINK11 NATO intership data modem.
44	MS5 300-3300Hz 13-tone Soviet-made speech vocoder. Twelve tones for data, one tone at 3300Hz for tuning. This example is of a Ground-to-Air link of the Russian Airforce.
45	PACK300 1750Hz centre frequency, 300 baud AX-25 amateur Packet.
46	PACTOR1 2210Hz centre frequency, 100 baud PACTOR (UNHCR). SELCAL (sounds the same as SITOR ARQ), then after stations connected, calling station goes to PACTOR IRS mode, then PACTOR ISS mode at 100 baud.
47	PICC12 2210Hz centre frequency, Racal 12-tone Piccolo Mk6, traffic, idles, then traffic (crypto).
48	PICC3CH 510Hz centre frequency, idle to start, then hand keying, 910Hz centre frequency, traffic, 1310Hz centre frequency, idle.
49	PICC510 510Hz centre frequency, single channel 6-tone Racal Piccolo Mk6. Idle, traffic, then idle.
50	PICC910 910Hz centre frequency, single channel 6-tone Racal Piccolo Mk6 on crypto traffic.
51	PICCIDLE 910Hz centre frequency, idling then off air.
52	POCSAG VHF POCSAG pager - 512bps then 1200bps.
53	POLARQ 800Hz centre frequency, 100 baud polish diplo ARQ 1:6 RC.
54	ROUFEC1 2210Hz centre frequency, 164.5 baud ROU-FEC, idle start then into traffic.
55	ROUFEC2 2210Hz centre frequency, 164.5 baud ROU-FEC, end of traffic, idle, then off, then morse sign-off with QRU.
56	RSARQ720 1965Hz centre frequency, RS-ARQ, 720bps, sending QBFs (German Diplo) occasional buzz to the data bursts are 'Idles'.
57	TORG10 2210Hz centre frequency, 11-bit ITA2 (with error correction) Russian system for Meteo broadcasts to Antarctica.
58	TT2300B Thrane & Thrane 2300B data modem. Eight tone 1:8 RC ARQ.
59	TWINPLX1 2210Hz centre frequency, 100 baud, four frequency Twinplex, -200/-85/+85/+200 (Dutch Diplo).
60	TWINPLX2 1700Hz centre frequency, 100 baud, four frequency Twinplex, -400/-200/+200/+400.
61	TWINPLX3 2210Hz centre frequency, 100 baud, four frequency Twinplex, -170/-85/+85/+170 (Spanish Diplo).

The audio section of this month's cover CD contains some 61 tracks of mainly h.f. digital modes you're likely to bump into as you tune through the spectrum. Here is the track listing of these off-air samples. So that you can have a go at decoding the sample with your favourite decoder, the centre frequency, details are given where applicable.

Even if you don't have a decoder (shame on you, there's no excuse now as there are plenty on the CD), then you can use this selection to build your recognition skills enabling you to identify modes you will hear on-air.

Most tracks are of about 30 seconds duration. Exceptions are the ACARS track 12 which is 5 seconds long and the FAX samples, track 29 to 32 inclusive, which are longer.

The name at the begining of the discription refers to the equivelent .WAV file in the /SOUNDS directory on the data section of the disk.

We hope you enjoy your *SWM* CD

MULTICOMM 2000

WORLD WIDE MAIL ORDER LARGE SHOWROOM
FINANCING AVAILABLE

★ ★ ★ RECEIVERS ★ ★ ★

JRC NRD-545 G

The ultimate short wave receiver.

OUR VERY SPECIAL PRICE

£1199.00

or 36 months @ £43.34

DSP ALL MODE DETECTION DSP DIGITAL IF FILTER DSP PASS BAND SHIFT DSP AGC
DSP NOISE REDUCTION DSP BEAT CANCELLER DSP NOISE BLANKER DSP NOTCH FILTER
DSP SQUELCH DSP TONE CONTROL DSP S METER DSP BFO DSP RF GAIN

★ **WIDE BAND CONVERTER UNIT £249.00** ★ **NVA-319 SPEAKER £139.00** ★

JRC NRD-345

This smart little set is JRCs entry point into the receiver market. It features syncronous detection as well as all mode. Good value for money!!

OUR PRICE £499.00

or 36 mths @ £18.04

FINANCE ARRANGED

APR 19.5%

YAESU FRG-100

GREAT beginner's receiver. Easy to operate. GREAT VALUE for money. 50 memories. 50kHz-30MHz.

5 UNITS ONLY!

OUR PRICE £375.00

or 36 mths @ £13.56

AOR AR7030

The receiver you LIKE or DISLIKE. We don't consider this to be a beginner's receiver. Plenty 2nd hand units available.

OUR PRICE £669.00

or 36 mths @ £24.18

DRAKE R8B

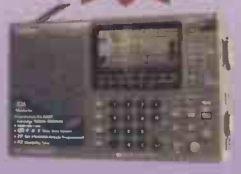
The "BEST" American receiver ever made. Still in high demand with many fabulous features.

OUR PRICE £959.00

or 36 mths @ £34.67

VISIT OUR "NEW" WEBSITE

ROBERTS R-861



All mode, short wave plus VHF portable receiver. RDS. AM narrow filter, stereo.

OUR PRICE £139.00

NEW!

ICOM IC-R75

£699 or 36 mths @ £25.27

Icom's latest HF receiver.
Fully featured DSP technology.
ORDERS BEING TAKEN NOW!
BOOK EARLY!

WE HAVE MOVED

RACAL RA-1792

2 units only!
Top of the range, full mil spec.
Superb condition.

£875

SALES HOTLINE 01480 406770

NO DEPOSIT FINANCING AVAILABLE
USED EQUIPMENT URGENTLY WANTED!

★ ★ ★ SCANNERS ★ ★ ★

ICOM IC-R8500

100kHz-2GHz continuous. All mode. No gaps. 1000 memories. 4 IF band widths. Alpha numeric display. Probably the best all round set in its class. Direct PC interface. Keypad entry.
OUR SPECIAL PRICE
£1269.00
or 36 mths @ £45.87

AOR AR5000

10kHz-2GHz. All mode. 1000 memories DTMF decoder. Direct PC connection. 45 channel per sec scan speed. This receiver has it all in one.
OUR SPECIAL PRICE
£1125.00
or 36 mths @ £40.67

BEARCAT 9000XLT

An amazing receiver at an amazing price. 25-1300MHz. 500 memories. Alpha numeric display. 100 channels per sec scan speed. Auto store AM/FM selectable.
OUR SPECIAL PRICE
£229.00 or 36 mths @ £8.28

AOR AR3000A

A great value for money receiver covering 100kHz-2036MHz. 400 memory channels. Multimode. Direct PC connection. The full frequency spectrum coverage.
LIMITED OFFER £550.00
or 36 mths @ £19.88

NO DEPOSIT FINANCE

NEW MODEL

FAIRHAVEN RD-500 VX

This unit is an "UNBELIEVABLE" full range scanner. All mode, voice record, data base, TV module and alpha numeric display to name just a few features.
OUR SPECIAL PRICE £799.00
or 36 mths @ £28.88

NO DEPOSIT FINANCE

★ ★ ★ HAND-HELDS ★ ★ ★

YUPITERU MVT-9000

The best full range all mode hand-held scanner ever produced.
OUR PRICE
£319.00
or 36 mths @ £11.53

YUPITERU MVT-7200

We have a limited quantity available.
OUR PRICE
£225.00

LIMITED STOCK

YUPITERU MVT-7100

The greatest value for money scanner ever produced.
OUR PRICE
£185.00

AOR AR8000

Special bargain price on a limited quantity.
OUR PRICE
£195.00

ALINCO DJX-10

Our favourite. All mode full frequency coverage scanner. 100kHz-2000MHz.
OUR PRICE
£259.00
or 36 mths @ £9.36

AOR AR8200

AOR's latest release.
NEW & USED UNITS AVAILABLE
NEW PRICE
£349.00
or 36 mths @ £12.62

WE HAVE MOVED

UNIT 4, LITTLE END ROAD
EATON SOCON, CAMBS PE19 3JH

WEBSITE: http://www.multicomm2000.com
E-MAIL: Sales@multicomm2000.com FAX: 01480 216456

Wire Antennas - The Part 1

The all important physical attributes on an antenna installation are the subject of Joe Carr K4IPV's attentions this month.

Antennas have been a passion of mine for more years than I care to admit. When I was a kid with a receiver (and hopes of a Novice licence) I scrambled up more than a few trees to install bits of wire for radio reception and (later) transmission. Over my radio career I've seen a lot of people install antennas 'the hard way', only to be disappointed a bit later on. If an antenna is not installed properly, then it will most likely have a very short life...and probably won't work quite as well as one that is properly done.

Volumes have been written on wire antennas. Indeed, many of my antenna books spend a lot of space on the topic; one entire book on wire antennas is being prepared by Butterworth-Heinemann in the UK. What seems to be missing in many books is detail on the mechanical aspects of wire antenna installation. Although some books cover the mechanicals, much is often missing. Let's take a look at some of the basics. But first, let's take a look at safety issues...we would like to keep you alive!

Antenna Erection Safety

I initially titled this section "How to have a safe erection" but thought better of it. Antennas are inherently dangerous to erect if certain precautions are not followed. It is not possible to foresee all of the situations that you might face in erecting an antenna. I would like to give you all possible warnings, but that is not even possible. You're on your own, and must take your own responsibility when installing an antenna. I can, however, give you some general safety guidelines. Knowledge of what you face, some hardnosed sound judgement, modulated by common sense, are the best tools on any antenna job.

One rule that is an absolute is that no antenna should ever be erected where either the antenna, the feed line, or any part thereof crosses over an a.c. mains power line or pole transformer. **Ever!** This is a 'no kidding' - don't do it! Power lines look insulated, but there are often small breaks or weakened spots (especially a couple days or more after installation) that can bring the antenna into contact - lethal contact - with the hot power line. Every year or so we hear about an s.w.l., scanner/monitor buff or licensed amateur radio operater being killed by tossing an antenna wire over a power line. Avoid making yourself into a high power resistor - it might blow your life-fuse!

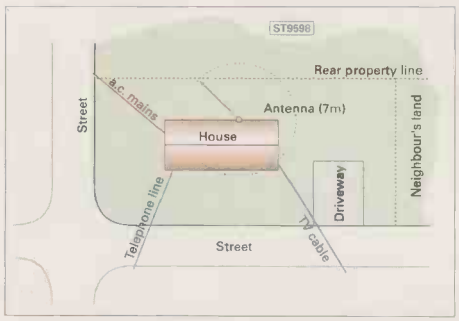


Fig. 1.1 Joe's own property showing the fall radius of his vertical mast.

Also, the same rule applies to situations where the antenna can fall onto a power line if it fails mechanically. You have to examine the situation to see if there is any possible way for that antenna, or its support structure, to fall onto a power line if it breaks in any way whatsoever. The diagram **Fig. 1.1** shows my property in Virginia. A 7m mast is erected on the back of the house, and it's 7m 'fall radius' is plotted. It should not intersect either the power lines or the cable TV line even when it fails and is wind-whipped.

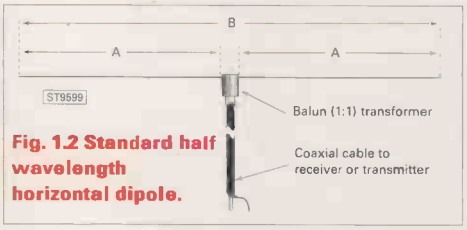


Fig. 1.2 Standard half wavelength horizontal dipole.

Note that the antenna could fall over the property line onto the next property to the rear. After consultation with the other landowner and the county mechanical inspector, it was determined that my rear fence is sufficient protection for the other homeowner. Because it is technically on my land, the fence damage is my responsibility. However, should the other homeowner change his mind, or a new homeowner buy the place, then my antenna would have to move.

Another caution is that you have to be physically fit to do the work. While the on-the-ground portions of the work is not usually too strenuous, any climbing at all, even on ladders, can be taxing. Antenna materials are deceptively lightweight on the ground, but when you get up on even a small ladder, they are remarkably difficult to handle. Attempting to manhandle a 7m vertical once wiped my back out to the extent that I needed 800mg of Ibuprofin three times a day for about a week, and I consider myself fortunate that the pain hit me after I'd dismounted the ladder. Besides, if you could see me, you would wonder why a man my size was on any ladder in the first place!

Before using a ladder, learn how to use a ladder. A lot of homeowners, whether putting up antennas or painting the upstairs windows, fall off ladders that were being used incorrectly. There is a right way and a wrong way to use each of the different types of ladder...learn to use them correctly.

If the wind blows even a few kilometers per hour, the danger is magnified considerably. I recall a friend - who is a large, strong 'bear of a man' - attempting to install a 26-element television 'all channel' rotatable antenna on the roof of his two story beach house (he wanted to be able to pick up Richmond, VA, Norfolk, VA, Washington, DC and Baltimore, MD on TV and scanner, from a beach house on the Chesapeake Bay). The antenna was easily handled with one hand on the ground and with no wind blowing, but up on the roof it was a different story. 'Big Al' was on the peak of the roof, when an off-shore gust came up suddenly and caught the antenna. It acted like a hang glider, and pulled Al off the roof, plunging down two stories to the patio below; he fractured his pelvis and busted a leg. Two months in orthopedist's casts, and a year of physiotherapy followed...not to mention lost wages. Expensive TV antenna, I reckon. Be Careful.

One good rule is to always work under the 'buddy system'. Ask as many friends as are needed to safely do the job, and always have at least one assistant, even when you think you can do it alone.

Always use quality materials and use good work practices. Antennas, being potentially dangerous, should always have the best of both goods and workmanship in order to keep quality high. It is not just the electrical or radio reception workings that are important, but also the ability to stay up in the air and safe.

When planning the antenna job, keep in mind that pedestrian traffic around your home could possibly affect the antenna system. Wires are difficult to see, and if an antenna wire is low enough to intersect someone's body, then it is possible to cause very serious injury to passersby. In the USA, even when the person is a trespasser (or even burglar!), the courts may hold a homeowner liable for injuries caused by an inappropriately designed and installed antenna. Take care for safety not only of yourself, but of others.

One necessary reminder is that your local government might have some interesting ideas - legal requirements actually - concerning your antenna installation. The electrical, mechanical and zoning codes must be observed. There is a great deal of similarity between local codes because most of them are adaptations from certain national standards. But there are enough differences that one needs to consult local authorities. Indeed, you may need a licence or building permit to install the antenna in the first place.

One problem that s.w.l.s and monitors face in the USA is that their antennas are not protected by the FCC as are licensed amateurs' antennas (local governments have limited

Mechanical Aspects

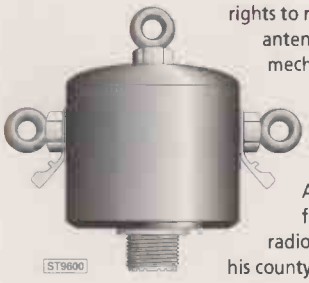


Fig. 1.3 a) (above) Centre insulator; b) BALUN transformer.

rights to regulate amateur antennas, only 'reasonable' mechanical and electrical standards can be imposed), so it may be illegal for you to install any antenna. About 30 years ago a friend of mine in a radio club found out that his county had an ordinance that said "...an outdoor antenna must be double its own height plus 15m from the nearest property line". He received a summons after a complaint from a neighbour. In a county full of quarter acre home lots, however, that was a ridiculous law. Very few outdoor TV antennas met that strict requirement! So Hal went to the court house and asked for 50000 complaints forms. Using a local county directory, he and a dozen ham operators from the local clubs proceeded to fill out the same complaint as he'd received against every homeowner in the area (or at least as many as they could in five days of working!). The county board repealed the law during the next monthly meeting.

Save all paperwork regarding your building permit, including inspection decals or papers, and the original drawings (with the local building inspector's stamps). If a casualty occurs, then your insurance company may elect to not pay off if you have violated an electrical, mechanical, building or zoning code. That clause may be overlooked by an enthusiastic antenna builder, but it could prove to be a costly oversight if something happens.

The Basic Wire Antenna

Wire antennas come in a bewildering variety of forms, but for our purposes our 'standard model' is our old friend the half wavelength horizontal dipole (**Fig. 1.2**). The overall length (B) in metres is found from $144/F_{MHz}$. Each element (A) is one-half the overall length, or $72/F_{MHz}$. The antenna's nominal feedpoint impedance at resonance is 72Ω, so is a good match to standard 75Ω coaxial cable. It is common practice to use a 1:1 BALUN transformer at the feedpoint in order to balance currents and keep the pattern according to textbook predictions.

Centre Insulators

When I was a kid it was common (but poor) practice to strip a few centimetres of coaxial cable, part the braid and centre conductor, and connect them to each side of the dipole. We would then wonder why the damn thing fell down in the next wind storm. Even if you elect to not use the BALUN transformer, a ready-made centre insulator is a must. **Figure 1.3a** shows a common form of centre insulator for use with dipoles and other wire antennas. There is an SO-239 coaxial connector on the bottom to accept the feedline, and two eyebolts mounted with solder connectors for the antenna elements on the side walls. At the top is a small eyebolt that is used to strain relieve the system, or hang it from a centre support (as when inverted-vee dipoles are built).

A larger form is shown in **Fig. 1.3b**. The enlarged section indicates that this device contains a 4:1 or 1:1 BALUN transformer. The 1:1 size is recommended for ordinary dipoles, while a 4:1 unit is used for folded dipoles and certain other antennas.

Connections to the device, whether straight centre insulator or BALUN form, are shown in **Fig. 1.4**. For simplicity, only one side is shown (the other side being identical). The elements (A in **Fig. 1.2**) are typically made of 16 or 18s.w.g. antenna wire. The best wire is stranded and is copper-clad steel core (Copperweld™).

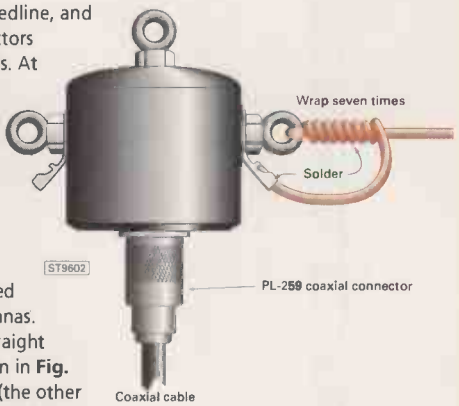


Fig. 1.4 Connection to the centre insulator or BALUN.

The end of the antenna wire is passed through the eye bolt, and then doubled back and twisted onto itself seven to ten times. The remainder of the wire is then soldered to the solder terminal. Some people prefer to use a separate 'pig tail' wire to connect the antenna element to the solder terminal. It is fastened to the antenna element wire between the seven-turn twist and the eye bolt.

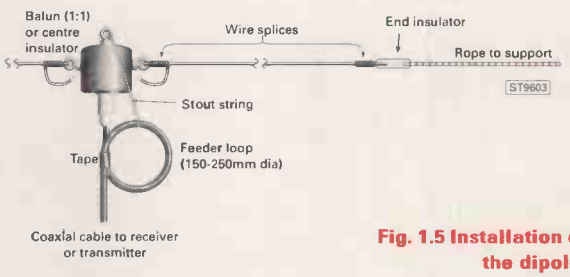


Fig. 1.5 Installation of the dipole.

When preparing the centre connector/BALUN, it is good practice to use steel wool or abrasive paper on the solder lug in order to remove oxidation. The oxidation makes it hard to solder, and forces you to use too much heat to make a good connection. Also, be sure to have a large pair of pliers in order to crimp the wings of the solder lugs onto the wire.

Solder assists in making a good connection at the solder lugs, but the crimp should be good enough to do the job. The solder then provides corrosion protection. Also, tin the seven-turn twist section with solder. This act does not increase the strength or provide better electrical connection; it is protection against corrosion.

Note: Use only resin core solder for antennas! Typical solder is in 50:50 or 60:40 lead:tin ratio, and may be labeled 'Radio-TV' or 'electronic' or something similar. Plumber's solder is acid core and will destroy your antenna a short time after it is erected.

Figure 1.5 shows the dipole installed. The ends of the two wire elements are connected to end insulators, which are in turn supported by rope to a vertical support (mast, tree, roof line of house, etc.). Although shown nice and straight here, the actual installation will droop a bit in the centre due to the weights of the centre insulator or BALUN and the coaxial cable.

Note that the coaxial cable is formed into a 150 to 250mm loop just below the coaxial connector to the centre insulator or BALUN. This forms a species of r.f. choke to keep currents from flowing the outer shield, and improves the pattern. The coax loop is bound together with black electrician's tape or some similar adhesive medium, and then fastened to the top eyelet with stout string or fishing line for strain relief.

Joe continues with the ins and outs of antenna installation next month in Part 2.

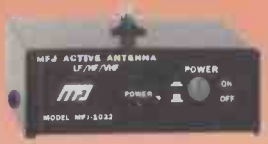
MULTICOMM 2000

LARGE SHOWROOM BEST PRICES

★ ★ ★ ACCESSORIES ★ ★ ★

MFJ-784B
DSP **£169**

MFJ-781
DSP **£119**



MFJ-1022
ACTIVE ANTENNA **£36**

MFJ-781
DECODER **£149**

MFJ-959B
Provides proper impedance matching between your receiver and antenna. 20dB pre-amp. 20dB attenuator.
£79

MFJ-1020B
Tuned indoor active antenna. Plus pre-selector. Can be used with an external antenna.
£69

MFJ-1040B
All band pre-selector. Rejects out of band signals 1.8 to 54MHz. Connect 2 antennas plus 2 receivers.
£89

MFJ-1026
Eliminate interference. Expose hidden stations. All mode operation. 60dB null wipes out interference and noise. Unbelievable performance.
£125

MFJ-956
Short wave, medium wave and long wave pre-selector tuner. Boost stations that are weak while rejecting images, intermod, etc. Frequency coverage 15 to 30MHz.
£32

NEW PRODUCT

NCT CLEAR SPEACH SPEAKER
Superb DSP speaker unit guarnateed to improve clarity and intelligibility of any receiver or scanner. **£99**

QEP-400
£10

DESK STAND
£18

ICOM PCR-1000
£259

ICOM IC-R10
£249

SGC POWER CLEAR
DSP + speaker **£259**

ICOM PCR-100
£199

OPTO MINI SCOUT
Frequency counter.
£165.00

Techtoyz
counter
£78.00

MFJ 112
clock
£22.00

QS-400
bracket
£10.00

Scanmaster SP-55
£59.00

Kenwood HS-5
£59.00

UK's LARGEST SHOWROOM

WE HAVE MOVED

MULTICOMM DISCONE

MULTICOMM DESKTOP

MULTICOMM MOBILE

SALES HOTLINE 01480 406770

NO DEPOSIT FINANCING AVAILABLE
USED EQUIPMENT URGENTLY WANTED!

★ ★ ★ USED EQUIPMENT ★ ★ ★

Lowe HF-225
Several to choose from.
£210.00

JRC NRD-525
4 to choose from.
From £499.00

JRC NRD-535
Brilliant receiver.
£799.00
or 36 months @ £28.88

AOR AR3000A
Several from
£475.00
or 36 months @ £17.17

Icom IC-R7000
Several from
£525.00
or 36 months @ £18.98

Icom IC-R71E
Great short wave receiver.
£499.00
or 36 months @ £18.04

Yaesu FRG-100
As new. 3 to choose from.
£299.00
or 36 months @ £10.81

DRAKE R8E
Excellent short wave set from
£550.00
or 36 months @ £19.88

OPENING HOURS

Monday - Friday 9.00-5.00pm.
Saturday 9.00-2.00pm.
Closed Sundays.

PART EXCHANGE

We urgently require your treasured set. We buy outright for cash. Alternatively, use your old equipment as a deposit on finance for a new or used set.

FINANCE

WE NOW CAN OFFER YOU A COMPETITIVE FINANCE PACKAGE WITH NO DEPOSIT.
Multicomm 2000 is a licensed credit broker. Written quotations are available upon request.

3, 6 & 12 MONTH WARRANTY ON MOST OF OUR USED EQUIPMENT

WE NEED YOUR USED EQUIPMENT

TOP PRICES PAID...GUARANTEED!!!

LET US SELL YOUR EQUIPMENT FOR YOU.

SHORTWAVE RECEIVERS

AOR AR7030	Boxed as new £475
DRAKE R8E	Great performer. As new £589
DRAKE R8E	Boxed. Mint £550
EDDYSTONE 1650	+ pre-selector. Very rare £1250
ICOM IC-R71E	Great condition £495
ICOM IC-R71E	Boxed. Mint £465
ICOM IC-R72E	As new condition £425
JRC NRD-525	As new £549
JRC NRD-525	Boxed in great condition £595
JRC NRD-535	Incl Lowe mod. late model £899
KENWOOD R-5000	Immaculate, great value £525
KENWOOD R-5000	+ VHF great condition £599
KENWOOD R-5000	+ VHF great condition £625
LOWE HF-150	Great beginners set £199
LOWE HF-150	Great beginners set £210
LOWE HF-150	Great beginners set £225
LOWE HF-225	As new £229
LOWE HF-225	Good condition £210
LOWE HF-225	+ keypad £249
RACAL RA-1792	Top spec. A-1 condition £950
RACAL RA-1792	Top spec £799
REALISTIC DX-394	Ex demo £110
ROBERTS RC-818	Portable, boxed £90
SONY CRF-360	Fantastic semi portable £399
SONY SW-77	As new, unwanted gift £199
TARGET HF-3	As new, hardly used £99
YAESU FRG-100	6 weeks old. As new £315
YAESU FRG-8800	Brilliant condition £275

SCANNERS

AOR AR1000	Hand-held, clean, complete £90
AOR AR2002	Boxed, exceptional condition £140
AOR AR2700	Boxed, as new £139
AOR AR3000	Boxed in 1st class condition £395

AOR AR3000A	4 mths old. Looks unused £559
AOR AR3000A	Boxed, as new £539
AOR AR3000A	Superb condition, boxed £499
AOR AR3000A	Superb condition, boxed £525
AOR AR3000A	Boxed, hardly used £485
AOR AR3000A	Great value for money. Boxed £469
AOR AR8000	As new £169
AOR AR8200	Latest model £289
AOR AR8200	Our demonstrator £299
ICOM IC-R1	New but tatty box £199
ICOM IC-R-10	Ex-demo £220
ICOM IC-R7000	As new £589
ICOM IC-R7000	VHF/UHF base £625
REALISTIC PRO-2006	A-1 condition £149
WELZ WS-1000	Mini scanner, as new £95
WIN-108	Civil airband, hand-held £90
YAESU FRG-9600	Boxed, as new £229
YUPITERU MVT-7000	Boxed, as new £129
YUPITERU MVT-7000	Boxed, as new £129
YUPITERU MVT-7000	Un-boxed, complete £119
YUPITERU MVT-7100	As new, boxed £169
YUPITERU MVT-7100	As new, boxed £169
YUPITERU MVT-7100	As new £165
YUPITERU MVT-7100	As new, complete £159
YUPITERU MVT-7200	Ex demo £200
YUPITERU MVT-9000	Ten days old £249
YUPITERU MVT-9000	As new, complete £245
YUPITERU MVT-9000	As new, great saving £239
YUPITERU MVT-9000	Ex-demo £289

ACCESSORIES

CODEMASTER CWR-610E	CW/RTTY decoder £49
DATONG FL-2	Audio filter, as new £39
JIM-75	Pre-amp, VHF/UHF, immaculate £40
MFJ-781B	DSP filter, as new £90
MFJ-784B	Deluxe DSP filter £129
OPTO-LINX RS-232	Controller, ex-demo £69
OPTO-SCOUT	Model 40, ex-demo £229
SCANMASTER SP-55	VHF/UHF pre-amp £49
TECHTOYZ	Mini counter, ex-demo £79
TIMEWAVE DSP-9	As new, great value £129
TIMEWAVE DSP-9	As new, great value £125
YAESU FRT-7700	HF ATU £49
YAESU FRT-7700	HF ATU £49
YAESU FRT-7700	HF ATU £49
YAESU FRV-7700	VHF Converter £49
YAESU FRV-7700	VHF Converter £49

LATE ARRIVALS

KENWOOD TS-570D	Converted to receive only £699
MICROWAVE MODULES	ATV converter £29
SEM	VHF to HF converter £20
YUPITERU MVT-3300	Ex-demo, new £90
YUPITERU MVT-3300	Ex-demo, new £90
ICOM IC-R71	HM mobile, rare £40

USED EQUIPMENT NEEDED NOW!

FINANCE EXAMPLE

Cash Price	No deposit	Balance for finance	36 months @	Total finance price
£289.00	£00.00	£289.00	£10.45	£376.20

WE HAVE MOVED

UNIT 4, LITTLE END ROAD
EATON SOCON, CAMBS PE19 3JH

WEBSITE: http://www.multicomm2000.com
E-MAIL: Sales@multicomm2000.com FAX: 01480 216456

My Wavelength

Old Lessons, often repeated for the beginner

This month, John Wilson examines when is a bargain not a bargain. Service and support are the mostly invisible side of a complex product purchase, so what happens if they are not included in the price?

I seem to have generated quite a lot of correspondence with my latest articles, and I have to thank everyone who has communicated either directly or via *Short Wave Magazine* on so many subjects. One topic which has come up time and time again is the question of service backup, and I did issue a warning about the potential costs of owning second-hand professional receivers should they go wrong and require professional service at professional prices. What I wasn't prepared for was the letter from the owner of a Trio R-820 who had been quoted a service rate of £40 an hour for attempting to fix it. From the description of the apparent fault, and acknowledging that I do know the R-820 quite well, I cannot possibly see how an hourly rate of £40 can be justified; but there it is.

In *The Times* today I read that Sony are closing one of their German manufacturing plants and moving operations to their existing factories in South Wales because of the recent negotiations in Germany which have resulted in a maximum working week of 35 hours, whereas we in Britain have laid down a maximum of 48 hours. Even at the German working week, the service rates quoted above result in a weekly income of £1400 - not bad for a service engineer, but of course it won't be the service engineer who will pick up the rewards, will it? Since I have been told many times that I virtually invented the concept of supporting sales into the radio hobby market by providing technical backup of a very high standard when Bill Lowe and I first came together in the late 1960s, I probably have wider experience than most, and perhaps this is the time to try and explain the sometimes complex relationship between sales, support and the end user.

A Dealer's Dream

Every dealer has the dream of having exclusive rights to a product which sells like hot cross buns at Easter, has good profit margins and **never goes wrong**. In this ideal situation, profits can be maximised, life can be very pleasant and all customers happy with the dealer, but as we all know, this is just a dream and never realised in practice unless you are the wonderfully amusing chap from Birmingham who sat next to me on a very difficult series of flights from Heathrow to Seoul some years ago and asked me what line of business I was in. When I told him "electronics" he shook his head in pity and said "I've a simple business rule which I always apply. I never sell anything that has moving parts".

Further conversation revealed that he was travelling to Korea to buy stainless steel cutlery, which idea clearly embodied his "no moving parts" philosophy and as he went on to say "I don't have any warranty problems because I can always send someone a replacement knife and fork". No wonder he was a happy man. I often thought about him when faced with ever more complex and demanding pieces of hobby electronics; or even when faced with ever more complex and demanding customers...and believe me, I remember each and every name and callsign.

However, back to the dealer/customer relationship, and its effect on service backup. When considering the purchase of a new piece of electronic equipment, be it receiver, computer, TV set or Hi-Fi, most people scour the relevant dealers' advertisements looking for - wait for it - the best deal. This is a euphemism for "the lowest price", and when in this frame of mind, the last thing the person looking thinks about is the honesty and integrity of the supplier or the level of support which may or may not be provided in the event of technical problems. In this atmosphere the dealers are forced into a price competition which drives their margins lower and lower, to the point where something has to give, and that something is invariably the level of service support.

Just take a look at all the current adverts which boast "Price Promise", "Phone", "Read ***s advert then check our price", "Censored". These are all taken from a quick glance at the latest issue of *SWM* and presumably reflect what the dealers think their customers want. I am certain that all these advertisers have service and support facilities, but only one firm in the magazine actually makes a positive statement about having a full time service department. Perhaps in these days of throw-away artefacts, service is an outmoded concept?

Customer Support A Priority

Of course the situation has changed considerably since the heady days between 1970 and the late 1980s when any foreign manufacturer of electronic products imported into the UK and/or Europe had sole appointed distributors representing their products and providing all the customer support needed. The relationship between manufacturer and distributor was contractual and renewed at stated periods so long as the distributor provided the quality of two way support demanded by both customer and manufacturer. This meant that each distributor worth employing would make customer support a real priority and ensure that service and spares backup, together with technical knowledge, was available at all times.

One of the duties of a distributor was to appoint sub dealers in different parts of the country and give factory support to these dealers and their customers. It was taken for granted by the manufacturers that the distributor would take care of the market by appointing dealers who would preserve the reputation of the product brand, but this policy was often seen by the disgruntled few as being a

cartel operation, and this led to accusations of profiteering and of distributors operating a closed shop policy with their favoured dealers.

Enter stage left not the Three Musketeers but the Grey Marketeers. Cavalier chaps these, who specialised in buying hot selling products from sources outside the normal distribution chain and selling them on to retail customers at what seemed attractive prices. Trouble was that when these fellows bought from, say, a retail dealer in the Akihabara district of Tokyo, they not only bypassed the factory distribution network but also the factory/distributor support services. Not that this worried the eager retail customers, who simply read the discounted prices and bought from the Grey Market with not a single consideration for what they would do when something went wrong, as so often it did.

Radio amateurs in the Leicester area will remember the company which set up there some years ago offering equipment at cash and carry prices. How exciting it all was, and how the Leicester repeater buzzed with news of each new toy purchased by local amateurs. But what happened when the firm went to the wall after about a year leaving their previous happy customers without a shred of support? No service, no spares, no assistance; just the Official Receiver winding up the operation. When it all went crash, I went to a warehouse in Rotterdam to identify Trio equipment which had been caught on its way to the UK. It turned out to have come via a dealer in South America and had been sitting in a dockside warehouse by the Amazon for about four months before being transferred to Rotterdam. When I examined some of the individual items I discovered that high temperature and humidity had caused extensive corrosion, so I can't imagine what state that Leicester gear is now in.

The whole situation was a mess, and I don't know how or when the manufacturers took the decision to change their whole structure, but the writing was on the wall for the distributor networks when Nissan in Japan moved into the UK and opened up their own operation which sidelined and destroyed Nissan UK. The cards began to fall for the radio distributors as well, with the setting up of Yaesu UK and Trio-Kenwood UK to take the place of their previous distributors.

However, removal of the traditional distributors has not resulted in the end of the Grey Marketeers, and although more subtly hidden these days, their operations still exist and will continue so long as there are price differentials across the world markets and customers willing to take a chance on buying for price discount alone.

Accept The Compromise?

Should any of this concern you? I suppose it all depends on your willingness to accept the compromise between price and service. I don't expect my TV set to fail, and still use a Sony trinitron portable, which is now 18 years old and has never given a moment's trouble. However, it wouldn't be the end of the world if it failed and I had to replace it with a new set, because I can pop down to the local superstore and buy a new TV for about £100, but I wouldn't be quite so happy if I had laid out a large amount of money for a top class short wave receiver and couldn't get it repaired without shelling out £40 an hour.

So what is a service engineer worth? If you have a perfectly functioning piece of 'electrickery' you don't have to consider this question, and it has to be said that modern electronic equipment is incredibly reliable, but in the event that something **does** go wrong, then you really have to put a value on the chap who sorts it out for you. I don't know how you, dear reader, pay for a service on your car, but the mechanic (not engineer) who carries out the oil change and proves it by leaving a substantial amount of said oil on your steering wheel, seats and carpets will probably be charged out at £20 an hour or more.

... CHAP FROM BIRMINGHAM ...

Whilst accepting that the modern automobile is a far cry from the simple motors of the 1950s, have you ever actually looked at the circuit of a modern receiver or transceiver? Shortly after the introduction of the Kenwood TS-950S transceiver when I was still a director of Lowe Electronics, Rob Gill (one of my dedicated service engineers) and I dissected the service manual and strung out the circuit diagrams end to end to see how far it would stretch. Would you believe that we ended up with a circuit that was 10m (33 feet in old money) in length, and we realised that this would stretch the full length of a continental touring coach. Now you need a substantially intelligent person to be able to tackle repairs of something like this and without denigrating the skilled auto engineers in your local garage, would £20 an hour seem unreasonable for someone of Rob's calibre?

The Individual Dealer

But who pays when service is needed? The individual dealer who has been compelled to reduce margins to a bare minimum in order to compete with the other advertisers, simply cannot afford to have a staff of skilled engineers on hand to answer questions and sort out problems when faced with the customer who was perfectly delighted to get the lowest price, but doesn't see why service should be charged for. My dedicated classicists should take a look at the traditional depiction of the head of Janus if they wish to see a typical customer.

One approach, sometimes used in desperation and sometimes as a stated policy, is to replace the offending item with a new one. This makes the customer very happy, but what do you think happens to the faulty exchanged item? Do you really think it will be thrown away by the dealer? Not Pygmalion likely; it will be repaired at some future date and put back into circulation as a 'demonstrator' or 'nearly new' or even as an 'unwanted gift', but sure as God made little apples it will reappear somewhere, perhaps even as an exchange for yet another faulty unit, what a tangled web we weave!

Don't Despair!

If all this drives you to gloom and despondency don't despair, because I know most of the reputable dealers in the UK and they are not crooks or con-men, just folk wanting to make a decent living from working in what, in

The SMC Guarantee

With over 40 Years experience and service in the communications industry, we supply and service our customers requirements throughout the world. No job is too small and customer satisfaction is a major priority.

Price Match

We will match any of our competitors prices on any equipment distributed for the UK market place, by authorised dealers.

Professional Advice

Our professional sales teams have a huge wealth of knowledge both in amateur and professional communications equipment. We are waiting to advise and help you. We will give you facts not fiction.

Excellent Service

Where possible your order will be processed and sent out the same day

AXMINSTER
01297 34918

SOUTHAMPTON
01703 246222

FLEXIBLE FINANCE DEALS AVAILABLE

email: amateur@smc-comms.com
web: www.smc-comms.com
fax: 01703 246206

AR-5000
Unbeleivable coverage 10kHz - 2600mHz, only matched by it's wonderful performance. This is truly a professional quality machine

£1295 CALL SMC

AR-8200
One of the finest scanners with a real cult following

£369 CALL SMC

IC-R2
Probably the value scanner today

£139 CALL SMC

FRG-100
The well proven FRG100
CALL for special deals

£419 CALL SMC

The Lowe HF-150
is now constructed on site in Southampton by SMC. There is now a range of accessories available to enhance this best selling radio. 10,000 customers can't all be wrong. Come and try one now

We have extended the FREE IF150 interface offer worth £44.95 due to the enormous interest.

£425 CALL SMC

The Sangean ATS-909
We can offer you this fantastic World Band radio incorporating a host of features at a ridiculous price.

£129 CALL SMC

The Sangean ATS-818
A World Band radio for how much?

£95 CALL SMC

ICOM PCR1000
Superb radio- just link to your PC
All Modes continuous coverage to 1300MHz.

£299 CALL SMC

NEW from ICOM

Coming Soon

The new IC-R75E Receiver from ICOM - But don't believe all you read Nobody has one to sell you yet and the UK spec has not been officially printed. price around £699

New Products

UNIDEN BEARCAT
UBC220XLT £149.95
UBC9000XLT SPECIAL PRICE -CALL
BC8600 £149.95

Alkaline Rechargeable batteries now in stock
Pack 4 x AA batteries and Charger £13.99
Pack 4 x AA batteries £5.99

NEW to Short Wave listening
Try out the AKD HF-3S

Phone Rodney at Axminster for a really special deal

SMC

HQ - S.M.House . School Close . Chandlers Ford Ind Est . Eastleigh . Hants . SO53 4BY
Reg Ward - 1 Westminster House . West Street . Axminster . Devon . EX13 5NX

South Midlands Communications Ltd

In My Experience

most cases, is their own hobby. My advice to anyone contemplating buying a new receiver is to seek out a dealer you know personally and who has a good reputation amongst other hobbyists. If the dealer has been around for some time, the reputation will already be established and you will have been into his premises several times to do some research into possible new toys, and usually have them demonstrated to you.

Whatever you do, resist the temptation to send off a large cheque to some place you never heard of and is 480km away from your home, unless you absolutely **know** that the dealer is OK, and please, please don't succumb to the lowest price offered. If you are buying an item at £750 and you are tempted by a price of £699, just think what that £51 may eventually cost you when the air turns sour, or you find that carriage charges to and from the 480km distant emporium has wiped out the discount.

My (probably unwanted) advice from a long, long life in the business falls into several categories:

The Manufacturers

Should provide a list of approved stockists of their equipment and demonstrate their support for those dealers who do a good job of representing the brand. Should make clear statements about service and spare parts support, both for the end user and the appointed dealer network.

The Dealers

Should first of all personalise their business dealings. This is an intensely personal market and the company should be represented as real people and not hidden away behind some anodyne business name. There was never any doubt about who wrote the advertising for my old company because I put my name to it, and everyone knew Bill Lowe, or Harry James, or Jack Tweedy, or whoever. I read the advertisements from UniCom and wonder why Dennis Goodwin has not put his name to the company, because he established a good reputation as a manager in the Icom UK company and must have a faithful following. What about it Dennis? Your name is a real asset.

In this context, one person above all others has taken the same view as me, and that is of course Martin Lynch. Starting from zero in about 1991, Martin has established an enviable reputation as a good chap with whom to do business, and his whole approach is personal. The style shows through in all his advertising, and it has also rubbed off on his staff. I have to say that I am slightly biased in this because Martin told me that his starting point was my own advertising approach, and that he used my style of presentation because he thought it was right for the market. He has obviously developed this in his own unique way, but thanks for the compliment Martin, your success seems to prove my point.

Just to be even handed about all this, its also refreshing to see Nevada introducing their specialist staff in the magazine advertising so that you can put a face to the name, and it's instructive to read their headline "After 30 successful years we're not just box shifters." Very true, and worth repeating.

The Customers (That's You, Folks)

Should perhaps take longer to think about the implications of parting with large amounts of hard earned cash on the single basis of "lowest price". As far as service support is concerned, get to know your dealer's position on this by making enquiries from friends or by listening on the 80m and 40m amateur bands. You'll soon hear some home truths, although it should also be said that "Hell hath no fury like an amateur scorned", and I repeat that I have cause to remember many names and callsigns from those days when I stuck my head over the parapet.

Consider taking a common course of action which is available to purchasers of washing machines or motor cars; that of extended warranties in the form of insurance

policies. If something expensive should occur, it's nice to know that the bill will be paid by someone else. At the risk of embarrassing him, there is one dealer who instituted this scheme some time ago and its worth asking him about it. Guess who? But I have to emphasise that I have no connection either personal or business with Martin Lynch and have no axes to grind. In fact, when I was in the position of supplier to Martin our relationship at times could best be described as "tense", but now I'm out of the game for good I can take a more relaxed view of all that went before and tell the plain truth.

Buying Second-Hand

Take care when buying second-hand, especially from the "Bring and Buy" stall at the local radio rally unless you are either capable of sorting out problems for yourself or are prepared to throw the damned thing away when it bursts into flames. Buying second-hand from a reputable, and preferably local dealer, should provide the same support as buying new, provided that what you buy is not so old that parts are no longer available. Just because I still use favourite equipment dating from the Collins heydays of the 1960s does not make that a recommendation for you to do the same unless you were brought up, as I was, to look after it properly.

As a personal tip, if you have a decent but elderly radio in your possession, don't trade it in for peanuts but keep it as a standby should you need to send off your latest radio for attention. I can still listen to most of my interests using a Hammarlund HQ-180 which probably isn't worth a bean in commercial value, but still works well enough to give me pleasure (and the audio from the valve output stage is so nice to hear).

Finally, and as always, *Caveat Emptor* my little chickens.

SWM

Spying On The Spies

David White G3ZPA

concludes his look at the history of Hanslope Park Radio Station.

Part 2

In 1943 an experimental radio direction finding hut, which was made bullet proof, was built at the south end of the huge antenna field towards Haversham old village. This used a new system called the 'spaced loop', which consisted of two square loops placed at either end of a metal boom on a short mast located at the centre of the hut roof.

After a considerable period of testing and use, it was not deemed to be satisfactory and its use was discontinued. A gathering of all the radio direction finding operators from the whole SCU3/RSS DF network had been called together to pool their thoughts and ideas on this system, but it was decided to continue with the existing manual Adcock system, as captain Louis Varney G5RV realised that he had such highly skilled operators who could locate an enemy transmission almost as quick as the new automatic spinning goniometers, which displayed the bearing of an enemy signal on the face of an oscilloscope.

All the other intercept sites, which now belonged to SCU3, were somewhat smaller and at St Erth and Thurso there were 20 bays and at Gilnahirk there were 14 as had the unit at Arkely. The Cupar station in Scotland and Sandridge near St Albans still came under the control of the Post Office, but were also connected to the DF control at Barnet, which was located on the ground floor at Arkely View and manned by a contingent of ATS girls.

Secret Radio Station

All Foreign Office diplomatic messages were now being sent and received from the secret radio station at Whaddon with transmitter sites built at Gawcott, Creslow and Calverton and other two way radio stations for clandestine use being built at Poundon, Nash and Upper Weald. In the meantime, an agreement with the British Security Co-ordination and the US and Canadian authorities on 7th September 1941 resulted in a top secret site being chosen at Oshawa on the shores of Lake Ontario near Toronto in Canada, which was used as a special agent training school for the Special Operations Executive and was known as STS103, which was used to train the American agents and which was largely responsible for setting up the American network, which was known as the Office of Strategic Services (OSS).

This site also had a secret wireless station built alongside it, which exchanged signals with Poundon in Buckinghamshire. This system was considerably expanded during 1942 and grew into the secret system which was used to pass all British intelligence messages to and from Washington, New York, Ottawa and London and it was known as 'Hydra'. The initial link from Washington and New York was by landline teleprinter and was converted to Morse code at Oshawa to transmit between there and Britain.

Later on, the system was converted to transmit the teletype baudot signals direct and were received at Whaddon. After the war, the undersea cable was used to send all the Rockex traffic direct to the existing royal corps of signals station at Doon Street, Waterloo in London, that had been taken over by the Foreign Office after GCHQ had decided to close Whaddon and move to Eastcote in Middlesex.

Hanslope Park radio operators outside the intercept station in 1943. They were all civilian radio amateurs who were legally allowed to wear army uniforms of the Royal Corps of Signals. Reading from left to right they are as follows: William Peat GM3AVA, Pat Hawker G3VA, J. Bowers G4NY, J.F. Mosley G2CIW and in front is Gerry Openshaw G2BTO.

Proposed Closure

It was decided to continue using the Foreign Offices intercept station at Ivy Farm, Knockholt in Kent for the benefit of GCHQ, but the proposed closure of Hanslope Park as an intercept station in September 1945 could not be stopped, despite strong representations from Keneth Morton-Evans who was the controller of the Radio Security Service. Fortunately, however, a decision had been made that as Whaddon had outgrown itself that it too was going to be closed and what better than to use an existing superb radio station located nearby.

So, accordingly, a small team of engineers and building contractors set about converting Hanslope intercept site over to two-way working, starting in November 1945 and having it ready in February 1946. A new teleprinter room and registry and amplifier room was built and 32 large brass Marconi Morse keys fitted to the bays.

The existing transmitter station at Creslow had its keying lines switched from Whaddon over to Hanslope and all the Whaddon staff that did not wish to be demobbed were transferred to Hanslope at the end of February 1946, just as the last of the radio amateurs who wished to be returned to normal civilian duties were being sent back to Arkely View for demob. All diplomatic radio traffic that had been handled by Whaddon from 1940-1946 was now being routed through Hanslope.

Demobbed & Reorganised

As so many of the staff were being demobbed from the Royal Corps of Signals in an orderly progressive way, they simply changed into civilian clothes and were re-employed once again on the same duties throughout 1946 and 1947. Re-organisation resulted in all military personnel being withdrawn from SCU3.

By the end of February 1947, the last unit to be withdrawn from Hanslope was the production unit, which had been mainly responsible for building the Rockex cipher machine there since 1944. This unit was transferred to the Palace of Industry at Wembley in Middlesex late 1947 and then in 1948 was transferred to their new home at Boreham Wood in Hertfordshire.

Thurso was the first of the intercept and DF stations to be closed in 1943. Nash closed in November 1944 and all its responsibilities were transferred to Forfar. Weald closed in the summer of 1945 and, along with the transmitter site at Calverton, was totally dismantled. Gilnahirk and St Erth were also closed but Forfar continued in operation until the mid 1960s.

Unit Renamed

On the 1st April 1947 the whole unit was renamed the 'Diplomatic Wireless Service' and supplemented its vast world-wide system of Morse code communication to all British embassies overseas, by taking over the Hydra system to handle the Rockex traffic. This was taken from Stanbridge and installed at Hanslope in 1947, using AR88 receivers for tuning the remarkable multiplex system, where up to three channels of signals could be received from one transmitter.

The resulting signals were fed down landlines to the station in Waterloo, which was now called the London Traffic Centre (LTC) which came under the auspices of the Diplomatic Wireless Service and used all the American Teletype machines, which were already in place having been left by the Royal

Corps of Signals. These were model 15B and model 14 printing reperforators.

At LTC, the signals were passed direct to the Ministry of Defence, GCHQ, Canada House and the British Foreign Office again by teleprinters. The outgoing signals from LTC were sent direct to Crowborough transmitting station where an ASPI transmitter was used to send high power signals to Oshawa.

Exhausting Work

Traffic density was extremely high at LTC and as there were normally only 10 operators on each watch, it was very exhausting work. Although the SCU's had been disbanded in 1947, the existing Voluntary Interceptor network continued on a much reduced scale and RSS was now under the management of GCHQ at Barnet, but this was finally wound up in late 1952. The remnants of the SCU's and RSS being totally absorbed by GCHQ.

As the Americans had invented a new teleprinter cipher machine called the 'Telekrypton', the British did not want to use this name and when Edward Travis, the head of Bletchley Park, visited the Rockefeller Centre in New York he decided to call it the 'Rockex', and it is still known by that name.

During the war, as the number of undulators was increased, the speed and quantity of Morse code increased accordingly and in 1943 was being received at over 80 words per minute. Under very good radio propagation conditions, a speed of 140 words a minute was possible.

As landline communications throughout all of Europe were now practically non existent between foreign countries and the UK, it can be seen that the world-wide radio system set up under the jurisdiction of the Diplomatic Wireless Service became of tremendous importance and its operating staff were held in high regard.

Hanslope Park staff were considerably expanded and all wartime buildings which had been built there were again fully utilised and even the large lodge at Bullington End, which had been used at first as an intercept station, and then for staff accommodation and offices from the end of 1942, gradually was used for various technical purposes and operator training. It even had a teleprinter link installed.

Derelict & Vandalised

The accommodation part was finally relinquished in 1968, the offices were abandoned in 1972 and the whole of The Lodge and its outbuildings were abandoned at the end of 1972. It became quite derelict and vandalised until it was purchased in 1988 and became the Hatton Court Hotel as from that year.

Nearly all British embassies overseas were equipped with an HRO receiver and either a Mark 33 or 119 transmitter and a Morse key. Also a Hatz or Onan portable generator were placed in every embassy as an emergency power supply for the radio room. These were later replaced by larger Lister diesel generators as power requirements were increased. Antennas were normally set up on the roof of the embassy or sometimes in the gardens if they were large enough.

A huge network of civilian Morse code radio transmissions of diplomatic messages was now well under way. A very large number of staff were employed in the service from 1947 onwards. The embassy transmitters were soon found to be underpowered for the long range diplomatic posts and accordingly better transmitters were supplied. The Mark 233 gave over 40W of output power and was fine for medium range posts.

Signals Reliably Passed

When the 500W transmitter called the Mark 214 was brought into service, then excellent long range signals were reliably passed to Hanslope Park. A relay post for the far east missions was situated at New Delhi in India and another one was constructed in Singapore to provide signals to Hanslope when propagation was not good to the far east posts.

In the 1950s, antennas were standardised to a metal 8m tapered tube called a monopole and this was usually mounted on the roof of all the embassies and sometimes in the ground if there was plenty of room. Training was normally done at Hanslope and later in The Lodge, but eventually it was decided a proper training school was needed as new staff were constantly being enrolled.

The Diplomatic Wireless Service at Hanslope Park laid on a special prime stand at the International Radio Engineering & Communications exhibition that was held at the Royal Horticultural hall in Westminster, starting on 2nd October 1968. The revolutionary 33-tone Piccolo system was demonstrated live on the air and was given much acclaim by all military and commercial organisations as well as attracting much attention from the amateur radio fraternity.

A country mansion, which had been used by the wartime Special Operations Executive and known as Poundon House, near the villages of Poundon and Marsh Gibbon in Buckinghamshire, was leased and became the central training school for DWS. The amount of messages that were being passed in the 1950s to and from Hanslope Park was tremendous and radio contacts were lasting all day with the normal average of 25 to 35 words a minute maximum speed on hand channel Morse code.

The London Traffic Centre at Waterloo was mainly passing Canadian embassy and military traffic between Ottawa in Canada and London and was using the undersea cable across the Atlantic Ocean and many channels of radio teleprinters were in use using the model 15B made by the Teletype Corporation of Chicago. This ran at a speed of 45 baud (58 words a minute) and while this was a lot faster than hand Morse, it was still subject to a lot of errors.

Multitone Signalling

So, in the early 1950s, studies went ahead to try and improve the signalling equipment and reduce the error rate. The chief engineer and his team at that time cleverly worked out a system of multitone signalling and in 1958 development began of a system which was to become known as Piccolo, because of its musical sound when running.

An early model was demonstrated in March 1963 at the HF Convention held by the Institution of Electrical Engineers. This early model, which used an amplitude modulated signal, was successfully, although was still not all that much better than conventional frequency shift keying (RTTY).

The answer from Mr HK Robin and his team was to go onto single sideband operation without any pilot carrier. This system was introduced at Hanslope Park from the mid 1960s with the ultimate intention of phasing out all hand Morse communication.

During 1944, a code enciphering machine had been given to the government by the Americans and 100 of these top secret machines had been constructed in that year by the production unit at Hanslope Park. This was known as the ROCK-X, which was used to supplement the existing cumbersome cipher machine known as the TYPE-X, which had been introduced in 1936.

In 1957, all 64 of the wartime HRO receivers which had given such sterling service were replaced by a more modern British type called the Eddystone 730, fitted with a large rectangular type of slide rule dial. These continued to the end of the Morse code days in the late 1970s.

At the transmitter site in Creslow, more modern transmitters had been fitted over the years and in 1973 the last of the vintage RCA wartime transmitters were finally replaced with

Park House, Hanslope Park.

ROBERTS

R881

- PLL multi-band digital pre-set world radio
- APS (Automatic pre-set system) on MW and FM – automatically selects and stores stations in pre-set memories
- Direct frequency tuning via key pad
- Auto scan tuning
- Memory scan tuning
- Direct access to your favourite SW band
- Stereo FM via earphones (included)
- Dual time clock/alarm with 12 or 24 hour display
- Radio/buzzer alarm

£80.00

R861

- RDS Multi-band digital preset stereo world radio
- PLL digital tuner with FM/MW/LW/SW wave band coverage
- 307 memories - (261 on SW, 18 MW, 18 FM, 9 on LW plus priority station)
- RDS (Radio Data System) station name
- SSB (USB/LSB) 40Hz/step fine tuning AM RF gain control
- Five tuning methods - direct frequency tuning, auto scan, manual tuning, memory recall, rotary tuning
- ATS (Auto Tuning System) - auto scan and pre-set stations in signal strength priority (FM/MW/LW)
- Continuous AM coverage 153kHz - 29.999MHz.

£200.00

- PLL multi-band digital preset stereo world radio cassette recorder
- 5 tuning methods: direct frequency keying, auto-scan, manual scan, memory recall and rotary

RC828

- TIME RECORDING START
- 45 preset stations
- Dual time clock/alarm
- Receive single side-band and CW transmissions
- Continuous AM coverage 150kHz - 29.999MHz

£220.00

R876

- LCD display for all important functions
- ATS (Automatic Tuning System) scans the waveband in use and puts the strongest signals into memory automatically (not on SW)
- 5 tuning methods and 54 preset stations
- Dual time clock/alarm with precise setting
- Stereo FM via earphones (included)
- Countdown timer, stand-by function and adjustable sleep timer
- Key lock to stop accidental use
- Complete with auto dual voltage AC adaptor, portable short wave aerial, stereo earphones and soft carrying pouch

£130.00

R809

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

£100.00

Contact Roberts Radio Ltd. for further details or local stockists

Tel: 01709 571722 Fax: 01709 571255

modern MEL types. From 1968-1978 the 33-tone piccolo equipment which was brilliantly successful had carried a vast amount of traffic at greatly increased speed (100 words per minute), but from 1978 another new kind of 6-tone piccolo was gradually introduced, which reduced the operating bandwidth in an already overcrowded radio spectrum.

Intensive Training

As the equipment got more complicated, it was essential to have longer and more intensive training. So, it was decided to forego the lease on Poundon House central training school and replace it with a purpose built training school within the grounds of Hanslope Park, which offered extra hours of on-site training and gave a much higher degree of security. This was built and opened in 1976 and was located close to the mansion.

Some staff brought back all the historic and vintage radio equipment from Poundon, which was then systematically destroyed at Hanslope, bringing a tear to the eye of the author, who could do nothing to stop it! As so much of the more modern equipment was actually designed and built by DWS, the production unit, which had been located at Borehamwood in Hertfordshire, was moved back to Hanslope in the very late 1960s, which made it easier to build and test out new devices quickly.

The Crowborough radio transmitting site, which was started in 1942 by Special Communications Unit Nr 3, had been taken over after the war by the Diplomatic Wireless Service, and they were also responsible for all the overseas broadcasting stations. But in the late 1970s decisions had been made to close Crowborough and locate everything at Oxfordness on the east coast.

The BBC would take over responsibility for all its UK and overseas broadcasting stations, such as Zyyi, Masirah, Berberra, Perim Island and Dubai. On 31st March 1973, the Diplomatic Wireless Service ceased to exist and became the communications division of the Foreign & Commonwealth Office, with responsibility entirely to diplomatic communications and the link with the BBC being completely broken.

All administration had been done from the mansion, which was known as the Big House, but after 1973, much more was taken over by the FCO in London. Many of the old curved roof wartime buildings were pulled down in the 1960s, but several of the rectangular shaped ones survived until the early 1990s.

One of the old wooden buildings became a sports and social clubhouse and was known to everyone as the 'Plug & Socket'. The DWS table tennis team had always used the basement of the mansion for their practice and matches, but they then transferred into the 'Plug & Socket' where three proper tables had been set up to accommodate all visiting teams from various commercial firms from Wolverhampton and Bletchley.

Finally Closed

In 1971, the old far east relay station using radio teleprinters at Singapore through Hanslope to LTC and since 1968 only to Hanslope was finally closed due to pressure by the Singapore government for land required for housing. A brand new relay station was built at Darwin, in northern Australia, and commenced operation in August 1971.

With this switch over, all radio teleprinter systems had been discontinued in favour of the piccolo system, with still a few Morse code stations that had not been converted yet. The London Traffic Centre had closed in early 1969 with the withdrawal of the Canadian traffic in the summer of 1968, when they had decided to dismantle their high power radio station at Oshawa.

A relay station especially for the southern African posts, which were being converted from Morse code to piccolo working, was opened on the island of St Helena in 1967 and this ran until 1985 when, with higher power transmitters in use, it was possible to do direct working to the posts on a regular and reliable basis.

Computerised System

In the late 1970s, a decision was made to introduce an automated computerised message handling system, and accordingly a new central receiver site building was constructed and made operational during the summer of 1985. It was fitted with a very large mainframe computer called the Ferranti Angus, of which two had been purchased second-hand. The second one was fitted into the communications section at the Foreign Office in London.

The new central receiver site was a pyramid shaped building, which had 600 large 12V batteries installed to act as an emergency power supply to the Argus and all equipment in the station in the event of a mains failure. Plessey radios and the new 6-tone piccolos were installed, and all of the ComCen was located in a new secure area, which when in full operation, was totally quiet and nothing appeared to be happening. It was hard to believe that hundreds of messages were being automatically handled every hour of the day.

The old central receiver site was finally demolished in 1987 after 45 years regular service, and after it had an extension built in 1946 to accommodate the new teleprinter room, registry and the Hydra radio teleprinter section. Also, another extension was built in 1968 to house the new secure communications centre (ComCen), an automatic search system known as Area Control and the radio room, which became known as Picctune.

The new 6-tone Mk 'F' Piccolo system as used by Hanslope Park throughout the 1980s until closure on 4th July 1993. From top to bottom, the hybrid equipment was as follows: remote unattended calling system panel, two dual diversity Plessey PRS 2250 receivers, Redifon RFS 11 pre-selectors, Racal LA 1117 modems, Sayrosa 607B frequency synthesisers, HCD 1MHz source frequency reference oscillators, mains distribution panel indicators.

More Flexible System

The number of staff could be gradually reduced as a more flexible system of operating several stations at once was introduced. This system continued until a political decision was made to do away with all high frequency communications and to use personal computers and modems which could use the public STD telephone system that was being rapidly installed all over the world, and also the new relay satellites that were now in orbit around the earth.

Subsequently, the whole high frequency radio communication system came to an end on 4th July 1993. The newly constructed transmitter building with its fifty-two modern transmitters that could be remotely controlled from the receiver site were taken out of service, all staff that did not take early retirement were transferred to London.

The Darwin radio relay station was also closed and all staff withdrawn, thus bringing to an end one of the most important radio stations, that played a vital part during the war and for a very long time afterwards. Hanslope Park is still operated by the Foreign & Commonwealth Office as a technical centre to this day, but is no longer a radio communications centre.

On Display

Interestingly enough, much of the equipment from the Hanslope Park radio station, along with many photographs dating back to the war, are now on display at the old government code breaking centre at Bletchley Park, which, as from the 5th February 1994, became a museum to display all the wartime codebreaking and radio equipment that was used during World War Two. It is open every other weekend throughout the year to the public. ***SWM***

Attention-123!

A Most Enduring Mystery

For those of you who read our first column (April '98), you may have spotted a brief reference to S28 - affectionately known as 'The Buzzer'. This is a station which operates continuously, 24hours a day, every day of the year, but messages are extremely rare. S28 has used several formats since first reported, in 1981, and is one of the easiest 'mystery' signals to monitor, yet still retains many secrets.

The transmitter power is not easy to determine, but it seems that an omnidirectional antenna is used. The estimated reliable coverage area is 300-500km daytime, and 1000-2000km after sunset.

Frequency

The key frequency is 4.625MHz, however, it has also used 3.320 and 3.329MHz - at different times - in parallel with 4.625, but only very rarely and for very short periods. These may be test transmissions from a reserve transmitter at another site.

Mode

Despite numerous suggestions that it uses complex data modes (a common interpretation of 'odd' transmissions, often based on nothing more than wishful thinking!), the signal is nothing more sophisticated than full carrier a.m. - a tone of around 0.300MHz, which sounds every 2.5 seconds. At h+59 this changes to a continuous two-tone warble at the same rate for one minute, which is a relatively recent innovation - occasionaly this may occur at other times. Originally, the signal consisted of a repeated 'pip', and its present longer 'buzz' appeared around 1988.

Location

This is the subject of much speculation! At ENIGMA we have gathered a large file on its possible location. Approximate bearings indicated the Belarus/Central European Russia area. Disinformation stated 'by the main road' at Penza (50km SE of Moscow). Professional fixes using Thompson narrow base triangulation from France, a fix taken from Holland combined with a triangulation taken from Germany/Denmark/Sweden, indicates that the main site is WNW of Moscow in the Tver region.

Agency

Despite many letters sent to us by the Polish Radio Authority, the Russian Ministry of Communications and the State Committee for Frequency Registration, they have all failed to gain any response. To our knowledge, no official response concerning S28 has ever been received by a member of the public.

Purpose

With a news blackout we can only speculate on this. However, it should be borne in mind that this is an important transmission for someone! Something operating for so many years around the clock is hardly a minor player in the h.f. bands. Over the years, suggestions have accumulated. These include; a badly managed standard time signal, a remote system synchronisation circuit (?), an emergency communications link to Western Europe, a control mechanism for Russia's nuclear weapons, a warning system for nuclear accidents, a military or civil defence channel marker (yes, but marking a channel for what?), etc. One which we did pursue was a claim from a reliable source that the transmissions were monitored at the International Atomic Agency HQ in Vienna, who unsurprisingly, denied all knowledge.

The Message

Monitoring this signal for any period soon becomes mind-numbing; soothing it is not. Switch it off and you'll still hear it in your head for a while longer! We assume that Britain's Composite Signals Organisation (CSO) or maybe military SIGNIT are busy monitoring its output. (No doubt they've developed an electronic system to capture any variations in the monotony). Until December 24 1997 we designated this station XB; now we can put a language to it, hence S28. This was thanks to a vigilant member in Wales, who tuned in to find it making an uncharacteristic 'pipping sequence' late that night. Fortunately, he recorded what followed; a Russian speaking male voice reading out a message, which we translated (English translation in italics):

"*This is UZB-76. This is UZB-76* (two words unintelligible-fading) Nul Vosjim (*08*) *BROMAL* (spoken as one word) (unintelligible few words including figures) dvatsat-shest (*twenty-six*) jedenista tchetjorka dvoika nul nul petjorka (*14005*) Boris Roman Mikhail Anna Leonid (phonetics of Bromal) simjorka tchetjorka dvioka njorka / njorka njorka jedenitsa tchetjorka" (*742? ??14* - two four figure groups). This recording was a repeat message, and was followed by another 'pip sequence' and then back to the usual buzzing.

The numbers used are a modified Russian: jedenitsa, dvoika, ?, tchetjorka, petjorka, ?, simjorka, vosjim, ?, nul (0). 'Bromal' is a hypnotic, but probably acts as a codeword in this context. The callsign series including UZB is allocated to Ukraine, and the ITU claim no knowledge of UZB-76, which came as no surprise!

Station S30 (Formerly XT)

Another round-the-clock mystery station, easily found during European night hours. It consists of a pip sent 65 times a minute, and follows a simple schedule. Using two transmitters, it operates from 0530-1400 on 5.449MHz, and 1400-0530 on 3.757MHz (with short parallel overlap). Messages are more frequent than S28, but still rare and unpredictable. The pip is interrupted by a Russian speaking male voice, e.g. (translated) "For 014, 071, 206, 500, 634, 850. How do you read me?" (repeat, then straight back into pips). Replies are sent by other means. According to information received, the site is in S. Russia, Krasnodar/Volgograd area.

The largest of all 24 hour/day networks are the Single letter Transmissions (MX) - but more on these in a future issue. We are keen to learn more about all these stations, any information is always welcome.

The 'Annual Repeat' Phenomena

Most stations often need to repeat their messages, occasionally for months until thier receipt is confirmed. However, some have a very peculiar habit of sending the same message on an annual cycle. For example, M3 regularly sends the same message a whole year later, its transmission appearing on the same scheduled day of the week. Sometimes the same message may run for several years in this way. Some stations may send the same message on different schedules, e.g. Family Ib and XIV-M1 is at present running, amongst others, three schedules per week (136, 419 and 514) all carrying the same message. This probably means that three recipients, all with the same 'One Time Pads', are being fed the same message. When receipt is confirmed by any one of these, the appropriate schedule starts sending a new message.

What is inexplicable is the repetition of the same message just once each year. One suggestion is practice traffic, but this would surely use different text each time, and wouldn't restrict itself to such rigid infrequent scheduling. Another suggestion is 'dummy traffic' to confuse monitors. This is just as unlikely, for deception traffic must be opaque: it must appear just as if it were valid traffic, otherwise it wouldn't deceive. Besides, about 90% of M3's tranmissions send no messages, so if they really wanted to do this thay could 'fill out' all these null message calls with bogus traffic, e.g. as E3, the Poacher, does, which never sends null message calls. Whatever the reason, someone, say, on the first Monday of each February, goes to the trouble of digging out an old Morse tape to play yet again! And so on, many times throughout the year. Any ideas on why, would be most welcome.

Paul of Ely, who read our recent Newsletter article on British sites, asks us about the US h.f. transmitting site at Barford St. John, near Banbury. You are correct in suspecting that the CIA use its facilities under USAF cover; agent-running transmissions have long operated from here. Until a few years ago this was the home of the covert KRH50 transmissions. Although run by USAF, it comprises several elements, the most well-known being the USAF GHFS. However, these are by no means the only frequencies used here, as the US State Dept. (London Embassy), which includes the CIA, have their own secure compound at the receiving site at Croughton (which includes satellite terminals). Many such sites are used worldwide by US Numbers Stations and covert operations.

Lastly, an appeal. Can anyone help us in obtaining h.f. goniometers (manual or motor-driven, size immaterial)? They are needed for use with Adcock direction finding antennas, and are vital for achieving reliable results and higher fixing accuracy on signals. Any help would be much appreciated.

Until next time we wish you good listening, and hope those of you who received our booklet have found it helpful; part 2 will follow when completed.

■ PAUL ESSERY GW3KFE, PO BOX 4, NEWTOWN, POWYS SY16 1ZZ
■ E-MAIL: gw3kfe@pwpublishing.ltd.uk

Amateur Bands

Our anonymous correspondent is interested in antennas. This time she wants to know about some of the more oddball efforts which were used successfully. In the UK, one immediately thinks of GW3UUZ, using his lighthouse tower at Nash Point to prop up a quarter-wave vertical for Top Band, plus above ground full length quarter-wave radials, with the whole shooting-match sitting atop a cliff half-wave above the sea. To listen to Andy's HQ129X on Top Band on that combo was a revelation! Later, as G3UUZ on the Bishop Rock lighthouse, I believe Andy had a vertical dipole for 3.5MHz.

At the other end of the scale, one recalls years ago a letter from a prison, where the writer said he was using the metalwork of the bed as an antenna. Outside the UK, an interesting one was that of **Mal Geddes**, once G3JO, who settled in what was then Rhodesia after WW2, in which he had lost a leg. Mal became ZE3JO, later Z23JO, and after first building a brick radio shack; for a joke he hung his spare artificial leg from the ceiling, with a wire connected to the lower end, loaded it up with a tuning unit against earth, and worked in excess of 100 countries with it. Against this, we had W1BB using the local water-tower to prop up a Top Band dipole, involving a shack away from home. Or W6AM and his rhombics - a trip of around 48km each way just to go and use them, so he had a full kilowatt of r.f. mobile from his car - the rig was a Swan, and there were five v.f.o.s. Don was at the time of his death the top DX dog world-wide, and not far short with the mobile rig either.

Letters

From **Paul Goodhall** in Oxford first; he has been sampling the delights of slow-scan television thanks to a program G0PBX told him about, to be found at **http://www.siliconpixels.com** Seemingly, you simply plug the receiver output to the 'line-in' on the computer sound card and away you go! Another new interest is noting and recording the daily solar flux readings given on DK0WCY at 10.144MHz - but one hopes that Paul will also look at the A or K indices, either of which indicates the downside of solar activity - high A or K indicate poor conditions; as a very rough guide a K value of of 4 (or more), or an A index of 30 upwards indicate things are less than good. Against that, high flux plus low A/K values indicate good conditions. A severe geomagnetic storm looks at an A of 100+, and if you are in the far north you can look to the skies for an aurora display.

On the 'heard' front Paul mentions ZL9CI, DK0WCY umpteen times, ZB2, T77M, W6YSS, 8P9EM, TF3A showing that you don't have to be very far distant to be DX (!), one of those nasty numbers things sitting on 3.8MHz, something calling itself '1X1AU', some JAs VK3DVV, some VUs, DUs, VK7VV, ZA1MH, JT1CO, VE2RP, CN8RM, 7X2BK, 4X2BJH, H44NL, CO8HO, OX3LP, and some SSTV stations, calls unmentioned. It took a few moments for me to catch on; Paul uses red ink for all his c.w. logging and black for the s.s.b; but he often puts a 0 in the 'T' column of his log when putting the report on a sideband signal in - RST 590 is a bit startling!

We had a letter plus s.a.e. from **R. Revill** in Sheffield who has become interested in the amateur bands. He wanted to know about *DX News Sheet* - an annual sub can be taken out by contacting the **Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE**, or telephoning **(01707) 659015**. On the question of the various prefixes which are or were in use on our bands, the best answer is to have a current copy of the RSGB Prefix List - older readers will remember the various lists kept by the late Geoff Watts which have been taken on and unified into a single publication by John Forward G3HTA, and published by the RSGB. John keeps everything up-to-date and so new editions come out pretty regularly. It includes earlier prefixes, and the current ITU allocations, so if a new prefix pops up, it can be identified with fair certainty.

Goings-On

The ZL9CI Campbell Island operation went QRT on January 24 with 96004 contacts in the log, which breaks the previous record by VK0IR of 80673 contacts in 1997. They took just nine hours to dismantle the antennas and eight stations, though earlier some operators had been chased by a couple of big sea lions! On a different tack, they had generator failures and, worst of all, a Boot sector virus which infected disks and all eleven laptops.

I guess when you reach the tender age of 92 your enthusiasm for operating slips a bit; VK4XN says he hasn't been active for years but he's still getting QSLs - so if you hear VK4XN you've found Australia Slim.

What are the most wanted countries? From anywhere P5 North Korea is most wanted and BV9P Pratas second. In Europe No 3 is Macquarie, which is down at 11 world-wide. Most of the European want list is in the Pacific, but Yemen 70 remains wanted both in Europe and elsewhere. Interestingly, P51AA/UA4AA was reported on 7.015MHz around noon on January 4, giving name as Pel, and seeming to know and be known by several Russian stations; he gave UA4AA as the QSL route - but UA4AA isn't listed in the *Call Book*! It was said he was demonstrating amateur radio to the authorities.

Looking ahead, March 6-7 is down for the CQ WW 'phone contest, and the end of March to early April is slated for activity from 3B8 and 3B9, with a counter-attraction in HS0ZCW. In June A92GD goes QRT.

A DXCC news release, dated February 3 '99, says ITU have granted E4 as the prefix for Palestine. Palestine is added to the DXCC list, effective October 1 '99. Contacts will be valid after February 1 '99. There is no connection with the 'Palestine' deleted from the DXCC list in 1968.

Letters - Again

Some of yer real Charlie-Whisky from **Ted Towell** on Sheppey. On Top Band (2100) he found 5B4AGC and EA6ACC then went to 7MHz for ZL9CI (1600), KP2J, VP2EY (both 2100), at 2200 ZA1FD, 6W4RX, CO2FC, PY2NZR. before a shift to 10MHz for ZL9CI, C56NY, SU1SK all at 1900. On 14MHz Ted noted 5H3RK and ED9XAD, while 18MHz over a cup of tea yielded 9K2MU, 4Z5DB, ZB2EO, and EA8CN. Noon zulu saw VQ9QM, and three hours later N6FF, W7IUO, KP2J, XE1IDJ, P49M, 3DA6Z, 6Y5/DL7VOG, VQ9QM again, and AD6C. Finally, 'Ten' which showed with 9J2BO, TL5A, 6W6JX, HK6KKK, 8P9DX, CO2OR, YV1NX, PR8BNP, FR5BT, KP4KO, JX7DFA, LU7DZJ, W6OV, N0TM for Nebraska, W6PU, KP3AO, AA1AC/VP9. On a different tack, Ted was irritated by the deliberate jamming of ZL9CI - more than one station, and someone even playing music on top of them. Heaven knows why the world's licencing authorities don't shut a few of these nuisances down.

Now we come to **Colin Dean** in Barnsley. His 3.5MHz sideband crop took in A41LZ, A61AH, BV5BG, EX2T, HB0/DL1RWB, HL3IUA, JA1-0, N7ML, OD5NJ, OY4TN, RA0WA, SU1SK, TA2J, TA3D, TF8GX, T77WI, UN7TX, VK2XN, VK3APN, VK3DZM, VK4BER, VK5MS, VK6LK, VP8CZJ, YB0DX, '1X1AU' 4L2M before shifting up to 7MHz for AP2N, A47RS, A61AS, A92FZ, ON4CFI/A92, BV2RS, C31JI, C33BO, FM5WE, an assortment of JAs, OD5VT, RA0SA, RV0AM, SU1GS, TA1AR, TA3EM, UK8GK, UK8ZAH, UN7LG, VK2FD, ZA1FD, ZS2ZG, 4J1S, 4L1AE, 4L1UN, 4L0CR, 5A1A and 6W1RN.

QSL Addresses

Some interesting ones to note, thanks to various sources, notably *DX News* magazine. KU9C says the BQ9P cards should start to hit the mail around the end of February. BD4EG: Zeng Feng, PO Box 122-001 Shanghai 200122, China. BD4ER:Kent PO Box 122-001, Shanghai 200122 China; BD4RE PO Box 10 38 Guangdong Road Nanjing 210003 China; BD4RW, Z. N. Ben Luo, PO Box 538 Nanjing Jiangsu 210003 China, BG5WJC Cai Jian-Jun, PO Box 321 Qingliu, Fujian 3653000 China; BG6JW PO Box 074 Luoyang 471000; BI4Q Jiang Su DX Club, PO Box 538, Nanjing 210005, China; BV4RA Pang Shon-Ywu, PO Box 922 Taichung, Taiwan.

Obituary, King Hussein of Jordan, JY1.

The King, who died on the morning of February 7, was first licensed back in the mid-1960s, due to his previous UK Service training in electronics, which was well above RAE standard, and the high standard of his Morse, too. His second - British-born - wife, Princess Muna, started him off and she herself became JY2. From then onwards, Jordan disappeared from the 'Most Wanted' lists in short order, and changed to being a country where amateur radio could and would flourish. On his visits to UK, the King would sometimes use his UK callsign, and he was, of course, for years an Honorary member of the Radio Society of Harrow.

His first few QSOs indicated very clearly his service operator training, but he soon became adept at the amateur radio style of operating both when calling in a pile-up, and when at the 'sharp-end' controlling the pack called him.

Jordan was, and is, a country of violent emotions; one recalls listening to JY1 one evening when a rattling noise became audible. Asked by his QSO partner what the noise in the background was, the King replied "bullets hitting the walls outside", seemingly quite unruffled. Although much less active in recent years there is no doubt the interest was still there, though of course the increasing problems in and around Jordan took up much more of his time, and in more recent times his illness mitigated against him being on the bands.

King Hussein of Jordan JY1 will be missed in amateur radio circles, and in a greater sense both in and around Jordan. One hopes that his half-English successor proves as adept at keeping peace in a troubled region.

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

Satellite TV News

The World lost a peacemaker, a caring king and a compassionate friend of the peoples living in the Hashemite Kingdom of Jordan when King Hussein died on February 7th, 1999. His last intervention in the Middle East peace process was late October 1998 when he left his sick bed to bring together opposing sides at the White House during the Israeli/Palestine peace talks. He was flown home to Amman on February 5th and died two days later.

As with all public figures these days, the private family loss becomes a high profile media event. His final flight home was carried live from the 'States, as was the arrival at Amman airport.

Jordan TV by this time was entering a situation of public mourning with regular programming replaced by readings from the Koran, non-commentary 'picture profiles' of the Kingdom and the news. (The Jordan digital TV programme appears on *Hot Bird* 13°E, 12.654GHz-H SR 27500; FEC 3/4 and carries the main JTV-1 Arabic language service for most of the programme day with the English service JTV-2 fed from 2000UTC for about two hours. There are several other Arabic TV services in this package, e.g. Oman, Sharjah, Saudi TV1, etc.).

The festive side of Reuters via *Intelsat K*.

Islamic tradition is that following death, the body must be buried within 24 hours. After the King's death on the 7th, preparations were made for the funeral on Monday 8th and an outside broadcast unit appeared at Amman airport to cover the arrival of the principal mourners from around the World. Despite the friction that exists between Jordan and Syria, the uplink out of Amman airport was carried as a main news feed on *Arabsat 2B* via the Syrian Channel 1 output (30.5°E, C-Band, 4.080GHz RHC analogue).

Emotion ran high amongst ordinary folk, as was evident from the news output on JTV, the frustration, anguish and despair showed on the faces - they had lost a king that had kept them secure within a sensitive Middle East hot spot of warfare and violence - the future unknown...

The Virgin balloon terminated unfortunately off Hawaii on Christmas Day, via *Eutelsat II F3* @ 16°E.

Whilst the peoples of Jordan prepared for the future, on the other side of the World, NASA continued with space exploration and at 2100 hours, 7 February, NASA TV broadcast the launch of the rocket 'Stardust' into space. As with all digital programme and news feeds, programme carriers are left up for long periods (digital mode needs limited bandwidths which are cheap!) and the Reuters lease (*Intelsat K*, 21.5°W, 11.566GHz-H, SR 5632; FEC 3/4) carried the whole launch plus delays.

The technical quality was breathtaking and dramatic, a camera mounted on the side of the rocket showed the four solid booster stages blow off and various casings circle away against the backdrop of the Earth - the whole launch, once the rockets blasted into life, was televised from the rocket camera, and as it lifted away from the Earth, the Eastern seaboard appeared and soon the Earth's curvature was visible against the dark blue of space.

Digital ident from *NileSat-1* @ 7°E.

A national tragedy hit Colombia, Central America, at the end of January when an earthquake devastated a wide area of the country bringing down buildings, wrecking communications, resulting in the inevitable loss of life. Within a day, a flyaway news unit was on-location amongst the debris uplinking the 'APTN COLOMBIA Earthquake Site' test card and sending back all too familiar pictures of destruction.

Unfortunately, the search for life became a recovery of the victims with footage showing the rubble being searched and bodies found. The APTN feed was first seen here Eastbound over the Atlantic on the 21.5°W *Intelsat K* via a Reuters analogue circuit - 11.595GHz-V from January 28.

There's on going SNG activity - in analogue - on the 36°E *II F3 Eutelsat*. If your dish can track round to the East, then check out this bird. I noticed colour bars and ident from a Belgacom SNG skytruck at 10.962GHz-H, though other frequencies have been noticed in use at the low end of Ku-band. It's a slightly noisy signal on my 1.2m dish, but a welcome sign of life from a quiet part of the Clarke Belt.

Eutelsat's II F3 was of course living happily at 16°E, but was replaced a few weeks ago by the more powerful *W2*. The *II F3* was then shunted along to 36°E and the then incumbant veteran *II F1* moved on to slot at 48°E. As an aside, I have heard from a trade installation engineer that certain Astra channels (19.2°E) are suffering adjacent satellite interference from *W2* at 16°E caused by the higher downlink powers of *W2* coupled with the use of inferior/too small Astra dishes - the smaller the dish the wider the beamwidth, which in turn picks up 16°E signals as well as 19.2°E channels.

Our Surrey correspondent, **Roy Carman**, saw *Intelsat 705* @ 18°W on basketball 14th January @ 11.140GHz-V, though he's uncertain where the teams were from. The only indication of location was the caption indicating the teams in play were 'Olokwandi v Fucka'!

A rather more positive sighting on January 27th via *Intelsat K* digital - SR5632; FEC 3/4; 11.566GHz-H, one of the Reuters leases - carried a UK ident 'UKI-425 OTRANTO'. This mid evening news feed covered the build-up in the Adriatic of a NATO naval force following the unrest in the Serbian/Albanian border region. This could well be the next flash point for military action if peace cannot be maintained in the area.

An ABC news feed seen on *Intelsat K* but referring to *Intelsat 605* @ 27.5°W ex Tiernan, China.

Earlier that evening, the Spanish uplink firm Telefonica were active in Madrid with a live news insert outside a street cafe, though odd that *PAS-3R/6* was being accessed at 43°W rather than Spain's own *Hispasat* bird at 30°W. The analogue feed - 11.697GHz-H. The strange places that satellite hookups happen.

Returning from Camberley on February 10, I popped into the Eastleigh Asda store for a 'cuppa'. In the car park was an NTL uplink truck feeding up to *Orion-1* @ 37°W and inside the store several cameras were in use with interviews on the shop floor and in the upstairs cafe with a background of the store commercial area.

There have been many golf outside broadcasts lately and a good slot to check for American output is the Globecast digital lease on *'K*, here there are three Eastbound carriers - 11.590GHz-V; SR 20145; FEC 3/4 - called Channels 1, 2 and 3. During January and into February, these carried a succession of golfing tournaments, including the Bob Hope Chrysler Classic and NGPA Memorial Gold from Naples (USA).

Analogue feed from the Colombian earthquake disaster on *'K*.

Globecast can be seen in analogue on the 5°W and 3°E *Telecom* satellites with a scrolling caption selling their service across a colour bar test pattern. And a local football match was the January 23 Pompey v Leeds that linked via the *Telecom 2C* 3°E bird, 12.606GHz-V.

Roy has recently 'gone digital' having purchased a Praxis 8600, the first receiver proved troublesome and was returned to the

Check out for analogue feeds ex 36°E.

manufacturer, the replacement proved more successful. One of Roy's first sightings was on the German *Kopernikus-2* bird (*DFS-2*) @ 28.5°E, Jan 26, this a political discussion between Bayerischer Rundfunk and a Turkish TV station - 12.724GHz-V, SR6111; FEC 3/4.

We were delighted to receive a letter from reader **Michael Stonebridge**, St. Isidore, Alberta, Canada, an isolated community about 208km NW of Edmonton. Michael relies on satellite for TV programme variety being only two terrestrial TV stations locally (one in French!). His satellite experience dates back to '82 and pioneering days of early backyard home terminals in C-Band nothing was scrambled - at least not until 1987 - when hacking became the norm with modified and pirate decoders.

Canada is very touchy as to what their citizens can view and many American channels are illegal to watch or subscribe to, mainly due to copyright or content reasons. Michael sent a picture of his backyard dish, a 3m mesh with a 35°K noise l.n.b., Chaparral combination feedhorn and mechanical polorotor - there is no protective cover and no electronic problems have ever been experienced. The only possible source of problem are the moose and deer that walk past as their tracks can often be seen in the snow!

Unlike the small gardens and 2m fences in downtown suburban UK, Michael's 'garden' seems to have no fence and disappears into the distance. It looks very cold there, though the air is very dry and not the damp coldness that we suffer in the UK. (I bet they don't suffer council planning officers either!).

Orbital News

The Russian broadcaster NTV has launched a digital platform offering 18 channels including BBC/Discovery, MTV, VH-1 and Nickelodean and several movie channels, and already has nearly 200000 subscribers on the books. By April '99 the programme count will increase with the arrival of several new channels such as Geographic and Blooomberg - broadcasters RTR and TV6 have also been invited on board with their offerings.

The German group Deutsche Telekom and the '@TV' are opening a digital programme platform this coming Autumn offering regional programming from the North Rhine, Munich and Frankfurt regions. Lifestyle programming such as *Landscape*, *TM-3* and *Spiegel-TV* are also in discussion with the platform providers and may come on board. After 'on and off' discussions, it looks if the Spanish groups Canal Satelite Digital and Via digital will get together into a single digital platform, earlier differences over respective group valuations have been resolved.

The Italian government is likely to introduce legislation to restrict the ingress into Italian broadcasting by Murdoch's News Corporation Europe and intends to introduce anti-trust measures covering advertising earnings and establishing European TV production/sports content in digital transmissions. News Corporation intended to buy 80% in the Stream Italian digital platform, but if the legislation goes ahead then it's likely that News Corp will pull out of the proposed deal.

There's change planned in France with their broadcasting bill, though the Prime Minister is awaiting the outcome of Spring elections before moving - plans are to reduce the advertising income of both the France 2 and 3 national networks.

The Lyons based Euronews channel, now owned by ITN, will soon have the French doco channel 'Regions' move into the same HQ and share some of the in-house production facilities. The move will be completed by late July.

Following the success of the Spanish language version of CNN+ in Madrid, CNN is now planning to open a Turkish language CNN+ version offering a 24 hour service of local/international news. CNN may form the co-production channel with an on-shore Turkish group though alternatives are also under discussion off-shore.

European sports channel 'Eurosport' have delayed the opening of their UK service until all the technical/production facilities are up and running. The UK variant will be similar to the mainstream Eurosport, but will include UK national/regional sporting news programming. The full UK satellite service should be on-air by mid March.

American satellite operator PanAmSat have major headaches with problems in their satellite fleet. Previously several of their craft had suffered control processor faults resulting in a change-over to reserve control units, but battery problems now afflict both *PAS-5* and *Galaxy 8-I*, with the loss of battery cells on both birds. Though the craft can maintain OK working in sunlight, during periods of solar eclipse or in darkness transponder current demand outstrips available supply.

All the problem craft are the popular Hughes *HS-601* satellite. Hughes Space and Communications have been contracted to build the *AsiaSat 3-SB* satellite, this as a standby lest the *AsiaSat 3S* launching about now fails to gain orbit, the *3-SB* will be ready to launch end '99. If the *3S* launches and slots OK the *3-SB* will be utilised for a future *AsiaSat* series launch.

All isn't well out in *AsiaSat* country following the Star-TV (Hong Kong) mid December decision to cut the authorisation stream downlink on all 19 channels of the C-Band Indovision digital platform. The reason simply is that Indovision have failed to pay their bills to Star and it now totals over $25 million. Indovison are now advising installers to fit S-Band (2.6GHz), l.n.b.s/feeds to dishes and take their channel output from the *Cakrawarta-1* satellite, but this satellite suffers solar illumination outage also having duff batteries!

LEO - low earth orbiting - satellites within the Iridium communications systems are now on stream and able to provide international telephone contacts. The 66 or so craft provide the means of 'cellphone' comms between points anywhere on the Earth, currently it's authorised to operate in 120 countries with many more expected over the next few years.

However, two problems have emerged, the suppliers are unable to keep up with demand reckoned to be 200000 units by January '99, compared to the 100000 manufactured by Motorola and Kyocera Corp. These aren't your normal £59 Asda specials, but upmarket units costing $3000 and calls work out at around $2 per minute local and up to $7 for international calls, and they are billed at minute intervals. Secondly, Japan is unsure of system reliability and isn't charging clients a monthly fee for the first six months until the system is proved.

Eutelsat is moving their *II F5* satellite to 12.5°W and the telecom carrier Teleglobe have leased capacity for trans-Atlantic connectivity using Internet/data and broadcast content.

And finally the *SatFACTS* New Zealand publication (January '99) comments on certain current digital IRDs and interference radiation. Apart from modulating internal baseband video and incoming terrestrial signals (via its diplexing input sockets) to a common u.h.f. channel, modulators are also extracting the switch mode p.s.u. shash and upping the interference to u.h.f. and actually radiating it out of the terrestrial **input** socket back into the terrestrial antenna coaxial downlead. This in turn produces chronic interference to neighbouring TVs!

The analogue test card from Bosnia on 13°E, it resembles an old 'hand crafted' card of the mid 60s!

NASA TV digital via 21.5°W, the live launch plus interviews.

Jordan TV-1 channel digital via *Hot bird* @ 13°E, a crowd listens to the news that King Hussein has died February 7.

The 3m C-Band dish used by reader Michael J. Stonebridge, St. Isidore, Alberta, Canada.

■ GRAHAM TANNER, 64 ATTLEE ROAD, HAYES, MIDDLESEX UB4 9JE
■ E-MAIL: ssb.utils@pwpublishing.ltd.uk

SSB Utilities

VOLMET Changes

During late January I received several E-mails and even a 'phone-call to tell me that the format of the RAF VOLMET transmissions had changed. Up until mid-January, the transmission was a continuous repeating loop giving weather details for most RAF airfields, and also similar details for airfields where the RAF are currently operating, (i.e., Gioa del Colle in Italy for Operation Deliberate Forge - operations over the former Yugoslav republics).

However, during January, the format of the transmission was changed. It is now similar to some of the civil VOLMET transmissions around the globe. Each half-hour is split-up into five segments, and the airfields covered during each segment vary. The sequence between H+00 to H+29 is repeated from H+30 to H+59. Thus, the airfields reported upon at H+00 appear again at H+30.

Naturally, as world-wide situations change, airfields can be added to different segments as the need arises. On this page I have listed the times and airfields for the new VOLMET broadcast. If anybody wants to know where some of these exotic sounding places are, please write-in.

JMC Update

Last month I gave some details about the Joint Maritime Conference (JMC) exercises that are held around the northern UK throughout the year. I now have some more information which will be of use to those of you who listen to these events.

It has been pointed out by several readers that you can obtain some information about each JMC from the Internet. Since the JMC occupies such a large airspace, the CAA issues a supplemental bulletin containing details of the area(s) to be used. These are available from **http://www.ais.org.uk** and then look under the list of 1999 Supplements. The pages contain maps of the areas to be used; with this kind of information to hand, when you finally manage to find any h.f. signals from the exercise participants, you can see what area they are operating in.

The only frequencies mentioned in this document are a few u.h.f. airband jamming safety frequencies, so if you are looking for h.f. frequencies you're out of luck! This little snippet of information will be too late for JMC 99-1, but please bear it in mind for JMC 99-2 during the middle of the year.

New Zealand

During January I received a letter from New Zealand, from **Evan Murray** who is the National Secretary of the New Zealand Radio DX League. He sent along two pages of his own loggings, two copies of their monthly journal (*The New Zealand DX Times*), and also copies of logs from some of their members covering some events in their region during the past six months.

Starting with Evan's Logs. Naturally, they contain a lot of reports for traffic around the Pacific rim, including lots of aeronautical stations, aircraft, and fishing boats, but also included are a number of Logs from the Indian sub-continent, NASA re-broadcasts of Shuttle flights, and even aircraft crossing the Atlantic on the NAT tracks. It always surprises me just how far s.s.b. utility signals can travel, and if listeners down under can hear signals from our area, then we should (and could!) hear signals from there. See later for details of my successes.

Back to Evan's letter. He included some comprehensive logs from members covering two important international news-worthy events. The first of these was the balloon-flight of Steve Fossett, who flew from the USA, across Europe and parts of Asia, across Australia, before finally ditching in the Pacific Ocean off the coast of Queensland. Although this was over six-months ago, reading the reports brings back many memories of trying to hear these comms.

The second series of Logs cover the SAR operations for the Sydney-Hobart yacht race just a few days after Christmas a few months back. Although I did personally manage to hear some of these comms, seeing everything listed out with aircraft and ship callsigns brings back many memories of this tragedy.

Those of you who are interested in finding out more about the New Zealand Radio DX League may like to know that they have a web-page - **http://navigator.co.nz/nzrdxl** - so check it out.

Antarctica

Prompted by the letter from Evan Murray (see above) and some timely advice from **Ian Doyle**, I spent a few days listening to 8.867MHz during the early morning, just before departing for work. Ian suggested this frequency and time as very good for hearing Australia and New Zealand, and seeing the kind of air traffic logged by Evan helped me decide to try to hear some signals from down under.

Much to my surprise, the very first morning I heard several SELCAL tones, and faint signals from several aircraft. The following day conditions had improved, and I managed to make out the callsigns of a few aircraft, and also hear Auckland and Brisbane ATCs talking to aircraft.

On the third day, I hit the jackpot - I logged flight ICE 06 working Auckland ATC reporting their position as 50°S 170°E, and an ETA for Christchurch. This is one of the US Navy transport flights from McMurdo Sound in Antarctica returning to its operating base at Christchurch Airport. What most impressed me was that the signal was S3-5, and fully quieting my receiver!

I have yet to work out the distance from me to the aircraft, but it is probably going to be a personal best for me. Using the maps in the *AirNav* program (as I reviewed in the January '99 issue) I was able to generate a map of the area (New Zealand and Australia), and to plot the position and track of this flight as it approached the southern tip of the South Island of New Zealand.

Letters

The first letter this month comes from **Kevin Jeffrey** who lives in Kent. He uses an AOR AR3000A for h.f. listening, with a long-wire antenna run internally round a spare-room. Kevin lives in a flat and cannot erect an external wire antenna, but is considering some sort of active antenna. Well Kevin, if you put your active antenna somewhere outside your flat, you will find that the signals will improve, but so will the noise level. In fact, if you put it anywhere, you will find that the same thing happens!

A lot of people expect wonders from active antennas, but many people are also disappointed with the results. As well as an increase in signal strength, there is also an increase in background noise and interference. What you really need to do is to maximise the signal and minimise the noise. A carefully tuned antenna is the best thing for this. By all means, try an active antenna, but do not expect it to work wonders, and be prepared to be disappointed with the results. (*For a rather different point of view see the Wellbrook ALA 1530 active loop review next month - **Ed***).

Next up is **Steven Harper** from the south of France. He uses a Kenwood R-1000 with a long-wire antenna, and wants to know what frequencies to use to listen for transatlantic flights, especially Concorde flights. Well, these get quite a bit of coverage over the months between this column and Godfrey Manning's 'Airband' column. Instead of repeating the same set of frequencies every other month, I'll direct Steven to one of the many frequency guides that are available - I would suggest *Airwaves 98* available from Photavia Press (who advertise in *SWM* each month) or from the *SWM* Book Store.

H+00, H+30 - Aldergrove, Manchester, Prestwick, Stansted, Bardufoss, Bergen, Evenes
H+06, H+36 - Benson, Brize Norton, Bruggen, Hannover, Laarbruch, Lyneham, Northolt, Odiham
H+12, H+42 - Cranwell, Kinloss, Leeming, Leuchars, Marham, St. Mawgan, Waddington
H+18, H+48 - Ascension, Bahrain, Dakar, Keflavik, Montevideo, Rio De Janeiro
H+24, H+54 - Adana, Akrotiri, Ancona, Aviano, Gioia Del Colle, Split

The following airfields can also be included when required: H+00, H+36 - Bodo, Edinburgh, London Gatwick, London Heathrow, London Luton, Newcastle, Oslo, Stavanger, Teeside, Trondheim, Vaerlose; H+06, H+36 - Hamburg, Munster, RamsteinH+12, H+42 - Coltishall, Coningsby, Lossiemouth, Shawbury, Yeovilton; H+18, H+48 - Cairo, Hurghada, Jeddah, Mombasa, Nairobi, Punta Arenas, Recife; H+24, H+54 - Brindisi, Catania, Faro, Gibraltar, Lisbon, Palermo, Rome and Sarajevo.

■ PETER BOND c/o EDITORIAL OFFICES, BROADSTONE
■ E-MAIL: milair@pwpublishing.ltd.uk

MilAir

This month I will be catching up on a few letters and E-mails, plus news on a variety of RAF unit changes.

Moving Story

Dave G writes to me with news of a fortunate or unfortunate move, depending on which way you look at it. Until recently he lived just north of Cambridge, a location which he described as giving excellent MilAir listening to the many airfields in Lincolnshire and East Anglia. He uses an AOR AR3000A with a rooftop nest of dipoles, apparently to very good effect. He was recently promoted at work (the fortunate part), but as he works for a nation-wide firm, he was being asked to manage a branch in Bournemouth; the unfortunate part - loss of good MilAir location.

After a couple of weeks in Bournemouth, he managed to get a day off, and started searching around the military airband. He reports that he soon locked into Portland (now closed), Yeovilton, Boscombe and a variety of other stations, including French Military/Mazout Radar, on frequencies **269.0** and **296.625**. The aircraft was using the callsign CYRANO, which we both agree is a French Air Force E-3F AWACS. The main outcome of Dave's scanning session were two frequencies he heard whilst searching that he could not identify, and he asked if 'MilAir' readers can help. The first is **358.875**, which sounded like an RAF Air-to-Air frequency, the second was **278.125**, which also had faint RAF voices on it. I have a note in my records from one unconfirmed source, that indicates that **278.125** was a Valley GCI frequency. Any ideas, anyone?

SATCOM

An E-mail from the 'silent listener' asks me for information regarding the reception of the USAF u.h.f. SATCOM signals, especially as he feels that more and more transmissions will be switched from h.f. to Satellite communications. He first asks if USAF SATCOM transmissions can be received in the UK. This is not an area where I have dabbled too much, but I am fairly confident that the answer is yes. As my correspondent notes, Mildenhall has several SATCOM antennas located on the airfield; at least one of which presumably belongs to the 352nd Special Operations Group. A colleague tells me that **261.5MHz** has been reported as the 352 SOG Satcom downlink frequency.

With many u.h.f. military downlink transmissions made in the range 260-261MHz, it is therefore well within the capabilities of most scanners to receive these frequencies, but perhaps most importantly with the right type of antenna. This leads us on to the second question; what type of antenna is needed, and is it possible for someone to build one on a limited budget? I must profess that I am no expert on SATCOM antennas, so I put the question directly to 'MilAir' readers. Have any of you built an antenna that has successfully received these transmissions? If so, please let us know. Assuming it is possible to receive these transmissions, the next relevant question would be, how much of the transmissions are in the clear and how much is scrambled?

News - RAF Wyton

Jonathan C. has sent me an E-mail concerning the RAF station at Wyton (located just east of Huntingdon). The former home of 51 Squadron and 360 Squadron, the airfield closed to military air traffic on 30 April 1995. Since then the only activity has been microlight flying, but this is soon to change, according to a February edition of *RAF News*. The airfield is to re-open in September 1999 and, whilst the thunder of jets may not be heard, it will still see a fair bit of aircraft activity.

The London University Air Squadron and No. 6 Air Experience Flight are to move here from RAF Benson. This is to allow for expansion of helicopter training by 33 Squadron at Benson, and the future arrival of the re-formed 28 Squadron, who are to operate the brand new Merlin helicopter. Secondly, the Cambridge University Air squadron and No 5 Air Experience Flight will also move to Wyton from Cambridge Airport. All of the re-located units will fly the new RAF training aircraft the Grob Tutor. This is to replace the ageing Bulldog T.1 which has been in faithful service with the RAF for over 25 years and is now approaching the end of its airframe life.

As Honington kept its allocation of frequencies whilst reduced to a care and maintenance status, I wondered if Wyton might be the same. Consequently, I dug through the records and found the frequencies in use when Wyton closed. They were: Tower **312.275**, Approach **134.05** (current)/**362.375**, Radar **249.55/292.9**, Departures **375.525**, and Ground **293.65**. When I get some more positive news on the frequencies, I will let you know. Thanks to Jonathan for the RAF News.

News - RAF Cottesmore

The Tri-National Tornado Training Establishment (TTTE) at RAF Cottesmore is to be disbanded on March 31 1999. The unit's Tornados will relocate to RAF Lossiemouth, where they will be merged into 15 Squadron. This will see the formation of a new National Tornado Operation Conversion Unit (NTOCU). Whether 15 Squadron will still exist in title is uncertain, as I couldn't find any information on the RAF Homepage.

To replace the TTTE as residents of Cottesmore, are two RAF Germany Squadrons who are returning from to the UK from RAF Laarbruch. The first will be 4 Squadron on April 1 1999, followed by 3 Squadron on June 1 1999. Please note that these are the official squadron transfer dates, and are not necessarily the dates on which the first aircraft will arrive! Laarbruch frequencies to listen out for are as follows; 3 SQN, Operations **244.675**, Air-to-Air **260.95** and **368.275**. 4 SQN, Operations **246.85**, Air-to-Air **245.25** and **246.975**. A couple of these squadron frequencies utilised in Germany clash with current UK allocations, so they may well be changed. It is also possible that they may adopt some of the TTTE Air-to-Air frequencies. Whatever happens, if you hear frequencies in use during this change round, please let us know.

Lastly, our photograph this month is a Sea King HC.4, wearing SFOR (Stabilisation Force) markings.

Air Shows

I am grateful to **Ian** and **Mike**, who have sent in a list of air show dates for 1999. As many aviation magazines cover this information very thoroughly, I don't feel that the 'MilAir' column is the right forum for a list of show dates. Thanks anyway.

Code-Words

In answer to my request for information, my thanks go to **Ian, MB** and **Patrick B**, who all sent in a list of tactical code-words. I shall compile them and include a listing in a future column. Unfortunately, it may have to be abbreviated, as one of the lists ran to over 140 code-words!

■ LAWRENCE HARRIS, 5 BURNHAM PARK ROAD, PEVERELL, PLYMOUTH, DEVON PL3 5QB
■ E-MAIL: info.orbit@pwpublishing.ltd.uk ■ WEB SITE: http://www.peverell.demon.co.uk

Info in Orbit

Beginners Start Here!

When a reader called direct from Australia to suggest that I wrote a feature for beginners, I realised how long it is since I last provided such an introduction. Thanks therefore to **Gordon Griffin** for a timely reminder. In this column I shall look at the basics of weather satellites (WXSATs) and include samples of the pictures to illustrate what one can expect to get using the different types of system.

Amazing?

When not at the telescope, I sit at my computer - see **Fig. 1** - developing articles on satellites and astronomy, while next to me, another computer constantly displays the latest satellite images of Australia, America, India, China, Russia, and - just occasionally - Britain. How can this be? It was on 4 October 1957 that the first artificial earth satellite (*Sputnik-1*) was launched; I was 12 years old and remember the news being announced on our (tiny) black-and-white television.

Here we are at the end of the century, with a constellation (collection) of imaging satellites covering the whole planet, providing a constant stream of signals that can be decoded using not outrageously expensive equipment. This is progress in electronics. It was only a few years after *Sputnik-1* that the Americans put an imaging system into space to take pictures of the weather.

Let us see what is now actually available to people using different receiving systems, by looking first at examples of each of the four types of image potentially receivable from the weather satellites.

The 'Weather' Pictures

Figure 2: *NOAA-14* received on 9 February by Bob Cobey - This is just one section of the 'a.p.t.' image received. A typical, complete transmission comprises two side-by-side images of different spectral content. Such 'polar orbiter' or 'a.p.t.' systems are those most commonly used when people first start WXSAT monitoring.

Figure 3: a WEFAX C02 format image 1230UTC 14 February from *METEOSAT-7*. Do appreciate the difference between receiving a WEFAX image directly from the satellite, and receiving it via a short wave radio transmission. The equipment used here is entirely different. I would recommend a WEFAX system for serious consideration for beginners.

Figure 4: N-14 August from Roger Ray; an 'h.r.p.t.' image. This is the highest resolution imagery available from the polar orbiting WXSATs, and reception requires specialist hardware; it is therefore relatively expensive.

Figure 5: a PDUS image from *METEOSAT-7*. This is the highest resolution imagery available from the geostationary METEOSATS, also requiring special hardware, and therefore relatively expensive.

All the information about these images and the equipment required to obtain them will be included in this and next month's column. Let us now review basic satellite information.

Fig. 1: Me at the main computer. A wider lens would also show two other computers nearby - one dedicated to imaging.

Satellites

Any object orbiting a larger body in space, is called a satellite. The earth has one large natural satellite (the Moon), and many artificial ones, launched since the start of the space age. Satellites come in all shapes and sizes; we can classify them according to their onboard equipment (cameras, radiation sensors, re-broadcast capabilities), or even according to their orbits.

Fig. 2: *NOAA-14* received on 9 February by Bob Cobey.

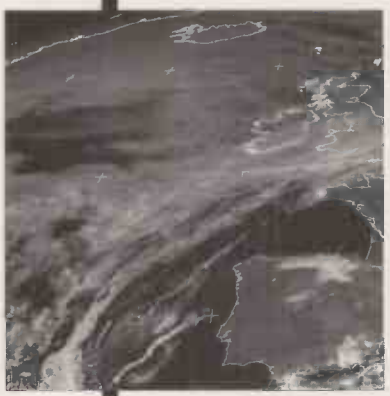


Fig. 3: A WEFAX C02 format image 1230UTC 14 February from *METEOSAT-7*.

The earth rotates once in 24 hours (23 hours 56 minutes and 4 seconds, to be a little more accurate), so a satellite in an orbit, which takes it over the poles every 100 minutes or so, will pass over every place on earth during that 24 hours. From such an orbit, a satellite carrying imaging equipment can 'see' the weather everywhere on earth.

An onboard tape-recorder can retain image data from remote parts - the poles, for example - where there are no ground stations to collect the data. Recorded data can be transmitted to a suitable ground station at a later time.

Imaging satellites can be commercially or nationally operated. A weather satellite is an imaging satellite that transmits image data in one (or two) of four specific formats. WXSATs are to be distinguished from commercial imaging satellites - such as the French SPOT series. These collect image data that is of an entirely different nature, and used for different purposes.

Fig. 4: N-14 August from Roger Ray; an 'h.r.p.t.' image.

Fig. 5: A PDUS image from *METEOSAT-7*.

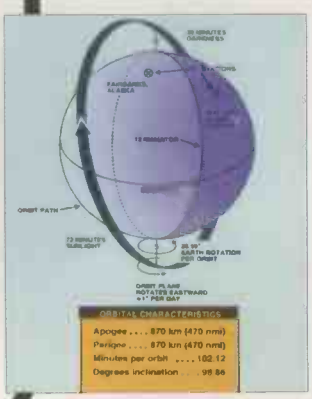


Fig. 6: A typical polar orbit of a NOAA WXSAT.

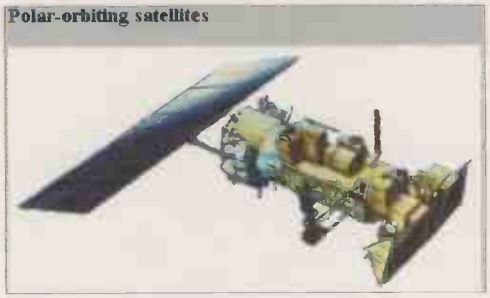


Fig. 7: A NOAA polar WXSAT.

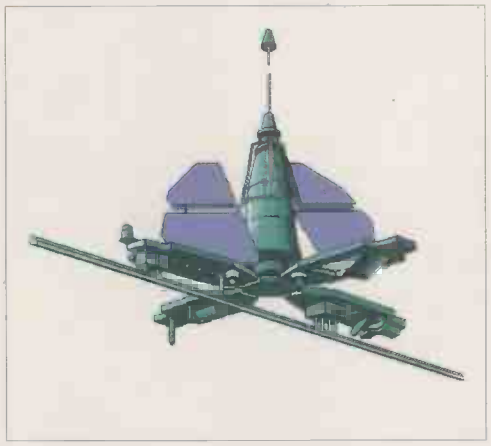


Fig. 8: OKEAN series.

Weather satellites are operated as two distinct types - those in orbits which pass over the poles (and therefore have high orbital inclinations), and those located in the geostationary arc - some 35,800km distance from earth. It is therefore to be expected that the equipment required to receive signals from polar orbiting satellites and from geostationary satellites is different - but fortunately, there are also significant similarities!

Names & Orbits

The names NOAA, METEOR, RESURS, OKEAN, SICH and FENGYUN may be heard during discussions about polar orbiting WXSATs. Each of these provides, or has previously provided, 'standard' a.p.t. WXSAT images. NOAA (National Oceanographic and Atmospheric Administration) polar WXSATs transmit continuously everyday. There is one METEOR WXSAT currently operational, and it transmits only in sunlight. RESURS occasionally provides one day's worth of a.p.t. transmissions.

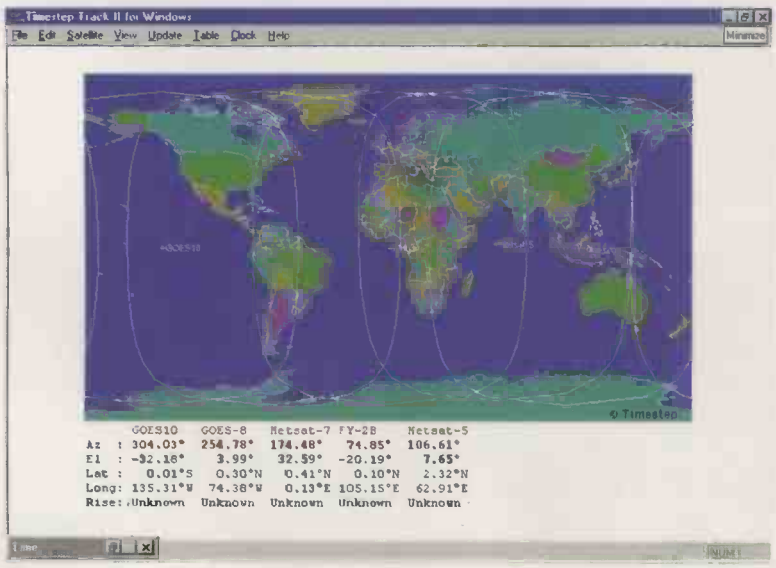


Fig. 9: Footprints of operating geostationary WXSATs.

To complicate matters, OKEAN and SICH are not really WXSATs - they are oceanographic satellites - but they sometimes transmit at least one 'standard' image format that can be received using normal WXSAT equipment - hence their inclusion. *FENGYUN-1A* (and *-1B*) were Chinese WXSATs launched in 1988 and 1990, but neither are now functioning. As at mid-February 1999, the satellite status is as indicated in the last section 'Frequencies', where I list currently operating satellites.

Because all of these WXSATs are in 'polar' orbits, they have certain characteristics. The three currently active NOAA WXSATs (*12*, *14* and *15*) are in sun-synchronous orbits; this is another way of saying that each passes over Britain (and every other place) at about the same local time each day.

By tuning to 137.50MHz (using suitable hardware) you will hear *NOAA-12* and *NOAA-15* at least three times each morning and early evening - every day. Similarly, *NOAA-14* can be heard daily on 137.62MHz during the early afternoon.

Pass-time Relationships

Because NOAA orbits are sun-synchronous, passes remain at similar times each day. For satellite monitoring it is almost essential to have a computer program that displays the current position of those satellites that you wish to monitor. Such programs can usually provide a list of pass times for each satellite.

Studying such a listing for each of the NOAA WXSATs shows that the main passes for *NOAA-12* occur about 22 minutes earlier on successive days. *NOAA-14* passes occur about 12 minutes earlier on successive days, and *NOAA-15* passes about 22 minutes earlier. The elevation reached by each satellite during successive daily passes changes steadily - rising to a maximum and then falling.

As one NOAA sequence ends, so another one has already begun, and the cycle repeats, leaving the pass time of maximum elevation around the same nominal time each day.

METEOR 3-5 has an orbit that slowly precesses - that is, its orbital plane slowly rotates around the earth with respect to the sun. Consequently, it is not sun-synchronous; pass times average about 18 minutes earlier on successive days.

The remaining polar satellites - *OKEAN-4*, *SICH-1* and *RESURS 1-4* transmit infrequently; RESURS has not been reported transmitting a.p.t. since late January; its previous a.p.t. operations ended last August.

Geostationary

This is the name of the orbital distance at which satellites orbit the earth once each 24 hours. The entire Clarke Belt (35,787km above the equator) is occupied by satellites of different types. International agreements dictate transmission frequencies and usage of each orbital 'slot' - ensuring that conflicting frequencies do not occur. From such locations, geostationary weather satellites constantly monitor the local hemisphere.

Severe weather can be identified and valuable meteorological data routinely collected. METEOSAT, INDOEX, GOES, GOMS, GMS and FENGYUN are all geostationary WXSATs located at specific longitudes around the earth.

METEOSAT-7 (0° longitude) is operated by EUMETSAT (European Organisation for the Exploitation of Meteorological Satellites), and *METEOSAT-5* is operating as 'INDOEX' over longitude 63°E. America operates the GOES (Geostationary Operational Environmental Satellites) constellation, currently *GOES-8* (at longitude 74°W), and *GOES-10* (at longitude 135°W), positioned over the east and west coasts of America respectively.

GMS-5 (Geostationary Meteorological Satellite - positioned over 138°E) is operated by Japan, and GOMS (Geostationary Operational Meteorological Satellite) is operated by the Commonwealth of Independent States (formerly Russia), though unfortunately it has apparently failed. *FENGYUN-2* (positioned over longitude 105°E) is operated by the Republic of China.

Transmission Formats - Those Fancy Names!

There are four principle types of WXSAT telemetry: automatic picture transmission (a.p.t.), high resolution picture transmission (h.r.p.t.), WEFAX (weather facsimile) and primary data. Different WXSATs also transmit other types of image data, depending on national requirements; I am not including those transmission formats in this discussion.

The operational polar-orbiting WXSATs transmit a.p.t.; the NOAAs also transmit h.r.p.t. from which a.p.t. is derived in real-time. The geostationary WXSATs usually transmit WEFAX which is derived from primary data. It is the frequency of these various transmissions that determines the nature and complexity of the receiving equipment - and therefore the relative cost of setting up an efficient system to receive telemetry.

The 137MHz band is used for a.p.t. transmissions. The 1700MHz band is used for h.r.p.t. transmissions. METEOSAT WEFAX is transmitted on both 1691.0 and 1694.5MHz. Primary Data is transmitted on 1694.5MHz. These are the data types shown in **Figs. 2 - 5**. The different picture resolution can be seen.

Automatic Picture Transmission (a.p.t.)

Weather satellite signals are like no others. The signal transmitted by the satellite is unique in both content and construction. Hardly surprising therefore that we need specialist receivers for optimum reception.

Whatever orbit the satellite is in - it scans the earth below. There may be land, sea and clouds; beyond the earth itself is the blackness of space. So what does a weather satellite 'see'? Consider what it does not see. Polar WXSATs do not see the whole planet instantaneously. Nor do they see colour.

Weather satellites 'see' whatever the on-board sensors can detect. On current generation weather satellites there is no colour sensor; the colour often seen in pictures is artificially generated by computer. Certain types of image processing software can add shades of green and blue to the otherwise black-and-white satellite image.

The satellite (or part of it) may rotate in orbit to provide a stabilised platform. The equipment (usually a telescope) forms an image which is then analysed by a number of sensors. Each sensor responds to radiation from one portion of the spectrum - so these determine what will be 'seen' by the satellite.

WXSATs usually have at least three types of sensor - one to detect the visible spectrum (and therefore produce images which our eyes can readily interpret), one which responds to heat radiation (thermal sensors), and one which is sensitive to the near infra-red spectrum (sometimes called the water vapour band).

The imager produces a 'scan' line corresponding to the instantaneous view of the scene below. Whilst over an ocean, part of the scene may be dark because water normally reflects little light. If over cloud, that part of the line will be bright. The on-board electronics now process the signal output from the scan analysis.

The data modulates a 2400Hz sub-carrier such that the brighter the scene, the lower the modulation; bright clouds result in maximum carrier. Conversely, over clear sea, the dark scene results in deep modulation of the sub-carrier. Rather than have the dark sea reduce the carrier level to zero, conventional practice is to leave a residual 5% carrier.

The resulting signal contains the content of the original picture, subject to the limitations of the modulation process and the sub-carrier frequency. What this really means is that the signal which results from this process does not actually contain the full amount of data available. The newly modulated sub-carrier is now used to frequency modulate the main (v.h.f.) transmission frequency of the satellite - selected in the 137MHz band - and this is the signal we tune to when 'listening' for the satellite.

You can hear the v.h.f. frequencies of the currently operational polar weather satellites by tuning to 137.50MHz (*NOAA-12* and *NOAA-15*), 137.62MHz (*NOAA-14*) and 137.85MHz (*METEOR 3-5*). You can also scan 137.40MHz which is used by the two oceanographic satellites *OKEAN-4* and *SICH-1*, but these satellites only transmit for brief periods. A suitable satellite tracking program enables you to predict when a satellite will pass.

Next month I complete this 'beginner's' feature with details of the actual hardware and the costs involved in setting up your ground station.

Fig. 10: METEOSAT.

Current WXSATs

On 15 February at 0910UTC, I received a.p.t. from *RESURS 1#4* on 137.85MHz during its first low elevation pass over Britain. As on 17 February, it has continued daylight tranmsisions. All three NOAA WXSATs remain in full operation; *METEOR 3-5* transmissions continue in sunlight only. *OKEAN-4* has made short daily transmissions on some occasions.

Kepler elements - WXSATs, *MIR* and Shuttle

1 If you want a computer disk file containing recent elements for the WXSATs, AMSATs and others of general interest, together with a large file holding elements for thousands of satellites, please enclose 50p with a PC-formatted disk and stamped envelope. A print-out is included that identifies NASA catalogue numbers for the WXSATs. The disk file is ideal for automatic updating of tracking software.

2 I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions **to the address at the head of the column**. Transmission frequencies are given for the operating satellites. This data originates from NASA.

Shuttle Launch Schedule

STS-96 Discovery - 2nd US International Space Station flight: payload Spacehab Double Module. Scheduled for launch on 20 May at 1432UTC.

A comprehensive listing of all Shuttle flights and payloads, together with associated information, is available from me as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz.
NOAA-12 and *NOAA-15* transmit a.p.t. on 137.50MHz.
NOAAs transmit beacon data on 137.77 or 136.77MHz.
METEOR 3-5 uses 137.85MHz in sunlight only.
OKEAN-4 and *SICH-1* use 137.40MHz.
RESURS 01#4 may transmit a.p.t. on 137.30MHz.
METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.
GOES-8 (western horizon) uses 1691MHz for WEFAX.
MIR (Russian space station) uses 143.625MHz for voice.

■ FARIS RAOUF c/o EDITORIAL OFFICES, BROADSTONE
■ E-MAIL: scanning@pwpublishing.ltd.uk

Scanning

I've received an amazing number of letters and E-mails over the last two months, and so to keep them from building up and becoming too 'stale', I'm going to dedicate this month's column to answering as many of these as I can.

I think I'd better start with the answer to the question **Geoff Halligey** posed two months back, regarding some mysterious transmissions in the 31MHz area. I've received a number of letters and E-mails regarding this, including particularly informative ones from **Dick** in Sidcup and **Paul Beaumont** in London, not to mention a note from none other than *SWM*'s Airband columnist, **Godfrey Manning**, explaining that these are a set of frequencies being used by a new range of Cordless 'phones, including the likes of the BT Freestyle 80 Plus and Southwestern Bell FF777. The frequencies used are listed in **Table 1** on the right.

But, as Paul notes, you are just asking for trouble if you tune in to these frequencies, as doing so will cause you to fall foul of not only the Wireless Telegraphy Act 1949, but also the Interception of Communications Act.

Paul Wade from Essex wants to know the London Air Ambulance, G-HEMS, for which he has a frequency of 132.650MHz. He also wants to know if a frequency other than 122.950MHz is being used for the replacement for the tragically-lost Kent Air Ambulance, and what frequency the Essex Air Ambulance can be found on. I can answer the first question easily enough - try 122.950MHz, which is the frequency I have listed. I'm not sure about the other two though - can anyone out there help?

Another reception enquiry comes from **A. Lincoln**, who lives in Letchworth. He's been trying to listen to transmissions on the Amateur 70cm bands, but hardly hears anything via the GB3PI and GB3HN repeaters, and is worried that his problem may be his antenna. Well, from what you describe, Mr Lincoln, I think the problem is, as you guess, a lack of activity on that band in your area, but if any readers local to you know differently, perhaps they could drop me a line?

A thorny issue rears its head in a letter from a reader in Ilford, who I'll make anonymous for his peace of mind. Basically, he wants to know how safe it is to send in lists of frequencies to companies such as the publishers of the *UK Scanning Directory*, since technically it is illegal for him to listen to these frequencies. Well, since it is perfectly legal to own and indeed create and publish books such as the *UK Scanning Directory*, in my mind owning a list of frequencies of a similar nature should also be legal, and so you have nothing to worry about. Entering these frequencies in a scanner or receiver, even if you never listen to these frequencies, is another matter, however, and it is at this point that you can fall foul of the law.

Interesting Question

Perhaps the most interesting question of the month comes from **Michael Hopkins** in Eire, who wants to know about the practicalities of listening to h.f. frequencies on a standard hand-held scanner, such as his Yupiteru MVT-7100. I suppose technically this isn't really a scanning question, but since it involves scanners, and is something that many scanner users will be interested in, I think it is well worth covering here.

The quality of h.f. reception on a hand-held scanner involves two related issues, the capabilities of the scanner's internal circuitry, and the capabilities of its antenna.

If you look at any typical hand-held scanner and compare it with the likes of a non-portable receiver offering a similar frequency coverage, an Icom IC-R8500 for example, you can't fail to be amazed at how so much functionality can be packed into such a small space. But no matter how clever a hand-held scanner's manufacturers have been, they will always have to make compromises because of the lack of space, including the sensitivity and selectivity of the receiver as a whole. This means that you'll never get the same class of reception quality with a hand-held scanner as you would with a larger model, particularly top of the range h.f.-only products such as AOR's AR7030.

Nevertheless, the MVT-7100 isn't bad at h.f. reception, and I've always been quite surprised at how well it deals with s.s.b. transmissions, so Michael is in luck here, though owners of some other hand-held scanners may find themselves a little more handicapped.

Turning to the question of antennas, because hand-held scanners tend not to be designed for high level h.f. broadcast signals as larger or more specialised models are, the type and choice of antenna is particularly critical. In particular, the low-cost telescopic or helical antennas that tend to be supplied with hand-held scanners just aren't up to the job of efficiently receiving h.f. transmissions, mainly because they just aren't long enough.

The obvious solution is to attach some form of external antenna - even a long length of un-insulated wire would do, and simply attach it in some way to the hand-held scanner's antenna input though you'd be better off looking at page 52 of this issue. This will certainly help, but for the very best reception when using this type of antenna, you'll also need to add one or two other components. The first is what's known as a 'magnetic long wire balun', which attempts to help match the random impedance of a random length of wire with that of the 50Ω antenna input that most scanners have, thus maximising the flow of signals from the antenna to the scanner.

Additionally, you should consider a pre-selector. These relatively simple products basically tune out signals from unwanted segments of the h.f. band and give your scanner or indeed any h.f. receiver a better chance of picking up signals that might otherwise be lost in the background babble. When shopping around for baluns and pre-selectors, it is worth noting that some pre-selectors include pre-amps to boost weak signals, you are best to avoid these as they actually make the situation of an easily overloaded scanner worse. You are probably better off obtaining an attenuator of say, 20-30dB to reduce the level of signal coming out of the pre-selector! Much better than just driving the scanner front-end into overload with resulting spurii generation all over the place. You should also note that some forms of commercially available h.f. antennas claim to have 50Ω outputs and therefore won't need a balun!

Channel	Base TX (MHz)	Handset TX (MHz)
1	31.0375	39.9375
2	31.0625	39.9625
3	31.0875	39.9875
4	31.1125	40.0125
5	31.1375	40.0375
6	31.1625	40.0625
7	31.1875	40.0875
8	31.2125	40.1125

Table 1.

That's It!

I'm afraid that'll have to be it for this month - I've run out of room! Please keep the letters coming in and remember to keep on the right side of all applicable laws - tuning in to transmissions you are not authorised to listen to can result in a fine, confiscation of your equipment, and even imprisonment.

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

Propagation Forecasts

How to use the Propagation Charts.

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

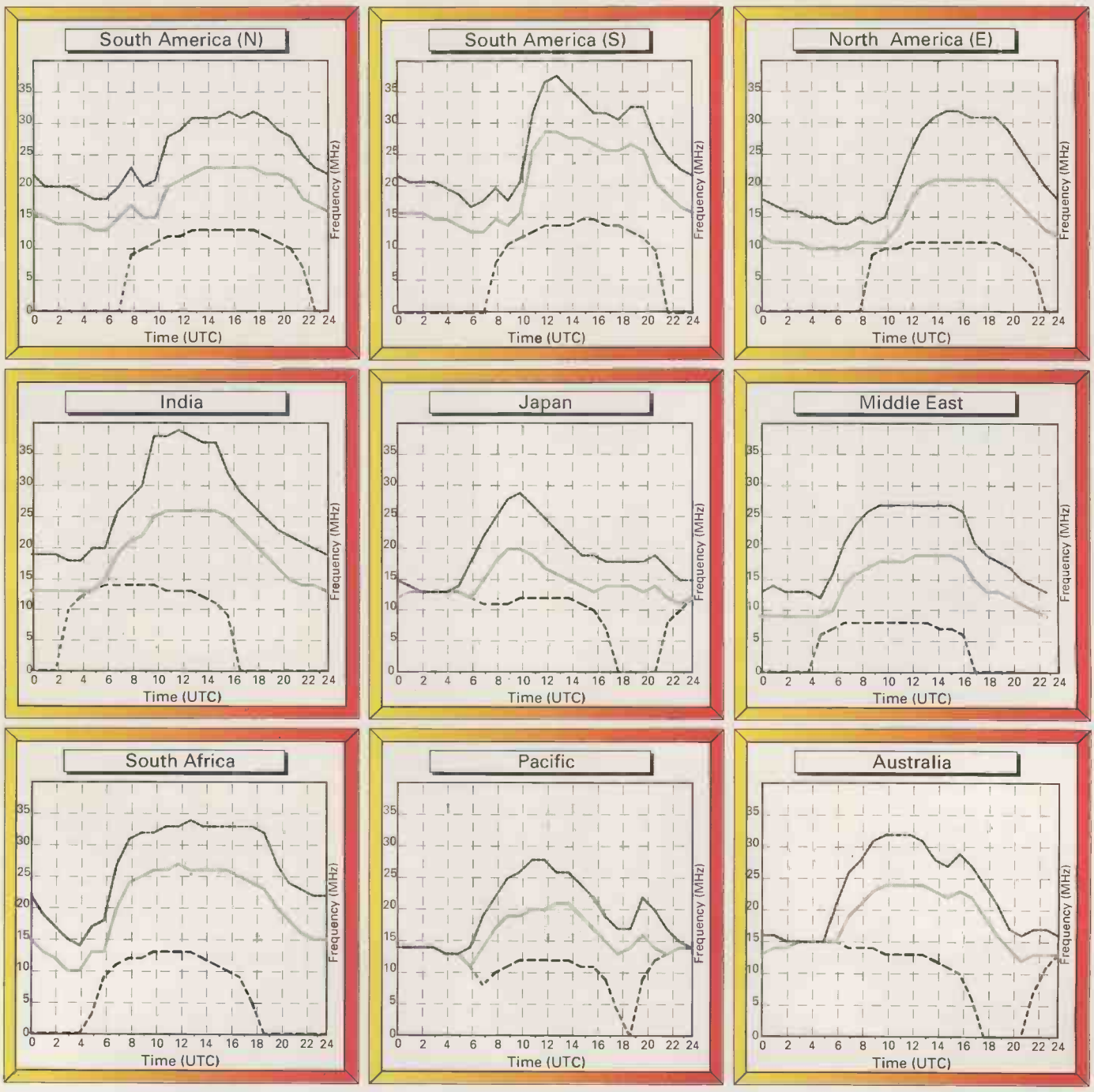
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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

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

Good luck and happy listening.

April 1999
Circuits to London

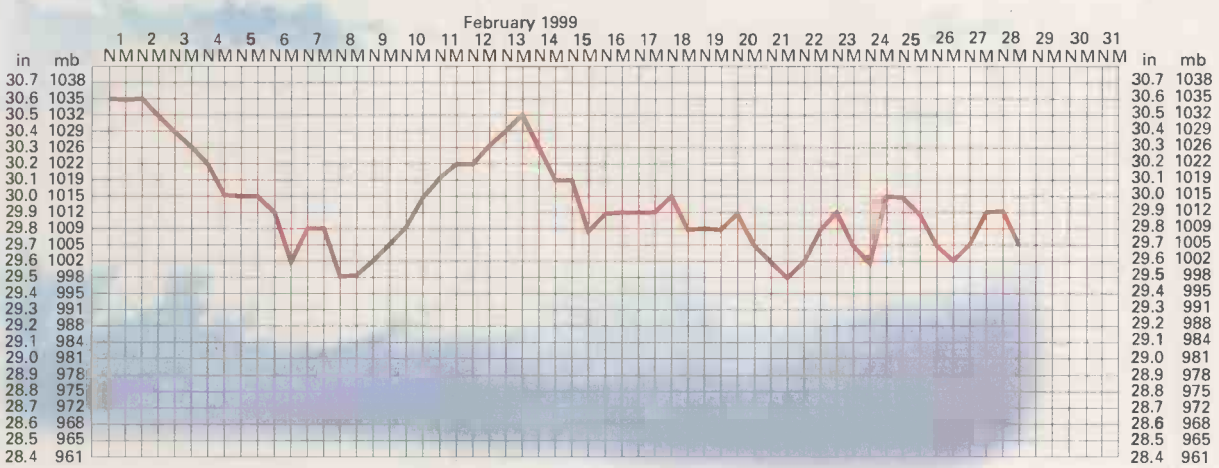


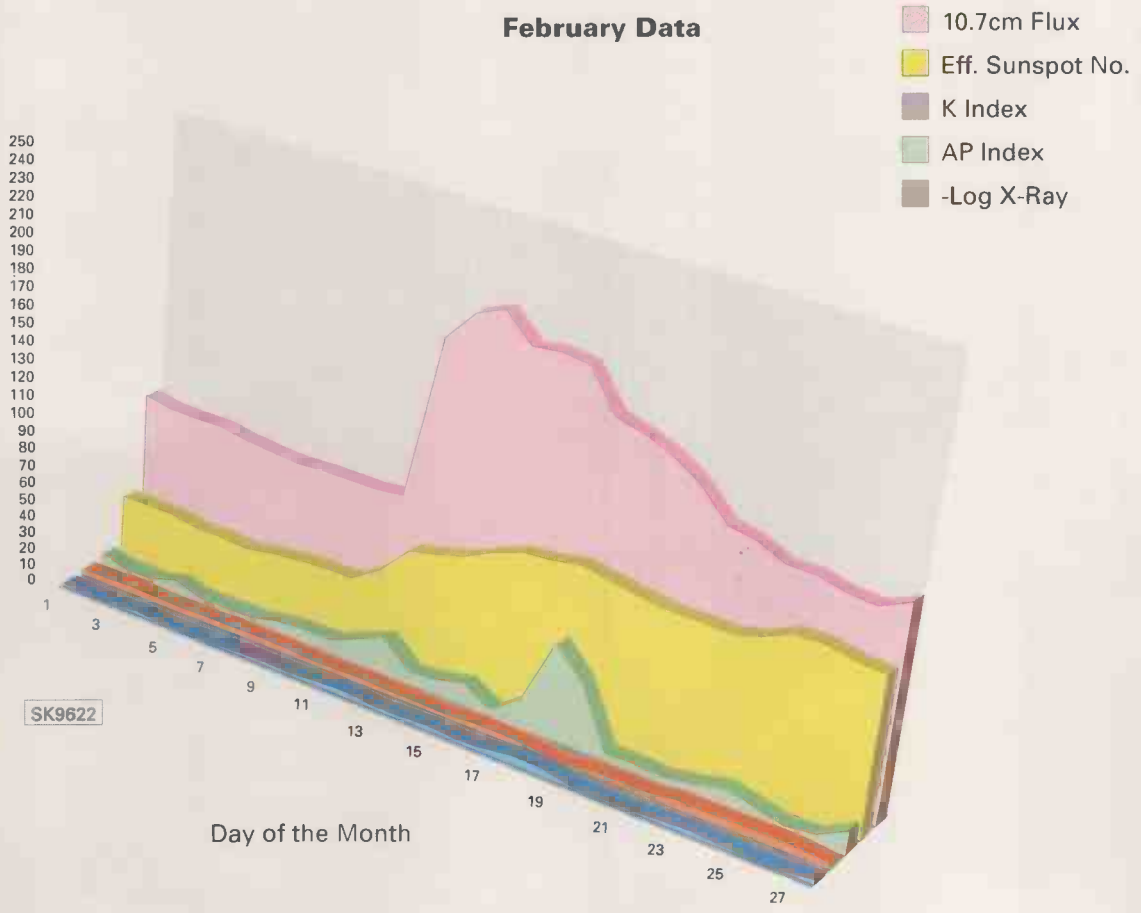
SK9621

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

Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, February 1999.





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.

KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

DX Television

Keep On Writing!

Please send reception reports, news, off-screen photographs and information by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS, United Kingdom.** Please note that photographs can be submitted on PC disk if preferred.

January was not as bad for long-distance TV reception as most enthusiasts had feared. The *Quadrantids* Meteor-Shower produced some activity, although it did take a huge amount of effort and perseverance to reap the rewards.

Reception Reports

Peter Barber (Coventry) has been monitoring NED-1 (Netherlands) on Channel E4 most days. The best time for signals seems to be between 1100 and 1200UTC and from 1400 until 1500UTC. The channel is occasionally enlivened by Meteor-Shower 'pings' from countries further away. Other DXers have noticed that NED-1 on E4 tends to be more prominent before 0900 with signals hovering just above noise-level.

Reception conditions up in the north of England have been extremely poor, according to **Ian Milton** (Tyne and Wear). Digital interference on normally blank channels has not helped matters, neither has a seized-up rotator. If digital interference does prove to have such a devastating effect during future tropospheric lifts, then going mobile may be the only solution.

On January 21 and 22, Peter Barber became aware of an increase in the signal strength of his nearby u.h.f. transmissions, caused by a slight tropospheric lift. **Simon Hockenhull** (Bristol) noticed reception late on the 22nd lasting through until the early hours of the 23rd. It provided excellent colour pictures from Crystal Palace and co-channel effects between Rowridge and Sandy Heath transmissions.

Earlier in the month, **Stephen Michie** (Bristol) identified Belgium and France in Band III.

F2 Reception

For signs of F2-Layer activity, **Brian Williams** (Penarth) regularly listens to the 30-45MHz bands using an IC-756 with a spectrum analyser and pre-amplifier. Already USA/Canadian p.m.r. and utilities, including the Highway Authorities, have been heard around 32MHz.

Brian has sent us details of Australian and New Zealand TV channels which might be received here via F2 propagation. The Queensland outlet was received in the United Kingdom several times during the last two F2 peaks (in the late Seventies and the late Eighties). It could prove to be very useful to enter the following frequencies into your scanner:-

Australia: Channel AU0

RTQ Queensland (100kW) on 46.1718MHz
ABMNO New South Wales (100kW) on 46.2395MHz

New Zealand: Channel NZ1

Te Aroha (100kW) 45.240MHz
Wellington, Hedgehope and Hamilton (all 100kW) on 45.250MHz
Queensbury (100kW) on 45.260MHz

Band III Antenna Design

Having read of **Nigel Williams'** antenna experiments (*SWM* December '98, page 69) Brian Williams (Penarth) has provided details of a Band III antenna design which, although loft mounted, has proved successful over the last fifteen years. It has five elements and covers 175-210MHz (Channels E5 to E10) with a forward gain of around 3.5dBd (see **Fig. 1**). The elements are 6mm in diameter, except the folded dipole, which is 10mm. The antenna should be mounted horizontally with 50Ω coaxial feeder used rather than 75Ω. This is because the feedpoint is more like 45Ω than 75Ω.

The element lengths can be varied slightly to favour the parts of Band III which may be of interest. Brian comments that v.h.f. TV antennas are still to be seen on the chimneys of houses years after the closure of the 405-line system.

Reception Log For January

This month's reception reports have been supplied by Stephen Michie (Bristol) and Simon Hockenhull (Bristol). All times shown are in UTC.

Day	Log
1	Meteor-Shower: Unidentified programmes on Channel E3 at 0822; Sweden (SVT-1) E3 with Cinemascope feature film at 2212 and 2215.
3	Meteor-Shower: Unidentified programmes on E3 at 0758, 1014, 1205, 1740, 1744 and between 1850 and 1900; Sweden or Norway E3 with a subtitled programme at 2229. Tropospheric: Netherlands (NED-1) E4 at 1630; Belgium E8 (RTBF-1) and E10 (VRT TV1); France (Canal Plus) L5.
4	Meteor-Shower: Unidentified Breakfast TV news on E3 at 0711; Finland or Sweden E3 with text page at 0932. Sporadic-E: Unidentified programme on E3 at 1545 (weak signals).
5	Meteor-Shower: Unidentified programmes on E3 at 0735 and 0754; Norway or Sweden E3 with subtitled programme at 2308.
6	Meteor-Shower: Sweden or Norway with text page at 0752.
7	Meteor-Shower: Unidentified Breakfast TV news on E3 at 0733.
8	Meteor-Shower: Unidentified programmes between 1130 and 1145.
9	Meteor-Shower (between 1115 and 1215): Denmark (DR-TV) E3; Netherlands (NED-1) E4.
15	Meteor-Shower: Unidentified programme on E3 at 1708.
23	Tropospheric: Crystal Palace with co-channel effects between Rowridge and Sandy Heath observed.

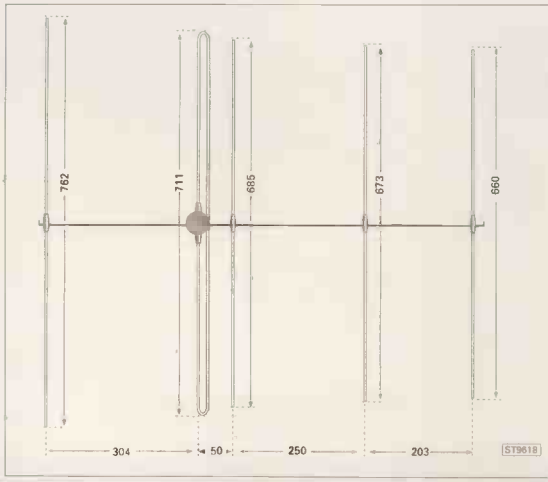


Fig. 1: Details of Brian Williams's 5-element Band III array.

Digital Problems

Digital Terrestrial TV (DTT) has not had quite the impact the broadcasters had hoped for. Patchy reception coverage and the intermittent pixelation of the picture (breaking up into small squares), seems to be the big 'thumbs down' for digital terrestrial reception at the moment. The first problem cannot really be solved without increasing the power of the digital multiplexes, which would result in co-channel problems to other services, both analogue and digital.

The second problem appears to be caused by the effects of locally-generated interference such as thermostat switches, etc. The effect with analogue reception would probably be an insignificant blip on the picture which most viewers would not notice. Unfortunately, with digital transmission, the signal is interrupted and the picture 'freezes' momentarily until the set-top box responds again to the incoming train of digital data. The stop and start effect is extremely irritating. Careful siting of the antenna and the use of double-screened coaxial downlead such as CT-100 should improve matters.

We might add that this problem is more likely to happen in areas of marginal signal strength where a poor signal-to-noise ratio situation exists. Peter Barber adds that when all the problems with digital terrestrial transmissions have abated and the plug is finally pulled on analogue TV, he will revert to s.w.l.ing and save a fortune on the licence fee.

PC Interference Problem

Having sorted out the intermittent interference from his local cable operator, Simon Hockenhull (Bristol) is now experiencing an increase in interference from his neighbour's PC. At times it triggers his scanner on Channels E2, R1 and E3. Fortunately, Simon has cured the problem by using his loft-mounted Band I loop antenna which is mounted towards the rear of the house.

Multi-System Receiver

At the time of writing this column, Comet are selling a Goodmans 13cm multi-system (PAL/SECAM) colour receiver (Model C520) for just £139.95. It boasts systems B, G, I, D, K and L (France), with complete u.h.f./v.h.f. coverage from 48-860MHz. Tuning is manual and the receiver also has baseband audio/video inputs and outputs. The receiver runs off 12V d.c. or via a mains adaptor, which is supplied.

Digital Antenna

Maplin is currently advertising a 'Digital Indoor Aerial', utilising latest technology for a clearer picture (it looks like a normal 4-element Yagi encrusted in black plastic!). Digital compatibility is ensured, and all for only £7.99. Unfortunately, the blurb doesn't say whether it is suitable for good old-fashioned colour TV!

Colourful Column

Nice compliments are what we like to hear (so don't send any complaints - only joking!), so please keep sending them in! **Nick Potter** (Derby) finds the column an interesting read and may one day take the plunge and 'have a go'. Enthused by the 'Getting Started' DXTV Special article in the January '99 issue, **Gary Cunningham** (Ballymena, County Antrim) intends to have a small receiving station up and running by the summer.

George Newport (Canterbury) says "keep up the good work". A slow-scan (SSTV) enthusiast rather than a broadcast band fan, George always reads the column. Peter Barber (Coventry) tells us that the column gets better by the month. Both the revised layout and colour photographs of test cards are the main attractions, as well as the text of course! We were going to include mostly black-and-white pictures this month but, after receiving Peter's letter, we're having second thoughts. Perhaps our Editor, Kevin, can give the monochrome pictures a makeover with his magic electronic paint-box! (*But guys, that would spoil the authenticity*- **Ed.**)

Fig. 2: Martin Dale's DX antenna installation, comprising of a wideband u.h.f. grid with Band III antenna, plus rear-mounted Band I dipole below. Note the home-made alignment bearing or mast stabiliser consisting of an alloy sleeve bracketed to the chimney.

Fig. 3: 405-line transmissions from Alexandra Palace, received in the USA/Canada by F2-Layer propagation in the late Thirties at 45MHz. Photo supplied by Roger Bunney (Romsey).

Fig. 4: Slow-scan (SSTV) picture with greetings from a Spanish enthusiast, received by George Newport (Canterbury).

Fig. 5: A colourful, scenic view via slow-scan TV, received by George Newport (Canterbury).

Fig. 6: This month's 'trip down memory lane' takes us back to the early Seventies, and the logo used by Anglia TV.

THE QUICKEST AND MOST COMPREHENSIVE RADIO BOOK SERVICE IN THE UK

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

SWM Book Store

LISTENING GUIDES

Airband

	Pages	Price
AIR BAND RADIO HANDBOOK 6th Edition. David J. Smith	192	£9.99
AIRCRAFT RADIO FREQUENCIES & GUIDE BOOK 2nd Edition	96	£5.99
AIR TRAFFIC CONTROL 7th Edition. Graham Duke	112	£8.99
AIRWAVES 99	134	£9.95
CALLSIGN 99	168	£9.95
FLIGHT ROUTINGS 1998. Williams	160	£6.95
INTERNATIONAL AIR BAND RADIO HANDBOOK. David J. Smith	192	£9.99
NORTH ATLANTIC FLIGHT COMMUNICATIONS 2nd Edition (Inc. software)	172	£16.50
UNDERSTANDING ACARS 3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn	80	£9.95
VHF/UHF AIRBAND FREQUENCY & CALLSIGN GUIDE. July 1998 Edition	308	£12.50
WORLD AIRLINE FLEET & SELCAL DIRECTORY	300	£16.00
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY 2nd Edition. Robert E. Evans	260	£19.95

Datamodes

FAX & RTTY WEATHER REPORTS. Philip Mitchell	88	£11.50
GUIDE TO UTILITY STATIONS 1999. 17th Edition. Joerg Klingenfuss	580	£30.00
GUIDE TO WORLDWIDE WEATHERFAX SERVICES. 18th Edition. Joerg Klingenfuss	436	£23.00
WEATHER REPORTS FROM RADIO SOURCES. Philip Mitchell	32	£7.50
RADIO DATA CODE MANUAL. 16th Edition. Joerg Klingenfuss	788	£30.00

DXTV

DXTV FOR BEGINNERS. Simon Hamer	31	£3.95
GUIDE TO DX-TV. Keith Hamer & Garry Smith	36	£3.95
GUIDE TO WORLDWIDE TV TEST CARDS	60	£4.95
MASTS - PRACTICAL IDEAS FOR THE DXER. Hamer/Smith	36	£4.95
THIS IS BBC TV - FIRST 30YRS OF TV GRAPHICS. Keith Hamer & Garry Smith	38	£4.95
THE FIRST 30 YEARS OF BBC-2. Keith Hamer & Garry Smith	60	£4.95

Frequency Guides

1999 SHORTWAVE FREQUENCY GUIDE. Joerg Klingenfuss	564	23.00
1999 SUPER FREQUENCY LIST CD-ROM. Joerg Klingenfuss	n/a	£23.00
FERRELL'S CONFIDENTIAL FREQUENCY LIST NEW 11th Edition	450	£19.95
GLOBAL RADIO GUIDE 1999	32	3.95
PASSPORT TO WORLD BAND RADIO 1999	528	£15.50
RADIO LISTENERS GUIDE 1999	128	£4.95
RSGB IOTA DIRECTORY & YEARBOOK 1998/9 (A4 size)	112	£8.95
SHORTWAVE INTERNATIONAL FREQUENCY GUIDE	176	£12.95
VHF-UHF SCANNING FREQUENCY GUIDE. Bill Laver	192	£12.95
WORLD RADIO TV HANDBOOK 1999	640	£19.50

General

BUYING A USED SHORT WAVE RECEIVER 3rd Edition (Booklet). F. Osterman	23	£2.95
GETTING ON TRACK WITH APRS. Stan Horzepa WA1LOU	165	£11.50
POP WENT THE PIRATES. Keith Skues	568	£16.95
RADIO SCIENCE OBSERVATION Volume 1 (inc. CD-ROM). Joe Carr	414	£26.95
SHORT WAVE COMMUNICATIONS. Peter Rouse GU1DKD	187	£4.50
SHORT WAVE RADIO LISTENING FOR BEGINNERS	174	£13.95
SHORTWAVE RECEIVERS PAST & PRESENT (NEW 3rd Edition)	450	£25.95
SHORTWAVE LISTENER'S GUIDE. Ian Poole	192	£14.95
THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK New 5th Edition Andrew Yoder	410	£19.95

Maritime

DIARY OF A MARITIME RADIO OFFICER. Ross Bradshaw	230	£12.95
ELECTRONICS AFLOAT. Tim Bartlett	92	£11.95
GMDSS EDITIONS MARINE SSB OPERATION. Michael Gale	96	£11.95
GMDSS EDITIONS MARINE VHF OPERATION. Michael Gale	48	£7.95
GMDSS FOR SMALL CRAFT. Alan Clemmetsen	94	£11.95
RADAR FOR SMALL CRAFT. Tim Bartlett	96	£11.95
SCANNING THE MARITIME BANDS. 2nd Edition	158	£9.75
SHORTWAVE MARITIME COMMUNICATIONS. B. E. Richardson	195	£16.50
SHIP TO SHORE RADIO FREQUENCIES. Ken Davies	95	£5.99
SIMPLE ELECTRONIC NAVIGATION. 2nd Edition. Mike Chenery	64	£8.95
SIMPLE GPS NAVIGATION. Mik Chinery	96	£10.95
WATCHERS OF THE WAVES. Brian Faulkner	118	£13.50

Satellite

AN INTRODUCTION TO SATELLITE COMMUNICATIONS BP326.F. A. Wilson	230	£5.95
ARRL SATELLITE ANTHOLOGY 4th Edition	150	£9.50
NEWNES GUIDE TO SATELLITE TV. Derek Stephenson	371	£19.95
SATELLITE HANDBOOK (ARRL) New Edition Martin Davidoff K2UBC	370	£15.50
SATELLITE PROJECTS HANDBOOK. Lawrence Harris	174	£14.99
SATELLITE TELEVISION. A layman's guide. Peter Pearson	73	£1.00
WEATHER SATELLITE HANDBOOK. 5th Edition. Dr Ralph E. Taggart WB8DQT	192	£15.50

Scanning

AN INTRODUCTION TO SCANNERS AND SCANNING BP311. I. D. Poole	152	£4.99
SCANNER BUSTERS 2. D.C. Poole	100	£6.00
SCANNERS 2 INTERNATIONAL. Peter Rouse GU1DKD	261	£10.95
SCANNERS 3 PUTTING SCANNERS INTO PRACTICE. 4th Revision. Peter Rouse	271	£10.95
SCANNING SECRETS. Mark Francis	280	£16.95
UK SCANNING DIRECTORY 6th Edition	540	£18.50

AMATEUR RADIO

Amateur Television

AN INTRODUCTION TO AMATEUR TELEVISION. Mike Wooding G6IQM & Trevor Brown G8CJS	156	£5.00
SLOW SCAN TELEVISION EXPLAINED. Mike Wooding G6IQM	156	£5.00
THE AMATEUR TV COMPENDIUM. Mike Wooding G6IQM	104	£3.50

Antennas & Transmission Lines

25 SIMPLE AMATEUR BAND AERIALS BP125. E.M. Noll	63	£1.95
25 SIMPLE INDOOR AND WINDOW AERIALS BP136. E.M. Noll	50	£1.75
25 SIMPLE SHORT WAVE BROADCAST BAND AERIALS BP132. E.M. Noll	63	£1.95
25 SIMPLE TROPICAL AND MW BAND AERIALS BP145. E.M. Noll	54	£1.75
ANTENNA EXPERIMENTERS GUIDE (RSGB). Peter Dodd G3LDO	160	£15.00
ANTENNA IMPEDANCE MATCHING (ARRL). Wilfred N. Caron	195	£15.50
ANTENNAS FOR VHF AND UHF BP301. I.D. Poole	104	£4.95
ANTENNAS & TECHNIQUES FOR LOW BAND DXING (ARRL)	394	£15.50
ANTENNA TOOLKIT (inc. CD-ROM). Joseph J. Carr	214	£25.00
ARRL ANTENNA BOOK 18th Edition	732	£24.00
ARRL ANTENNA BOOK ON CDROM	n/a	£28.00
ARRL ANTENNA COMPENDIUM Volume One	175	£10.50
ARRL ANTENNA COMPENDIUM Volume Two	208	£10.50
ARRL ANTENNA COMPENDIUM Volume Three. Edited by Jerry Hall K1TD	236	£11.50
ARRL ANTENNA COMPENDIUM Volume Four	204	£16.50
ARRL ANTENNA COMPENDIUM Volume Five	200	£16.50
BEAM ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX	268	£8.95
BUILDING & USING BALUNS. Jerry Sevick	125	£18.95
CUBICAL QUAD ANTENNAS 3rd Edition. William Orr W6SAI and Stuart Cowan W2LX	110	£8.95
EXPERIMENTAL ANTENNA TOPICS BP278. H.C. Wright	70	£3.50
G-QRP CLUB ANTENNA HANDBOOK. Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRI/GW0LNQ	155	£7.25
HF ANTENNA COLLECTION (RSGB). Edited by Erwin David G4LQI	233	£10.99
HF ANTENNAS FOR ALL LOCATIONS (RSGB). Les Moxon G6XN	322	£14.65
MORE OUT OF THIN AIR (PWP)	112	£6.95
PRACTICAL ANTENNAS FOR NOVICES. John Heys G3BDQ	52	£6.30
PRACTICAL ANTENNA HANDBOOK 3rd Edition. (Inc. software) Joseph J. Carr	580	£33.45
PRACTICAL WIRE ANTENNAS RSGB. John Heys G3BDQ	100	£8.95
RADIO AMATEUR ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX	188	£8.50
RECEIVING ANTENNA HANDBOOK. Joe Carr	189	£17.50
SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS.		
THE TRUTH ABOUT CB ANTENNAS. (Orr & Cowan)	224	£8.95
W.I. Orr W6SAI & S.D. Cowan W2LX	188	£8.95
VERTICAL ANTENNAS. W.I. Orr W6SAI & S.D. Cowan W2LX	192	£8.95
W1FB'S ANTENNA NOTEBOOK (ARRL). Doug DeMaw W1FB	123	£8.00

Beginners (inc RAE)

AN INTRODUCTION TO AMATEUR RADIO - New Edition. Ian Poole G3YWX	150	£4.99
BASIC RADIO PRINCIPLES & TECHNOLOGY. Ian Poole G3YWX	262	£14.99
BASIC RADIO & ELECTRONIC CALCULATIONS. Ray Petri G0OAT	160	£13.95
AN RAE STUDENTS NOTEBOOK. Bob Griffiths G7NHB	76	£6.95
HOW TO PASS THE RADIO AMATEURS' EXAMINATION (RSGB) Clive Smith G4FZH and George Benbow G3HB	88	£8.75
PRACTICAL RECEIVERS FOR BEGINNERS (RSGB). John Case GW4HWR	165	£12.50
THE NOVICE RADIO AMATEURS EXAMINATION HANDBOOK (BP375) Ian Poole G3YWX	150	£4.95
THE RADIO AMATEURS' QUESTION & ANSWER REFERENCE MANUAL. Fifth Edition. Ray Petri G0OAT	208	£13.95
RADIO AMATEURS EXAMINATION/END OF COURSE TEST PAPERS. Ray Petri G0OAT	104	£13.95
RAE MANUAL (RSGB). New Revised Edition. G.L.Benbow G3HB	127	£12.75
RAE REVISION NOTES (RSGB). G.L.Benbow G3HB	92	£5.25
THE NOVICE LICENCE STUDENT'S NOTEBOOK. John Case GW4HWR	124	£5.00
SHORTWAVE RADIO LISTENING FOR BEGINNERS. Anita Louise McCormick KA8KGI	176	£14.95
TRAINING FOR THE NOVICE LICENCE A MANUAL FOR THE INSTRUCTOR (RSGB) John Case GW4HWR	101	£6.75
YOUR FIRST AMATEUR STATION. (RSGB) Colin Redwood G6MXL	120	£5.75

Callbooks

JOINT INT/N AMERICAN CALLBOOK CD-ROM	n/a	£40.00
RSGB CALLSEEKER CD-ROM 1999	n/a	£14.50
RSGB YEARBOOK 1999 EDITION	432	£14.50

Computing

AN INTRODUCTION TO THE WORLDWIDE WEB FOR PC AND MAC USERS. (BP390) D.C & O. Bishop	148	£6.99
ELECTRONIC PROJECTS FOR YOUR PC BP320. R.A.Penfold	102	£3.99
E-MAIL ON THE INTERNET. BP420	156	£6.99
GETTING THE MOST FROM YOUR PC HARD DISK BP280	90	£3.95
HOW TO EXPAND & UPGRADE YOUR PC BP450 R. A. Penfold	170	£ 6.99
INTERFACING PCs AND COMPATIBLES BP272. R. A. Penfold	86	£4.99
MS-OFFICE ONE STEP AT A TIME (BP402)	77	£5.95
MS WORKS FOR WINDOWS 95 EXPLAINED BP405	175	£5.95
NEWNES COMPUTER ENGINEER'S POCKET BOOK Third Edition. Michael Tooley	256	£12.95
PERSONAL COMPUTERS IN THE HAM SHACK (ARRL)	284	£11.50
THE INTERNET AND WORLD WIDE WEB EXPLAINED. J. Shelley	130	£5.95
WINDOWS '98 ASSISTANT (BP454) I. Sinclair	160	£6.99
WINDOWS '98 EXPLAINED (BP456). N. Kantaris & P. Oliver	160	£6.99
WINDOWS '98 - HAND DISK & FILE MANAGEMENT. (BP455) J. Gatendy	160	£6.99

	Pages	Price

EMC

ARRL RFI BOOK (Practical Cures For Radio Freqeuncy Interference)		£15.50
INTERFERENCE HANDBOOK. William R. Nelson WA6FQG.	250	£9.50
RSGB GUIDE TO EMC. 2nd Edition. Robin Page-Jones G3JWI.	204	£18.50

Historical

100 RADIO HOOK UPS. 2nd Edition (reprinted)	48	£3.35
1934 OFFICIAL SHORT WAVE RADIO MANUAL. Edited by Hugo Gernsback.	260	£11.85
COMMUNICATIONS RECEIVERS - THE VACUUM TUBE ERA. R.S. Moore	141	£17.95
CRYSTAL SET BUILDING & MORE (Inc Newsletters Vol 6 & 7 of Xtal Set Society)	98	£11.00
CRYSTAL SET PROJECTS. Phil Anderson	160	£10.00
DOUBLE TESLA-OUDIN COIL	24	£3.95
EXPERIMENTAL TELEVISION (1932)	312	£11.75
HEATHKIT - A GUIDE TO AMATEUR RADIO PROJECTS. C. Penson	248	£21.95
HENLEYS 222 RADIO CIRCUIT DIAGRAMS (1924)	271	£9.45
HOW TO BUILD YOUR FIRST VACUUM TUBE REGENERATIVE RECEIVER. T.J. Lindsay	127	£7.30
HOW TO BUILD YOUR RADIO RECEIVER (A4) (Popular Radio Handbook No. 1)	100	£6.95
OLD TIME RADIOS - RESTORATION & REPAIR. J. Carr.	256	£20.95
RADIO TESLA - THE SECRET'S OF TESLA'S RADIO AND WIRELESS POWER	36	£5.30
SECRETS OF HOMEBUILT REGENERATIVE RECEIVERS (Rockey)	127	£7.95
SEEING BY WIRELESS - THE STORY OF BAIRD TELEVISION. Ray Herbert	27	£4.95
TESLA COIL	24	£3.95
TESLA - THE LOST INVENTIONS	32	£4.75
THE XTAL SET SOCIETY NEWSLETTER. Volume 1 & 2 Combined. Phil Anderson W0XI.	96	£14.00
THE CRYSTAL SET HANDBOOK & VOL. 3 XTAL NEWSLETTER. Phil Anderson W0XI	130	£8.00
THE XTAL SET SOCIETY NEWSLETTER. Volume 4. Phil Anderson W0XI	88	£7.00
THE CRYSTAL SET HANDBOOK & VOL. 5 XTAL NEWSLETTER. Phil Anderson W0XI	88	£7.00
THE TESLA HIGH FREQUENCY COIL (1910).	120	£6.95
CRYSTAL RADIO HISTORY, FUNDAMENTALS AND DESIGN. P.A. Kinzie	122	£8.00
THOSE GREAT OLD HANDBOOK RECEIVERS (1929 + 1934)	94	£6.95
VISION BY RADIO (1925) (Jenkin)	140	£7.85
WIRELESS FOR THE WARRIOR VOL. 1 (Wireless Sets 1-88)	204	£27.50
WIRELESS FOR THE WARRIOR VOL. 2 (Hardback - Standard Sets of World War II)	430	£36.00

Maps & Log Books

AMATEUR RADIO LOGBOOK (RSGB).	50	£3.75
AMATEUR RADIO WORLD ATLAS (A4 SIZE)	20	£8.00
GREAT CIRCLE MAP 600mm x 600mm	n/a	£1.50
NORTH ATLANTIC ROUTE CHART.	740 x 520mm	£8.50
QTH LOCATOR MAP OF EUROPE. New Edition	1080 x 680mm	£7.00
RADIO AMATEURS MAP OF THE WORLD. New Edition	980 x 680mm	£7.00
RECEIVING STATION LOG BOOK (RSGB).	60	£3.75
RSGB 1998 PREFIX GUIDE.	32	£6.25

Morse

SECRETS OF LEARNING MORSE CODE Mark Francis	84	£6.95

Microwaves

AN INTRODUCTION TO MICROWAVES (BP312). F.A. Wilson	134	£3.95
ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL. Various Authors	446	£15.50
ARRL UHF/MICROWAVE PROJECT MANUAL VOL 2	160	£11.50
ARRL UHF/MICROWAVES PROJECT MANUAL (ARRL)	352	£15.50
MICROWAVE & WIRELESS COMMUNICATIONS TECHNOLOGY. Joseph J. Carr	436	£27.50
MICROWAVE HANDBOOK - COMPONENTS & OPERATING VOL 1 (RSGB)	110	£10.50
MICROWAVE HANDBOOK - CONSTRUCTION & TESTING VOL 2 (RSGB)	120	£15.75
MICROWAVE HANDBOOK - BANDS & EQUIPMENT VOL 3 (RSGB)	140	£15.75
OR BUY ALL 3 FOR		£34.00

Operating & Handbooks

ALL ABOUT HAM RADIO. Harry Helms	290	£16.50
AMATEUR RADIO OPERATING MANUAL (RSGB). Ray Eckersley G4FTJ	249	£12.23
ARRL HANDBOOK 1999 76th Edition	380	£24.00
ARRL HANDBOOK 1999 ON CD-ROM	n/a	£33.00
ARRL OPERATING MANUAL NEW EDITION.	420	£18.50
ARRL RADIO BUYERS SOURCEBOOK VOL1 1 (QST Reviews 1981-1991)	280	£11.50
ARRL RADIO BUYERS SOURCEBOOK VOL1 2 (QST Reviews 1991-1993)	240	£11.50
COMPLETE DX'ER. Bob Locher	204	£9.50
DISCOVERING DXING (2nd Edition). John Zondlo	90	£7.50
HAM RADIO MADE EASY (ARRL). Steve Ford	204	£11.50
HINTS AND KINKS FOR THE RADIO AMATEUR. Edited by Charles L. Hutchinson and David Newkirk.	129	£9.50
LOW PROFILE AMATEUR RADIO (ARRL). Jim Kearman KR1S	124	£7.50
SETTING UP AN AMATEUR RADIO STATION BP300. I.D. Poole	81	£3.95
TRANSMITTER HUNTING - RADIO DIRECTION FINDING SIMPLIFIED. Joseph D. Moell & Thomas N. Curlee.	325	£24.95

Packet

HF DIGITAL COMPANION. Steve Ford	120	£7.50
NOS INTRO: TCP/IP OVER PACKET RADIO. Ian Wade G3NRW	356	£11.50
PACKET RADIO PRIMER (RSGB). Dave Comber G8UYZ & Martyn Corfi G8NZU.	266	£8.95
PACKET, SPEED & MORE SPEED APPLICATIONS (ARRL)	148	£10.50
PRACTICAL PACKET RADIO. Stan Horzepa	140	£10.50
YOUR PACKET COMPANION. Steve Ford WB8IMY	170	£7.50

Propagation

AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293. J.G. Lee	116	£3.95
YOUR GUIDE TO PROPAGATION (RSGB) Ian Poole	88	£6.95

QRP

QRP POWER (ARRL)	188	£11.50
G-QRP CLUB CIRCUIT HANDBOOK. Edited by Rev. G. Dobbs G3RJV.	96	£9.00
INTRODUCING QRP. Dick Pascoe G0BPS	48	£6.95
W1FB's QRP NOTEBOOK (ARRL). 2nd Edition. Doug DeMaw W1FB.	175	£8.00

Test Equipment

AN INTRODUCTION TO THE ELECTROMAGNETIC WAVE BP315. F.A. Wilson	122	£4.95
BUILD YOUR OWN TEST EQUIPMENT. Davidson	285	£19.95
GETTING THE MOST FROM YOUR MULTIMETER BP239. R.A. Penfold.	102	£2.95
HANDS-ON GUIDE TO OSCILLOSCOPES. Barry Ross.	228	£20.95
HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT BP267. R.A. Penfold	104	£3.50
MORE ADVANCED TEST EQUIPMENT CONSTRUCTION BP249. R.A. Penfold.	102	£3.50
MORE ADVANCED USES OF THE MULTIMETER BP265. R.A. Penfold.	96	£2.95
OSCILLOSCOPES - HOW TO USE THEM/HOW THEY WORK. 4th edition. Ian Hickman	259	£16.95
PRACTICAL TRANSMITTERS FOR NOVICES. John Case GW4HWR.	126	£12.30
TEST EQUIPMENT FOR THE RADIO AMATEUR. Clive Smith G4FZH	170	£10.95

VHF

ALL ABOUT VHF AMATEUR RADIO. W. I. Orr W6SAI.	163	£8.85
VHF/UHF HANDBOOK (RSGB). Dick Biddulph G8PDS	180	£18.75

ELECTRONICS

General

BEGINNERS GUIDE TO MODERN ELECTRONIC COMPONENTS BP285	166	£4.99
CIRCUIT SOURCE BOOK 1 - BP321. R.A. Penfold	182	£4.95
CIRCUIT SOURCE BOOK 2 - BP322. R.A. Penfold	214	£4.95
DIGITAL ELECTRONICS (CDROM). Mike Tooley	n/a	£45.00
ELECTRONIC PROJECT BUILDING FOR BEGINNERS. R. Penfold. (BP392)	110	£4.95
FAULT FINDING ELECTRONIC PROJECTS BP391	133	£4.99
GETTING STARTED IN PRACTICAL ELECTRONICS BP345. Owen Bishop	198	£4.95.
HOW ELECTRONIC THINGS WORK ... AND WHAT TO DO WHEN THEY DON'T, Goodman .		£16.95
HOW TO TEST ALMOST EVERYTHING ELECTRONIC	326	£16.95
NEWNES AUDIO AND HI-FI ENGINEER'S POCKET BOOK 3rd Edition. Vivian Capel.	210	£14.95
PARTS GALLERY & ELECTRONICS CIRCUITS & COMPONENTS (CDROM). Mike Tooley	n/a	£35.00
PICTUTOR (CDROM). John Decker	n/a	£45.00
POWER SUPPLY PROJECTS BP76. R.A. Penfold	89	£3.99
PRACTICAL DIGITAL ELECTRONICS FOR TECHNICIANS. Will Kimber	262	£19.95
PRACTICAL ELECTRONIC FILTERS BP299. Owen Bishop.	89	£4.95
PRACTICAL ELECTRONICS HANDBOOK. Ian Sinclair.	439	£14.95
PRACTICAL OSCILLATOR CIRCUITS BP393. A. Flind.	136	£4.99
PREAMPLIFIER & FILTER CIRCUITS BP309. R.A. Penfold.	92	£3.95
RADIO ENGINEERS FACTFINDER FOR WINDOWS (Floppy Disk) John Davies	n/a	£18.00
SCROGGIES - FOUNDATIONS OF WIRELESS & ELECTRONICS. 11th Edition	292	£19.95
TEST EQUIPMENT CONSTRUCTION BP248. R.A. Penfold.	104	£3.99
THE ART OF SOLDERING BP324. R. Brewster	84	£3.99
UNDERSTANDING BASIC ELECTRONICS (ARRL)	314	£15.50
UNDERSTANDING DIGITAL TECHNOLOGY. F. Wilson. (BP376)	110	£4.95
VALVE AMPLIFIERS. Morgan Jones.	374	£25.00
VALVE & TRANSISTOR AUDIO AMPLIFIERS. John Lindsay Hood.	310	19.95
W1FB's DESIGN NOTEBOOK (ARRL). Doug DeMaw W1FB.	195	£8.00

Data

ARRL ELECTRONICS DATA BOOK. Doug DeMaw W1FB.	260	£8.95
ELECTRONIC HOBBYIST DATA BOOK BP396. R.A. Penfold	242	£5.95
LF SOURCE BOOK (RSGB) 2nd Edition. Peter Dodd	130	£7.50
PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE BP53. F.A. Wilson.	249	£3.95
PRACTICAL ELECTRONIC DESIGN DATA BP316. Owen Bishop.	327	£5.99
PRACTICAL RF HANDBOOK (2nd Edition). Ian Hickman.	302	£19.95
RF CIRCUIT DESIGNS. Chris Bowick	176	£18.95
SECRETS OF RF CIRCUIT DESIGN. New Edition (Hardback) Joseph Carr	405	£41.95
SOLID STATE DESIGN FOR THE RADIO AMATEUR (ARRL) Les Hayward W7ZOI & Doug DeMaw W1FB	256	£11.50
SPREAD SPECTRUM SOURCE BOOK	320	£15.50
TOWERS INTERNATIONAL MOSPOWER & OTHER FET SELECTOR	140	£19.95
TOWERS INTERNATIONAL TRANSISTOR SELECTOR - UPDATE 5	476	£24.95
TRANSISTOR DATA TABLES (BP401)	178	£5.95

Projects

35 OPTO-DISPLAY TERMINAL BLOCK PROJECTS BP140	104	£4.99
BUILD YOUR OWN INTELLIGENT AMATEUR RADIO TRANSCEIVER. Randy L. Henderson.	350	£25.95
COIL DESIGN & CONSTRUCTION MANUAL BP160. B.B. Babani	106	£3.95
HOW TO DESIGN & MAKE YOUR OWN PCBs BP121. R.A. Penfold	66	£2.50
MORE ADVANCED POWER SUPPLY PROJECTS BP192. R.A. Penfold	92	£2.95
PROJECTS FOR RADIO AMATEURS & SWLs BP304. R.A. Penfold	92	£3.95
RADIO RECEIVER PROJECTS YOU CAN BUILD.	312	£20.95
SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275. R.A. Penfold	88	£3.95

Valves/Tubes

ELECTRON TUBE LOCATOR. George H. Fathauer	350	£21.95
ESSENTIAL CHARACTERISTICS (TUBES & TRANSISTORS) (Original publishers General Electric) Re-published by Antique Electronic Supply (Arizona)	475	£10.50
HANDBOOK OF RADIO, TV, INDUSTRIAL & TRANSMITTING TUBE & VALVE EQUIVALENTS	60	£2.95
RADIO VALVE GUIDE BOOK VOL 1	54	£2.95
RADIO VALVE GUIDE BOOK VOL 2	42	£2.95
RADIO VALVE GUIDE BOOK VOL 3	40	£2.95
RADIO VALVE GUIDE BOOK VOL 4	48	£2.95
RADIO VALVE GUIDE BOOK VOL 5	44	£2.95
RCA RECEIVING TUBE MANUAL (Original Publishers Radio Corporation Of America). Re-published by Antique Electronic Supply (Arizona)	384	£10.50
RCA TRANSMITTING TUBES (Original Publisher Radio Corporation of America) Re-published by Antique Electronic Supply (Arizona)	318	£10.50
TUBE SUBSTITUTION HANDBOOK.	150	£15.50

■ MIKE RICHARDS G4WNC, PO BOX 1863, RINGWOOD, HANTS BH24 3XD
■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: http://www.btinternet.com/~mikespage

Decode

Air Waves in Danger!

Regular readers will recall I recently made mention of the worrying plans a few electricity companies have to send high speed data over the mains power distribution network. The problem comes from the potentially high levels of r.f. power that will be radiated by these systems. If the initial predictions are true, this could seriously effect many radio users and put our hobby under threat.

Although opposition to these schemes was sketchy at first, it looks as though things are beginning to pick-up. The latest news has come from an article kindly sent to me by **Dave Miller**. In their December *IEE News* they report that the Radiocommunications Agency has backed the IEE's warnings over plans for data via the mains. "The Agency says it is concerned about the potential degradation of the lower portion of the high frequency spectrum and has given its assurance that everything that can be done to make such systems compatible will be considered".

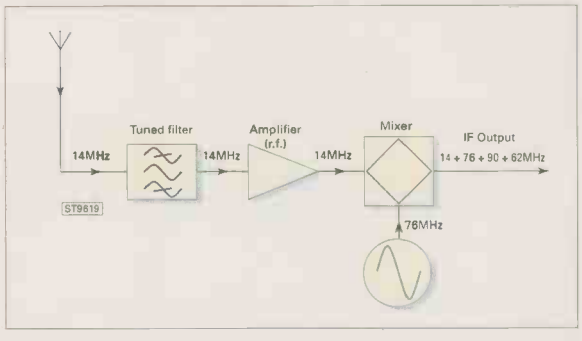
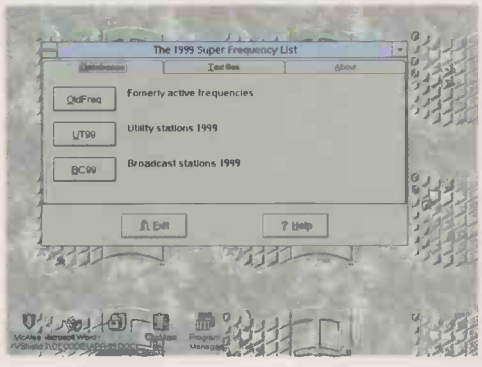


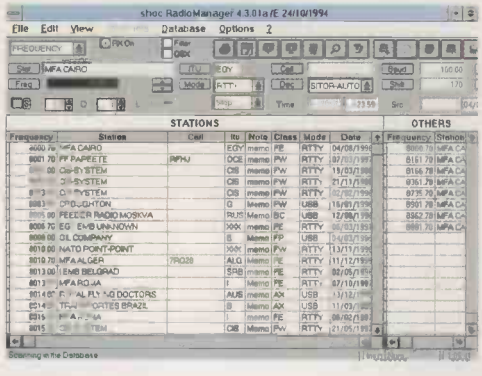
Fig. 1: Receiver front-end.

RA Chief Executive **David Hendon** told the Institute, "however, the view that the Agency has developed, as a result of several months of trials in its own laboratories and from measurements around a test site at Guildford and at Manchester, aligns with the IEE's comment that the level of leakage is not compatible with the use of the h.f. radio spectrum for wireless communications. We have also evaluated the harmonics of the fundamental frequencies involved and with the current equipment and found that the levels are not acceptable. It is clear that the mains network was never intended to support such a system and the inevitable leakage at frequencies above 50Hz is unacceptable."



Main menu for the *Klingenfuss Super Frequency List.*

Clearly the support is growing, but don't give-up. I would also be interested to hear from any 'Decode' readers based around Manchester or Guildford who have noticed increased noise levels over the past few months.



Radio Spectrum Manager Demo.

Preselector Or ATU?

Over the past few months I've received a number of questions from readers about the relative merits of using pre-selectors or a.t.u.s for utility monitoring. The latest to come my way is from **Andrew Morley** in Redhill. Andrew uses an AR3000 scanner and has recently started using it for the reception of h.f. utilities. However, he's suffering problems with interference from high power medium wave broadcast stations and asks for advice on how he might fix this. He also asks whether or not a pre-selector would be a good idea.

Andrew is certainly not alone with this problem, and it's particularly common with those listeners using a wide range receiver. That's not to cast doubts on these receivers, but more a recognition of the design difficulties of producing very wide frequency range receivers. However, the problem can also afflict conventional communications receivers. The other important point is that the performance deterioration caused by strong signals tends to effect utility signals much more severely than broadcast or other speech services.

Let's start with a look at the first stages of a typical receiver to see the problems that can be caused by strong signals being presented to the receiver's antenna socket. You will need to refer to the block diagram in **Fig. 1** for this.

The very first stage is the input tuned circuit which has two main functions. The first is to provide impedance matching between the antenna and the receiver's first stage of signal processing. The second is to provide some filtering to make sure only the wanted signals get through and to get rid of the strong unwanted signals we're discussing here.

In the example, I've shown a radio frequency amplifier stage. Not all receivers have these and, whilst they might sound like a good idea, they can make the overload problems even worse. The next stage is probably one of the most critical areas from the point of view of the designer. Let's just run through what it has to do and why it's used.

You will find a mixer at the front-end of all superhet receivers as it's fundamental to their operation. One of the key points about the superhet receiver system is that the tiny r.f. voltages from the antenna are converted to a fixed frequency in the early stages in the receiver. By converting the signals to a fixed frequency, the design of the rest of the receiver becomes very much simpler. This is especially true with the design of the very narrow and well controlled filters we take for granted.

Let's just look at what the mixer does. On one connection or port you will find the r.f. signal whilst the other port will have a relatively powerful local oscillator signal. Inside the mixer, the circuitry puts these two signals together and provides four combined signals at it's output. These are the two original signals (r.f. and local oscillator) plus two new signals, which are known as the sum and difference signals. These are simply the r.f. plus the local oscillator and the r.f. minus the local oscillator.

Here's a simple example with a few numbers to illustrate the point. Wanted r.f. signal = 14.0MHz, Local Oscillator = 76MHz, Mixer Output = 14.0MHz, 76MHz, 90MHz, 62MHz. In this example, the frequency we want to keep is 62MHz, this is called the Intermediate Frequency or i.f. To create this, all you have to do is pass the mixer output through a relatively easy to design filter that will pass 62MHz but reject the rest.

In a modern receiver you will find that the signal will go through a further mixer later in the receiver then bring the i.f. down to a much lower frequency where the design of well controlled narrow filters is much easier. Now we've covered the receiver basics, let's see what goes wrong when we encounter a very strong signal on a different band.

If you are using the common random wire antenna, you will find there's nothing in the antenna's design to stop medium wave signals so you can be sure they will be presented to the antenna socket of your receiver! The next chance to keep these signals out comes from that initial filter just before the r.f. amplifier.

However, there is a bit of a design problem here. If you are designing a very wide range receiver, how are you going to put together an effective filter that will follow your tuning? The answer is with great difficulty. As a result, you will find that some of the cheaper receivers have virtually no front-end filtering at all.

Ok, so our unwanted powerful medium wave signal has got to the r.f. amplifier - what happens next? Unless the r.f. amplifier

has been particularly well designed it may well go into overload. If you want an idea of what happens next, you only need to recall that rock guitarists make use of overload to produce the rich distorted sounds they use.

Put simply, overload means the r.f. amplifier will generate all manner of extra, spurious signals that you don't want! You can bet your boots that some of these will be in the band of frequencies you're trying to monitor! Now the mixer can't tell the difference between real signals and rubbish from the r.f. amplifier, so it will duly translate them to the i.f. frequency so they can pass through the rest of the receiver.

You may also find the powerful signals coming from the r.f. amplifier cause the mixer to go into overload. This will result in distortion and spurious signals being generated within the mixer which will be translated into rubbish around our wanted signal. Another effect of these distorted and unwanted signals is that they tend to desensitise the receiver. This means that the receiver's overall sensitivity is reduced so the level of our wanted signal is reduced probably to the point where it can no longer be heard!

So, what does a receiver suffering overload sound like? In fact, it usually sounds quite lively. If you just quickly tune around the bands you will hear what sounds like loads of signals. However, if you try and resolve them you will find that they are just noises and not real signals at all. You may also find signals that appear to be in the wrong place, i.e. broadcast stations in the middle of the 14MHz amateur band. This is a result of all the spurious signals round the mixer that can cause all manner of strange effects.

Let's take a look at how we can give your receiver a helping hand. There are plenty of things that can be done - most of which are very cheap! First of all, I would be very wary of connecting a long, random wire antenna to most wide range receivers (i.e. h.f. - v.h.f. - u.h.f). A more modest antenna is likely to give a much better overall result.

Next hot tip is to check your receiver's owners' manual and see if it has an r.f. amplifier. If it does, you need to see if it can be turned-off! Whilst the r.f. amplifier is generally fine if you're going to be working with a short whip antenna, they are frequently **very** bad news if you connect a decent antenna.

Another useful and relatively cheap trick is to make use of an attenuator. This is just a simple combination of resistors designed to reduce the level of signal getting to the receiver. You may find you have one built-in to your receiver but, if not, they are readily available from radio and electronic shops. If you're just going to buy one, I would advise going for 20dB.

If you have a problem with a particular local station rather than general high power signals, you could try a different tack. If you fancy some home construction you could build a very simple r.f. trap to shunt this one station away. The trap uses the effect presented by a series resonant circuit (capacitor and inductor connected in series).

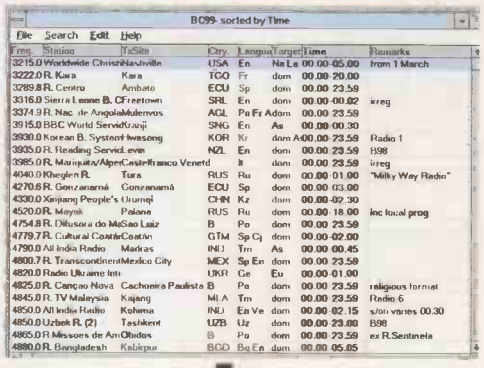
At the resonant frequency of this combination, the circuit acts rather like a short circuit. However, at all other frequencies it has very little effect. If you were to connect this directly across our antenna socket you should be able to significantly reduce the level of the offending signal without effecting anything else.

If you want to try this, I would suggest you start with the circuit in **Fig. 2** with the following values. L1 = 470µH (Maplin min. radial lead inductor Cat AH36P) C2 = 0-50pF (Maplin 6mm trimmer capacitor Cat VI63T) C1 = This needs to be selected to suit the station you're trying to reject according to this table:

kHz	C1 (pF)	
520 - 600	150	(Cat WX58N)
600 - 670	100	(Cat WX56L)
670 - 800	68	(Cat WX54J)
800 - 1000	33	(Cat WX50E)
1000 - 2300	not required.	

I've included the Maplin catalogue numbers for convenience. I can't guarantee success as the effectiveness rather depends on the impedance of your antenna system at the receiver connection. If you want ready made help for the overload problem, there are really two options - Pre-selector or antenna tuning unit. In truth, the pre-selector is the device that's designed specifically put back in place the filtering that should be at the front-end of the receiver. The pre-selector's filtering is specifically designed to protect the receiver from strong out-of-band signals. Therefore the pre-selector is likely to provide the best improvement.

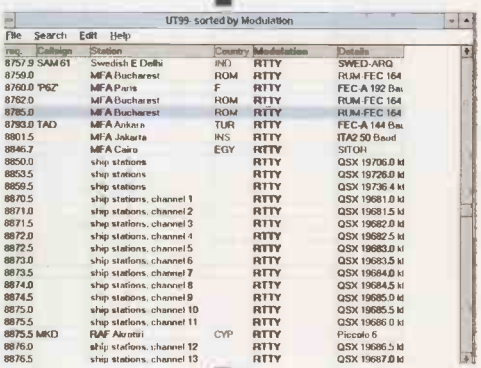
The only snag being that pre-selectors also tend to be the most expensive fix (other than buying a new receiver, that is). An alternative would be to use an antenna tuning unit. Now this is very much second best, in these circumstances, but it can offer some help because it also contains tuned circuits that are designed to help match the antenna to the receiver. So although its basic role is antenna matching, most will provide a useful degree of filtering for those offending signals. Another bonus is that most receive only a.t.u.s also contain switchable attenuators to help control the signal levels.


BC99- sorted by Time

File Search Edit Help

Freq	Station	TxSite	City	Langua	Target	Time	Remarks
3215.0	Worldwide Christ	Nashville	USA	En	Na La	00.00-05.00	from 1 March
3222.0	R. Kara	Kara	TGO	Fr	dom	00.00-20.00	
3289.8	R. Centro	Ambato	ECU	Sp	dom	00.00 23.59	
3316.0	Sierra Leone B. CF	reetown	SRL	En	dom	00.00-00.02	irreg
3374.0	R. Nac. de Angola	Malenvos	AGL	Pa Fr	Adom	00.00 23.59	
3915.0	BBC World Service	Kranji	SNG	En	As	00.00-00.30	
3930.0	Korean B. System	Iwasong	KOR	Ko	dom A	00.00-23.59	Radio 1
3935.0	R. Reading Service	Lewin	NZL	En	dom	00.00 23.59	B98
3985.0	R. Maniquita/Alpen	Castelfranco Veneto		It	dom	00.00 23.59	irreg
4040.0	Kheglen R.	Tura	RUS	Ru	dom	00.00 01.00	"Milky Way Radio"
4270.6	R. Gonzanamá	Gonzanamá	ECU	Sp	dom	00.00 03.00	
4330.0	Xinjiang People's	Urumqi	CHN	Kz	dom	00.00-07.30	
4520.0	R. Moyak	Palana	RUS	Ru	dom	00.00-18.00	inc local prog
4754.8	R. Difusora do Mid	Sao Luiz	B	Po	dom	00.00 23.59	
4779.7	R. Cultural Costa	Castin	GTM	Sp Cj	dom	00.00-02.00	
4790.0	All India Radio	Madras	IND	Tm	As	00.00 00.45	
4800.7	R. Transcontinental	Mexico City	MEX	Sp En	dom	00.00 23.59	
4820.0	Radio Ukraine Int		UKR	Ge	Eu	00.00-01.00	
4825.0	R. Canção Nova	Cachoeira Paulista	B	Po	dom	00.00 23.59	religious format
4845.0	R. TV Malaysia	Kajang	MLA	Tm	dom	00.00 23.59	Radio 6
4850.0	All India Radio	Kohima	IND	En Ve	dom	00.00 02.15	s/on varies 00.30
4850.0	Uzbek R. (2)	Tashkent	UZB	Uz	dom	00.00 23.00	B98
4865.0	R Missoes de Am	Obidos	B	Po	dom	00.00 23.59	ex R.Sentinela
4880.0	R. Bangladesh	Kabirpur	BGD	Bg En	dom	00.00 05.05	

Broadcast Section of the *Klingenfuss Super Frequency List.*


UT99- sorted by Modulation

File Search Edit Help

freq	Callsign	Station	Country	Modulation	Details
8757.9	SAM 61	Swedish E Delhi	IND	RTTY	SWED-ARQ
8759.0		MFA Bucharest	ROM	RTTY	RUM-FEC 164
8760.0	"P6Z"	MFA Paris	F	RTTY	FEC-A 192 Bau
8762.0		MFA Bucharest	ROM	RTTY	RUM-FEC 164
8785.0		MFA Bucharest	ROM	RTTY	RUM-FEC 164
8793.0	TAD	MFA Ankara	TUR	RTTY	FEC-A 144 Bau
8801.5		MFA Jakarta	INS	RTTY	ITA2 50 Baud
8846.7		MFA Cairo	EGY	RTTY	SITOR
8850.0		ship stations		RTTY	QSX 19706.0 kl
8853.5		ship stations		RTTY	QSX 19726.0 kl
8859.5		ship stations		RTTY	QSX 19736.4 kl
8870.5		ship stations, channel 1		RTTY	QSX 19681.0 kl
8871.0		ship stations, channel 2		RTTY	QSX 19681.5 kl
8871.5		ship stations, channel 3		RTTY	QSX 19682.0 kl
8872.0		ship stations, channel 4		RTTY	QSX 19682.5 kl
8872.5		ship stations, channel 5		RTTY	QSX 19683.0 kl
8873.0		ship stations, channel 6		RTTY	QSX 19683.5 kl
8873.5		ship stations, channel 7		RTTY	QSX 19684.0 kl
8874.0		ship stations, channel 8		RTTY	QSX 19684.5 kl
8874.5		ship stations, channel 9		RTTY	QSX 19685.0 kl
8875.0		ship stations, channel 10		RTTY	QSX 19685.5 kl
8875.5		ship stations, channel 11		RTTY	QSX 19686.0 kl
8875.5	MKD	RAF Akrotiri	CYP	RTTY	Piccolo 6
8876.0		ship stations, channel 12		RTTY	QSX 19686.5 kl
8876.5		ship stations, channel 13		RTTY	QSX 19687.0 kl

Utility section of the *Klingenfuss Super Frequency List.*

Hot Frequencies

Yes it's out! the new *Klingenfuss 1999 Guide to Utility Radio Stations* (17th edition) is now on the streets. The guide contains the usual bang up-to-date listing of utility station (11600 frequencies this time) along with a host of useful information designed to make life easy for the enthusiast.

Joerg has made a number of layout improvements with this latest edition that certainly make the frequency listings much easier to read. The change has come from the use of column lines to make clear separations between each entry. It's perhaps a small point but the overall effect is a great improvement.

The 1999 edition is also 32 pages longer, primarily I think to make room for the improved layout. If you're seriously into utility listening, this remains the book to have - it's the most comprehensive and up-to-date by a long way. If you're one of those listeners that only buys a 'Klingenfuss' every few years - this year's is a good one to get!

If you prefer to get your data in digital format then maybe the *Klingenfuss 1999 Super Frequency List CD-ROM* is what you need. This disk contains a comprehensive database of utility, clandestine, domestic and international frequencies based on the data contained in the Klingenfuss book range. Included with the disk is it's own powerful search engine for location stations. I've included a screen shot or two so you can see what it looks like.

As an added bonus, demo copies of the excellent *RadioRaft* decoder and shoc *Radio Spectrum Manager v5.0.* Both are well worth a look. In addition to producing new versions of these excellent listings, Joerg has released yet another new book. Titled *Radiotelex Messages*, the first edition of the 568 page book provides hundreds of sample pages from received messages.

The range of systems received is huge and includes a look at what messages used to look like along with lots of samples of current systems. The book is likely to appeal to a limited audience, but certainly gives you a useful preview of the type of message that can be received with the appropriate equipment.

All these publications are currently available from the *SWM* Book Store. The *1999 Guide to Utility Radio Stations* costing £30, whilst the *1999 Super Frequency List CD-ROM* is priced at £23 and the new *RadioTelex Messages* costs £27. My thanks to Joerg for supplying the review copies.

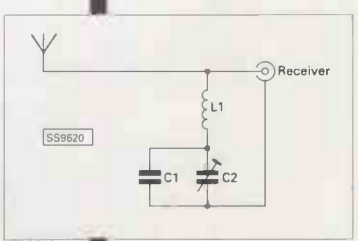


Fig. 2: Medium wave station filter.

■ JOHN HODGKINSON - ALRS, c/o *SWM* EDITORIAL OFFICES
■ E-MAIL: aas@pwpublishing.ltd.uk

All At Sea

Maritime E-Mail Systems

In previous columns, I discussed the upsurge of digital marine communications using state-of-the-art equipment which can easily be obtained, either on the amateur market or from dedicated suppliers of marine radio equipment. The cost of this equipment is relatively inexpensive when compared to satellite systems, and transmission modes employed enable it to be highly cost effective, and affordable by even the smallest boat owner. A few years ago, E-mail using terrestrial radio was unheard of! It is now commonplace amongst the small craft leisure community and is beginning to be adopted by international cargo shipping, who have realised how user-friendly these systems are, bearing in mind that the highly trained Radio Officer is now no more.

In this month's column I will detail just a few of the new Coast Radio stations that have appeared in the last couple of years; their primary remit being to serve the yachting market, and secondary, whoever else decides to use them. Globe Wireless, the American company, are trying very hard to corner the 'big ship' market and appear, at the moment, to be the most successful major player. What follows are a few of the 'small fry' stations who, incidentally, have been extremely difficult to track down as regards frequencies and modes of transmission in use.

Berne Radio has been operational for many years as a Maritime and Aeronautical Coast Radio Station, and is located at Riedern, a few kilometres outside of the city of Berne in Switzerland. Like all large Maritime Coast Radio Stations, it has been badly affected by the Global Maritime and Distress Safety System (GMDSS), and has had to look at supplying alternative services to meet customer demand. A requirement still exists for the traditional high frequency Radiotelephone and Radiotelex services, for those vessels that still have a need to use terrestrial services for whatever reason. Frequencies in use are too numerous to list, but can be found in the *Admiralty List of Radio Signals (ALRS) Volume 1*. Berne are also highly regarded for their Aeronautical service, providing the world's airlines with 'phone patch facilities, on-demand airport weather reports and access to airline communication networks.

However, they are now responding to the rising demand for E-mail, and are tailoring their services accordingly. Berne is now active on a range of frequencies from 3-20MHz, using Clover and Pactor 1 and 2 as primary transmission modes. The following list of frequencies (suppressed carrier) were under test early last year, and from monitoring, it appears to be still at the fledgling stage. Anyone with further information **please** let me know! All frequencies are in MHz using J2B mode; subcarrier offset is 1700Hz and employing simplex operation.

3.010, 4.763, 5.4405, 8.070, 11.172, 13.990, 18.230, 20.090

Traffic lists are sent on the even hour using FEC/SITOR Mode B, and this is probably the best time to monitor. Transmissions are **very** short, usually less than two minutes, so you have to be sharp and ready and waiting on the frequency to catch them. There is no channel marker emitted as per Globe Wireless stations, and no SELCAL facility. The onus is on the customer to contact the station and check in at regular intervals.

Software in use supports a number of modes permitting PACTOR 1, PACTOR 2, Clover 2000 as well as SITOR A ARQ and SITOR B FEC. Also contained within the software is an Antenna Direction facility allowing the customer to convey their exact position to Berne Radio, and automatically optimize the highly directional antenna system to their signal.

Types of traffic include E-mails (including binary attachments), FAX and Telex messages between the customer and any Internet, FAX or Telex address, pictures and simplex telephone calls.

Quite a mish-mash there, which could provide a lot of entertainment. Unfortunately, my duties as Editor of *ALRS Vol 1* take up most of my time and don't allow for long term monitoring, so if anyone receives anything interesting I would be extremely grateful if they could let me know!

Another small operation in relative terms, supplying a low cost E-mail service to small craft in the eastern Indian Ocean and Western Pacific, is SEAMAIL. Designed by cruising sailors, the service is run by Xaxero Marine Software Engineering Ltd., New Zealand, in conjunction with **Penta Comstat Radio (VZX)** located in Gosford, New South Wales, Australia and **Niko Radio (ZKRT)** located in Raratonga, New Zealand.

Both stations have 24 hour coverage on a range of frequencies as follows:

Penta Comstat Radio (VZX)

Assigned	Upper Sideband
6.357	6.3548
8.442	8.4398
12.680	12.6778
16.908	16.9058

Niko Radio (ZKRT)

Assigned	Upper Sideband
6.9283	6.9305
12.2155	12.2123

Xaxero claim Pacific and Indian Ocean coverage with this set-up using SITOR, PACTOR and GTOR as primary modes. Information is extremely sparse concerning these two stations, mainly because propagation from this part of the world is not compliant with my office hours, therefore, unless I risk serious earache from my other half, monitoring is nigh on impossible. If there are any night owls out there who would like to take on the challenge, then I would be very grateful for anything received.

Identifying the stations should be fairly easy. Penta Comstat emits a message "de VZX SeaMail active on GTOR or PACTOR" in TOR FEC, then listens for 30 seconds for any forthcoming traffic. Two transceivers each scan two frequencies. If no traffic is received during the 30 second stand-by, the announcement and stand-by is repeated on the next frequency, and so on and so forth. This system is basically text only and does not accept file attachments. A traffic list is broadcast every hour on the hour once on each frequency, and weather information is issued twice daily at 0800 and 2000UTC for the Southwest Pacific Island area, 25°S to the Equator and 160°E to 120°W. Transmissions are usually in ARQ using either PACTOR or GTOR, depending on propagation conditions.

In order to ensure reliable coverage in the Eastern Pacific, Xaxero have teamed up with an American station going by the name of 'The Message Center Inc' located near Mobile, Alabama. A traffic sharing agreement has been established, with E-mails automatically routed to the other station for vessels outside of the range of one station, but within range of the other. Unfortunately, 'The Message Center Inc' is very reticent to divulge any information about themselves, including frequencies, even after various telephone calls and FAXes. So once again, I am appealing for help on this one. A set of frequencies would be wonderful, but anything will do!

The Sailmail Association is a non-profit making association of yacht owners, that operate and maintain a licensed two-way private Coast Radio station in Palo Alto, California, which incidentally is also the home of Globe Wireless. As service is limited to yachtsmen, this station comes outside of the remit for *ALRS Volume 1*, but it could be worth a listen nevertheless. Traffic is limited solely to E-mails (text only), and as far as I can gather, modes are limited to SITOR and PACTOR. Frequencies as follows:

Sailmail Frequencies

Assigned	Upper Sideband
2.6614	2.6597
5.8814	5.8797
7.9714	7.9697

The only viable frequency for the UK is 7.9714MHz, and then only at the right time of day. So, if anyone fancies a crack at that one then I would be very interested in any results obtained.

PinOak Digital first came to light in August last year, when it was copied on 4.153MHz u.s.b. by a regular contributor to ALRS. Transmission characteristics are a short data burst followed by a morse identification 'WHW462', repeated approximately every four minutes. Subsequent investigations revealed the transmission emanating from a site in Gladstone, New Jersey, USA, owned by the PinOak Digital Corporation. Again, the station appears to be using PACTOR 2 and claims world-wide coverage on frequencies ranging from 4 to 22MHz. Many more investigations brought to light the following list of frequencies which, I might add, have not been heard in the ALRS office.

4.153	4.1545	4.5514	7.9514	8.3025	8.3385
12.3705	12.4185	16.5515	16.6145	18.8475	22.1815

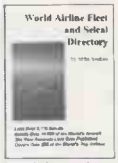
PinOak Digital (WHW462)

PinOak's website indicates that he works in shipping of some description, but quite what type remains to be seen. Information on this individual is extremely hazy. Any information will be most gratefully received.

Further information on all of the above can be viewed at the following websites: Berne Radio, **www.bernradio.ch** Message Center Inc , **world.std.com/~msgctr** Seamail, **www.pca.cc** Sailmail, **www.sailmail.com** and PinOak Digital, **www.pinoak.com**

Happy listening!

Airband books



World Airline Fleet and SELCAL Directory

For the radio enthusiast monitoring the aircraft bands on HF or VHF over 5,170 confirmed 'current' Selcal codes are listed with details of the aircraft. In addition there is an extensive guide to all HF aviation communications from around the globe. Covering the world's top airlines, it lists over 10,000 aircraft detailing the types owned by each airline, when they were built, who owned them previously, their exact model number and serial number so you will easily be able to identify the aircraft heard while monitoring their radio communications. This is the most comprehensive and accurate guide published.

Price: £16.00 + £2.75 UK postage. Europe add £3.60 or £8.25 elsewhere.

North Atlantic Flight Communications

New 2nd edition

Plot trans Atlantic flights with your HF radio and computer. Enter the flight details and watch in real time as the program plots the flight's progress across the North Atlantic on high resolution charts. The accompanying large book clearly explains all the procedures from filing the flight plan right through to landing at the destination and describes the radio communications system in depth. Software requires IBM/PC and runs on Windows95 & 98.

Price: £16.50 + £1.50 UK post. Europe add £2.25 or £5.00 airmail elsewhere.

The UK Scanning Directory, 6th edition The best UK VHF/UHF frequency list	£19.50
Scanner Busters 2	£5.00
Scanning The Maritime Bands	£9.75
UK Scanning Chart	£3.00
Short Wave Maritime Communications	£15.50
Short Wave Eavesdropper CD ROM	£16.50
Fax, Satellite and RTTY Weather Reports	£11.50
Weather Reports from Radio Sources	£7.50
Mobile Phones - The Tricks of the Trade	£18.75

THE ABOVE BOOKS INCLUDE UK POSTAGE

VISA *Ask for free catalogue.* Allow 14 days delivery MasterCard

INTERPRODUCTS (SW49)
8 Abbot Street, Perth PH2 0EB, Scotland
Tel & Fax: (01738) 441199
E-mail: interproducts@netmatters.co.uk

JAVIATION

Carlton Works, Carlton Street, Bradford BD7 1DA

AOR AR8200

AOR's latest receiver is being supported with free software from AOR but you still need a RS-232 interface.
Quote this advert and receive a **FREE** RS-232 interface worth £39.99 (our RS-8200) with your AR8200 order.

MVT-7100's £189.00

VHF/UHF AIRBAND GUIDE

Our 1998 VHF/UHF Airband Guide is now available - over 300 pages of invaluable information for the airband listener - £12.50.

If you would like a printed catalogue, please feel free to contact us or send a large S.A.E. (38p). Thanks.

Computer Interfaces

RS-2700/8000

Housed in DB-25 this interface is compatible with both the AR7200 and AR8000. Supplied with a Flat Flexible Cable for use with both these models. Now available for just £34.99.

RS-8200

Housed in DB-25 the RS-8200 allows computer control of the AR8200 and supports both software and hardware squelch detect. £39.99.

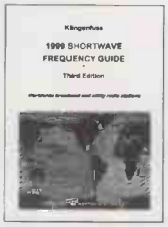
JAV-232

Not only compatible with the AR8200 but many other receivers as well including the AR8000, AR2700, Alinco DJ-X10, Icom IC-R10 and IC-R2 to name a few. When used with the AR8000 or AR8200 the JAV-232 also provides a squelch activated tape recording circuit and audio. The AR8200 connections also provide a FM Discriminator output for DATA decoding. The JAV-232 costs £69.99 but for connection to the AR8200 an optional OS-8200/DIN lead is required at £15.00.

Other interfaces for the Icom IC-R2, IC-R10 and Alinco DJ-X10 also available.

Telephone: (01274) 732146
www.Javiation.co.uk

RADIOTELEX MESSAGES - 25 years of monitoring global teleprinter and data communications!



Summarizes several decades of continuous worldwide radio monitoring between 1974 and 1998, and gives an expert's insight in dozens of interesting message formats and modern transmission protocols. Covers 1,004 messages and screenshots of 692 utility stations from 136 countries. With its comprehensive coverage of global aeronautical, commercial, diplomatic, government, maritime, meteorological, military, navigation, police, press, public, and secret radiocommunications on shortwave, this manual is not only highly informative but also very amusing. In one word: fascinating! 572 pages · £ 27 or DM 70 (worldwide postage included)

1999 SUPER FREQUENCY LIST CD-ROM

worldwide broadcast and utility radio stations!

10,400 entries with latest schedules of all clandestine, domestic and international broadcasters on shortwave. 10,800 frequencies from our 1999 Utility Radio Guide (see below). 16,100 formerly active frequencies. All on one CD-ROM for PCs with Windows 3.1™ or Windows™ 95 and 98. You can search for specific frequencies, countries, stations, languages, call signs, and times, and browse through all that data within milliseconds. It can't get faster and easier than this! £ 23 or DM 60 (worldwide postage included)

1999 SHORTWAVE FREQUENCY GUIDE

Really user-friendly, clearly arranged, and up-to-date! Now includes full details on the future digital modulation broadcast technique, and a solid introduction to real shortwave radio monitoring. Contains more than 21,000 entries with all broadcast and utility radio stations worldwide from our *1999 Super Frequency List on CD-ROM*, and a unique alphabetical list of broadcast stations: Two handbooks in one - at a sensational low price! 564 pages · £ 23 or DM 60 (worldwide postage included)

1999 GUIDE TO UTILITY RADIO STATIONS

Here are the *really* fascinating radio services on SW: aero, diplo, maritime, meteo, military, police, press, and telecom. 10,800 *up-to-date* frequencies from 0 to 30 MHz are listed (improved layout!), plus abbreviations, addresses, call signs, codes, explanations, frequency band plans, meteo/NAVTEX/press schedules, modulation types, all Q and Z codes, and much more!. Includes dozens of screenshots of state-of-the-art digital data decoders. 580 pages · £ 30 or DM 80 (worldwide postage included)

Special package price: CD-ROM + SW Frequency Guide = £ 39. More package deals available on request. Plus: Worldwide Weather Services = £ 23. Double CD Recording of Modulation Types = £ 39. Radio Data Code Manual = £ 30. Shortwave Communication Receivers 1942-1997 = £ 39. Sample pages and colour screenshots can be viewed on our comprehensive Internet WWW site (see below). Payment can be made by cheque or credit card - we accept American Express, Eurocard, Mastercard and Visa. Please ask for our free catalogue with recommendations from all over the world! ☺

Klingenfuss Publications · Hagenloher Str. 14 · D-72070 Tuebingen · Germany
Fax 0049 7071 600849 · Phone 0049 7071 62830 · E-Mail klingenfuss@compuserve.com
Internet http://ourworld.compuserve.com/homepages/Klingenfuss/

Designed as easy-to build projects for the Novice RAE students and in fact all beginners. These little kits include printed circuit boards and ALL the components you are going to need!

"NOVICE" Receiver, covers 6 to 18MHz. Definitely not a "Communications" receiver but great fun to build! The kit includes the Tuning Capacitor and a high impedance earpiece.

"NOVICE" Amplifier - boosts the output of the "NOVICE" receiver to modest speaker volume - or use it as a handy 'bench' amplifier. The miniature loudspeaker is, of course, included.

Kits are just £8.00 each
plus £1 postage for either one or both of them.

LAKE ELECTRONICS

Dept *SWM*, 7 Middleton Close, Nuthall
Nottingham NG16 1BX
VISA ★ ★ **Phone 0115-938 2509** ★ ★ MasterCard
E-mail: radkit@compuserve.com
Send SSAE for a brochure of our complete range.

Trading Post

Please write clearly in **BLOCK CAPITALS** - up to a maximum of 30 words plus 12 words for your address, and send it together with your payment of £6.00 (£4.00 subscribers), to **Alison Frith Trading Post, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.** If an order form is not provided due to space constraints, a form from a previous issue can be used as long as the cornerflash or Subscriber Number is attached as proof of purchase of the magazine. Adverts appear on a first-come-first-served basis. If there is not enough space to feature a Trading Post ad in the issue you request it is automatically entered into the next one. All queries to Alison on **(01202) 659910.** We cannot accept advertisements from traders, or for equipment which is illegal to posses, use or which cannot be licensed in the UK. Please note that *SWM* are in no way liable for any loss incurred as a result of buying or selling via 'Trading Post'. Please note cancellations can not be accepted.

For Sale

AOR AR2000 scanner, £95. Sony ICF-2001D s.w./AIR/f.m., £95. Panasonic RF-B40DL p.l.l. tuning 27 presets, £49. Tel: Watford 0181-950 3425 or (0976) 661195.

AOR AR3030 with mechanical Collins filters, 30kHz - 30MHz, plus 118.000/170.000 v.h.f., s.s.b., a.m., synchronus.a.m., f.m., c.w., FAX, 100 memories, n.f.m. 100, 10, 5Hz tuning steps, like new, boxed, £400. Tel: (01295) 662488.

AOR AR5000, one year old, as new, plus skyscan and passive antennas. Must be

seen. Mobile telescopic pole, all for £900. Terry on (0410) 996084, or (01268) 735530.

Dressler h.f. active antenna, £40. Binoculars professional, 20 x 80, coast guard observation, astronomy etc., case, mint condition, £295 o.n.o. Tennamast, height 75m, retracted 4.2m, £100. Tel: Warwicks (01926) 854556.

Eddystone 1650 professional receiver, excellent condition, 160 channel, memories, direct entry auto/manual tuning, full filters u.s.b./l.s.b. a.m., first class radio workshop & operator manual, offers? PRO-2035 base scanner, 1000 channel, 20 - 9460MHz, like new, handbook, £100. Trio 9R59 valve, b.f.o. & multiplier, £70. Tel: W.London 0181-813 9193.

Icom IC-R10 as new, boxed, £185 o.n.o. David on 0116-291 7078 after 1800, or mobile (0411) 290578.

Icom IC-R8500 boxed, first class condition, £895 o.n.o. Ill health forces sale. Carriage paid. Tel: (01482) 813439 anytime.

JRC NRD-535 communications receiver, mint condition, with manual, £725. Carriage extra. Brian, Leicestershire. Tel: (01455) 840158.

JRC NRD-535 mint condition options fitted BWC, RTTY demodulator, 1kHz filter, first class radio in first class condition. Ill health forces sale, £750, carriage paid. Tel: (01482) 813439 anytime.

Lowe HF-250 30kHz-30MHz all modes a.m./f.m., £355. Sony ICF-SW1 150kHz - 30MHz broadcast radio, £50. ERA MkII Microreader, £90. Must clear, any offers! Mr. Lucas, Jersey. Tel/FAX: (01534) 610213.

Meteosat receiving system spot frequency receiver, 1.8m dish and dipole feed, 2cm down converter, Martelec JUF2 interface, 486 IBM computer and monitor with *JVFAX* program. Full details, price £570 o.n.o. Roy, North London. Tel: 0181-443 4908 evenings.

Murphy TA92 radio, working order, buyer collect. Offers. Tel: (01493) 669347.

PRO-63 100 channel scanner, little used, £100. DX-394 only used about three hours, immaculate condition, £90. Lowe SRX-100 receiver, £85. Being sold due to eyesight failure. Tel: Northampton (01327) 842285.

Signal R-535 airband receiver. Includes portable carrying case and fitted battery compartment with whip antenna, boxed, with operating manual. All in immaculate condition, £230 o.v.n.o. Tel: (01506) 631673, any evening.

VT-225 airband scanner, v.h.f. u.h.f., books, maps, £165. Tel: Barnsley (01226) 714908.

Yaesu FRG-100, complete with, p.s.u., still under warranty, £325. Pete, N. Wales. Tel: (01492) 622619.

Realistic DX-394 h.f. receiver, £65 + £5 postage. Panasonic RF-B45 receiver m.w., l.w., s.w., f.m., s.s.b., £25 + £5 postage. R. Pearce, Bungay, Suffolk. Tel: (01986) 894270.

* Please note that all pictures are from our own picture library.

Wanted

Icom 781, IC R9000, or RA1792 500D. Price paid. Tel: (01606) 862175 anytime.

Exchange

Icom IC-R2 scanner, as new, will exchange for Grundig YB400PE, Sony SW100E, Sony 7600G, Roberts R861 or Alinco DJ-X10 scanner with adjustment. Brian on (01624) 823816 evenings.

ORDER FORM

PLEASE WRITE IN BLOCK CAPITALS

I enclose Cheque/P.O. for £.....(£4.00/£6.00)

Made payable to *PW Publishing Ltd.*

Please insert this advertisement IN THE NEXT AVAILABLE ISSUE OF SHORT WAVE MAGAZINE

Name .....

Address.....

.....

.....

.....

Post Code .....

Credit Card Details

Card Number

SWITCH DELTA MasterCard VISA

Signature.....

Expiry date of card.....

Subscription Number (on mailer label).....

FOR SALE/WANTED/EXCHANGE maximum 30 words

	(30)		

CONTACT DETAILS maximum 12 words

			(12)

SUBSCRIPTION RATES

We are holding the subs price down for the next three months. Avoid the cover price rise now!

Please enquire for airmail rates

SHORT WAVE MAGAZINE - 6 MONTHS

❑ **£16.50** (UK)

SHORT WAVE MAGAZINE - 1 YEAR

❑ **£30.00** (UK) ❑ **£35.00** (Europe)

❑ **£38.00** (Rest of World Airsaver) ❑ **£45.00** (Rest of World Airmail)

SPECIAL JOINT SUBSCRIPTION WITH PRACTICAL WIRELESS (1 YEAR)

❑ **£50.00 (UK)** ❑ **£59.00 (Europe Airmail)**

❑ **£63.00 (Rest of World Airsaver)**

❑ **£74.00 (Rest of World Airmail)**

Please start my subscription with the.....issue.

MONITORING TIMES - 1 Year (12 issues)

❑ **£38 (UK)** ❑ **£43 (Europe Airmail)**

❑ **£49 (Rest of World Airmail)**

BINDERS

❑ Please send me .....*SWM* Binders at **£6.50** .....**£**

Postal charges: £1 for one, £2 for two or more (overseas surface)

FREE P&P if you order two or more (UK only) .....**£**

❑ Please send me the following books

.....**£**

.....**£**

.....**£**

.....**£**

Postal charges.

UK: £1 for one, £2 for two or more.....**£**

Overseas:

£2.00 per item. .....**£**

NEW FASTER NEXT DAY SERVICE (UK)
(For orders received before noon) £4.50 .....**£**

GRAND TOTAL .....**£**

Order Form

FOR ALL MAIL ORDER PURCHASES IN *SHORT WAVE MAGAZINE*

You can now order on-line.

See www.pwpublishing.ltd.uk/books/ for more information

Back issues at £2.99 inc. P&P. Phone, FAX or E-mail for availability

TELEPHONE ORDERS TAKEN ON (01202) 659930
between the hours of 9.00am - 5.00pm. Outside these hours your order will be recorded on an answerphone

FAX ORDERS TAKEN ON (01202) 659950

Or please fill in the details ticking the relevant boxes, a photocopy will be acceptable to save you cutting your treasured copy!

To: PW Publishing Ltd., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

PAYMENT DETAILS

Name.....

Address .....

.....

.....**Postcode** .....

Telephone No.....

I enclose cheque/PO (Payable to PW Publishing Ltd.) **£**

Or
Charge to my MasterCard/Visa/Switch/AMEX Card the amount of **£**

Card No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

SWITCH MasterCard VISA AMERICAN EXPRESS

Valid from.....to.....

Signature .....Tel:.....

Issue No: .....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at time of going to press. **Please note:** all payments must be made in Sterling. Cash not accepted.

TELEPHONE ORDERS TAKEN ON (01202) 659930
FAX ORDERS TAKEN ON (01202) 659950

STAR BUY

This month we're giving you the chance to buy a copy of the 1999 edition of the ***Radio Listener's Guide*** for the special price of **£4.95 post free!**

This informative guide shows the frequencies and locations of all the radio stations in the UK. There is information on BBC Radio, Independent Radio, The World Service, Overseas stations, Satellite stations, Internet stations, Pirate radio and much more, in fact, you'll be surprised by how many stations there are to listen to!

The guide has actually been organised so that the various station types are listed separately, and in the centre of the guide, you'll find 'quick reference' colour frequency maps for the main national radio stations, so, for example, if you are looking for Radio 4's frequency while visiting Oxfordshire, look at the quick reference map for Radio 4. Very handy!

TO ORDER, PLEASE USE THE ORDER FORM ABOVE OR CALL THE CREDIT CARD & ORDER HOTLINE ON (01202) 659930 AND QUOTE SWM 4

Index to advertisers

PUBLISHED on the fourth Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Printed in England by Southernprint (Web Offset), Factory Road, Upton Industrial Estate, Poole, Dorset BH16 5SN. Tel: (01202) 622226. Distributed by Seymour, 86 Newman Street, London W1P 3LD. Tel: 0171-396 8000, Fax: 0171-396 8002,
Web: **http://www.seymour.co.uk**. Sole Agents for Australia and New Zealand – Gordon and Gotch (Asia) Ltd.; South Africa – Central News Agency Ltd. Subscriptions INLAND £30, EUROPE £35, REST OF WORLD (Airsaver) £38, REST OF WORLD (Airmail) £45 payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not without the written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

ICOM

25 YEARS 1974 - 1999

IC-PCR1000 & IC-PCR100

CALLING ALL SERIOUS LISTENERS - HEAR ALL THAT'S GOING ON... ON YOUR PC!

- An exciting new radio receiving idea!
- For today's listener who doesn't want to miss a thing!
- Not a knob in sight, just use your PC keypad and mouse.
- A choice of interface screens showing all you need, as on a real receiver.
- Bandscope functions for easy location of busy frequencies.
- PCR1000: All-mode Rx - 100kHz~1300MHz.
  PCR100: AM/FM/WFM, 100kHz~1300MHz.
- *Optional UT-106 DSP Digital Filter Unit for Automatic Notch Filtering and Improved Noise Reduction, for IC-PCR1000 only.

You now have a choice!

The IC-PCR1000 and the NEW budget IC-PCR100 (without SSB) are versatile receivers that let you listen to the exciting world of communications via your computer. Long before the Internet even existed, the airwaves have been filled with communications of all kinds - broadcast radio and television, Ham, special services and aviation to name just a few. These two PC-based receivers offer a new and sophisticated way to listen to what's going on.

PCR100 components

*UT-106 DSP Rx Filter Unit for PCR1000

PC's not included

Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742.
URL: http://www.icomuk.co.uk E-mail: info@icomuk.co.uk

Count on us!

Lowe Electronics Ltd

IT'S A WINNER

We always said it was "simply the best" and now we know it is...

BEST SEMI-PRO RADIO 1999

*"CONCLUSION

All in all, the JRC NRD-545 is one of the finest HF receivers ever to come our way and we enjoyed every moment of the test period. At £1595 it could not be classed as inexpensive, but if cost is a secondary consideration to all-out performance allied to ease of use there are very few other choices. Perhaps the most eloquent tribute we can give to the NRD-545 is that we were very sorry to have to return it!"

*Extract of the review on the JRC-NRD 545 from the World Radio TV Handbook 1999

JRC NRD545

PHONE LOWE TODAY FOR THE **BEST RECEIVER** *AND* **THE BEST PRICE**

IMPORTANT

BEWARE OF GREY IMPORTS LOWE IS THE ONLY AUTHORISED JRC DISTRIBUTOR TO OUR UK DEALERS - CHECK WITH US THAT YOUR MODEL IS UNDER WARRANTY BEFORE YOU BUY

Branches
Bristol & Wales
79 Gloucester Road, Patchway, Bristol BS12 5QJ,
Tel 0117 931 5263 Fax 0117 931 5270
North East, Unit
18B, Airport Industrial Estate, Newcastle, NE3 2EF,
Tel 0191 214 5424, Fax 0191 214 0761, Email
info@lowenewc.demon.co.uk

Lowe Electronics Ltd

Chesterfield Road, Matlock, Derbyshire, DE4 5LE
Telephone (General Enquiries) 01629 580800
Fax 01629 580020
Orders FREEPHONE 0800 174749
Email: info@lowe.co.uk
URRL: http://www.lowe.co.uk

Showroom opening hours are 9.30am to 5pm Mon-Fri and 10am to 4pm on Sat, but check with our local branches as times may vary