short wave magazine

BRITAIN'S BEST RADIO MAGAZINE

FREE Nevada Communications Catalogue

SWM 2000 INDEX

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JOHN WILSON ON THE RA-17

SATELLITE TV THE INSIDE STORY

December 2000 £2.99

Scanner Spect

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The latest handheld from Yupiteru. New smaller size - see review - Shortwave Magazine October 2000

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- 10 Memory Banks
- 8.83kHz Airband
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MVT-3300

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- Steps - 5, 6.25, 10, 12.5, 25kHz
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- Priority channels - 10
- Scan/Search speed - 30/ sec
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- Supplied with NiCads, mains charger, 12VDC cigar lead, belt clip and carry strap
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- Squelch control
- Volume control
- Optional accessories

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Wideband scanning receiver

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- Channel scope peak search
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  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
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- Battery save facility
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- Stylish cabinet with large speaker
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short wave magazine

December 2000 Issue

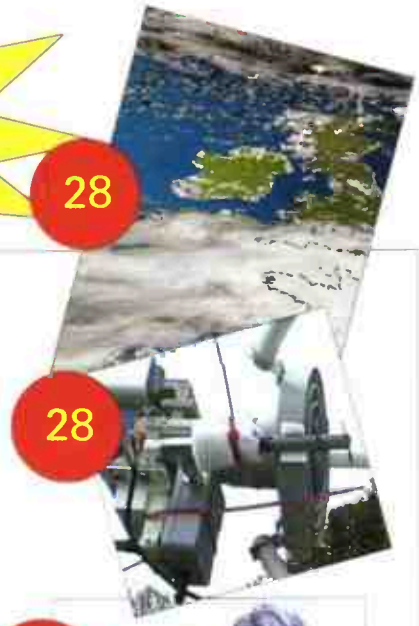
CHECK OUT THE *SWM* 2000 INDEX ON PAGE 37

BROADCAST

SATELLITE TV SPECIAL

COVER SUBJECT

The 'workings' of a SISLink SNG (Satellite News Gathering) truck.



WIN A WORLDSPACE RADIO - FOUR HITACHI KH-WS1s TO BE WON - SEE PAGE 36

features

Coming next month in *SWM* January 2001 Issue. ☛ DXTV Special
☛ Don't miss the *SWM*/PROMA Scanning Directory Offer, order your January *SWM* now or miss out on this CD worth £20 *contents subject to change

regular columns

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Components For *SWM* Projects
In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, **KANGA PRODUCTS, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

Photocopies & Back Issues
We have a selection of back issues, covering the past three years of *SWM*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *SWM* are £2.99 each and photocopies are £2.99 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.

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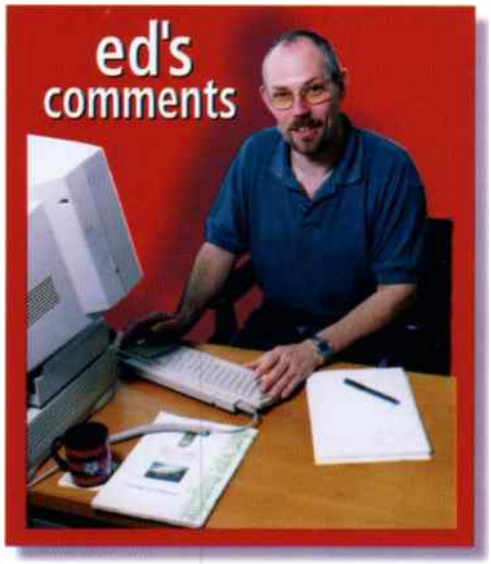
Technical Help
We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by *SWM*, then please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



As I write this month's 'ed's comments', the UK is in the grips of a weather system that has caused misery untold to massive populated areas. Yorkshire and specifically areas around the Rivers Derwent, Ouse, Nidd and Ure; on the other coast the River Severn. Even the highly managed River Thames have all broken their banks. Concern is of course felt by all for those living in these effected areas, I wish any readers in any flood effected locality all the best and good luck with sorting out the mess when the waters fall. I have been getting a daily update from a fellow Land Rover owning E-mail buddy from North Yorkshire and I know it's pretty grim to put it mildly.

I'm sure all the WXSAT enthusiasts are busy monitoring the captured images that depict the weather systems that prevail. There is also much additional localised radio activity in and around the disaster areas that will be have been captured by all you scanner users too. Our Scanning Directory offer next month will be very useful in helping to identify any such transmissions.

Shuttle Mission STS-92

This NASA mission provided a huge amount of discussion on the *SWM* Readers Internet E-mail list, with many monitors trying to catch some transmissions from space, me included. Unfortunately, it seems that we were all disappointed. There has been more success with the Russian *ISS* crew that are in orbit now (9th November). Lawrence Harris informs me that he has been overwhelmed with requests for information and he will be covering the *ISS* in detail in the January 2001 *SWM*.

Severe Solar Radiation Storm

Still in space, I've just had notice of a severe solar radiation storm which began yesterday, 8 November, at 2350UTC, which reached a level of S4 on the NOAA Space Weather Scales. The storm, which ranks as the fourth largest since 1976, is expected to peak over the course of the next several hours and then slowly diminish over the next three to four days.

This severe radiation storm could pose a hazard to the astronauts on the *International Space Station* as well as passengers on commercial airlines flying at high latitudes. The storm could also adversely effect the operation of satellites. It will have effect on earth based communications across the spectrum too.

Simple Radio?

I had a telephone call from Jack Warren who at 77 years young is very enthusiastic about crystal sets. Jack is keen to see some more features on the deceptively simple and elegant receivers that I mentioned last month. I find it refreshing that I receive such enthusiasm at both ends of the technological range that we cover. The other extreme is the Digital Satellite radio run by WorldSpace.

You can attempt to win a radio suitable of receiving WorldSpace broadcasts by entering our competition on page 36 of this very magazine. Good luck.

The *SWM* Scanning Directory

What ever happens, don't miss next month's *Short Wave Magazine* if you have any interest in the spectrum above 30MHz. We have arranged a high quality scanning Directory CD exclusively for *SWM* readers. For details on how to get your disk, which is worth £20, make sure you secure a copy of January 2001 *Short Wave Magazine*. As they say on the TV "miss it - miss out!".

RA Warning

I recently received the following communication from the Radiocommunications Agency. They ask that I make readers aware of the content, so here we are:

"The Agency has noted that certain persons intend to operate on amateur radio frequencies using the callsign series '1SL' from Roughs Tower situated in the Thames Estuary between 9 and 12 December 2000. The structure is situated within United Kingdom territorial waters. Consequently, any such operation which is other than under and in accordance with a valid amateur radio licence issued by the United Kingdom or other Administration, would constitute an offence contrary to section 1 of the *Wireless Telegraphy Act 1949*.

If the persons concerned do not hold a United Kingdom amateur radio licence, it would be necessary for them to hold an amateur radio licence issued by another Administration, and with whom the United Kingdom has a reciprocal agreement under which nationals of that country can operate using their callsign together with the appropriate 'M' prefix for a limited period from within the United Kingdom. The call sign series '1SL' is not permitted for use in the United Kingdom. If an UK radio amateur were to reply to an operator using a '1SL' callsign, they would be in breach of clause 1(4) of *BR68*.

Although some persons have called Rough Tower 'the Principality of Sealand' the United Kingdom does not recognise 'the Principality of Sealand' as a sovereign independent state and is not aware that any other state has accorded such recognition. Consequently, and as explained above, unless radio use on the structure is authorised under a licence issued by a recognised state, an offence will be committed."

You have been warned, I hope that the legal position is clear. I'd hate to see any *SWM* readers get into hot water.

Simply The Best

No other radio magazine covers the range of subjects as those featured in *SWM*. We are currently and have been for many years, the best selling radio magazine in the UK. This is due to our commitment to keep abreast of what is relevant to our readers. More importantly it's due to you, the reader, voting with your pocket and buying the fruits of our labours. As this year draws to a close, I'd like to thank you all on behalf of everyone involved in the production of *Short Wave Magazine* for your loyalty. All the best and see you in Volume 59.

As this is the December issue of *SWM*, you will find an index of all the items featured during the year 2000.

vy 73 Kevin

Continued on page 44

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

SWM Book Store

LISTENING GUIDES

Airband

	Pages	Price
Abc AIRBAND RADIO GUIDE 4th Edition	96	£7 99
Abc BRITISH AIRPORTS (6th Edition) A Wright	112	£8 99
Abc CIVIL AIRLINER RECOGNITION 6th Edition Peter R March	128	£9 99
AIR TRAFFIC CONTROL 7th Edition Graham Duke	112	£8 99
AIRWAVES 2000	134	£9 95
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NORTH ATLANTIC FLIGHT COMMUNICATIONS 2nd Edition (Inc software)	172	£16 50
UNDERSTANDING ACARS 3rd Edition Aircraft Communications Addressing and Reporting System Ed Flynn	80	£9 95
WORLD AIRLINE FLEET & SELCAL DIRECTORY	300	£16 00
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY 2nd Edition Robert E Evans	260	£19 95

Datamodes

FAX & RTTY WEATHER REPORTS Philip Mitchell	88	£11 50
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WEATHER REPORTS FROM RADIO SOURCES Philip Mitchell	32	£7 50
RADIO DATA CODE MANUAL 16th Edition Joerg Klingenfuss	788	£30 00
RADIOTELEX MESSAGES (25 Years of Monitoring Global Teleprinter & Data Communications 1st Edition	568	£20 00

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DXTV FOR BEGINNERS Simon Hamer	31	£3 95
GUIDE TO DXTV Keith Hamer & Garry Smith	36	£3 95
GUIDE TO WORLDWIDE TV TEST CARDS	60	£4 95
MASTS - PRACTICAL IDEAS FOR THE DXER Hamer/Smith	36	£4 95
THIS IS BBC TV - FIRST 30YRS OF TV GRAPHICS Keith Hamer & Garry Smith	38	£4 95
THE FIRST 30 YEARS OF BBC-2 Keith Hamer & Garry Smith	60	£4 95

Frequency Guides

2000 SUPER FREQUENCY LIST on CDROM Joerg Klingenfuss	n/a	£23 00
FERRELL'S CONFIDENTIAL FREQUENCY LIST 11th Edition	450	£19 95
GLOBAL RADIO GUIDE 2000	32	£3 95
GUIDE TO UTILITY RADIO STATIONS 2000 18th Edition Joerg Klingenfuss	580	£30 00
PASSPORT TO WORLD BAND RADIO 2000	528	£15 50
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SHORTWAVE FREQUENCY GUIDE 2000 - 4th Edition Joerg Klingenfuss	564	£23 00
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WORLD RADIO TV HANDBOOK 2000	640	£19 95

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AMATEUR RADIO

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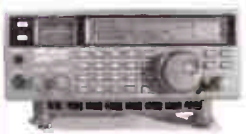

AR5000

AR3000A

ICOM

PCR1000

PCR100

Model	Description	£ RRP inc VAT
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ICOM YAESU KENWOOD ALINCO AOR

YUPITERU

YUPITERU MVT 9000 EU

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

£329.00

YUPITERU MVT 3300EU

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  108 -170MHz
  300 - 470MHz
  806 - 1000MHz
- MODES: AM/NFM
- STEPS:
  5, 6.25, 10, 12.5, 25kHz
- MEMORIES: 200
- BAND MEMORIES: 10 (user re-programmable)
- PRIORITY CHANNELS: 10
- SCAN/SEARCH SPEED: 30 per sec
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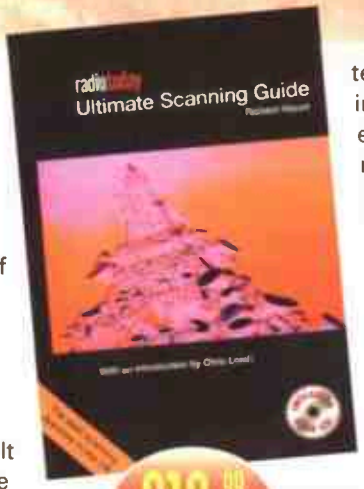
VALVE & TRANSISTOR AUDIO AMPLIFIERS John Lindsay Hood	310	£19 95

Book Profiles

A selection of books for you to choose from this month. Remember, you can order your books by 'phone, FAX, E-mail or post.

Ultimate Scanning Guide



£19.99

The frequencies above 30MHz - the v.h.f. and u.h.f. bands - contain a fascinating collection of signals: broadcast, amateur, emergency services, taxis, pagers and just about anyone using radio for short range communication. It is easy to monitor these signals with an inexpensive receiver, which because it searches or scans for signals, is called a scanner.

The *Ultimate Scanning Guide* contains a huge listing of thousands of frequencies and who uses them, as well as reviews of scanners, an introduction to scanning and what's legal to listen to. The author, Richard Allport, has certainly made sure the frequency listing is as up-to-date as possible. Supplied free with this guide is a CD-ROM of all the articles and listings from the book, in a searchable form. **£19.99**.

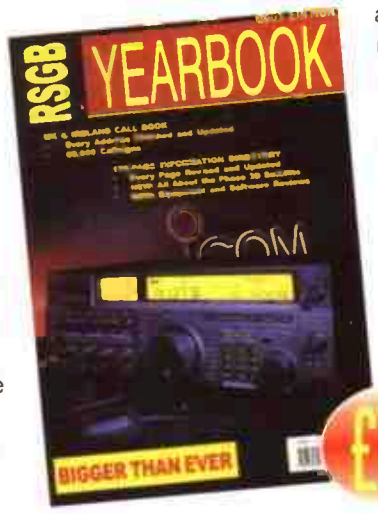
The Amateur Radio Operating Manual

£24.95

Now in its 5th edition, *The Amateur Radio Operating Manual* is essential reading for any amateur radio operator. Describing operating techniques invaluable for enjoying amateur radio to the full, the reader is taken through the principles of basic contacts, the secrets of working DX and winning contests. More specialised topics, such as data communications, mobile operation, television and talk-in stations are included along with a comprehensive set of operating aids and reference information.

Now extensively revised and enlarged, *The Amateur Radio Operating Manual* also features a completely new section on organising a DXpedition station. So, purchase this invaluable aid - no amateur radio station is complete without it! **£24.95**.

RSGB Yearbook

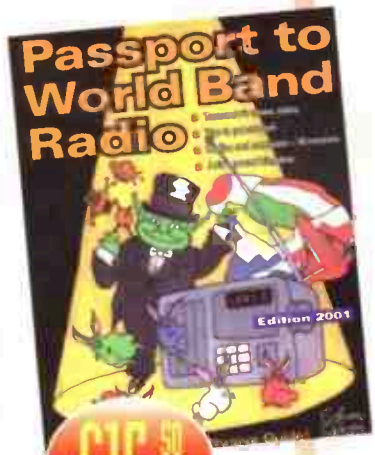


£15.99

This bigger than ever 2001 edition of the UK & Ireland Callbook is truly up-to-date. Each page has been checked and updated so that you can be confident that you have the most current information to hand. Of the 464 pages in this book, only a handful are identical to those in last year's edition.

The number of colour pages have been increased and also added are a selection of the best reviews from the now defunct *Radio Today* and *RadCom*. Included this year is a feature on the revolutionary AMSAT Phase-3D satellites which is due to launch, coloured repeater maps and an alphabetical repeater listing, introductions to h.f. and v.h.f. contesting, ARDF rules and more about amateur radio on the Internet. All for **£15.99**.

Passport To World Band Radio



£15.50

World band radio explodes with hundreds of programmes you can't find elsewhere. From the matchless reporting of the BBC to the musical heights of the Andes, it's a broadcast menu that's one part Newsweek, another National Geographic. Every station stands out. Comedy from England, science from Russia, waltzes from Austria - it's the depth and variety that is missing from ordinary radio and TV. *Passport To World Band Radio* covers it all - what's on, what to buy and how to get started.

Begin your personal adventure and order your copy now for just **£15.50**.

Iridium Satellites & Flares

If you know where to look, you'll see them just after sunset or just before sunrise

The first time you see one of your predicted flares light up against a dark starry sky will certainly not be your last. You'll be hooked and join the ever-growing group of hobbyists known as 'flare watchers'. John Moore explains all.

Ever since final deployment of the Iridium communication satellites - a fleet of 66 in all with some to spare, back in 1998 last, Motorola, Inc., - the company which operates the system has, for some reason or other, received in the past both good and bad press headlines. What with recent agreement between the astronomical community concerning frequency spillage and allocation times, the furores have made lots of people very nervous and somewhat angry.

However, setting these worries aside for the moment and forgetting about the company's policies, the existence of the actual physical Iridium satellites has, as an indirect consequence, made a growing number of people very happy.

These aren't, as you might expect, owners, providers, shareholders or investors of the company, but are in fact a group of hobbyist to a new and leisurely pastime known amongst their community as 'flare watchers'.

Flares & Flaring

So what, you might ask, is flare watching? Is it some new term introduced into the lingo of the global communications markets - indication of a flash rise or fall in shares, or has it got something to do with the latest revival of 60s clothing? No, the answer to the question is in the skies.

To begin with, within the next hour or so, right now above your particular part of the sky, over 200 objects (space debris and satellites) will whiz by over your head at various altitudes and velocities. Most of them are small or minuscule in size and very hard to see, however, quite a few are large enough to be seen with the naked eye during times of early morning, late evening or night-time. The majority of them are satellites and they look, for all intents and purposes, like small, dull stars moving slowly across the sky.

As anyone knows, satellites don't give off light of their own, therefore, the light that we are seeing must undoubtedly be reflections of sunlight bouncing off their bodies. During a comparatively brief period after sunset or before dawn when the sun is still below the horizon, any object overhead, still receiving the sun's rays, will naturally be illuminated, and allow us to see them against a dark sky. This is the scenario and physics behind flare watching.

In the case of the Iridium satellites, reflective sunlight is greatly enhanced due to three highly polished, silver-coated antennas (1.8m long and 0.86m wide - about the size of a large hall mirror) positioned at 120° intervals, around the main body - the bus, of each satellite. These antennas called MMAs (Main Mission Antennas) are angled 60° away from the satellite's main axis which, for communicational purposes, is continually maintained into a vertical position that always points toward the centre of the earth.

As a result, when the geometry of the sun, satellite and observer on earth are aligned into a unique angular arrangement for all three to 'see' each other, a very intense bright flash (a flare) occurs - seen streaking across the sky. You may find the brightness of an Iridium flare hard to comprehend at first, until you actually see one.

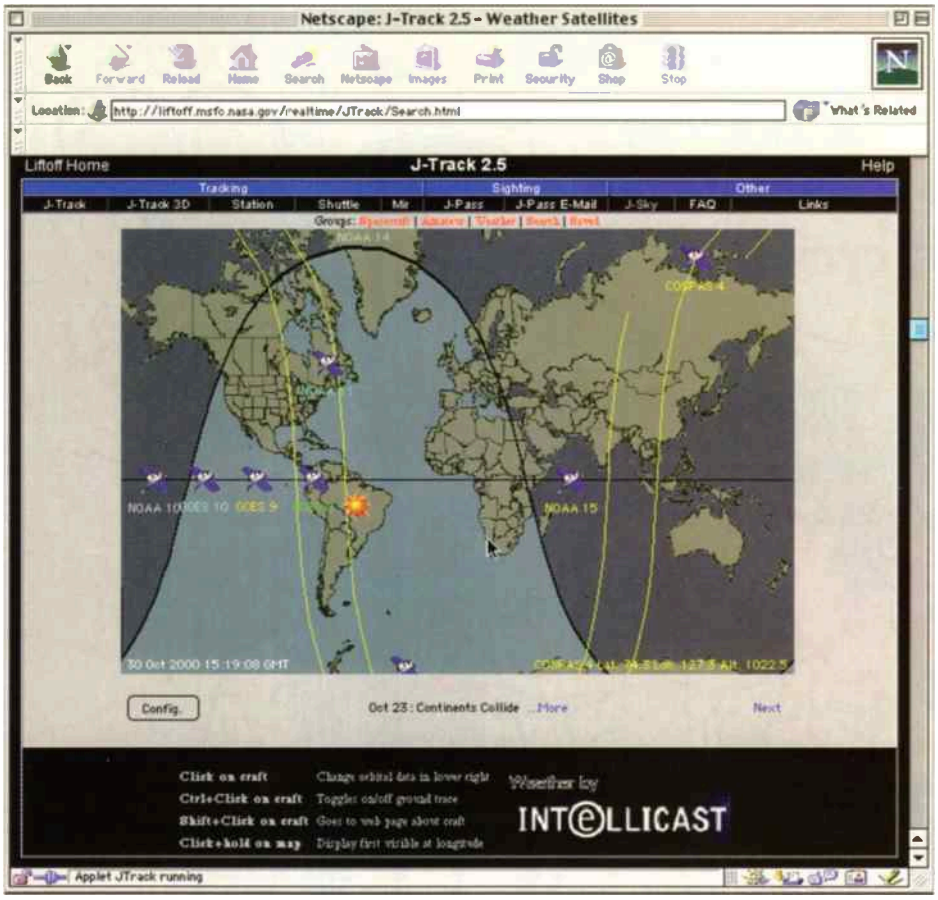
As the sun's light strikes one of the mirror-like antennas at an angle, it is reflected back off, naturally enough, at another angle down towards the observer on earth, and because the satellite is moving in its orbit, the antenna, therefore, only reflects for the brief time that the sun's light happens to be striking it.

Usually, the amazing phenomena lasts only five to ten seconds duration, but on rare occasions, the flashes can last anywhere up to 20 seconds long. This is because most of the 66 satellites that orbit, are continually reflecting sunlight onto some particular part of the earth. Each reflection is only tens of kilometres across at the earth's surface, so depending on what relative position you happen to be at, as it passes over, the magnitude drop-off of its brightness is quite rapid.

Therefore, a person standing at the centre of a flash will see the very brightest - a 'specular' flare (about 99% reflected sunlight) usually around -9 magnitude, while someone else 36km away might see the same flare but at -4 magnitude - a 'grazing' or 'glinting' flare (equal to Venus in brightness). (Magnitude here is literally a measure of intensity of brightness - the higher the negative value, the brighter it is). Flares can be up to 100 times brighter than any star visible in the sky.

Continued on page 48...

...continued from page 46



J-TRACK in action.

Some flares can be so bright in fact, that it's quite possible to see them during daylight, but you really need to know where to look, at the precise time. Afterwards, when the satellite flares, it will continue to travel across the sky growing fainter and fainter until finally it disappears. If the flare is visible in the east, then the satellite will be travelling to the south, and if visible in the west the satellite is travelling towards north.

On any given night an observer is likely to see, on average, anything from two to three good Iridium flares per night, while on other occasions, an observing run could produce at least five or more, depending on how long you want to stay out. This regularity is due to Iridium's highly inclined orbital planes of which there are six. Each is separately spaced at 30° away from each other, converging nearly over both poles.

Therefore, the greater your latitude (north and south), the higher the chances are that an Iridium satellite will be visible. Each one of the 66 satellites circles the earth approximately 14.75 times a day, blanketing the earth, one following the other nine minutes apart - allowing five to six satellites to be above the horizon at any one time.

The best thing about this fascinating hobby is that you don't need any technical expertise or equipment to see the flares - not even binoculars. All that is required is knowing where and when the flares are about to happen, and the best source for finding that out, is from one of the many online websites, which give predictions for any location in the world.

Getting The Data

In some sites, all that is required is simply entering your longitude and latitude co-ordinates, the date and time you want to observe and, hey presto, you'll be presented with a list of flare predictions. Other sites just ask you for your country, city and town, and the rest is easy. From there on in, you're hooked and before you know it, you're out showing off to your friends - predicting flashes in the sky. Once you've gotten used to the prediction side of things, you might want to run your own predictions.

To accurately predict Iridium flares, or any of the 8,000 objects that are presently orbiting our earth, you'll need tracking software, which you can download for free from the Internet. These are programs that load a set of orbital data or orbital elements (produced by the many corporations and companies that require statistical data on their particular satellite) into their programming, and then generates the celestial co-ordinates, range and elevation to your own particular needs.

Some of these softwares are so good in fact, that they can plot a satellite's track through starfields or else show a 3-D representation of the orbit as seen from space. The best thing about using these various softwares is that they allow you also to view many other satellites, other than the Iridium alone. You can, for instance, look up weather satellites, spy satellites, navigation satellites, satellites just launched, *MIR* and the *International Space Station* - the list is endless.

You'll never forget your first time, when a prediction that you just looked up actually happens before your eyes. All of a sudden, in a remote part of the sky, a bright line of light miraculously appears - almost as if you willed it there. Your prediction has come through, and the following hobbyist of flare watchers has just gained another advocate. Enjoy Iridium flares, you'll find them very addictive. ***SWM***

Internet Sources For Flare Predictions

German Space Operations Centre (GSOC)
One of the best prediction sites for Iridium Flares, Satellites, *MIR*, International Space Station, Starshine and more. Easy access for any county in Ireland or the world.
http://www.gsoc.dlr.de/satvis

J-TRACK
NASA based prediction software allowing you to have access to nearly all the satellites up there.
http://liftoff.msfc.nasa.gov/RealTime/JTrack/

SatSpy
Tracking software that shows you the satellite as it would look against a starry background. *Windows 3.1* version available also.
http://www.satspy.com

SKYSAT
Satellite and Iridium flare site providing graphical portrayals of Iridium satellite tracks against a starmap background.
http://members.aol.com/skysatrj/index.html

Visual Satellite Observers Homepage
Great introduction site for all things to do with satellites, including links to prediction software for Iridium flares.
http://www2.satellite.eu.org/sat/vsohp/satintro.html

WINORBIT
Free software to download allowing graphical display of satellites and others up there.
http://www.sat-net.com/winorbit/

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AN1 Active SW antenna *RRP £74.95* .... ASK price **£59.95**
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AN-102 Compact active antenna **£59.95**
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GPS 12 - hand-held GPS ..... **£Phone**
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Finally Linked

Back on Friday 29th September, the **Didcot Repeater GB3DI** and the **Oxford Repeater GB3OX** were finally linked. The plans for linking these two repeaters have been around for some time, but the technical details for achieving the linking are not trivial.

The two repeaters - **both** on 70cm - are linked using in-band linking. That is, each repeater receives the other by listening to its output - while it is transmitting itself only 150kHz away. This is achieved by careful positioning of linking Yagi antennas and deliberately 'deaf' linking receivers.

The linking is active all the time, in effect giving a large coverage area repeater with two input and two output frequencies. The whole operation is transparent to the user, with the only obvious difference being that a station going into GB3OX will get an 'X' at the end of his over, but one going into GB3DI will get a 'D' - this 'X' or 'D' being heard from **both** repeaters. This useful feature does mean that users can tell which repeater other users are transmitting to - at the end of their over.

When not 'up' - that is when not in use for a QSO, the repeaters operate individually, giving their respective beacons on a 10 minute cycle. When one is accessed, both then start to relay the over and the beacon times are re-synchronised.

During a QSO, when the 10 minute beacon time is up, the beacon itself is delayed until the end of that over, when both repeaters give their own callsigns on their own transmitters at high c.w. speed, (about 30w.p.m.), so as not to disrupt the QSO too much. After the beacon has been sent, the link is then re-established and the QSO can continue.

The control for this is implemented by using another, extra CTCSS tone, on top of the one already in use for 'normal' repeater operation. This extra tone is transmitted at a much lower level (about -24dB on the through audio). Associated with the linking receiver is a linking control board which recovers this low-level CTCSS tone by a switched-capacitor high-pass filter, amplifier and CTCSS decoder.

The detect output from the CTCSS decoder is used, together with squelch and local control inputs by a PIC to inform the main logic that linking should take place. When transmitting 'through audio', the CTCSS decoder is switched to transmit to produce the link CTCSS tone.

The PIC also monitors the remote control channel (on the main repeater control board) and adds some extra DTMF controls to remotely enable and disable the linking system. An 'on-air' reset to the main control logic is also provided.

The main repeater control system is the G8CUL logic, with a firmware update to interface to the linking control system. Initial on-air tests are showing that the system is performing well with a few minor 'features' yet to be ironed-out.

Maxitronix At Maplin

Maplin Electronics has expanded its electronics product range with the introduction of Maxitronix project labs. These four new kits are ideal for the engineer and advanced enthusiast alike.

For those new to electronics, the 30-in-one kit (FW57) for just £14.99 is a safe and fun project with solderless connections. This starter kit allows you to build up to thirty different projects from a radio to simple computer circuits.

Priced competitively at £29.99, the 130-in-one kit (FW58) is also a great way to get started in the world of electronics. With no previous knowledge required, the kit includes a step-by-step manual on assembling circuits allowing you to build a range of projects from a simple logic circuit to an a.m. broadcast station.

For the more advanced, the 200 in one (FW61), priced at £39.99, and the 300-in-one (FW74), at £49.99, allow you to learn and build more advanced circuits, including an electronic game or voice level meter. You can also learn about individual components and schematic symbols. Both these kits come complete with a comprehensive illustrated easy-to-use manual.

Maxitronix is available direct from Maplin Electronics. For the latest copy of the catalogue or CD-ROM call **(0870) 2646000** or visit your local Maplin Electronics Store. Product orders can also be placed through Maplin's web site, visit **www.maplin.co.uk**

Perfect Travelling Companion

If you're a keen traveller who loves keeping up-to-date with what's going on back home, then the R9914 digital world band radio from Roberts Radio could be your perfect travelling companion. In a stylish silver finish, the R9914 is branded with the BBC World Service logo and boasts a wide range of practical features including multiple short wave bands so listeners can keep abreast of all the music and news across the globe.

The lightweight R9914 is handy for backpacks and suitcase of all sizes. It has 45 station preset memories and a scanning circuit which allows the user to search for active stations. The R9914 is further enhanced with alarm and timer functions, has a digital 24-hour clock and allows for a second time zone to be programmed in.

Roberts Radio is renowned for premium quality and sound clarity and the R9914 is no exception. It comes complete with stereo earphones, soft carrying pouch and a free BBC World Service guide to short wave radio - all for £100.

Call **(01709) 571722** for your nearest stockist.

Yuletide Social

The **Hoddesdon Radio Club** have a Christmas Social on 19th December - all are welcome. Contact **Don** on **0208-292 3678** for more information.

Take Control

TiVo Inc., in association with British Sky Broadcasting, has changed the way British viewers watch television forever with the launch of TiVo, the first ever Personal Television recorder (PTR) and service. Now available, TiVo will give viewers unprecedented control over what they watch and when they watch it, regardless of when programmes are scheduled.

For the first time ever, British viewers will be able to pause, rewind and playback in slow-motion live television. Recording programmes is as easy as the touch of a button - no more setting the clock or remembering the videotape.

TiVo's hard disk recording system can store up to 40 hours of programming, giving the viewers the chance to truly take control. TiVo also boasts an intelligent system that provides viewers the opportunity to teach it their viewing preferences and recording habits, TiVo will then automatically suggest on record programmes it thinks they would like to watch.

One of TiVo's most useful features allows viewers to set up a Season Pass that automatically records every episode of a series, meaning viewers will never miss their favourite programmes again.

Manufactured by consumer electronics manufacturer Thomson, under the Thomson SCENIUM brand, the TiVo Recorder is available at Dixons, Currys and selected electrical retailers or direct by calling **(08702) 418486**.

The TiVo Recorder will work in almost all UK homes, no matter how they receive their television.

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.

November 25: The Rochdale & District Amateur Radio Society are holding their traditional radio rally at St. Vincent de Paul Catholic Church Hall, Caldershaw Road, off the A680 Edenfield Road, approx two miles west of Rochdale. Follow the orange arrows from M62 J20. Doors open 1030 (1015 for disabled visitors). Entrance fee is just £1 and there will be refreshments/rest area. **John G7OAI**, evenings, on **(01706) 376204**

November 25/26: The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9. There will be trade stands, talk-in on 2m and 70cm, Bring & Buy, special interest groups, free parking, disabled facilities, camp site, family attractions, licensed bar, catering and Morse tests. Doors open on Saturday at 1015 till 1700 and on the Sunday from 1000 till 1600. Further information on **(01923) 893929**

November 26: The Bishop Auckland Radio Amateurs Club (BARAC) Rally will take place at Spennymoor Leisure Centre. This venue is ideally suited for both trader and disabled visitors as it boasts good parking and access to large ground floor hall. There will be the usual radio, computer, electronics and Bring & Buy stalls, as well as catering and bar facilities. Morse tests are available on demand. There will be lots to do for all the family within the Leisure Centre for members of the family not interested in radio. Doors open 1100 (1030 for disabled visitors). Admission is £1, under 14s free of charge. Talk-in on S22. **Mark G0GFG** on **(01388) 745353** or **G7OCK** on **(01388) 762678**

2001

January 28: The Horncastle Amateur Radio, Electronics & Computer Fair is to be held at the Horncastle Youth Centre, The Old School, Cagthorpe, Horncastle, Lincs, (nr Horncastle Police Station). Admission just 50p. There will be Morse code tests and refreshments available. Information and bookings taken on **(01526) 860320** or **(07778) 274535**

February 4: The 16th South Essex ARS Radio Rally will be held at the Paddocks (situated at the end of the A130), Long Rd, Canvey Island, Essex. Doors open at 1030 and featured will be Amateur Radio, Computer and Electronic Component exhibitors. Home-made refreshments, free car parking with space outside main doors for disabled visitors. Details from **Brian Bellamy G7IIO** on **(01268) 756331** or E-mail: **briang7iio@yahoo.com**

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DX Television

All good things come to an end and that includes the Sporadic-E season. The last 'real' opening occurred on September 2nd and apart from Benelux stations received in Bristol via enhanced tropospherics, there was little else of any significance around.

Reception Reports

On September 1st, **Peter Barclay** (Sunderland), **Tom Crane** (Hawkwell) and **Stephen Michie** (Bristol) all reported strong Italian Sporadic-E signals during the morning. Peter Barclay and **Ian Milton** (Ryton) logged Spanish and Portuguese signals during the early evening. September 2nd produced a glorious evening opening for **Peter Barber** (Coventry) when Channel R2 came alive at around 1800UTC with signals flooding in from Lithuania, the Ukraine, Hungary (RTL KLUB) and Moldova.

At 1837UTC, **Simon Hockenhull** (Bristol) noticed an unidentified news bulletin on R1, sporting a plain '1' logo in the upper right of the picture. At 1844UTC on R2, Peter Barclay spotted a mystery logo consisting of a curly stylised '2' in the top-right of the screen. By 2000UTC, TVE-1 (Spain) was showing football which continued past 2108UTC, at times accompanied on E3 by co-channel signals from the Portuguese (RTP-1) Lousã outlet.

Peter Barber witnessed the final Sporadic-E opening of the season on the 3rd with a twenty-minute display of RTP-1 on E3 from 1000UTC. Stephen Michie watched Olympic pictures flutter up via Meteor-Shower on E3 at around 0730 on the 17th, 22nd and 24th. The signals are thought to be of Danish origin because the DR-TV PM5534 is normally seen around this time.

During a recent mobile DXpedition atop Cairn O'Mouth in Aberdeenshire, **George Garden** (Edinburgh) identified Border TV from the 2kW vertically-polarised Eyemouth relay on Channel 29, using a Sony l.c.d. TV and an antenna draped over the truck mirror.

Mystery 525-Line Reception

Recent TEP (Trans-Equatorial Propagation) successes from **Lt. Col. Rana Roy** (India) include signals from south-east Asia on Channel E2, usually between 1400 and 1730, local time. These are thought to have originated from the various high-power outlets throughout Thailand.

Between 1830 and 1915, what appears to be 525-line 60Hz pictures have been resolved on Channel R1, from south-east Asia. Adjusting the vertical hold control synchronised the images albeit with a reduction in height. This is a characteristic of a 60Hz picture (i.e. System M 525-line standard) received on a 50Hz receiver. No audio could be resolved.

Vietnam is a possible System M contender because Channels A2 and A4 are used. The lower frequency allocation is somewhat of a mystery as it is a non-standard channel. It is not the first time that System M signals have been resolved on Channel R1. During the last F2 peak there were several instances of such reception in the UK, mostly in the form of a white cross-hatch pattern. Could these signals have originated from the same source?

The mystery FuBK test card has been seen again on Channel E2 or R1 from the west between 1800 and 1830, local time. Does anyone have any suggestions?

Since September 5th, Rana reports enhanced tropospheric reception from Pakistan on E5 and E10. Indian TV came in from Amritsar E7, Jallandhar E9, Kasauli E6, and an unidentified low-power translator on E5 relaying Doordarshan programs from Delhi.

Alarm Bells Rang Out!

In late summer, Ian Milton spent an idyllic holiday in Wales, far away from the irritants of everyday life. Arriving with a Plustron TVR5D monochrome receiver and a small active dipole, Ian was amazed to discover the luxury of an interference-free Band I. Even R1/E2a was superbly clear which allowed the best reception of Austria for years. It was sheer bliss, a DXer's dream paradise, complete freedom from 49MHz pagers and those dreaded baby alarms.

However, during the second week, neighbours moved into the adjoining property armed with screaming baby. Instantly, if not sooner, the alarm bells tolled loud and clear for Ian. No sooner had the baby-buggy, shawl and rattle disappeared over the doorstep the 49MHz baby alarm burst into action producing a superb white raster, all the way up to E3. Even worse, it also produced strange images from Band II f.m. stations in reverse frequency order up to E4, making it impossible for any pictures to be resolved!

Fig. 1: Part of the Swiss identification sequence used by SF-DRS.

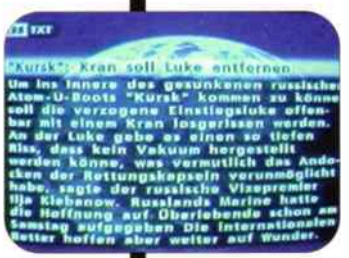

Fig. 2: A text page produced by 'Swiss TXT' and radiated instead of a test card by SF-DRS.

British TV In Éire

Damian Grehan (Co. Mayo, Éire) advises that low-power repeaters relaying TV signals from the United Kingdom are now licensed. Powers range from 1W to 1.6kW. The nearest local relay is 29km away and radiates 5W on Channels 41, 44, 47 and 51.

Swiss TV

Initially, the German-language SF-2 TV network was only distributed via cable systems. Recently it has become available via transmitters located within German-speaking areas of the country. Our thanks to **Sean Bateman** (Coalville) for supplying the following list of transmitters which radiate SF-2:-

Transmitter	SF-1	SF-2	Transmitter	SF-1	SF-2
Ausserberg	E6	E26	Pfaender	E11	E32
Bantiger	E2	E43	Rigi	E6	E32
Celerina	E9	E65	Saentis	E7	E31
Chasseral	E25	E62	Schaffhausen	E47	E50
Feldis	E26	E28	Sedrun	E46	E59
Gebidem	E11	E60	St. Chrischona	E11	E49
Klewenalp	E10	E55	St. Niklaus/VS	E64 (E9)	E54
Lavin	E41	E55	Uetliberg	E3	E26
Lopper	E25	-	Valzeina	E10	E66
Niederhorn	E53	E65	Wattenwill	E6	E60
Olten	E42	E63	Ziegelbruecke	E59	E68

This month's column features several off-screen shots of Swiss TV captions received by the authors in August.

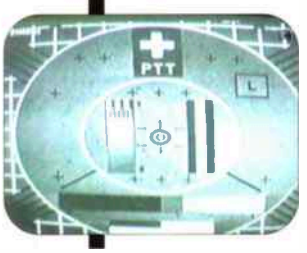

Fig. 3: The monoscopic test card originally transmitted by '+PTT' in Switzerland during the 60s and 70s but shown again very briefly in August 2000! This particular version has the designation letter 'L' in the small square to signify that it was coming from the studios in Lugano.

FM Reports

On the 4th at 2330UTC, Simon Hockenhull noticed test transmissions for 'Real Radio' in South Wales on 105.4 and 105.9MHz. The signals are received at good levels using no

DXTV Log For September

Reception reports this month have been supplied by Peter Barber, Peter Barclay, Simon Hockenhull, Ian Milton, Stephen Michie and Tom Crane. All times are shown in UTC.

Day	Log
1	Italy (RAIUNO) A and B; Italy (TVA -Italian private station); Spain (TVE-1) E2, E3 and E4; Portugal (RTP-1) E3. All signals via Sporadic-E (SpE).
2	Lithuania (LRT) R2; Ukraine (YT-2) R2; Italy (RAIUNO) A; Hungary (RTL KLUB) R2; Moldova (TVM) R2; France (Canal Plus) L3; Spain (TVE-1) E3; Portugal (RTP-1) E3. All signals via SpE.
3	Portugal E3 via SpE from 1000 until 1020.
7	Denmark (DR-TV) PM5534 test card on E3 at 0727 via Meteor-Shower (MS).
9	Unidentified programme on E3 at 0733 via MS.
11	Belgium RTBF-1 on E8 and VRT TV1 on E10 via tropospheric propagation.
12	Belgium RTBF-1 E8, VRT TV1 E10, KETNET CANVAS E25 and E62; Netherlands: NED-1: E4 and E29; NED-2: E27, E32 and E45; NED-3: E30, E35 and E42. All via tropospheric propagation.
17/22/24	Unidentified 'Olympics' on E3 around 0730 via MS.

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

Airband

While working at a well-known hospital the other day, I couldn't help but notice the helipad. Not much there, a square of concrete in the middle of a small grass field with a concrete path leading away to the hospital. The pad itself had two low-level floodlights and a windsock; the tallest part of the hospital is fitted with a strobe light, there are no other approach aids.

Such sites don't usually have any more to offer than this example. Military helicopters might work the Rescue Co-ordination Centre 5.680MHz u.s.b. when *en route*, otherwise the only radio facilities would be at nearby aerodromes, not at the hospitals. One purpose of these flights is the smooth transport of patients with spinal injuries to specialist centres, the vibration of a road ambulance can sometimes make the condition worse.

I know that the debate continues about the cost-effectiveness of air ambulances. Meanwhile, let's remember that this is not the same as routine air-taxi operations. The work involves putting the machine down in unprepared, obstructed, places. Incidents don't choose their sites to be suitable for helicopters. It will possibly be the first time a helicopter has ever landed there.

So, spare a thought for those pilots who are willing to help others by flying this demanding and sometimes dangerous rôle. Accidents and fatalities in the air-ambulance and air-sea rescue world continue to be reported.

Information Sources

What do pilots consult to find hospital helipads? *Helicopter Landing Sites (Hospitals, United Kingdom)* from RAF 1 AIDU is the answer and contact details for this publisher appear on my *Airband Factsheet*. To obtain one, send a pre-paid self-addressed reply envelope (to hold two A4 sheets) to the Broadstone editorial offices (but **not** to me!). I see from the publication that each site has a unique identification applicable to the Sea King Mk. 3A. My guess is that an automated navigation system finds the best route to the destination once the appropriate code is entered. Can any air-sea rescue experts confirm this?

If you have Internet access, the CAA places regular information at **www.ais.org.uk** including Royal Flight NOTAMs ('Bulletin Information' menu, select 'UK Daily Navigation Warnings'). Temporary airspace restrictions (including Royal Flights and *Red Arrows* displays) are still listed on the telephone recording (0500) 354802, updated at 1900 local each day. See *AIC* 92/2000 from the CAA.

Receiver Hardware

I can't answer questions about which receiver is best. This is partly because it comes down to personal preference. Some modern sets offer a wide range of facilities, hours of endless fun if you have the time. I also know that other readers can't be bothered with such complexity because they are more familiar with earlier, straightforward radios, or they just want a simple requirement met without having to spend time reading a lengthy operating manual.

Let's not forget those so-called older sets. Operators didn't need to wade through long documentation to make them work and, indeed, one set was often very similar to another in operation. But, whereas these days you practically need computer knowledge to operate an advanced scanner, in the old days you had to possess genuine radio skills to get the best out of simpler equipment. I don't think that you can compare the two.

The young computer expert of today, immediately at home with the complex user interface of a miniaturised scanner, is neither cleverer nor less skilful than the old-timer who is familiar with valved communications receivers. These two exponents of our hobby both make valuable contributions, it is just that they have concentrated on different skills.

When choosing a receiver, the first job is to decide what's required in terms of coverage. The set with the most ecstatic review is useless if it can't tune to what you want to hear. In the case of the civil airband, the full allocation 108-137MHz is essential (well, not the actual band edges themselves).

Nowadays, 8.33kHz channel spacing is being implemented. You should expect a new set to offer this if you want to future-proof the money you've invested in it. So far, I have discovered that the following receivers offer this narrower spacing: AOR AR8200, Alinco DJ-X2 and Yupiteru MVT-7300. Can anyone add to the list?

Having reviewed the paper specifications of likely contenders, the next step is to try them out. No reputable dealer or genuine private vendor (if second-hand) will object to a fair trial. If they do, be sceptical and look elsewhere.

Radar

Can you make use of received s.s.r. squawk codes ('ed's comments,' *SWM* October page 4)? As I described in my column last month, basic mode 3A/C data carries the squawk code and flight level, that's all. To solve the aircraft's position, you need to know the time delay between sending the interrogation pulse and receiving the reply (distance) and the instantaneous azimuth angle of the radar head when the reply is received (for bearing). Amateur equipment is unable to accurately measure the head azimuth. Even living near a head, picking up the interrogation pulse would only resolve an ellipse on which the aircraft could lie.

A direction-finding antenna might give an estimate of the angle from which the reply originated. So, with amateur equipment, direction finding by passive radar is going to be difficult, inaccurate, and only possible if the receiver is located near a radar head. Transmitting a radar pulse to stimulate a response is dangerous and illegal as it could trigger false position indications on air traffic controllers' screens.

For amateur enthusiasts, the best plan is to retrieve NATS data from the Internet at **www.flightpathuk.com** once it becomes available. Buying a dedicated computer might be cheaper and easier than setting up a passive radar receiver! I doubt if all aircraft will show, despite the claim, as many light aircraft don't squawk when outside regulated airspace, or just show the anonymous 7000 conspicuity code.

Abbreviations

ACARS	Aircraft Communications Addressing And Reporting System
AIC	*Aeronautical Information Circular*
AIP	*Aeronautical Information Publication*
ATIS	Automatic Terminal Information Service
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
ft	feet
i.l.s.	instrument landing system
kHz	kilohertz
MHz	megahertz
NATS	National Air Traffic Services
NOTAM	NOTice to AirMen (includes AirWomen)
s.s.r.	secondary surveillance radar
u.s.b.	upper sideband

Lightning under wraps.
Christine Mlynek

Continued on page 52

DXTV

Continued from page 50

more than a telescopic rod antenna.

Simon feels the intrusion of these new stations will restrict DXing around 105MHz, the only real clear part of the band. However, on the 9th, Stephen Michie logged the usual crop of 'locals' from Mendlesham and Croydon plus 'Wave 105' on 105.2MHz from Chillerton Down. Reception on the 12th included 'News Direct' on 97.5MHz from Croydon. At 2035UTC on the 10th, Simon Hockenhull identified BBC R2 from Wrotham on 89.10MHz.

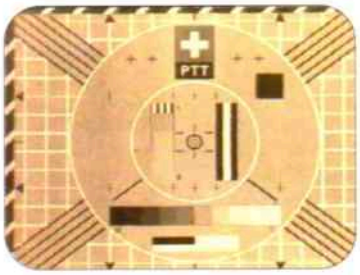

Fig. 4: An official photogreph of the Swiss '+PTT' Test Cerd.

During dense fog on the 20th, George Garden (Edinburgh) drove to the summit of Cairn O'Mouth, in Aberdeenshire. On 106.0MHz, a station called 'Kiss FM' could be heard, over 'Beat 106', from an unknown outlet in Northern Ireland.

Finally, Gösta van der Linden advises that in the Netherlands, DAB test transmissions have ceased due to the shortage of receiver supply.

Fig. 5: A photogreph for DX and train enthusiasts alike! A Swiss loco decorated to advertise the Swiss TV services of SRG and SSR. The loco was tracked down (no pun intended) in August at Luzern railway station. Any chance of seeing a British train sporting the BBC Ident? You'll be lucky if the ancient rolling-stock even bothers to turn up!

Digital Terrestrial News

While the United Kingdom has enjoyed a nationwide digital terrestrial TV service on-air for the past two years, other European countries have been slow to follow suit.

In the Czech Republic, experimental digital test transmissions have taken place around Prague using Channel E25. Three TV and two radio programmes are currently being aired.

In the Netherlands, test transmissions commenced in October using Channel E60. The transmission authority 'Nozema' expect interference to some analogue broadcasts.

The name of the French DTT service is 'DVB/T'. Transmitters on test include Rennes, Vannes and Lorient.

In Éire, digital allocations have been assigned for each main outlet. As in the United Kingdom, six multiplexes have been allocated for each transmitter although a small number have only four until frequency allocations permit.

Service Information

Gösta van der Linden (Netherlands) has supplied the following information about Bands I/II transmitters:-

Hungary: The latest logo is 'M 1' within a rectangle (grey on the left and white on the right) in the upper right of the screen.

Latvia: The 'LTV' transmitter at Riga on Channel R3 has been renewed. The e.r.p. is 150 kW. There are no plans to close it in the near future.

Serbia: Kapaonik on Channel E3 still transmits an empty sync bar (i.e. no VITS or text information). The original transmitter offset was 'zero'; now it is 2M (-2.6kHz). Serbian broadcasts may now be interrupted after the TV building in Beograd was set alight on October 5th during the revolution.

Macedonia: Mt. Pelister (Channel E4) now has an offset of 1P (+1.3kHz). The old offset was 2M (-2.6kHz).

Iran: There are at least two IRIB TV transmitters operating on Channel E2, one with an offset of 8M and one with an offset of 8P. The E3 outlet has an offset of 8P.

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.** We can also use off-air pictures stored as JPG files on PC disks and good-quality video recordings.

Fig. 6: This month's forage 'Down Memory Lane'. The 'star' logo used between commercials in some ITV regions during the 50s and 60s.

Airband

Continued from page 51

Hope someone's looking after this Gnet.
Christine Mlynek.

Likewise, ACARS is transmitted by many (most?) large transport aircraft, but only at certain phases of flight. It is not a substitute for continuous position location by radar. If NATS radar data is made available on the Internet then I would expect it to be best at displaying aircraft in controlled airspace, mainly airliners.

Military Low Flying

Watch out, private pilots! Fatal collisions between low-flying military fast jets and light aircraft have been reported over the years. Above 2000ft height there is little chance of an encounter, though.

W.J. Mainwaring GW8AWT (Maenordeilo, Wales) was working on Chain Home radar as late as the 1950s and also has experience with Ground Controlled Approach/Radio duties (I assume that's Approach and not Attack, anyway). He lives at 200ft above sea level yet military fast jets seem to fly below him!

I can assure GW8AWT that this must be unusual since most military low flying is subject to 250ft minimum separation distance and would hence be higher than his house even when over the sea (*AIC* 91/2000). In the Tactical Training Areas (TTAs), one of which overlies central Wales, a few flights go down to 100ft. However, none of the SA postcode area lies under a TTA.

My maps don't show the precise location of GW8AWT but, at 200ft, he might be near the coast. The *Chart of United Kingdom Areas of Intense Air Activity, Aerial Tactics Areas and Military Low Flying System* ENR 6-5-2-1 is available, for the cost of postage alone, from the CAA (address as on the *Factsheet*). This chart shows a north-bound choke point where low-flyers pass west of Lanelli, possibly also avoiding Swansea and the various danger areas around Pembrey.

Frequency & Operational News

On behalf of readers, thanks to **Martin Sutton** (CAA) who sends *AIP* amendments that will have taken effect by the time this edition is published.

New significant points in the Manchester area are SANBA, TABLY, XOBRO and XUMAT. I have precise co-ordinates if you write in and ask. A significant point defines a navigational procedure or airway but does not demand a position report unless directed by the controller.

Aerodromes next. Isle of Man has improved i.l.s., now on 111.15MHz. Runway 08 ident is IRW, 26 is IRY. The d.m.e. has hence moved to channel 48Y (1135MHz reply). Leeds Bradford runway 10/28 becomes 09/27 because magnetic north has moved. London City Tower is now 118.4 (was 127.95, usually ATIS, but reverted to Tower secondary if the primary 118.075MHz was unavailable). Thames Radar 132.7MHz will direct pilots as to which Tower frequency to call.

Secondary surveillance radar squawk codes have been updated and you can write in to ask if you need to know about a specific example. The complete list would take up this entire column!

All letters received up to October 12 have been answered. The next three deadlines (for topical information) are December 11, January 8 and February 5. Replies always appear in this column and it is regretted that **no** direct correspondence is possible.

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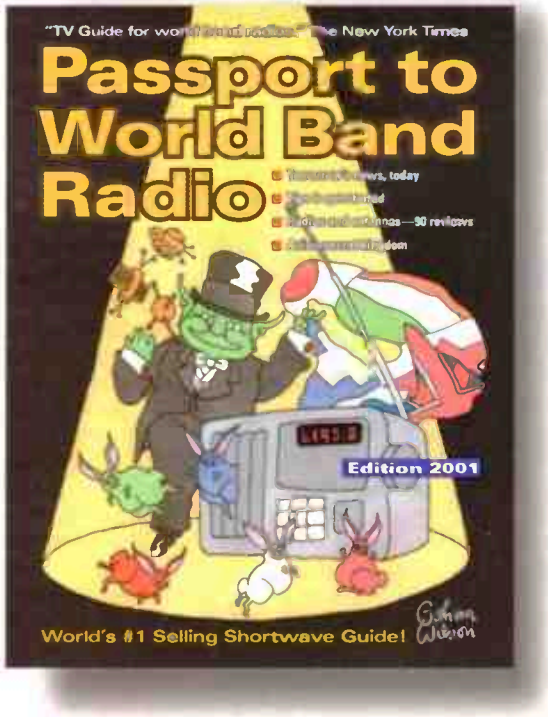

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MilAir

Aerodata 2000

This month we will be going off at a tangent to review an intriguing piece of MilAir software. During the past few months I have received correspondence from four *SWM* readers, regarding some aviation related software, the item in question being *Aerodata 2000*. They asked if I had received any reports regarding the operation and performance of this CD-ROM.

Well, I went one better and contacted Aerodata who very kindly supplied me with a copy for review. Now whilst it can be argued that this software is aimed more at the Aviation Enthusiast than the Military Airband listener, the two are inextricably linked with a large percentage of airband listeners being enthusiasts first. However, future developments will benefit the MilAir listener.

Massive Database

In simplistic terms, *Aerodata 2000* is a massive database of military and civil aircraft. It can be bought as a complete item, at the wallet draining price of £199, or as separate modules, so it can be tailored to the individuals needs.

The modules and their prices are as follows: (1) Airliners and Biz Jets/£75, (2) Balloons, Microlights, Gliders, etc./£30, (3) Civil and Military Utility/£20, (4) Fighters and Bombers/£50, (5) Helicopters/£30, (6) Light Aircraft/£50, (7) Military Trainers/£25, (8) Military Transports and Tankers/£20.

The MilAir enthusiast would need to buy at least five modules to cover most military types at a total cost of £145. It is a shame that there is not an option to buy just civil or military aircraft, but with the databases built around aircraft types, this would have been impractical with many types being used by both military and civil operators. The prices above include a free Internet update service for the first year, subsequent years for the complete package cost £100 per annum.

The installation procedure was quite straightforward, but when it asks you which directory to put it in, use the one they suggest, it doesn't like you renaming the directory! The first thing that strikes you is the enormous amount of work that has gone into this project. The full package which was supplied for review contains over 3,200 aircraft types and 500,000 aircraft records with this number predicted to increase to over 700,000 by the end of 2001.

The search engines are quite comprehensive allowing you to search the databases by several different parameters, this includes: Construction number, Serial, Tailcode, Selcal, Aircraft Name, etc. The Lists/Registers section allows you to produce listings for: Aircraft types, Operators, Airfield residents, Military Units or whole countries.

Using my 300MHz Pentium with 128Mb of RAM, producing the whole UK civil and military registers took just nine seconds, not bad for a total of almost 20,000 aircraft. Producing the same registers for most European countries took less than 10 seconds, Canada was 12 seconds and the big test, the USA, took 1 minute 45 seconds.

It is worth pointing out that these registers contain not only currently active aircraft, but also those that are stored, preserved or are museum exhibits. For example, if you ask for a list of airfield residents for Yeovilton, you will get a listing of all the based military aircraft, plus you also get the FAA Museum residents, Gate Guards, etc. There is also a selection of options for you to generate hard copy reports of various listings, but as the manual warns, don't try to print out the whole of the US Air Arms unless you have a lot of time and paper handy!

The system is designed so that you can record your own sightings, photographs and even aircraft you have flown on. There is an autologging facility which make entering your sightings relatively easy, the authors quote an instance where after a bit of practice you should be able to record 800 serials in under two hours. If you are concerned about losing precious records in the instance of a hard disk crash there are comprehensive backup facilities in place. If the instructions are followed correctly, the safeguards will result in no loss of data.

Also within the management section of the database are tools for insuring the correct maintenance of the system. This involves regularly compacting the database every 10 days - you cannot get out of this chore as the software will not let you. The compact on my machine took just over seven minutes and whilst some may consider this a pain, it is a small price to pay for a hopefully trouble free database.

You can manually update the aircraft records if you wish, but most users will subscribe to the Internet updating group. After a confirmation sequence, you then receive other users postings plus the regular updates in the form of an attached Zip file. Unzip the file, click on the resulting executable file, tell the computer which drive *Aerodata* is on and the databases will automatically be updated when you next open *Aerodata* - easy!

With almost 30 people working on the updates, they can arrive quite regularly, so it is recommended that you follow good management procedure and re-index the databases as well as compacting them. This re-index took 29 minutes on my machine, but it can take a lot longer on slower computers. Be warned - you cannot use the computer whilst the re-index is running.

General Moan

I did find a few minor things that were annoying whilst using *Aerodata*, but having spoken to the company, they are very receptive to ideas and suggestions and many of the things I would have liked to have seen will be incorporated into the new version 2.0 due out in Spring 2001. As an example, for the Military enthusiast to produce a unit listing for the Indian Air Force, you would have to know that the civil registration prefix is VT-! There is not yet a means to select it by country, but as I said, this will hopefully be incorporated in to version 2.

The one general moan I did have was that I found the manual a little hard to follow at times and some subjects needed to be expanded and re-written.

How Good?

So, down to the bottom line, how good is the aircraft data included in the databases? Over a period of weeks I must have made several hundred searches for information and in general I found the current aircraft information to be accurate and up-to-date. I did find some omissions and errors, but in a project of this size it is to be expected and the whole point of the update group is for the user to pass on any new information, so that the master databases can be amended.

Whilst some of you may raise an eyebrow, I did enjoy using elements of the civil directories. Having been fortunate enough to have photographed many US Military Propliners, C-54, C-118, C-131, etc., I thought I would throw *Aerodata* a curve ball and see if it could track down some of these great old transports. I was quite impressed with the number of these old aircraft the databases contained and even more surprised at how many were still in use commercially in North and South America.

Whether this type of database will replace books for the mobile user remains to be seen, I think it will be a few years before we are all walking around with a palmtop or even smaller computer strapped to our wrist - but I am sure it will happen one day! As a home base station, I not only found it to be a good reference to the current Military aviation scene but also as a powerful research tool. Not only is current information still being added and amended, the authors are endeavouring to add more historical information to look after the interests of people like me who have been around the aviation scene for over 30 years!

The new version will have a lot of new information and some software changes, many coming from suggestions from current users. For the MilAir listener there are plans to add a frequency database, they also hope to add Maps and ICAO codes. The new version will be free to existing users and will remain at £199 for new customers.

And so to the bottom line, is the complete package worth £199? I think the price tag will scare a few people away, but when you compare it to the book equivalent and you consider that it is being constantly updated, it will continue to evolve and that it gives you easy access to an enormous amount of current and historical aircraft information - my personal opinion is that it is well worth the money.

Thanks To

My thanks to Aerodata for the chance to review the CD, they can be found at: **Cedar Cottage, 27a The Street, Holywell Row, Mildenhall, Suffolk IP28 8LS, Tel: (01638) 714182.**

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

Maritime Beacons

Most of the listeners who searched the band during July, August and/or September found plenty to interest them after dark when the sky waves from distant beacons reached our shores. Over in N.Ireland **Tom Smyth** (Co.Fermanagh) was pleased to add the beacon at Ristna, Estonia (RS) on **307.5kHz** to his all-time list.

In Co.Down **Robert Connolly** (Kilkeel) compiled an extensive log which included several beacons he had not heard before: Punta D. Maestre, Italy (ME) on **304.0kHz**; also three in the Ukrainian chain on **312.5** - Mys Aytodorskiy (AT); Mys Kyz-Aul (KA); Ilinskiy (IL). Reception of them has recently been made possible because the beacon at Kalpieda, Lithuania (KA) is now transmitting on **305.0** instead of **312.5**. Robert says "Strangely I have not heard either LB (Leipaja) or AK (Akmenrags) of the Baltic chain for some time although the remainder of that chain have been heard regularly".

Several beacons in the Ukrainian/Latvian chains were also logged for the first time by **Brian Keyte** in Gt. Bookham: M.Khersonesskiy (SW) and M.Tarkhankutskiy (TR), which share **309.5**; also Mys Aytodorskiy (AT), Doobskiy (DB) and Mys Kyz-Aul (KA) which share **312.5**. He says "Some readers may not know that there are frequencies which several beacons in an area share, each transmitting for one minute leaving the next five minutes clear for the others to transmit in their turn. This means that it is necessary to monitor the frequency for six minutes to avoid missing any of them. Frequencies to try from the UK are **312.5kHz** (with its two separate chains) and in really good conditions **309.5kHz**". Brian has noticed that the beacon at Cap Spartel, Morocco (SP) on **312.6** also has a long silence period. The callsign (SP), which is sent eight times, is followed by a plain carrier, then SP is repeated eight times followed by a plain carrier and SP twice. A four minute (approx) silence period then comes next before the sequence is repeated.

During his searches of the band at around 2200UTC **Peter Pollard** (Rugby) heard two beacons on the Faeroe Is - Myggenaes (MY) **337.0** & Akraberg (AB) **381.0**. From the South he picked up the sky waves from five beacons along the coast of Spain - Cabo Finisterre (FI) **288.5**; Cabo Villano (VI) **290.5**; Cabo Mayor (MY) **304.5**; Punta Estaca Bares (BA) **309.5**; also Cabo de Palos (PA) **313.0**, being the most distant. He says "I had hoped to hear more beacons with the closure of several which swamped my radio, but the background static and other noises made it difficult".

Not far away in Northampton, **Fred Wilmshurst** picked up the sky waves from the beacon at Carla Figuera, Majorca (FI) on **286.5**; also six beacons along the coast of N.Spain - Cabo Machichaco (MA) **284.5**; (FI) **288.5**; (VI) **290.5**; Torre de Hercules (L) **301.5**; (MY) **304.5**; (BA) **309.5**. From the North he heard three of the Faeroe Is beacons, (MY) **337.0**; (AB) **381.0** and Nolso (NL) **404.0** but the most distant was the Prins Christian Sund beacon (OZN) on **372.0**, which is located on the most southerly tip of Greenland.

Three of the beacons along the coast of N.Spain (MA **284.5**; MY **304.5**; BA **309.5**) were also received after dark by **Fred Pallant** in Storrington but several others which he logged proved to be aero NDBs, which are outside the scope of this column.

No doubt the long clear sea paths leading to the Isle of Man enabled **Albert Moore** (Douglas) to receive the ground waves from some of the Spanish beacons during daylight - MA **284.5**; FI **288.5**; VI **290.5**; L **301.5**; Rota (D) **303.0**; MY **304.5**; BA **309.5**. The more distant ones, which became audible after dark via sky wave paths, were Carla Figuera, Majorca (FI) **286.5**; Cabo San Sebastian (SN) **291.0**; also Mahon Minorca (MH) **292.0**.

With so many of the beacons within ground wave range of the UK having been closed down reception in most locations during daylight is very disappointing. Perhaps the increasing hours of darkness will encourage more listeners to explore the band during the evening.

DXers:-
(A) Robert Connolly, Kilkeel.
(B) Brian Keyte, Gt.Bookham.
(C) Albert Moore, Douglas, IoM.
(D) Fred Pallant, Storrington.
(E) Peter Pollard, Rugby.
(F) Tom Smyth, Co.Fermanagh.
(G) Fred Wilmshurst, Northampton.

Long Wave Maritime Radiobeacon Chart

Freq (kHz)	C/S	Station Name	Location	DXer
283.0	KK	Kulusuk	Greenland	A*
284.5	MA	Cabo Machichaco	NE.Spain	A,B,C,D*,G*
285.0	NO	Cabo de la Nao Lt	S.Spain	A*,B*
286.5	FI	Cala Figuera	Majorca	A*,B*,C*,G*
287.3	HA	Haifa Lt	Israel	A*
288.5	FI	Cabo Finisterre Lt	N.W.Spain	A,B*,C,E*,F*,G*
288.5	UD	Cabo Salou	S.Spain	A*
289.5	NP	Punta Carena	Italy	B*
290.5	VI	Cabo Villano Lt	N.Spain	A,C,E*,F*,G*
291.0	SN	Cabo San Sebastian	S.Spain	A*,C*
291.9	LT	La Isleta	Canaries	A*
292.0	MH	Mahon, Minorca	Balearic Is	A*,C*
293.5	RO	Cabo Silleiro Lt	N.Spain	A*
295.5	CB	La Corbiere Lt	Jersey C.I.	A,B
296.0	KN	Skrova Lt	Norway	B*
297.0	B	Cabo Trafalgar	SW.Spain	A*
297.5	MA	Mantyluoto	Finland	A*
297.5	PS	Cabo Penas Lt	N.Spain	A
298.0	TA	Cabo Gata	S.Spain	A*
299.0	O	Tarifa	S.Spain	A*
301.5	L	Torre de Hercules	N.Spain	A*,B*,C,G*
303.0	D	Rota	SW.Spain	A*,B*,C
303.5	OR	Punta de Llobregat	S.Spain	A*,B*,C
304.0	ME	Punta D.Maestra	Italy	A*
304.5	MY	Cabo Mayor Lt	N.Spain	A,B,C,D*,E*,F*,G*
305.0	KA	Klaipeda Rear Lt	Lithuania	A*,B*
305.7	OA	Oalatangi Lt	Iceland	B*
306.5	H	Hel Lt	Poland	A*,B*,C*
307.5	RS	Ristna	Estonia	A*,B*,C,F*
308.0	AK	Table D'Oukacha	Morocco	A*
309.5	BA	Punta Estaca Bares	N.Spain	A,B,C,D*,E*,F*,G*
309.5	OD	Odesskiy	Ukraine	B*
309.5	SW	M.Khersonesskiy	Ukraine	A*,B*
309.5	TR	M.Tarkhankutskiy	Ukraine	A*,B*
310.5	OA	Damietta Mouth	Egypt	A*
310.5	GV	Genova	Italy	A*
311.5	SA	Senigallia	Italy	A*
312.5	AT	Mys Aytodorskiy	Ukraine	A*,B*
312.5	BK	Baltijsk	Russia	A*,B*
312.5	BT	Mys Taran Lt	Russia	A*,B*,G*
312.5	OB	Ooobskiy	Ukraine	A*,B*
312.5	IL	Ilinskiy	Ukraine	A*
312.5	KA	Mys Kyz-Aul	Ukraine	A*,B*
312.6	SP	Cap Spartel	Morocco	A*,B*
313.0	PA	Cabo de Palos Lt	S.Spain	A*,E*
314.5	TL	Punta D.Penna	Italy	A*
315.5	NO	Nida	Lithuania	A*
337.0	MY	Myggenaes	Faeroe Is	A*,B*,E*,G*
372.0	OZN	Prins Chris's Sund	Greenland	A*,G*
381.0	AB	Akraberg	Faeroe Is	A*,B*,E*,G*
404.0	NL	Nolso	Faeroe Is	A*,B*,G*

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

PAUL ESSERY GW3KFE, PO BOX 4, NEWTOWN, POWYS SY16 1ZZ

Amateur Bands

More improvisation this time! An attempt to update my other computer was looking good - until I tried to start this month's column. At somewhere around line 27, everything 'locked up' with a switch-off as the only way out - and of course Murphy's Law now took centre stage. How lucky I'd kept the old Amstrad PC1640! Incidentally, to those of you who enquired, the Ancient is on the mend, thanks.

Antennas

If you haven't already checked everything over - it's maybe too late. Seriously though, guys should be carefully checked twice a year. Nylon's OK for halyards 'cos it's stretchiness may save your antenna in a high wind, but for mast guys, use 8 or 16 plait pre-stretched terylene - easy on the hands and doesn't stretch. Avoid the 'natural' ropes (cotton, sisal, hemp) like the plague because they're only half as strong as the synthetic types and worse they lose what little strength they had when they get wet.

How do ropes fail? Obviously Chafe - 'parcel' that bit with cloth and a bit of tallow or you can use a bit of old hosepipe, if you can make it stay put. A taut piece of rope needs much less 'edge' to cut through it. Rope 'crippling' is the cause of most inexplicable failures. A crippled rope has suffered a sharp 'nip' - half the strands have been compressed and the others are in tension.

Where for example? Round a shackle, as part of a knot(!), and similar - which might include the salesman in the chandler who pulls off the length you asked for from the coil. A rule of thumb says a rope of diameter X needs to go round a curve diameter 3X to be reasonably safe. If you do get a kink, then it must **not** be yanked out, but 'chased' out right to the end.

Breaking-strain can fall to one third in some knots - a good reason for using splices. If you make an eye-splice include a thimble or at a pinch a piece of hosepipe. Finally, organise things so you can end-for-end guys, and give 'em a bath regularly: plastic bag, hot (not boiling) water, a good shake and hang out to dry.

Scrapping rope calls for willpower! Open up the lay, and look for strands broken or powdered. For the braided stuff, it can look horrible outside but still maintain adequate strength.

Scrap Rope is best marked as such, used in undemanding jobs or junked.

Letters

Our anonymous correspondent asks why modern rigs have two v.f.o.s. Backalong a DXer had transmitter and two different receivers - one or t'other would best serve to dig in the pile-up, and the other look for his transmit frequency. The slight differences in receiver design might make all the difference.

Safety: as usual, the letter from **GW8AWT** in Manordeilo raises various interesting points. Wyn has a friend, a fireman on the Isle of Wight, who says that all their electrical problems arise from 13A sockets or plugs. For myself, I make a routine of checking and tightening all the wire-locking screws regularly.

Wyn adds a few acid words on the subject of the noisy nearby 11kV line - interestingly enough, when I lived in Hertfordshire years ago, I passed under an IIkV line and one of the 132kV ones going to and from work - and always it was the 11kV line that made most noise! On the bands, Wyn heard a ZL1 one dawn, which says we are at equinox-time.

Back in the August issue I mentioned a computer program for RAE students and G7NIR asks where he can lay hands on a copy. Lester's son tried RAE unsuccessfully back in schooldays, but now he's in the RAF and has some spare time for study. My present copy is updated since the previous mention and I believe Murray G3KZB may well have added still more material - you can E-mail him at **murray.g3kzb@virgin.net** or download from **http://freespace.virgin.net/murray.g3kzb**

Now to the letter from **Colin Dean** in Barnsley. On 18MHz he found A41MA, BV5BG, CN8CJ, DS5RNM, DU1KT, EX2X, FR5DX, FR5GQ, JA9AA, JY8NJ, KH0/JA1WKT, KH0/JA8CCL, OD5NH, OX/W5FKX, SU1SK, UN9PQ, VK9XV, VU3MCV, YB2LAB, YB0DNK, YC0LBK, ZA1E, ZS6GF, 7K2PMJ and 9M0F. Next came 21MHz, where he booked in A4/XE1KK, BW2000, DU1IEB, DU8BOF, DU8DJ, DU9BCD, DU9RG, D44BS, EK6DA, EY8MM, EZ3A, E21EIC, HL1KTX, HS1NGR, HS0/G3NOM, JY4NE, NP2BT, P29CC, P43E, SU1SK, S79SBP, S92SV, TR0A, UN7JFU, UP0A, VK4NVX, VK9XV, VR2LW, V85GA, XX9TRR, YB0A, ZD7VC, 4S7SW, 5A3I, 5H5A, 5R8FL, 5R8GQ, 7Q7JL, 8N2000, 8P9JT, 8Q7XX, 8R1Z, 9K2HS, 9M2XA, 9V1BG and 9V1RH. That leaves us 28MHz and ET3VSC, P29KJP, SU9ZZ, N8LW, YC3IZK, YB0A, ZS1HL, 4F2KWT and 5Z4RT.

Propagation experts and **John Collins** in Birmingham don't seem to gel! Basically the propagation forecast can look to trends - for example there is an 'active' sun side and a less active one. However, while one can predict which side is looking at us, sunspots for example occur at random. We can say a complete cycle takes about 11 years, but we can't forecast a sunspot will occur tomorrow at 0900.

It is a reasonable guess that the peak of this cycle is about now, but it'll be six months after the event before we can be sure. John seems to have changed to an Eddystone 930/4, but he still sticks to 7MHz. He has extended his dipole to 13m, and has had no neighbour complaints. He lives at the end of a cul-de-sac and close to a canal - one wonders whether it's the Stratford-on-Avon or the Worcester & Birmingham, but either way water is a great help.

The HF Field Day planner who looks for a high spot merely demonstrates lack of knowledge - the ideal spot is over moist ground. The effect is present at v.h.f. too, but here of course you are looking for long-range line-of-sight paths which make the high places mandatory.

The next letter, from the Goodhalls, father and son surprised me a little. When they had a day up in London, they bought the narrow filter for the Icom 8500 and a couple of full-size G5RV antennas. A wire antenna like the G5RV is so easy to make that it seems a waste to buy one!

Anyway, back to the crop. Some Gs were noted on Top Band and on 3.5MHz a session around 0400 produced an assortment of east Coast W/VEs and the odd South American working into Europe. Up again to 7MHz where not much was logged, then 14MHz for various modes - p.s.k., c.w. and sideband. Taking s.s.b. first we see 9Y4SF, VP9JR, TA2RJ, KC1TX, K1UQV, W4GXT, AX4BR, 4X6HV/M, P43E, K6ERT, N9LA, J4IOG, VK0MM, while the c.w. saw JA3HBF on to 3B8FG, 5V7VJ, W2KKZ, FR5FD, K7SP, DU3NXE, leaving p.s.k. for W3STW, VE3AHZ, W9ICO, AA4P, K3UB, K1VD, KF4SIR, N4KYM, JA4EFV, CX2AV, WC0Y, VE2SG,ZP6GHA, VK3OM, and of course the smaller fry.

At 18MHz we can see K4VAH, W1SXN, then 9H1ET working in succession KB2PAQ, M5GAC, W4FQT, W4GF, W2YE, PT7SY, N5NBK, W4UEM, W3MEL, TI5KD, W4ET and AA2YF. Later in the month, they logged K4VAH, 5R8FU, WB4GOA, KN4EZ, W3EI - all sidebanders. Up to 21MHz and JA0LHU with CO7OTA, WD4NGB working JY8NJ, and WA3AWU. On 24MHz 5V7VJ was working Yanks, ZD9ZM on c.w. and EX2X on sideband, which leaves Ten for V51AS, ZD9ZM and 5V7VJ.

Finis

That's all for this time. Send your letters, as ever to **Box 4, Newtown, Powys SY16 1ZZ** to reach me by the first of the month. Don't forget, news as well as lists, laughs and disasters!

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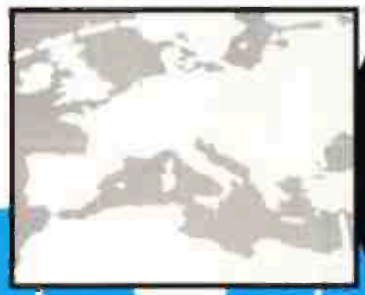

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LM&S

This is the last edition of 'LM&S' for the year 2000 and the festive season will not be far away by the time it is published, so may I take this opportunity to wish all readers a Very Happy Christmas. The information herein is based upon reports of actual reception which are sent to me each month by dedicated listeners so that others who enjoy this hobby may benefit from their findings. To them and anyone who has contributed to LM&S during the year I extend my sincere thanks.

If you would like to join the regular contributors to 'LM&S' during the year 2001 please post your reports to reach me at the above address by the first week of the month following your reception.

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 September.

A lift in the propagation conditions was observed around 2000UTC on September 30 by **Fred Pallant** (Storrington), when two stations in Europe suffered co-channel interference from two stations in N.Africa. Those affected were Donebach DLF, Germany (500kW) and Bechar, Algeria (1000kW), which share **153kHz**; also Munich DLF, Germany (500kW) and Azilal, Morocco (800kW), both on **207kHz.**

Medium Wave Reports

A report of m.w. transatlantic reception during September came from **David Edwardson** in Wallsend. He used a 2.5 x 2.5m wall mounted fixed loop ahead of his Trio R-600 receiver plus m.w. converter to search the band at night for m.w. broadcasts from stations in E.Canada and E.USA. At 2310UTC on the 16th VOCM in St. John's, New Foundland became audible on **590kHz**, with a weather report, station ident and pop music. The transmission rated SINPO 25552. David says "I tuned in during the rest of the month and band conditions were poor. No other DX was heard".

Quite extensive logs were compiled by some of the listeners who searched the band after dark for sky waves from stations in the Middle East, N.Africa, Europe and Scandinavia - see chart. **Simon Hockenhull** (E.Bristol) noticed that the French m.w. domestic network is now on the air throughout the evenings. Bordeaux on **1206** can now be heard alongside Virgin on **1215.** In Newry, **Eddie McKeown** found the reception of Bordeaux so clear that he intends to use it as a monitor for the other frequencies.

During a caravan holiday near Newquay, Cornwall **Bernard Curtis** (Stalbridge) used a Vega Selena receiver with a loop to search the band. He compiled some interesting logs (see charts) but reception was marred by interference from a communal TV antenna, which was connected to all of the caravans.

Whilst visiting Scotland in early September **Brian Keyte** (Gt.Bookham) drove to a quiet glen among high mountains at Strathconan, WNW of Inverness and connected his AOR AR7030 receiver, which was powered from the car battery, to a barbed wire fence as an antenna. It worked well and he compiled an extensive local radio log - see chart. As well as several South of England stations he logged for the first time BBC Hereford & Worcester on **738**, which rated 14342 at 0610UTC. He noticed that ILR 1458 Lite AM, Manchester had become BIG 1458 AM.

A visit to Worthing at the end of September enabled **Harry Richards** (Barton-on-Humber) to explore the local radio scene from a different location. During daylight he picked up the ground waves from twenty-six stations, the most distant being BBC R.Nottingham (1kW) on **1584**.

Long Wave Chart

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

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

Listeners:-
(A) Sheila Hughes, Morden.
(B) George Millmore, Wootton, IoW.
(C) Fred Pallant, Storrington.
(D) Tom Smyth, Co.Fermanagh
(E) Phil Townsend, E.London.
(F) Fred Wilmshurst, Northampton.

Short Wave Reports

In the **25MHz (11m)** band the daily broadcasts to E/C.Africa by R.France International (RFI) on **25.820** (Fr 0900-1300UTC) continued during September and they could still be received here in early October. At the time of writing it is not known if they will form part of the RFI winter schedule, which will commence on October 28. No reports arrived here from the intended target area but some listeners in the UK monitored the transmissions daily.

Sometimes there was a sporadic E opening between the UK and S.Europe and enhanced signal ratings were noted - a very clear and strong signal with an echo was received between 1000 and 1200 on September 3 and again on the 11th by **Vic Prier** in Colyton. However, reception of the transmissions in the UK tends to be poor because they are beamed in the opposite direction and arrive here via back scatter and other unreliable modes.

The SINPO ratings quoted in the reports were 25222 at 0900UTC in Newry; 43333 at 0925 in Stalbridge; 34433 at 1000 by **Robert Connolly** in Kilkeel; 15232 at 1053 in Storrington; 15521 at 1215 in E.Bristol; 25343 at 1217 by **Fred Wilmshurst** in Northampton.

In contrast, there is a high level of activity in the **21MHz (13m)** band and good reception from many areas has been evident except during periods of high solar activity. The most distant broadcaster to reach our shores in this band is R.Australia. Their transmission to Pacific areas via Shepparton on **21.725** (Eng 0200-0900) was rated 44433 at 0800 by **Sheila Hughes** in Morden. At 0900 they change frequency and broadcast to Asia via Shepparton on **21.820** (Eng 0900-1400). Their transmission was rated 24222 at 0904 in Newry & 25522 at 1257 in E.Bristol.

Other broadcasters who are active in this band during the morning include Swiss R.Int via Sottens **21.750** (Fr, Ger, It, Eng to Near East, Africa 0600-0815), rated 34222 at 0738 in Newry; R.Finland via Pori **21.670** (Eng to Australia, Asia, W.Eur 0630-0645), rated 44433 at 0640 by **Stan Evans** in Herstmonceux; DW via Wertachtal **21.790** (Eng to Australia, Asia 0900-0945) 33333 at 0905 by **Thomas Williams** in Truro; R.Pakistan **21.460** (Ur to Eur 0800?-1100, Eng 1100-1105) 33333 at 0914 by **Tom Winzor** in Plymouth; BBC via Seychelles **21.470** (Eng to Africa 0900-1300) 23422 at 1010 in Colyton; RFI via ? **21.580** (Fr to C.Africa 0900-1100) 34443 at 1015 in Kilkeel.

After mid-day they include Vatican R.Italy **21.620** (Various to Asia, Pacific [Eng 1345-1405]) rated 34343 at 1350 by **Robert Hughes** in Liverpool; R.For Peace Int (RFPI), Costa Rica **21.815** (Eng [u.s.b.] to N.America 1200-?), rated 32222 at 1430 in Stalbridge; Channel Africa, Johannesburg **21.725** (Eng to ? 1300?-1455) 54554 at 1455 by **Bill Griffith** while in Finhault, SE.Switzerland; R.Portugal Int via Sines? **21.830** (Port to Brazil 1130-1500?) 45544 at 1457 in Northampton; RAI Rome **21.520/21.535** (It [Football Comm]) 45554 at 1547 in Wallsend.

A few broadcasters are using the narrow **18MHz (15m)** band, which is allocated to single sideband (s.s.b.) broadcasting in the future, for amplitude modulated (a.m.) transmissions. Mentioned in the reports were R.Sweden, Stockholm on **18.960** (Eng, Sw to N.America 1330-1430), rated 54445 at 1335 in Stalbridge & 45343 at 1406 in Northampton; WYFR via Okeechobee, USA **18.980** (Eng to Africa, Eur 1600-2200) 34343 at 1733 in Newry.

The **17MHz (16m)** band is being used by many broadcasters to reach listeners in chosen target areas. R.New Zealand's broadcast is beamed to Pacific areas on **17.675** (Eng 1755-0705) but it has been reaching the UK quite well. It was rated 32223 at 0000 in Stalbridge & 44333 at 0530 by **David Hall** in Morpeth.

R.Australia has also been reaching the UK in this band. Their broadcast to Asia via Shepparton on **17.750** (Eng 0000-0500, 0600-1100) was rated 35442 at 0604 in Wallsend, 45444 at 0735 in Herstmonceux & SIO 444 at 0754 by **Francis Hearne** in N.Bristol.

Also mentioned in the reports were the Voice of Russia **17.495** (Eng to Australia 0700-0900), rated 34333 at 0830 in Morden; BBC via Kranji, Singapore **17.760** (Eng to Asia 0500-1030) 14321 at 0928 by **Rhoderick Illman** in Oxted; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1600) 25333 at 0746 in Storrington & 43443 at 0958 in Finault, Switzerland; BBC via Masirah Is, Oman **17.790** (Eng to Asia 0600-0800, 0900-1100) 32322 at 1015 in Kilkeel; Voice of Turkey **17.830** (Eng to Eur? 1230-1325) 33333 at 1235 in Plymouth; Israel R, Jerusalem **17.545** (Heb [Home Svce relay] to Eur, N.America 0600-1900?) 55555 at 1615 in Liverpool; Vatican R, Italy **17.515** (Eng to Africa 1730-1800) 44444 at 1751 in Colyton; Channel Africa via Meyerton **17.870** (Eng to W.Africa 1800-1830) 44444 at 1800 in Newry; Israel R, Jerusalem **17.535** (Fr, Eng to Eur, N.America 1930-2025) 45334 at 1930 by **Peter Pollard** in Rugby; R.Nederlands via Bonaire, Ned.Antilles **17.605** (Eng to Africa 1830-2025) 33233 at 1930 by **Clare Pinder** in Appleby; BBC via Ascension Is **17.830** (Eng to Africa 0800-2100) 45523 at 2048 in E.Bristol; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600-2200) 22222 at 2132 in Truro; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200) 45343 at 2150 in Northampton.

R.New Zealand has now returned to the **15MHz (19m)** band during the morning. Their broadcast to Pacific areas on **15.175** (Eng 0705-1100) is followed by a programme for troops in E.Timor (Eng 1100-1305). During some mornings their 100kW transmissions have reached the UK with ratings of 44333 at 0730 in Appleby, 44333 at 0800 in Morden, 44444 at 0925 in Rugby, 35553 at 1206 in Wallsend & 33333 at 1300 in Truro.

R.Australia's broadcasts via Shepparton have been received on the following frequencies: **15.240** (Eng to Pacific areas 0100-0900), rated 45444 at 0836 in Northampton; **15.415** (Eng to Asia 0100-0400, 0600-0900) 33333 at 0605 in Morpeth; **15.515** (Eng to Pacific, N.America 0200-0900) 45433 at 0635 in Herstmonceux.

Many other broadcasters may be heard in this band including HCJB Quito, Ecuador **15.160** (Eng to Eur? 0600-0800), rated 34333 at 0735 by **Vera Brindley** in Woodhall Spa; V of Armenia, Yerevan **15.270** (Various to Eur, M.East [Eng 0840-0900] Sun) 44444 at 0840 in

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SSB Utilities

South Bound II

In the September 2000 issue of *Short Wave Magazine* I mentioned a letter from **John Thompson** of Lancashire who reported hearing a station passing weather information to several yachts, and he guessed that it was some sort of race. The answer was somewhat different - it was the station 'South Bound II' and operator Herb passing daily weather advice to mariners in the Atlantic Ocean. In the original item I said that I thought the station was located somewhere in the Caribbean, but I was somewhat wide of the mark!

Bill Archibald from Scotland wrote in with copies of an article from the December 1999 issue of the yachting magazine *Cruising World* which explains all about Herb and 'South Bound II'. The whole article is much too long to repeat here, but some of the more important points are as follows.

The two most surprising facts for me are that the transmissions from 'South Bound II' are not coming from a vessel at all, they are coming from the basement of Herb's home. The other revelation is that the signals are not coming from anywhere in the Caribbean, they are coming from a small town on the edge of Lake Ontario, just outside Toronto in Canada. The station is named 'South Bound II' (two words, not one) after the sloop used by his family while sailing to the Caribbean in 1982. On the way they encountered some unexpected storms, so Herb started to investigate how to acquire weather data and how to predict its movements.

Up until 1994 the station operated from Bermuda, but has since moved back to its present site in Canada. Herb spends most of the day collecting and collating weather information from various sources, and then creates his own series of weather forecast maps. Vessels call-in between 1930 and 2000UTC, and Herbs provides them with a free forecast for the following 24-hours or 48-hours.

Concorde

Following the tragic crash of the Air France Concorde at Paris in July this year, most listeners would have never expected to hear this graceful machine on h.f. ever again. Within a few days of the crash (incidentally, onto a hotel that I stayed in a few years ago!), both the Air France and British Airways fleets were grounded by their respective aviation authorities.

It probably escaped most peoples attention that Air France had a Concorde flight which remained in New York overnight, so that it was able to make the flight back to Paris early the following morning. So the grounding order left a single Concorde stranded in New York, waiting for clearance to fly home.

Clearance was given for a special 'one-time' flight from New York to Paris, non-stop, and without flying over any other countries. This is not really a problem for Concorde, as it flew under those conditions almost every day, but the conditions were stipulated by the authorities just to make sure. There was no date assigned to the flight, other than it had to be completed by a certain date. Naturally, Air France wanted to get their aircraft home, so the flight was undertaken as soon as practicable.

During the afternoon of 21st September **George Woolley** was listening to Stockholm Radio on 8.930MHz, and was most surprised to hear 'Air France Concorde 389V' making a phone-patch to Air France Operations at Paris/De Gaulle airport. The phone-patch was conducted in French, so George was unable to follow the conversation.

I speak enough French to get by, but this would have been a technical conversation between Concorde and Air France Operations, so even I would have had difficulties understanding what was being said. However, this was the 'stranded' Air France Concorde returning from New York.

I tried to find a photograph of Concorde in my files to illustrate this item (surely everybody knows what it looks like now!), but I was unable to find anything. With the grounding of Concorde it seems that I am now too late to get any more photographs. This is such a shame as Concorde is such a spectacular aircraft - it almost stops all the traffic at Heathrow when it lands or takes-off - something that no other aircraft does.

As I write these words (during early October) there are moves to keep the entire Concorde fleet grounded forever, and there are other moves to get them re-instated. British Airways have said that they want to resume Concorde operation by the end of the year or early in 2001. I have been told that they are sending their Concorde pilots to use the simulator at Bristol/Filton so that they can remain 'current', ready for when the aircraft comes back into service.

If and when that time arises, I would expect that there would be several Concorde flights around the country so that pilots can practice their take-off and landings. On the other hand, I have been told that Air France Concorde pilots are being re-trained on other aircraft types, but a recent report in the press indicates that Air France want to get their aircraft back in the air "in the next few months".

Let's hope that both airlines are successful in returning them to flight, as I certainly enjoy hearing them on h.f.

GHFS Changes

Richard Patterson from Oxford writes to say that he has recently heard the Salinas GHFS station making test transmissions on 11.175MHz. I mentioned this in the February 1999 issue of *SWM*, but it is certainly one of the rarer GHFS stations. I often used to see reports on the Internet from people hearing Salinas GHFS, but I always seemed to be doing something else when it was active.

After several months of 'not really trying', I managed to hear Salinas GHFS working some USAF aircraft. I think that I heard it about four to five times within a seven day period (a bit like London buses really - nothing for ages, then they all show up at once!). I still hear it occasionally now, but it tends to be during the evenings (UK time) when propagation is good to the Caribbean.

Richard goes on to ask a question about the EAMs being broadcast on GHFS frequencies. He says that they appear to be much louder than any other traffic on the GHFS frequencies, and he wonders if they use a more powerful transmitter for EAMs. Well, I suppose that this is the most likely answer, but I doubt very much if the USAF GHFS people would confirm this one way or the other.

Obviously, transmitting the EAM at a much higher power makes it more likely that the recipients will be able to hear the signal clearly. If you listen for EAMs long enough you will hear that the same EAM is often transmitted by several different GHFS stations over a matter of minutes (or tens of minutes if it is a long EAM). Sometimes the EAM transmission is so strong that you can hear an echo, and this is almost certainly the effect of multi-path propagation.

Richard also comments that most EAMs seem to come from the GHFS at Andrews AFB. In fact, they also frequently come from Offutt and Croughton, but things are changing in the world of the GHFS. Many GHFS stations are losing their operators and being controlled remotely by Andrews GHFS.

Hopefully in the next few months the situation will have settled down and I will be able to present a more accurate picture. At the moment it is quite common to hear a GHFS station transmit an EAM, and end it with the message "...Andrews, err, correction, this is Croughton, Out". Even the GHFS operators are having problems adjusting to the new set-up.

CCF

Just one final snippet this month. For those of you who like to listen to the various Cadet forces on h.f. (the ATC, SCC and CCF), the CCF will be holding their annual 'Winter Wine' radio contest over the weekend of 2nd/3rd December. If this follows the same format as previous years, it will run for 24-hours starting from 1400UTC on the first day. The contest will be held shortly after this issue appears on your doormat or in the shops, so hopefully most people will remember to try to listen at some point over the weekend. In the December issue last year I listed their frequencies, so start looking for those back-issues now! *(They are available from the* SWM *Book Store - **Ed.**)*.

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Info in Orbit

With *NOAA-15* remaining in a fault condition, it was a delightful experience to watch the launch of *NOAA-L* on Thursday 21 September from Vandenberg Air Force Base, California, via the Internet, using a streaming video link from NASA. The advent of new Internet services offering unmetered (free) calls for a fixed monthly payment, enabled me to see the launch in real-time. Controllers successfully verified deployment of the solar array, and confirmed the spacecraft was in a 'power positive' condition.

Harry McCain, POES (Polar Operational Environmental Spacecraft) programme manager at NASA's Goddard Space Flight Centre, Greenbelt, Maryland, confirmed: "The spacecraft is now in orbit and all data indicate we have a healthy spacecraft". NASA turn operational control of the *NOAA-L* spacecraft over to NOAA after 10 days - from which time *NOAA-L* is renamed *NOAA-16*. Comprehensive on-orbit verification is expected to take a further 45 days.

The *NOAA-L* satellite was built by Lockheed Martin Space Systems Company, Sunnyvale, California, and launched for the National Oceanic and Atmospheric Administration under technical guidance and project management by the Goddard Space Flight Centre.

The only surprise for me, was an unexpected delay before the enabling of image telemetry. My recollection of previous launches was the early powering on of the a.p.t. (137MHz band) transmitter. I did not detect any telemetry for several hours, before which reports quickly appeared on the Internet WXSAT mailing lists confirming daytime reception of a.p.t. over America.

My first image was the overnight - and therefore blank - a.p.t. transmission on 137.62MHz, followed by a short piece of h.r.p.t. - see **Fig. 1** - received on 22 September during the first part of the 1307UTC north-bound afternoon pass. The pass was short for one reason - it was a left-circularly polarised signal on 1702.5MHz - a different frequency.

A tip-off from an American on the Internet advised that this signal was available prior to formal h.r.p.t. on 1707MHz, and so it was, when it came northbound over north Africa. Using a standard right-circularly polarised feed meant that only a short burst of telemetry would be decodable at the start of the pass, and a strengthening signal would paradoxically weaken the small component receivable by my antenna. Within hours, the normal h.r.p.t. signal was enabled on 1707MHz, and a strong signal was received.

Once the satellite was successfully deployed in orbit, the first stage of equipment power-on is completed. Visible-light channels 1 and 2, and 'long-visible' channel 3A - see **Table 1** - were enabled soon after launch, occupying three of the five h.r.p.t. channels, and allowing a.p.t. to provide side-by-side channels 1 and 2.

At this point, there has to be a pause for satellite stabilisation. When a satellite is first launched, its exposure to the vacuum of space causes various physical events to occur. No matter how 'clean' the room was where it was assembled and tested, most of its surfaces contain adsorbed gases, and possibly other contaminants.

Under conditions of exposure to vacuum, these gases are slowly released. During this period, due to de-gassing, the satellite's orbit or attitude may suffer slight changes. Additionally, the released gases would condense on any cooled surface, so activation of the infra-red sensors, which require significant cooling, has to be delayed for several days. During the period before these channels are activated, the a.p.t. transmission includes channels 1 and 2 continuously and therefore blank imagery overnight.

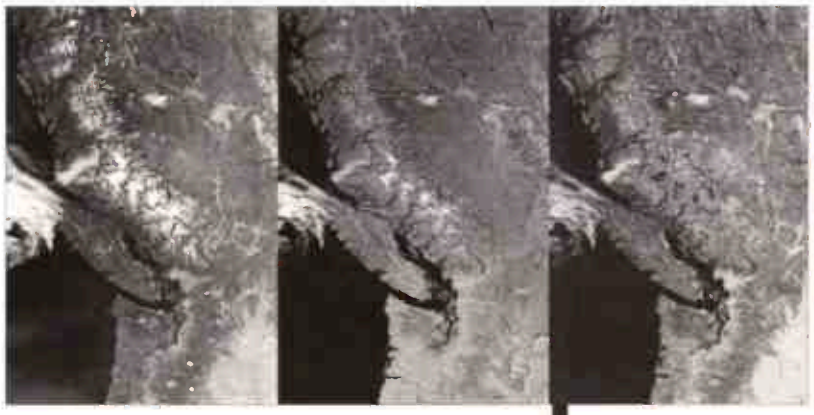

Fig. 2: *NOAA-L* (16) h.r.p.t. image 22 September 2132UTC from Chuck Vaughn.

Table 1: Channel Wavelengths.

Channel	µm
1	0.58 - 0.68
2	0.725 - 1.00
3A	1.58 - 1.64
3B	3.55 - 3.93
4	10.30 - 11.30
5	11.50 - 12.50

Figure 4 shows my first real image from *NOAA-L*, transmitted on 1707MHz - I captured the a.p.t. image as well. The colour is artificial - even more so than usual because there is no Channel 4 (infra-red) data. **Chuck Vaughn** provided a side-by-side h.r.p.t. image - see **Fig. 2** - showing the variation in sensor views from the three channels. Pictures from other people monitoring *NOAA-L* were received during following days.

NOAA-16 Infra-red Channels Enabled

Channels 4 and 5 (infra-red) were enabled around 12 October, and **Fig. 7** shows my first such image. Sicily and Italy are seen with great clarity in this h.r.p.t. image.

Launch Times & The NOAAs

All NOAA WXSATs have been launched at precise times to enable their orbits to be sun-synchronous with specific characteristics. Over a period of years, orbital changes cause the times of equator crossing to vary - and not always in a desirable manner! **Peter Wakelin** is a specialist contributor to the Internet 'wxsat-l' mailing list and has provided a succinct description of the nature of the problem.

"*NOAA-14*'s launch time was 1002UTC, 19 minutes earlier than

Fig. 1: *NOAA-L* 22 September 1307UTC channel 2 h.r.p.t. image from Plymouth.

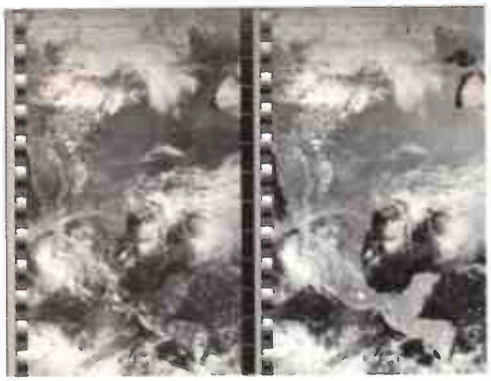

Fig. 3: *NOAA-L* early orbit a.p.t. image from Paul Ruscher of FSU Meteorology.

that of *NOAA-16*. So way back in 1994, *NOAA-14*'s illumination was very similar to that of *NOAA-16*(L) now. If these satellites were launched into a truly polar orbit, that is, their inclination to the eastward equator direction (the first term in the 2nd line of the two-line elements) was precisely 90°, then the orbital plane would remain fixed in space and points on earth would pass through the orbital plane (360/365.25)x4 minutes earlier each day.

To make a point on earth pass through the plane at the same time each day (a sun-synchronous orbit) requires the orbital inclination to be about 98.9° for an 850km orbit so that the earth's equatorial bulge 'pulls' the orbital plane around to compensate for the earth's motion around the sun. The Right Ascension of the Ascending Node (the term following inclination in the two-line elements) needs to increase by 360/365.25° per day to maintain true sun-synchronism.

Unfortunately, the inclination of all orbits is affected by external forces, mainly the gravitational effects of the sun and moon, so precise sun-synchronism cannot be maintained without using thrusters on board the satellites to maintain the correct inclination. This is not done on the NOAA satellites, and *NOAA-14*'s inclination has increased to more than 99.1°, thus destroying true sun-synchronism.

Launch technology is such that initial orbit injection is accurate enough to ensure approximate sun-synchronism throughout the operational life of the spacecraft. *NOAA-14* was not intended to be the primary afternoon craft for as long as six years. At the CGMS meeting in April 1995, *NOAA-L*'s launch was projected for 1997! Those who remember *NOAA-9* will recall that by the time it eventually died, its transit time had shifted by many hours".

Current WXSATs

While *NOAA-16* continues towards full operations, *NOAA-15* continued to provide largely unusable imagery - a replacement is not scheduled for launch until later next year. This month (November) sees the implementation of a new transmission schedule (S0011M01) by *METEOSAT-7*, though changes are likely to be minimal. The new dissemination schedule will become active on 28 November 2000 at 0830UTC. A copy was still not available for review at mid-October.

Figure 8 shows the latest high resolution (PDUS) image of Europe - the deep depression that caused severe flooding in eastern Britain is seen to the east, and the next batch of heavy rain was expected from the new system just reaching Ireland. Will it ever end?

METEOR Terminator Transmissions

Anyone who monitors *METEOR 3-5* and *METEOR 2-21* is aware that when they approach the terminator (the night-day border), the satellite is usually powered off for at least a few weeks. It is worth clarifying the actual reasons for the switch-off, because all is not necessarily as it seems!

"Meteors usually switch off for a period when their orbital planes approach that of the terminator (the day/night boundary on the earth's surface). At this time the satellite is inevitably in continuous sunlight, sometimes for weeks, and power availability is high. The reason for switching off is the low level of solar illumination on the ground below - rendering imaging unsatisfactory or impossible.

The *METEOR 3-5* outage in late September was not 'terminator related' as illumination was more than adequate at high northern latitudes throughout the period. Also, the switch-off was not announced in the 'Orbit' message - the regular posting to the Internet 'wxsat-l' list - as has been the practice recently". My thanks again to **Peter Wakelin** for providing this information. The possibility therefore arises that *METEOR 3-5* has developed further problems.

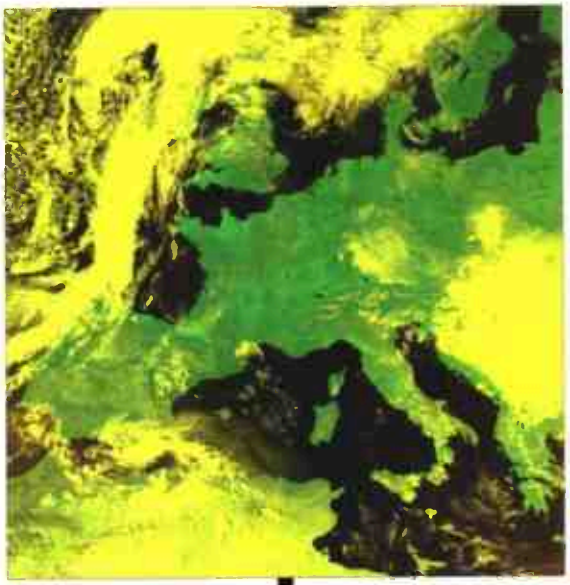

Fig. 4: *NOAA-L* h.r.p.t. 23 September 1256UTC from Plymouth.

David Taylor's *SatSignal*

Those WXSAT monitors who use a soundcard to store the incoming a.p.t. signal from a WXSAT receiver may already be familiar with *SatSignal*, a program that decodes a previously recorded *wav* file. *NOAA-L* gave David his first experience of a new NOAA satellite being launched. It presented a number of new challenges in signal processing because, having two very similar channels during its test period, it sounded more like a four-scans-per-second METEOSAT or OKEAN signal, and was indeed recognised as such by his software.

David told me about the modifications: "The image processing that I normally use to produce false-colour images - by combining the visible and thermal channels - was inappropriate for the dual-visible signal. As soon as I could get hold of a suitable wave file - I found an old one from Les Hamilton of *NOAA-13* - I was able to modify the software to avoid the false detection as a four scans/second signal. By measuring the signal's auto-correlation at 0.25 and 0.5 seconds, and comparing the results, the false positive could be avoided.

Having two visible channels reminded me of the processing that can be done with the 5-channel h.r.p.t. signals to create an index of the amount of vegetation present by subtracting channel 1 from channel 2. This is called Normalised Difference Vegetation Index (NDVI) in the NOAA documents. Clouds and sea will have approximately the same reflectivity, but the chlorophyll pigment content of vegetation makes it appear brighter in channel 2.

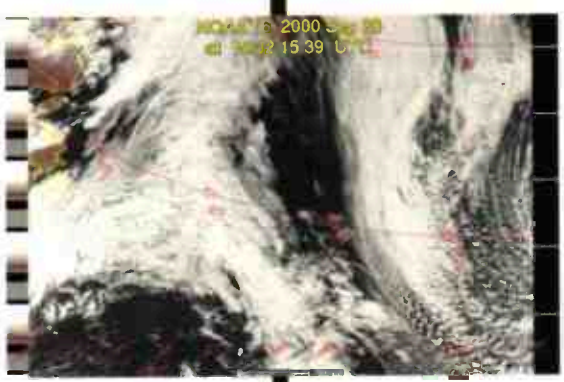

Fig. 5: *NOAA-16* 28 September 1532UTC from Peter Benney.

Fig. 6: *NOAA-16* 30 September from Barry McDougall.

Continued on page 65.

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Continued from page 62.

Using that difference value, the picture can be made red in vegetated areas, with the amount of red showing the amount of vegetation. Unfortunately for the a.p.t. enthusiast, there is a limited time for seeing this unusual measurement, as the IR sensors will soon be turned on, and the usual visible and IR signals should then be seen".

Figure 9 shows one of David's first results with the technique. This program is now available on his Web site at: **http://www.david-taylor.pwp.blueyonder.co.uk/software/wxsat.htm**

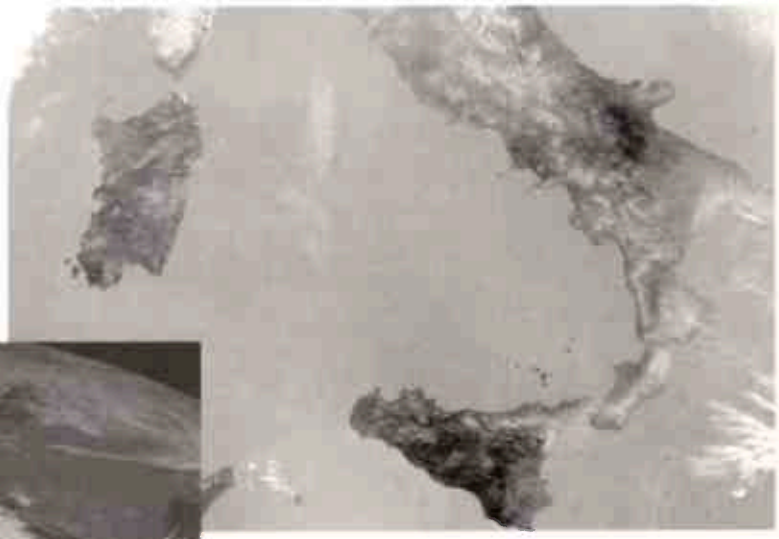
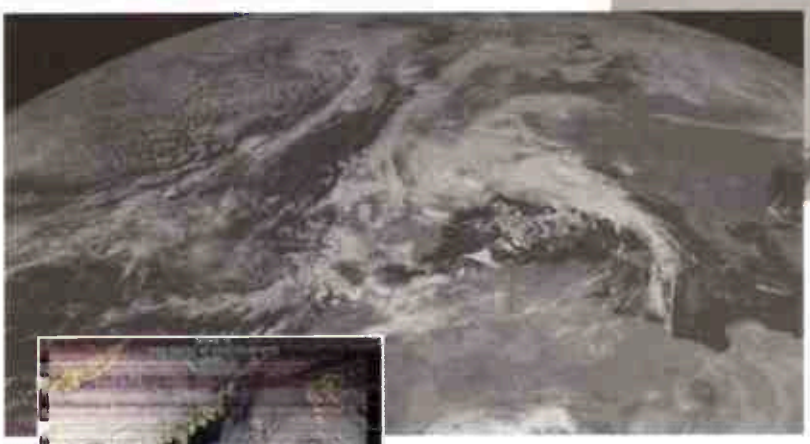


Fig. 7: *NOAA-16* 12 October 1304UTC, my first channel 4 (infra-red) h.r.p.t. image.

Fig. 8: *METEOSAT-7* 1202UTC 15 October 2000 – the week of floods.



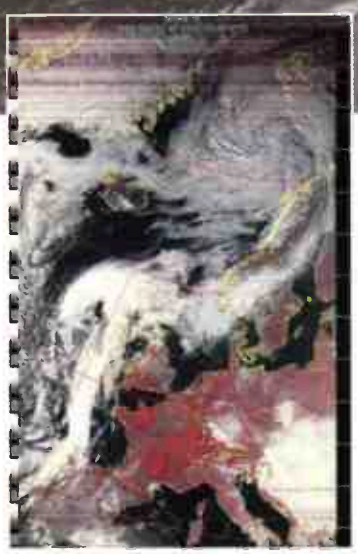


Fig. 9: *NOAA-16* 23 September 1258UTC from David Taylor.

Internet Site Reminders

With the newly operational *NOAA-16* WXSAT transmitting, here is a reminder about web sites carrying further information on NOAA satellites: **http://poes.gsfc.nasa.gov** - **http://www2.ncdc.noaa.gov/docs/intro.htm** and **http://www.osd.noaa.gov/sats/poes.htm**

Fig. 10: Shuttle landing.

Shuttle Launch Schedule

STS-97 *Endeavour*: launch 30 November for 6th *ISS* flight.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me, at the address at the head of the column, as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.

Kepler Elements - WXSATs, *MIR* & Shuttle

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.

For Beginners - A Day In The Life Of WXSATs

Those who are new to the hobby may wonder about the list of WXSATs always included at the end of this column. A typical day's monitoring would produce the following log:

After midnight, *NOAA-16* is the first WXSAT to be heard. It passes southbound in sun-synchronous orbit around 0230UTC, and should be heard an average of three successive passes, transmitting infra-red images. Later in the night/early morning hours, *NOAA-14* and then *NOAA-12* will pass over southbound, also transmitting infra-red channels. *NOAA-15* remains in a fault condition unlikely to be rectified, so when it passes around 0730UTC, its imagery is unpredictable.

Overnight METEOR passes will not be heard because they do not transmit a.p.t. while in the earth's shadow. Normally, either *METEOR 2-21* or *METEOR 3-5* will be heard - depending on the current position of their orbital planes. *RESURS 01-N4* operates in a similar manner from sun-synchronous orbit, though it can be heard for part of the overnight orbit during summer months.

NOAA satellites will be heard again during their north-bound afternoon passes between mid-day and mid-evening - starting with *NOAA-16*, and ending once more with *NOAA-15*. Daytime passes of RESURS provide imagery of variable quality.

Frequencies

NOAA-14 and *NOAA-16* transmit a.p.t. on 137.62MHz.
NOAA-12 (OK) and *NOAA-15* (fault condition) transmits a.p.t. on 137.50MHz.
NOAAs transmit beacon data on 137.77 or 136.77MHz.
METEOR 3-5 may transmit a.p.t. on 137.30MHz.
METEOR 2-21 may transmit a.p.t. on 137.40MHz.
OKEAN-4 and *SICH-1* may use 137.40MHz for brief transmissions.
RESURS 01#4 transmits a.p.t. on 137.85MHz.
METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.
GOES-8 (western horizon) uses 1691MHz for WEFAX.

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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.

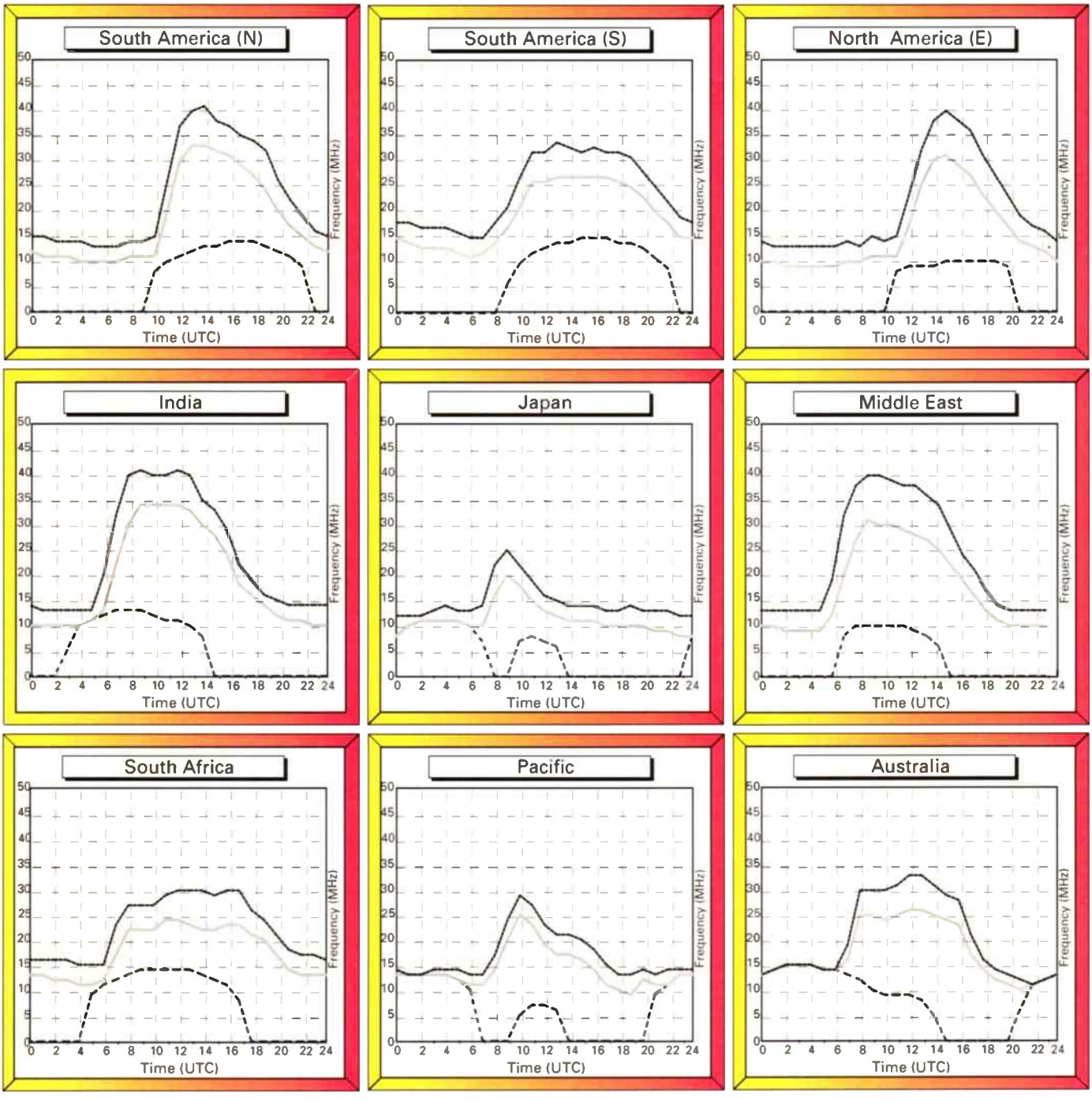
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

December 2000
Circuits to London



SK9809

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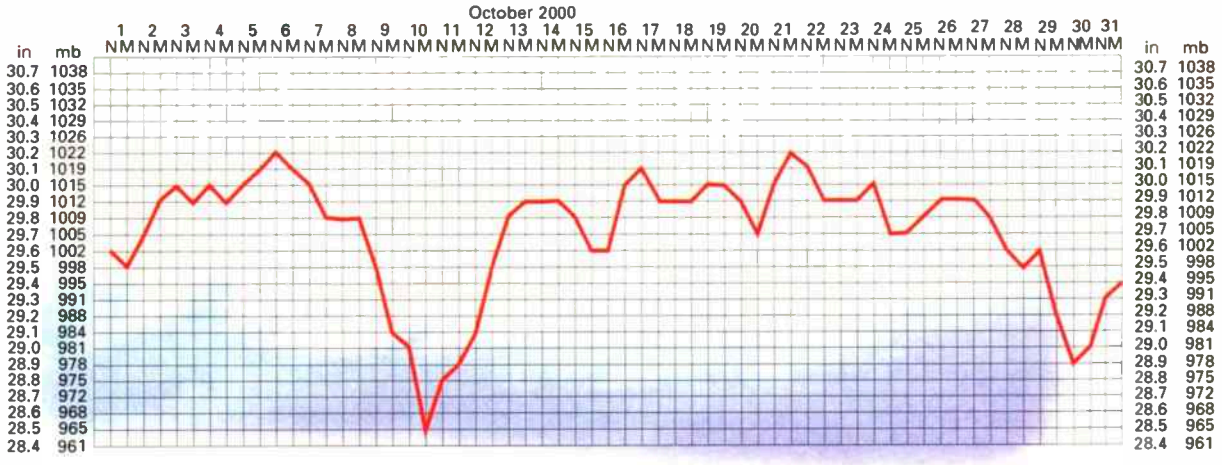
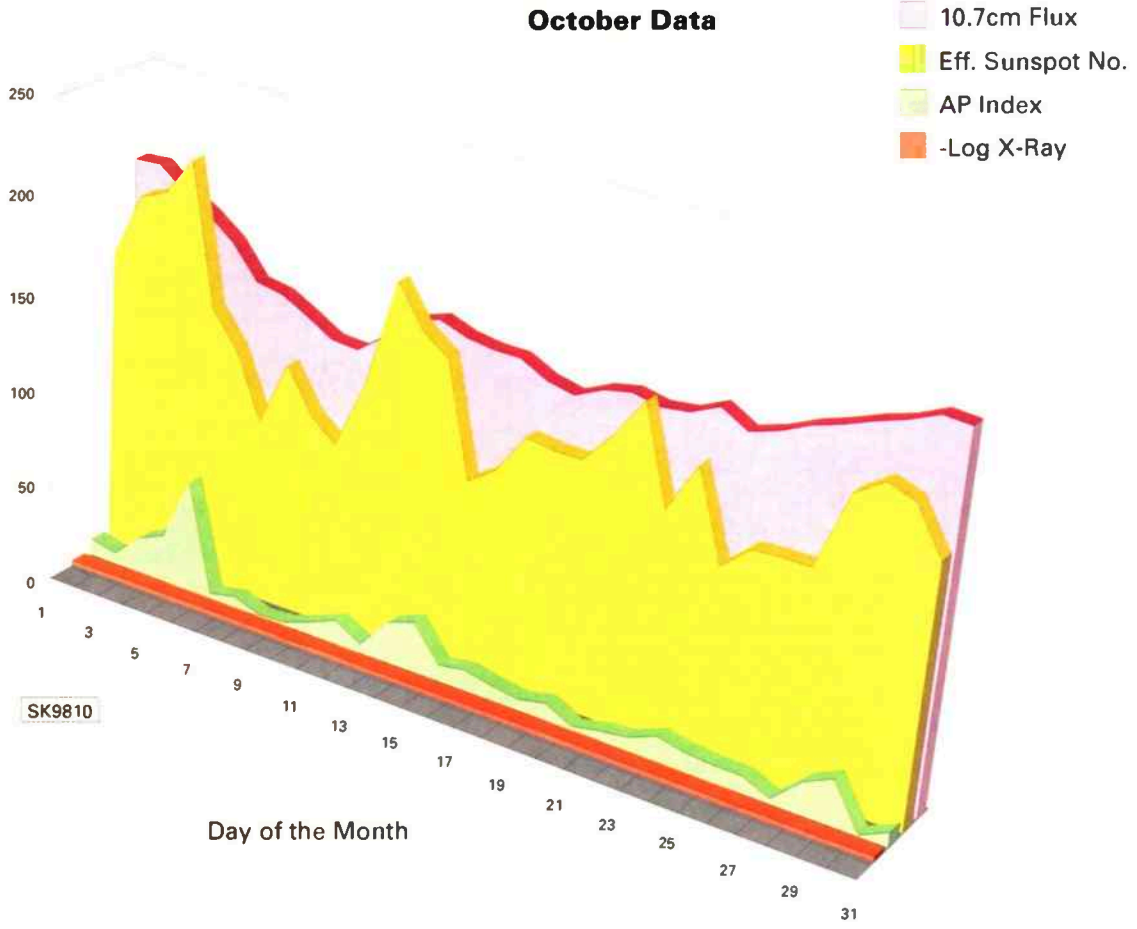
Propagation Extra

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





guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed).

K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

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Attention-123!

This issue is mainly devoted to a summary of Family I (Russian) operation covering the period January to July 2000 intended for our next *ENIGMA Newsletter* (other dates refer to 1999). As it can only be as accurate as the logs received, it can never be complete, but it gives a good idea of activity levels. Schedule Numbers are listed where appropriate - some of these change at regular intervals, others irregularly and yet others remain constant for years. This family uses Morse, polytone, English, German, Russian and Spanish.

Family Ia

M14 & M14A - 136, 137 (First ever report from USA), 207, 239, 263(A), 325, 362 (normally M14A but also noted on 16 September 2315 4.040 sending null), 403, 409, 517, 529, 560(A), 637 (USA), 652, 713, 835, 863 (USA), 871, 891, 953, 986.

January - July:
292 409 428 517 637 (0200 schedule) 753 953

M14A is still running the same three weekly schedules (263, 362 560) on Mon, Wed and Fri at 1900.

E6 - 106 175 192 197 208 264 290 325 346 362 387 392 395 461 471 531 576 578 602 637 692 705 710 912 946 958

E17y - 398 noted in USA with **parallels** reported for first time (0200 2 September) - 10.863//14.540. Other tranmissions include:- 6.855, 6.867 (538), 9.142 (IP 0750), 10.450, 10.899 (6 July 0115: 371), 11.148 (September 0200), 13.452 (July 0300: 621), 14.540 (September 0100: 547), 14.560 (October 0100: 849), 14.880 (0100), 15.692 (0140)

January - July:
185 267 379 486 735 948

Reported daily in USA in April at 2000 on 5.407. Sent 250 groups on 23 April ending at 0245 on 10.129. On 17th January the same message (604/102) was sent at least three times: SN 379 - 2300 and 0200 on 7.775 and at 0300 on 5.728MHz. On the same day at 0215 a different schedule was running (185) and was reported on 4.783 with DK 470 and GC 239 - a long message. Could any monitors from the USA be able to establish any E17y schedules?

E17z - always 274. This year was hovered around 10.240 at 1400, but erratic as always. A daring 58 group message on 29 March made an exciting change from the usual 50.

G6 - 328, 531, 564, 609 (new schedule 6 July 0400 10.440, SN not reported) 1st Mon/Tue 1900 and 2000, 2nd Sat/Sun 2020.

January - July:
290 308 429 833 1st Monday of the month 1900 and 2000 didn't appear in February but was back in March (SN 308).

S6 - 123 265 428 429 463 482 498 547 624 631 652 831 867

On 8th February SN 867 sent **five** groups (DK 451)
A **three** group message appeared on 27 March 0600 on 7.620: 967-251/3=56338 40503 34210. Note lack of stutter groups typical of very short messages. SN 123 seems to have been used for a test transmission, only being heard on 21 March IP 1457-59, IP 1507-1514 on 16.340. At 1523 it was in progress on 19.460 until 1529 and at 1533 it had popped up on 23.880 (very high!) until 1545. Each time it cut off suddenly after sending 123 repeatedly.

S6C - logged on 13 June on 13.420 sending '11872' from 1920-1925 and 1935-1939.

V6 - 453, 591 (1st Friday 2100 and 2200). This schedule seemed to end by April.

V6A & **V23** - no reports.

S25 - No reports, now assumed extinct.

Family Ib - Russia

Repeats usually **rise** in frequency in European mornings and **fall** in the evenings. After decades this sub-family has recently changed its call-up and repeat pattern. Calls are now only sent for **two** minutes (instead of five). The single null-message repeat is now sent **20** minutes later (instead of 10) on the secondary frequency. The two standard repeats remain unchanged. These shorter calls make the logging of SNs much harder for monitors, who must work much faster!

M12 - 082, 135#, 147, 169, 242, 257#, 258, 269, 275, 289 (279 groups on 1 October, 331 17 October), 302, 326, 351 (311 group on 3 September), 363, 416, 418, 419 (373 group 5 November) 446, 521, 541, 555 (yes! Freq-related 14521-13521-12521), 557, 658*, 578, 691, 749*, 750, 791, 840 (GC 227 22 October), 886, 941 (GC 333 3 September, 299 17 September, 301 24.9, 949, 957, 963#
*** special and linked**
 # linked with *

January - July:
042 082 084 134 135 162 208 248 (MCW) 257 357 398 416 446 462 494 505 507 583 658 749 791 853 (A MCW) 875 876 945 954 963

After many years the regular special SN 658 (associated with 749) has disappeared.

Longest message this period: 347 groups (SN 398 on primary 16.326), SN 042 also carried 339 groups on 26 May (on primary 19.033 - a very high freq.). Daily 749 is still running around at 1600 and messages are still only sent on Mon, Tue and Wed.

M12A (new designation) - M12's first variant has been discovered at 1500 on 23 April on 6.765. Format as follows:
853 853 853 333 (R5)
= = 024 024 60 60 = = (msg1: 60 x single 5 figure random groups)
= = 025 025 59 59 = = (msg2: 59 x single 5 figure random groups)
= = 333 333 = = 024 024 60 60 (R of msg1)
= = 333 333 = = 025 025 59 59 (R of msg2) = = 000 000

Cut number Morse was used: AU34567DNT - a system previously unknown to us. Auto-keyed m.c.w. As you can see, it's radically different to M12. This transmission may have been linked to a M12 transmission on 6.766 (1kHz higher) on 13 April at 1500. This was also in m.c.w. (rare for M12) and the call (248 248 248 000) lasted 8-9 minutes instead of the original five or present two minutes.

E7 - 172 234 343 418 682 825 919 920 946

Incomplete schedule (Mon and Wed at 2000 (summer), 2100 (winter) on primary):

Month	Primary Freq	2nd	3rd	SN
Dec 98	?.9??	5.107	4.559	915
Jan 99	?.9??	5.166	4.6??	916
Feb 99	?.9??	5.443	4.602	946
Mar 99	6.837	5.267	4.559	825
Apr 99	9.982	8.189	6.9??	919
May 99	12.178	10.774	9.2??	172
Jun 99	13.383	11.424	10.387	343
Jul 99	12.150	11.490	10.4??	144
Aug 99	12.171	10.727	9.417	174
Sep 99	10.327	8.192	6.957	319
Oct 99	6.849	5.824	4.602	886
Nov 99	5.870	5.415	4.595	845
Dec 99	5.9??	5.108	4.558	915
Jan 00	?.9??	5.168	4.6??	916

Unexpectedly, this pattern suddenly changed on 22 March where the usual 825 on 5.267 (Sec) became 418 and had shot up to 8.185! On Mon 3rd April this became 920 and on its third sending was as high as 12.217 (Sec) 11.028 (3rd). There's also a Friday morning schedule at 0500/20/40 - SN not known.

Operated on five consecutive days in February this year: 21/22 - 946-621/103; 23/24 - 946-622/23; Fri 25 - 946-000. This behaviour not noted before, note consecutive DKs. It was back on on Mon 28 February with another null message, and two days later (Wed March 1), the ID had changed as expected to 825 (and freqs.).

G7 - 267 (GC 279 29 November), 359, 418 (18min call once!), 531, 703, 742. Since July all on Mon and Wed.

January - July:
267 359 531 577 703

S7 - 048, 411, 415, 481, 826, 915. Only Mon, Tue and Sat over this period.

V7 - 074, 103, 130, 148, 159, 234, 403, 407, 609, 710. Mon 2000, Tue 0600, Thu 0600, Fri 2000.

January - July:
234 305 499

XPH - 158 (248 groups on 1 October), 314, 511 (89 groups on 1 October), 645, 648, 69? Tue and Thu 0600 and 2000.

January - July:
075 149 433 546 692 792 973 976 Tue and Fri 0700 2000, 2100, 2200, IDs change monthly with freqs. and are made up of the 100kHz digits - as is common with Family Ib. Two XPHs were operating in parallel on Sun 28 May 1920 (3.756//5.448).

Please note that ENIGMA has been forced to close to general membership. Since our last article, further unforeseen circumstances have worked against us. However, as long as we continue to receive logs, these will be analysed and published. Further details in next 'Attention 123!'. Please contact Enigma 2000 web site **http://reachus.at/enigma**

Newry; Swiss R.Int via Julich, Germany **15.315** (Eng, Ger, Fr, It to SW.Eur 1000-1230) 44444 at 1015 in Kilkeel; BBC via Skelton, UK **15.485** (Eng to Eur, Africa 0600-1800) 44444 at 1030 in Finault, Switzerland; R.Romania Int **15.390** (Eng to W.Eur 1300-1356) 34433 at 1312 by **Gerald Guest** in Dudley; WEWN via Vandiver, USA **15.745** (Eng to Eur 1000-2200) 43443 at 1423 in Plymouth.

Later, All India R. via Bangalore **15.200** (Eng to W.Africa 1745-1945) was 44444 at 1750 in Colyton; Africa No.1, Gabon **15.475** (Fr to W.Africa 1600-1900) 34433 at 1828 in Storrington; Israel R, Jerusalem **15.650** (Fr?, Eng to Eur 1900-2025) 45434 at 1912 in E.Bristol; VOA via Philippines **15.180** (Eng to E.Asia 1900-2000) 32223 at 1945 in Stalbridge; RCI via Sackville **15.325** (Eng to Eur, N & W.Africa 2000-2300) 54454 at 2100 in Liverpool; R.Korea **15.575** (Fr, Eng to Eur 2000-2130) 43444 at 2120 by **Tony Hall** in Freshwater Bay, IoW; RAE Buenos Aires, Argentina **15.345** (Sp to Eur, Africa 2200-0000) 44444 at 2225 in Oxted.

There is also much to interest the listener in the **13MHz (22m)** band. Mentioned in the reports were Christian Science SWB via WSHB Cyprus Creek, USA **13.650** (Eng to Africa 0700-0800, Tues & Thurs only) rated 34333 at 0747 in Woodhall Spa; Swiss R.Int via Sottens **13.685** (Eng, It, Ger, Fr to Australia 0830-1030) 43433 at 0840 in Herstmonceux; R.Austria Int via Moosbrunn **13.730** (Ger to Eur) 34343 at 1006 in Rugby; R.Nederlands via Irkutsk **13.710** (Eng to Asia, Far East, Pacific 0930-1125) 23332 at 1013 in Oxted; R.Australia via Shepparton **13.605** (Eng to Pacific 0800-1200) 33333 at 1025 in Kilkeel; R.Prague, Czech Rep. **13.580** (Eng to Eur, Asia 1300-1330) 54444 at 1302 in Plymouth; Croatian R, Zargreb **13.830** (Eng, Cr to Eur, N.America) 43333 at 1345 in Stalbridge.

Later, the Voice of Vietnam, Hanoi **13.740** (Eng, Fr to Eur 1800-2000) was rated 34434 at 1800 in Dudley & 32223 at 1940 in Stalbridge; AIR via Bangalore **13.750** (Eng to Africa 1800-1945) 44333 at 1805 in Morden; R.Austria Int via Moosbrunn **13.730** (Ger, Eng to Eur, Africa 1800-1900) 34333 at 1840 in E.Bristol; R.Nederlands via Flevo **13.700** (Eng to Africa 1830-2025) 21111 at 1945 in Truro; VOA via Greenville, USA **13.725** (Eng to M.East 1900-2000) 45434 at 1952 in Colyton; Vatican R, Italy **13.765** (Eng to Africa 2000-2030) 44434 at 2018 in Newry; R.Damascus, Syria **13.610** (Eng to Eur 2005-2105; Eng to America, Pacific 2105-2205) 45343 at 2020 in Freshwater Bay, IoW; R.Havana Cuba **13.750** (Eng to Eur 2030-2130 [best on u.s.b]) 22222 at 2030 in Appleby; V of Turkey, Ankara **13.640** (Eng to Eur 2200-2300) 55544 at 2242 in Northampton.

Although R.Australia's broadcasts in the **11MHz (25m)** band can usually be received in the UK reception is often better higher in frequency. Their transmission to E.Asia via Shepparton on **11.880** (Eng 0900-1100) was rated only 22222 at 0900 in Truro. Later, their transmission from Shepparton on **11.660** (Various to Asia 1430-1700) was rated 35553 at 1527 in Wallsend.

Also noted in the reports were World Harvest R.(WHRI) via Maine, USA **11.565** (Eng to Africa 0700-?), rated 24332 at 0934 in Oxted; R.Korea Int via Sackville **11.715** (Eng to E.USA 1030-1100) 33233 at 1030 in Appleby; R.Ukraine **11.705** (Eng to Australia 1100-1200) 44333 at 1100 in Morden; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1730) 44333 at 1300 in Herstmonceux; R.Japan via Sri Lanka **11.880** (Eng to M.East 1400-1500) 44444 at 1400 in Finhault, Switzerland & 32223 at 1445 in Stalbridge.

During the evening R.Nederlands via Flevo **11.655** (Eng to Africa 1730-2025) was 44333 at 1746 in Colyton; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 54444 at 1832 in Plymouth; V of Mediterranean, Malta via Russia? **12.060** (Eng to Eur, N.Africa 1900-2000) 44444 at 1900 in Dudley; BBC via Woofferton, UK **12.095** (Eng to Eur, N/E.Africa 0600-1700, Eng to E.Eur, CIS 1700-2100) 44333 at 1905 in Liverpool; R.Damascus, Syria **12.085** (Ger, Fr, Eng to Eur 1805-2105) 35443 at 2012 in Newry; R.Japan via Ascension Is **11.855** (Eng to S.Africa? 2100-2200) 45434 at 2104 in Freshwater Bay, IoW; R.Romania Int **11.940** (Eng to W.Eur 2100-2200) 44444 at 2139 in Woodhall Spa.

Later, the BBC via Ascension Is **12.095** (Eng to S.America 2100-0300) was 34343 at 2242 in Northampton & 45444 at 0113 in E.Bristol; R.Romania **11.775** (Eng to ? 2300-2359) SIO 333 at 2324 in N.Bristol; BBC via Masirah **11.955** (Eng to Asia 0000-0300) 33343 at 0037 in Kilkeel.

The occupants of the **9MHz (31m)** band during the morning include R.Havana Cuba **9.550** (Eng 0530-0600), rated 33222 at 0530 in Appleby; TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0655-0820) 44444 at 0812 in Plymouth; R.Australia via Shepparton **9.710** (Eng to Pacific areas 0800-0900) 22222 at 0835 in Truro; Christian Science BC via WSHB Cypress Creek, USA **9.860** (Sp, Eng to Eur 0800-1000) 44444 at 0900 in Morden; AWR via Forli **9.610** (Eng to Eur? 0930-1000) 34233 at 0930 in Newry; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 55544 at 0945 in Herstmonceux & 44444 at 0950 in Finault, Switzerland; R.Mediterranee Int, Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0100) 34434 at 1143 in Oxted.

Later, R.Australia via Shepparton **9.475** (Eng to S.Asia 1400-1800) was 43343 at 1745 in Liverpool; Voice of Vietnam, Hanoi **9.730** (Viet, Eng to Eur 1700-1830) 44444 at 1745 in Colyton; R.Ext.Espana (REE), Spain **9.665** (Sp to Eur 1700-2200 Sat/Sun) 55555 at 1842 in Wallsend; R.Nederlands via Flevo **9.895** (Eng to Africa 1830-2025) 45444 at 1905 in Northampton; V of Russia **9.480** (Eng [WS]) 55434 at 1915 in E.Bristol; VOIRI Tehran, Iran **9.022** (Eng to W.Eur 1930-2030) 45444 at 1930 in Freshwater Bay, IoW; R.Pyongyang, Korea **9.335** (Sp, Eng to Eur 1800-2000) 34433 at 1950 in Rugby; R.Australia via Shepparton on **9.500** (Eng to Asia 1430-2130) was rated 33212 at 2118 by **Colin Smith** in Co.Armagh; R.Bulgaria **9.400** (Eng to Eur 2100-2200) 33323 at 2149 in Woodhall Spa; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2245) SIO 222 at 2202 in N.Bristol; WWCR Nashville, USA **9.475** (Eng to Eur, Africa 2200-0000) 43334 at 2320 in Stalbridge; R.Nederlands via Bonaire, Ned.Antilles **9.845** (Eng to N.America 2330-0125) 44444 at 0050 in Kilkeel.

Some of the broadcasts in the **7MHz (41m)** band are intended for listeners in Europe. Those noted came from Vatican R, Italy **7.250** (Various), rated 54444 at 0500 in Morden; WYFR via Okeechobee, USA **7.355** (Eng 0600-0800, also to Africa) 44444 at 0620 in Stalbridge; R.Japan via Woofferton, UK **7.230** (Eng, Jap 0500-0700) 44433 at 0630 in Herstmonceux; Sudwestfunk via Rohrdorf **7.265** (Ger 24hrs) 54554 at 1100 in Finhault, Switzerland; R.Polonia (Polish R), Warsaw **7.270** (Pol, Eng 1100-1300) 34232 at 1126 in Oxted; R.Slovakia via Velke Kostolany **7.345** (Fr, Ger, Eng 1700-1900) 54444 at 1721 in Plymouth; R.Korea Seoul 7.550 (Kor 1700-1900) 32443 at 1820 in Colyton; RAI Rome **7.290** (Eng 1935-1955) 54444 at 1940 in Freshwater Bay, IoW; R.Denmark via R.Norway **7.485** (Dan 2030-2055) 55555 at 2030 in Rugby; R.Canada Int via Woofferton, UK **7.235** (Eng 2100-2200) 45444 at 2157 in Northampton; V of Turkey **7.190** (Eng 2200-2245?) 53433 at 2205 in E.Bristol.

Although intended for other areas the Voice of Nigeria, Ikorodu **7.255** (Fr, Eng to W.Africa 1800-2000?) rated 34222 at 1907 in Newry; VOA via Sri Lanka **7.115** (Eng to Asia? 0100-0300) 44444 at 0100 in Kilkeel; WJCR Upton, USA **7.490** (Eng to E.USA 24hrs) 44343 at 0510 in Morpeth.

Many more broadcasts for European listeners may be received in the **6MHz (49m)** band. Some originate from R.Vlaanderen Int, Belgium **5.985** (Eng 0700-0730), rated 55544 at 0705 in Herstmonceux; Sudwestrundfunk, Germany **6.030** (Ger) 54554 at 1100 in Finault, Switzerland; R.Slovakia Int **6.055** (Eng 1630-1700)

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	C,F,J
585	R.Solway	B	2.00	A,E
603	Capital G,Lin'brne	I	0.10	F,G,I,J
630	R.Bedfordshire(3CR)	B	0.20	C,F,G,I,J
630	R.Cornwall	B	2.00	A,F
657	R.Clwyd	B	2.00	A,E,F,H,I,J
657	R.Cornwall	B	0.50	A,F
666	Cl.Gold 666, Exeter	I	0.34	A,B,C,F,J
666	R.York	B	0.80	A,E,I
729	BBC Essex	B	0.20	F,G,I,J
738	Hereford/Worcester	B	0.037	A,C,D,E,F,I,J
756	R.Cumbria	B	1.00	A,E
756	The Magic 756,Powys	I	0.63	A,F,J
765	BBC Essex	B	0.50	A,E,F,G,J
774	R.Kent	B	0.70	D,F,G,I,J
774	Cl.Gold 774, Glos	I	0.14	F,J
792	Cl.Gold 792,Bedford	I	0.27	F,I,J
792	R.Foyle	B	1.00	A,E
801	R.Devon	B	2.00	A,B,C,E,F
828	Cl.Gold 828, Luton	I	0.20	I,J
828	Magic 828, Leeds	I	0.12	A
828	Asian Netwk Sedgley	B	0.20	A
828	2CR Cl.G,Bournem'th	I	0.27	F,G
837	R.Cumbria/Furness	B	1.50	A,E
837	Asian Netwk Leics	B	0.45	A,F,I,J
855	R.Devon	B	1.00	A,B,F
855	R.Lancashire	B	1.50	A,E
855	R.Norfolk, Postwick	B	1.50	H*,I
855	Sunshine 855,Ludlow	I	0.15	C,E,J
873	R.Norfolk, W.Lynn	B	0.30	F,I,J
936	Brunel CG, W.Wilts	I	0.18	F,J
936	Fresh AM, Hawes	I	1.00	A,E,H*
945	Cl.Gold GEM, Derby	I	0.20	A,E,J
945	Capital G, Bexhill	I	0.75	F,G,I
954	Cl.Gold 954,Torquay	I	0.32	E,F,G
954	Cl.Gold 954, H'ford	I	0.16	A,C,J
963	Asian Sd, E.Lancs	I	0.80	A,E
963	Liberty R, Hackney	I	1.00	E,F,G,J
972	Liberty R, Southall	I	1.00	A,E,F,G,H,J
990	R.Aberdeen	B	1.00	E
990	R,Devon, E.Devon	B	1.00	A,F
990	Magic AM,Doncaster	I	0.25	E
990	Cl.G, Wolverhampton	I	0.09	E,J
999	C.Gold GEM Nott'ham	I	0.25	J
999	Magic 9-99 P'stn	I	0.80	A,E
999	R.Solent	B	1.00	F,G,I
999	Valley R, Aberdare	I	0.300	C
1017	Cl.G,WABC,Shr'shire	I	0.70	A,E,I,J
1026	R.Cambridgeshire	B	0.50	I,J
1026	Downtown R, Belfast	I	1.70	A,E,H
1026	R Jersey	B	1.00	F,G
1035	RTL C'try(Ritz)1035	I	1.00	E*,F,H,J
1035	N.Sound 2, Aberdeen	I	0.78	A,E
1035	West Sound AM, Ayr	I	0.32	E
1107	Moray Fth,Inverness	I	1.50	E
1116	R.Derby	B	1.20	A,D*,E,J
1116	R.Guernsey	B	0.50	F,G
1116	Valley R, Ebbw Vale	I	0.50	C,E
1152	Cl.G Amber, Norwich	I	0.83	E
1152	Clyde 2, Glasgow	I	3.06	E
1152	LBC 1152 AM	I	23.50	F,G,H,J
1152	Pic'ly 1152,Manch'r	I	1.50	A
1152	Cl.G, Birmingham	I	3.00	J
1161	R.Bedfordshire(3CR)	B	0.10	H*,I,J
1161	Brunel Cl.G,Swindon	I	0.16	F
1161	Magic 1161, Goxhill	I	0.35	A
1161	Southern Counties R	B	1.00	F,G
1161	Tay AM, Dundee	I	1.40	E
1170	Magic 1170,Stockton	I	0.32	A,E
1170	Capital G,Portsm'th	I	0.50	F,G,I
1170	Swansea Snd,Swansea	I	0.58	E
1170	1170AM,High Wycombe	I	0.25	J
1242	Capital G,Maidstone	I	0.32	F,G,I
1251	C.G Amber,Bury StEd	I	0.76	A,D,E,I
1260	Brunel CG, Bristol	I	1.60	F
1260	Marcher G, Wrexham	I	0.64	E
1260	SabrasSnd,Leicester	I	0.29	J
1260	R.York	B	0.50	E
1296	Radio XL,Birmingham	I	5.00	A,E,F,H*,J
1305	Magic AM,Barnsley	I	0.15	A,E
1305	Premier via ?	I	0.50	E,F,J
1305	Touch AM, Newport	I	0.20	E,F
1323	Capital G,Southwick	I	0.50	F,G,I*,J
1323	SomersetSnd,Bristol	B	0.63	A,E
1332	Premier, Battersea	I	1.00	E,F
1332	Cl.Gold 1332,Pr'bo	I	0.60	A,E,J
1332	Wiltshire Sound	B	0.30	E,F
1359	Cl.Gold 1359, C'try	I	0.27	E,J
1359	R.Solent	B	0.85	F
1359	Touch AM, Cardiff	I	0.20	E
1368	R.Lincolnshire	B	2.00	E,J
1368	Southern Counties R	B	0.50	D*,F,G,I
1377	Asian Sd, Rochdale	I	0.10	A,E*
1413	R.Gloucester via ?	B	?	J
1413	R.Gloucester,B'kley	B	0.50	G*
1413	R.Gloucester,Bo'ton	B	0.50	E
1413	Premier via ?	I	0.50	E,F
1413	Fresh AM, Skipton	I	0.10	A,E
1431	Breeze,Southend	I	0.35	D*,E,F,I
1431	Cl.Gold, Reading	I	0.14	E,F,J
1449	R.Peterboro/Cambs	B	0.15	A,E,F,J
1458	R.Cumbria	B	0.50	A,E
1458	R.Devon	B	2.00	A
1458	1458 Lite AM Manch'	I	5.00	E
1458	R.Newcastle	B	2.00	E
1458	Sunrise, London	I	50.00	B*,F,G,J
1458	Asian Netwk Langley	B	5.00	J
1485	Cl.Gold, Newbury	I	1.00	J
1485	R.Humberside (Hull)	B	1.00	E
1485	R.Merseyside	B	1.20	A,D*,E,F
1485	Southern Counties R	B	1.00	D*,F,G,I
1503	R,Stoke-on-Trent	B	1.00	A,C*,D*,E,F,H,J
1521	Breeze, Reigate	I	0.64	D*,E,F,G,I,J
1530	R.Essex, Southend	B	0.15	F,I
1530	Cl.Gold W.Yorks	I	0.74	A,E
1530	Cl.Gold Worcester	I	0.52	E,F,J
1548	R.Bristol	B	5.00	F,H*
1548	Capital G, London	I	97.50	A,D,E,F,G
1548	Magic1548,Liverpool	I	4.40	E
1548	Forth AM, Edinburgh	I	2.20	E
1557	R.Lancashire	B	0.25	A,D*,E
1557	Cl.Gold C7,N.hant	I	0.76	D,E,J
1557	Capital G, So'ton	I	0.50	F,G
1566	CountySnd,Guildford	I	0.50	B*,C,D,E,F,G,I
1584	London Turkish R	I	0.20	D,F
1584	R.Nottingham	B	1.00	D*,E,G,J
1584	R.Shropshire	B	0.50	A,E
1584	Tay, Perth	I	0.21	E
1602	R.Kent	B	0.25	D,E,F,I

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

Listeners.-
(A) Robert Connolly, Kilkeel.
(B) Bernard Curtis, while near Newquay, Cornwall
(C) Simon Hockenhull, E Bristol
(D) Sheila Hughes, Morden
(E) Brian Keyte, while near Inverness.
(F) George Millmore, Wootton, IoW
(G) Harry Richards, while in Worthing.
(H) Tom Smyth, Co.Fermanagh.
(I) Phil Townsend, E.London.
(J) Fred Wilmshurst, Northampton

■ DAVE ROBERTS c/o *SWM* EDITORIAL OFFICES, BROADSTONE
■ E-MAIL: scanning@pwpublishing.ltd.uk

Scanning

Most Members of Parliament have got one, some military and police personnel have got them, I have got one, and just to be seasonal...Good King Wenceslas had one. Got it...? Yes, they all have a page.

You know the noise. When you are searching for that particularly elusive voice signal and then suddenly everything is wiped out by the up and down tones followed by a noise that sounds pretty much like an airlock in the bathroom cold tap - you have just found a pager signal. They are primarily in the 153 and 454MHz segments of the spectrum and boy are they a nuisance.

Having said that, they are so easy to hear that it's more of a challenge to filter the signals out than to listen to them. With mobile 'phones being extremely popular these days and with their ability to send text messages enhancing their flexibility, you could be forgiven for wondering whether the days of the pager are numbered. It seems not. The advantages are simplicity, size and cost.

Monitor The Signals

So what is needed to monitor the signals. Firstly, a receiver to receive the signal. Secondly, I am sorry to have to report, you will require a computer. Now, here the choice becomes evident. There are two main computer programs that decode pager traffic. Both decode the standard paging signal which is coded as POCSAG - which stands for Post Office Code Standardisation Advisory Group - in case you felt you needed to know.

The first program is called *poc32* which is available on the Internet and simply requires a lead between the audio socket on your receiver and the line input on the soundcard of your more modern type computer running *Windows 95* or thereafter. Set-up is straightforward and you should be receiving pager messages more or less immediately.

I must say that I have not had much success with this program and in any case it seems that many *SWM* readers do not have access to a modern computer. Do not despair, there is a program which only requires an ancient 286 or later computer running *DOS* with a minimum 512k of memory (that **is** minimal I assure you) and a small hard drive. These machines are being slung out by many people these days and some readers will have an old 286 or 386 machine in the loft.

If you have a computer running *Windows 95* then you should be able to run *POCSAG* in the *Windows 95* MS-DOS mode. I can't get it to run in a *Windows 95* session. But an old machine running in an old *DOS* version is ideal. The program is called *PD* (*Pocsag Decoder*) and it is currently on version 2.05. So you will need a copy of this program and a demodulator which connects between a 'com' port on your computer and your receiver.

Now, the documentation says that it is better to take the signal out of the radio straight from the discriminator, but I have had this program running on four different scanners now and I have always just used the audio out sockets on these sets and the results have been great.

The demodulators are available from Pervisell at High Wycombe who advertise in this magazine and in *Practical Wireless*. They cost a few pounds and Phil Perkins of Pervisell will supply a disk with a demo version of the PD program together with the demodulator.

So, once you plug in the radio to the demodulator and the demodulator into the computer you read the documentation first. I, like many radio people, suffer from 'docuphobia' and only read the manual when all else fails, but on this occasion you will find it worthwhile. The program **does** work.

You will find that the volume setting is critical but within no time at all you will see other people's pager signals scrolling on the screen. If you decide that this program is for you, then for an extra fee you can register *PD* which will give you extra features. These are really what makes the *PD* such a useful intelligence tool.

With the registered version you can enter a word or few words of text and whenever they are sent in a message, the full message, time, date and RIC (that's the unique identity code of the paged pager) are saved to a separate file. Likewise, all the messages for the day are saved to a file and can be reviewed by looking at them with a text editor and then messages with an interesting content can be identified.

As the RIC of the pager is attached to the message, you can then identify the codes of pagers of interest and place those RICs in a file to be specifically monitored by *PD* automatically. For instance, as an extreme example, if you spotted a message in the day's file which read 'Kev, you have won 4 million on the Lottery' *(blimey - I have to make a call - **Ed**)* you may consider it a possibility that you have monitored our Editor's pager. You just look at the RIC above that text in the file and then you have the code of Kevin's pager. Enter that in the file and then if you receive a signal for him again it will be logged to it's own file.

Now To The Frequencies

Page One Minicall (used to be Mercury):	137.975; 138.175; 153.350
BT Paging:	153.125; 153.150; 153.175; 153.225 and their test frequency is 153.200
Aircall:	153.275 and 153.325
Northern Ireland Air Paging:	153.825
Air Call Voice Paging:	454.075 (voice traffic)
Air Call Paging:	454.775
Medicall Paging:	454.200
Millicom Paging:	454.675
Pageboy Paging:	454.825
Hutchison Paging:	466.075

You will need to set your receiver to n.b.f.m. *PD* will decode tone only and text pagers. I am told that a program which will decode the FLEX paging is on the way. Paging systems work nationally by sending a signal from a satellite to the various base stations throughout the UK sequentially so that the signals do not clash.

In the case of BT, the satellite that they use is the *Eutelsat 2* which lives 36,320km above us and tears along at 28,800km/h - the downlink is at 12.537617GHz horizontal. This is a very basic overview of what you can do with these noisy signals, but can be very informative monitoring indeed.

Pervisell are always there to supply the demodulators and Phil Perkins has offered to supply demodulators free to the first three people who order them mentioning *Short Wave Magazine*. To make this fair to subscribers and casual purchasers alike, only orders to Pervisell made on or after 13th December will count. I shall let you know who got them for nothing in the February 2001 column.

Donington Show

Now a subject change. I went to the Donington show in September and bought some junk - as I always do. There is still no news on the IC R-3 scanner, but gossip collected from the Internet reckons that the version on sale in the USA will not receive TV signals above 2GHz which will limit its use for serious video monitoring folk.

The best bit about the show was the characters that I met there. Lots of old mates and also some new. It was good to meet Paul Goodhall who is very involved with the Oxford radio club. Paul's son Peter was

unable to attend as he was taking exams!

No new kit there for us really, but the bargain of the show was a complete Datong d.f. unit as used by crime squads and other official people. It looked to be in good shape to me and seemed a deal at £150. Also, for the same money, one of the traders was selling new Alinco DJG5EY scanner/transceivers. These units normally go for almost twice that amount. Of course, I blinked and the Datong had gone and by the time I returned to see the Alinco radios they had all gone too.

Sore heads all round on the Sunday morning and I returned to the wild hills where even pager signals don't penetrate!

As an aside...has anyone got a Redifon R408 receiver they want to get shot of? A loon of my acquaintance is after one.

■ MIKE RICHARDS G4WNC, PO BOX 1863, RINGWOOD, HANTS BH24 3XD
■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: http://www.btinternet.com/~mikespage

Decode

Following last month's close look at an up-to-date RTTY program, this month I'm taking a look at a really good Morse Code package. The program is called *CWGet* and has been featured in this column before. However, now that I've had time to play with it, I think its really worth a closer look.

Receiving Morse with a computer has always represented something of a challenge to amateur computer programmers simply because hand sent Morse is so variable. Programming to receive modes such as RTTY, SITOR, etc. are relatively easy because the transmissions are machine/computer generated and so follow a very precise pattern.

When it comes to resolving hand-sent Morse, life for the programmer gets a bit more complex. This is because hand sent Morse can vary enormously in the formation of the letters and the sending speed. In the very worst cases you will find that operators can develop a very stylised Morse where some characters take on a completely new rhythm!

The situation is further complicated by the code itself which has no regularity to it. Whereas RTTY is very formalised with a start bit five data bits and 1.5 stops bits, Morse can vary from a single dot through to a long string of dashes. So, although Morse may be thought of as one of the most basic radio communication modes, from a programmers point of view, its one of the most difficult to resolve reliably.

From all this it's no surprise to find that there has been much debate about Morse programs over the years, with all manner of programming techniques to try and make a better program. The program up for discussion here is *CWGet* which uses the latest in d.s.p. programming to make a simple but very effective Morse decoder.

One of the great things about the program is the very practical approach adopted throughout. All the facilities have been carefully thought through to make life that bit easier for the operator.

To run the program you will need a Windows PC with a 75MHz Pentium or better processor, which is a pretty basic specification. When loaded, it takes up a very modest 1.4Mb of disk space which is refreshingly small. As you can see from the screen shots, when you start the program, you're presented with a fairly busy display, but don't worry, everything is worth having.

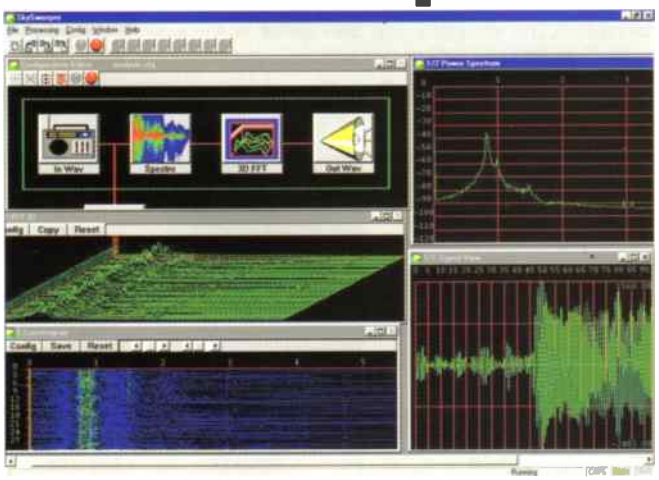
At the top of the display is the usual File menu and underneath that is some short-cut push buttons to control some of the main features. Next comes a very powerful little spectrum analyser that lets you see the signals that are around and also see what the program's working on. This covers the frequency range from about 160Hz right through to 3kHz and works extremely well.

You can very easily spot any Morse signals in the band. To make the tuning really simple you just have to click the mouse pointer on the signal you want and the decoder moves direct to that frequency. If the signal you want is the strongest on the spectrum display, you can just press 'GotoMax' and the decoder automatically moves.

As an alternative, you can set the AutoGTM or Auto go-to-max and the decoder will automatically re-tune to the strongest signal when the current signal stops. However, the real star performer is the AFC or Automatic Frequency Control function. Once you've chosen the signal you want to monitor, this feature keeps your tuning spot-on, even if your receiver drifts.

CwGet Main Receive Screen.

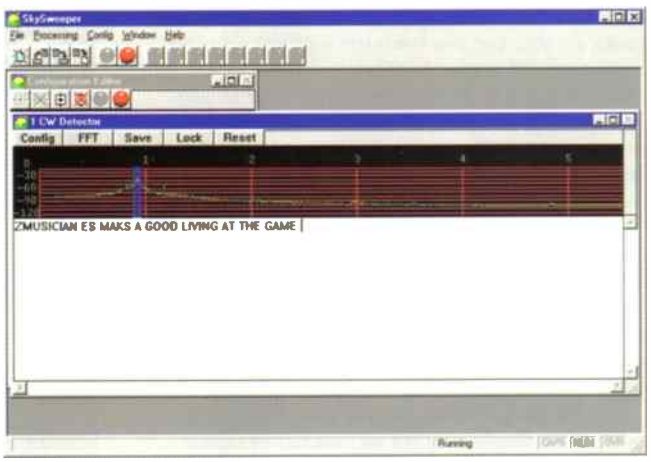
The real benefit comes when the signal hands over to the other operator. In this case you will usually find a change in frequency which *CWGet* automatically compensates for and retunes. The speed at which this happens is all fully adjustable, so it really is a very powerful feature.



Skysweeper's full scale analysis.

To add to these very powerful features, there is a d.s.p. bust filter for reducing impulsive noise interference. The filter is fully configurable to handle a wide range of different signals. Perhaps more importantly there is an excellent bandpass filter with four settings to choose from.

One important point to note is that you should be using the wider filter settings for commercial 20w.p.m. or faster Morse or you will introduce errors. As with all filters you should start with as little as possible and use the least amount of filtering required to overcome the problem.



Skysweeper decoding c.w.

As well as providing excellent decoding facilities, *CWGet* features automatic saving to a log file so you can keep track of all you receive. I have to say this is a really good program that shows what can be done

with modern d.s.p. programming and a standard PC. If you would like to give the program a try it can be downloaded from:
http://www.dxsoft.com

MMTTY Download

Geoff Halligey has written with problems downloading this program following last month's 'Decode'. I haven't been able to spot anything obviously wrong but, if you're having troubles, you could try this direct link to the program file: **http://www.qsl.net/ve5kc/files/MMTTY159E.EXE** *(Don't forget that although the domain part of the url is case insensitive, the directory and file names must be in the case as per the references printed - **Ed.**).*

A useful tip is to keep an eye on my web page as I always put fixes to any download problems on the site. Check-out Software Gems or the News page. If you do have a problem, please contact me by E-mail or the feedback page on the web to let me know so I can sort out a fix.

SkySweeper

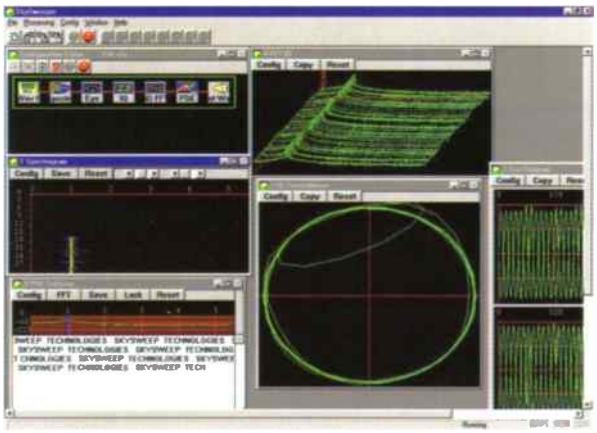
This wonderful new decoding program has just been released in version 2.1 with lots of new features to make it even more impressive. If you've not come across this gem before, it is rather more than just another decoding program. As well as decoders for most of the popular modes, you also get a bank of signal analysis tools and some very impressive d.s.p. filters as well.

The secret of the program's flexibility comes from the unique way in which the user interface works. As you can see from the pictures, you are presented with a neat configuration box where you can choose the building blocks you want to use.

Once you've decided what you want to do, you can assemble them in whichever order you like. This offers tremendous flexibility to be able to easily customise the program to work the way you want it to.

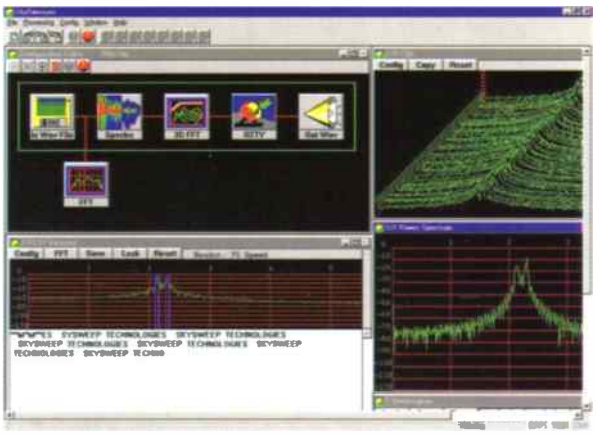
The new analysis tools are the IQ Constellation, Statistics and an Eye Diagram. The IQ Constellation is a very complex analysis tool that splits the signal into in-phase and quadrature components. After some further processing these are plotted as X and Y coordinates on the display.

All the parameters are fully adjustable so you can use the display to take all manner of signal apart. The Eye Diagram is particularly good for looking for repeating patterns in digital signals and again all the setting can be altered. The Statistics pack can be used to examine signal parameters such as the power average, minimum and maximum.



Skysweeper's PSK decoding system.

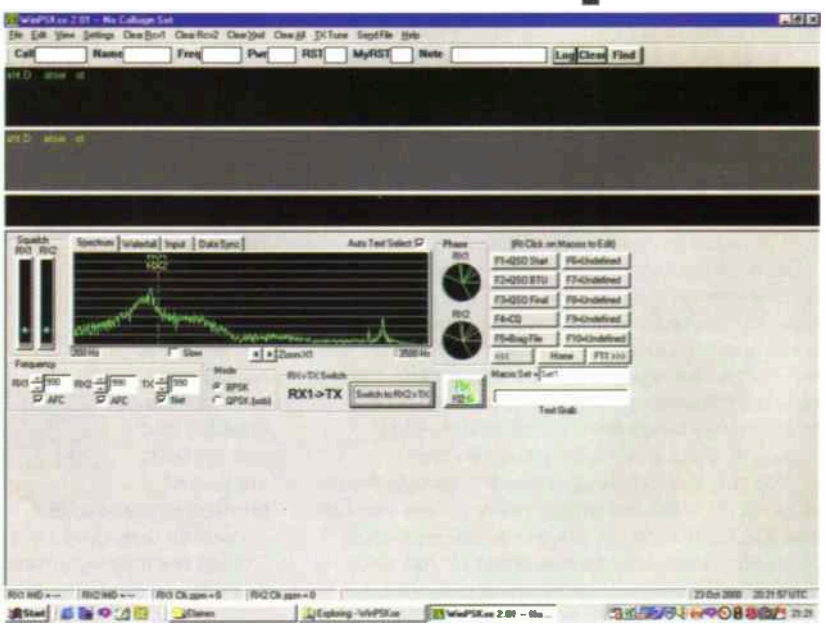
Next on the list of goodies comes the additional decoding modes which have now been increased to include Hellschreiber and a.m. Weather FAX, as per satellite transmissions. You may wonder about the inclusion of Hellschreiber but, despite being a very old mode, you will still find it being used by radio amateurs. The Weather FAX option will be a welcome addition for anyone interested in satellite weather FAX reception.



RTTY decoding with Skysweeper.

New PSK Software

The final software release for this month is *WinPSKse* by KA1DT. This is a specialist program for reeiving amateur p.s.k. signals and includes a number of additions. You'll need a Windows PC with at least a 133MHz processor to run the program, but if you're interested in this mode, it looks to be worth a try. You can download a copy from: **http://www.winpskse.com/**



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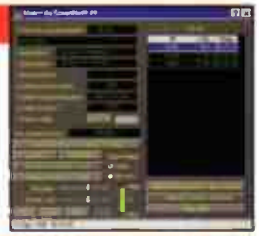

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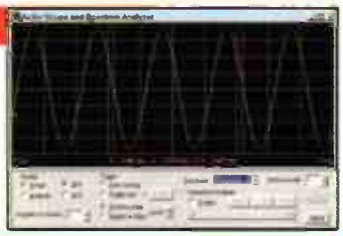

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"Five stars for its mechanical design"
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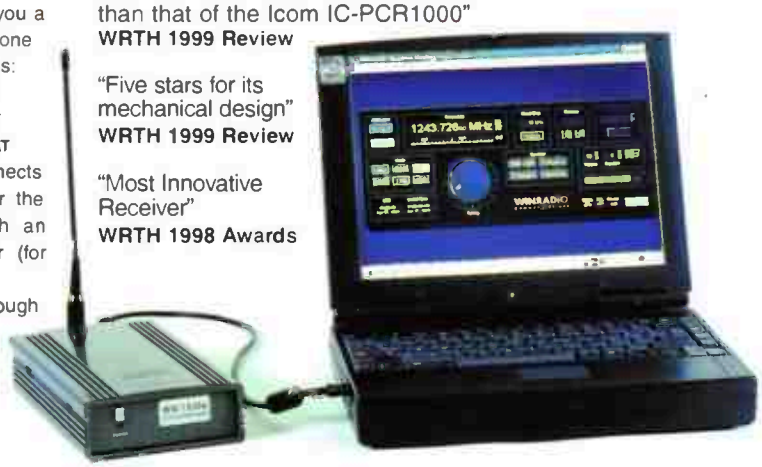

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Construction of internals	WR-1000i/WR-1550i-3100iDSP- Internal full length ISA cards		
Construction of externals	WR-1000e/WR-1550e - 3100e - external RS232/PCMCIA (optional)		
Frequency range	0.5-1300 MHz	0.15-1500 MHz	0.15-1500 MHz
Modes	AM,SSB/CW,FM-N,FM-W	AM,LSB,USB,CW,FM-N,FM-W	AM,LSB,USB,CW,FM-N,FM-W
Tuning resolution	100 Hz (5 Hz BFO)	10 Hz (1Hz for SSB and CW)	10 Hz (1Hz for SSB and CW)
IF bandwidths	6 kHz (AM/SSB), 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)
Receiver type	PLL-based triple-conv. superhet		
Scanning speed	10 ch/sec (AM), 50 ch/sec (FM)		
Audio output on card	200mW	200mW	200mW
Max on one motherboard	8 cards	8 cards	6-8 cards (please ask)
Dynamic range	65 dB	70 dB	85dB
IF shift (passband tuning)	no	±2 kHz	±2 kHz
DSP in hardware	no - use optional DS software		YES (ISA card ONLY)
IRQ required	no	no	yes (for ISA card)
Spectrum Scope	yes	yes	yes
Visitune	yes	yes	yes
Published software API	yes	yes	yes (also DSP)
Internal ISA cards	£299 inc vat	£369 inc vat	£1169.13 inc
External units	£359 inc vat	£429 inc vat	£1169.13 inc (hardware DSP only internal)
PCMCIA Adapter (external):	£59.00 inc vat when bought with 'e' series unit (otherwise: £99 inc vat)		
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Grundig Satellit 700 receiver, £200. K. Greetham, Tyne & Wear. Tel: 0191-414 3745.

Icom IC-R70, £240. Yaesu FRG-8800 plus v.h.f., £250 - carriage paid. Mr Gibson G3JAX, QTHR. Tel: Bosham (01243) 574210.

Icom IC-R7000, as new condition, boxed with manual, £450. Tel: E. Sussex (01273) 486471 1800-2100 please.

Icom R75, excellent condition, 30kHz - 60MHz with d.s.p., with FL233, £500, still in box. Also AR8200, excellent condition, 2040MHz with case, box, £280. Tel: (01252) 373005.

JRC NRD-525 communications receiver, mint, boxed with manual, fitted with CMH-532, RS-232 PC computer control interface with programming manual (frequency, mode, bandwidth, a.g.c., attenuator, memory channels), £450. Tel: Bucks (01753) 885163.

JRC NRD-525 receiver, mint, with manual, £385 o.n.o. JRC JST-135 transceiver, 10 to 150W with gen coverage RX, mint, boxed, with manual, £400 o.n.o. Tel: Somerset (01458) 447019.

Mint radios: Zenith 7000, Grundig YP500, Panasonic RFD65D, used Revox B780 tuner/amp, B&O 1202 RCD/player, Sony 502EC disc player, Wavecom W4010 decoder, J&R 10in speakers, various Opto frequency counters, offers invited for items. Tel: London (01923) 828836.

Philips AE3750 digital world radio, l.w., m.w., f.m., stereo, s.w., 1.7-30MHz, used for one month so as new, £70 including postage. Tel: Nottingham 0115-973 2608.

Trio JR-310 and 9R59D, also Yaesu FRG-7, all in excellent condition, £50 each. Tel: Northumberland (01434) 681469.

Trio R-2000 + v.h.f., £250. Trio R-1000, like new, £150. Sony ICF-2100D airband, like new, £120. Sony PRO-80 + v.h.f., v.g.c., £95. Grundig YB-500 s.s.b., s.w.r., £65.

Yupiteru MVT-7100 hand-held receiver, immaculate, boxed, bargain, £175 inc. post, charger, handbook, frequencies 530kHz to 1650MHz, 2m handy FT-411 charger, sp. mic., handbook, new, spare battery pack, excellent, £100 car adapter, also. George, S. Wales. Tel: (01443) 437345 anytime.

Yupiteru MVT-7100 scanner, boxed with NiCads and charger, as new, £140. Tom, Cheshire. Tel: (01270) 761600.

Yupiteru MVT-9000EU scanner, complete with instruction manual, boxed, in v.g.c., £200. Tel: Essex (01268) 475124.

Yupiteru MVT-9000 wide-band all-mode scanner, fully boxed, with two manuals. JIM PSU-101 desk stand. Haydon AIR-44 antenna. 15m low loss coaxial, the lot for, £260. Tel: Norwich (01603) 746952.

Wanted

Competent amateur or professional repair required on Philips car cassette receiver DC777 f.m., l.w., m.w. & s.w. (3.170-21.910MHz), working, but not faulty, no spares available from VDO/Philips. Tony, Denbigh. Tel: (01745) 710363.

Hammarlund HQ180/A, Eddystone 830/7 or 9, must be in mint, unmodified condition, good price paid for nice examples, will collect. Phil on (01745) 582032 or (01462) 734461.

Sony WA-8000 (not WA8800) receiver in good working condition, must be able to deliver in London - payment in £ sterling. Tel: (0467) 864329 or +255-22-2780456 (Tanzania, E. Africa).

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AR8000 wide-band all-mode receiver with mains charger and airband filter, boxed, exchange for Collins TCS12 RX/TX, ex-military radio. Clive, Birmingham. Tel: 0121-608 3188.

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Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
3.230	SABC Meyerton	S.Africa	1834	F
3.240	TWR Shona	Swaziland	1804	F
3.255	BBC via Meyerton	S.Africa	1844	E,F,I
3.270	Namibian BC,Windhoek	Namibia	2340	A
3.290	Namibian BC,Windhoek	Namibia	1928	A,F
3.316	SLBS Goderich	Sierra Leone	1917	F
3.320	SABC (RSG) Meyerton	S.Africa	2040	A,F,I
3.335	CBS Taipei	Taiwan	2035	F,I
3.356	R.Botswana	Gaberone	1822	F
3.365	GBC R-2	Ghana	2355	A
3.365	AIR Delhi	India	1758	F
3.380	NBC Blantyre	Malawi	2038	F,I
3.915	BBC via Kranji	Singapore	2105	A,E
3.955	R.Taipei via Skelton	England	1800	B,C,E,G,J,K
3.970	R.Korea via Skelton	England	2100	E,G,I
3.975	R.Budapest	Hungary	2000	C,E,G,I,J
3.980	Nexus, Milan	Italy	2119	E
3.985	Nexus, Milan	Italy	2000	C,I
3.995	DW via Julich	Germany	2120	A,E,H,I
4.760	AIR Port Blair	India	0010	A
4.770	FRCN,Kaduna	Nigeria	2100	C,E,I
4.775	AIR Imphal	India	1707	F
4.790	Azad Kashmir R.	Pakistan	0045	E
4.800	AIR Hyderabad	India	1708	E,F
4.815	R.diff TV Burkina	Ouagadougou	1951	F
4.820	R.Botswana, Gaberone	Botswana	1824	D,F
4.820	AIR Calcutta	India	1802	F
4.830	R.Tachira	Venezuela	0055	A
4.835	RTM Bamako	Mali	2050	D,I
4.840	AIR Bombay	India	0043	E,F
4.845	RTM Kuala Lumpur	Malaysia	1703	F
4.845	ORTM Nouakchott	Mauritania	2123	A,E,F,I
4.850	R.Yaounde	Cameroon	2114	E,I
4.860	AIR Delhi	India	1850	F
4.885	R.Clube do Para	Brazil	0602	D
4.885	KBC East Sce Nairobi	Kenya	1934	E,F
4.890	RFI Paris	via Gabon	0358	D,E
4.890	R.Port Moresby	Pag.N. Guinea	2014	F
4.895	Pakistan BC	Pakistan	1703	F
4.905	Anhanguera	Brazil	0125	D
4.905	R. La Oroya	Peru	0424	D
4.915	GBC-1, Accra	Ghana	2123	A,E
4.920	AIR Chennai	India	1702	F
4.930	R.Barahona	Dominican Rep	0133	D
4.935	KBC Gen Sce Nairobi	Kenya	1924	F
4.950	AIR Srinagar	India	1709	F
4.950	VOA via Sao Tome	Sao Tome	2000	C,E,F,G,I
4.960	R.Cima	Dominion Rep.	0405	D
4.965	Christian Voice	Zambia	1804	F
4.975	R.Uganda, Kampala	Uganda	1910	F,G,I,J
4.980	Ecos del Torbes	Venezuela	0145	A,D
4.985	R.Brazil Central	Brazil	0030	A
5.005	R.Nacional, Bata	Eq.Guinea	1920	F,J
5.010	AIR Thiru'puram	India	0037	E
5.020	La V du Sahel,Niamey	Niger	1944	F,I
5.025	R.Rebelde, Habana	Cuba	0604	D
5.025	R.Uganda, Kampala	Uganda	1826	F
5.030	AWR Latin America	Costa Rica	0015	A
5.047	R.Togo, Lome	Togo	1937	F
5.050	R.Tanzania	Tanzania	1820	F,I
5.055	Faro del Caribe	Costa Rica	0445	D
5.060	PBS Xinjiang, Urumqi	China	0020	A

LM&S *continued*

DXers :-

(A) Robert Connolly, Kilkeel.
(B) Stan Evans, Herstmonceux
(C) Bill Griffith, while in Finhault, Switzerland.
(D) David Hall, Morpeth
(E) Eddie McKeown, Newry.
(F) Fred Pallant, Storrington.
(G) Clare Pinder, while in Appleby
(H) Peter Pollard, Rugby
(I) Vic Prier, Colyton
(J) Phil Townsend, E London
(K) Tom Winzor, Plymouth.

Listeners:-

(A) Bernard Curtis, while near Newquay, Cornwall.
(B) Simon Hockenhull, E.Bristol.
(C) Sheila Hughes, Morden
(D) Brian Keyte, while near Inverness.
(E) Eddie McKeown, Newry.
(F) George Millmore, Wootton IoW
(G) Clare Pinder, while in Appleby
(H) Tom Smyth, Co Fermanagh
(I) Phil Townsend, E London.
(J) Bruce Watt, W.London
(K) Fred Wilmshurst, Northampton.

44444 at 1633 in Newry; R.Sweden via Horby **6.065** (Eng 1730-1800) **54444** at 1735 in Plymouth; R.Slovakia Int **5.920** (Eng 1830-1900) **44444** at 1830 in Morden; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 44434 at 1928 in Colyton; R.Budapest, Hungary **6.025** (Eng 1930-2000) 43444 at 1930 in Appleby; R.Finland, Helsinki **6.110** (Eng 1930-1945) heard at 1935 in Truro; BBC via Cyprus **5.875** (Various to E.Eur 1700-2130) 44434 at 2035 in Rugby; R.Canada Int via Skelton, UK **5.995** (Fr, Eng 1900-2200) 44434 at 2046 in N.Bristol; Deutschland R, Berlin **6.005** (Ger 24hrs) 55444 at 2215 in Northampton.

While beaming to other areas the BBC via Nakhon Sawan, Thailand **5.965** (Eng to Asia 2100-0000) rated 23332 at 2100 in Oxted; R.Canada Int via Sackville? **5.995** (Eng, Fr to USA, Caribbean, Mexico, C.America 0500-0600) SIO 444 at 0524 in N.Bristol; WHRI South Bend, USA **5.745** (Eng to N.America 2100?-1000) 43334 at 0630 in Stalbridge.

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
531	Torshavn	Faeroe Is.	100	D
531	Berg	Germany	20	E*,F
531	RNE5 via ?	Spain	?	F
531	Beromunster	Switzerland	500	E*,H*,K*
540	Wavre	Belgium	150/50	B,C,E*,F,I,K*
540	Sidi Bennour	Morocco	600	F*
549	Les Trembles	Algeria	600	F*
549	Thumau (DLF)	Germany	200	F,I,K*
558	Espoo	Finland	50	E*
558	RNE5 via ?	Spain	?	E*,F*
567	Tullamore(RTE1)	Eire	500	A,B,D,E*,F,H,I,J*,K
567	RNE5 via ?	Spain	?	F*
576	Muhlacker(SDR)	Germany	500	E*,F,K*
576	Barcelona(RNE5)	Spain	50	F*
585	Paris(FIP)	France	8	F,I
585	Madrid(RNE1)	Spain	200	E*,F*
585	Dumfries(BBCScot)	UK	2	D,E*
594	Frankfurt(HR)	Germany	1000/400	E*,F*
594	Oujda-1	Morocco	100	F*
594	Muge	Portugal	100	E*
603	Lyon	France	300	E*,F
603	Bucharest	Romania	50	F*
603	Newcastle(BBC)	UK	2	D,E*
612	Athlone(RTE2)	Eire	100	A,B,C,D,E*,F,H,J*,K*
612	Sebaa Aioun	Morocco	300	F*
612	RNE1 via ?	Spain	10	F*
621	Wavre	Belgium	80	C,E*,F,I,K
621	Barcelona(OCR)	Spain	50	E*
630	Vigra	Norway	100	E*
630	Tunis-Djedeida	Tunisia	600	F*
639	Praha(Liblice)	Czech	1500	E*,F*
639	RNE1 via ?	Spain	?	E*,F*
648	Orfordness(BBC)	UK	500	D,E*,F,I,K
657	Napoli	Italy	120	F*
657	Madrid(RNE5)	Spain	20	F*
657	Wrexham(BBCWales)	UK	2	D,E*,H*,K
666	MesskirchRohrd(SWF)	Germany	150	E*,K*
666	Sitkunai(R.Vilnius)	Lithuania	500	E*
666	Lisboa	Portugal	135	F*
675	R10 FM	Holland	120	B,E*,F,I,J,K
684	Sevilla(RNE1)	Spain	500	E*,F*
693	Droitwich(BBC)	UK	150	F,K
693	Enniskillen(BBC)	UK	1	H
702	Flensburg(NDR)	Germany	5	E*,F*
702	TWR via Monte Carlo	Monaco	300	E*,F*
711	Rennes 1	France	300	A,B,E*,F,I,K*
711	Laayoune	Morocco	600	F*
720	Lisnagarvey(BBC4)	N.Ireland	10	A,D,H
720	Sfax	Tunisia	200	F*
720	Lots Rd,Ldn(BBC4)	UK	0.5	F
729	Cork(RTE1)	Eire	10	D,E*,F,H
729	RNE1 via ?	Spain	?	E*,F*
738	Paris	France	4	C,E*,F
738	Barcelona(RNE1)	Spain	500	E*,F*
747	Flevo(Hilv2)	Holland	400	B,E*,F,I,K
756	Braunschweig(DLF)	Germany	800/200	E*,F*
756	Bilbao(EI)	Spain	5	F*
756	Redruth(BBC)	UK	2	E*,F
765	Sottens	Switzerland	500	E*,F*
774	Enniskillen(BBC)	N.Ireland	1	D,E*
774	RNE1 via ?	Spain	?	E*,F*,K*
774	Plymouth(BBC)	UK	1	A
783	Leipzig(MDR)	Germany	100	E*
783	Miramar(R.Porto)	Portugal	100	F*
792	Limoges	France	300	E*
792	Lingen(NDR)	Germany	5	F*
792	Sevilla(SER)	Spain	20	E*
792	Londonderry(BBC)	UK	1	H
801	Munchen-Ismaning	Germany	300	E*,F*
801	RNE1 via ?	Spain	?	E*
810	Volgograd	Russia	150	K*
810	Westerglen(BBCScot)	UK	100	D,E*,F*,H,J*,K*
819	Batra	Egypt	450	E*
819	S.Sebastian(EI)	Spain	5	F*
828	Rotterdam	Holland	20	E*,I
837	Nancy	France	200	E*,H*
837	COPE via ?	Spain	?	F*
846	Rome	Italy	1200	E*,F*,K*
855	RNE1 via ?	Spain	?	E*,F*,K*
864	Paris	France	300	B,E*,F,I
864	Socuellamos(RNE1)	Spain	2	F*
873	Frankfurt(AFN)	Germany	150	E*,F*,J*
873	Zaragoza(SER)	Spain	20	E*,F*
873	Enniskillen(R.UI)	UK	1	D,E*,H
882	COPE via ?	Spain	?	C*,E*
882	Washford(BBCWales)	UK	100	A,C*,D,E*,F,H,I,K
891	Algiers	Algeria	600/300	F*
891	Hulsberg	Netherlands	20	E*
900	Brno(CRo2)	Czech Rep	25	E*,F*
900	Milan	Italy	600	E*,F*
909	Lisnagarvey(BBC5)	N.Ireland	10	H
909	B'mars Pk(BBC5)	UK	140	F,K
918	Domzale	Slovenia	600/100	C*,E*,F*
918	Madrid(R.Int)	Spain	20	C*
927	Wolvertem	Belgium	300	E*,F,I,K*
936	Bremen	Germany	100	E*,F*
945	Toulouse	France	300	E*
954	Brno (CRo2)	Czech Rep.	200	E*
954	Madrid(CI)	Spain	20	F*
963	Pori	Finland	600	E*,F*
963	Tir Chonaill	Eire	10	H*
972	Hamburg(NDR)	Germany	300	B*,E*,F*
981	Alger	Algeria	600/300	F*
990	Berlin	Germany	300	E*,F*
990	R.Bilbao(SER)	Spain	10	E*,F*
990	Redmoss(BBC)	UK	1	E*
990	Tywyn(BBC)	UK	1	D
999	Schwerin (RIAS)	Germany	20	E*
999	Madrid(COPE)	Spain	50	E*
1008	Flevo(Hilv-5)	Holland	400	E*,F,I,K
1017	Rheinsender(SWF)	Germany	600	B*,E*,F*,I
1017	RNE5 via ?	Spain	?	E*
1035	Lisbon(Prog3)	Portugal	120	E*
1044	Dresden(MDR)	Germany	20	E*,F*
1044	SER via ?	Spain	?	B*,E*
1044	S.Sebastian(SER)	Spain	10	F*
1053	Talk Sport via ?	UK	?	E*,F,H,K
1062	Kalundborg	Denmark	250	B*,E*,F*
1071	Bilbao(EI)	Spain	5	E*
1071	Talk Sport via ?	UK	?	E*
1080	SER via ?	Spain	?	E*,F*
1089	Talk Sport via ?	UK	?	E*,F,H,K
1098	Nitra(Jarok)	Slovakia	1500	E*,F*
1107	AFN via ?	Germany	10	E*
1107	Talk Sport via ?	UK	?	E*,F
1116	Pontevedra(SER)	Spain	5	E*
1125	La Louviere	Belgium	20	E*,F*,I
1134	Zadar(Croatian R)	Croatia	600/1200	E*,F*,K*
1143	AFN via ?	Germany	1	E*,F*
1143	COPE via ?	Spain	2	E*,F*
1152	RNE5 via ?	Spain	10	F*
1161	Ain-Salah	Algeria	5	F*
1179	Solvesborg	Sweden	600	E*,F*,H,K*
1188	Kuurne	Belgium	5	E*,I
1188	Szolnok	Hungary	135	F*
1197	Munich(VOA)	Germany	300	E*
1197	Virgin via ?	UK	?	E*,F,H,K
1206	Bordeaux	France	100	B*,E*,F*
1215	Virgin via ?	UK	?	E*,F,H,K
1224	Vidin	Bulgaria	500	F*
1224	Lelystad	Holland	50	E*,F*
1233	RFE via ?	Czech Rep.	?	E*
1233	Virgin via ?	UK	?	E*,K
1242	Marseille	France	150	E*
1251	Marcali	Hungary	500	E*
1251	Huisberg	Netherlands	10	C,E*
1260	SER via ?	Spain	?	E*,F*
1260	Guildford (V)	UK	0.5	E*
1269	Neumunster(DLF)	Germany	600	E*,F*,K*
1278	Dublin/Cork(RTE2)	Eire	10	B,C,D,E*,F*,H,J*,K
1287	RFE via ?	Czech Rep.	?	E*,F*
1287	Lerida(SER)	Spain	10	F*
1296	Valencia(COPE)	Spain	10	F*
1296	Orfordness(BBC)	UK	500	E*,J*
1305	RNE5 via ?	Spain	?	E*,F*
1314	Kvitsoy	Norway	1200	B*,E*,F*,K*
1323	W'brunn (V.Russia)	Germany	1000/150	E*,K*
1332	Rome	Italy	300	E*,F*
1341	Lisnagarvey(BBC)	N.Ireland	100	A,D,F*,H,K*
1350	Cesvaine/Kuldiga	Latvia	50	F*
1359	Madrid(RNE-FS)	Spain	600	E*
1368	Foxdale(Manx R)	Is of Man	20	A,C*,D,F*,H*
1377	Lille	France	300	B,E*,F*,I,K*
1386	Bolshakovo	Russia	2500	C*,E*,F*,G*
1395	TWR via Fiiake	Albania	500	E*
1395	Lopic	Netherlands	120/40	F,I,K*
1404	Brest	France	20	B*,E*,F,K*
1413	RNE5 via ?	Spain	?	E*,F*
1422	Heusweiler(DLF)	Germany	1200/600	E*,F*,K*
1440	Marnach(RTL)	Luxembourg	1200	E*,F,K*
1449	Redmoss(BBC)	UK	2	D,E*
1458	Fiiake	Albania	500	F*
1467	Monte Carlo(TWR)	Monaco	1000/400	E*,F*
1476	Wien-Bisamberg	Austria	600	E*,F*
1485	Carlisle(BBC)	UK	1	D
1494	Clermont-Ferrand	France	20	E*,F*,K*
1512	Wolvertem	Belgium	300	C*,F,G,I,K*
1512	Palermo	Italy	2	E*
1521	Kosice(Cicatice)	Slovakia	600	E*,F*,K*
1530	Vatican R	Italy	150/450	C*,E*,F*,K*
1539	Mainflingen(ERF)	Germany	350(700)	C*,E*,F*,K*
1539	SER via ?	Spain	?	C*
1557	Nice	France	300	C*
1575	Genova	Italy	50	F*,K*
1575	SER via ?	Spain	5	F*,K*
1584	SER via ?	Spain	2	F*
1593	Holzkirchen(VOA)	Germany	150	C*,E*,F*
1602	SER via ?	Spain	?	C*,K*
1602	Vitoria(EI)	Spain	10	C*,E*,F*,K*
1611	Vatican R	Italy	15	D,E*

■ **Greg Baker, PO BOX 3307, MANUKA, ACT 2603, AUSTRALIA**
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Bandscan Australia

This time my news is dominated by Radio Australia (RA) but I also have news of Australia Television, views and the RA web site and some reception reports.

Radio Australia

Many stories never seem to go away. I reported last time that a long term lease on the Cox Peninsula facilities near Darwin, once a mainstay of Radio Australia, had been sold for an undisclosed sum to Christian Vision, a British religious broadcaster. Since that story appeared, it has been speculated that the money changing hands is somewhere in the order of two million Australian dollars (about £725,000) for a ten year lease. Critics point out that the site was refurbished in the early 1990s for $A12 million (£4.4 million). Also the new British owner has been reported to have said the site is worth $A25 million (£9 million).

However, that is not the big news about the Cox Peninsula though the stories are linked. The government has recently announced that it will make $A3 million (£1.1 million) available per year for the next three years to augment Radio Australia funds. This will make the total RA budget about $A12 million (£4.4 million) which is about half what it was before the cuts took effect in 1997.

Anyway, it seems that the very people who shut down RA use of the Cox Peninsula facilities in 1997 to save money and because short wave technology was outdated, have now decided that Australia needs a voice in south Asia and particularly in Indonesia. And guess what one of the options is? To lease time on the Cox Peninsula transmitters from Christian Vision. Other options include leasing time on transmission facilities in Taiwan and Singapore.

A priority use for the additional funding will be to re-commence broadcasting into west and central Indonesia. RA is reported to be considering an increase by five hours from three and a half hours currently broadcast per day in the Indonesian language. Another option will be to expand the RA voice into Korea.

Commentators have unanimously poured scorn on the government for what is seen as an outrageous blunder affecting Australia's credibility.

Other Outlets

Because of the funding cuts to RA, the broadcaster has arranged relay and re-broadcasting agreements throughout this region. In the past two years RA has made arrangements with over one hundred partner stations to relay news, current affairs and lifestyle programs. For the Internet connected details of these stations are on RA's Internet pages found through **http://www.abc.net.au/ra/hear**

RA Web Site

RA's lack of resources really starts to show on their web site which apparently receives ten million hits every year. It is my opinion that the RA site is far from as useful as it could be and the site is certainly far from being user-friendly.

Starting at **http://www.abc.net.au/ra** *SWM* readers can see for themselves what seems to me to be a site designed by a committee and executed by a succession of people apparently working in total isolation from one another. One other difficulty as I see it is that web users can easily and without warning leave RA's pages and dive into far differently designed ABC radio and television pages. I hope RA's additional funding will be used in part to make this site more useful and usable.

Readers interested in commenting on the RA site can do so through one of the E-mail addresses on **http://www.abc.net.au/ra/contact_ra.htm** or to me at **greg@pcug.org.au**

RA Schedule

The RA short wave schedule is at **http://www.abc.net.au/ra/hear/shortwave.htm** for the Internet connected. The frequencies that RA broadcasts on are: 5.995, 6.020, 7.240, 9.580, 9.660, 9.815, 11.650, 12.080, 13.605, 15.240, 15.515, 17.580, 17.715, 17.795, 21.725 and 21.740MHz.

The frequency schedule in English is currently:

UTC	Frequency (MHz)
0000-0800	17.580, 15.240 and 21.725
0200-0700	15.515
0700-0900	15.240
0800-0900	5.995
0800-1200	13.605
1100-1400	6.020
1100-2130	9.580
1200-1700	11.650
1400-1800	5.995
1700-2100	9.815
1700-2200	11.880
1800-2000	6.080
1800-2000	7.240
2000-2200	12.080
2100-0000	17.715
2100-0100	21.740
2100-2200	7.240
2100-2200	7.240
2200-0200	17.795
2300-0800	9.660
2300-0900	12.080

Australia Television

Readers of this column will recall that the Australian Broadcasting Corporation (ABC) sold Australia Television in 1997 to the Seven Network, one of Australia's commercial free to air television networks. This too was part of the drive to reduce ABC running costs in the wake of huge budget cuts after the current government came to power. It seems that Seven too is struggling to make a profit from this service and is carefully considering its future.

In this context and in almost the same breath as announcing funding increases for RA, the government has said it will consider providing some support funding for Australia Television. Again, the foreign affairs implications of muffling Australia's voice in the region are at last being allowed to be heard and acted on.

Reports

Norman Locke from Whittlesey near Peterborough, North Cambridgeshire, has been very busy listening to all manner of transmissions from this part of the world. These include transmissions from maritime users to aircraft using high frequency in this area. He heard Sydney VOLMET on 11.387MHz at 0600UTC and amateur operator VK9XV on the 21MHz band. Norman uses a Kenwood R-2000 with a 30m long wire antenna. His QTH is just 2m above sea level. His interests are shipping and aircraft, particularly the Royal Flying Doctor Service.

Colin Smith from Armagh Northern Ireland has heard Radio Australia on 9.500MHz at around 2120UTC with SINPO 33212. He uses a Roberts R-876 portable receiver with a Roberts portable short wave antenna.

Martyn Gardiner from Portsmouth has been busy of late, but has still had some time to trawl the airwaves. He too has been successful on several occasions with Radio Australia on 9.500MHz in the period 2000-2100UTC. On one occasion Martyn was able to use a transistor portable rather than bring in his Icom R8500 and long wire antenna.

BROADCAST

Other News

Queensland is to get $A25 million (£9 million) to deliver continuous mobile telephone coverage along 9425km of highway. The government announcements of the funding said that this would make the longest continuous mobile telephone coverage in the world.

Yet another enquiry has been announced, this time into the adequacy of radio services in non-metropolitan Australia. The report of the enquiry is due by 23 February 2001.

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

Commercial Classic? Racal RA-17

John Wilson G3PCY, fulfils the many requests to investigate the classic British radio otherwise known as the RA-17.

Several people have asked the Editor why I have not included the most famous British receiver of recent classic reviews. One reason is that I thought that so much had already been written about the RA-17 that I would be raking over cold ashes to do it all again, but the opportunity presented itself when I discovered a local chap here in North Devon who had an early but well preserved and unmodified RA-17 sitting doing nothing, so with apologies to those of you who know a great deal more than I, here goes with a look at another all-time great (or is it?).

First Encounter

I first met the RA-17 face to face when I was working for Marconi, living in Ikeja outside Lagos and teaching local engineers on the first h.f. training course ever to be run in Nigeria. Another branch of Marconi came out to install a high powered h.f. station at Ikorodu and invited me along to sample the latest offerings from our company. At this time, Marconi had commercial connections with Eddystone and were selling their receivers re-badged as Marconi products, so it was with some surprise that I found a Racal RA-17 as the main station monitor receiver in the new Marconi station. This was in the early 1960s and bearing in mind that the GEC BRT-400 was reckoned to be the best thing around, I was impressed by the design of the RA-17, for here was a receiver with an almost linear frequency readout (which was also accurate), and resettability of a class which I had not seen before (and they told me it was drift cancelling as well!).

The RA-17 series has been researched in great depth by various chaps who know a great deal about it, and its probably true to say that no other receiver of recent (i.e. post WW2) origin has had so much written about it. For me, the definitive texts are two articles in *Radio Bygones* magazine (Oct/Nov 1993 and Christmas 1993) written by Keith Thrower, and *The Racal Handbook* by Rinus Jansen, also available from *Radio Bygones* magazine. These are for anyone who wants to know the whole story and its a fascinating tale, but I adopted my usual approach in taking an RA-17 straight off the open market, as it were, and seeing what a typical purchaser would get for his money today. The unit so kindly loaned to me was an RA-17L, serial number 6640, and year designator TK which means (I think) that it was manufactured in September 1962 which makes it the same age as the RA-17 I encountered in Nigeria. Fate was smiling upon me.

Now a brief note on commercial history. The RA-17 sprang from an aborted contract between Racal and the Admiralty for the supply of 200 h.f. receivers, the basis of which was that Racal would obtain the manufacturing rights for UK production of the Collins 51-J which was then considered to be the very best h.f. receiver in the world. The agreement between Racal and Collins collapsed when Collins insisted that all components should be sourced from the US, when Racal were proposing that UK components should be used. Racal were thus left holding a valuable contract without any means of fulfilling it. The story of how Dr. Trevor Wadley appeared on the scene with his drift cancelling loop system is best told by others, but the RA-17 was to be the British answer to the Collins 51-J and the rest, as they say, is history.

Back To The Present

Forty years on, how does the RA-17 stand up today? First of all its heavy, but not quite like the AR88D. I could lift it using the straight back and use the knees method, but swinging it on to a waist-high test bench made me puff a bit. Built like a battleship and painted the same colour, the RA-17 is a bit forbidding to start with and although it might sound silly, it didn't feel as friendly as the AR88, possibly because I was brought up on USA black crackle rather than the plain shiny grey paint, (the handbook tells me that it is Light Battleship Grey, BS specification 381C, colour 697 just in case you want to colour match the curtains to it) but it definitely didn't feel friendly, even less so when I realised that I didn't have a connector which fitted the antenna socket, and had forgotten what they called the weird connector used. Fortunately, I did find a length of coaxial cable with the correct connector and made an adapter to take BNC plugs so was at least able to listen around (using the Wellbrook ALA1530 loop, 'cause I'm still impressed by its performance at low frequencies).

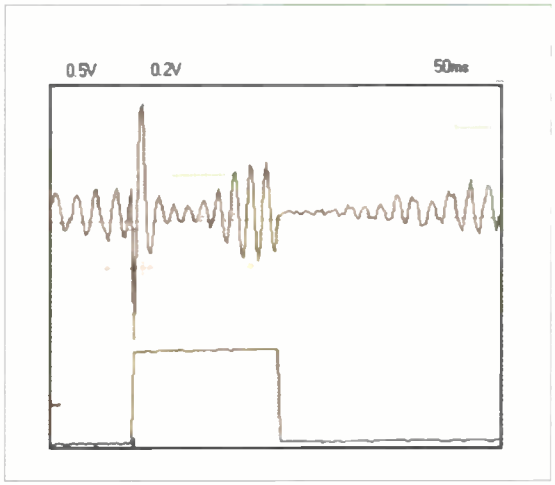


Fig. 1: How the RA-17 behaves on a realistic r.f. signal with the a.g.c. set to short time constant.

Mechanical construction is based on a massive die-cast lower chassis which incorporates all the inner screening for the various multi-section filters for the drift cancelling system, and carries the power supply, audio and final i.f. sections of the receiver. Sitting on top of this main chassis are two more die-

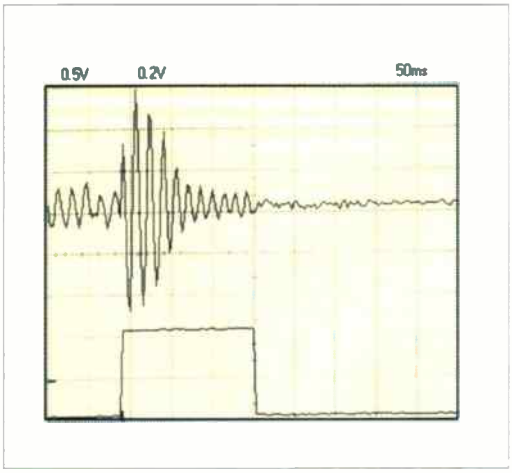


Fig. 2: Here is what happens when the a.g.c. is set to long.

cast units, one containing the first v.f.o. unit which generates the first conversion oscillator signal and drives the MHz dial, whilst the second box carries the second v.f.o. which covers the tuneable i.f. and has the famous 35mm film strip dial calibrated in kHz from 1 to 1000. The effective scale length using this dial arrangement is 44m from end to end, giving a typical dial span of 150mm for each 100kHz. Obviously the die-cast units make the RA-17 mechanically robust, but can bring servicing problems should you need to work inside either of the two v.f.o. boxes. Dedicated RA-17 enthusiasts will say that its easy to strip down the receiver for service, but I never found it a task I looked forward to with any enthusiasm. On the other hand, the proper service manual is a delight to use, with clear photographs identifying virtually every component and its placement within the receiver, so I strongly recommend that anyone contemplating purchase of an RA-17 should ensure that a full manual comes with it.

The technical specification for the RA-17 is quite impressive, particularly in the i.f. selectivity which offers six bandwidths of 13, 6.5z, 3, 1.2kHz, 300 and 100Hz, the two narrowest bandwidths being obtained using crystal half lattice filters. The selectivity is defined by having all the filtering between the third mixer and the first 100kHz i.f. stage, the later i.f. amplifiers using over-coupled transformers with no means of changing their bandwidth. Shape factors of the wider bandwidths are typical of coupled L/C circuits, giving quite sloping sides to the i.f. passband at 3kHz (shape factor 5:1) and 1.2kHz (shape factor 6:1), but slightly better at 6.5kHz (shape factor 3:1). Up at the sharp end, the frequency coverage of the RA-17 is quoted as 1 to 30MHz, with a handbook comment saying that this can be extended down to 500kHz with degraded performance. If your interest is in l.f. listening then the RA-17 is not for you. You will find another slight problem at the blunt end in that the maximum audio output is only 50mW, the RA-17 being primarily designed for the professional c.w. operator with a pair of headphones firmly clamped to his head, or being used in a remote location with audio sent down a balanced 600Ω line. If however, you have a North American market version of the RA-17 you get a proper output stage delivering 1W into 3Ω instead of the 50mW delivered by the EF91 r.f. pentode used in the UK versions.

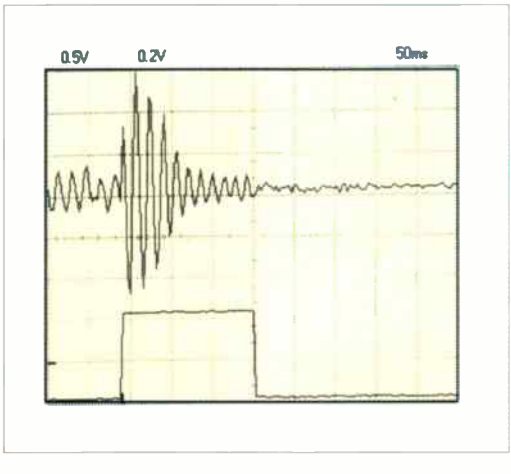


Fig. 3: The RA-17 behaves in a much better fashion when the a.g.c. is switched off and manual gain control is used.

Gross Mismatch

Back at the sharp end the r.f. selectivity is provided by a bank of dual tuned circuits designated preselector on the front panel. Now you just know that this would appeal to me even though it means a twiddle on the preselector knob each time you move receiver frequency, because I believe that r.f. selectivity is vital in providing good second order intermodulation performance. However, if you don't want to twiddle, Racal provide a switch position which bypasses the r.f. tuned circuits and gives a flat response across the receiver tuning range. The drawback to this arrangement is that the antenna input is then connected across a 75Ω resistor, with a 220pF capacitor feeding the high impedance grid of the cascode r.f. amplifier valve. The resultant gross mismatch drops the receiver sensitivity rather drastically and leads the unwary to think that either the antenna connector has fallen off the back panel or a low flying C-130 has swept away the antenna itself. The measured effect is that on 14.2MHz c.w. with a 3kHz bandwidth, the receiver sensitivity is -117dBm for 12dB SINAD using the preselector. Switching to the wideband position drops the sensitivity by 16dB, and this is of course for a matched generator to load impedance. If you happen to be using a high (ish) impedance antenna the losses would be much greater.

Using the RA-17 is straightforward enough. To tune to a wanted frequency you simply turn the dial marked MHz (actually its usually marked Mc/s but I have used current terminology throughout so as not to confuse the youngsters, even though it might bring tears to the eyes of those of us who still thing that Mc/s is much more descriptive and correct than calling a cyclical phenomenon after a German physicist). However, to return to the subject, twiddle the MHz dial until the band you want. appears in the little window and carefully peak for maximum noise. The drift cancelling system will take care of the rest. Now twiddle the other knob marked kHz and add the reading shown on the film scale to that on the MHz dial. I've somehow made this sound more complicated than it is in practice - believe me it's really easy. When it comes to mode selection we have to remember that the RA-17 comes from an age when the alternative to a.m. was c.w., so no provision was made for s.s.b. reception, although for commercial i.s.b. applications Racal later produced the RA-98 i.s.b. adapter which was a separate unit fed from the 100kHz i.f. output of the RA-17. Unless you have an RA-98 you have to use the time honoured method of turning off the a.g.c., switching on the b.f.o. and tuning it to the correct side of the i.f. passband, increasing the a.f. gain to maximum and then riding the r.f./i.f. gain control to get the relative levels of input signal and b.f.o. into the detector in the right relationship. Takes a good deal of practice to get this right, and I think I may have previously mentioned sandpapering your fingertips to get the correct feel for the control juggling involved.

Another reminder that the RA-17 is a c.w. receiver is that the r.f./i.f. gain control is disabled when a.g.c. is selected, the receiver running at full gain controlled only by the a.g.c. To use the manual r.f./i.f. gain control you have to select manual gain which then turns off the a.g.c. and you have to head for the manual gain control with some haste to avoid blowing your eardrums on strong signals. The handbook contradicts itself on this point by stating that the i.f. gain control is operative both in manual and a.g.c. positions of the system switch (page 13) but then goes on to describe how the same switch (S5) section E renders the i.f. gain control inoperative in a.g.c. mode (page 24). This was certainly the case in the RA-17 I was using and was confirmed by the actual circuit in the handbook.

Signal strength metering is provided by measuring the current flowing in the a.m. detector diode which is satisfactory until you switch on the b.f.o., at which point the meter hits near full scale as it measures the rectified b.f.o. signal and renders itself useless for c.w. and s.s.b. transmissions. Curiously the North American version of the

RA-17 provides an 'S' meter driven from the cathode of the last 100kHz i.f. amplifier so its perfectly possible to modify the UK version of the RA-17 should you wish because the details (outline only) are given in the receiver handbook. Anyone who knows which end of a soldering iron to pick it up by should have little trouble in the modification. I am reminded of an old friend George Robbins who ran a marine radio business in Liverpool and said of a radio amateur we both knew. He calls himself an engineer, but if he picks up a screwdriver there's only a fifty percent chance he'll get the right end.

Testing Time

As part of my formal measurements I now include a performance check of the a.g.c. system of the receiver under test, and perhaps this is the moment to reveal that the a.g.c. in the RA-17 I tested was a disaster. I will remind you that I do this test using a short but defined burst of r.f. lasting some 150ms into the antenna socket, monitoring the burst and resultant audio output using a sampling oscilloscope. This simple test which I devised some time ago following a request from Michael O'Beirne for a more detailed analysis of a.g.c. performance in receivers, tells more about how a receiver performs under real signal conditions than any amount of traditional steady state plotting using a signal generator and measuring the increase in audio output from the receiver. From the specification sheet for the RA-17, everything in the garden seems lovely, with an r.f. increase of 100dB above 1µV giving an audio output rise of less than 7dB, but these are steady state measurements. Take a look at **Fig. 1** which shows how the RA-17 behaves on a realistic r.f. signal with the a.g.c. set to short time constant. The r.f. signal has a steady level of -93dBm and is increased in the step to -53dBm before returning to 93dBm. Now this represents a level change of only 40dB so the a.g.c. should cope with it, but as you can see from the graph, at the initial step change the audio output from the receiver increases dramatically before the a.g.c. takes hold, at which point the a.g.c. over-corrects before restoring the receiver gain about half way through the signal burst. At the end of the burst the a.g.c. hangs as it should do before restoring the receiver gain in a controlled fashion. **Fig. 2** shows what happens when the a.g.c. is set to long, and indicates that the short high amplitude audio output burst is now much longer, presumably as the a.g.c. system charges up the time constant determining components. The overload condition exists for at least half the time of the signal burst, and then the receiver gain is held low after the burst until the time constant restores full gain (not shown on the graph). **Fig. 3** shows that the receiver behaves in a much better fashion when the a.g.c. is switched off and manual gain control is used, the resultant audio following the shape of the r.f. signal burst exactly.

These peculiar a.g.c. characteristics make the RA-17 a very tiring receiver to use for any length of time, and I found myself ignoring the a.g.c. and using manual gain instead, even though this meant adjusting the gain every time signal levels changed. Listening to h.f. ATCC signals from Shanwick involved reducing the r.f. gain each time Shanwick called an aircraft only to then have to restore the gain to hear the distant aircraft reply. I commented on the a.g.c. in a letter to Michael O'Beirne with whom I have an increasingly regular channel of communication and he kindly sent me some circuit extracts from the handbook of the RA-117E which clearly demonstrated that Racal were aware of the a.g.c. shortcomings and introduced modifications to separate the a.g.c. attack and decay characteristics for better a.g.c. performance. Take another look at **Fig. 1** and **Fig. 2** and you will see that changing the decay from short to long actually affected the way the RA-17 behaved on the leading edge of the r.f. burst; something which should not happen in any receiver. It doesn't take sharp eyes to note that Michael is referring to a later version of the RA-17 which incorporated another intermediate signal conversion to 1.6MHz before the final conversion to 100kHz, there having been some comments about image responses in the original RA-17 design with the image being only 200kHz away from the wanted signal. Just for information I measured the 100kHz image rejection at 14.2MHz and found it to be only 64dB, which is within the published specification in the handbook but not really good enough for a professional receiver. The things I learned

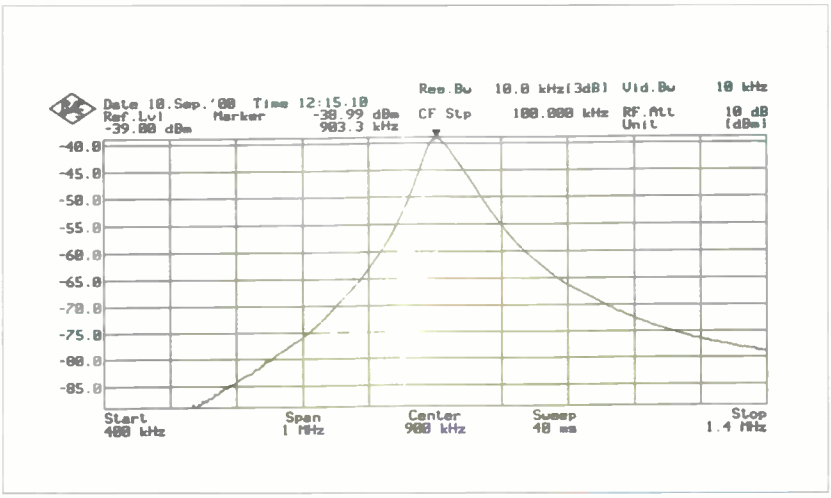


Fig. 4: The preselector passband centred on 900kHz.

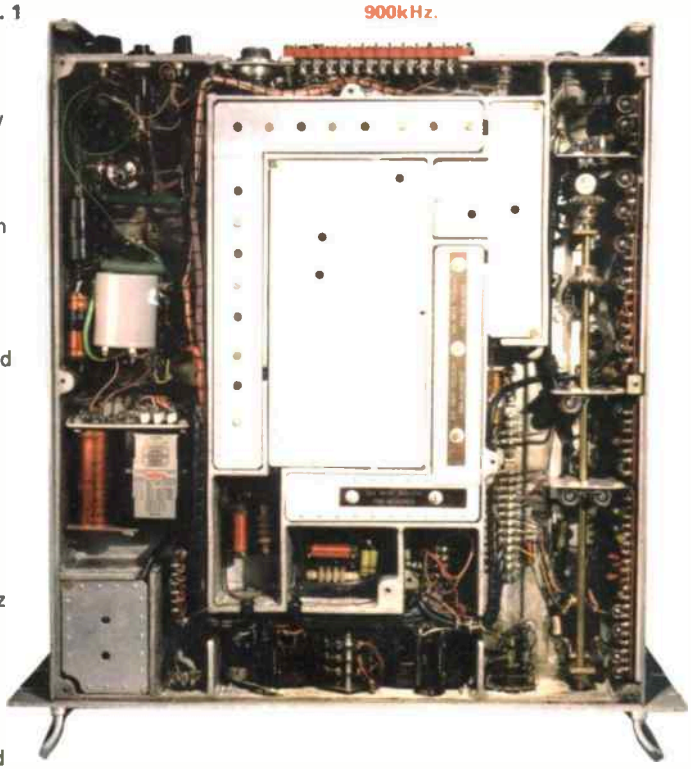
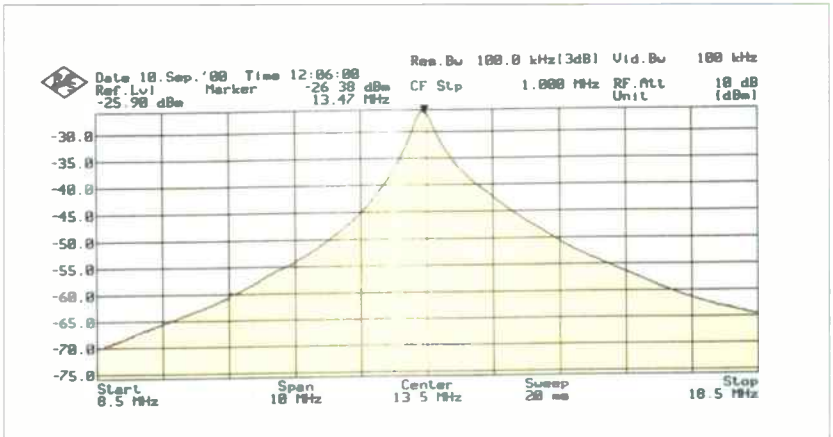


Fig. 5: The preselector passband centred on 13.5MHz.



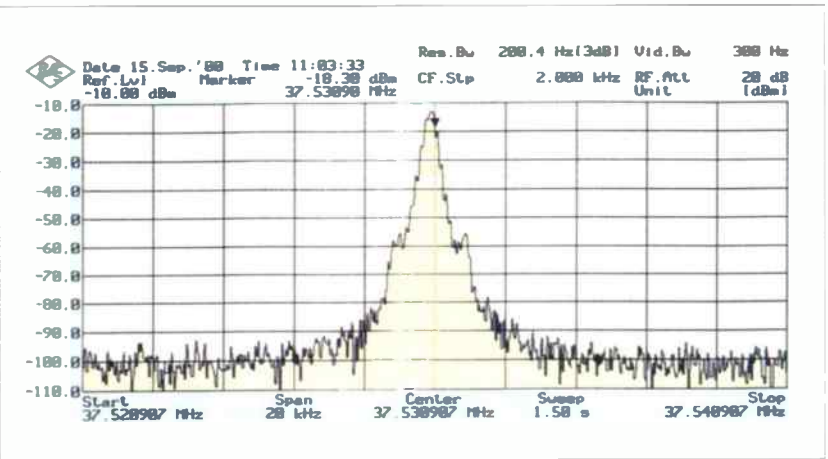
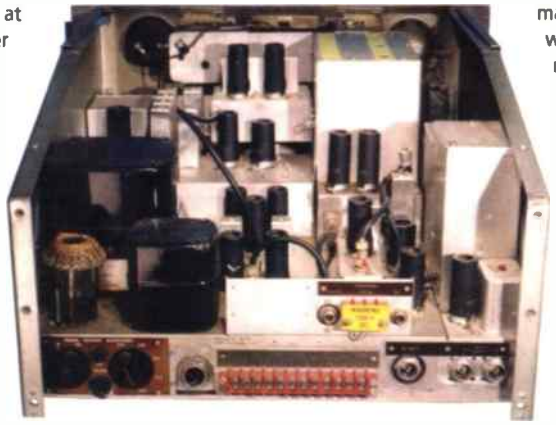


Fig. 6: The oscillator spectrum during a relatively quiet spell.

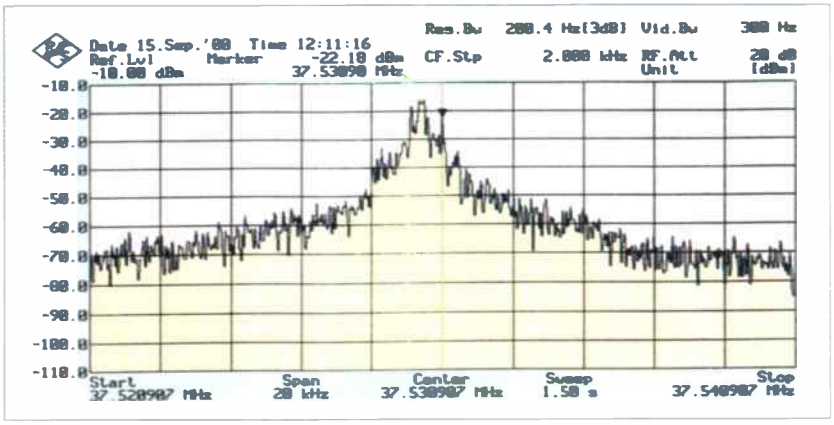
about the RA-17 during these tests were most illuminating, and occasionally disturbing.

Since we are now on to measurements, the sensitivity of the RA-17 is acceptable at -117dBm for c.w. and -113dBm for 60% modulated a.m. in a 3kHz bandwidth, falling to -101dBm for a.m. in the 6kHz bandwidth. These figures are obtained using the preselector control; with the preselector bypassed the sensitivity is some 16dB worse (commonly referred to as deaf). Dynamic range was respectable at 81dB with a third order intercept point at 10.5, better than expected for a valve receiver with an r.f. stage. Second order intercept using signals of 6.5MHz and 7MHz was +86dBm with a dynamic range of 109dB. Once again, chant "proper preselection produces perfect performance". **Fig. 4** shows the preselector passband centred on 900kHz, and **Fig. 5** centred on 13.5MHz where I do the second order measurements.



Phase noise was abysmal, much to my surprise, with figures for the reciprocal mixing ratio as low as 84dB even at wanted/unwanted spacings of 100kHz. This clearly needed investigation and since the RA-17 uses a version of the Collins conversion system but with the drift cancelling loop replacing the Collins crystal controlled first conversion oscillator, it was to the loop that I turned. I looked at the spectral purity and was surprised to find that the MHz oscillator was leaping around with frequency excursions up to 10kHz from the nominal frequency. **Fig. 6** shows the oscillator spectrum during a relatively quiet spell, whilst **Fig. 7** shows a more typical condition. The noise level is quite evident, and I think that this is probably the source of the extremely poor phase noise performance of the receiver. Compare these results with spectral purity of other receivers I have tested and you can judge for yourself how bad the situation is. The fact that this frequency jumping did not show up during normal listening is a tribute to the cleverness of the Wadley drift cancelling design, because the loop treated the rapid random excursions as drift and the system cancelled them out, so the listener cant even tell the loop is leaping around like a mad thing apart that is from the poor phase noise performance of the receiver.

Fig. 7: The spectrum with more typical conditions.



Typical Example?

Don't misunderstand me; I'm not saying that this performance is typical of your average RA-17; in fact I would guess that the MHz oscillator has a faulty component in there which is causing the instability. But what I am definitely saying is that the typical purchaser of a second-hand 40 year old RA-17 would never know that it was faulty in this way, which is a very unhappy situation indeed, and makes me think that perhaps Collins with a bank of crystal oscillators made a better job of their design.

One other comment about the RA-17 is that those of you (and I've heard it with my own ears more than once) who believe that the RA-17 cannot drift because it uses a drift cancelling loop are whistling in the wind. The drift cancelling loop only produces the conversion oscillator frequencies to convert the h.f. spectrum down to a tuneable i.f. (which is in essence a separate receiver) covering the range 2 to 3MHz with a conventional tuneable local oscillator (the kHz dial). If the v.f.o. in this section drifts, then the receiver drifts, so don't expect to switch on an RA-17 from cold, set it to a frequency and expect it to stay there for ever, because it may well not do that, good though it undoubtedly is.

As for my digging inside the second v.f.o. unit; I decided that the job would involve me in considerable labour and resisted the temptation I've had RA-17s apart before and I don't have the time to tackle the work involved.

At the risk of upsetting the many RA-17 enthusiasts out there, I ended the session with a distinct feeling that given the choice between an RA-17 and an AR88D I would probably choose the AR88D. Perhaps with a later RA-117E coupled to an RA-98D I would find happiness, but if Racal really designed their receiver as a substitute for the Collins 51-J series, and despite the truly elegant work of Trevor Wadley, I still think that Collins were ahead. This is one receiver which for me didn't have the indefinable magic something which would make it A Classic. Sorry folks.

My thanks to Alan Singleton for the loan of his RA-17L, and to Michael O'Beirne for his willingness to pass on useful information about aspects of the RA-17 of which I was not aware. Thanks too, to all the owners of RA-17 series receivers who will no doubt let me know in no uncertain manner of their feelings about my less than enthusiastic overview of their pride and joy. ***SWM***

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We wish a Happy Christmas and Preposterous New Year to all our listeners.

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Satellite Reception - Two Years On

Roger Bunney brings us another 'Satellite TV Special'.

The first satellite TV special featured in this very learned publication two years ago - the December 1998 issue in fact. It's now December 2000 and I'm two years older (and feel it), none the wiser, still slogging at the daily toil and certainly none the richer!

Folk write in and ask "I'm a reader and can you tell me how do I start satellite reception?" and I usually reply that to cover this subject I'd have to write a book, I haven't the time, but suggest contacting our good friends in the *SWM* Book Store who will happily relieve you of your hard earned money if you ask for the *Satellite Television Installation Guide* by John Breeds and also the December 1998 back issue of *SWM*.

I will also suggest you beg, borrow or even buy a copy of the NTL publication *MPEG - Digital Television For All*, another publication from the John Breeds stable - Swift Television Publications - ring him on (01793) 750620. Unfortunately, these are all very specialist books and the low print number means that they're not on sale in Asda stores at knock down Jilly Cooper paperback prices.

My second job in the very early 60s was mending 405-line TVs - with valves - and went into television programme making thereafter. I found the understanding of MPEG compression, things like 'predictive and interpolative temporal coding' and 'bidirectionally interpolated motion prediction' rather too heavy for me! But modern man brought up on *DOS* and Zip Disks will grasp compression techniques with ease.

All You Need To Know

I spoke with our respected Editor Kevin Nice and apparently back copies of *SWM* December 1998 issue are still available. This particular edition included the first ever 'Satellite TV Special' and contains all you really need to know about the basics of satellites, equipment acquisition and use. I would recommend that newcomers, or those contemplating taking satellite reception up as a hobby, should read over the articles in that issue - and perhaps even the December 1999 *SWM*, the scene of the second 'Satellite TV Special' supplement.

I personally feel that repeating - albeit rewritten - the same information a couple of years on isn't fair on established readers as very little in fact has changed. Perhaps if a 'Satellite TV Special' is required end of 2001 we can consider a rewrite and update.

The main change over the last two years has been the almost universal move of TV links from analogue to digital and it's a very rare sighting these days to actually find OB and news feeds in analogue. I was fortunate a few months back to notice a Serbian satellite analogue feed via their perhaps only remaining sat uplink truck - this an open-air memorial/military service in a mountain village.

The answer therefore is to go digital, the pictures within this 'Special' will show that quite dramatic reception is easily obtained using small dishes, basic equipment and patience - there's no need for a Jodrell Bank dish towering over your end terrace house to achieve exciting satellite reception!

How To Satellite DX

A few years ago, the 'how to monitor DX' query would have been a relatively simple task once having grasped the basics of the receiving system. Now says Roger, "we must consider analogue and digital reception, and decide whether our interest lies in seeking out distant TV programmes or in the more elusive outside broadcast and news feeds".

If it's broadcast reception and the challenge of finding unusual broadcast programmes you're interested in, then you really need to consider both analogue and digital receivers, though the latter is rapidly taking over from analogue. Digital compression means that in the space of a single analogue channel bandwidth you can squeeze perhaps eight digital programme channels plus an assortment of radio channels.

Take for example a reader that is very interested in the Arab world. An analogue receiver will provide several Arabic channels via *Eutelsat W2* @ 16°E plus many more on *Arabsat 3A* in the 26°E slot. A digital receiver will offer Arabic programme bouquets (or packages) both via the *Hot Bird* slot @ 13°E and on *Arabsat* 26°E.

To narrow the field down more, you could watch Yemen or Oman TV, or perhaps six channels of Lebanese TV on a discrete 1m dish mounted at ground level. More digital Arabic programming for example may be found on the *NileSat* slot @ 7°W. Most European countries are represented

somewhere across the Clarke Belt in digital.

A large number of channels are still presented in analogue, though again the transition is to digital - minimal bandwidth means minimal leasing charges from *Eutelsat*. You want to learn French - an 800mm dish propped up against the kitchen wall aimed at *Telecom 2B/D* @ 5°W will (currently) give you seven French national network programmes.

To maximise your channel catchment profile, you will need a dish that tracks across the Clarke Belt, certainly between about 30°E to 30°W. Specific interests such as French, Italian or Arabic for example can be achieved on a basic fixed dish. A tracking dish DXing option is perhaps akin to short wave listening if you're exploring the wealth of TV programmes from many parts of the world.

Analogue & Digital

So, we need to access both analogue and digital signals. Many receivers now are integrated analogue and digital units, others are stand-alone digital or analogue. Receivers can also incorporate a positioner for dish tracking. The output from a receiver is usually via an r.f. modulator, i.e. it comes out as a u.h.f. channel to connect with your TV antenna socket or it can be transferred via the SCART socket.

Obviously a combined analogue/digital unit will have just the single u.h.f. and SCART out for the receiver, but if the option is to use individual analogue and digital receivers into a single TV receiver, then you'll need a change-over switch to select either r.f. (u.h.f.) satellite receiver output or the simpler option is to feed the analogue receiver output into the TV antenna socket and the digital receiver output via SCART, simply switching the TV set to 'TV' or 'video in'.

Many digital satellite receivers accept a single satellite signal via the F-type input socket at the rear and include a second F-type socket as an 'i.f. out' to feed a second (analogue) receiver. If your eventual digital receiver doesn't feature a second i.f. output, then it's simple enough to find an active splitter to provide two parallel LNB i.f. signals for each receiver.

It is important however, to remember that modern receivers provide switching signals and voltages to control the LNB such as DiSEqc and its variants, band switching, polarity control and skew, etc. up the coaxial downfeeder, so if separate receivers are used, one must be the master (provides all control options) and the other receiver becomes the 'mute' slave.

Best Source

The market place is wide and diverse and the best source for equipment advertisements is *What Satellite TV*, a monthly magazine from WV Publications. The analogue receiver selected should feature the ability to (fast) scan the whole i.f. LNB input spectrum and manual tuning scan with your finger on the remote, variable audio parameters plus subcarrier tuning, threshold extension (TE) down to about 3-4dB, switchable bandwidths say 27/18MHz and at least 500 memories.

Preset menus must include LNB voltage on and off - it's very important that in scan or tune that you actually see shash (or snow) on the screen, some receivers when the strong signal disappears instantly provides a blank (blue) screen - you will be seeking both strong and weak signals. Most receivers will offer only Ku-band, but a few will offer both C and Ku-band.

C-Band however, will require as a very minimum a 1.5m dish plus LNB, which will in turn require a larger garden and more outlay. C-Band is the real DX band, but needs much more equipment commitment.

What's Available

There are a mass of digital receivers available but only a few are really OK for 'DXing'. Broadcast signal reception tends to have much higher Symbol Rates (SR) commonly 27500 with FEC @ 3/4. But there are variations.

Dubai Business channel on *NileSat* comes up at 11.882GHz-H with SR 27500+3/4, on *NSS-K* the same channel appears at 11.928GHz-H @ SR 20000+3/4. So we need a receiver with both variable SR and FEC. The more flexible receivers therefore will offer an SR tuning range between 1-45Ms/s, though 2-30Ms/s will cover most options.

FEC (Forward Error Correction) ranges must include 1/2, 2/3, 3/4, 5/6, 7/8 though current equipment often has auto select on signal acquisition. There are many variables and unless an up-to-date receiver list is in use, the DXer really must use equipment that you merely tune to a frequency and put the receiver into an auto mode for the digital parameters to be found automatically and downloaded into your receiver. As for broadcast TV zappers, you will undoubtedly need a memory capacity exceeding 1000 as the number of broadcast channels is vast.

Roy Carman's feature entitled 'Musings Of A Digital Sat-Zapper' on page 23 gives an awareness of digital receivers and how to tune the beasts. My own method is to use a scanning Manhattan receiver model LT-6300 plus Mk2 - this was a bottom range analogue receiver with most of what you need to sat-DX, it lacks switchable bandwidths.

Move the dish to a known satellite slot. Display the receiver output on a TV set, the screen is full of shash. Then scan up and off it tunes, stopping on signals either visible as an analogue picture/channel or on shash. The receiver stops scanning because 'something' is there. If it's not an analogue picture, it may be data or a digital picture. That frequency is then tapped into the digital receiver which in turn tunes itself to roughly the input frequency. If it's a digital MPEG-2 TV signal, bells ring, lights flash and the signal downloads into the digital receiver memory.

Analogue tuning is in effect the first part of the digital search as the previous paragraph. Weak signals can be enhanced by reducing the i.f. bandwidth and/or progressively advancing threshold extension. Audio subcarrier tuning will be required though the 6.60MHz is a very common option. Often regional radio channels are found on other audio subcarriers.

I'm not involved in the TV or satellite trade and therefore wish to avoid recommending specific receivers - hopefully guidance can be sought from the experiences detailed in this supplement!

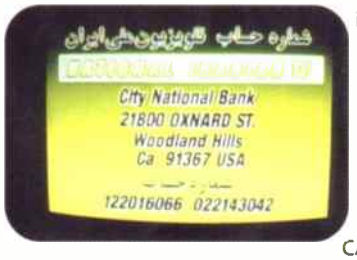
Where To Look

Where to look for channel information...*What Satellite TV* has both analogue and digital programme channels listings, but press time means that these lists are often dated. *Tele-Satellite International*, a bi-monthly priced at £2.90, includes both a CD-ROM and booklet listings for programmes - this is a subscription magazine in the UK.

Stefan Hagedorn's *Transponder News* Internet newsletter (free) appears perhaps two to three times weekly, including both broadcast and OB feeds with a few news items in both German and English language sections. There are several other Internet news sources covering satellite channel activity.

Channels are either FTA - free to air - or encrypted. Encryption means that you pay a subscription fee up-front for you to be switched on. For example BSKYB used Videocrypt for their analogue services and a dedicated smart card is provided which BSKYB's subscriber centre can switch on and off via the satellite downlink.

Until recently, many of the Scandinavian D2MAC hard core channels were available, but new piracy laws have made the sale of both equipment and cards illegal. It's common to find digital receivers on sale for either FTA reception only or fitted with CI - Common Interface - slots. The common interface slot enables the slotting in of a CAM - Conditional Access Module - which is in effect a decoder unit.



With no CAMS plugged into the CIs, the receiver will act FTA. The 'Echostar AD-3000IP Viaccess' receiver is fitted with two CI slots and already has 'embedded' Viaccess within the receiver's electronics, this is a commonly used encryption system and incorporation of this standard saves the cost of a CAM. All that would be needed for any Viaccess encrypted transmission is the authorised smart card in the Viaccess slot.

BSKYB receivers are dedicated only to BSKYB transmissions at 28°E with fixed digital parameters (Videoguard encryption, SR 27500; FEC 2/3) and are unsuitable for use on other satellites. The suggested listings will indicate the many broadcast channels available and where to look for these transmissions.

Majority Content

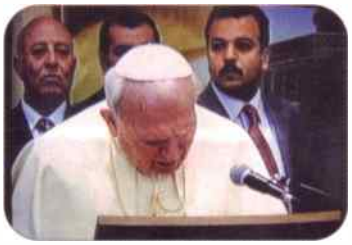
Regular followers of my 'Satellite TV News' column will know that the majority content covers news feeds, outside broadcast and 'wild feeds' seen on numerous satellites though are neither regular or timetabled. They appear at random, often on differing frequencies on following days. An increasing number are encrypted or use NDS encoding requiring six to eight key numbers to unlock the signal.

The NDS system is therefore impossible to crack at this time with equipment that the average enthusiast uses. The EBU on its many leased circuit on *Eutelsat W3* @ 7°E have opted into an improved version of MPEG-2 known as MPEG 4:2:2 - this features a higher sampling rate for video content, but renders the signals invisible on the basic MPEG-2 receiver that we hobbyists use, (commercial rumours suggest that a Korean firm is assessing the introduction of a 4:2:2 receiver, the cheapest 4:2:2 receiver currently is the Alteai around £K2 - no this isn't Altai!).

When & Where

When and where to look for OB (outside broadcast) feeds, news inserts and interviews, news exchanges lease is a technique and knowledge that tends to come with experience. If it's breaking news in Moscow - as so often in recent weeks - then the horizontal slot on *2F3* @ 21.5°E is a good place to start (previously at 36°E), up will come the service ident saying 'RTV Moscow 4' (Reuters) or something like that. This carries feeds for both BBC, ITV and any other customer that will buy time over this uplink.

If it's a major story then video footage will probably appear on *NSS-K* @ 21.5°W routing into the 'States - the service ident will probably say 'Reuters Moscow 1', etc. Both *Eutelsat's 2F4* @ 10°E and *W2* @ 16°E are candidates for almost anything from Europe and the nearer Middle East, be it sport or news. With *Europe*Sat* opening up at 45°E this too will be a good hunting ground for Middle East/SE Asian material.



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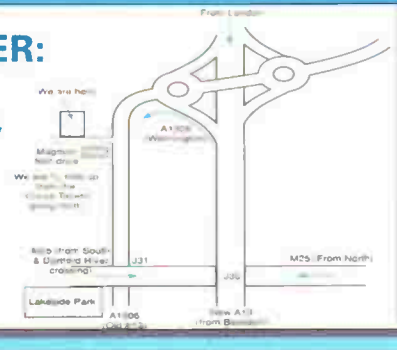

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...continued from page 18

The BBC and French TV often make use of *Telecom 2C* @ 3°E and *Telecom 2B* @ 5°W for both news and sport - check out 12.500-12.650GHz. BBC regional SNG services also make use of the 3°E slot. It's worth checking around 1800-1900 when evening news magazines programmes are including live inserts.

Intelsat 705 @ 18°W is a sadly neglected bird, though in the past has carried many Italian circuits such as sport, entertainment and religious output - sometimes I have seen up to four feeds simultaneously from this slot. The test pattern usually carries an inlaid ID on colour bars such as 'ITA-3 ROMA'.

My favourite satellite is *NSS-K*, formally known as *Intelsat K* until part privatisation a year or so back. Signal levels on this satellite are usually strong and a 900mm dish should have little problem in locking up its wide and varied menu of sports, news and close circuit feeds. If you're into golf, then the Globecast package of three channels - 12.590GHz-V, SR 20145; FEC 3/4 is a good starting point as many PGA tournaments are carried over this frequency.

All the main North American motor racing circuits, the *Indy 500* and *Daytonna* appear and usually in the clear since they are often 'dirty' - that is they carry both commentary for the American network, e.g. ABC with FX and a separate FX track without commentary for other broadcasters such as BSKYB Sports that might want to use the programming and insert their own 'pure English' commentary. The 'dirty' feeds will often include commercials, or give timed gaps with random shots, conversation from the trackside commentators whilst the commercials are inserted by ABC presentation control.

Corporate Traffic

Eastbound corporate traffic sometimes is carried such as computer get-togethers from IBM USA to their European colleagues with 2-way Q and A sessions. News from the USA is often seen and Bill Clinton White House press calls are always found as are NASA output for their space/Shuttle missions. *Intelsat 801* @ 31.5°W is a usual spot for any European sports that is being fed back into the UK - particularly ITV. This bird also has found favour with certain regional ITV stations for their live news reports, e.g. Meridian.

These are the main spots to first check out, remember that there are now a mass of satellites across our sky and news feeds can appear almost anywhere, even *Hot Bird* carries APTN feeds from time to time. The 'Atlantic Gate' 12.5°W slot now operated by *Eutelsat* is slowly gaining commercial interest as is the nearby *Telstar 12* slot at 15°W.

Telstar 11/Orion @ 37.5°W is an often overlooked bird, it carries a mix of programming, Channel 5 distribution programme feeds, the Lottery data circuits, BFBS programming 11.561GHz-V, so if you want to know what BFBS Gibraltar, Bosnia or even Nepal, check it out here.

PanAmSat have two slots at 43° and 45°W (PAS3R/6 and the aged *PAS-1* respectively) which come to life with news and sports from time to time. The PAS birds spend much of their life spot beaming into the Americas though they all have Euro illumination.

Usually Encrypted

Unfortunately, certain of the SNG downlinks are usually encrypted, such as the SISLink horse racing feeds from around the UK. SIS use their racecourse coverage both for Turf Accountant coverage and for BSKYB 'The Racing Channel' and understandably they don't want their expensively acquired material watched for free! *Intelsat 605* @ 27.5°W is used for the SIS feed into the bookies, you'll see a dedicated 900mm or so dish on the roof or wall of these premises for the SIS downlink channel.

The sky is alive with signals in Ku-band arriving from all directions and I have only just scratched the surface with the above information. If you have a 1m dish, you're in business for a sat-zapping and 'DXing' career. It's strange after perhaps 35 years of terrestrial DXing struggling for the weakest of distant signals, I can use a 1.2m dish on a five foot post in the garden and receive perfect pictures from TV5 Thailand!

Musings Of A Digital Sat-Zapper

When the Editor asked me to prepare another *SWM* 'Satellite TV Special' I thought that perhaps Roy Carman, a widely experienced digital satellite DXer, could offer us his wisdom and experience in an article on the general topic of 'Digital Satellite TV Reception' within the DXing environment. What follows however is a tale of patience plus frustration, the former at having to adopt inconvenient and slow methods of receiver tuning when the technology is already there to design a hi-tech highly efficient and rapid method of displaying digital signals. Equipment manufacturers are named, though the frustration experienced in dealing with certain technically incompetent sales outlets over several years isn't detailed! Take it away Roy...

Gone are the heady days of simple analogue satellite DXing - well nearly anyway. Most of the world's news gathering for television is now delivered to news studios by digital satellite news gathering mobiles (DSNG).

Struggling on with analogue, I was foolishly awaiting the perfect DXing digital receiver, it never came and has yet to appear!

Looking around the market place, Nokia was setting the pace, or so we were told. However I found their memory capability somewhat restricting. One sweep of *Hotbird* or *Astra* would swamp them. The early Nokias however had one thing going for them. The capability of auto detect symbol rate, a critical function for the avid DXer.

So what did I do? I foolishly purchased a Praxis 9800 AD+P as my first digital receiver (AD+P = analogue digital and positioner). This had auto forward error correction (FEC) but not auto symbol rate (SR).

Whilst searching analogue, using an Echostar LT-8700, I discovered that when passing a digital signal, the screen darkened, the menu data glowed whiter and the signal level rose. Checking these signals with published frequency tables confirmed my findings. The 'found frequency' was transferred to the Praxis along with the polarity. The FEC set to 'auto' and I then entered the well known SR valves 5632, 6111, 22000, 27500, etc.

This method was haphazard, time consuming and downright unsuccessful. However, the exercise proved one thing, the Praxis 9800 was not up to the job, plus it also suffered many software problems making tuning operations difficult. The one plus point it had was a large digital memory and an inbuilt positioner unlike other digital receivers at that time. I am pleased to say the Praxis receivers are now greatly improved.

Discovering Digital

I had now reached the stage where I could detect a frequency and a method - however *ad hoc* - of discovering digital feeds. Automatic detection of SR had become a must. I considered the then new Nokia 9800, only to discover that it was a 'dreadful receiver'. I passed my observations onto Nokia only to find their reaction to be somewhat indifferent to say the least. The receiver was returned from whence it came - rapidly!

'Dr. Overflow' had by this time surfaced and I noticed that the Nokia 9600 had been fitted with a 'Dr. Overflow' program included and a modified 9600 was duly purchased. As I excitedly set the receiver up, I discovered that Nokia had 'pulled the plug' on the DXing world by fitting cheaper tuners of Latvian manufacture that didn't permit auto SR detection. As I had specifically requested 'auto SR', the dealer was contacted - he was one of the very few good dealers around and it was soon replaced with a British made RSD ODM-300.

Easy To Use

The RSD ODM-300 is a relatively simple receiver to use. Installation is easy but you will require an outboard dish positioner, there's not one included on the model 300. But yes, the ODM-300 has both auto symbol rate and auto FEC, I could now check any MPEG2 4:2:0 signal that was found. The RSD however does have a problem, that being of a poor threshold.

I was trawling the satellite bands one day with an old BT SVS-300 analogue receiver and found that during it's 'auto search' it would stop - not only at analogue channels, but on other signal 'activity' be it data or MPEG digital signals. I had thus by accident found another means of finding occupied frequencies.

From that discovery I soon developed a three receiver DXing plan: a) search out a working

digital frequency using either the Echostar LT 8700 or the BT SVS-300; b) having found what is presumed a working digital frequency enter that data into the RSD ODM-300 to search out the symbol rate (SR) and forward error correction (FEC). The RSD will also give the feed title (service ident), all relevant PIDS (programme ident including both audio and video PIDs) and if the received signal is 'encrypted' or 'free to air'. If the former RSD ODM-300, the receiver will instruct you to 'INSERT CAM' (conditional access module).

The ODM-300 channel listing is somewhat irksome, it will sort into satellite order but does not delineate by satellite when switching through the channels - many digital receivers suffer the same infuriating problem. So to simplify things I used the Praxis as a library for ease of finding channels/feeds. Since those early days things have changed **but** there is still no sign of the perfect DXing digital satellite receiver.

My Installation

At this point it might be helpful to describe my own fairly modest home installation which has evolved over the last couple of years.

In the garden is a FIBO 1.2m Gregorian dish with a Genesis twin universal LNB. The Gregorian dish resembles an offset dish in appearance, but has a small secondary reflector on the LNB support arm. One LNB output feeds into the excellent Echostar AD3000 IP - don't you believe all you read in other magazines, this is a truly magnificent receiver!

The other LNB output goes into an RSD ODM-302, a slightly improved version of the 300 version. The loop through on the 302 is then connected to the 'B' antenna input on the Echostar LT-8700 analogue receiver. Using the Echostar 3000 with its internal positioner to track the dish, the 8700 is used to find a prospective signal feed frequency on the satellite selected. This information is keyed into the RSD 302. If a digital signal is found the parameters are then displayed from the 302 which is then 'libraried' into the Echostar 3000 thus completing the signal acquisition loop.

The Echostar AD 3000 IP - although I am sure not intended by the manufacturers - has what can only be termed as a beneficial quirk that is very useful to the DXer. Whilst searching through 'libraried' channels I noticed the upper signal bar 'twitch' on some 'non working channels'. I fed the frequency and polarity data into the 302 and discovered a channel working on the frequency, but with different digital parameters. Often the twitching is caused by a channel working nearby, say ±8MHz of the given frequency.

A classic example is 12.530GHz horizontal on *Telecom 2c*. Through the 'twitch' display the following active frequencies have been found by transferring the 'twitch' data to the RSD 302.

Nominal input @ 12.530GHz-H. SR and FEC respectively: 5632+3/4; 5700+3/4; 5804+3/4; 6111+3/4; 6148+7/8; 6289+7/8. I have also found it worth checking vertical polarisation at this time which produced: 12.530GHz-V. SR and FEC respectively were found at the following data rates: 5429+3/4; 6289+7/8; 6945+3/4; 10000+7/8.

All the above courtesy of a twitching Echostar 3000 and an RSD ODM-302!

DX Trick

Another DXing trick used is to find out the old analogue transponders on the various satellites. Insert them into your chosen analogue search receiver and depending upon the receiver either a signal level bar or numerical signal level is usually displayed.

If the signal level is 'high' on the transponder and there isn't an analogue signal present this usually indicates a digital channel working somewhere on the transponder. So using the AUTO SR receiver of your choice, feed in the data namely frequency and polarity - with luck you will have a result. Remember that the analogue transponder frequency is the actual centre of the signal - so if you don't get results using that initial input, work on the principal of it being a 36MHz wide transponder, so it could be home to perhaps six channels digitally - they're in there somewhere.

An example - an analogue transponder frequency of 11.096GHz; minus 18MHz from that giving a start frequency of 11.078GHz and then search every 6MHz upwards to and including 11.114GHz. The digital receiver searches both the input frequency and a range each side for signals. This way the whole 36MHz of the transponder will be searched.

Like Fishing?

Sat DXing is like fishing, sometimes you catch, sometimes you don't. It's that mystery that makes life interesting. DXing is fun, it has kept me sane for the past few years, **but why** do we have to operate in such a cack handed manner?

Why can't a DX receiver be built that searches for a working frequency and downloads everything automatically? I left the army some 16 years ago, even then long before I departed, any frequency working in the h.f. to u.h.f. spectrum could be easily detected.

A receiver could be built in either of one of two ways. One that carries out a frequency spectrum search, e.g. 10.700GHz to 12.750GHz. On detecting a working signal this could be passed to the inbuilt receiver for processing into a working channel.

The second method is to build the receiver around a spectrum analyser. The detected frequencies are stored in the receiver's memory for it to work through in due course, processing them into working channels.

Add a timer to the two methods above and you could DX whilst you are away from home!

A receiver that plods through the frequency band stopping every 6MHz to check through every SR and FEC is totally pointless as well as time consuming. Successful DXing is about being in the right place at the right time.

I have tried most of the so-called advanced receivers and **none, not one of them does the job properly**, and satellite magazines, please stop saying a receiver is DX friendly, when it doesn't have an auto SR installed.

Receiver manufacturers please take note. Until the perfect receiver arrives we'll have to make do and mend...Good DXing.

Looking Into The LNB

Roger Bunney guides us through the important issue surrounding the choice of the all important 'sharp end' of the SAT DX system.

The LNB - Low Noise Block Downconverter - is that chunk of electronics mounted at the focal point of the dish. It amplifies and downconverts the weak incoming satellite signals within the 10.7-12.8GHz band to an easier to manage lower i.f. typically around 950-2250MHz, sending the converted signals down the coaxial cable to the satellite receiver.

The LNB-F will also be encountered frequently, these are the LNBs fitted on Sky and/or *Hot Bird* dishes that incorporate both the LNB electronics plus an integrated polariser (for switching vertical and horizontal polarisation) and attached feedhorn. The LNB-F is fine for fixed dish reception since it can be physically optimised for vertical/horizontal reception, but used on a tracking dish has no capacity for polarity skewing - that is fine tuning for maximum smoke on weak signals.

The LNB-F is switched from vertical polarisation to horizontal polarisation by switching the supply voltage from 13V (vertical) to 18V (horizontal). An internal voltage stabiliser within the LNB circuitry ensures that its d.c. supply remains stable.

Stand-Alone LNBs

The more upmarket satellite tracking systems however use a stand-alone LNB and are fitted with a quality polariser between the input flange of the LNB and the output flange of the feed horn. Polarity switching between vertical and horizontal plus skew control is then achieved via a 2-wire (magnetic) or 3-wire (mechanical) control wire from the receiver.

The convenience of magnetic has overtaken mechanical polarisers and only very specialised systems have mechanical systems currently - the mechanical system however maintains a linear response across the whole Ku-band and the bonus of a throughput lower insertion loss than the magnetic type.

Ku-band satellite signals with the single band LNB didn't last long at 10.95-11.70GHz, there was expansion into the *Telecom* band of 12.50-12.80GHz, the BSS-Ku-band of 11.70-12.20MHz also hit the headlines and soon we were into LNBs with coverage of 10.95-12.80GHz. *Astra 1D* took the lower end down to 10.70GHz!

So the single-band LNB lost favour and the dual-band switching LNB became the flavour of the month. These LNBs operate simply by switching the supply voltage from 13 to 18V which in turn switches the LNB's oscillator (LO) by 1GHz. The popular LNB LO now is 9.75 switching 10.75GHz, my own LNB is an earlier 10GHz LO Chaparral and this switches 10 to 11GHz. The discussion thus far relates to stand alone LNBs plus an external polariser and feed system.

The LNB-F however already is using the 13/18V switching for polarity control (V/H) to achieve band switching a control tone at 22kHz (approx. level 600mV) is sent up the coaxial feeder from the receiver to switch the LNBs local osillator and hence band coverage. The Essex firm 'Global' actually make a manually operated, external 22kHz tone insertion unit for receivers without 22kHz capacity on board.

LNB Variations

If you check through equipment advertisements you will see a host of LNB variations which may state any of the following - single-band, dual-band, triple, quad, enhanced and universal plus single and dual/twin outputs. The universal will cover from 10.70-12.80GHz whereas others will cover from 10.95GHz upwards in whole or segments.

Occasionally there will be mention of LNB single - WR75 or C150, this describes the input flange mating to the polariser output flange, WR-75 is rectangular and C150 is circular, you join like with like. If however you have differing flange matings, e.g. a C150 wanting to bolt to a WR-75, then a quarter wave matching flange - to convert rectangular to circular - can be included - known in the business as a 'sweetie'! It's like a very thick washer with a 'rounded rectangular' central waveguide.

Fixed satellite systems became more versatile when it was found that a 900mm dish aligned on the *Hot Bird* slot @ 13°E could also be used with an offset arm mounted LNB for *Astra* @ 19.2°E. Thus we hit the problem of band switching, polarity switching and alternate LNB switching (for the two LNB-Fs) on the single dish mounting arm. *Eutelsat* - that operates the *Hot Bird* slot - came to the rescue with the introduction of DiSEqC. DiSEqC utilised the existing 22kHz tone bursts but added digital data bytes to provide switching functions.

Several Levels

The Eutelsat DiSEqC data system operates at several levels. The basic 'Simple DiSEqC' merely provides for switching between two LNBs, a 12.5m/sec tone burst provides sufficient data bytes to instruct the switch from LNB-a to LNB-b. Then there is a DiSEqC version V1.0 that includes additional data bytes to switch up to four universal LNBs plus providing polarity and oscillator switching control.

Version V2.0 provides both control data byte switching up and receives reverse LNB data down

Continued on page 28...

FIRST IN RADIO

WATERS & STANTON

WE WILL MATCH OR BEAT COMPETITIVE PRICES ON GENUINE UK STOCK.

GPS-12

£99 Plus £7.50 Carr.

Special Offer

- Uses up to 12 satellites for fast acquisition
- 500 waypoints available for storage
- Up to 20 reversible routes can be planned and stored
- 7 grids available including Maidenhead
- 107 map datums including one User Datum
- 15m accuracy with speed to 999knots
- Realtime graphics display
- High contrast LCD
- Fast switch-on acquisition - 15 secs
- Autolocate time (anywhere in world) 5 mins
- Built-in antenna (no external connection)
- Uses 4 x AA cells - life typically 24 hours
- Size 53 x 147 x 31mm* Weight 269g

Limited Stock

MFJ-8100K

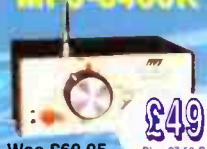
£59 Plus £7.50 Carr.

A complete short wave receiver kit-based on a regenerative design. Our boss G3OJV built one and was amazed at the sensitivity even on a short wire.

- 3.5 - 22MHz
- SSB CW AM
- Runs from PP3 battery
- Slow motion dial
- Dual headphone sockets.
- Just like the old days!

Special Offer!

MFJ-8400K



Was £69.95

£49 Plus £7.50 Carr.

2m FM Receiver kit including cabinet. Everything you need to build this lovely little rcvr.

- Dual conversion
- Ceramic filter
- 144 - 148MHz FM
- Use internal PP3
- External 12V
- 50 Ohm input
- Includes case & knobs etc.

Special Offer!

VR-5000

Arriving Soon

£t.b.a. Plus £7.50 Carr.

Yaesu's exciting new scanner.

- 100kHz - 2599MHz
- FM AM SSB CW
- Real-time band scope
- DSP Noise and notch filters
- 2000 Memories
- Optional digital voice recorder
- Large digital display
- Super HF performance
- Ultra sensitive
- Fully programmable

AR-8600

Arriving Soon

£t.b.a. Plus £7.50 Carr.

AOR's exciting new scanner.

- 500kHz - 2040MHz
- FM AM SSB CW
- 1000 Memories
- 2000 pass frequencies
- 37ch sec scan
- 8.33kHz airband steps
- RS232 PC interface fitted
- 10.7MHz IF for SDU5500
- Accepts up to 5 slot in cards

Scancat

Virtual Receiver

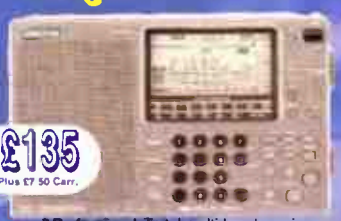
- Unlimited memories
- Logging File
- Spectrum scope
- Personal data base
- 100 scan bands
- Access import
- CTCSS & DCS mode
- Voice recording
- Direct keyboard entry (SE version only)

Adds Features Views Spectrum Creates Logs Keyboard Entry

Scancat Gold	£99.95
Scancat Gold SE	£159.95

Plus £5.00 Carr.

Sangean ATS-909



£135 Plus £7.50 Carr.

- Professional digital multi-band receiver
- 307 memories * Five tuning methods
- ATS - auto scan and preset
- E2 PROM for memories back up
- FM stereo via earphones
- Automatic search strongest signal station
- 8 characters for editing names in display
- SSB (USB/LSB) 40Hz step on fine tuning
- AM RF gain control
- 3 individual timers * Adjustable sleep timer
- Direct 1 button key favorite station recall
- Pre-programmed station name and freq.
- AM wide/narrow filter and FM mono/stereo
- RDS (Radio Data System)
- Size 215 x 133 x 37.5mm
- Weight 850g without batteries

We are pleased to announce the new 2001 UK Radio Communications Equipment guide. Running to over 300 pages, this is Europe's largest guide and catalogue devoted to amateur radio equipment. You'll find over 2000 products described in detail with full colour illustrations and specifications. It's a complex shopping guide to an amazing selection of radio products. There are also some informative articles and the usual selection of tips. And the price remains the same as last year. To order simply phone your credit card number to **08000 73 73 88** or send a cheque for the total amount. **£2.95 plus £1.25 postage.**

AOR-3000A Receiver

100kHz - 2036MHz

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

£749 Plus £7.50 Carr.

Special Offer

30kHz - 30MHz NASA HF-4E Receiver

Computer Compatible FREE Software Disk

SAVE £50

£149 Plus £6.00 Carr.

Was £199.95

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

IC-R75 Receiver

30kHz - 60MHz

ICOM

FREE AC PSU & DSP Unit

£595 Plus £7.50 Carr.

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

YAESU FRG-100 Receiver

50kHz - 30MHz

£389 Plus £7.50 Carr.

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

0kHz - 32MHz AOR-7030 Receiver

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

Phone Plus £7.50 Carr.

Fairhaven RD-60MVX 60kHz - 1.76MHz

Phone Plus £7.50 Carr.

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

COMMUNICATION

www.wspic.com

e-mail: sales@wspic.com

RETAIL MON-SAT 9.00-5.30pm

Fax:01702 205843

Enquiries: 01702 206835

01702 204965

Orders only: 08000 73 73 88

22 Main Rd, Hockley, Essex, SS5 4QS

Yupiteru MVT-9000EU Mk2

100kHz - 1.9GHz

Phone Plus £6.00 Carr.

Latest Mk2 Version

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

Yupiteru MVT-7100EU

100kHz - 1.65GHz

Phone Plus £6.00 Carr.

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

Yupiteru MVT-7000EX

100kHz - 1.3GHz

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

AOR-8200 Series 2

500kHz - 2040MHz

£179 Plus £6.00 Carr.

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

IC-R10E

Phone Plus £6.00 Carr.

£259 Plus £7.50 Carr.

500kHz - 1300MHz

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

IC-R2

500kHz - 1300MHz

£129 Plus £7.50 Carr.

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

VR-500

£199 Plus £7.50 Carr.

This lovely little scanner from Yaesu offers superb performance.

- 100kHz - 1300MHz
- 1000 Memories
- 100 Skip channels 10 Search bands
- 8 Character alphanumeric display
- Band scope Priority monitoring
- PC programmable
- Smart search feature
- Alpha numeric recall
- Size 58 x 95 x 24mm 220g

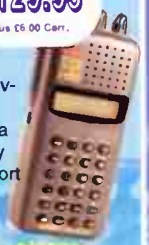
Sangean ATS-818

£119 Plus £6.00 Carr.

- Digital multi-band world receiver
- 150-29999kHz plus 87.5-108MHz
- Five separate tuning methods
- 45 memory presets
- FM stereo via earphones
- Dual time display
- Signal strength indicator
- AM wide/narrow filter
- Adjustable Sleep Timer * Standby function * Adjustable RF Gain
- High/ Low tone control & safety lock switch * Large LCD readout
- BFO (beat frequency oscillator) for SSB and CW
- Size 296 x 192 x 68mm * Weight: 1800g without batteries

UBC - 220XLT HANDHELD SCANNER

£129.95 Plus £6.00 Carr.



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

ICOM PCR-1000

Computer controlled receiver

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

LAPTOP COMPATIBLE

£295 Plus £6.00 Carr.

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

Hoka Gold-3 Decoding Software

OK!!

We are now the UK distributors. As used by governments, it can decode just about any form of data transmission on HF and VHF. Simply connect between PC and Rx audio. Can be loaded on any number of PCs. This is a very advanced programmed. £349.95 Plus £2.00 Carr.

Sangean ATS-818ACS

£139 Plus £6.00 Carr.

- Digital multi-band receiver
- 150-29999kHz, 87.5-108MHz
- Five tuning methods
- 54 memory presets
- FM stereo via earphones
- Dual time display
- Signal strength indicator
- AM wide/narrow filter
- Adjustable Sleep Timer * Standby function * Adjustable RF Gain
- BFO (beat frequency oscillator) for SSB and CW
- Built-in tape recorder, Play, Record, Auto Stop, Normal/CRo2
- Size 296 x 192 x 68mm * Weight: 2000g without batteries

WATSON Capture that Frequency!

10MHz - 9GHz

Hunts down Frequencies

Supplied with telescopic antenna and AC battery charger. If you are within 200 ft or so of the handheld, you should be able to read off the frequency. Note it down and enter it in your scanner. It's that simple and it's pocket sized. £59.95 Plus £5.00 Carr.

FBI - 9 Skin Coloured Earpiece

£9.95 Plus £2.00 Carr.

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

W-LWB MkII Long Wire Balun

Just attach any length of wire and feed back to radio with coax cable. Reduces interference and improves matching to receiver. £22.95 Plus £2.00 Carr.

JM-838WF

Jumbo 12 hour radio locked clock with weather forecaster, barometer, date & time, internal temperature. £49.95 Plus £2.00 Carr.

WWC-411

Jumbo 266mm diam wall clock. 12/24 hours, day date and internal temp C or F £34.95 Plus £2.00 Carr.

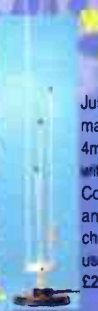
MFJ-125

24 hour quartz clock with smaller day, date and 12 hour sweep dials. Each can be set independently. £34.95 Plus £2.00 Carr.

WS-Desktop

The answer to those who want to improve the scanner performance using an indoor antenna. Covers 25 - 1300MHz and includes coax cable terminated with BNC plug. £49.95 Plus £2.00 Carr.

WS-Mobile Antenna



Just 0.9m high with magnetic base and 4m cable terminated with BNC plug. Covers 25 - 1300MHz and is the ideal choice for scanner users. £24.95 Plus £2.00 Carr.

SWL DX-1 HF Ant.

Covers 1.5 - 30Mhz and is 50m long With 10m feeder wire back to receiver. An ideal general purpose antenna. £25.95 Plus £2.00 Carr.

Global AT-2000

The classic wire antenna tuner for short wave listening. Covering 1.8 - 30MHz, it includes our exclusive Q-switch, which improves front-end selectivity. Just connect a random length of wire and connect a coax cable from ATU back to receiver. £89.95 Plus £3.00 Carr.

High Quality Coax Switch

Select two antennas or feeding two receivers at the flick of a switch. Rated up to 600MHz and almost half the price of competitive models. SO-239 sockets. £12.95 Plus £2.00 Carr.

RB-928 Radio Controlled

A radio controlled clock at a price, only W & S offers! Large display with signal strength indicator 2 programmable alarms and snooze feature. £9.95 Plus £2.00 Carr.

BA-928U Weather Station

Self-contained indicating weather forecast, pressure with 24-hour history (altitude adjustment), indoor and outdoor temperature, moon phases, time, day week, alarm table or wall mount, AA cells included, plus wireless linked remote temp. sensor £79.95 Plus £2.00 Carr.

WS-Base Dipole

The classic antenna covering 25Mhz to 1300MHz. Ideal for all scanners. Height is 1.2m Just connect coax cable to the SO-239 socket. Suitable for indoor or outdoor use £49.95 Plus £2.00 Carr.

QS-300 Desk Stand

Designed for all handheld scanners. Your scanner sits on the adjustable holder and a short BNC cable runs to an SO-239 socket, ready for you to plug your external antenna into. A really smart device. £13.95 Plus £2.00 Carr.

QS-400

The dash mount that enables any handheld to be mounted on the vent grill of your car. £9.95 Plus £2.00 Carr.

...continued from page 25

to the receiver. Additional control data is available for actioning a tracking dish. It follows however, that DiSEqC compatible LNBs must be used for the system to function.

With the move into digital reception the technical press highlights the use of modern LNBs with absolute frequency stability. In my own set-up - and that of fellow enthusiasts - most quality LNBs over the past five years previously used for analogue reception are perfectly OK in the digital domain, for example my own Chaparral LNB that works perfectly well on digital signals. Phase noise is a noise generated by the LNB's oscillator which can cause problems if excessive noise mixes with the incoming digital signal during downconversion causing a degradation of the BER - Bit Error Rate.

Weather Protection

It is very important to protect the LNB package out on the dish from the elements, remember that the LNB will be exposed to frost, snow, hail, rain, heat and the focused solar energy at the occurence of the Equinoxes. I provide full weather protection with a simple yet effective slide over cover made from a cheap washing up detergent bottle, cutting off the spout end and carefully slitting the plastic tube underneath with a hole for the coaxial cable to exit downwards. The LNB is therefore dry and protected and after nearly six years looks like new - as several spiders resident there-in can testify.

The plastic will become brittle after a couple of years due to weather and UV exposure so a summertime task is to replace the LNB protective cover - and check the LNB/polariser connections at the same time. The gain of a quality LNB should be relatively flat over the band with no abrupt gain swings, typical overall gain figures should reflect about 55-60dB and noise levels at 0.8dB or lower. The quality LNB will always be checked individually for gain and noise, a performance chart or other table duly signed will be included.

Has To Match

When buying a dish and LNB system it is very important to ensure that the feed system 'matches' the dish into which it is pointing, an LNB feed horn for an offset dish will provide less than wonderful performance if fitted to a prime focus dish, even a feed horn, e.g. scalar rings intended for prime focus dishes must be matched, this may very according to the type of prime focus (parabolic) dish, differing between a deep and shallow profile.

The feed needs to illuminate (look into) the dish and not under illuminate - that is not see all of the reflective surface - nor look past the edges of the dish as efficiency will fall. Make sure that there is a ventilated plastic cap over the feed tube aperture to let the signals in but keep the spiders out, if open, spiders always know and soon there will be an occupant clagging up the tube with sticky web, a very difficult task to keep clear. Spiders produce high signal attenuation.

Your dealer will advise and it is very important that an experienced satellite dealer (or installer that deals with tracking systems) is consulted, the Sky 'Mini-dish' installer is unlikely to provide gainful experience with the installation of a tracking dish.

Hopefully these notes will guide the satellite user into a greater awareness of what happens out there on the dish - it is the most important part of the whole satellite receiving system!

This is C

John Locker has one 'ell of a time with

Cast your mind back to the September 2000 issue of *SWM* and the excellent article by the Editor entitled 'Receiving Inmarsat'. In that piece, Kevin introduced us to the principle of receiving signals from the four bird geostationary Inmarsat fleet and explained the transmission modes.

Using purpose-built equipment from Timestep, it was demonstrated how easy it was to lock onto L-band transmissions. Coincidentally, during early summer I was carrying out similar experiments, again with a Timestep kit.

Reception from the Inmarsat *AOR-E* bird was excellent using the standard helical antenna, beefed up by the high gain, low noise pre-amp. However, I decided that it would be an interesting exercise to mount the equipment at the focal point of a satellite TV dish to see what else could be achieved.

Fig. 1: NASA briefings are relayed via Inmarsat AOR-E.

Obviously, placing a metre long helical at the front-end of a prime focus dish just wasn't practical, so I turned my attention to an old surplus dipole, which had been cut to 2.4GHz. Hmmm I thought...I wonder?

The Timestep pre-amp is conveniently designed with N-type connector at the antenna input, perfect for the dipole, which was quickly and easily attached. Next step was to position the unit on the dish.

I use a 1.8m prime focus antenna for Ku and C-band work. This utilises a co-rotor for polarity control, which is quite a big chunk of metalwork at the focus of the dish.

To minimise shadow effect, the pre-amp/dipole arrangement was strapped to the side of the co-rotor, giving me an offset of about 6°. Initially the dipole was simply pointed towards the centre of the dish, and the antenna positioned at 21.5°W, that's 6° off from Inmarsat at 15.5°W.

Next the connections were made to the 2GHz receiver. Here to cut costs I used the small but very efficient Yupiteru MVT-9000. Now, a lot has been said about using this type of scanner for microwave reception, little of it complimentary. However, any doubts seem to be unfounded, as again, reception from Inmarsat was spot on, requiring very little tweeking of the dipole antenna, in focal length and skew.

Fig. 2: Inside the Afstar pod.

You may be asking, with the demise of the Inmarsat re-broadcast of AFN, why bother? You may also wonder why I set the system up with a 6° offset. This, as they say, is where the plan comes together! It's a little known fact that NASA use Inmarsat *AOR-E* for a communications net during shuttle missions, especially the launch campaign.

In the days prior to lift-off the links between the down range landing sites, in Europe and North Africa, are tested, and occasionally, crew briefings are also transmitted, for the benefit of overseas team members. Then, about an hour before launch, the downrange team come on frequency to exchange weather and mission status details. This link remains until the shuttle reaches orbit .

One 'L' Of A Dish!

a dish or two. He reveals just what can be achieved in practice with a bit of ingenuity.

At the same time, more often than not, NASA TV is relayed live via the Atlantic TV satellite *NSS-K* (21.5°W) in digital format. So, with the Inmarsat receiving equipment strapped to the dish, not only is it possible to receive incoming live pictures of the launch, but also to monitor the banter between KSC (Kennedy Space Centre) and the downrange launch team.

There are no pre-determined frequencies for these broadcasts, they can pop up anywhere within the Inmarsat range, 1.535 - 1.545GHz. Consequently, when a launch is in progress, it's well worth checking the Inmarsat band for NASA transmissions!

But Wait, There's More!

I mentioned earlier that I use C-band receiving equipment. A quick look at Kevin's September article will reveal that Inmarsat has a C-band allocation for ship to shore transmissions.

Whilst general recommendations are that a dish of 2.5m or above is needed to resolve these broadcasts, in practice, this is not so. I found that if I directed the dish to 15.5°W, and by using a power pass filter, took the signal from the C-band LNB into the antenna of the scanner, I could, by tuning the 1.53 - 1.54GHz range, receive the C-band audio transmissions.

Not only that, but by placing the dish around 18°W, I could get both L-band transmissions from the dipole and C-band from the LNB. Consequently, by utilising the dual v.f.o. facility on the MVT-9000 is was possible to monitor both sides of the transmission, provided I quickly scanned both inputs to home in on the two sides of the broadcast!

Fig. 3: Afstar pod with AA cell for scale.

Fig. 4: Timestep pre-amp and dipole mounted on small mesh dish.

But That's Not All

Having placed the pre-amp dipole affair on the dish, and attained such excellent results on Inmarsat, it seemed a shame not to check the rest of the arc for other transmissions. Of course, if you can see 54°W and/or 64.5°E, then using this technique you should be able to pinpoint the *AOR-W* and *IOR-E* Inmarsat birds. Because of my location, I can't do that, so I turned my attention to Meteosat.

METEOSAT-7 is positioned in geosationary orbit at South. Monitoring the Meteosat birds is regularly covered in Lawrence Harris's column 'Info In Orbit' and you'll see that the main downlink frequency from *METEOSAT-7* is 1.691GHz. As this was well outside the range of the Inmarsat pre-amp I didn't really expect to hear much from the weather satellite. All the same it was worth a try. So taking into account the 6° offset, the dish was positioned so that the dipole would receive from south.

Cautiously I dialled in 1.691GHz on the MVT-9000 having first turned the dipole array through 90° to change polarity. To my surprise the chunk, chunk of the weather FAX signal came booming in!

Normally, WXSAT enthusiasts will use a down converter to reduce this signal to the 137MHz band for use with specially filtered receivers, but I decided to take the transmission at source and see what could be done.

By downloading an excellent software programme, *WXSat*, from the Internet, it took just minutes to bring up my first image from *METEOSAT-7*. WXSat uses the soundcard of your PC to process the signal, no interface is needed. The sound source is simply taken from the receiver/scanner audio out to 'line in' on your sound card.

Despite the lack of filtering on the MVT-9000 I was astounded by the quality of the images I received. All this from a standard satellite TV dish, and of course I could continue watching TV transmissions as usual!

Further experimentation revealed that even a much smaller 800mm mesh offset dish gave acceptable, if slightly noisy, images from *METEOSAT-7* using the pre-amp/dipole unit, especially if a small backplate was fitted. In addition, to protect the dipole from rain fade, it was encased in a primitive cover made from part of a lemonade bottle, and the top off a sweet container, in true *Blue Peter* style!

Fig. 5: *METEOSAT-7* image captured using pre-amp and dipole on 1.8m dish shows ship trails off Africa.

Enter The Pod!

The key to all this is of course is using a high quality pre-amp and suitable antenna. The Timestep unit is great, but expensive. An alternative for readers wishing to try a bit of d.i.y. is the Afstar Pod antenna.

Designed to be mounted on the deck of a vessel this strange looking component, mysteriously like a mini Dalek, combines high gain pre-amp, in the region of 55dB, with omni-directional antenna. It is tuned to receive both Inmarsat and GPS frequencies, and in fact can facilitate a transmit function at just over 1.6GHz.

When originally on the market a few years ago, it seems the price tag was nearly £1000, however now, on the US surplus market, they change hands for around £40! At that price I thought I would see what they were made of.

The first thing you have to do with the pod, is a bit of major surgery. The fitted antenna is of no use for Inmarsat A work, so has to be removed, carefully. It comes away, together with its base plate, the latter is then removed and re-fitted, with a short piece of cable soldered into place, to make the fly lead connections. The antenna of your choice can then be connected, keep the fly lead as short as possible.

The unit requires 12-18V d.c. at around 100mA. A standard satellite receiver, fitted with d.c. block, provides an adequate power supply.

Initial results from the pod, which only arrived a few days before deadline, are promising, and if the internal filters can be bypassed it should be possible to receive Meteosat data too. You can find further information about the Afstar Pod at **www.afstar.com**

So, with a bit of ingenuity, your standard satellite TV dish can be put to a number of uses. Next year's project? Well I rather fancy a solar powered oven, but could I really replace the co-rotor with a chicken spit?

Please note that monitoring Inmarsat may be illegal in the country you live in.

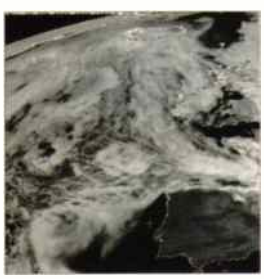
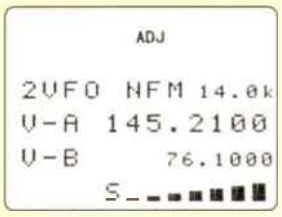
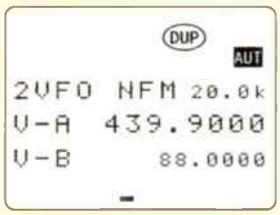
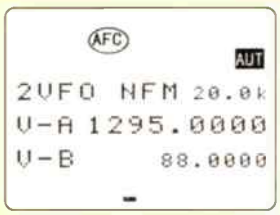


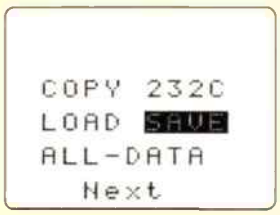
Fig. 6: *METEOSAT-7* image showing ship trails in detail.

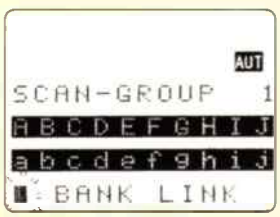
Fig. 7: For experimental work pre-amp and dipole strapped to the side of the co-rotor on 1.8m dish.

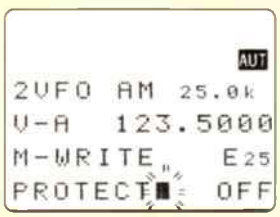


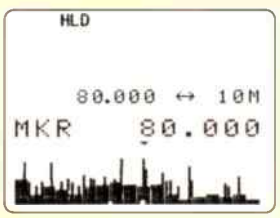


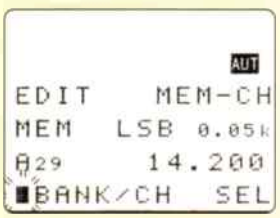












NEW AR8600

MOBILE - BASE - TRANS-PORTABLE

The AR8600 is an extremely versatile **all mode** receiver **(530kHz - 2040MHz)** which can be used virtually anywhere, mobile, base or trans-portable... powered from an external 12V d.c. power supply, optional d.c. lead from a 12V vehicle or from an optional internally fitted NiCad battery pack. A strong twin metal case with die cast front panel characterises the multi-purpose role. All mode receive capability is provided including Single Side Band with programmable tuning steps down to a resolution of 50Hz with the frequency established by a highly accurate Temperature Compensated Crystal Oscillator (TCXO). An RS232 port further extends the capabilities with free supporting control software available from the AOR web sites.

Although many microprocessor features have been adopted from the trendsetting AR8200 Series-2 hand portable receiver, **the AR8600 RF front-end is an all new design with preselection around VHF to ensure the highest levels of adjacent channel rejection with software spurii cancellation**. In addition to a hinged telescopic whip aerial, the AR8600 is supplied with a **detachable plug in medium wave bar aerial** which locates on the rear chassis of the receiver for localised medium wave monitoring. An additional BNC socket is mounted on the rear chassis so that **10.7MHz i.f. output** may be extracted for use with external spectrum display and vector analyser units such as the AOR SDU5500. The TCXO ensures **high stability** with **minimal internal spurii** and is usually only seen in top of the range (more expensive) models such as the AR5000 and AR7030.

The chassis is manufactured from two metal compartments, effectively a **metal chassis inside a metal cabinet...** this provides excellent screening characteristics and great robustness highlighting its multi application role. The **front panel** is also manufactured from **die-cast aluminium**. Size is 155(W) x 57(H) x 195(D) excl. projections, weight less than 2kg.

The all important **8.33 kHz airband channel step is *correctly implemented*. Computer control** is available via a standard 9-pin RS232 D-type connector on the rear chassis, just a standard RS232 cable is required for connection to a PC, the extensive RS232 command list is printed in the operating manual. In addition, **'optional internal SLOT CARDS'** (which fit into the rear chassis of the AR8600) extend the capabilities even further, five cards may be fitted with two operational simultaneously. **Supplied with:** Swivel base telescopic whip aerial, MW bar, comprehensive illustrated operating manual with RS232 listing, a.c. power supply.

AR8200 SERIES-2

NEVER BEFORE HAS ONE HAND PORTABLE OFFERED SO MUCH

The AR8200 represented a beacon when first released, technology marches forward with the NEW AR8200 SERIES-2 keeping the innovative concept and forward thinking alive and bright. It has not been easy improving on what many thought to be the ultimate, however the NEW AR8200 SERIES-2 does provide even more with nothing taken away.

A Temperature Compensated Crystal Oscillator **(TCXO)** now forms the heart of the AR8200 SERIES-2, this ensures **high stability** with **minimal internal spurii**. Performance too has seen the AOR R&D team fine tuning the design for **best sensitivity and strong signal handling** over the extremely wide coverage of 530kHz to 2040MHz (all mode receive without gaps). The aerial has also been replaced by a **telescopic whip** on a swivel base, this ensures the best results, a medium wave bar aerial is also provided as standard. The design team have certainly been taking account of customers wishes, the keyboard ZERO key has been swapped in position with the DECIMAL to match the telephone layout, LCD illumination has been increased (for improved visibility) and following requests for longer operation between charges, the **4 x AA size NiCads have been increased in capacity**, again reflecting improvements in modern technology. The obvious change has been left for last... the **cabinet colour** has been changed from green to **black!**

The list of features is vast, tuning step sizes are programmable in all modes down to 50Hz with comprehensive step adjust and correctly implemented **8.33kHz** for the new VHF airband spacing. Connection to a computer is possible with the optional CC8200 lead/interface with free PC software available from the AOR web site. Unique optional slot cards further enhance features (CTCSS, tone eliminator, record / playback, external memories, voice inversion).

★★★★☆ AR5000+3 awarded four starts by both the authoritative Passport To World Band Radio and World Radio & TV Handbook

AR5000
True base receivers are few and far between, some have simply evolved from the hand held equivalents with little tangible improvement in performance or facilities over their smaller counterparts - *the AR5000 is not like this!*
High performance, top quality build and true wide coverage all mode receive. The "+3" version offers even more with synchronous AM, AFC and Noise Blanker. Popular with government agencies throughout the world.

AR5000c
When making critical measurements, the frequency coherence is very important whether a single or multiple unit is employed. This involves the use of a single reference for all oscillators employed throughout the receiver. The AR5000C now provides this commercially required capability. The "C" version may be provided to order in either the standard AR5000 format or with two of the +3 additions of AFC and NB. If you are a commercial operator with this application in mind, please request the separate specification leaflet for the AR5000C.

AR5000+3 - Sync AM, AFC, NB

The "+3" version offers even more with synchronous AM (upper side band, lower side band and double side band with excellent lock range), AFC (Automatic Frequency Control for accurately tracking moving transmissions or unusual band plans) and Noise Blanker.

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

World Radio TV Handbook'99.
Speaking of the AR5000+3 in conclusion... "Compared with the ICOM ICR-8500 it offers considerably more features, better strong-signal handling, wider coverage and decidedly superior filters".

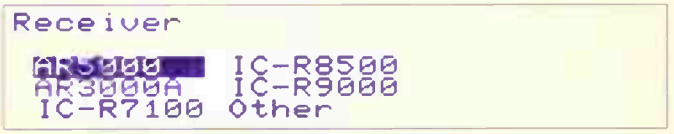
AR5000+3
- ✓ Wide frequency coverage 10 kHz - 2600 MHz
- ✓ All mode reception: USB, LSB, CW, AM, Synchronous AM, NFM, WFM with automode tuning (any mode and bandwidth on any frequency is possible)
- ✓ Automatic Frequency Control
- ✓ Noise blanker
- ✓ High stability TCXO reference, 1 Hz NCO tuning
- ✓ 1,000 memories, 10 memory banks, 20 search banks, 5 VFOs (all twice!), alpha tag, EEPROM chip storage
- ✓ Multiple IF bandwidth 3 kHz, 6 kHz, 15 kHz, 30 kHz, 110 kHz, 220 kHz with an option position for 500 Hz CW. (30 kHz is ideal for WEFAX).
- ✓ High sensitivity and excellent strong signal handling assisted by a preselected front end from 500 kHz - 1 GHz
- ✓ Extensive RS232 control list
- ✓ SDU ready with IF output for spectrum display unit

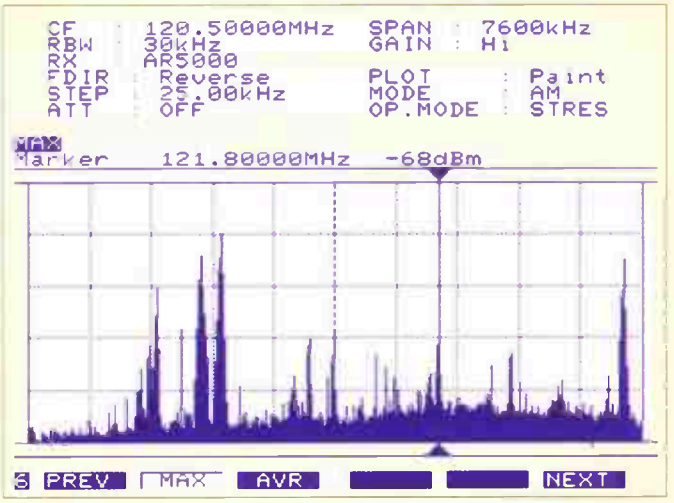
FOR FURTHER DETAILS, PLEASE VISIT YOUR DEALER, CALL FOR A LEAFLET OR VISIT THE AOR UK WEB SITE AT
www.aoruk.com

Setting new standards, **SDU5500** Spectrum Display Unit

The SDU5500 is an 'all new' Spectrum Display Unit and a worthy successor to the SDU5000 (which offered practical and cost effective monitoring). Coupled to the AR5000 receiver, it provides a spectrum display of 10 MHz bandwidth anywhere between 10 kHz and 2600 MHz.

Already pressed into commercial usage by the government, the professionalism of the unit has truly been grasped. The SDU5500 has a high resolution monochrome (white/blue) LCD with improved status read-out on the top-half of the display with a spin wheel tuner controlling the marker position, similar to a dedicated high-priced spectrum analyser.





The SDU5500 supports a number of AOR and ICOM receivers, see above. In addition, the SDU5500 may be used with other receivers which offer a 10.7 MHz I.F. output with suitably wide bandwidth, please refer to the colour leaflet for details. Various enhancements have been implemented over the earlier SDU to provide even greater functionality and professionalism. **Free internet download software** for the PC Windows operating system is available from our UK web site.

As reviewed in the December '99 edition of *Short Wave Magazine*

AR7030 Collins promotion Sept'00 / Oct'00
The Collins promotion has been a great success with many more happy AR7030 operators in the UK and around the world. Sizable commercial orders are also being processed, the production team are working full speed to satisfy the current high level of orders... this high demand may lead to temporary short term shortages or delays in supply, however you will be pleased with the results!

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

Satellite TV News

Arriving home late afternoon on October 10th I was confronted with Sky News showing riots and general bedlam in Belgrade, the locals at last were revolting against the rigged election attempts and the dictatorship of Slobodan Molosevic, seeking to put their elected Vojislav Kostunica candidate into parliament. At about the same time, **Roy Carman** (Dorking) rang to advise of a live feed out of Belgrade on *NSS-K*, 21.5°W - 11.462GHz-H (SR 6111 + FEC 3/4).

Not a new test card but a close up of the alignment sighting elements for the (successful) docking of Shuttle *Atlantis* with the *International Space Station* - again shown live over *NSS-K*.

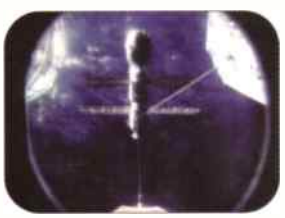
Checking out on my RSD ODM-300 the receiver absolutely refused to lock up on the signal - despite there being an 80% signal level present. Meanwhile, Roy's Echostar 3000 was happily displaying pictures! I detoured at this point and checked out the Serbian transmitter feed transmitted on the Russian *Express-3A* sat, 11°W - 11.518GHz-H, 16000+ 3/4, this locked up OK to reveal a downlink carrier - or the equivalent in digital technology - but with absolutely no video content.

Mission Control at Houston (via *NSS-K*).

Another signal in the same digital package showed an 'odd' video image in 525-lines system M. The signal then cut never to return that day - with Sky News reporting that the Belgrade TV centre had been burnt down, perhaps that's why the uplink 'carrier' ceased. At that point it seemed better to view Sky TV!

A Meridian TV regional broadcast, the presenter is front lit making the Thames in the background darken, via *801* @ 31.5°W.

Checking the next day showed that programming of sorts had returned, poor VHS quality pop music video and at 2000 hours a prolonged live 'phone-in with the new Serbian president Kostunica, more music and a second 'phone-in session with another politician, at least the new regime was certainly talking to the people.



Shuttle *Atlantis* approaches the *International Space Station* as seen from the Shuttle camera, this action was carried live via *NSS-K* sat @ 21.5°W.

Indicative of the censoring that the 'Slobo' regime carried out was a signal noted on September 25th on *NSS-K*, 11.625GHz-V at an unusual SR 5703; FEC 3/4 - the report into ARD Germany from Belgrade showing jubilant crowds hearing the news of the voting - which was anti Slobo - but in the middle of the report the signal was abruptly cut to black and 30 seconds later up came an 'NNN BERLIN' test pattern, it's thought that Belgrade censors stopped the transmission!

Another Meridian regional offering from the Newbury Showground, a few seconds later the gun went unexpectedly bang! with an appropriate reaction from the presenter (via *801*).

Roy Carman whilst scanning the Clarke Belt stopped awhile on *Turksat 1C* @ 42°E to check out for any new activity and hit luck. Sitting on 11.022GHz-V running an unusual SR 6515 and FEC 5/6 was a 10 channel bouquet of channels - well a set of vacant channels numbered 1-10 with 1-7 carrying black level, 8 and 9 encrypted and the 10th with 'Cine Spot'. The latter, though strong, would only give a picture on Roy's Echostar 3000 receiver when the video PID 518, audio PID 710 and PCR PID 819 were entered.

Cruising along to *Sirius 3* @ 5°E the same day and an outside broadcast from a German football stadium @ 12.609GHz-V digital with more unusual parameters of SR 6859 and FEC 7/8. Turks were seen waving the Kurdish flag and pictures of the Kurd leader - he's currently in prison under sentence of death back in Turkey for acts of terrorism. Roy gathered that the concert being performed in the stadium was a 'benefit' event on the Kurdish leader's behalf.

Travelling to the site of breaking regional news is an increasing commitment for broadcasters, witness the heavy flooding in the Sussex/Kent areas after record rainfalls over the 10/11/12th October, the latter day saw both Meridian 'Path 1' and 'Path 2' trucks uplinking live (over 31.5°W) out of a very watery Uckfield town with water up to five feet in some houses.

It's interesting to see how regional TV is using satellite for coverage of local events - the BT Global Challenge leaving Southampton had Meridian heavily in attendance, the Friday before departure TES-43 was again with the yachts at Ocean Village, earlier that day the same truck had been busy carrying live interviews with Chay Blyth, the organiser of the Global Challenge event and years past also a round-the-world yachtsman. Strange to think that the Meridian studio is about 1.5km distant, but without a line of sight path the satellite truck feeds back via an up/down linkpath of around 72,000km!

Evening of September 15th coverage of the Newbury Show featured a marching band, this satellite linked back to the studio a little distance away in Newbury town centre - the Thames Valley/Berkshire 'Meridian Tonight' service ex Hannington transmitter.

I deliberately avoided coverage of the BT Global Challenge yacht start from the Solent, Sunday September 10th, as live pictures were carried all day from the Shuttle *Atlantis* as it circled the Earth approaching the *International Space Station* now in part constructed. The mission was to carry final provisions and to check out the air content prior to the first occupants moving in shortly.

The approach and connection to the access hatch was also transmitted live over the NASA-TV service ex Houston Mission Control Centre via the Reuters lease on *NSS-K*, 21.5°W @ 11462GHz-H, SR 5632, FEC 3/4. Preparations were also well advanced during the Sunday flight for a space walk the following day by both the American and Russian astronauts.

Aerial view of the 'Sea Launch' rocket platform, a modified oil drilling rig. Control operations are from a nearby ship.

October 9th and heavy rain precipitated over the Southern UK sufficient to encourage the Newbury/Meridian satellite truck to take up a position on a bridge over the M4 to view the commuter evening movement in the rain and offer a traffic report for one minute! However, what was more interesting appeared at 10.964GHz-V, 5632+3/4, at 1800, with a caption ex Paris 'Digital Bridge' and inviting users to ring a Paris 'phone number.

In answer to a reader's query, there are numerous reception loggings received each month. I tend to skim through them and select those featured by the important events of the month from a selection of the various satellites visible over our horizon and capable of being received with lowish budget equipment in an average back garden - or I might use pictures that are unusual or rare.

'Typical' dish antennas used by enthusiasts range between 800mm-1.2m for Ku-band reception, even buying new will set you back from about £30 up to £100 plus a polar mount and stand. Tracking motor systems now are relatively cheap and much simpler to set up than a few years back.

'Subs Club'

Take out a one year subscription to *SWM* this month and you could **save £5** on the latest *Passport To World Band Radio*, 2001 edition - normally priced at £15.50 (so it could be yours for just £10.50 + P&P) - see our Book Profiles on page 45 for details of this new 2001 edition.

Whether you're brand new to the hobby of radio monitoring, or a seasoned DXer, there is something in *SWM* for you each month! By subscribing to *SWM*, you also get the extra benefits of:

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- **John Goodall G0SKR** puts the Philips Pronto - a wireless remote control system to the test.

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PLACE YOUR ORDER TODAY!

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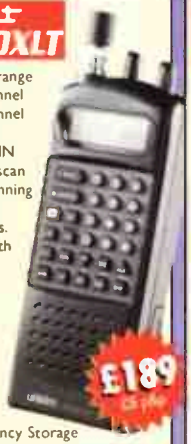
Bearcat UBC 3000XLT



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 Ch
- 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

Bearcat UBC 220XLT

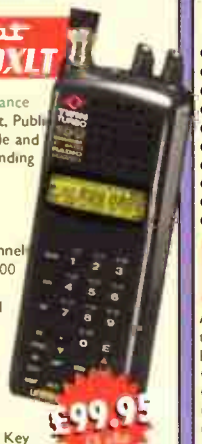
Uniden has built its reputation on reliability, ease of use and quality of reception with its most popular model, the 220XLT. Ideal for Aircraft, Public Service & UHF Communications.

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

CHEQUE SPREAD

£129.95

Bearcat UBC 120XLT



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

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

£99.95

AOR AR8200 SPECIAL!

MkII

- 530kHz-2047MHz
- All Mode including 8.33kHz AM
- 1000 Memories
- TCXO high stability oscillator
- Improved receiver
- Telescopic whip
- Higher capacity NiCads
- New black cabinet
- Plus LOTS MORE!

£399.95

We carry the FULL RANGE of accessories!

Yaesu VR500 SPECIAL!

ULTRA COMPACT RADIO

- 100kHz - 1299995MHz
- FM, Wide FM, USB, LSB, CW, AM
- 1091 Memory channels
- Weight 220g
- C/w Antenna, carrystrap, Belt clip
- Optional Charger: NC60
- Accessories

FNB-59 NiCad battery pack
NC-60 AC adaptor
CSC-72 Soft case
EDC-5B DC cable with cigar lighter plug
EDC-6 DC cable
CT-35 Cloning cable

£199

Icom IC-R2 SPECIAL!

The IC-R2 is one of the smallest radios we have ever seen. But Palm size wide band size is not everything. Packed in this receivers small package are some pretty big features.

- 500kHz -1310MHz
- AM/FM/WFM
- 400 memories for storing favourite channels plus 25 band edge memories for easy scanning between specified frequencY

PRICE MATCH

Bearcat UBC 860XLT

CHEQUE SPREAD

AIRBAND Base Scanner

A stylish low profile base scanner with TWIN TURBO scan and search facility. Covers civil airband, marine, police, cellular plus more!

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

£129.95

Bearcat UBC 9000XLT

£249

- 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

Bearcat UBC 60XLT

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

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

£79.95

SCANMASTER ANTENNAS

DOUBLE DISCONE SCANMASTER DD 1300

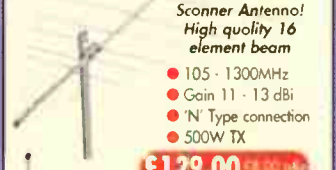
A high performance wideband antenna

- 25-1300MHz
- Ultra wideband TX capability

£39.95

SCANMASTER LP1300

The ULTIMATE Sconner Antenno! High quolity 16 element beam



- 105 - 1300MHz
- Gain 11 - 13 dBi
- 'N' Type connection
- 500W TX

£129.00

NOMAD PORTABLE

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

£19.95

OXI SHORTWAVE ANTENNA
Covers ALL shortwaves

Standard enamelled copper wire ontenna up to 50 metres long with 10 metres of single feed wire. May be adjusted to suit garden. ● (Max) 50mtrs long

£25.95

GOODMANS TRACKER

2 WAY BUSINESS & PERSONAL COMMUNICATIONS SYSTEM

SPECIAL OFFER!

PAIR £99

PMR 446 LICENCE FREE RADIOS

NO LICENCE FEE
NO CALL CHARGES
NO LINE RENTAL
Typical range: up to 3km

THIS MONTH ONLY we will include FREE OF CHARGE
- 2 X DROP IN CHARGERS
- 2 X VOX HEADSETS
- NiCad BATTERIES

worth £34!

USED EQUIPMENT

ALL SAFETY TESTED & GUARANTEED FOR 3 MONTHS

SHORTWAVE RECEIVERS	
AOR [illegible]	475
DRAKE SW2	399
GRUNDIG YB500	99
SONY ICF SW77	189
ICOM IC-R72	399
ICOM IC-R75 + UT102	525
JRC NRD 525	499
JRC NRD 535	799
KENWOOD R1000	699
REALISTIC DX394	119
YAESU FRG8800	329
SCANNING RECEIVERS	
AOR AR8200	189
BEARCAT UBC 3[illegible]	110
BEARCAT UBC 9[illegible]	189
COMMTEL SR[illegible]	129
ICOM IC-R1	159
REALISTIC PRO 2035	175
REALISTIC PRO 2035	125
YUPITERU MT205	185
YUPITERU MVT7100	179

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We ship *FAST* 'cos we've got the stock!

ICOM IC-R75

IN STOCK! READY TO SHIP!

CHEQUE SPREAD

The LATEST HOT Receiver from ICOM

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

PRICE MATCH

~~£649~~ £599 Ch p&p

ICOM IC-R8500

CHEQUE SPREAD

LATEST VERSION

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. Has 3 ROTEL DATA CHANNELS

~~£1399~~ £1299 Ch p&p

GRUNDIG YB400

CHEQUE SPREAD

PRICE MATCH

PORTABLE SW RADIO

Passport to World Band Radio

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

£120 Ch p&p

YUPITERU MVT 7300

- 530kHz 1 GHz
- 1000 Memories
- 8.33kHz airband
- Plus LOTS MORE!

£289

See review October 2000 SWM

NEW!

JRC NRD-345

CHEQUE SPREAD

SPECIAL!

- AM synch detector ● Low noise PLL chip
- Noise blanker ● Wide dynamic range
- Sensitive receiver ● RS232 computer I/F
- 100 memories ● Clock/Timer functions
- Supplied c/w AC mains adaptor
- INCLUDING MAINS AC SUPPLY

~~£449~~ £399 Ch p&p

JRC NRD-545

TOP OF THE RANGE WITH DSP

PRICE MATCH

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

~~£1499~~ £1299 Ch p&p

VHF CONVERTER 30 - 2000MHz £299

Memcom AR108

Dedicated Airband radio

- 108-180MHz
- 99 Memory channels
- Dual watch
- Mains Charger £8.95

£69.95

AIRBAND

YAESU FRG-100

PRICE MATCH

CHEQUE SPREAD

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

~~£399~~ £369 Ch p&p

AOR AR-8600

NEW!

NOW IN STOCK!

All mode wideband base RX

- 530kHz-2040MHz
- 8.33kHz airband steps
- Optional slot cards

£CALL

GRUNDIG PORSCHE P2000

A stylish radio designed by F.A. Porsche

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

£89.95 Ch p&p

YUPITERU MVT 7100

Still the most popular handheld

- 530kHz-1650MHz

BEST BUY!

~~£249~~ £CALL

ROBERTS R9914

CHEQUE SPREAD

- LW/MW/FM/SW
- 45 presets
- SSB reception
- Tuning 1kHz steps
- Direct keypad + rotary tuning
- Clock/alarm functions
- AC adaptor

NEW! PLL Digital World Band Radio

£99.95 Ch p&p

SONY SW30

FULLY DIGITAL WORLD BAND SHORTWAVE FM MW & LW PORTABLE RADIO

~~£49.95~~ £39.95 £6 p&p

SANGEAN ATS818

UNBEATABLE VALUE FOR MONEY!

SW WITH SSB

SPECIAL!

~~£129~~ £99 Ch p&p

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

OPTIONAL MAINS ADAPTOR £9.95

JRC ST3

HEADPHONES

A real quality pair of headphones designed for the discerning shortwave and communications enthusiasts

~~£79.95~~ £69.95 Ch p&p

AOR AR 5000

CHEQUE SPREAD

IN STOCK READY TO SHIP

~~£1,599~~ PRICE MATCH

- 10kH - 2.6GHz

All mode top class receiver & scanner packed with features

AR 5000+3 ..... £1799

YAESU VR 5000

CHEQUE SPREAD

NEW!

MOBILE WIDEBAND RECEIVER

- 100kHz - 1.3[illegible]MHz
- Multi mode
- Real time band scope
- Optional DSP bandpass notch & noise reduction
- Optional filters

www.nevada.co.uk

£CALL Ch p&p

BEST PRICES ON GARMIN GPS PRODUCTS!

GPS III PLUS £349 Ch p&p

Garmin's most popular GPS with detailed maps & street data.

GPS 12	£129.95
GPS 12 CX	£239.95
GPS 12 MAP	£329.00
GPS 12XL	£189.95
E-MAP	£199.95
E-TREX	£119.95
GPS 148	£209.95

STREET PILOT

MONO PILOT Package inc CD, 8Mb Data Card etc £549

COLOUR PILOT Package inc CD, 8Mb Data Card etc £649

MAP SOURCE CD ROMS Australia/NZ, UK, France, Italy etc £69.95

FULL RANGE OF GARMIN ACCESSORIES IN STOCK - CALL FOR INFO & PRICES

SCANMASTER SP55

WIDEBAND PREAMP

Improve the reception of your scanner!

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

PRICE CUT

~~£69.95~~ £59.95 Ch p&p

AOR AR 3000A

SHIPPED TODAY!

CHEQUE SPREAD

~~£799~~ PRICE MATCH

- 100kH - 2036MHz

Classic receiver as used by Government, Military etc

AR 3000A+ ..... ~~£895~~ PRICE MATCH

ICOM PCR 1000

PRICE MATCH

COMPUTER RADIO SYSTEM

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

CHEQUE SPREAD

PCR OPTION DSP UNIT OT-106 £82.00

~~£399.95~~ £349.95 Ch p&p

Palstar AM30

~~£79.95~~ £69.95 Ch p&p

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

S-LINE UNIT

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

(ON ANY ITEM OVER £100)

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

WIN one of four, yes four Hitachi portable Digital Satellite radios.

Due to the *SWM* October 2000 feature on the WorldSpace satellite network, there has been a massive increase in awareness and demand for radios capable of tuning into the WorldSpace L-band channels.

Worth £99.99 inc P&P.

simplyradios.com are the only UK outlet for the WorldSpace capable receivers and *Short Wave Magazine* has persuaded them to kindly donate four sets as a prize for this month's competition.

Chris Ellis of **simplyradios.com** says, "We are specialists in Portable, Personal and world-band radios, from all major manufacturers. Choose a radio by type, style, price or features, all models with non technical independent reviews."

So go on, try your luck and have a go, you never know you could be listening to Digital Radio in 2001.

How to win a radio that will receive the only operational broadcast digital satellite radio network.

Simply fill in the form below with your details and answer the two questions. All the correct answers will be entered into the draw that will take place 25 January 2001. The competition closes 19 January 2001, the four lucky winners will be announced in the March 2001 issue of *SWM*.

The Editor's decision is final.

Name: .....

Address: .....

.....

.....

Tel: .....

E-mail: .....

Do you buy *SWM* every month? .....Where do you buy *SWM*? .....

Question 1: Who are the UK outlet for WorldSpace Radio?

Answer: .....

Question 2: What band does WorldSpace Radio transmit in?

Answer: .....

Now send your completed answers to ***SWM* WorldSpace Comp., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.**

SWM 2000 Index

Constructional

Features

Reviews

Regulars

Continued on page 40....

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: active 40kHz at full performance 40MHz (-3dB)
Gain: 3.3dB gain
Output impedance: 50-75 ohm coaxial
Connector to Rx: PL comes as the standard. Other standards can be fitted upon request.
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 1430mm
ARA40 TEL 125cm total length with telescopic whip extended, 45cm minimum length. Antenna tube 40mm x 1430mm

Ideal for portable radio

£139

ARA 60

Technical performance

Frequency range: 4.0kHz-60MHz (-3 dB) performance 60-120MHz 2.5dB 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 +/-0.2dB
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 1460mm

Ideal for base stations

£169

ARA 2000

Technical performance

Frequency range: 50-2000MHz
Output impedance: 50-75 ohms coaxial
Gain: 10dB (100MHz) 14dB (1400MHz) 16dB (2000MHz)
Noise figure: 1.5-2dB (100MHz) 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 150mA 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.

NOW BACK IN STOCK!

The JRC NRD 545 Deluxe Receiver

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

Special Package Deal

A new NRD-545 with matching Deluxe Speaker NVA-319 & optional VHF/UHF converter CHE-199 allowing coverage on AM/FM/WBFM up to 2000MHz.

Total RRP £2197.00 ML&S £1649. Also available on finance, NO DEPOSIT & 48 payments of only £57.63 p/m

Save almost £500 off the package deal & pay nothing until MAY 2001

Specifications

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

Features

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

NEW YAESU VR5000

Yaesu have just announced a new base scanner. This is their first scanner since the legendary FRG9600 and looks to become another benchmark.

Features include:

- 12 volt operation
- 100kHz - 25999.9998MHz frequency range
- Operating modes are CW, LSB, USB, AM, AM-N, WAM, FMN AND WFM
- Real Time Band Scope
- 2000 memories
- World Clock
- Case size is 180w x 70 h x 203 deep. (Weight approx 1.9kg).

Options include:

- DSP Bandpass, Notch and Noise Reduction Filters
- Digital Voice Recorders

ARRIVING MID-NOVEMBER. ESTIMATED RRP £799. CALL NOW TO SECURE AN EARLY DELIVERY.

NEW AOR AR-8600

At last the long-awaited base version of the AOR8200.

While the operation and logic of this unit are the same as the AOR8200 the AOR8600 front end is re-designed to cope with base antennae. This radio will be at home in the car or on the desk top. Coverage is 500kHz - 2040MHz.

PRICE TO BE ANNOUNCED!

Options include computer control, Plug-in memory module for 400 memories, CTCSS decode, Record Chip for 20 seconds of audio, Tone Eliminator and Voice Inverter.

Yaesu VR-500

Pocket Scanner

100kHz - 1.3GHz
AM/FM/WFM/
SSB/CW
BAND SCOPE
PC PROGRAMMABLE

Only £199.95

Icom IC-R75E £699

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

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AVE EXTRA POUNDS!!

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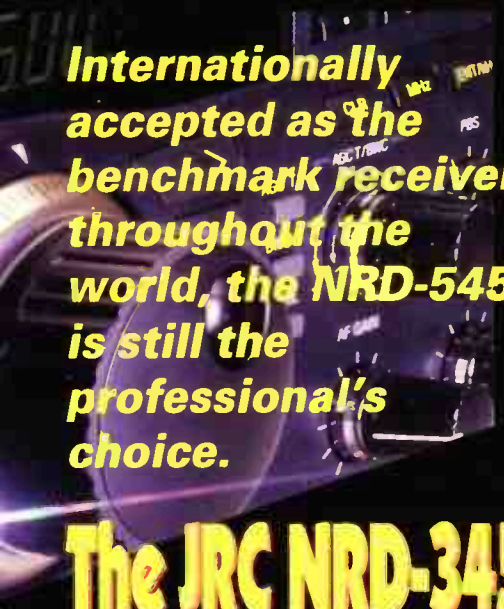

Internationally accepted as the benchmark receiver throughout the world, the NRD-545 is still the professional's choice.

Dear Mr Lynch

I am writing to congratulate you on the service that I have received from your company.

At 13.00 on Tuesday of this week I placed an order for a Yaesu VR500 via telephone. Twenty four and a half hours later I had the unit in my hand! Not only was your delivery time extremely fast, but I also bought my receiver for forty pounds less than I could find it anywhere else.

Your staff were most helpful on the telephone and your website is easy to navigate to locate the product that was required.

Once again thank you very much for your splendid service. I look forward to using you again and I wish you and your business every success for the future.

Kind regards
Matthew Bird

The JRC NRD-345

New Lower Price!

Whilst JRC offer the ultimate receiver in the shape of the NRD-545, for those of you who can't quite convince yourself, the NRD-345 makes a low cost alternative. Simple to use and built to the same standards as its big brother, take a closer look at the 345 and of course the price!

- .1 - 30MHz Coverage
- AM/CW/SSB/Fax
- AM Synchronous Detection
- One Chip DDS-1C Digital Synthesizer
- Noise Blanker
- High Sensitivity & wide dynamic range

ML&S: ONLY £399 with PSU
No Deposit, then 48 x £12.14 p/m

Icom IC-R8500

Our dear friend Mr John Wilson gave this superb all band all mode receiver the thumbs up and it's hardly surprising. Icom have actually sold more of this product to HM Governments than enthusiasts. If it's good enough for 'them' it's good enough for you and me.

ONLY £1399 NO DEPOSIT,
THEN 48 x £42.57p/m.

AOR AR-5000A
RRP £1395.00
NO DEPOSIT,
THEN 48 x £42.45 p/m.

AOR AR-5000+3
The AR-5000+3 including AFC, Synchronous AM & noise blanker.
RRP £1699 **NO DEPOSIT,**

AOR AR-3000A
RRP £749.00
NO DEPOSIT,
THEN 48 x £22.79 p/m.

AOR AR-3000A plus
RRP £849.00
NO DEPOSIT,
THEN 48 x £25.84 p/m.

Icom PCR-1000
RRP £349. DSP UT-106 at only £79.95.
AVAILABLE ON FREE FINANCE - zero apr
ONLY £49 DEPOSIT, THEN 12 x £25 p/m.

AOR AR-8200 MkII
NOW WITH HIGHER POWER NICADS, TXCXO, NEW BLACK CABINET AND OTHER ENHANCEMENTS.
In stock in limited numbers at £419.00
No deposit and 48 x £12.75 p/m.

Icom ICR-2E
INCLUDING FREE CARRIAGE.
£149.00

NEW MVT-7300
In stock now
Call for details

New at ML&S

Garmin Street Pilot

The Street pilot is an excellent in car GPS unit with map detail down to street level. The amber backlit display is easy to read and makes the unit Ideal for navigation in unknown territory. The Street Pilot is also at home with APRS when used in conjunction with a THD7E or TMD700E. Supplied with *The UK Metro Guide* on CD Rom, an 8mb Ram module cigar Lead, PC lead and a magnetic roof mount antenna the system is all **ready to go at £595.00** including delivery to your Door.

Garmin E Map

The Garmin Emap is a hand held version of the Street Pilot and comes with Data lead,8 mb Ram Card & *UK Metro Guide* on CD Rom at **only £329.00.**

The Garmin GPS3plus

The ever popular GPS3 now has more map detail and allows upload to street level. **Available at £339.00**

Road and Recreation CD Rom available at £99.00

FINANCE EXAMPLE

All examples do not include P&P.

Cash Price	Deposit	PAID IN 6 MONTHS	APR
£299	Nil.	£299	0%

OR

Cash Price	48 Payments of	Total Credit Price (T.A.P.)	APR
£749	£22.79	£1093.92	21.9%

Written quotations available on request

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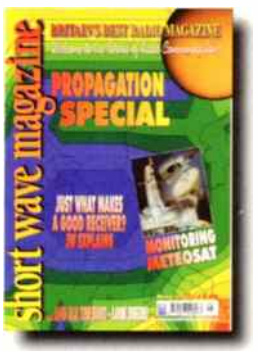
To offer finance terms up to 48 months with no deposit. We welcome your part exchange against any new (or used!) product, provided its clean and in good working order. Call the Sales Desk today. APR 21.9%. Payment protection is also available up to 36 months. All units are brand new and boxed with manufacturers 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. E10 p&p on all major items.

AVE EXTRA POUNDS!! hamradio.co.uk



Competitions

Special Offers & Subs Offers

Free Gifts

Don't forget that we still have available *SWM* Back Issues for 2000, as well as 1996, 1997, 1998 and 1999, but hurry as stocks are limited. To order Back Issues, either use the Order Form on page 76 of this issue, or call the Credit Card & Order Hotline on (01202) 659930. Back Issues are available for £2.99 inc. P&P.

ROBERTS

Sound for Generations

The New R9914 from Roberts

PLL digital world band radio – ideal for BBC WORLD SERVICE

- LW/MW/FM/SW wavebands
- 45 station presets
- SSB for reception of single sideband and CW transmissions
- Direct keypad tuning
- Rotary tuning
- Station tuning in 1kHz steps
- Dual conversion for improved SW image rejection
- Digital clock
- Alarm/time functions
- Key lock
- FM stereo via earphones
- Soft carry pouch
- Complete with AC adaptor

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BY APPOINTMENT H R H THE PRINCE OF WALES MANUFACTURERS & SUPPLIERS OF RADIO RECEIVERS ROBERTS RADIO LIMITED

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PO Box 130, Mexborough, South Yorkshire S64 8YT

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LOWE ELECTRONICS LTD

Check out www. lowe.co.uk for the best secure on line shopping

JRC NRD545

A superlative short-wave receiver, designed to fulfil the needs of professional monitoring stations, the NRD545 is equally at home with the serious hobby listener.

The DSP implementation starts at IF frequencies so don't confuse this with lesser DSP receivers that simply process the recovered audio. You can therefore control the IF bandwidth from 10kHz down to just 42Hz allowing total control for AM, SSB, CW or data signals, really helping to reduce interference. Heterodynes and noise can also be removed and the notch filter will automatically track changes in the frequency of the interfering tone. As you would expect from a top-flight receiver, computer control is fully integrated and there are 1000 memory channels, with memory and band programmable scan features.

SPECIAL OFFER
Genuine UK Stock.
Full Manufacturers Warranty.

Ordering Information
Product Code: NRD545

Lowe Price £1195

Carriage: £10.00 by Courier

BRAND NEW RECEIVERS

Lowe HF-150

Extra special once in a life time never to be repeated offer!

LIMITED STOCKS, FIRST COME FIRST SERVED.

Ordering Information
Product Code: HF-150

Lowe Price £249.00

Carriage: £10.00 by Courier

MVT-7300

- Full coverage from 531kHz to 1320Mhz
- Wide FM
- Narrow FM, AM
- Narrow AM, LSB and USB
- 8.33kHz channel steps are correctly implemented
- 1000 memories
- Supplied with belt clip, wrist loop, flexible antenna.
- Optional accessories include NiMh batteries at £8.95 and matching charger at £9.95

Ordering Information
Product Code: MVT-7300

Lowe Price £289.00

Carriage: £10.00 by Courier

MVT7100

In our view...simply the best!

This is the scanner of choice for many of our serious users. If a radio is transmitting and you are close enough you will hear it on the MVT7100. Superb for monitoring military and civil airband channels - also allows you to listen to ground crews and base security. Its shortwave coverage with SSB offers opportunities for monitoring Shanwick and the trans-Atlantic routes!

- LSB/USB/AM/WBFM/NBFM Reception
- 1000 memory channels
- High sensitivity
- Signal Strength Meter
- Illuminated keypad
- High speed search & scan functions
- User friendly
- Battery save function
- Priority function
- Individual power/volume and
- Tuning dial
- Channel pass function on memory

Ordering Information
Product Code: MVT7100

Lowe Price £229.00

Carriage: £10.00 by Courier

Ordering Information
Product Code: IC-R2E

Lowe Price £149.00

Carriage: £10.00 by Courier

IC-R2

Our lowest priced full coverage scanner also happens to be our smallest! The frequency coverage is from 0.495MHz to 1309.995MHz with NO GAPS making it ideal for monitoring military airband channels.

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www.lowe.co.uk

Send us four first-class stamps for our latest full colour catalogue, full of receivers, antennas, books, accessories, nightvision and GPS receivers and more!