

ShortWaveMagazine

SWM

& Scanning Scene

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magazine



Reviewed
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UBC-105XLT
Starter Scanner

SSB
Special
Inside Kinloss
Rescue

Free Radio?
SW Radio Africa
Examined



06 > June '05

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PH-13



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 - 148-174 MHz VHF High Band
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- 100 Channels
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- Twin Turbo, Search and Scan
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- Size: 15.3cm H x 6.7cm W x 4.5cm D
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- Supplied complete with: UK mains charger, Belt clip, earphone & flexible antenna

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- Scans 100 channels per second!
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- 806.00-960.00 MHz
- 1240.00-1300.00 MHz

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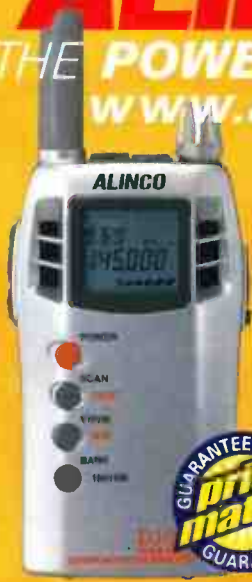
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SSB Utilities Special



Broadcast

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18 SSB Utilities Special - ARCC Kinloss Rescue & What is SSB?

Ben Hogan pays a visit to Kinloss Rescue to discover more about the work that is done there, as well as clarifying what is meant by the term single side band (s.s.b.) in the annual special dedicated to the subject.



27 Free Radio?

Jason Walsh asks if SW Radio Africa is merely another foreign-backed clandestine propaganda organ, or a new form of independent and dissenting media?

32 Starting Out - Part 9

We continue with the highly popular re-run of the excellent beginner series from the past, originally brought to you by the late Brian Oddy G3FEX. This time you'll learn about frequency synthesis and the Wadley Loop system.

36 Air traffic Control - Part 1

Ian Doyle looks towards summer as he give us a glimpse behind the scenes of the Royal International Air Tattoo and the Air Traffic Control that plays such an important part.

64 SWM Club Listing

If you want to meet others with a passion for radio, then look no further. Use our comprehensive and most up-to-date guide to local clubs. Please note this is now split into three parts running on a rotating basis.



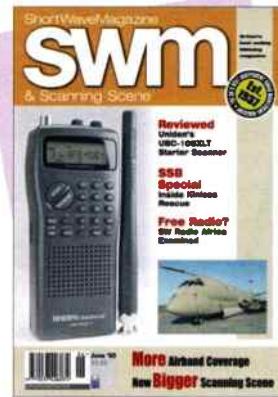
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cover subject: *The new Bearcat UBC-105XLT takes Dave Roberts back to his early scanning days as he reviews the latest in 'starter' scanners to be launched.*

Share your thoughts

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Join in with the on-line action on the SWM Readers' E-mail Forum - send an E-mail to swm_readers_subscribe@yahoo.com to subscribe - don't miss the on-line action!

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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.

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 £5.00 inc P&P each and photocopies are £3.00 per article inc P&P.

Binders are also available (each binder takes one volume) for £6.50 plus £1.50 P&P for one binder, £2.75 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for SWM/PW is also available from the Editorial Offices for £2 inc P&P.

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ED's



comments

Welcome to the facelift *Short Wave Magazine*, to borrow parlance often used by the car industry. As you'll notice there's been a reorganisation of the sequence of features. Main topics are grouped together in sections - I hope that you enjoy the new look SWM. As always, I'm very interested to learn of your opinions, so please feel free to write either conventionally or via electronic means and E-mail. Something omitted to mention last month is that we will no longer be running the whole club listing in every issue. Instead, the list will be split into three with each part being featured in sequence and run on a rotating basis. All you club secretaries please continue to send in updates as this will ensure that we continue to provide the most up-to-date club listing in the UK.

Space Shuttle

As far as I can tell, 22 May represented the resurrection of the Space Shuttle missions. The flights of these extra-terrestrial juggernauts are due to recommence on this historical day.

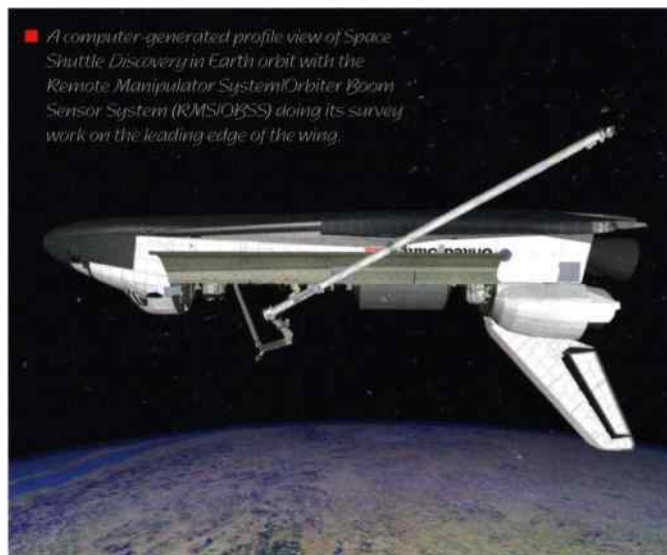
At the time of writing this piece, NASA were saying that Space Shuttle *Discovery's* STS-114 mission now had a targeted launch date of 22 May with a launch window extending to 3 June, therefore allowing time to complete engineering analysis, validation and verification testing of the Shuttle for a safe Return to Flight.

As I write this, the Shuttle sits on the launch pad at Kennedy Space Centre in Florida with technicians preparing it for its trip to the *International Space Station*. During the past week, engineers performed clearance checks of the robotic arm and the new Orbiter Boom Sensor System. They also completed flight readiness tests on all three Space Shuttle Main Engines.

The Space Shuttle and its External Tank have undergone dozens of modifications in preparation for Return to Flight. The updates to the Shuttle system come



■ Astronaut Robert L. Curbeam, wearing a training version of the Extravehicular Mobility Unit (EMU) space suit, participates in Return to Flight training on board a KC-135 aircraft near Johnson Space Center (JSC). The aircraft flew a series of special parabolas to afford a number of zero-g "windows" for rehearsing extravehicular activity (EVA) tasks for repairing damaged Shuttle tiles.



■ A computer-generated profile view of Space Shuttle *Discovery* in Earth orbit with the Remote Manipulator System/Orbiter Boom Sensor System (RMS/OBSS) doing its survey work on the leading edge of the wing.

in response to the Columbia accident and recommendations from accident investigators.

Lots of fascinating information can be found at <http://spaceflight.nasa.gov/outreach/readersroom.html>

I hope that as you read this, the mission is being undertaken with *Discovery* having had a good launch.

This renewed shuttle activity will no doubt result in some interesting radio traffic. It's likely you may already have heard activity on the h.f. launch co-ordination frequencies. Don't forget that the shuttle and *ISS* need to be overhead to be able to hear them on v.h.f. and higher frequencies.

To determine when that signals can be detected you can use www.heavens-

above.com This excellent site is ideal for predicting earth satellite and stellar object positions. I strongly suggest book marking it. An equally useful alternative can be found at www.fourmilab.ch/earthview/satellite.html this site offers you a view of the earth from the selected satellite. Interesting as you get to journey around the planet aboard non-geostationary vehicles.

Uniden Strike

I note that the massive eastern radio manufacturer Uniden was a victim of labour relations disputes recently. It was reported in the daily press that there was a rather short-lived strike.

On the face of it, the 10,000 fired-up workers at Uniden Electronic Products seemed to have a lot going for them when they went on strike.

Their main demand, the formation of a union, had long been guaranteed in China's labour law. Uniden's Japanese ownership reckoned they had little reason to expect sympathy in China during an angry crisis between Tokyo and Beijing. Moreover, the days had passed when another batch of eager workers could easily be found; the assembly plants that form an endless expanse here in the Pearl River Delta had started to experience a shortage of workers.

But by Saturday, eight days after the strike began, Uniden started humming again with a full complement of 10,600 young men and women in pastel uniforms, their dextrous hands busily assembling cordless phones and other radio products for export stores around the world. Several strike leaders had disappeared to jail cells, their frightened colleagues said. Pressure from local government officials, backed by police, had forced the employees back to the assembly line, once again deferring their dream of a worker-run union.

Ofcom

The UK radio regulatory body Ofcom, would seem to be rather frustrated by the somewhat negative reactions of the RSGB to their notices of proposed change in the administration of licensed spectrum

users. This general deregulation, which seems to be aimed at reducing the burden on the tax payer by cutting the need for annual licence renewals potentially effects the radio amateur element of the hobby radio scene. Ofcom's attempts to use the RSGB seem to have been rather frustrated, it now appears that they have decided to contact clubs directly perhaps to circumvent the national society's spin on the licencing consultation. For more information please take a look at Clive's 'Amateur Band' column on page 63 of this issue.

TenTec

I was pleased to learn from **Richard Hillier** at TenTec Direct that they have recently agreed to supply Martin Lynch & Sons Ltd. with the excellent TenTec range of transceivers. **Martin G4HKS** leading light at ML&S Martin Lynch & Sons Ltd., Outline House 73 Guildford Street Chertsey, Surrey KT16 9AS was so impressed with the performance of the TenTec products that he felt compelled to include the radios in his new store's range. Good move Martin!

M3TTO

Eileen Saunders is perhaps not a name well known to you, if you are a reader of *SWM*. But, if you are one of our advertisers then it will be very familiar indeed. Eileen is the persuasive force in the *SWM* advertising department. She's the one who's responsible for ensuring that all those in the trade don't get away. After being with us for just over five years Eileen **M3TTO** has decided to seek pastures new and will be leaving us shortly after this issue is on the news stands. I'd like to thank Eileen for all her hard work over the years and wish her good fortune with her new undertaking. Keep an ear open on the amateur bands during Jamboree events and similar as Eileen is also a Brown Owl and a keen amateur operator.

73 Kevin

QSL

THE MOST UPLIFTING PHONE-IN QSL VOUCHER TO SEND ON ANY SWL SERVICE

Dear Ed

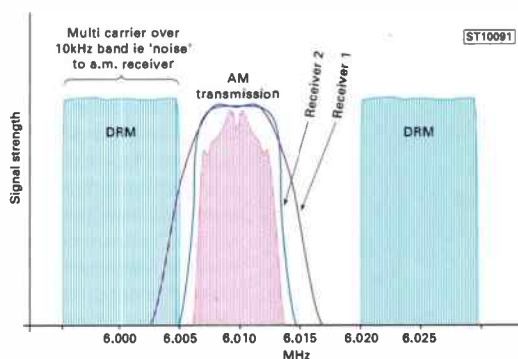
Below I have listed three topics that to me are detrimental to the future of short wave broadcasting.

■ DRM and a.m. broadcasts side-by-side

We can now hear three or four transmissions in most of the lower broadcast band during the day, i.e. in the 49, 41 and 31m bands. Because of the nature of DRM transmissions being a block of carriers transmitted in a 10kHz spread with a rectangular power pattern these signals appear as a wide block of noise to a conventional a.m. receiver occupying what seems like 15 or 20kHz to the usual non-professional hobbyist receiver. For most receivers bought on the 'High Street' an a.m. transmitter would have to be 15 or 20kHz from the nominal DRM frequency so as not to hear the noise. Even a receiver with selectable bandwidth, such as a Sangean ATS803 set to the narrow B/W, some ± 2.5 kHz for instance I can no longer hear Radio Australia on 9.475MHz due to excessive QRM from Radio Russia DRM on 9.480MHz. Whilst the engineers continue to play with their DRM transmitters why should existing a.m. broadcasters suffer such unwarranted interference? Where is the IFRB (International Frequency Registration Board)? Not in *WRTH*. Who do we complain to?

Anyhow there are no DRM receivers yet, proper receivers!

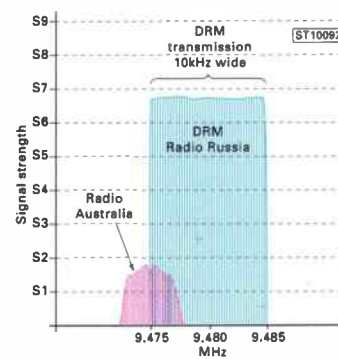
Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor at *QSL*, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.



■ Fig. 1: DRM on two frequencies 25kHz apart and a.m. signal on 6.010MHz. RX1 Cheaper portables with a selectivity of ± 6 kHz will suffer interference from a DRM station 10kHz away. So also if reception of 6.015MHz was attempted (DRM on 6.025MHz say). RX2 To achieve satisfactory a.m. reception would have to have a narrow i.f. filter ± 3 kHz at worst, narrower better. Stations on 6.010 or 6.015 could be received but not 6.050 or 6.020. Why should a.m. and DRM be mixed throughout the short wave bands? Give DRM (for engineers to play with) a sub-band away from a.m.! The two cannot mix!

■ Loss of BBC World Service

Since the end of March, daytime reception here in Ireland has gone from bad to virtually nil. Over the years the BBC has progressively dropped all short wave broadcasting on their lower bands. 3.955MHz is long gone, 6.195 is given over to some unrecognisable languages, 9.410MHz is used very little and suffers interference and any higher frequencies are either skipping over from the UK or useless from far of transmitter sites. Even 1531kHz, which I could have received at times is blocked by World Harvest Radio WHRI. BBC World Service is now only a shadow of



■ Fig. 2: DRM transmission 10kHz bandwidth 1400 to 1700 UTC typical reception! Where is the International Frequency Registration Board? Just what are they planning?

itself and its programming is going downhill too.

■ Pulse Interference On Short Wave

For more than a year I have been noticing a pulse type noise across the short wave frequencies during daytime that can span a very wide range of frequencies between about 7 up to 22MHz and whilst not very strong (remember the Russian Woodpecker?) is annoying. It appears as a tack-tack-tack-tack sound at a rate of 4 to 5 times per second and must be some form of h.f. over-the-horizon Radar, but from where? At first I thought it was local noise but I have heard it whilst on holiday in south east Spain and would like to know if it could be located and closed down. It's just more pollution on the airwaves.

Des Walsh

Voice of Russia

The Voice of Russia broadcasts to Europe on a variety of frequencies. Check out these and tune-in:

0200 - 0300 on 603kHz
 0300 - 0400 on 603 and 1543kHz
 0400 - 0500 on 603 and 693kHz
 0500 - 0600 on 603, 693 and 1323kHz
 0600 - 0900 on 15.780MHz, 603, 693 and 1323kHz
 1400 - 1500 on 9.480MHz
 1500 - 1600 on 9.810, 11.980, 12.040 and 15.455MHz
 1700 - 1800 on 7.390, 9.820, 9.480, 9.890, 11.675MHz and 1494kHz
 1800 - 1900 on 9.480, 9.820, 9.890 and 11.630MHz
 1900 - 2000 on 7.310, 7.380, 9.890 and 12.070MHz
 2000 - 2100 on 7.310, 7.330, 12.070 and 15.455MHz.

To keep up-to-date with the latest you can also check out the website at www.vor.ru/world.html



Satellite News

The Amateur Phase Three Satellite P3E is scheduled for launch this autumn into a highly elliptical earth orbit. It will be in range for up to 8 hours each orbit and will provide worldwide coverage using transponder operating on either 430 to 144MHz or 430MHz to 13cm.

The Mars Orbiter (PSA) should be launched into earth orbit in 2007 when it will then fire its onboard motor to send it to Mars. It will be the first Amateur Satellite to go to another planet. There will be a beacon onboard operating in the Amateur 10GHz band, this will provide Radio Amateurs with the ultimate in DX signals. When the satellite is in Mars orbit it is hoped to deploy a package onto the surface.

A presentation on the P3E and the Mars Orbiter will be given at the AMSAT-UK Space Colloquium, which is taking place at the University of Surrey in Guildford from 29-31 July. All Radio Amateurs and s.w.l.s are welcome to attend the event. For more details contact the secretary **Jim Heck G3WGM**, Tel: (01258) 453959, E-mail: g3wgm@amsat.org, Website: www.uk.amsat.org

Build A TRF Receiver

p.c.b. with component markings on the top side. The KRC-4 also comes with a comprehensive step-by-step instruction booklet plus all the hardware, including a pre-drilled case and batteries!

The KRC-4 is available now for £19.99 plus £4 P&P (UK and Ireland) direct from the **Kit Radio Company, Unit 11, Marlborough Court, Westerham, Kent TN16 1EU. Tel: (01959) 563023.**

Payment can be made by credit card, cheque or postal order.

Once you've built your kit if you find you can't get your project working, don't panic simply contact KRC's 'Get You Going' service, where you will have the option to return your kit with £10 and they will return it to you in full working order with a defect report. For more details on the full range of KRC

kits send an s.a.e. to the address given above or check out the website at www.hometown.aol.co.uk/kitradioco/uk.htm



If you're thinking of building a t.r.f. receiver, why not try this one? The Kit Radio Company (KRC) has just launched the KRC-4, a t.r.f. receiver kit aimed particularly at the first time builder.

The KRC-4 features plug-in coils to cover both the medium and short wave bands. Using a single transistor reflex circuit, KRC say "this receiver couldn't be any simpler, but the audio output is more than adequate to drive a crystal earphone".

Supplied with engraved front panels ready for painting in a colour of your choice and a



Radio Mics use WiNRADiO

Short Wave Magazine has just discovered that the Australian radio manufacturer WiNRADiO, wide band external receiver the WR1550E is used 'extensively' for monitoring the performance of various radio mic systems. Well known bands and performers such as ColdPlay, Metalica, Sting and Vanessa Carlton, as well as TV shows such as Channel 4's *Hollyoaks* all use WiNRADiO sweep receivers to check frequencies before mic channel allocation.

Radixion, the UK agents for WiNRADiO have recently shipped WR1550E computer based receivers to the pop band ColdPlay who have joined the group of users. An obvious use but neat all the same.

WiNRADiO

Yearbook Exclusive

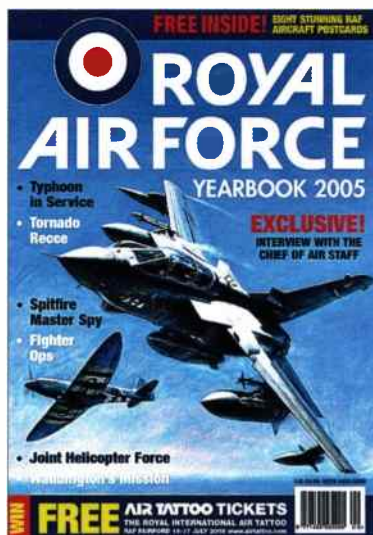
The future make-up of the world's oldest independent air force and its role in the 21st century has been outlined by Chief of Air Staff Air Chief Marshal **Sir Jock Stirrup** in an exclusive interview for the *RAF Yearbook 2005*.

The yearbook, which is published by The Royal Air Force Charitable Trust Enterprises (RAFCTE), offers an in-depth look at strategy, operations and deployments, as well as examining the latest leading-edge aerospace technology.

In the interview, Sir Jock, who next year succeeds General Sir Michael Walker as Chief of Defence Staff, outlines his vision of a more agile and adaptable Royal Air Force based on well-trained people making the most of technological opportunities. He says that whilst the Royal Air Force would continue to change and consolidate to meet future needs, it was not a "declining business". "We are in greater demand today than ever", he said.

In addition to the exclusive interview, the bumper 100-page magazine also includes the latest on the Eurofighter Typhoon, details of a new battle management group at RAF Waddington, Marham's Tactical Intelligence Wing plus a report on last year's largest exercise in the UK – *Eagle's Eye*. There is also competition to win tickets to the Royal International Air Tattoo plus a superb collector's set of eight, free postcards featuring a range of historic and current aircraft of the Royal Air Force.

The new-look *Royal Air Force Yearbook 2005*, which incorporates the RAF's latest, official logo branding on its front cover, is on sale at WH Smiths and all good newsagents now. It can also be purchased online at www.airtattooshop.com



RAF Waddington Airshow

The RAF Waddington Airshow takes place on 2-3 July and included in this year's show will be some very special pictures and mementoes for visitors to buy to help raise money for the Lincolnshire & Nottinghamshire Air Ambulance.

BAE Systems have closed The North Sea Range, which lies off the coast of Lincolnshire and vacated their offices at RAF Waddington. The range was used British and visiting overseas aircrew for their air-to-ground target practice. BAE Systems would collate the information received by their equipment sited along the range and the crews would then return for a de-brief. Over the years, it became tradition for the crews to leave an autographed photograph of their planes and these have been donated to the Lincolnshire and Nottinghamshire Air Ambulance.

The Air Ambulance, an M D Explorer helicopter, is based at RAF Waddington and covers a total of 4800km. The charity relies on donations and fundraising events to cover the annual running costs of £1.5 million. The Explorer will be on display at the Waddington Airshow.

The Airshow is a must for all enthusiasts, so why not make a date in your diary and go along? Full details can be found at www.waddingtonairshow.co.uk

Licence Free Radios from Maxon

Maxon has recently released the new VK-446 two-way personal radio for use on the PMR 446 licence free private mobile radio service. The VK-446 is designed for users of all ages and could be used for a shopping trip, going for a picnic at the beach, or just hanging out around the park with its coverage range of 3km.

These versatile radios use CTCSS for selective calling, which is particularly useful in multiple user environments. Maxon state that the VK-466 boast clear voice quality, as well as a number of practical, easy to use features.

The VK-466 offers several call management features including a talk confirmation tone that signals to others when one party has finished talking. In addition, the VK-446 comes with 10 different call tones, as well as an audible call tone to get others' attention before one party starts talking.

Main features of the VK-446 include:

- 8-Channel capability
- Up to 3km range
- Channel Scan
- Hands-free voice (VOX) operation with 3 levels
- 10 different call tones
- Large, back-lit l.c.d.
- Keypad lock
- Auto Squelch
- Headset/mic jack

The VK-466 licence free radio is sold as a pack, which consists of two radios, two neck loops, two external speaker/microphones and a user manual, costing **£39.99** and is available from Maxon dealers nationwide. Contact Maxon on **(01442) 267777** for your nearest stockist. For more information on the VK-466 take a look at www.maxon.co.uk/vk446.htm



Free CDXC Membership With ML&S

The Chiltern DX Club (CDXC) is internationally known for their h.f. operators, particularly in DXing and contest operating. The CDXC is the UK's largest h.f. DX and contest-orientated group of radio amateurs and was founded in the early 1980s by a small group of keen DXers in the Chiltern Hills of South East England.

Starting in June, **Martin Lynch & Sons** in conjunction with the 'Big Three', Yaesu, Kenwood & Icom are offering **free** CDXC membership to everyone who purchases an h.f. transceiver from their Chertsey store during that month. This is a limited offer and closes later this year.

Martin Lynch commented "The members of CDXC promote excellent operating standards throughout the h.f. bands and it's a pleasure to offer assistance in further recruitment. Score 10/10 to the manufacturers for their help in sponsoring the idea too".

So, what are you waiting for? Martin says: "Make that purchase today!"

communiqué

In The Clear with Heil

Check out the Heil CLEAR-SPEECH d.s.p. speaker available now from Waters & Stanton PLC. The Heil CLEAR-SPEECH is billed as a high quality d.s.p. speaker with easy-to-use controls. It has a front panel mounted five-step switch for selecting the depth of d.s.p. control for different noise sources.

It also has a separate volume and tone controls, as well as a bypass switch and it is fitted with an i.e.d. sensitivity input level monitor. The audio is further enhanced by an acoustically tuned enclosure for superb audio quality. There are separate sockets for an external speaker (if required) and headphones.

The CLEAR-SPEECH can be used for all communications - amateur or professional, fixed or mobile. Housed in a smart black case, the CLEAR SPEECH costs **£169.95**, is supplied with fixing bracket and is available now from **Waters & Stanton PLC., 22 Main Road, Hockley, Essex S55 4QS. Tel: (01702) 203353, FAX: (01702) 205843, E-mail: sales@wsplc.com Website: www.wsplc.com**



Radio Sweden

The year 2005 marks a number of anniversaries for Sweden. It's the 100 year anniversary of the peaceful dissolution of the union of Norway and Sweden, the 150th anniversary of Swedish postage stamps and the Centenary birthday celebrations of Dag Hammarskjöld, former Secretary General of the UN, and Greta Garbo.

Radio Sweden can be heard in Europe from 1230 - 1300 and 1330 - 1400 on 15.735MHz, 1730 - 1800 on 6.065MHz and 1179kHz, 1900 - 1930 on 1179kHz, 1930 - 2000 and 2130 - 2200 on 6.650MHz.

Radio Sweden, SE - 105 10 Stockholm, Sweden. Website: www.sr.se/rs/

Skywards with WRN

One of the leading satellite transmission companies for the UK radio industry, WRN, is now hosting Virgin Radio *Classic Rock* on its 'RADIO' channel, Sky Digital 934, from Sunday 1 May, 2005. Having commenced on 1 May WRN is receiving the Virgin Radio Classic Rock feed at its central London broadcast centre and inserting it into its 'RADIO' channel. WRN is also undertaking the EPG submissions to Sky Digital that Virgin Radio is producing for its classic rock station.

The 'RADIO' Channel is one of several unique and innovative service offerings developed by

WRN for radio stations seeking access to Sky Digital. **Richard Jacobs**, WRN's Business Development Manager, said: "We developed the 'On Air' service a year ago as a home for broadcasters seeking temporary positions on the Sky platform - either because they are waiting for their own channel number, trialing a station or operating over a temporary period of time. Twelve months on, we now operate two such channels - 'RADIO' on 934 and "On Air" on 938 and I am really delighted that through the 'RADIO' channel we're hosting Virgin Radio *Classic Rock*".

'Hanoi Taxi' Makes Airshow Debut

A historic aircraft that was the first to airlift USA prisoners of war from North Vietnam on 12 February 1973, will make its European debut at the Royal International Air Tattoo, at RAF Fairford, Gloucestershire on 16-17 July. The C-141 'Hanoi Taxi' is based at Wright-Patterson Air Force Base, in Ohio and its participation in this year's Air Tattoo will present the first and last opportunity for people to see this aircraft in Europe before it is retired in early 2006.



The aircraft's name comes from the writing inscribed upon the flight engineer's panel by those Prisoners of War who boarded the plane for the freedom flight. Signatures of the freed prisoners have been preserved on the panel over the years and are the centre piece of what is essentially a flying museum.

Plaques, documents and photographs of the homecoming are part of the on-board exhibit researched and created by the 445th Airlift Wing. Etchings of the names of those who were missing in action were taken from the Vietnam Wall in Washington and are mounted on the plane.

Air Tattoo Director **Tim Prince** said he was delighted that the appearance of the Hanoi Taxi would continue the Air Tattoo's long tradition of bringing rare and interesting aircraft to the Tattoo. "The Air Tattoo is a celebration of aviation in all its guises and it is particularly pleasing when we host the visit of an aircraft that took part in a specific historic event. This is just another example of the incredible support we receive from the US Air Force."



rallies

May 29: The Mid-Ulster Amateur Radio Club are holding their rally and computer fair in The Embankment, Derrymacash, near Lurgan, Co. Armagh. Doors open at 12 noon and there will be all the usual trade stands, Bring & Buy, pub lunches, etc. Talk-in on S22. **Ivan** on **02838 342501**.

May 29: The Waters & Stanton PLC Open Day takes place at their Holey Shop today. For full details telephone **(01702) 206835**.

June 5: The Spalding Radio Rally. Doors open 1000 (0730 for traders). Talk-in on S22 and admission is just £2. There will be indoor traders and outdoor pitches with plenty of free, tarmac parking on site. **Ambrose MODJA** on **(07989) 636520**, E-mail: **m0dja@qsl.net** or **John G4NBR** on **(07946) 302815**.

June 5: The 9th Red Rose QRP Festival is to be held at the Formby Hall, Alder Street (off High Street), Atherton, Manchester. This is a friendly get together, to promote low power amateur operating and home construction. There will be trade stands and individual stall, sale of new and surplus equipment and components, club stands, low cost Bring & Buy, Morse receiving tests with certificates, all in large spacious halls at ground level, with a huge, free car park and disabled facilities. Talk-in on S22 and admission is just £1.50. More details from **Les Jackson G4HZJ** on **(01942) 870634** or E-mail: **g4hzj@ntlworld.com**

June 12: The Elvaston Castle National Radio Rally will be held at Elvaston Castle. There will be a craft show, giant flea market, grand Bring & Buy, Children's entertainment and much more. Parking is £6 for cars and £12 for coaches and this includes entry to the rally. There is on-site catering and licensed bar facilities.

June 19: The Worthing & District Amateur Radio Club are holding their Summer Rally at Newhaven Fort Museum from 1030 till 1430. A special entrance fee of £2.50 has been agreed, which will also give amateurs access to all other Fort facilities, including GB2NFM and the display of radio equipment from the past. Tables are provided at £15 for traders and £10 for private sellers and clubs. Tables must be booked in advance. Any profits from the rally will go towards enhancing the radio museum display at the Fort. Newhaven is in Sussex, midway between Brighton and Eastbourne, and the Fort is well signposted from the centre of the town. This date is also the date of the London to Brighton charity bike ride, so traffic may be heavier than normal. It is also Fathers Day, so what better way than to spend it with the family at the Fort Museum, taking in the rally and the spectacular views across the Channel. An impressive day out! **Jim G4XRU** on **(01273) 473505** or visit **www.wadarc.org.uk**

June 19: The Annual Newbury & District Amateur Radio Society's Car Boot Sale takes place at the Ackland Memorial Hall, nr. Thatcham, Berkshire. Directions and a map can be found on the club's website, visit **www.ndars.org.uk**

June 19: The East Sussex Wireless Revival takes place at 0930 at the Suffolk Showground, Felixstowe Road, Ipswich. There will be ample car parking and well signposted access. The main attraction will be the radio car boot sale. In addition there will be a Bring & Buy, book stall, h.f. station and local club stalls, as well as food and refreshments. More information from **www.btinternet.com/~thomassg/eswr.htm** or contact **John Quarmby G3XDY** on **(01473) 717830** or **Steve Thomas M1ACB** on **(07720) 412648**.

Horncastle Rally

Make a date in your diary to visit the Horncastle Radio and Computing rally in July.

The Horncastle Radio and Computing Rally takes place on Sunday 24 July at Horncastle Youth Centre, near the Wong, Horncastle, Lincolnshire from 1030 hours. Entry is just £1, very young accompanied children, free. Why not go along and join in the fun?

More details are available by calling **(01507) 527835** (sensible hours please) or by E-mailing: **g3zpu@hotmail.com**

Dover Radio Club Success



■ Above, from left to right: David Harding G0DQI (Lead Instructor), Sue Asling, Steve Asling, Barry Wise, Chris Loughran, Cecil Armstrong G0OJZ (Senior Invigilator), Graham Cahill 2E1ITE (Assistant Invigilator), Samantha Evans (9), Ben Sutton, Samantha Whitlock, Brian Joyner G8ZYZ (Assistant Instructor).



The Dover Radio Club are pleased to announce that their latest Foundation Course has bought the club success yet again, with passes for all those who took part. Held on 16 April, the photos here show the successful candidates. A big well done to all the new Dover licensees! If you're interested in joining the Dover Radio Club check out their website at **www.darc.org.uk** to find out how to get involved.

■ Left, from left to right: David Harding G0DQI (Lead Instructor), Graham Cahill 2E1ITE (Assistant Invigilator), Cecil Armstrong G0OJZ (Senior Invigilator), Brian Joyner G8ZYZ (Assistant Instructor) with Samantha Evans aged 9.

Broadcasts in English

The Summer 2005 (A05) edition of *Broadcasts in English* is now available from the British DX Club. Compiled by Dave Kenny this latest edition contains details on all currently known international broadcasts in English on short wave and medium wave for the A05 schedule period.

The 32-page booklet is presented in time order throughout and covers all target areas. Transmitter sites are given where known. Also included is a comprehensive guide to DX and Media Programmes; schedules for Digital Radio Mondiale (DRM) transmissions and World Radio Network in English to Europe.

To get your copy of *Broadcasts in English* send the appropriate payment to the **British DX Club, 126 Bargery Road, Catford, London SE6 2LR**. Copies cost: United Kingdom - £2 Sterling; Overseas - 6 International Reply Coupons; 5 Euros or \$5 US. Sterling payments should be made by cheque or postal order to British DX Club. Dollar or Euro payments to be made in cash. Payment can also be made via Paypal - please E-mail **secretary@bdxc.org.uk** for details.

For more details on the BDXC-UK take a look at **www.bdxc.org.uk**

Bearcat UBC-105XLT

Dave Roberts is reminded of early scanning experiences by the new entry level Bearcat hand-held.



SUM
REVIEWED
ITEMS

The very first scanning receiver that I ever set eyes on, was a Uniden Bearcat 220FB. The year was 1977 and I watched enthralled as the owner, who had spent a serious percentage of his week's wage buying it, soon had it monitoring the police personal radio frequencies at u.h.f.

This guy was a very dedicated scanning fiend. His Austin Maxi was always to be seen parked in high locations while he plucked signals from the air. Just to keep this in perspective I only had an old 2m band receiver in my rusty Hillman in those days. That first exposure to what the Bearcat could do



grabbed my attention and fired an enthusiasm that has never deserted me and one that has cost me plenty of cash over the intervening years.

The thrill is still there and the new Bearcat UBC-105XLT has done nothing to dissipate it. Here in the small garret where I spend much of my day there are always at least two Uniden scanners running. The Uniden company must have made as many radio receivers as Henry Ford knocked out jalopies.

Sturdy Set

For a purchaser who knows his subject the Uniden packaging always clearly indicates just what is featured in the radio. In this case we are told that the radio possesses nine bands with six pre-programmed search bands, ten storage banks with priority channel and a 'direct frequency search' option. This means that at the touch of a button you can search up or down from the frequency entered in any memory channel.

The UBC-105 is supplied with a 160mm long rubber encased antenna and a belt clip. Inside the set is a battery compartment that holds four AA cells.

The antenna is attached to the set top by a trusty BNC connector. This is a 'good thing' as it allows easy connection of an external antenna by this means. If you don't think that this is a useful feature, just try making up a patch connector for the SMA connectors that are increasingly common on radios these days!

The Chinese manufactured UBC-105 fills the hand as nicely as John Wayne's shotgun being about 150mm tall by 65mm wide. The UBC-105's case is made of sturdy plastic and gives the impression that it will stand up to a fair bit of tough usage.

Easy to Use!

Life is a complicated journey. These days even telephones come supplied with a weighty instruction manual. The UBC-105 has a small instruction pamphlet supplied with it, which I made a conscious effort not to look at for the first five minutes as I wanted to see just how straightforward it was to programme the radio. I can honestly say that without reference to the handbook I had the batteries and antenna installed, a dozen or so frequencies loaded up and was receiving a couple of airline pilots nattering to each other on 123.450MHz, (they were beefing about an air traffic controller) all within the five minutes I had allowed myself. It's that simple! Then I examined the manual. It's written in understandable English and guides the reader, logically, through the procedures required to start entering frequencies and searching bands.

Supplied without batteries, the UBC-105 can be run on any AA sized cells. A 9V power adapter/charger is an optional extra that plugs into the coaxial power socket on the side of the set. I would recommend purchasing the adapter and

running the receiver from that source when mains power is available and when out portable, you can't beat Manganese Alkaline batteries such as Duracells. I've been let down much too often by NiCad batteries to trust them.

On/off and volume are controlled by a rotary control on the top panel as is the squelch setting. This is where the earphone socket lives too. The front face has the usual liquid crystal display section that indicates, frequency, channel and the operational mode in use. Below the display are the 21 buttons that control programming and functions, including one that switches the display back-light on, and lower still is the radio's speaker. This set does not allow a choice of mode. The airband segment, basically 108-137 is all a.m., the rest is all n.b.f.m. It makes programming simple I can tell you. Select the channel you want to fill. Enter the frequency (don't forget the decimal point), press enter - that's it. I reckon even a professional footballer could manage to do it!

Likewise searching. Hold the limit/band button for two seconds and a search band with its limits is displayed. Don't want that one? Fine, just hit the up or down arrows until you find a band you do want and remove finger. The UBC-105 starts the search all on its own. If it stops on something you want to store just press the MON/CLR button and that frequency is stored in a 'Monitor Memory' a kind of scratchpad that holds up to ten frequencies that can be assigned to proper memory channels later. Then tap the up or down arrows to resume your search - excellent.

Search & Scan

This radio has the usual American style 5kHz search and channel steps at the 29-54, 137-143 and 146-174MHz ranges. 144-146 and 406-512MHz all have 12.5kHz steps while the civil airband enthusiast will be well pleased that the 108-137MHz segment is searchable in either 12.5 or 8.33kHz steps. Similarly, frequencies within these parameters can be entered into the memory channels. Running through smaller segments of the search bands can also be accomplished, although not quite as simply as other functions. Annoying stoppages on data frequencies or where unwanted internally generated signals (birdies) appear, can also be skipped at the touch of a button. Search speed runs at twenty steps per second while scanning is accomplished at seventeen channels per second. The hundred channels available can therefore be scanned in at total of just under six seconds. Any one of the hundred available channels can be designated as a 'priority' channel to be scanned every two seconds whatever else the set happens to be doing at the time.

Individual memory channels can be 'locked out' to ensure that they are ignored when a scan is taking place but as the handbook says, "Record the locked-out channels in some convenient place". Good advice indeed.

The scan process is delayed for two seconds when a signal is received and then resumes should no further transmission be received on that channel.

The set's 100 memories are arranged in ten banks of ten channels. Each bank can be switched in or out of the overall scan if required.

Performance

Reception with the supplied antenna is adequate and appears to be just as sensitive as my Kenwood TH-F7 on two metres and high v.h.f. frequencies. The same goes for u.h.f. I couldn't resist hooking the UBC-105XLT up to an external whip antenna mounted about 3m off the ground. This is where I had some real fun. During the very first scan I heard an aircraft that had previously called "mayday" on a military u.h.f. frequency, (not covered by the UBC-105), come up on the local airfield approach channel saying that he had lost all his engines and was considering ejection. I bet he was! The pilot was down safely in just a couple of minutes before the normal emergency procedures could be initiated, but I did hear a number of frequencies leap into life as other services

were notified, albeit the pilot was safe in the gents loo at the airport by the time they were all ready.

The audio output is specified at just under a quarter of a watt and my view is that perhaps the set could do with a tad more. Although the recovered audio characteristics are such that they somehow compensates for the slight lack of audio power.

The frequency steps at v.h.f. high band are not in step with the UK allocations, but entering a frequency as near as possible to that required produced acceptable results due to the not too narrow filtering. I could, for instance, clearly monitor transmissions on 154.8625MHz by programming 154.860 into the selected channel. Not a surprise really but nevertheless satisfying. The lack of low v.h.f. coverage in the 70 and 80MHz region is a bit of a disappointment but check the price. This is an entry level scanner - remember?

The UBC-105 will particularly appeal to the civil airband enthusiast who will also need to monitor the u.h.f. ground frequencies in use at airports. The v.h.f. and u.h.f. amateur bands are very well catered for, as is marine v.h.f. band.

Does What it Says

This entry level Uniden set is so very easy to programme and use and this just has to be a big plus in any receiver, especially one that is very much a 'grab and go' unit. Its rugged construction and reasonable price will also make it useful to anyone whose requirement is for a scanning receiver in connection with their employment or as an accompaniment to another interest for example sailing or aviation.

The UBC-105XLT is a basic scanner that gets you going very quickly indeed. It would be a useful addition to anyone's scanning armoury, whether they already possess the latest and most expensive radio toy, or just have a need to hear what's going on in the area. It does what it says on the box and for me, recreated that original thrill that I had when I first got my hands on the old Bearcat 220FB all those years ago.

Thanks go to **Nevada, Unit 1, Fitzherbert Spur, Farlington, Portsmouth, Hampshire PO6 1TT** Tel: 0203-9231 3090.

E-mail: sales@nevada.co.uk The UBC-105XLT costs £99.95 plus P&P.

SWM



Specifications:

Memories:	100 in ten banks of 10, 10 monitor memories, priority channel, memory lockout, 20 search skip frequencies.
Frequency coverage:	29-54MHz, 108-137MHz, 137-144MHz, 144-146MHz, 146-174MHz, 406-512MHz.
Scan speed:	17 channels per second
Search rate:	20 steps per second
Modes:	108-137MHz a.m., all others n.b.f.m. (no manual override).
Audio output:	230mW into 8Ω Internal speaker or 40mW into a 64Ω earphone.
Power requirement:	2x AA cell or 9V d.c. external.
Weight:	216g without batteries.

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Ultimate Scanning Guide

By Richard Allport

Includes FREE Frequency Search CD

When the first edition of the 'Radio Today Ultimate Scanning Guide' first appeared in 2001 it set new standards in that expected from Scanning books. Not only did the directory claim to have a greater accuracy than other guides it also contained for the first time a searchable CD of the frequencies. Time has moved on and this edition of the book has many new features and touches. For those not familiar with Scanning directories this book provides a simple way to work out exactly who is broadcasting on a given frequency. The reader is provided with clear guidance as to what is available to listen to and what should be avoided. As with the previous edition the listings have been edited to ensure that defunct and duplicated entries have been deleted. This again makes the Radio Today 'Ultimate Scanning Guide' the most accurate and useable directory available. As before this book also contains a free searchable frequency CD. When this first appeared in the Radio Today 'Ultimate Scanning Guide' the CD caused a sensation and the new version is significant step forward. With an improved interface and lightening quick searching this is a boon to any scanning enthusiast. If you are a long standing scanning enthusiast or new to the hobby then you will find this book a "must have" for your book shelf and the yardstick by which every other book in this field is judged.

Size: 240mm 174mm, paperback, 464 pages ISBN: 1-905-08606-7

APRS:

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World Radio History

Scanning Scene

- **Dave Roberts** *do SWM Editorial Offices, Broadstone*
- **E-mail** *scanning@pwpublishing.ltd.uk*

Imagine that scanning receivers from the Uniden Bearcat company must be among the most popular in the world. As a result there are many accessories manufactured for the range and yet another one designed for UBC base station scanners has come to light. It's a Radio Frequency Interference (RFI) enclosure made by Triton Engineering in Chicago, Illinois. Intended for use by the military.

The idea of the RFI enclosure is that the Bearcat is operated within the enclosure thus preventing the spurious r.f. signals from causing interference to other electronic equipment. Of course the reverse will also be the case in that the enclosure will also prevent interference getting into the radio from other gear such as computers and the like. A company called Toronto Surplus and Scientific in Canada are selling them for \$35.

It's certainly interesting to ponder on just how much radio scanning is done by military units throughout the world. How many other 'official' scanner users are there in Britain?

I know that in the past the police forces purchased AR1000 hand-held units but these were fairly deaf. The Interference Investigators from the Department of Trade and Industry initially had AR2002 sets fitted in their cars but then

went over to another model (I shall not name it) with which they were less than delighted. The AR2002 was popular with many users as the control and monitoring software that was around at the time for the set was way ahead of anything else available.

Some official types were using the FRG-9600 as well. I remember visiting official premises where in one room banks of these were sat on shelves - all hooked up to antennas. In another room were about 60 Racal receivers all on single h.f. frequencies. I asked no questions.

What scanning receivers are the authorities using these days? Not all of the government units will be equipped with Rhode & Schwarz equipment.

Personally, I use an AR2002 that, since it was donated to me by my mate 'Arry, has never been turned off. Only ceasing to work when the mains power fails. The radio is still a really good receiver only hampered by the 20 channel availability and rather slow scan/search speed.

Radio Grand Prix

It's almost that time of year again - yes the British Grand Prix is to be held at Silverstone, Northamptonshire on the 8, 9 and 10 July. Some of the teams have announced their



intention to go fully encrypted, notably McLaren Mercedes whose new radio system has been supplied by Kenwood and is built to military encryption standard. The system is not infallible though as **Kimi Raikonen**, one of the McLaren drivers, found out when his radio failed during a recent Grand Prix.

Raikonen was blissfully unaware of the fact and carried on blasting down the track happily in ignorance of the fact that he was running out of fuel. The deployment of an old fashioned pit board saved the day and his tank was topped up just in time. Similarly Ferrari are believed to be running digital radios this season.

If you are in the area try searches between 160 and 170MHz, 147 and 154MHz and 453 to 468MHz. There'll be plenty to listen to. It's also possible that some of the old police u.h.f. channels (around 450MHz) may be active as well.

Airwave TETRA

First it was Pye, then it became Philips, then Simoco. Now called Sepura, the telecommunications company has just received an order for 1800 Airwave TETRA radios (sorry – terminals) from the British Army. The UK military, rather unsurprisingly, announced that Airwave would be the successor to the outdated MOULD radio communication system that has covered Britain in a very insecure fashion.

The extra radios may or may not have anything to do with the recent announcement of the formation of a Special Reconnaissance Regiment whose primary role will be to undertake surveillance and gather intelligence on terrorist operations. Open to applicants from all armed services, both men and women, the Regiment will no doubt have requirement for hand-held and covert radio equipment.

Cosmos Launched

Sometime between 20 April and 30 May a spacecraft called *Cosmos 1* will be launched from a submerged Russian submarine in the Barents Sea, the launch vehicle being a Volna rocket. The spacecraft's flight will last around six weeks before the orbit decays and it's burned up on re-entry.

The purpose of the mission is to establish the feasibility of 'solar sails', large deployable panels that catch solar particles known as solar wind, with a view to them acting as a propulsion medium for the spacecraft. Should the launch take place the ground controllers will be receiving data from the craft, which will end up in an orbit around 1287km high. Listen for the data on 401.4725MHz.

Microphone Use Increase

There seems to be an increasing use of radio microphones these days. Churches, public places, events and, of course, performances use these little gadgets that can be purchased from on-line auction sites for only a few pounds. Whether licensed or not they are becoming increasingly popular. Try monitoring for them from about 173 to 175MHz. There's a lot more activity on this band than you would immediately imagine.

Another thing, just because you don't reside anywhere near the sea or a tidal waterway, please don't ignore the v.h.f. Marine band. Pirate activity often occurs between 156-



163MHz on v.h.f. Even small boats that shouldn't, are heard using these frequencies, likewise taxis and other land based pirates.

Taxi!

Some months ago I reported on a small taxi company in the home counties who had been using an illegal cordless telephone system that had saved them a fortune in redirected mobile telephone calls. I've heard on the grapevine that disaster struck for them in the shape of some chaps from the Department of Trade and Industry or similar who turned up to check out their radio licence.

Sadly, for the cabbies the DTI guys spotted the rather obviously odd antenna on the roof of the terraced house from where they operate and, being experienced people, they immediately recognised the system as being illegal. Well it would be, as it operates on military air bands!

The taxi staff were full of praise for the Investigators and said that they were very pleasant people. The kit was confiscated and no further action is being taken. Apparently the taxi guys were told "We've confiscated dozens of these systems."



Listening In

Finally, as summer is very nearly here, should you holiday in France and take your GSM mobile 'phone with you, rest assured that the security services there have just made it easier for themselves to listen to your calls. They have purchased equipment that enables them to monitor mobile 'phone calls without the necessity to have to go via the service provider and apply for authority to do so...all the legal stuff must be so tiresome!

The equipment emulates the mobile 'phone base and basically when the handset asks, 'What level of encryption should I use?' the software answers, 'Don't worry mon frere, pas d'encryption est required', or something like that. The French Security services can then just 'ear ze calls. But the wine and ciggies are cheap aren't they?

Scanning Frequency Snapshot

Kevin Nice presents a quick selection of some interesting frequencies for your scanner's memories.

Coastguard VHF channels

Channel No	Frequency (MHz)	Comments
0	156.000	This is the Coastguard SAR frequency and is for Coastguard use only. Marine band radios will not normally be fitted with this channel.
99	160.600	Coastguard search units (often used by Auxiliaries) Another channel fitted only to Coastguard radios where it may be labelled P.01.
16	156.800	Distress and calling channel.
6	156.300	On scene search channel.
10	156.500	Pollution control channel. Used also for weather forecasts in some areas.
23	157.150	Weather forecasts and sometimes use by lighthouse maintenance staff. (paired freq. is 161.750MHz).
53	158.650	Mountain Rescue - this channel not fitted in normal marine sets.
53A	153.600	As above.
13	156.650	Sometime rescue use - channel also preferred by DERA/QinetiQ MOD Ranges.
67	156.375	Working channel and weather, some use as a secondary calling channel in Solent area.
73	156.675	Weather and working channel.
86	157.325	Paired with 161.925 in some areas. Weather Ch.
70	156.525	This is the DSC channel using data.
30	157.500	Lighthouse maintenance staff.

St. John Ambulance Channel Line-up

Low band channels:

Channel	Displays	MHz
1	LSJ1	77.6875
2	LSJ2	86.3375
3	LSJ3	86.3500
4	LSJ4	86.3625
5	LSJ5	86.3750

VHF

Channel	Displays	MHz
1	SJA 1	173.0500
2	SJA 2	169.3125
3	SJA 3	164.0625
4	SJA 4	173.0625
5	SJA 5	164.0500
6	SJA 6	173.0875
7	SJA 7	169.0875
8	NSJ 1	National channel to be allocated
9	NSJ 2	As above

CTCSS tone on all the above is 186.2Hz.

St. John ambulances team u.h.f. sets:

Channel	Displays	MHz
1	USJ1	449.3125
2	USJ2	449.400
3	USJ3	449.475

World Rally Championship

MHz	Mode	Use
169.150	n.b.f.m.	Simplex
169.3625	n.b.f.m.	Simplex
452.750	n.b.f.m.	Repeater output
457.305	n.b.f.m.	Course technical services
457.280	n.b.f.m.	?
457.420	n.b.f.m.	TV director.

UK VHF Search And Rescue

Ch	MHz	Mode	Use
0	156.000	n.b.f.m.	Coastguard and remote land SAR units
24b	161.800	n.b.f.m.	land SAR units
42a	157.200	n.b.f.m.	simplex air-to-ground
53a*	158.650	n.b.f.m.	Primary Simplex
62b	160.725	n.b.f.m.	Land SAR units
63a	156.175	n.b.f.m.	Land SAR units
63b	160.775	n.b.f.m.	Land SAR units
64a	156.225	n.b.f.m.	Land SAR units
64b	160.825	n.b.f.m.	Land SAR units
73	156.675	n.b.f.m.	
83a	157.175	n.b.f.m.	Infill repeater linking
83b	161.775	n.b.f.m.	Infill repeater linking
91	155.350	n.b.f.m.	Can be paired with 92
92	147.475	n.b.f.m.	If this occurs then pair known as Ch 94
93	152.850	n.b.f.m.	Simplex frequency
95	86.3125	n.b.f.m.	Primary low band channel
96	86.325	n.b.f.m.	Secondary low band channel
99	160.600	n.b.f.m.	Coastguard use only

*On occasions may be paired with Channel 93 with 53a being the mobile transmit channel and 93 being base transmit.

British Grand Prix

Here are a few 'up-to-date' frequencies. Though the teams and their communications change on an almost hourly basis so this is the best current shot of a few to monitor, although a good general search cannot be beaten at this event.

Output (MHz)	Input (MHz)	Mode	User
146.1875	-	n.b.f.m.	Jordan drivers
150.200	-	n.b.f.m.	Jordan drivers
151.275	-	n.b.f.m.	Jordan drivers
163.6375	159.1375	n.b.f.m.	Williams drivers
164.4625	169.4375	n.b.f.m.	Williams drivers
167.975	172.775	n.b.f.m.	Marshals
442.56875	-	n.b.f.m.	Jordan drivers
450.225	-	n.b.f.m.	McLaren
450.700	-	n.b.f.m.	Race engineers
453.925	-	n.b.f.m.	Security
456.675	462.175	n.b.f.m.	General Silverstone traffic
458.13125	468.000	n.b.f.m.	Renault
458.25625	468.250	n.b.f.m.	Renault
462.1625	-	n.b.f.m.	Race engineers
463.8875	-	n.b.f.m.	Renault engineers

The police helicopter video down-linking, usually have a busy weekend as the Chiltern Air Support Unit normally reports on the traffic queues and shows suitable aerial shots to their control facility.

The web is nearly over - watch these pages for further details.

Coming soon!
The UK Scanning Directory 9th Edition
Britain's most comprehensive frequency guide.

The long-awaited new, updated edition of this indispensable handbook for scanner users and frequency collectors will soon be available from the publishers of *Short Wave Magazine*.
 The last edition was a bestseller and we've spent many months updating it discarding old, outdated frequencies and adding thousands of new, verified ones to make sure the new edition is the most up-to-date and accurate frequency list available.
 As well as wide-ranging frequency lists, we've also included specially written articles on scanning for beginners, how to monitor the military and the civilian aviation bands, PMR, rallying and Formula 1 racing to make it essential reading for all radio enthusiasts.

ARCC - Kinloss Rescue

The number of lives saved by the actions of Kinloss Rescue amount to much more than mere statistics. Recently Ben Hogan paid ARCC a visit to learn more.

Every organisation in the world needs administration staff, a significant proportion of whom are statisticians, whose task is to cost and evaluate every operational facet of the business or service. The television and radio news constantly remind us of the amount of paperwork that, for example, the police have to complete to indicate how many people they have stopped, arrested or booked. Crime prevention statistics are always quoted although it has to be almost impossible to calculate just how many crimes have not been committed i.e. prevented. This obsession with figures surely increases the stress quotient of public service administrators everywhere.

■ *The sign outside the externally unprepossessing Aeronautical Rescue Coordination Centre.*



It must be an arduous task to have to quantify the service provided by any organisation in receipt of public funding. Well - actually not in all cases. You see, if you happen to be the administrator at the Aeronautical Rescue Coordination Centre (ARCC) at Kinloss, Morayshire, in Scotland you can inform your public with confidence just how many life threatening incidents have been attended by assets under your control. And the incident count for 2004, is 1529. That's an average of just over four a day. The figure means that, in effect, the number of people whose lives are saved as a direct result of intervention by the staff at the ARCC Kinloss must run into thousands each year.

In Britain there are many organisations and groups involved in 'on scene' life saving activities. Just think of a few, such as: Fire, Police and Ambulance services, Lifeboats, HM Coastguard, Mountain Rescue teams, Search and Rescue Dogs and Cave Rescuers. I'm sure that I've not listed all of them by any means. There has to be some overall control of units engaged in any major rescue operation and this is where the ARCC comes in. Located in an inconspicuous, low, building at the Royal Air Force base at Kinloss in Morayshire, the ARCC provides a 24h co-ordination function for aeronautical assets every day of the year.

The ARCC at Kinloss was opened in 1996 and replaced Regional Coordination Centres at Plymouth and Dunfermline (which was known as RCC Edinburgh). The ARCC has responsibility for just over two and a half million square kilometres of the Earth's surface on and around the UK bounded by 61° north, 45° south, 3° east and 30° west.

Saving Life

The mission of the ARCC is to assist in the saving of life through the efficient co-ordination of information and assets. The ARCC is responsible for the Operational Control of RAF Search and Rescue (SAR) helicopters, Royal Naval SAR helicopters and RAF Mountain Rescue Teams; with Tactical Control of the SAR Maritime Patrol Aircraft. The ARCC is specifically responsible for the co-ordination of military and civil aeronautical SAR within the UK Search and Rescue Region.

Tasks undertaken may involve: UK military SAR, NATO military SAR, Civil aeronautical SAR and civilian

SAR-Operations at the request of the Maritime Coastguard Agency and police. There can be Medevacs requested by Health Authorities, along with Support within Military Aid to the civil community. It will come as no surprise to anyone that most of the ARCC's time is spent in assisting civilians wherever they are.

To this end they have some impressive assets at their disposal including Westland-Sikorsky Sea King helicopters at RAF bases at Lossiemouth (also in Moray), Boulmer in Northumbria, Leconfield, Yorkshire, Wattisham in Suffolk, Chivenor in Devon and RAF Valley in Wales. Royal Navy Sea Kings are also deployed from HMS *Gannet* at Prestwick and HMS *Seahawk* at Culdrose in Cornwall. The Royal Air Force also have five Mountain Rescue Teams that they can deploy. These are at Kinloss, Leuchars, Leeming and RAF Valley in Wales.

In addition there is always an RAF Nimrod MR2 aircraft on 60-minute standby at Kinloss, in practice they're in the air faster than this if required. The Nimrod will then be used as a search tool, and to provide 'top cover' for other rescue aircraft engaging in rescue operations and also as a communications platform for any assets involved in SAR.

With all this responsibility and hardware at their disposal, you might expect to find an Operations Room at ARCC Kinloss that's a massive void filled with a multitude of functionaries. In practice there are very few staff on duty at any one time. There is an RAF Officer who acts as the controller and there will be at least one assistant controller on duty. During the daylight hours there are two assistants.

SARSAT Operator

Over on the far right of the Ops Room can be found the COSPAS-SARSAT operator. This system deserves a few thousand words in itself but space is at a premium, so briefly COSPAS-SARSAT was set up in 1988 by America, Canada, the USSR (now Russia) and France to provide emergency beacon location services worldwide.

The operation of COSPAS-SARSAT consists of geostationary and low earth orbiting satellites (LEOs) that receive data from emergency beacons when they are initiated. The satellites send the data for processing to ground terminals. The information is then evaluated and a location is established for the aircraft or vessel or individual in distress in order that rescue assets can

be deployed to the scene. The COSPAS-SARSAT op is therefore located within the ARCC to provide instant information as to an incident's location. Kinloss operations liaise with HM Coastguard, that operate their own rescue services so, it's appropriate that, at the moment, a Coastguard Officer is working in the Operations Room in a liaison role.

No office is without a computer system these days and, of course, ARCC Kinloss is no exception. When an incident is reported it is immediately logged onto the computer system running *Windows XP* based software. All actions or communications pertaining to a particular incident are recorded within

wide-screen TV and satellite system keep the staff up to date with the media slant on their operations.

Efficient And Swift

A few years ago the staff at ARCC wrestled with the problem to find the most efficient and swift means of alerting all staff to the commencement of an incident. Sirens were considered and were dismissed, as were bleeps and other electronic solutions. Then someone remembered, that in 1998, they had been presented with a rather fine brass bell, by the Shell Oil Company, following their efforts in connection with an incident on an



■ (above): The donated incident warning bell.



■ (left): Some of the staff in the Ops Room at ARCC.

■ (below): The notice board showing the 2005 rescues to 9th February 2005 and the 2004 rescue totals.

the incident log. Maps and other attachments can be added to the log for retrieval. Four cluster-configured servers ensure that data storage and management is not a problem. There's on-screen mapping of any area within the ARCC's operational area, that's a frequently used facility, often with the displayed maps being 'zoomed - in' to a fine scale when required.

The weather status of all UK air bases and airports is also immediately available to Ops Room staff. Any information displayed on any of the screens can be instantly projected onto screens on the Ops Room wall. A

offshore oil installation. The bell now sits on a desk and at the start of each incident someone tugs the cord ringing the bell. "It's an instantly recognisable sound throughout the building", says **Roger Sudworth** the RCS Manager.

Adjacent to the Ops Room and overlooking it through an observation window, is the small room known as the 'HF Shack'. Measuring about two metres by four, this is where the radio operators, who are assiduously monitored by Utility listeners, work. The ARCC staff in the h.f. shack are conscious that they have a regular and loyal audience around the world, but



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Deluxe SW ATU 0-30MHz. SO239 fittings.

(Probably the best ATU around)
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Micro-handly scanner. 100kHz-1300MHz. 700 memories/ stereo FM (earphones)/ attenuator/bug detector/audio descrambler. AM/FM/WFM/ Selectable tuning steps (incl's 8.33kHz).
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YAESU VR-500
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MVT-7100
Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad/car charger/charger/antenna. Extremely user-friendly hand-held receiver with outstanding performance.
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ALINCO DJ-X2000
100kHz-2.15GHz. All mode incl's SSB, "Flash Tune" reads frequency of nearby signal & tunes the handle for you. Amazing features include "Transwseeper" which helps locate hidden transmitters that may be used for eavesdropping. 160 seconds of digital audio memory. Includes battery pack and charger unit.
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£24.95 P&P £2.50



■ A Philips FM1000 v.h.f. set for the marine bands also to be found in the h.f. shack.

are not unduly bothered by that fact. All the operators are 'old school' types, properly trained h.f. men and all are twenty five words per minute c.w. operators with years of experience in h.f. communications. They almost visibly regret that Morse is not required any more. These blokes know what they're doing, all are touch typists, essential for swift, accurate logging. And their experience and competence ensures that they are not going to compromise confidentiality or operations by saying the wrong thing on-air.

The operator's training is one reason that they are not at all bothered about being overheard by hobbyists crouched over radio receivers worldwide. However, MOD Air Force Department h.f. radio officers, as a breed, are disappearing. There are only two supervisors and seven MOD Air Force radio officers left in the whole of the UK service. In the radio shack, the operators can enter information onto the computer incident logging system, as well as retrieve data that has been entered by the controllers in the Ops Room, who will be acting as planners and call takers/makers during an incident.

Operator Positions

There are only two operator positions within the shack with Vivistar Integrated Communications Control System (ICCS) touch screen terminals providing the landline control of the h.f. transmitters in use by ARCC. Headset working is the norm during incidents but the receivers have output speakers on the shelf above the workstations as well. The h.f. communications facilities used to be dealt with by HQ Strike Command

very well indeed.

Ten kilowatt transmitters are in use at Milltown, a site six kilometres north-east of Elgin in Moray, Scotland and at St. Eval in Cornwall. Additional transmitters are due to come on stream at Crimond on the Aberdeenshire coast and at Inskip near Preston. Reception is handled by facilities at Kinloss, Penhale Sands in Cornwall and at Forest Moor in Yorkshire. Government watchers will be aware that the Forest Moor site is the immediate neighbour of RAF Menwith Hill, allegedly a CIA

base in the UK. As you can imagine antennas are not a problem with steerable log periodic and practically every other kind of antenna available for use by VT Merlin's staff.

Kinloss Rescue operators are unique amongst the VT Merlin clients, in that Kinloss will specify which frequencies they wish to use at any time. Usually Merlin's customers give them a requirement for communications over a given path and Merlin staff calculate which frequency would best suit the purpose and set up the link. The operators at ARCC, however, have access to WinHF, a propagation prediction computer program, and are able to evaluate the frequencies that they require and request Merlin staff to set up the transmission equipment accordingly.

The WinHF propagation program operates from data made available by British Aerospace for the purpose. Throughout the working shift the h.f. shack radio operators verify the secondary and tertiary h.f.

frequencies in use. At the conclusion of each shift frequencies are again verified for the staff on the next tour of duty to use. Frequencies in use are written on a white board at the end wall of the shack.

Interference Sources

As any monitor of Kinloss Rescue is fully aware the h.f. shack crews often have a variety of interference sources to contend with. How often have we



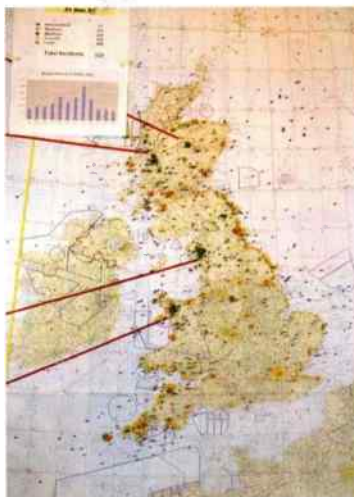
■ A closer look at the Marcom transceiver for chasing some interference.



■ Notice board with pictures and notes on the Boscastle incident of 16 August 2004

Integrated Communications System (STICS).

There was a period of two years during which time the Defence Communications Service Agency, Terrestrial Air Sea Communications took over the task prior to the service being privatised. Comms at h.f. are now handled by a private company, VT Merlin, a division of Vosper Thorneycroft. Despite initial misgivings about the change of service provider the overall impression is that the change to VT Merlin has worked out



■ The 2004 map with the location and types of incident.

all listened while a brace of fishing boat skippers natter happily amongst themselves, either exactly on 5.680MHz or on an adjacent frequency. These guys just dial any old number into the radio and start chatting. The frequencies are chosen on an arbitrary basis, often forming part of someone's telephone number or some other memorable figure.

The boat skippers often have no concept of licence conditions and interference to other users has rarely - if ever, polluted their minds. The radio operators at Kinloss have their regulars. One pair of fishermen often spend their spare time in the North Sea, chattering on a frequency very close to 5.680MHz. Then ARCC Kinloss operators will liaise with the local Coastguard, who use their radio systems on v.h.f. and h.f. in an attempt to deal with the problem.

If going via the Coastguard's system, doesn't do the trick then the ARCC h.f. shack has its very own transmitter, which lives in an alloy suitcase in a corner of the shack. The Morcom TW7000 transceiver generates about 150W of r.f. but this can be amplified by a nifty 500W linear stuffed under the desk. The Morcom's output, wired into an antenna array outside, can chase much of the interference away with the often heard announcement that "You are interfering with search and rescue operations."

Powerful Intruders

Occasionally there are more powerful intruders. Opposing Middle Eastern neighbours have, in the past, been a cause of irritation. One nation established an intermittent propaganda broadcasting station on 5.680MHz. As soon as their transmitter was heard to tune up, the next door neighbour in the sand fired up a bubble jamming transmitter. Between them, they effectively wiped out Kinloss. These days that particular problem has been resolved, as one of the nations has undergone 'regime change', the other

is minding its 'Ps and Qs', in case it finds itself next on the list.

Major interference or ongoing problems of this type are referred to VT Merlin at Forest Moor where they operate a frequency monitoring station. They can liaise with the Ofcom Operations Group's monitoring station at Baldock in Hertfordshire. If necessary the matter would then be referred by Ofcom, to the Foreign Office to resolve diplomatically with tea and digestive biscuits.

As the h.f. operators often have to speak with Nimrod aircraft, that themselves operate from the runway



■ The 17 million candle-power searchlight mounted on one wing.



■ The radio operator's position in the Nimrod aircraft.

just a few hundred metres away, there is also a marine band Phillips FM1000 radio in the shack. This means that Ops can speak with their Nimrod MR2 radio operator, whilst on the ground, or if they're operating nearby in the vicinity, without cluttering the h.f. frequencies with local transmissions. It also stops the possibility of distracting the pilots by using airband frequencies.

All communications with the ARCC, whether by radio or landline are recorded onto computer hard drive. When a transcript of this traffic is required, perhaps for an enquiry or similar, then all the conversations have

to be manually transcribed onto paper from the recording. No abbreviations or omissions are allowed as the written record must be a totally accurate record of the communications. A two day incident can take very many more days to transcribe. Although they are touch typists this is not popular work amongst the h.f. operators!

In the unlikely event that the ARCC would ever become inoperable for any reason there is a secondary or 'stand-by' facility, just five hundred metres away, within the RAF Kinloss base itself, that duplicates the ARCC facilities. This alternative centre is regularly brought on-line, in order to check out the systems there. Should a move to the secondary site be necessary it is hoped that assets under the control of Kinloss Rescue would not notice the transition.

Yearly Map

Each year, a map is prepared indicating the location and types of incidents that are dealt with by the ARCC. Staff can predict pretty accurately just how that map will look at the end of the year. There'll be clusters of coloured pins around Snowdonia, the Lake District and the Scottish Highlands. The West Country moorlands will have a smattering as well. There are always going to be maritime events in the fishing grounds. Similarly ARCC personnel have a fair idea of their busy periods with bank holiday weekends scoring highly.

The predictions are made by many rescue coordination staff throughout the world, but as the UK boasts a high population density, incidents are more common in the UK, with large numbers of people heading for the hills, dales and inshore waters on highdays and holidays. Some of these people always get into difficulties. There are, of course, anomalies on the map.

On the 16th August 2004 the small North Cornwall village of Boscastle was hit by an extreme flash flood. This event was certainly a 'one off' and the ARCC staff were working flat out for an extended period controlling the numerous helicopter rescues that took place there. Major incidents of that type thrust the ARCC and its staff into the public limelight and the satellite TV channel 'Sky News' stationed a reporter and news crew at Kinloss for the duration of the incident.



■ An RAF Nimrod aircraft is on 60-minute standby if needed.

As the name implies the ARCC is the Aeronautical RCC. In the main the centre controls airborne resources. Generally they can be categorised as rotary and fixed wing units. The helicopters used are predominantly Westland-Sikorsky S51 types known as Sea Kings. The Sea Kings are also fitted with h.f. radio sets, running up to 400W if required, but the Mk 3A Sea Kings only have 50W h.f. radios fitted. Callsigns SRG are adopted when on training sorties, with the prefix 'Rescue' being used when the aircraft are on a 'live' rescue mission.

As you'll probably be aware the Royal Air Force make a Nimrod MR2, maritime patrol aircraft, available for Search and Rescue operations. During these operations it can assist by searching for survivors at sea, guiding rescue helicopters and vessels and by dropping Rescue Packs to survivors in the water. These packs contain food, water, a dinghy and lights and provide assistance until such time as a rescuing vessel or helicopter arrives on scene. The Nimrods are all based at RAF Kinloss and their main role is primarily maritime surveillance and anti-submarine warfare.

Primarily A Warplane

The Nimrod aircraft is almost 39m long with a wingspan, almost as great, at 35m. Powered by four Rolls Royce 'Spey' turbofan engines it can reach speeds of over 900km per hour. It shouldn't be forgotten that Nimrod is primarily a warplane and is designed to carry torpedoes, depth charges and bombs. It can also be configured to carry air defence Sidewinder missiles. Ever mindful of the high workload placed upon the crews, Nimrod aircraft would not normally operate for more than eight hours continuously on search and rescue missions but its operational time can be extended

considerably as it can be refuelled whilst in flight.

A Nimrod plane carries a crew of thirteen and a mass of radar and magnetic detection equipment. Active and passive sonar buoys can be deployed from the aircraft in order to locate submarines. On viewing a Nimrod, plane one is immediately aware of a massive searchlight mounted on the front of the starboard wing fuel tank. This beast of a light, can deliver seventeen million candlepower but can only be run for one minute and then has to be turned off for a minimum of five minutes to allow the lens to cool. That would really light up your night!

The thirteen crew includes two pilots, a flight engineer, one wireless operator and various observers and systems operators. The pilots have the usual v.h.f. and u.h.f. civil and military air band equipment at their disposal. The cockpit, with positions for the two pilots and the flight engineer, is a rather cramped office in which to work. It's made more so by the fact that the air-to-air refuelling tube runs through it, just above the Captain's head - thankfully it's a padded fuel line.

Parachuting Out

Right next to the cockpit is the toilet compartment, its proximity to the cockpit has, on occasions, caused even the most hardened of military flyers to consider parachuting out of the aircraft! A small galley completes the welfare facilities on the Nimrod. From here aft it's all utilitarian. There are a number workstations for the radar operators and observers and there is, of course, the radio operator's position.

Slightly cramped but well equipped, would be the summary of the accommodation here. The radio op. has plenty of communications gear to keep him happy. There is a pair of airband v.h.f. sets, the same number of military u.h.f. radios, a marine v.h.f. set for liaison with vessels at the scene of search or with ARCC Kinloss. For the s.s.b. utility monitor there are two h.f. radios. While the Collins 618T h.f. transceiver may not be the latest equipment to grace a military jet it does have the advantage of working rather well.

Operating between 2-29.999MHz, the Collins set has 400W of s.s.b. that can be poured into the Nimrod's h.f. antenna (stretching from either side of the tail fin to the fuselage), the two 618Ts at the disposal of the Nimrod radio-man have provided radio

hobbyists in Europe with some of their most compelling listening.

A small typewriter-like terminal can be hooked up for data communications and some Nimrod aircraft are fitted for satellite communications operation. There's a small sliding drawer on the right hand side of the radio desk. It's about a third of the way up. Pulling it towards you reveals a lot of fluff and dust, odd fingernails and the like ...and a Morse Key. Although not used these days it's still there as a reminder of bygone operations. If that's not evocative enough, the two bomb release buttons on the pilot's control yoke act as a sharp reminder. The black one is marked 'C' denoting Conventional - the red one is marked 'N'. No prizes for guessing what that indicates!

Regular listeners to the ARCC frequencies will be familiar with the callsigns used by the aircraft. The callsigns Rescue 51 and, if a second operation is ongoing, Rescue 52, will be the calls to listen for. The aircraft on stand-by will, unsurprisingly, use the callsign 'Rescue Stand-by'.

Impressive Hardware

Any visitor to RAF Kinloss and the ARCC can't fail to be impressed by the operation. Obviously the technology and hardware is impressive with Nimrod aircraft flying in and out of the base being the most visible manifestation of an operational military facility. But in reality these material structures aren't the measure of the quality of any organisation. Staff of all ages and grades are employed at Kinloss. Royal Air Force and civilian personnel work together in many departments. The one common denominator amongst them is an attitude that is markedly upbeat and confident. This confidence comes from their undoubted ability and sense of purpose often absent in other walks of life.

All the people that I met during my visit were performing their duties with quiet efficiency and extreme good humour. It was a privilege to have met them and there is no doubt in my mind that any tax pounds expended in keeping the Aeronautical Rescue Coordination Centre and RAF Kinloss up and running are pounds, most certainly, well spent.

My thanks go to **Drew Buxton, Roger Sudworth, Andy and Sandy** and the staff at RAF Kinloss for the opportunity to meet them and gain an insight into their work. **SWM**

What is SSB?

If you've heard the term, but you're not sure what a single sideband signal is, then read on to find out more.

Anyone who writes for magazines receives quite a lot of correspondence from readers if they are lucky. I receive a sizable amount of mail every month and one question is posed fairly often is, "What actually is s.s.b.?" I'm sure everyone is familiar with the term and how to switch the radio to receive upper (u.s.b.) or lower (l.s.b.) sideband signals, but what exactly are single sideband (s.s.b.) signals and how long has it been in use.

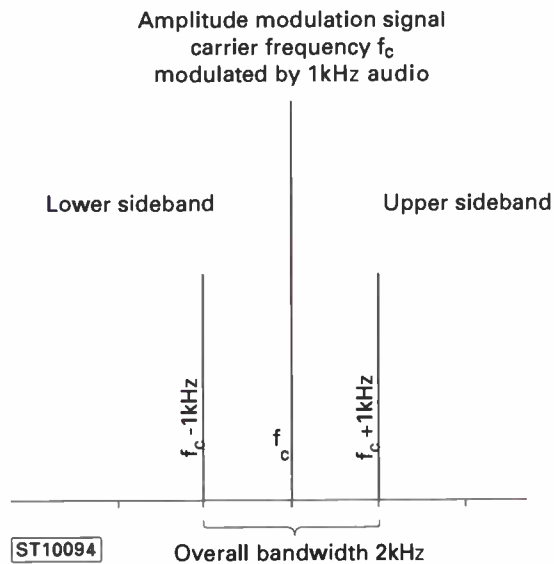
Common-or-garden analogue broadcast stations use amplitude modulation. An amplitude modulated (a.m.) signal consists of a carrier frequency with a band of signals on either side of it (the sidebands) that carries the information in the transmission. In essence there are three parts to the signal, the carrier and two sidebands. The information sent is effectively duplicated as it's transmitted as mirror-image signals, either side of the carrier frequency.

The mirror-imaging of the sidebands is shown in the illustrations of Fig. 1, Fig. 2 and Fig. 3. As each sideband carries the same information, if we could get rid of one of them we could save spectrum space. When a single sideband signal is created and transmitted, two of the three parts of that signal, shown in Fig. 3, are suppressed and not sent at all. As the carrier signal itself doesn't carry any information, but needs transmitter power to maintain it, we can get rid of that too!

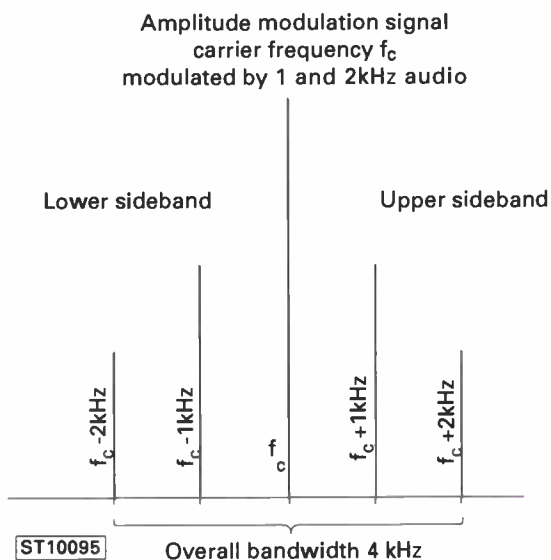
Suppression of one sideband and the carrier signal, allows just one of the sidebands to remain in the transmission. The illustration of Fig. 4 is a composite of two s.s.b. transmissions, of which, only one is actually transmitted. In reality only the upper (u.s.b.), or the lower sideband (l.s.b.) signals are transmitted. Note also that although both have the same notional 'carrier' frequency, it doesn't form any part of the transmitted signal.

Required To Receive

Unfortunately, a carrier wave is required to receive a signal. The carrier acts as a frequency reference and without it no signal can be resolved. So an s.s.b. receiver will have to create and inject its own carrier signal it at the correct frequency for the information to be recovered. To be successful, the frequency of the transmitter and the receiver must be exactly the same and both must be totally stable and not subject to frequency drifting. With typical modern equipment, this is rarely a problem, as they're often



■ Fig. 1: When a carrier signal f_c is modulated with a single audio frequency (of 1kHz), two sideband signals appear 1kHz above and below the carrier.



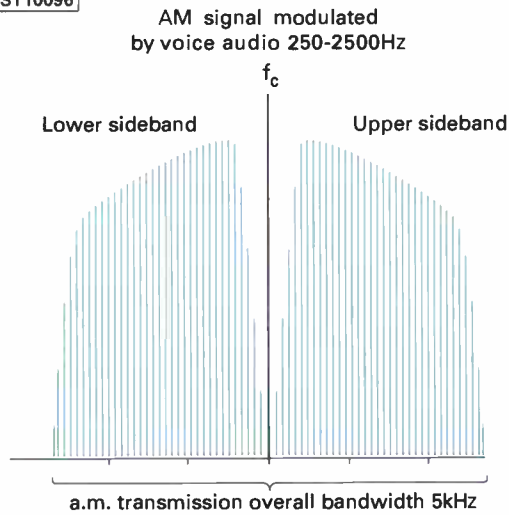
■ Fig. 2: Add in another modulating frequency at 2kHz, and again two more sideband signals appear. This time 2kHz above and below the carrier frequency.

frequency accurate to a fraction of one part per million per month. (1ppm = 0.000001).

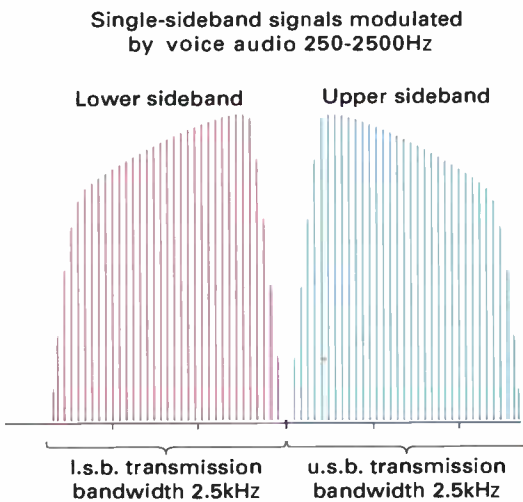
The advantages of s.s.b. communications over a.m. are therefore evident and these include, more 'talk power', increased range and frequency spectrum efficiency. There's often greater clarity than with a.m. transmissions. Talk power is increased, as an s.s.b. signal is less likely to be susceptible to other adjacent transmissions in the way a.m. signals are. Single sideband transmission suffers less distortion due to the carrier component of the signal fading. Over long distance signals, the differing frequencies within the transmission, suffer unequal fading, causing variable signal recovery. This is not so in s.s.b. signals, as the carrier is reinserted at the receiving radio.

To achieve the same signal distance the s.s.b. signal uses less input power, because no carrier wave is required to be sent at all. In a.m. transmissions a lot of input power to the transmitter is required just to transmit the continual carrier frequency signal. Consider for instance, a 100W a.m. transmitter transfers a quarter of its carrier power to each of its two sidebands. While a 50W s.s.b. transmitter transmits its full rated power into just one sideband. Therefore an

ST10096



ST10097



■ Fig. 3 (top): When a carrier signal is modulated with a more complex speech or sound signals then two distinct, mirror-image sidebands appear either side of the carrier. See text for more details.

■ Fig. 4 (above): Although both sideband signals are shown here, in reality only the upper (u.s.b.) or the lower (l.s.b.) sideband signal is transmitted at any one time. Note: that both signals refer to the same, though not transmitted, carrier frequency.

doubling of availability, but without the loss of any information. Two conversations can be transmitted on the same frequency, one on the upper sideband and one on the lower, without interfering with each other.

When radio was first used, the idea that an a.m. signal was made up of different components rather than being a single entity was pretty much unheard of. The fact that an amplitude modulated wave (a.m.) consists of a carrier and two sidebands carrying identical information spaced either side (i.e. one above and another below) the carrier by the frequency equal to the modulating frequency, was not definitely discovered until 1914. In 1908 some early work had been done in that field by two Americans, **Nathan B. Stubblefield** and one **Major Squire** of the US Army Signal Corps.

In 1915 one **John R Carson** who had been working with Squire, applied for a patent on the theory of suppressing one sideband. Eventually the patent was granted in 1923. Carson's development was not, initially, intended solely for use in radio systems but in the telephone industry in order to make more efficient use of line capacity. In the same year the first trans-Atlantic telephone link was established using s.s.b. with an on-air carrier frequency of 52kHz (or kilocycles as was the terminology then).

So, you can see, s.s.b. had, at an early stage, found favour due to the low transmission power available and the very narrow bandwidth of the low frequency antennas. As time

s.s.b. transmitter of 100W peak envelope power (p.e.p.) will have the same performance as an a.m. transmitter rated at 400W.

Needlessly Transmitted

As mentioned above, the information carried on each sideband of an a.m. signal is the same, the sidebands exhibit the same (but mirrored) profile when viewed on the screen of a spectrum analyser. The modulating information is therefore needlessly transmitted in duplicate. Removing one of these sidebands frees up the spectrum on one side of the carrier and allows more channels of communication in the same band space. Thus, there's effectively a

went on s.s.b. was utilised more generally but its use remained within low frequency radio and landline applications. In the earlier days of radio, more of the frequency spectrum was found to be usable and so, there was little incentive to use the airwaves sparingly. So, s.s.b. development was somewhat more sluggish and slow to find favour than it would have otherwise been. The advancement of s.s.b. was also slowed by the work done on frequency modulation (f.m.) techniques, which at the time, was thought to be the only way forward for voice communication.

Reliable Links

Although a reliable four-channel s.s.b. link had been established by the Dutch between Holland and one of their colonies in 1934 it took the threat of World War Two to accelerate the use of single sideband systems. In 1938 The US company, Western Electric placed a four channel s.s.b. transmitter in service which was purchased by the US Army and Navy for their h.f. fixed station facilities the same year.

Until the late 1940s there had not been much work done in the field of single-channel s.s.b. due to the difficulty in maintaining a stable frequency. Fixed frequency s.s.b. receivers needed to create a 'carrier' that would remain locked to the received signal. This requirement led to research into frequency stabilisation of quartz crystal oscillators and to the first frequency synthesizers. Much work also was carried out with variable frequency oscillators (v.f.o.), in order to increase their stability in different physical and electrical environments.

In 1951 the Collins Company first introduced, to the market place, their advanced mechanical filter that bears the Collins name. This highly stable and efficient filter made s.s.b. a much more practical communications solution. To remove one sideband from a signal it has to be effectively filtered out and the Collins filter made this action highly efficient. The Collins mechanical filter so effectively revolutionised s.s.b. communications that **Art Collins** was often erroneously credited with the invention of s.s.b. itself!

The company that Art Collins founded is now part of the giant Rockwell Group but still manufacturers mechanical filters at its premises at Costa Mesa, California and at Mexicali in Mexico. Until 1991 the company concentrated on filter manufacture for commercial and military applications and similar 'well-heeled' users but after that year they were able to make their products at a more affordable price, hence the filter's appearance in the hobby radio market place and not just as a military surplus item.

Government Agencies

It may seem these days, that the increasingly widespread use of digital signals and of satellite technology has pushed h.f. s.s.b. signals into the background of worldwide radio communication. But those of us who monitor the bands on a regular basis, know that this is totally untrue. Many government agencies worldwide utilise the mode, as do commercial interests, relief organisations, radio amateurs and other 'secretive' users. These days there are more radio manufacturers turning out s.s.b. transceivers than ever before. These radios are often lightweight, portable and affordable (the Yaesu FT-817 is a prime example of this) as well as being efficient.

With this amount of single sideband enabled equipment in use, you can be sure that the era of Single Side Band is a long way from being over.

SWM

Free Radio?

Jason Walsh asks if SW Radio Africa is merely another foreign-backed clandestine propaganda organ, or a new form of independent and dissenting media?

Broadcasting from an office in North London is a short wave radio station, which positions itself as the voice of democracy in Zimbabwe. SW Radio Africa claims to perform the task of the independent media. According to station manager **Gerry Jackson** the station is the Zimbabwean media in exile, providing a vital service in a country where the government have all but destroyed the free press.

The Zimbabwean government take a rather dim view of the station. In March 2005 they labelled the station's staff "white Rhodesian colonialists."

If you were to consider both claims in isolation Jackson's would likely resonate deeper. Traditionally, with clandestine radio, particularly anti-establishment broadcasts, the audience expects a peculiar mixture of musical filler material and rabid ranting – denunciations of the authorities and calls to arms. With its mixture of news and phone-in shows, this is not what's on offer from SW Radio Africa – though there are plenty of denunciations of the Zimbabwean government.

Gerry Jackson founded the station in 2001 and she was far from being a radio beginner. Jackson had been a journalist and had covered the Rhodesian wars in the 1970s alongside the BBC's **John Humphrys**, however she had subsequently developed a secondary career as a disc jockey on Zimbabwe Broadcasting Corporation's (ZBC) Radio Three (now 3FM), a popular music station. Jackson is quoted as saying "DJ-ing was my hobby really, but I'd been a journalist before and I was always involved but really only picked it up again in the mid-1990s."



■ **Nick Grace**, Washington bureau chief of *Clandestine Radio Watch*.

Jackson was dismissed from the Zimbabwe Broadcasting Corporation Radio after allowing callers to talk live on the air during a food riot. Her next move was to set up an independent radio station - Capital Radio.

Capital Radio began broadcasting from its base in a Harare hotel in September 2000 only to be shut down six days later by armed paramilitaries. Jackson went into hiding for almost a year before leaving Zimbabwe in November 2001. She surfaced in London a month later, launching SW Radio Africa.

Clandestine Confidential

To many ears today, clandestine radio transmissions seem like a thing of the past – both the strange output of the numbers stations on the one hand, and the anti-establishment broadcasts of the likes of the CIA's 1960s Cuba-directed effort Radio Swan or the Hizbollah-backed Voice of the Oppressed sound like leftover relics from the cold war. In truth, both forms of broadcasting still exist.





■ The team at SW Radio Africa in its North London studio.

The SW Radio Africa station is only one example of clandestine radio in operation today. Lebanon, Iraq, Moldova, Eritrea, Palestine, Saudi Arabia and Chechnya are all targeted by cloak-and-dagger broadcasters – sometimes several, offering both pro- and anti-establishment viewpoints.

The list of countries with clandestine radio operations is a roll call of the world's trouble spots, from Kashmir to Kurdistan there are dissident broadcasts, so it doesn't come as much of a surprise that Zimbabwe is being targeted.

The Zimbabwean Story

To say that Zimbabwe has a turbulent political situation would be a major understatement, but the history of Zimbabwe's troubles go back farther than the 1990s. **Robert Mugabe's** Zanu party came to power in Zimbabwe, then Rhodesia, in 1980 in an election following years of bitter civil war against Ian Smith's far-right and racist Rhodesian regime.

Zimbabwe was then declared independent with Robert Mugabe as prime minister, **Canaan Banana** was appointed to the position of president and the government stated its aim to embark upon a programme of peaceful land reform, where land would be purchased from white farmers and distributed to the landless poor.

In 1987 Mugabe became the first executive president of Zimbabwe and two years later the Lancaster House Agreement, under which the Zimbabwean government could only purchase land from willing sellers, expired. The parliament went on to approve legislation that would allow the authorities to make compulsory acquisitions as long as full compensation was paid.

Things changed in the 1990s when **Chenjerai Hunzvi** led uprisings against Mugabe claiming that the government had abandoned its plans for land reform and 1,503 farms were listed as being down for acquisitions. The International Monetary Fund agreed to give assistance to Zimbabwe and Mugabe announced a round of farm repossessions – 120 farms were to be acquired in return for full and fair compensation.

At this point the disputes, which are still being played out today arose. Some families began a series of farm occupations, forcing Mugabe to introduce the second phase of the land reform programme involving 150,000 families and 1 million hectares of land. Mugabe then appealed to Western donors to fund the reforms but they refused. He then ordered a further 841 farms to be confiscated, this time without compensation.

Since then the political situation in Zimbabwe has been famously volatile. The Zanu party have cracked down on both the political opposition and the media. No private broadcast stations operate from within the country, forcing Zimbabweans who want to hear independent news and views to listen to foreign broadcasters. This is the background against which SW Radio Africa is broadcasting.

Essentially Propaganda?

The question is, is SW Radio Africa a clandestine radio station in the same sense as military intelligence agency-backed broadcasting – a form of radio which is as often disinformation or psychological operations-led, as it is about spreading information free of censorship? A workable definition of clandestine radio can be tough to pin down.

Nick Grace, who runs the Internet based intelligence dossier on clandestine radio, Clandestine Radio Watch, said: "Clandestine radio is essentially propaganda – that said, no-one can really agree on a methodology to categorise a programme or station as 'clandestine'." "In order to run a station you have to have journalists. SW Radio Africa is radio

in exile. It seems to me that SW Radio Africa was on the air before the funding came in", argued Grace.

Media analyst and former Radio Netherlands broadcaster **Jonathan Marks** does consider SW Radio Africa to be a clandestine operation: "That's a pretty fair characterisation," he said. "If you look at their history, I believe they applied for a licence in Harare (as

Broadcasts to Zimbabwe

Officially, SW Radio Africa receives no money from the United States and the extensive USAID website makes no reference to SW Radio Africa. Indeed the USA international broadcaster, the Voice of America (VOA), already has its own programme targeted at Zimbabwe, *Studio 7*. Meanwhile, a station featuring former ZBC personalities called the Voice of the People is broadcasting on medium wave on a frequency allocated to Botswana. Voice of the People is funded by the Soros Foundation – an organisation founded by the billionaire currency speculator George Soros, under the aegis of the Open Society Initiative for Southern Africa.

Capital Radio) but had been turned down and so broadcasting from abroad is the only option. In terms of production quality they are the most professional-sounding outfit on the dial".

Marks raised some interesting questions about the station: "To what extent does their funding affect what they say? If you listen to SW Radio Africa you'll find it's very much an 'action station' hammering the regime. My question would be, does this fall into the trap of being an opposition station rather than an independent station? If you're trying to counteract an operation like Mugabe's, is this the best way to do it?" asked Marks.

Either way, SW Radio Africa is certainly not popular with the Zimbabwean authorities. On 10 March 2005 the station announced that its frequency of 6.145MHz in the 49m band was being jammed, "with a 2.0MHz blocking signal carrier modulated single tone, from 6.135 to 6.155, centered on 6.145." In response to this the station was moving to 4.880MHz in the 60m band.

The jamming continued. On 12 March the station announced that they were moving the main signal to 3.230MHz. An additional frequency of 11.845MHz also went

into operation, broadcast from Ascension Island.

The DX reports initially indicated that the jamming was not audible in North America or Europe, however South Africa's *Mercury* newspaper subsequently reported that Chinese radio engineers had been working on the jamming programme for more than a year at the behest of the Zimbabwean government.

The station's ability to change frequencies so rapidly has raised eyebrows in itself. When Radio Free Syria, a mouthpiece for the Reform Party of Syria, found its broadcasts jammed it was stymied by a restrictive contract with the broadcaster whose transmitters it was using, thought by some DXers to be Deutsche Welle. The strategy adopted by SW Radio Africa since then has been to broadcast on three frequencies simultaneously, as the Zimbabwean authorities appear to only have the ability to jam two frequencies simultaneously.

Gerry Jackson doesn't like the label 'clandestine' being applied to the station for fairly prosaic reasons. "I don't think it's clandestine. We are Zimbabwean – nothing we do is secret. We exist to help the democratic process in Zimbabwe where there has been a concerted attack on the media," she explained.

Despite all this, who pays for the station remains an issue, SW Radio Africa is clearly not working for commercial gain and must therefore be reliant on donations. So, where does the station get its money from? Jackson explained "We get our funding from non-governmental organisations (NGOs) and foundations – we don't name them because talking about it allows the Zimbabwean government to hit us with a hammer. The important point is that we have complete editorial control, and this is the point where nobody believes me, but it's true: nobody tells us what to say".

Reports indicate, however, that SW Radio Africa may not be being entirely honest when it says that it is entirely funded by NGOs. It seems likely that the station is in receipt of money from the United States government, even if not directly from one of the intelligence agencies.

Even if SW Radio Africa is entirely funded by NGOs, the whole issue raises the question of 'soft money' in broadcasting: is a station financed by a non-governmental organisation any less propaganda than one supported by the

CIA or MI6? According to Nick Grace this has led to the situation with clandestine broadcasts becoming more confused than ever: "The USA government is beefing up funding for Iranian exile programming and perhaps more to Syria and Lebanon. How is that funding to be distributed?"

SW Radio Africa

Frequencies are subject to change in order to avoid jamming. As of March 2005 jamming was ineffectual outside of the environs of Zimbabwe and southern Africa. The current frequencies can be obtained from the station's website at: www.swradioafrica.com

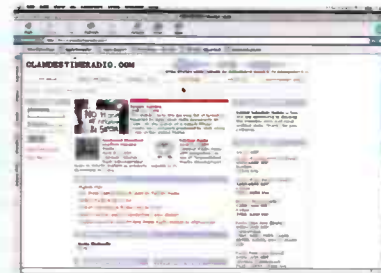
In the old days we knew the CIA and MI6 were behind stations. Now the web has gotten muddled, with all the NGOs getting involved it's like chaos theory has been applied. You have the Open Society Institute, the International Bar Association and so on. Then you have stations like the Democratic Voice of Burma, supported by a Norwegian organisation to the tune of \$1 million".

The question is what about SW Radio Africa? "Looking at the logistics SW Radio Africa it's clear that they definitely have

support from a variety of sources. Now, the Mugabe government would love a quote like that to bash the station, but does that make the programming illegitimate?" asked Grace rhetorically. "SW Radio Africa's programmes support freedom of speech, not the Movement for Democratic Change, and freedom of speech is a threat to the stability of the regime" he said.

SW Radio Africa openly works with the International Bar Association, but no other potential funding source is in the public domain. The so-called National Endowment for Democracy (NED) is a likely candidate for the funding of stations like SW Radio Africa.

Despite describing itself as a private foundation, the NED was created by the USA Government in 1983. Since then it has been regularly criticised by both left and right for interfering in foreign countries. It also illustrates the difficulty in conclusively labelling a station as government funded: despite being a private organisation, the NED is in receipt of money from the United States government, money which it then distributes to groups worldwide. According to **Peter Baker**, writing in the *Washington Post* on 20 March, the NED receives \$80 million dollars per year. Ironically, SW Radio Africa's reluctance to divulge its supporters is likely to intensify speculation about their backers, not quash it.



The Future Of Short Wave Radio

These are challenging times for short wave listeners, in the long term the writing is on the wall for analogue radio on short wave. The nightmare scenario is one of international broadcasters cutting services one by one until all that is left on h.f. alongside the radio amateurs and utility stations, is pirates or stations targeting the very poorest nations on earth. International broadcasters will continue to exist, but they're far from being vote winners at home and the attraction of transferring to satellite, digital broadcasts via DRM or the Internet.

In the short term however, SW Radio Africa is a shining light for those interested in short wave listening, but for operations like SW Radio Africa, short wave remains a medium of necessity, not one of choice as Jonathan Marks pointed out: "SW Radio Africa has no other way of getting its message into Zimbabwe – the Internet connections are ropey at the best of times. Recently they've also gone the medium wave route because of the greater audience and better reception".

"We have the medium wave in the morning. Covering distances a problem, but the real difficulty is that medium wave transmitters are like hen's teeth," explains Jackson. The station's choosing to use short wave is unlikely to be much of an impediment to its audience. Zimbabwe remains a poor country with a significant number of older radios, many of which include short wave reception" she continued.

As long as there are conflicts, which result in the suppression of independent media there will be counter-propaganda, be it funded by military intelligence, NGOs or crypto-governmental organisations and quangos. In this case there is likely to be no shortage of fascinating activity on the short wave bands for the foreseeable future.

SWM

Useful Internet Links

SW Radio Africa
www.swradioafrica.com

Clandestine Radio Watch
www.clandestineradio.com



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£339 B

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W-801 **£12.95 A**

BNC Reg/Gain 25-1900MHz 21cm long

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Starting Out

Part 9

The beginner's series that's back due to reader demand. This month we continue the rerun of the excellent beginner series from the past, originally brought to you by the late Brian Oddy G3FEX

The need for high stability in the local oscillator of any superhet receiver cannot be over-emphasised - ideally its operating frequency should be unaffected by vibration, changes in temperature and power supply variations. The purity of the output waveform from the oscillator is also important, because any harmonics present will enter the mixer and may cause unwanted signals at the input to the mixer to be converted to the chosen i.f. The oscillator's output should also be relatively free from noise because high noise levels degrade the performance of most mixers.

In practice, it is very difficult to construct a highly stable, free running, variable frequency oscillator (v.f.o.). Due to their inherent features. Some v.f.o. circuits are preferable to others, however, the use of rigid mechanical construction, good screening, high quality components and a voltage regulated power supply are essential with all types of circuit if a reasonably satisfactory performance is to be achieved.

Even small fluctuations in temperature will cause minute physical changes to occur in the components of any v.f.o. circuit, which in turn will result in variations in the frequency of oscillation. The small currents, which flow through the transistors, numerous resistors and some other components within a receiver, all cause heat to be generated, which will affect the stability of the v.f.o.

During the first hour or so of operation of any receiver, the rise in temperature within the cabinet may be quite rapid. This change in temperature often causes a considerable change or drift in frequency as the v.f.o. components warm up. Such changes are usually referred to as short term stability.

After the initial period, subsequent temperature changes are more gradual and tend to level out after an hour or two. Much greater v.f.o. stability is then normally evident (long term stability). More advanced v.f.o. designs usually incorporate some form of temperature compensation, whereby a special capacitor with a negative temperature coefficient is wired across the frequency determining network of the v.f.o. to provide an equal but opposite change in frequency.

Although strict adherence to all the foregoing points may result in good oscillator stability at relatively low frequencies, it is unlikely that high stability will be achieved when the fundamental output frequency required is greater than about 10MHz.

Consider for example, a simple, single-conversion superhet with a 'standard' i.f. of 455kHz. At higher signal frequencies, the local oscillator injection frequency has to be similarly high for the mixer of the receiver. When taking mechanical and thermal stability into account, it's easy to see why poor stability, poor tuning accuracy and drift will be a feature of these simple receivers. How, then, can this problem be overcome?

There are a number of ways in which the problems of stability and tuning accuracy may be approached. One

popular method avoids the need for a v.f.o. operating at high fundamental frequencies altogether! The secret is to use the second of the double conversion techniques described last time ('Starting Out' - Part 8, Feb. 2005) whereby a narrow band of incoming signals is initially converted to a lower frequency narrow band first i.f. by mixing them with the output from a crystal controlled oscillator. The second mixer and variable local oscillator can then operate at relatively low frequency over a limited tuning range to select a desired signal and convert it to the second fixed i.f. for further processing.

Heterodyne VFO

Another approach, which can be used in either single or double conversion receivers, which have fixed intermediate frequencies, is to employ a heterodyne v.f.o. In this system the same output from a high frequency crystal controlled oscillator (f_x) is pre-mixed with the output from a relatively low frequency v.f.o. (f_v), which covers only a single range, e.g. 3.0-3.5MHz. The resulting output ($f_x + f_v$) is then carefully filtered to remove any unwanted mixing products and harmonics before it is injected into the receiver mixer as the local oscillator frequency (f_o) - see Fig. 9.1.

Because the tuning range of the v.f.o. is limited to 500kHz, it can be carefully designed and temperature compensated to achieve good stability. Additionally, crystals will enable the receiver to cover several bands 500kHz wide, but note that the same v.f.o. tuning rate will exist on every band.

Frequency Synthesis

If the heterodyne v.f.o. principle is adopted in a general coverage receiver, the high cost of the numerous crystals required will detract from the advantage of the system so, it's best avoided. A much better approach for a general receiver using double conversion superhet principles, would be to employ a process called frequency synthesis, whereby all the injection frequencies required for the first mixer are derived from the output of a single high stability crystal controlled reference oscillator operating at 1MHz. The injection frequency for the second mixer could be obtained from a relatively low frequency v.f.o. with a tuning range of 1MHz.

In one type of frequency synthesis, an ingenious triple mixing drift-cancellation circuit, known as the Wadley Loop, is used, with a v.f.o. operating at v.h.f. to 'select' a desired harmonic from the output of a high stable crystal controlled reference oscillator, see Fig. 9.2.

The output from the reference oscillator (f_r) is coupled into a harmonic generator (h.g.) so as to provide copious amounts of harmonically related signals ($nx f_r = f_1$), it is also coupled into a buffer amplifier to provide isolation before it enters mixer two as f_4 . The output from the v.f.o. (f_2) is

injected into both Mixer 1 and Mixer 3. When the v.f.o. is set to a suitable frequency (f_2) it will mix with a harmonic from the harmonic generator, f_1 in Mixer 1, to produce an output frequency ($f_3 = f_2 - f_1$) corresponding to that of the sharply tuned i.f. amplifier IF₁.

The output from IF₁ enters Mixer 2 and mixes with the output from the buffer amplifier (f_4) to produce a difference frequency ($f_5 = f_3 - f_4$). It then passes through a band-pass tuned i.f. amplifier, IF₂ into Mixer 3 where it is again mixed with the output of the v.f.o. (f_2) for two reasons. the first reason is to arrive at the final frequency required, f_6 , and the second, is to enable the inherent drift in v.f.o. to be cancelled out.

In fact, the v.f.o. is independent of the output frequency, as can be seen from the following:

$$f_3 = f_2 - f_1$$

$$f_5 = f_3 - f_4 = f_2 - f_1 - f_4$$

$$f_6 = f_2 - f_5 = f_2 - (f_2 - f_1 - f_4)$$

therefore $f_6 = f_1 + f_4$. And since the v.f.o. frequency (f_2) is absent from the expression for the final frequency (f_6) the inherent drift in the v.f.o. will have no effect upon f_6 .

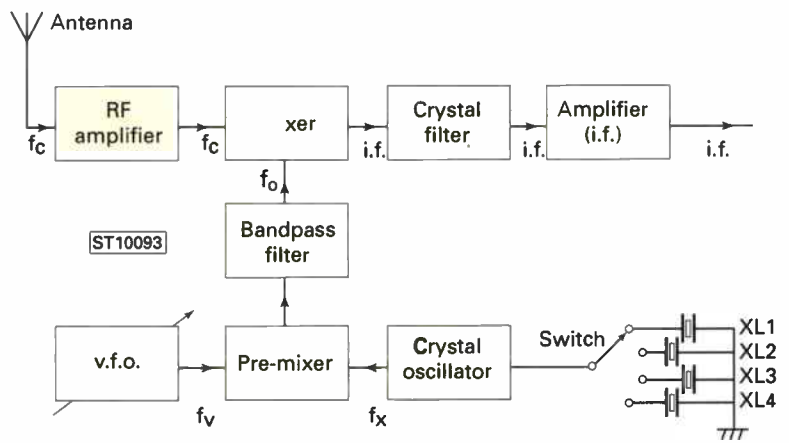


Fig. 9.1: This is the block diagram of a heterodyne v.f.o. See text for more detail.

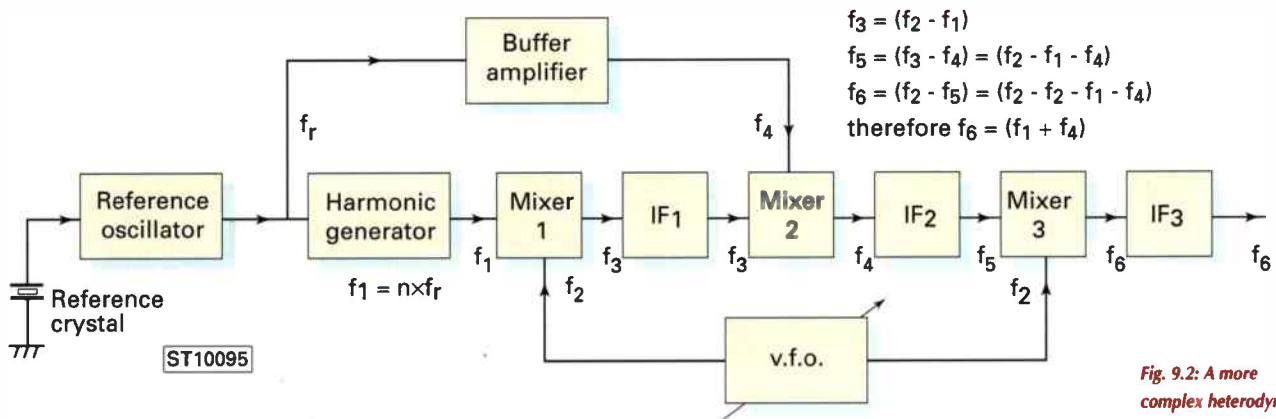


Fig. 9.2: A more complex heterodyne system uses multiple mixing to counteract drift in the v.f.o. See text for more detail.

Practical Example

To illustrate the role of the v.f.o. in the circuit, consider a practical example in which the following conditions apply:

- The reference oscillator frequency (f_r) = 1MHz.
- The output of the harmonic generator = $nx f_r = f_1$
- The buffer amplifier output (f_4) = 1MHz.
- That IF₁ is sharply peaked on $f_3 = 30$ MHz.
- The tuning of IF₂ is centred on $f_5 = 29$ MHz.

So, what will be the output frequency (f_6) if the v.f.o. frequency (f_2) is set to 50MHz?

At Mixer 1, ($f_2 - f_1$) = f_3 so, (50 - f_1) = 30, therefore, $f_1 = 20$ MHz (in other words the v.f.o. will in effect 'select' harmonic 20 of the reference oscillator to produce f_3)

At Mixer 2 ($f_3 - f_4$) = f_5
So, 30 - 1 = 29MHz, ie. IF₂

At Mixer 3 ($f_2 - f_5$) = f_6
So, the output frequency (f_6) = (50 - 29) = 21MHz

By substituting the appropriate figures it will be seen that if the v.f.o. frequency is changed to 49MHz, harmonic 19 will be selected and the output frequency will be 20MHz. If the v.f.o. frequency is increased to 51MHz the output frequency will become 22MHz. Note however that if the v.f.o. drifts to, say, 51.250MHz the output frequency remains at 22MHz, thus:

At Mixer 1 ($f_2 - f_1$) = f_3
So, (51.250 - 21) = 30.250

At Mixer 2 ($f_3 - f_4$) = f_5
So, (30.250 - 1) = 29.250
At Mixer 3 ($f_2 - f_5$) = f_6
So the output frequency becomes
(51.250 - 29.250) = 22MHz

The only effect of v.f.o. drift will be a reduction in the output level of f_6 due to the sharply tuned nature of IF₁ in a practical system a lamp or meter is used to indicate when the system is locked to the reference. And of course, there will be an absence of signal output when the system is unlocked.

It's possible to expand this system by removing the output buffer amplifier, f_4 , to Mixer 2 and instead, injecting the output from additional triple mixing circuits. These may be locked to the same reference oscillator via frequency dividers so as to provide small additional steps in the output frequency, with a 1MHz reference that may be in steps of 100kHz or 10kHz, etc.

The general principles of the Wadley Loop have been used in a number of well known receivers including the Raca RA17 and Yaesu models FRG-7 and FRG-7000. However, the advent of digital electronics has resulted in this type of circuit having been generally replaced by phase locked loop (p.l.l.) techniques, involving a standard reference oscillator and a voltage controlled oscillator.

The p.l.l. method of frequency generation can provide a fully synthesised local oscillator signal, which may be generated in small, but discrete steps. Now as there's no more space this month, I'll have to cover that next time.

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Air Traffic Control?

Ian Doyle looks forward to summer and gives us a glimpse behind the scenes at RIAT. He takes a two part look at the Air Traffic Control activity in the busy skies above RAF Fairford, The Home of The Royal International Air Tattoo.

For anybody with an interest in aviation and specifically listening to air traffic control, the Royal International Air Tattoo (RIAT) held annually at Royal Air Force Fairford, in Gloucestershire must be, without doubt, one of the highlights of the year. This year's event will be no exception and will provide the opportunity for all to view many types of different aircraft at close quarters both on the ground and in gut-wrenching aerial manoeuvres. If however, your interest centres on radio listening and specifically Airband Monitoring, RIAT can be just as fascinating.

But what happens behind the scenes from the perspective of Air Traffic Control? How exactly do you go about organising an event as awesome as RIAT 2005? When is the best time to listen, and on what frequencies? In this feature covering current frequencies and area radar I have provided a very basic overview directed at the novice listener, which covers the typical approach patterns, used by traffic arriving and departing the show. In addition the accompanying frequency blocks, should assist the reader in identifying when and where to listen.

Usually, RIAT takes place over the third weekend in July each year, with the show open to the general public on the Saturday and Sunday. There is also

restricted opening to the Park and View facilities on the Thursday, Friday and Sunday before and after the show. Planning for each event starts some two weeks after the previous show finishes. Invitations are made to various air arms, with negotiations continuing in the intervening period almost up to the start of the show. The logistics involved in bringing all these aircraft together is normally a lesson in human ingenuity, but is a task normally accomplished safely and with complete professionalism by all the staff involved, many of whom are volunteers.

Why Fairford?

Fairford became the unofficial home of RIAT in the late eighties, it is ideally suited for this type of event with a





major runway in excess of 3km in length, one of the longest in the UK. Many readers will be aware from previous articles in *SWM*, that the base has featured prominently during two Gulf Wars, and during the Kosovo crisis. It still features today for the annual 'Central Enterprise Exercise', a joint US/NATO Exercise that sees USA based heavy bombers deploy for up to six weeks at a time. These deployments typically consist of a mix of both B52 and B1 bombers, two of the heaviest aircraft in the USA's inventory. As well as a long runway, these types of aircraft also require lots of concrete hard standing in order to both taxi and park. Not surprisingly, as the base is only used once a year, it was soon adopted as the natural home for the Royal International Air Tattoo, with the huge lengths of taxiways and aprons proving an ideal location for what is the world's largest and arguably greatest airshow. In 2004 a base upgrade was completed, which will also now allow the deployment of the B2 stealth bomber.

Where's the Beach?

It must be said though, that whilst the situation on the ground in terms of positioning aircraft is excellent, this is not the case in the crowded airspace above Fairford. Guiding aircraft in and out of the base, before, after and during the show, was once described to me as an "air traffic controller's worst day at the office". Anyone monitoring the frequencies used by the Tattoo during this period, will bear witness to this. Matters are not helped by the fact that the base is located between two of the busiest Royal Air Force Aerodromes in Britain - RAF Brize Norton and RAF Lyneham. Each base currently houses three types of heavy transport/tanker aircraft and it is as a consequence of this role that both bases are in operation 24 hours a day, 365 days a year.

Located to the North is RAF Brize Norton with its compliment of modified formerly civilian Lockheed Tristar, BAC VC10s used in the Tanker/Transport role plus of course the C17.

To the west, RAF Lyneham, home of the RAF's fleet of slower but more agile Lockheed C130J Hercules transports. The airspace around both bases comes under the jurisdiction of the Brize Air Traffic Control Zone, which provides both an area radar and a flight information service. As well as handling and co-ordinating movements out of Brize, Lyneham and of course Fairford when active, Brize Radar also looks after the movement of numerous light aircraft and glider traffic routing to and from a numerous other smaller airfields in a local area covering many square kilometres.

To the south east lies the boundary of the London TMA (Terminal

Manoeuvring Area) serving aircraft arriving into and out of Heathrow, Gatwick, Stansted, London City, Luton, and RAF Northolt plus a myriad of other smaller aerodromes. As if all this wasn't complicated enough, located above the base between 27,000 and 45000ft are a number of the busiest air traffic routes in Europe.

Faced with these mounting obstacles, how do the various operating authorities go about handling such significant traffic flows over such a short space of time?

Four Authorities

Principally four major operating authorities control co-ordination of movements around Fairford. Brize Radar located at Brize Norton Airfield, has jurisdiction for the local surrounding area, Brize Radar is supported in this role by London Military and Swanick Mil, both being air traffic control arms of the RAF. They provide coverage of the airspace immediately outside the Brize Control Zone, with additional responsibility, for all military air traffic within the UK that's not under control of the civil sector, LATCC. The London Air Traffic Control Centre more commonly known under the acronym, (LATCC) is run by a Government owned civilian agency the National Air Traffic Service (NATS). LATCC controls all aircraft flying airways in the upper airspace on the major air routes which surround the Fairford base. London Mil is still based at West Drayton Air Traffic Control Centre in London, whilst Swanick Mil and LATCC are of course now based at Swanick near Southampton. Although the RAF station at West Drayton closed many years ago, the site still hosts certain sectors of the military air traffic control centre, this is co-located with the civil London Area and Terminal Control Centre controlling the busy low level airspace around the London TMA. The unit provides a vital link between civil and military flying and airspace requirements.

On the ground all these agencies are supported temporarily by a significant number of qualified ATC volunteers from other Air Traffic Control agencies in the UK with a significant proportion of these coming from Manchester Airport and the Manchester Air Traffic Control Sub-Centre. Many of these volunteers play in a variety of front-line roles supporting their colleagues in the RAF and LATCC in assisting with Flight planning and the co-ordination of the various movements both in the air and on the ground.

Next month I'll conclude my look at the organisation of the task of Air Traffic Control at the Fairford based Royal International Air Tattoo.

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I've just hear that Mildenhall has been cancelled again. Having included the information in last month's column, regarding the 4 June Mildenhall Community Appreciation Day, within two weeks the event was cancelled. Col **Richard Devereaux**, the 100th Air Refuelling Wing Commander said, "New cuts to help pay the rising costs of the global war on terrorism had forced them to take the disappointing decision. The most recent cuts have given me no choice. Mildenhall's first commitment was to support the war on terrorism. We sincerely appreciate the support of our British friends and neighbours in the local community and I am truly disappointed that the Community Appreciation Day will be cancelled". Sadly, it is my opinion that there is a good chance that we may not see another airshow of any sort at Mildenhall!

The Operations Desk!

A bit like buses coming along in pairs, E-mails on a similar subject often arrive close together. In the past few weeks I have had three pieces of correspondence all on related subjects. Two E-mails were asking about my own equipment and setup and I also had a letter from a reader who is a relatively new airband listener asking for some advice. I have never really given a full overview of my setup at home, so by combining the answers perhaps now is the time.

Let me start with my location. I'm fortunate to live on the side of a hill at about 85m above sea level, consequently, I have an excellent uncluttered outlook from the south west around to the north east. As I am located close to the south coast of England, this means that I can monitor a fair amount of airband activity throughout this 200° arc to the north of my location. This includes, London Military, London Control, Manchester Centre, Shannon Control, Shanwick Oceanic and even on occasion aircraft being handed off to the southern sectors of Scottish Control. Plus of course all the local airfield activity.

I find the reception to the south across the English Channel is not so good, with the hills behind me blocking signals. But I can still pick up Brest and Paris Control and occasionally some French Military traffic. Now, I am not suggesting that you should all attempt to move to a new house on the top of a hill but it does emphasize that wherever you are listening, an elevated location and/or antenna is a distinct advantage.

Antennas

I currently have four primary antennas to choose from, two in the loft, one on the roof and one on a post in the garden. Because of my exposed location, with numerous autumnal south westerly gales that howl across the face of the house, I've tended not to replace rooftop antennas in recent years. It was getting a bit expensive. Having the antennas located in the loft doesn't seem to have made a significant degradation to the airband signals. A few years ago, I lost all three of my external antennas in an autumn storm with gusts of wind over 120kph and that included a steerable log periodic which I decided not to replace. There was a time when we seemed to get one or two big gales each winter and that was it, now it seems to be five, six or more - Global warming I wonder?

On the roof I have a general purpose stainless steel double discone which is my, 'jack of all trades antenna' and is used for general listening throughout the spectrum from 30-900MHz. Like most wide-band discone antennas, its overall performance is a bit of a trade off against convenience but it still performs reasonably well on the two airbands. If possible, I would recommend buying a stainless steel discone, (or any other type of antenna), as they are much more robust in poor weather. I've found that the aluminium discones tend to oxidise when they have been outside for a while and the metal itself becomes brittle, leading to loss of individual elements. In strong winds the antennas tend to start shedding their elements until they end up looking like pieces of modern sculpture.

Also outside on a post is my h.f. antenna which is a **Wellbrook ALA1530** active loop antenna. I also have a longwire antenna connected to a 50Ω coaxial downlead via a 'balun', but since I bought the Wellbrook loop antenna, a couple of years ago, I very rarely use it. For more details about the antenna have a look at www.wellbrook.uk.com/products.html This is a very good antenna for monitoring on the upper side band (u.s.b.) h.f. airbands, plus I also occasionally use it to listen to the broadcast bands on which it also performs very well. Also for h.f. listening I use a **bhi NES10-2**, digital signal processing speaker. Connected to the IC-R8500 radio it gives excellent noise reduction and better clarity on h.f. Another byproduct of course, is that it also gives you a much more comfortable background noise level. The unit also works quite well on the v.h.f. and u.h.f. airbands if you want get more clarity from a weak signal, such as a distant ATIS for example.

In the loft I have a stainless steel double

discone on which I have cut down the elements so that they are approximately the correct lengths to cover the v.h.f. and u.h.f. airbands. For the v.h.f. airband, the quarter wave elements are between 635 and 547mm long, for the u.h.f. airband they are between 333 and 187mm. (You can buy a discone with the elements already cut for airband use).

The second antenna I have in the loft is an ex-military u.h.f. antenna, which I 'acquired' from a friend in the RAF around 15 years ago, it was classed as 'surplus to requirements'. I cannot tell you the manufacturer's name or type as any identification marks had been removed, but I suspect that it may have been made by Racal. The antenna is just over one metre tall and about 30mm in diameter and is contained within a sealed fibreglass casing, which is the traditional military olive drab. I have been told that it is a $\lambda/2$ wave ground plane u.h.f. antenna but I know no more than that.

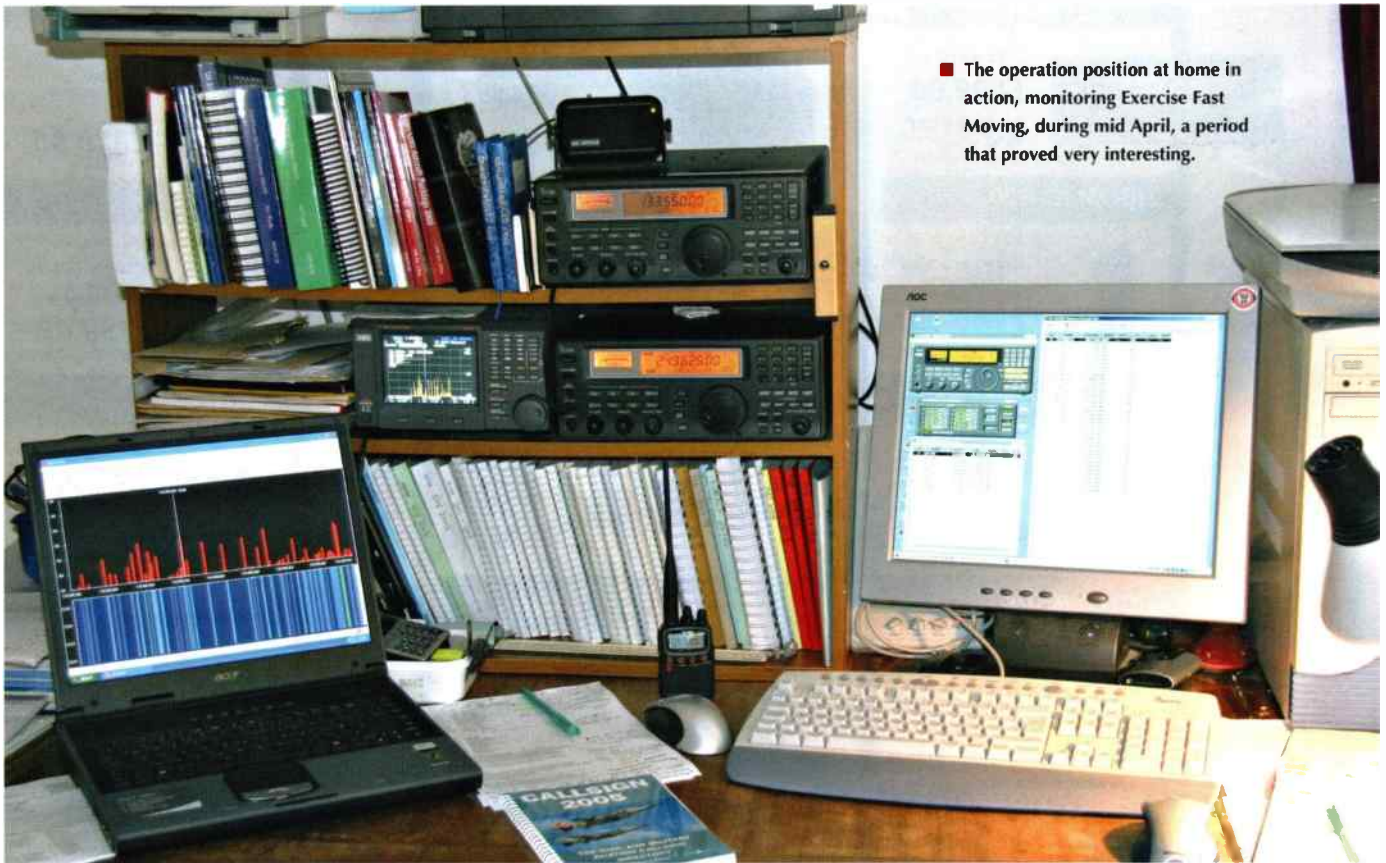
What I do know is that the encased antenna knocks spots off the discones on the military airband, especially between 250-350MHz. For example, whilst the discone struggles to pull in aircraft on first contact with Brize Norton Approach some 220km away, the military antenna gives a reasonable signal. (And no, I don't know where you can get one, I wish I did). However, watch out for the August airband special where I hope to have a review of two quality antennas specifically dedicated to the Civil and Military airbands.

All the v.h.f. and u.h.f. antennas are connected using low-loss cable, that is cable that's quite thick, (approximately 11mm diameter). It can be a bit of a pain to route this feeder from the roof or loft to the radio, (especially through wall cavities), but I think that the results are worth it. If I have the need to use an extra radio then I use an **RF Systems SP-3** splitter/combiner to split a balanced antenna signal to the extra radio.

Radios

Now to look at my radios. Regular readers will know that I have long been a fan of the Icom IC-R8500. I have used one for around 12 years and I still consider it to be one of the best h.f.-v.h.f.-u.h.f. airband receivers available. Until last September, I had used it alongside an **AOR AR8600** for several years but the opportunity unexpectedly arose to buy a second R8500 at what I thought was a bargain price. I had always wanted the 'dream team' of two R8500s and so the deal was done and after several years of sterling service the AR8600 was sold on eBay.

I do miss the instant portability of the AR8600



■ The operation position at home in action, monitoring Exercise Fast Moving, during mid April, a period that proved very interesting.

with its internal battery pack, but sadly something had to go. I also still use my dear old **Signal R-535** which has served me well for many years. This is used to mainly monitor spot frequencies, especially where its excellent sensitivity can pull in weak signals. For home and mobile use I use my trusty **Yupiteru MT-7100** and if I am travelling light I also use a **Yaesu VR-120** which neatly slips into a small pocket on the camera bag.

Computer Control

The R8500s are used with several pieces of computer software. Control of the radios is executed by two different computer programs. The first is Icom's own control package **RS-R8500** and secondly by using a shareware package called **tk8500**. This latter program can be downloaded from the web-site at www.parnass.org (along with programs for a variety of other radios). Both programs have their positive and negative sides so by using each of them to their strengths it gives me the best of both worlds. The bottom line is that I have control of the radios from the software and also the ability to upload or download complete sets of memories. I also regularly use **Xcorder** which is an excellent piece of software for recording audio from the radio. The latest version is **Xcorder 2.0** (2004), which can be downloaded

from www.xcorder.com (or it is available on the **SWM** Shareware CDROM from last year. Ed.)

The memories of the two R8500s are usually set up slightly differently, subject to what type of airband activity I am listening to. I have eight different configurations saved within the software that can be downloaded to both radios as needed. The main banks in those configurations are as follows: London Military, London Military plus the primary approach and radar of the local military airfields, two banks for the local military airfields, London Control, three banks linked with the ASACS/TAD frequencies, two banks of AWACS/MAGIC, two banks of Royal Navy and FOST (Flag Officer Sea Training), Squadron Operations and Air-to-Air, Air Refuelling, two banks of Forward Air Control. Plus an assortment of civil airfields, civil and military h.f. and other frequencies such as the marine band. These banks can all be linked together in many permutations using the **tk8500** software, thereby giving great scanning flexibility.

SDU5600

Whilst the two R8500s are controlled from the desktop computer, I currently have my **SDU5600** being controlled by software on the laptop. Over a decade ago, I owned this unit's forerunner the **SDU5000**, (this later developed

into the **SDU5500** in 1999). With the introduction of new technology such as digital signal processing (d.s.p.) and fast Fourier transforms analysis (FFT), the new **SDU5600** is a totally different beast. Aided by this new technology, one of the main differences is that the screen update rate is significantly faster than my old **SDU5000**, (up to six times per second).

This ability to update the screen quickly and often, allows the **SDU5600** to act as a spectrum analyser that can monitor a chunk of the airband spectrum, (up to 10MHz), in almost real time, the delay only being small fractions of a second. For the airbands, I tend to set it to an 8MHz span as this then gives the correct 25kHz step size. The ability to be able to analyse half of the civil airband or a good chunk of the military airband, certainly makes for some interesting monitoring.

So that's the setup at home - Now I should point out that I have worked long and hard to put together this monitoring post together with lots of saving and a few loans from the bank over the years. I realise that this setup is not going to be within the financial constraints of some readers but we all have to have a dream to achieve and this was mine.

The photo shows the operations desk in action at home during mid April, monitoring Exercise Fast Moving which has proved very interesting, but that'll have to be reported on next month!

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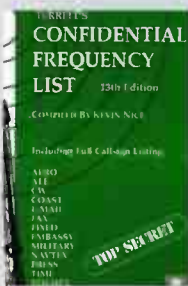
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Radio Listeners Guide

This handy annual publication contains radio product reviews and general information for listeners. Frequencies and locations of radio stations all over the UK and Ireland are given for BBC and commercial radio stations, as well as DAB services. All-in-all a very handy reference guide. £5.45



Passport to World Band Radio 2005 This book includes what's on world band radio, what to buy, how to get started and is written to make interesting reading. It contains a mix of articles, from an idiot's guide, to a five-minute start and ten easy catches to best times to listen. It also has a channel by channel guide to what's on the

25 Simple Tropical & MW Band Aerials

This concise book describes how to build 25 simple and inexpensive antennas for operation on the medium wave broadcast band (550 - 1600kHz) and on the 60, 75, 90 and 120 metre tropical bands. There are also designs for the 49m band. £1.75



An Introduction to Radio Wave Propagation

This book provides a broad, yet clear picture of radio wave propagation in a concise way without the use of too much technical language or mathematics. Included are explanations of the phenomena that is propagation dealing with everything from the Sun, through the ionosphere to noise. £3.95

ARRL Handbook

Radio amateurs and professionals rely on The ARRL Handbook for current antenna theory and a

wealth of practical, how-to construction projects. This 20th edition is extensively revised and includes contributions from leading antenna experts. Many designs are the result of the latest advances in computer modelling. £32.00



Antenna Toolkit

This book acts as a miniature antenna manual with very good technical explanations without ever over-doing the maths for the not-so-keen mathematicians! The drawings and illustrations are very clear and the section on instrumentation is very helpful. £25.00

RSGB Yearbook

There are almost 500 pages in the 2005 Yearbook, eight more than last year, but only a

Airband

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AIRWAVES 2005 (Photavia)	144	£10.95	AIR25
AIRBAND RADIO GUIDE (abc) 6th Edition	122	£8.99	ABRG6
AIRBAND RADIO HANDBOOK (Sutton) David Smith	190	£12.95	ABRHB
AIR TRAFFIC CONTROL		£9.99	ATC9
AIRWAVES SELCAL - CIVIL & MILITARY DIRECTORY (Photavia)	176	£11.95	AIRSEL
CALLSIGN 2005 (Photavia)	2005	£10.95	CAL25
CIVIL AIRCRAFT MARKINGS 2005 (abc) Alan Wright	368	7.99	CIVAIR
FLIGHT ROUTINGS 2005 Williams	180	£10.00	FR25
MILITARY AIRCRAFT MARKINGS 2005 (abc) March & Curtis	TBA	TBA	MILAIR
BRITISH ISLES ATLANTIC TRANSITION CHART (AERAD)	1020x520mm	£9.00	UKH6
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Frequency Guides

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KLINGENFUSS GUIDE TO UTILITY STATIONS 2005	552	£31.50	KFUTIL
KLINGENFUSS SHORTWAVE FREQUENCY GUIDE 2005	504	£24.50	KFSWFG
KLINGENFUSS SHORTWAVE FREQUENCIES CD 2005		£17.70	KFSWCD
PASSPORT TO WORLD BAND RADIO 2005 (IBS)	592	£17.50	PASS25
RADIO LISTENERS GUIDE 2005	160	£5.45	RLG25
WORLD RADIO TV HANDBOOK 2005 (WRTH)	688	£22.50	WRTH25

Scanning & Short Wave

	Pages	Price	Code
BUYING A USED SHORT WAVE RECEIVER - 4th Edition F. Osterman	78	£5.95	BUSWRX
RECEIVING (VALUE) STATION LOGBOOK (RSGB)	80	£4.95	RXLOG
SCANNER BUSTERS 3 D.C. Poole (Interproducts)	92	£5.00	SCANB3
SCANNERS 4 SCANNING INTO THE FUTURE Bill Robertson	245	£9.95	SCAN4
SHORT WAVE COMMUNICATIONS 1991. Peter Rouse (PWP) - WSL	187	£4.50	SWCOM
SHORTWAVE RECEIVERS PAST & PRESENT 3rd Edition F. Osterman	450	£25.95	SWRXPP
THE ESSENTIAL GUIDE TO SCANNING Martin Peters	108	£6.00	EGTS
THE SUPERHET RADIO HANDBOOK I.D. Poole (Babani)	104	£4.95	BP370

Antennas/Transmission Lines/Propagation

	Pages	Price	Code
25 SIMPLE INDOOR & WINDOW AERIALS E.M. Noll (Babani)	50	£1.75	BP136
25 SIMPLE TROPICAL & MW BAND AERIALS E.M. Noll (Babani)	54	£1.75	BP145
ANTENNA FILE (RSGB)	285	£18.99	ANTFIL
AN INTRODUCTION TO RADIO WAVE PROPAGATION J.G. Lee (Babani)	116	£3.95	BP293
ANTENNA TOOLKIT (inc. CD-ROM) Joseph J. Carr	214	£25.00	ANTOOL
ARRL ANTENNA BOOK (inc. CD ROM) 20th Edition	944	£32.00	RRAB20
BACKYARD ANTENNAS Peter Dodd G3LDO (RSGB)	200	£18.95	BYANTS
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very small handful are the same. Everything you need is covered within its pages: contact names, addresses, phone numbers, websites and E-mail addresses. A major new feature for this Yearbook is the RSGB Contesting Guide, which was formally published in *RadCom*. £16.95

Receiving Antenna Handbook

Your receiver is only as good as your antenna or so says the author of this book. It is a complete guide to high performance receiving antennas for long wave all the way to the upper end of the short wave spectrum. The designs aren't slightly modified amateur transmitting antennas but ones intended specifically for receiving purposes. £17.50



licensing changes and the ubiquity of PCs and the internet. To deal with these, the author has taken a completely new look at the content and approach. For example, some of the traditional demarcations between HF and VHF and between the various operating modes have been overturned, but new and comprehensive chapters on topics such as PCs in the shack and Operating Modes added. £16.95

VHF/UHF Antennas

With both the basic theory and constructional details for many antenna designs, the reader is taken through the essentials in an easy-to-understand way. All kinds of antennas are described from dipoles to Yagis and verticals to log periodic designs. £13.99



The Amateur Radio Operating Manual

This new edition of the RSGB Operating Manual reflects the huge impact in the past few years of

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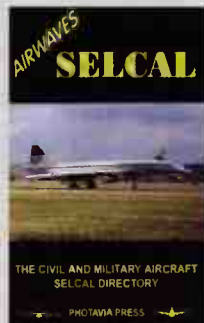
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Military Aircraft Markings 2005

This annual pocket favourite has been revised with a huge number of changes that have affected military serials over the past year. If you can see it or hear it, MAR 2004 will tell you who runs it or owns it! The accuracy of the contents can be relied on. £7.99



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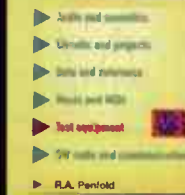
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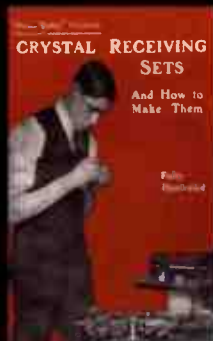
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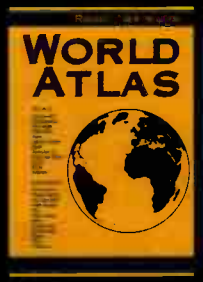
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LM&S

Long, Medium & Short Wave Bands

- **Martin Peters** 11 Jilbert Drive, Reading RG31 5DZ
- **E-mail:** lms@pwwpublishing.ltd.uk

Judging by the number of contributions this month, it's been very quiet out there... A new broadcast to look for is **Coalition Maritime Forces Radio One** from the Middle East. The station has been monitored recently on 9.133MHz in upper sideband at around 1100.

The station, operated by the US Navy Maritime Liaison Office (MARLO), aims to persuade listeners to provide information on terrorists' whereabouts and intentions, presumably in return for shed-loads of money. Programmes go out in Dari, Pashto, Urdu and Arabic, with the odd announcement in English.

On the air since April 2004, CMF Radio One is not often monitored outside of the region as it's broadcast at low power from ships operating in the area. Other announced frequencies are 6.125 and 15.500MHz.

It's possible that the outfit has stepped up a gear, in part, to counter the recent launch of a Taleban-backed pirate station in Afghanistan. The Voice of Shariat is anti the Karzai government and supposedly broadcasts from vehicles for a few hours a day. I guess the drivers are on short-term contracts.

New Station

Another one you may wish to bag is a new station operated by the Save the Gambia Democracy Project (STGDP), which began a series of 15-minute test transmissions at the end of April. The tests were designed to ascertain audibility of the station within Gambia. 9.430MHz was the chosen channel on 27-29 April at 2000. Depending on the results of the trial, scheduled transmissions, promoting human rights and free speech, were expected to begin within a short time.

On to Digital Radio Mondiale (DRM), where the UK's **Virgin Radio**, always at the forefront when it comes to broadcast technology, is reportedly to be heard (if you have the kit) on 9.720MHz from 0500-0900.

A clutch of UK commercial broadcasters are also trying their hand at DRM: Asian Sound, Classic Gold and Premier Radio go out at 0900-1100, 1100-1300 and 1300-1400 respectively on 9.815MHz.

These test broadcasts, running to the end of June and emanating from Austria's Moosbrunn facility, are beamed towards

the UK at a power of 40kW.

Virgin Radio's dynamic approach means that you can now listen in on a.m. and DAB nationwide, on f.m. in London, via Sky throughout Europe, on WorldSpace throughout Africa and Europe, and throughout the world on the Internet, either live or as a downloaded so-called podcast. You can even hear

them on your over your 3G mobile phone, most any place you happen to be.

The British DX Club (BDXC) has just published the latest edition of **Broadcasts in English**. The title tells all. In addition to an hour-by-hour listing of frequencies carrying English-language programming, the 32-page booklet rounds off with the most up-to-date DRM schedule available

Tropical Band Table

MHz	UTC	Service	Country	Listener
3.910	1937	Reflections Europe	IRL	D
3.915	2125	BBC World Service	G/SNG	B E
3.955	2104	Radio Korea International	KOR/G	D E
3.965	2130	Radio France International	F	B
3.975	2140	Radio Budapest	HNG	B D
4.005	2240	Vatican Radio	CVA	B
4.770	2235	FRCN Kaduna	NIG	R
4.800	2130	CNR1 Shijiazhuang	CHN	B D
4.810	1955	Voice of Armenia	ARM	D
4.820	2200	Xizang Lhasa	CHN	B D
4.845	2145	ORTM Nouakchott	MTN	B D
4.905	2220	Xizang Lhasa	CHN	B D
4.915	2300	GBC 1 Accra	GHA	B D
4.920	2225	Xizang Lhasa	CHN	B D
4.940	1949	Voice of America	USA/STP	D
4.976	2051	Radio Uganda, Kampala	UGA	D
4.985	2338	Radio Brasil Central	B	A
5.015	2245	Turkmen Radio	TKM	B
5.025	2046	Radio Tashkent	UZB	D
5.030	2215	Radio Burkina	BFA	B D
5.070	2325	WWCR, Nashville	USA	A
3.940	2145	RFI Radio (pirate)	G	C
4.975	2102	Radio Mundial, Sao Paulo	B	C
5.005	2110	R Nacional de Guinea Ecuatorial	GNE	C

DXers:-
A Thomas Williams, Truro
B Vic Prier, Seaton

C Freddy McGavin, Dublin
D Mike Casey, Manchester
E Simon Hockenhill, Bristol

Long Wave Table

kHz	Service	TX Location	Country	Power (kW)	Listener
153	Radio Romania	Brasov	ROU	1200	D*
153	Deutschlandfunk	Donebach	D	500/250	A* B C D
162	France Inter	Allouis	F	2000/1000	A B C
171	Medi 1	Nador	MRC	2000	D*
171	Radio Rossi	Bolsakovo	RUS	600	B D
177	Deutschlandradio Berlin	Zehlendorf	D	500	B C D*
183	Europe 1	Saarlouis	D	2000	A B C
189	Rikisutyarpid	Gufuskalar	ISL	150	C*
198	BBC Radio 4	Droitwich	G	500	B C
207	Deutschlandfunk	Aholmring	D	500	A* B C D
207	RTM A	Azilal	MRC	400	D*
216	Radio Monte Carlo	Roumpules	F	1400	A B C D
225	Polish Radio 1	Solec Kujawski	POL	1000	B C D
234	RTL	Beidweiler	LUX	2000	A B C
243	Denmark Radio 1	Kalundborg	DNK	300	B C D
252	Algiers Radio 3	Tipaza	ALG	1500/750	B C*
252	RTE Radio 1	Clarkstown	IRL	500/150	A B C D
261	Radio Rossi	Taldom	RUS	2500	C* D*
261	Radio Horizont	Sofia	BUL	75	D*
270	Czech Radio 1	Uherske Hradiste	CZE	650	B C D
279	Belarusian Radio 1	Sasnovy	BLR	500	C D*

* = dark

Listeners:-
A Thomas Williams, Truro
B Phil Townsend, London

C Harry Richards, Lincolnshire
D Simon Hockenhill, Bristol

(all languages), a rundown of DX and media-related programmes and the WRN English to Europe schedule. All-in-all, a fine reference source.

Whilst the booklet goes out to BDXC members free of charge, non-members can get theirs by sending a cheque for £2 or 6 IRCs to: **BDXC, 126 Bargery Road, London SE6 2LR.**

Meanwhile, *WRTH* has made available many international broadcasters' summer schedules via their website. For a link to this and a small collection of relevant information, please visit <http://tinyurl.com/44rpr>

OK I admit it, I was wrong! **Radio**

Medium Wave Table

KHz	Service	Location	Country	KW	Listeners
531	RTA 1	Ain-El-Beida	ALG	600/300	C*
531	Utyarp Foroya	Akraberg	FRD	200/100	D
531	RNE 5	Many	E	10-25	C*
531	Swiss Radio (German)	Beromunster	SUI	600	C* D*
540	Radio Twee	Wavre	BEL	150	B D
549	Deutschlandfunk (DLF)	Nordkirchen/ Thunau	D	100	B D*
549	UCB Europe	Dundalk	IRL	70	C D
558	RNE 5	Many	E	5-50	C*
567	RTE 1	Tullamore	IRL	500	B C D
576	Sudwestrundfunk (SWR)	Muhlacken	Q	100	B C D*
576	RNE 1	Barcelona	E	100	C* D*
585	RNE 1	Madrid	E	600	C* D*
585	FIP	Paris	F	8	C* D
585	BBC Radio Scotland	Dumfries	G	2	C
594	HR Skyline	Frankfurt	D	250	B C* D*
594	RTM A	Dujda	MRC	100	C* D*
594	Radio Renascenca	Muge	POR	100	D*
603	France Info	Lyon	F	300	C* D*
603	BBC Radio 4	Newcastle U Tyne	G	2	C
612	RTM A	Sebba-Ajoum	MRC	300	C*
612	RNE 1	Vitoria	E	10	C* D*
621	RTBF 1	Wavre	BEL	300	B D
630	Tunis Radio	Djedeida	TUN	600	D*
630	NRK Europakanalen	Vigra	NOR	100	C*
639	RNE 1	Many	E	10-300	D
639	Czech Radio 2	Prague	TCH	1500	B C* D*
648	BBC World Service	Drfordness	G	500	B C* D
657	RNE 5	Madrid	E	50	D*
657	BBC Radio Wales	Wrexham	G	2	B C D
666	Sudwestrundfunk (SWR)	Rohrdorf	D	150	C* D*
675	Arrow Classic Rock	Lopik	HOL	120	B C* D
684	RNE 1	Seville	E	600	C* D*
693	BBC Radio 5 Live	Many	G	1-150	B
693	RNE 1	Many	E	10-20	C*
702	NDR 4	Flensburg	D	5	C* D*
711	Radio Bleu	Rennes	F	300	B C* D
720	BBC Radio 4	Lisnagarvey	G	100	B D
729	RNE 1	Many	E	10-100	C* D*
729	RTE Radio 1	Cork	IRL	10	C* D
738	RNE 1	Barcelona	E	500	C* D*
738	Radio France International	Paris	F	5	D*
747	Radio 747	Flevoland	HDL	400	B C D
756	Deutschlandfunk (DLF)	Many	D	100-200	B C* D*
765	Dption Musique	Sottens	SUI	600	C* D*
774	RNE 1	Many	E	20-100	C
774	BBC Radio 4	Enniskillen	G	1	C
783	MDR Info	Leipzig	D	100	C* D*
792	France Info	Limoges	F	300	C* D*
792	BBC Radio Foyle	Londonderry	G	1	C
801	Bayern	Munich	D	100	C* D*
810	BBC Radio Scotland	Westerglen	G	100	C D*
819	Sud Radio	Toulouse	F	20	C* D*
819	Radio Euskadi	San Sebastian	E	10	D*
828	NDR	Hanover	D	20/5	C*
837	France Info	Nancy	F	200	C* D*
846	RAI Due	Rome	I	60	C*
855	RNE 1	Murcia	E	300	C*
864	La City Radio	Paris	F	300	B C* D
873	SER	Many	E	10-25	C*
873	American Forces Network	Frankfurt	D	150	C* D*
873	BBC Radio Ulster	Enniskillen	G	1	C
882	BBC Radio Wales	Washford	G	100	B C

Tatras International launched, as advertised, on 9 April via the 9.290MHz transmitter in Latvia. You can also listen online - www.rti.fm - and on Band 2 f.m. in parts of Slovakia. I've yet to see reports of actual observations of their scheduled satellite outlet, on *Eurobird* at 28°E, or on 1350kHz medium wave. Programme content I have so far personally heard, consists of hits from the last few years interspersed with some jingle IDs, one of which mentions the elusive satellite transmission.

Offshore Structures

Two offshore structures made the papers

recently; both having once played a part in the radio revolution of the sixties. First up, Red Sands Fort, a cluster of seven steel towers equipped with anti-aircraft guns, erected in the Thames Estuary during the war, and then abandoned by the British government in 1956. These edifices came to the attention of pirate radio entrepreneurs in the following decade, providing ready-made, stable platforms, complete with working generators, from which to broadcast. Red Sands became home to Radio Invicta, K-I-N-G and Radio 390; one of the most successful stations of that era. The fort fell silent, once more, in 1967 with the

KHz	Service	Location	Country	KW	Listeners
891	RTA 1	Algiers	ALG	600/300	D*
891	Radio 538	Hulsberg	HDL	20	C* D*
900	RAI Uno	Milan	I	600	C* D*
900	Radio Popular	Bilbao	E	10	C*
918	Radio Slovenia	Domzale	SVN	600/100	C* D*
927	Radio Een/927 Live	Wolvertem	BEL	300	B C* D*
936	Bremen 1	Bremen	D	50/10	C*
945	France Blue	Toulouse	F	300	C* D*
954	Czech Radio 2	Brno	CZE	200	C* D*
954	Dnda Cara Radio	Madrid	E	20	C* D*
963	YLE Radio	Pori	FIN	600	C* D
972	Nord Deutscher Rundfunk (NDR)	Hamburg	D	100	C* D*
981	RTA 2	Algiers	ALG	600/300	D*
990	Deutschlandfunk (DLF)	Berlin	D	100	C* D*
990	Radio Bilbao	Bilbao	E	10	D*
999	COPE	Madrid	E	50	C* D*
1008	SER	Many	E	5-10	B
1008	Radio 10 Gold	Flevoland	HOL	400	C* D
1017	Sudwestrundfunk (SWR)	Wolfsheim	D	100	B C* D*
1017	RNE 5	Many	E	10	C*
1026	SER	Many	E	5-10	C*
1035	Radio Nacional	Porto Alto	POR	100	C*
1044	RTM C	Sebba-Ajoum	MRC	300	D*
1044	MDR Info	Dresden	D	20	C* D*
1044	Radio San Sebastian	San Sebastian	E	10	C* D*
1053	Talksport	Orpwich	G	500	C*
1062	RAI Uno	Many	I	2-25	C*
1062	Denmark Radio P3	Kalunborg	DNK	250	B C* D*
1071	Euskadi Irratia	Bilbao	E	50	D*
1071	Talksport	Clipstone	G	1	C*
1080	SER	Many	E	5-10	C*
1089	Talksport	Brookmans Park	G	400	C
1098	RNE5	Almaria	E	10-25	C*
1098	Radio Slovensko	Nitra	SVK	50	C* D*
1107	American Forces Network	Bavaria	USA/D	10	C*
1107	Talksport	Many	G	2	C
1116	Radio Pontevedra	Pontevedra	E	5	C*
1125	Croatian Radio HR1	Deanovac	HRV	100	B D*
1125	Radio 21	Houdeng	BEL	10	C* D*
1125	BBC Radio Wales	Llandrindod Wells	G	1	D
1134	Croatian Radio HR1	Zadar	HRV	600	B C* D*
1143	American Forces Network	Many	USA/D	0.3-10	C* D*
1179	Swedish Radio	Solvensborg	S	600/300	B C* D
1179	Radio Netherlands	Solvensborg	HOL/S	600/300	D*
1179	Radio Canada International	Solvensborg	CAN/S	600/300	D
1179	SER	Valencia	E	50	C*
1188	VDA/RFE	Marcali	USA/HNG	500	C*
1188	Radio Twee	Kuurne	BEL	5	B D*
1197	Virgin Radio	Many	G	0.2-2	C
1206	France Info	Bordeaux	F	300	C* D
1215	Virgin Radio	Many	G	0.32-200	C
1224	Radio Popular	San Sebastian	E	10	C*
1233	Virgin Radio	Many	G	0.1-0.5	C*
1242	Virgin Radio	Many	G	0.5-2	C*
1242	France Info	Marseille	F	150	C* D
1260	SER	Many	E	5	C*
1251	Radio 747	Hulsberg	HDL	10	C*
1260	Virgin Radio	Lydd	G	1	B
1269	Deutschlandfunk (DLF)	Neumunster	D	300	B C* D*
1278	France Bleu	Strasbourg	F	300	D
1278	RTE Radio 2	Dublin/Cork	IRL	10	C*

KHz	Service	Location	Country	KW	Listeners
1287	SER	Many	E	5-10	C* D*
1296	COPE	Valencia	E	20	C*
1305	RNE 5	Many	E	10-25	C*
1314	NRK Europakanalen	Kvitsoy	NOR	1200	B C* D*
1323	Voice of Russia	Wachenbrunn	RUS/D	800/150	B C* D
1323	BBC World Service	Limassol	G/CYP	100	D*
1332	RAI Uno	Rome	I	300	C*
1341	BBC Radio Ulster	Lisnagarvey	G	100	D*
1350	Radio Orient	Nancy	FRN/F	300	C* D*
1359	RNE 1	Madrid	E	600	C* D*
1368	Manx Radio	Douglas	IDM G	20	C* D*
1377	France Info	Lille	F	300	B C* D*
1386	Voice of Russia	Sitkunai	RUS/U	750	B C*
1386	Radio Baltic Waves International	Sitkunai	LTU	750	C*
1395	Trans World Radio	Filake	MCD/ALB	500	C*
1404	France Info	Brest	F	20	C* D
1413	RNE 5	Many	E	5-10	C*
1422	Deutschlandfunk (DLF)	Heusweiler	D	1200/600	B C* D
1440	China Radio International	Marnach	(CHN/LUX)	1200/300	A* C* D*
1440	RTL	Marnach	(CHN/LUX)	1200/300	B C*
1449	Libyan Radio	Misurata	LBY	20	C*
1467	Trans World Radio	Romoules	MCD/F	1000	C*
1476	Radio 1476	Vienna	AUT	60	A* C* D*
1494	Voice of Russia	Krasnyy Bor	RUS	600	C*
1494	France Info	Clermont-Ferrand	F	20	B C* D
1503	Radio Saraysye	Bushehr	IRN	500	C*
1503	RNE 5	Many	E	2-5	D*
1512	Radio Nederland	Wolvertem	BEL/HDL	300/25	A*
1512	Radio Vlaanderen/Radio Een	Wolvertem	BEL	300/25	B C* D*
1512	ERA regional	Chania	GRC	100	D*
1521	Saudi Radio	Duba	ARS	2000	D*
1521	Radio Castello	Castello	E	2	D*
1530	Vatican Radio	Vatican City	CVA	150/450	A* C* D*
1539	Evangeliums Rundfunk	Mainflingen	D	700/120	C* D*
1567	France Info	Nice	F	300	B C* D*
1575	RAI Uno	Genova	I	50	C*
1575	SER	Many	E	5	C* D*
1575	Radio Nouveaux Talents	Paris	F	5	D*
1584	RMC Info?	Metz	F	1	D*
1593	Voice of America	Kuwait	USA/KWT	150	C* D*
1593	Radio Cluj	Sibiu	ROU	7	D
1602	Radio Vitoria	Vitoria	E	25	C* D
1611	Vatican Radio	Vatican City	CVA	100	C* D*

* = dark

Listeners:-
 AThomas Williams, Truro
 BPhil Townsend
 CEddie McKeown, Newry
 DSimon Hockenull, Bristol

Local Radio Table

kHz	Service	Svc area/TX site	kW	SWL
558	Spectrum	Crystal Palace	1	A B
603	Capital Gold	Littlebourne	0.1	A B
630	BBC 3CR	Luton	0.2	A B
657	BBC Radio Cornwall	Bodmin	2	B
686	Classic Gold	Exeter	0.34	B
729	BBC Essex	Manningtree	0.2	A
738	BBC Hereford & Worcester	Worcester	0.037	A B
756	Magic Makhyn	Newtown	0.63	B
765	BBC Essex	Chelmsford	0.5	A B
774	BBC Radio Kent	Littlebourne	0.7	A
792	Classic Gold	Bedford	0.275	B
801	BBC Radio Devon	Barnstaple	2	B
828	Classic Gold	Bournemouth	0.27	B
828	Classic Gold	Luton	0.2	A B
828	BBC Asian Network	Wolverhampton	0.2	B
837	BBC Asian Network	Leicester	0.5	A B
855	BBC Radio Norfolk	Norwich	1.5	A
855	Sunshine 855	Ludlow	0.15	B
873	BBC Radio Norfolk	West Lynn	0.3	A
945	Capital Gold	Bexhill	0.7	A B
954	Classic Gold	Torbay	0.4	B
954	Classic Gold	Hereford	0.16	B
963	Asian Club	Hackney	0.95	A B

kHz	Service	Svc area/TX site	kW	SWL
972	Asian Club	Southall	1	A B
990	BBC Radio Devon	Exeter	1	B
990	Classic Gold	Wolverhampton	0.09	B
999	BBC Radio Solent	Fareham	1	A B
999	Valleys Radio	Ebbw Vale	0.3	B
1017	Classic Gold	Shropshire	0.63	B
1026	BBC Radio Jersey	Trinity	1	B
1026	BBC Radio Cambridgeshire	Cambridge	0.5	A B
1035	Kismet Radio	Crystal Palace	1	A B
1116	Valleys Radio	Ebbw Vale	1	B
1116	BBC Radio Guernsey	Rohais	0.5	B
1152	Capital Gold	Birmingham	3	B
1161	BBC 3CR	Bedford	0.1	A
1170	Swansea Sound	Swansea	0.58	B
1170	Classic Gold Amber	Ipswich	0.28	A
1242	Capital Gold	Maidstone	0.32	A
1251	Classic Gold Amber	Bury St Edmunds	0.76	A B*
1296	Radio XL	Birmingham	10	B
1323	Capital Gold	Brighton	0.5	A B
1332	Classic Gold	Peterborough	0.6	A
1359	Classic Gold Breeze	Chelmsford	0.28	A
1368	BBC Southern Counties Radio	Duxhurst	0.5	A
1431	Classic Gold Breeze	Southend	0.35	A

kHz	Service	Svc area/TX site	kW	SWL
1431	Classic Gold	Reading	0.14	B
1458	Sunrise	London	125	A B
1458	BBC Asian Network	Birmingham	5	B
1485	BBC Southern Counties Radio	Brighton	1	A B*
1485	Classic Gold	Newbury	1	B
1503	Sound Radio	London	?	A
1503	BBC Radio Stoke	Staffordshire	1	B
1521	Classic Gold	Reigate	0.64	A B
1530	Capital Gold	Worcester	0.52	B
1530	BBC Radio Essex	Southend	0.15	A
1557	Classic Gold	Northampton	0.76	B
1566	County Sound	Guildford	0.8	A B
1566	BBC Somerset Sound	Taunton	0.6	B
1584	BBC Hereford & Worcester	Woodferton	0.3	B
1584	Turkish Radio	London	0.2	A B
1602	BBC Radio Kent	Rustall	0.25	B
1602	Desi Radio	Southall	0.07	A

* = dark

Listeners:-

- A Phil Townsend, London
- B Simon Hockenhull, Bristol

to requirements and has put it up for sale. REM Island would make an ideal base for a medium wave offshore radio station and there is bound to be a certain level of interest from radio enthusiasts of a certain age.

Noise

Simon Hockenhull in Bristol has noticed "yet another increase of electronic noise across medium wave". I'm afraid it's a sign of the times and those of us who are interested in weak signal reception are finding it ever more difficult due to the increasing levels of interference. Fifteen years ago TV timebase noise, power lines and the odd fluorescent tube or dodgy thermostat were the extent of most listeners' woes. Now, everyone has huge numbers of boxes in their houses: computers, satellite and Freeview receivers, the list goes on. All of these rely on switched-mode power supplies, which can generate noise throughout the medium and short wave spectrum. Then there's electronic water softeners, burglar alarms, so-called Power Saver plugs. All these gadgets conspire to make life difficult for listeners. Fortunately, the spectre of PLT - Internet over the power lines - may be beginning to fade. Let's hope so.

Please send me your contributions by the 10th of the month. If you've never written in before, why not start now - help make 'LM&S' a useful reference and get your name in lights!

A smattering of A05 English language schedules...

KNLS Alaska

0800-0900	11.870
1000-1100	9.795
1200-1300	9.615, 9.780
1400-1500	9.795

Kol Israel

0330-0345	9.345, 11.605, 17.600
0930-0945	15.640
1730-1745	9.345, 11.590, 15.640
1900-1925	11.590, 15.615, 15.640

Radio Pakistan

1600-1615	11.570, 15.100, 11.850, 15.725
-----------	--------------------------------

Radio Romania International

0100-0156	6.040, 9.690, 11.820, 15.430
0400-0456	9.780, 11.820, 15.140, 17.860
0630-0656	9.655, 11.830
1300-1356	11.830, 15.105

1800-1856	9.635, 11.830
2130-2156	7.165, 9.535, 9.645, 11.940
2300-2356	6.140, 7.265, 9.645, 11.940

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

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

Interference
 5 nil
 4 slight
 3 moderate
 2 severe
 1 extreme

Noise
 5 nil
 4 slight
 3 moderate
 2 severe
 1 extreme

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

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

Equipment Used:

Bernard Curtis - Realistic DX-390 + outdoor wire

Eddie McKeown - Grundig YB400 + whip

Francis Hearne - Sharp WQT370 or Yaesu FRG-7 Vega Selena + wire

Freddy McGavin, Dublin - Roberts RC828 + indoor wire

Geraint Gill - Grundig YB400 + whip

H Richards - Grundig Satellit 700 + Datong AD-270 or Yacht Boy 400 + wire

Michael Casey - Roberts RC828 + CTU9 + 60m indoor loop or outdoor 75m

inverted dipole

Phil Townsend - AOR AR7030 + amplified frame

Robert Hughes - AOR AR7030 + RF Systems antenna

Simon Hockenhull - Grundig YB400 + whip

Thomas Williams - Grundig YB400 or YB206

Vic Prier - Fairhaven RD500VX + Datong AD-270 or vertical

ARA-60 Active Antenna. £239.95

Frequency range 40kHz-60MHz (full performance) 60-120MHz
 2-3dB less gain

Output impedance 50-75 ohm coaxial

Connector to Rx PL type delivered as standard. Other standards can be fitted on request

Gain 10dB +/-0.2dBs

Intercept Point +50dBm IP 3rd order (10MHz/12V)

DC power supply 11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)

Mast diameter 30-50mm can be fitted

Dimensions 115cm total length. Antenna tube 50mm x 160mm
Ideal for base stations

ARA-2100 Active Antenna. £239.95

Frequency range 50-2100MHz

Output impedance 50-75 ohms coaxial

Gain 18dB-1000MHz
 9dB-1500MHz
 6dB-2100MHz

Noise figure 1.5-2dB-1000MHz
 1.8-2.5dB-1500MHz
 2.5-4dB-2000MHz
 +38dB typical

3rd order IP PdB = +22dBm

Output impedance 50-75 ohms coaxial

Connector standards N type connector at the antenna. BNC male connector to the receiver

Power supply 12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna

Dimensions Length 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

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YAESU VR-5000



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- Frequency coverage: 100 KHz-2599.99998 MHz
- Modes: CW, LSB, USB, AM, AM-N, WAM, FM-N, WFM
- Real time band scope
- DSP Bandpass, notch and noise reduction filters (optional)
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- World Clock
- Digital Voice Recorder
- Case Size: 180 (W) X 70 (H) X 203 (D) mm
- Weight (approx): 1.9 kg

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- FVS-1A Voice Synthesiser £39.95
- DVS-4 Digital Voice Recorder £29.95

Total RRP: £864 ML&S Only £629.00 or 36 x £22.87

Or 'bare-bones' VR-5000... **Only £489.95**

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SUITABLE MAST: 60mm



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New Product! Skyscan 747

Latest addition to the scanner scene is this wonderful "large format" handle. In complete opposition to the norm, this scanner is internal battery powered but is nice and big thus making it easier to use with a massive LCD Display. Covering AIR BAND, FM BAND (87.3-108.1MHz), & the Marine band. This is a real bargain scanner.

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 Antenna: AM Ferrite rod. FM/Air: Built-in telescopic. AF Output: 750mW (LOUD!).
 10 Memories. Squeech. Key Lock

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The AR-108 is a palm sized scanner covering 108 to 180 MHz. It gives the best possible receive sensitivity in the CIVIL AIRBAND. The radio covers this frequency in two bands. 108 - 136.975MHz for the Civil Airband and 136 - 180MHz for the rest of the VHF band. The frequency is changed by use of the up/down buttons on the selected digit. It holds a 99 memory bank for each of these bands, which are set independently. There are also facilities to lock in frequencies in the memories to pass on.

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Output Impedance 50-75 ohm coaxial

Connector to Rx PL type delivered as standard. Other standards can be fitted on request

Gain 10dB +/-0.2dBs

Intercept Point +50dBm IP 3rd order (10MHz/12V)

DC power supply 11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)

Mast diameter 30-50mm can be fitted

Dimensions 115cm total length. Antenna tube 50mm x 160mm
Ideal for base stations



ARA 2100 (NEW MODEL)

TECHNICAL PERFORMANCE

Frequency range 50-2100MHz

Output impedance 50-75 ohms coaxial

Gain 18dB-1000MHz
 9dB-1500MHz
 6dB-2100MHz

Noise figure 1.5-2dB -1000MHz
 1.8-2.5dB -1500MHz
 2.5-4dB -2000MHz

3rd order IP +38dBm typical
 PdB = +22dBm

Output impedance 50-75 ohms coaxial

Connector standards N type connector at the antenna. BNC male connector to the receiver

Power supply 12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna

Dimensions Length 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



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Long-distance reception conditions remained in the doldrums throughout March but by the time the magazine hits the bookshelves we should (hopefully) be seeing a trickle of Band I stations in the run up to the long-awaited Sporadic-E season.

Band I Reception Reports

On 7 March at 0944, **Peter Barber** (Coventry) identified HRT-1 (Croatia) co-channelling intermittently with the Dutch Lopik signal on Channel E4. This lasted until 0952 with a brief return at 1012. **Tony Jones** (Basildon) reports a hint of Band I activity on the 17th with unidentified weak pictures at 1814 on E2 and E3, the latter with a news programme. **Simon Hockenhuil** (Bristol) experienced another 'blank' month which was reflected by the poor conditions on the h.f. bands with both the 18 and 21MHz amateur radio bands struggling most days.

Tropospheric Reception

A slight tropospheric lift enabled **Stephen Michie** (Bristol) to log several UK, French and Belgian stations between the 17 and 20th. The 18th was the best day with French f.m. stations audible at 99.8, 103.7 and 105.2MHz. Belgian TV was visible on E8 (RTBF-1) and E10 (VRT TV1) from Wavre. Tony Jones comments that the build-up to lifts is always the same with a marked improvement of the picture quality of NED-1 on E4 from Lopik, followed by RTBF-1 E8 and VRT TV1 E10.

During a visit to Muir of Fowls near Alford in Aberdeenshire on the 29th, **George Garden** (Edinburgh) heard an erratic Norwegian signal breaking through at fairly strong strength on 97.3MHz. This was probably NRK P2 from the 120kW Bokn transmitter as the high pressure area was poised over Norway that day. George was using a Sony Music Centre fed from a three-element amplified f.m. antenna.

Rana Roy (Northern India) reports that between the 9 and 26th there was a daily display of tropospheric reception, typically Pakistan E5 (Lahore) and India E7 (Amritsar), E9 (Jallundhar) and E10 (Bathinda).

From Sunderland, **Peter Barclay** mentions that out of all the sound spacing of the Eastern European signals he received during the 'super' tropo in early December 2004, only TVP-2 on Channel E/R25 had 5.5MHz sound spacing; all the other TVP-1 and TVP-2 signals, along with the suspected Czech

station, were 6.5MHz.

Gösta van der Linden (Netherlands) comments on **Brian Manley's** recent reception of RTBF La Deux Anderlues on Channel E64. The e.r.p. of this transmitter is indeed only 3kW as shown on page 183 of RTBF's text service. The sound level is 0.15kW.

Analogue Switch-Off

The UK's first analogue transmitter was to be 'switched off' during the early hours of 30 March - well, almost, as BBC-2 Wales from the Ferryside relay was retained. The reason it was retained, the schedule differs slightly from the digital 'BBC-2 W' signal.

Low marks to 'Teletext' who blandly reported 'Sound and Picture quality are better on digital TV'. This is not strictly true. Compared with a good analogue picture, digital is inferior with artefacts such as facial details degraded. However, Simon Hockenhuil adds that the analogue signal in the Welsh region was poor, so a switch to digital was bound to be perceived as an improvement.

African Band I Reception

When Spain has finally axed its Band I outlets there will be only Portugal to contend with to the south. This means it will be worthwhile spending some time with the antenna beamed south/south-west to capture any African transmitters. Technical information has always been scant but Band I has been used over the years by many countries but the big question is whether these are still operational.

The Nigerian ENTV E2 Enugu outlet was abandoned around 1967 during the civil war but a year ago there were reports that Madrid E2 was causing severe co-channel interference to Nigerian broadcasts. This suggested that E2 was in use again in Nigeria.

Ghana (GBC) may still have an E2 outlet, although the last definite sighting was around 1990. From the Algarve **Hugh Cocks** mentioned that, while living in South Devon in the early Seventies, he received a RETMA 1956 Test Chart for "the whole afternoon" on E2, E3 and E4 from the south during the Spanish siesta period when TVE-1 was off-air. Ghana was suspected but never confirmed. Recently, Stephen Michie (Bristol) unearthed some pictures of the early days of GBC which showed the RETMA Test Chart lurking on a monitor in the background of the control room.

Keep On Writing!

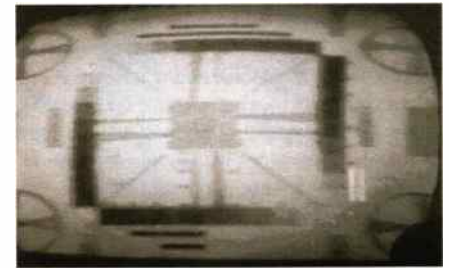
Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-schedule photographs and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS**. We can also use off-air pictures stored as JPG files on PC disks and good-quality video recordings. Finally this month, don't forget our new-look DXTV and Archive TV website at www.test-cards.fsnet.co.uk

New Station

A new African transmitter, possibly high-power, has been detected on E2 at 48.2486MHz. It has been received in southern Europe via trans-equatorial propagation with a much stronger and cleaner carrier than the 1kW Equatorial Guinea Malibo outlet.

The new station has been received in the Algarve several times by Hugh Cocks. And when present, a fine 'hash-like interference' is visible over 48-48.5MHz. The interference is accompanied by a crawling diagonal dot pattern over the picture. Strangely, no sound has been received and the reception is more frequent than Equatorial Guinea.

The direction suggests Guinea, Liberia or Sierra Leone. The latter has always been listed in the WRTH as E2 with an e.r.p. of 1kW but the offset of the new station differs. Many years ago, while on a business visit, a DXer claimed there were no visible Band I antennas in the capital of Freetown. A new terrestrial service



■ Fig. 1: The RETMA 1956 test chart, once popular in Europe before everyone went colour.



■ Fig. 2: A test card used by Ghana in the 1960s.



■ Fig. 3: The BBC 'Wavy Greyscale' clock caption, first transmitted in December 1949.

Attn' 123

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Frequencies - Reader, **Bill Kelly** of Worcester has asked us for a list of frequencies used by Numbers Stations in recent months. The usefulness of such a list depends very much on the station concerned and the habits of that station. Some numbers stations use the same frequencies for many years, while others regularly change their operating frequencies either according to predictable schedules or in a 'random' and seemingly unpredictable way.

For the very latest information we recommend contacting the ENIGMA 2000 group, who provide up-to-date frequency details - but, of course, this largely depends on logs received. The Morse and voice stations selected all refer to reports from the last few months. Please note that the frequencies used by many transmissions will go higher in the summer months. At best, the details below must only be seen as a rough guide.

M1 - (main network) Schedule number for May to August is 025:

Day	UTC	MHz
Sun	0700	6.780
Tue	1800	2.580
	2000	4.905
Thu	1800	5.280,
	2000	4.905
Sat	1500	6.434

(all hand-keyed as always).

M3/M3c - reports list 4.180, 4.505, 4.840, 4.910, 4.960, 5.360, 6.330, 6.480, 7.317, 7.375, 8.088, 9.340, 9.445, 9.610, 9.950, 10.210, 10.220, 10.385, 11.486MHz

M7 - uses M10 frequencies but schedules unpredictable.

M8a/c - For what it's worth, these are recent frequencies logged by ENIGMA 2000: 3.025, 3.244, 3.926, 4.027, 4.173, 4.478, 6.797, 6.826, 6.854, 6.866, 6.966, 6.933, 7.320, 7.519, 7.526; 7.555, 7.580, 7.890, 8.009, 8.096, 8.136, 8.186, 9.062, 9.153, 9.237, 9.323, 9.328, 10.119, 10.126, 10.344, 10.445, 11.432, 11.452, 11.566, 13.374MHz.

M10 - generally uses two frequencies in parallel: 3.522, 3.631, 3.810, 4.007, 4.030, 4.485, 4.835, 4.958, 5.027, 5.076, 5.301, 5.471, 5.861, 5.945, 6.758, 6.763, 7.745, 9.385, 9.445, 12.295, 14.563, 14.978, 15897MHz.

M12 - very many frequencies; change according to schedules.

M13/a - change according to schedules. 3.493, 4.042, 4.470, 4.830, 5.062, 5.262, 5.247, 5.377, 5.735, 5.745, 5.766, 5.783, 6.352, 6.377, 6.382, 6.455, 6.532, 6.574, 6.885, 6.993, 7.524, 7.534, 7.567, 7.927, 8.080, 8.107, 8.112, 9.264, 9.878MHz.

M14 - 4.040, 4.470, 4.830, 5.540, 5.745MHz (this station is far less active than formerly).

M23 - many frequencies, but low activity at present.

M51 - Many frequencies, seemingly random, 4-8MHz; completely unpredictable!

M55 - 12.150MHz. This is a rare (hand-keyed) station, but it was active in February calling '698 000'.

E3/a (Lincolnshire Poacher & Cherry Ripe) - same as ever!

E6 & E7 - very active; as most frequencies change monthly there is little point in listing them (same family as M12 & XP).

E10 - 2.696, 3.150, 3.230, 3.360, 3.557, 3.640, 3.840, 4.015, 4.165, 4.360, 4.461, 4.560, 4.780, 4.880, 5.091, 5.435, 5.820, 6.210, 6.270, 6.370, 6.498, 6.840, 6.912, 6.930, 7.358, 7.540, 7.760, 8.805, 9.130MHz.

E11 - 7.439, 7.663, 7.749, 8.090, 8.544, 9.450, 9.610, 10.125MHz.

E15 - daily 1100 18.000MHz; 1200 17.503; 1230 11.170; 1300 11.000; 1400 14.000; 1630 6.715; 1700 14.000; 1730 5.834; 1800 5.834; 1900 4.130; 2000 5.530 and 2100 4.130MHz.

E23 - schedule: Mon, Wed and Thu; 4-week cycles start 1st Monday of month.

E25/a - a relatively new station. Arabic music introduction.

Starts between 1235 and 1245 or 1325 and 1345 always on 9.450MHz.

G6 - Frequencies change monthly on a yearly basis. A few evening schedules operate.

G22 - (l.s.b.) 4.014, 4.031 and 4.461MHz. One late night schedule at 2300.

S4 - 3.373MHz. Only one schedule at 2245. (Same family as above and M3.)

S6 - Very many regular schedules; very many frequencies.

S10d - 2.846, 3.522, 3.564, 3.631, 3.810, 4.007, 4.030, 4.446, 4.485, 4.958, 5.027, 5.076, 5.272, 5.301, 5.471, 5.861, 5.904, 5.945, 6.758, 6.763, 6.946, 7.605, 7.745, 8.143, 8.175, 9.166, 9.385, 9.455, 9.971, 9.986, 11.417, 13.405, 14.565, 14.978 and 15.898MHz. Generally the station uses two parallel frequencies. Schedules predictable.

S17c - daily as always: 1250, now on 5.301/8.190MHz.

S21 - 1842 twice weekly, morning and evening. Only frequencies ever used: 3.160, 3.323, 3.821, 4.454, 4.498, 4.832, 4.854, 4.958, 5.075, 5.290, 5.373 and 5.740MHz.

S25c - 0900 11.115MHz.

V2/a - 3.245, 3.292, 3.389, 6.768, 6.797, 6.855, 7.482, 7.520, 7.527, 7.681, 7.887, 7.975, 8.010, 8.097, 8.136, 9.153, 9.354 and 11.566. Best times: late night to early mornings.

V7 - not very active at present, Tue and Thu 0600/0620/0640 13-17MHz range.

Please note that all times are UTC and frequencies are in MHz unless stated otherwise.

*ENIGMA 2000 operate an Internet group on the Yahoo Groups site. They can be found at <http://groups.yahoo.com/group/enigma2000/> you need to join the group to gain access to past posts by members and the group's file and image areas. You can also find the **SWM_Readers** group on the Yahoo Groups site. See page 5 of this issue for more details of how to join fellow SWM readers.

Week	UTC	MHz	UTC	MHz	UTC	MHz
1	0955	6.507	1155	8.188	1255	5.340
3	0755	4.832	0955	6.200	1155	8.188
		1255		6.507		
4	0955	8.188	1155	7.250		
Listen out for any Week 2 transmissions:						
2	0955	7.250,	1155	8.188.	1255	5.748.
These may have been re-activated in Morse (M4) or voice.						

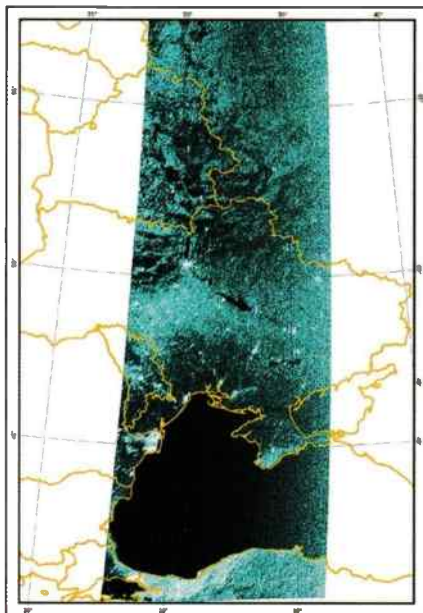
Infoⁱⁿ Orbit

• **Lawrence Harris** 55 Richville Road, Shirley, Southampton SO16 4GH
• **E-mail** info.orbit@pwpublishing.ltd.uk **Website** www.astronomer.plus.com

This edition will hopefully coincide with early transmissions from the new weather satellite *NOAA-N* (*NOAA-18* when in orbit), transmitting images on the new frequency. The saga of *SICH-1M* continues with the first high resolution image from this doomed satellite.

SICH-1M busy - but not for long!

It is clear that the Ukrainian satellite *SICH-1M* - see Fig. 1 - now has a very limited lifetime in orbit. The remote-sensing spacecraft was supposed to have entered a 681 x 640km orbit with an inclination of 82.5° (near polar). Early radar observations by NORAD found the third stage of the launch vehicle and both payloads were in a 281 x 639km orbit. It appeared that the second burn of the Tsyklon-3's third stage failed, leaving the spacecraft in a useless, unstable elliptical orbit. The second ignition of the third stage engine to circularise the orbit, had been expected to take place 39 minutes after the launch but a fault prevented this. Officials have now confirmed that *SICH-1M* does not have onboard propulsion to circularise its orbit for stable Earth observations. This somewhat contradicts early Russian media reports that the satellite did have fuel onboard that could be used to improve the orbit.



■ Fig. 2: *SICH-1M* RLSBO (radar) h.r.p.t. image from Viktor Gavrish.

The inevitable consequence of a very low perigee (the point in the orbit that's closest to earth) is orbital decay. There has been some discussion therefore about whether any sustained transmissions would be received from the spacecraft. The first transmission was recorded in late January but there have been few since. During March, a few v.h.f. transmissions (on 137.40MHz) continued to be received by a limited number of observers. Then, a surprise post from **Viktor Gavrish** in late March showed an h.r.p.t. image from *SICH-1M* - see Fig. 2. It is not clear from where Viktor obtained this image. My attempts to contact him directly have consistently failed. From his web site - see below - it appears that he does not have an h.r.p.t. reception system, so I assume that Viktor obtained the image from an official source. Viktor's web site can be found at www.vfs.org.ua

The Side Looking Real Aperture Radar - RLSBO - was built by Kharkov IRE, of the Ukraine. This instrument was the prime sensor on the OKEAN series and has an antenna of length 11.1m. Its main listed objective is surface monitoring of the earth, snow coverage and sea ice mapping.

SICH-1M RLSBO characteristics:
Wavelength/frequency: 31.4mm (9.7GHz) (X-band)

Data resolution = 1.7-2.8km in the flight direction and 1.3-0.7km in the cross track direction

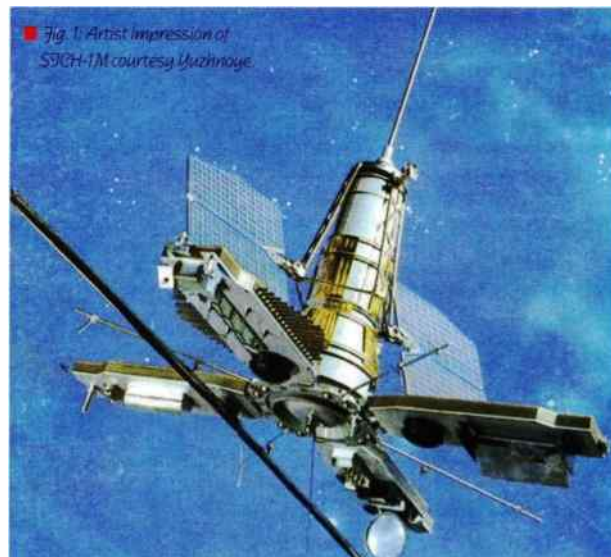
Swath width of 700km (increased from 450km on previous spacecraft to 700km on *SICH-1M*). The swath width is provided in two operational modes: 450 or 700km. The swath location is to the left of the spacecraft flight direction with a shift of 230km to the left from nadir. An illustration of the radar scanner's operation is shown in Fig. 3.

Transmissions on 137.40MHz have been rare. From his favoured location where he can see the hills of Turkey some 80km away, **Nigel Heasman** has recorded some rare imagery from *SICH-1M*, including what appears to have been an early radar image. **Douglas Deans** processed Nigel's wave file to produce Fig. 4. Careful examination shows that the transmission was very likely a recorded image

because the scene shows the area around Uruguay. **Les Hamilton** noted that "the estuary of Rio de la Plata shows up clearly in both images". The right-hand strip appears to be a visible-light image showing clouds and land. By grossly enhancing the central black strip, a radar image of the area - cloud free - can be identified. Les had the interesting idea of using NOAA's CLASS site to download the nearest NOAA h.r.p.t. data for the known time of *SICH-1M*'s flight over Uruguay to obtain the local cloud scene - see Fig. 5. This was processed with David Taylor's HRPT reader.

The saga of *SICH-1M* appears to have run its course with the publication of the first results from the satellite's instruments. **V. Korepanov** and the Variant team, Lviv Centre of Institute of Space Research, Ukraine:

"Because of so low perigee the available



■ Fig. 1: Artist impression of *SICH-1M* courtesy Yuzhnoye.

attitude control means appeared to be not efficient and as a result the satellite rotates around its axis with angular speed about 0.007 degrees of arc per second. Such onboard conditions made the operation of the main satellite payload - remote sensing instrumentation - impossible".

It is reasonable to assume that the transmissions that we have seen and recorded on rare occasions since launch have been simply to test the systems during the limited time before re-entry. It seems that the short, sad saga of *SICH-1M* is over.

Japanese WXSAT first images

The first test visible and infrared images from the recently launched *MTSAT-1R* geostationary satellite - see Fig. 6 - were taken at 0200 on 24 March 2005.

The new Multi-functional Transport Satellite (*MTSAT*) series has two roles: a meteorological function for the Japan Meteorological Agency and an aviation control function for the Civil Aviation Bureau of the Ministry of Land, Infrastructure and Transport. The *MTSAT* series will replace the Geostationary Meteorological Satellite (*GMS*) series as the next generation satellite series covering East Asia and the Western Pacific regions.

MTSAT-1R will provide imagery for the northern hemisphere every thirty minutes,

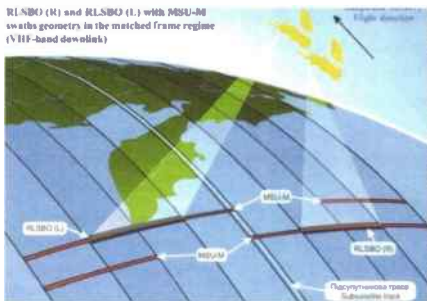


Fig. 3: SICH-1M radar scanner illustration courtesy NSAU.

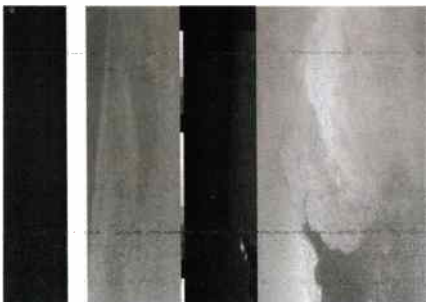


Fig. 4: SICH-1M multi-spectral image with radar from Nigel Heasman (see text).



Fig. 5: NOAA-16 23 March from Les Hamilton (using data from NOAA CLASS Library).



Fig. 6: MTSAT-1R first visible-light test image - courtesy Office of Meteorological Satellite Planning, Japan Meteorological Agency.

unlike the previous hourly rate, enabling the JMA to more closely monitor typhoon and cloud movement. The satellite has a new imager with a new infrared channel (IR4) in addition to the four already existing channels (VIS, IR1, IR2 and IR3) of the GMS-5. MTSAT-1R imagery will be more effective than GMS-5 in detecting low-level cloud and fog, and estimating sea surface temperature at night. It has enhanced brightness levels enabling an

improved image quality level. Some of these images should eventually replace the GOES-9 image sequence on METEOSAT-8's Foreign Satellite Data (also see later).

The view from America

Chuck Vaughn continues to routinely monitor the Chinese WXSAT FENGYUN-1D from his home in the USA, and posted Fig. 8. He comments: "We had a lot of rain this year so California is very green but the first areas of drying grass are appearing on the south end and west side of the San Joaquin valley where there's been little rain for a month".

NOAA-N preparations for launch

With the launch of NOAA-N scheduled for 11 May, hopefully it will already be operational by the time this appears. The first a.p.t. images are likely to be those from the non-infra-red channels. During the early-orbit phase, the satellite has to be out-gassed, a process that allows trapped atmospheric impurities to be released in the stable vacuum of orbit. After this time the equipment is cooled to very low temperatures and the infra-red sensors activated. The infra-red imagery can then be acquired and included in the telemetry stream.

During testing, a significant problem - a frequency drift - was found with STX3 - a data transmitter - see Fig. 9. The decision was taken to replace the entire unit, and at the end of February, inspections of the inside of the Equipment Support Module were completed. An STX-3 validation test was successfully completed, along with a successful check of the receive monitor. Spacecraft processing remained ahead of schedule, ready for the next task - the performance of the Spacecraft Aliveness test. Failure analysis of the removed STX-3 unit continued because it was important to find out exactly why the problem had occurred. The anomalous frequency shift was still present, so the STX was tested over its acceptance test temperature range - but the anomaly remained present at all temperatures.

By 4 March, the new STX-3 was undergoing burn-in testing. This process involves powering the transmitter and ensuring that it continues to work for a minimum period. Statistically most failures occur during early testing. Meanwhile, tests showed that the original unit had a faulty crystal in the oscillator. The fault was traced to a crack in the crystal. One Sunday morning there was an electrical surge in the commercial power to Vandenberg AFB! Fortunately the spacecraft was not powered up at that time; even so, an investigation had to be made to ensure that powering NOAA-N would not put it at risk. By 23 March, all work associated with the STX-3 change had been completed and the spacecraft was back in normal launch processing flow.

NOAA-N Spacecraft Processing Operations were completed by 8 April. Final close-out work was completed and the spacecraft was placed inside its protective contamination control bag under Nitrogen purge. It remained

bagged until it was atop the Delta II booster. Boeing spacecraft canning operations began on 18 April, and transportation of the spacecraft to the launch pad was scheduled for 20 April in support of an 11 May launch.

Inside the NASA spacecraft processing hangar located on North Vandenberg Air Force Base in California, the NOAA-N spacecraft is seen showing the solar arrays while on an assembly and test stand. It was then mated to the Delta II payload attach fitting.

Modifying for NOAA-18

The new WXSAT will be transmitting a.p.t. on the new frequencies (see details at the end of this column). How you modify your scanner depends on what provisions it has for adding new frequencies. The most popular models in use are probably Timestep's Proscan receiver and the RX2 receiver originally produced by the Remote Imaging Group in kit form. The Proscan receiver requires two new crystals - one for each of the new frequencies. These can be obtained from Timestep. The RX2 receiver can be modified by a changing a PIC - a flash programmable device produced by the Group for Earth Observation specifically for the RX2 receiver. I currently have one of these receivers under test, although these frequencies cannot currently be tested until the satellite is active! At nominal cost the frequencies can be added to your scanner, future-proofing it for some years!

METEOSAT-8 Foreign Satellite Data

With METEOSAT-8 providing us with a service of continuous, high quality images from several of the world's geostationary WXSATS, I plan to show occasional glimpses behind the scenes at METEOSAT headquarters. For those holding suitable licences, and that should be everybody, the data stream includes imagery from GOES-9, GOES-10, GOES-12, METEOSAT-5 (referred to as foreign satellite data), and also METEOSAT-7, the latter not actually being a foreign satellite! If you are receiving EUMETCast data via HotBird-6 then you need ensure that the instructions to set up the PIDs have been completed (301 for the multi-service channel that includes FSD). Your decoding software should include the option to receive all these images.

The Météo-France centre for the reception and re-transmission to EUMETSAT of Foreign Satellite Data (FSD) forms part of the EUMETSAT ground segment. Fig. 11 shows the Météo-France Operations Control Room to receive MSG data. To the right are the screens used to supervise the acquisition of image reception (GOES-E on the picture). On the left-hand side are the processing machines (ArchiPEL).

Kevin Hughes' regular a.p.t. image from NOAA-17 (see Fig. 12) shows how effective artificial colouring by software can be. By combining information from both a.p.t. channels (visible-light and infra-red), today's software is able to identify land and sea, producing a realistically coloured image from the basic grey-scale channels.



■ Fig. 7: METSAT satellites - courtesy Japan Meteorological Agency.



■ Fig. 8: FENGYUN-1D 16 April 1555UTC from Chuck Vaughn.



■ Fig. 9: The original NOAA-N STX-3 unit.



■ Fig. 10: NOAA-N satellite prior to enclosure - showing the solar panels folded.



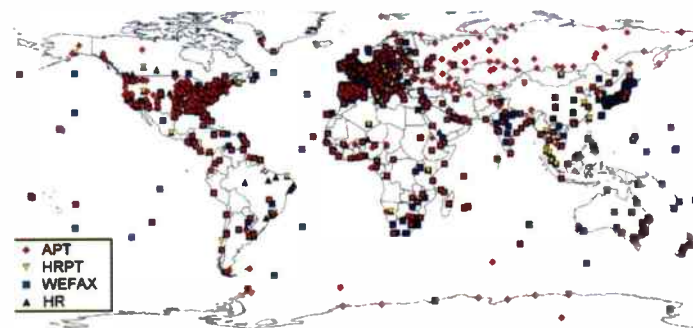
■ Fig. 11: Operations room for JSD (courtesy Météo-France) ©EUMETSAT 2005.



■ Fig. 12: NOAA-17 13 April 1034UTC from Kevin Hughes.

World-wide WXSAT stations

The World Meteorological Organisation conducts regular surveys through its members and other users, concerning the status of meteorological satellite receiving equipment within WMO Regions. The results are classified in four categories: reception of low resolution polar orbit data from Automatic Picture Transmissions (APT); reception from polar orbit of High Resolution Picture Transmissions (HRPT); reception of low resolution geostationary data (WEFAX) and High Resolution (HR) geostationary data.



■ Fig. 13: World-wide distribution of weather satellite reception equipment - courtesy WMO.

Fig. 13 illustrates the global distribution of the four types (APT, HRPT, WEFAX and HR) of receivers. Over 8000 stations are plotted on the diagram, including plots in the open oceans. These represent receivers on both commercial and private ships. Even Antarctica is ringed with satellite receivers used at the many scientific bases located there. Frequent satellite images can be received at each of these 8000 stations. These figures do not include the current distribution of METEOSAT-8 reception systems. Information courtesy WMO.

Shuttle - International Space Station

STS-114 heralds the Shuttle's Return-to-Flight mission and is scheduled for launch between 15 May and 3 June into an orbit passing over Britain and Europe. It will perform new safety checks in orbit on its way to the ISS where it will deliver essential food, water and equipment.

Next month I hope to carry a report about the GEO Symposium that was held at the end of April.

Frequencies

a.p.t.

NOAA-12 and NOAA-15 transmit a.p.t. on 137.50MHz.

During overlap periods, NOAA-12's a.p.t. may be switched off.

NOAA-17 transmits a.p.t. on 137.62MHz.

NOAA-18 should be transmitting a.p.t. on 137.9125MHz (backup 137.100MHz) after launch.

h.r.p.t.

NOAA-12 and NOAA-16 transmit h.r.p.t. on 1698.0MHz.

NOAA-14 (faulty) transmits on 1707MHz.

NOAA-15 transmits on 1702.5MHz.

NOAA-17 transmits on 1707MHz.

NOAA-18 should be transmitting h.r.p.t. on either 1698MHz or 1707MHz.

FENGYUN-1C (faulty) and FENGYUN-1D transmit on 1700.5MHz.

WEFAX

METEOSAT-7 (geostationary) transmits WEFAX on 1691 and 1694.5MHz, and Primary Data on 1691.0MHz until the end of 2005.

METEOSAT-8 HRIT, HRIT and other formats transmitted via HotBird-6 at 13°E on transponder 117 - 10.85344GHz as EUMETCast data.

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- Ben Hogan, *co SWM Editorial Offices*
- E-mail ssb.utilis@pwpublishing.ltd.uk

Antenna designers haven't given up on h.f. you know. Although there seems to be a trend towards usage of much higher frequencies than most of us monitor, there are professionals out there who are still looking at antenna systems that operate on the h.f. bands. One such engineer is currently researching 'covert' type antennas for transmission and reception from a vehicle using many frequencies within the h.f. spectrum.

I have operated transceivers in these frequencies from vehicles and believe me you tend to look conspicuous! A sport utility type four wheel drive with a base loaded whip mounted somewhere near the front of the truck tends to attract attention wherever you are so it was with great interest that I received the information from my old friend 'in the business'.

The pick-up truck is an increasingly popular vehicle. Add four-wheel drive and higher ground clearance to the equation and the pick-up proves itself up to dealing with most travel conditions. If you have a requirement to operate an h.f. radio system then it has usually been necessary to add highly visible whip antennas.

Experimentation is currently ongoing into a dipole type antenna that is established in the load bay of the pick-up. The truck is fitted with a 'Truckman' type top. This turns the flat bed pick-up into a van like space protected from the elements and prying eyes but because of its fibreglass manufacture, not from radio signals.

The h.f. radio set is mounted in the cab area as usual and an SGC automatic antenna tuning unit (a.a.t.u.) is remotely situated in the pick-up area. What is essentially a dipole with legs of 14.5m on either side is folded around each side of the pick-up canopy.

The antenna is suspended in the interior of the canopy. The a.a.t.u. loads this unusual array and results have shown that communications are possible over several hundred kilometres, depending on frequency in use and propagation conditions. I expect many more vehicles of this type to be in use in many parts of the world. I'll keep you posted as to developments.

Yosemite Sam

In April's editorial, the Editor, Kevin mused on the strange case of Yosemite Sam whose broadcasts were eventually traced, by some New Mexico amateur operators, to the MATIC facility on the Laguna Pueblo Reservation in

that state. The broadcasts immediately ceased. Well, it looks like the transmissions are back again but without Sam's voice.

There is some sort of voice transmission but the exact phrase seems indeterminate. The frequency of 3.890MHz has been identified and the same time interval has been noted as with the previous transmissions. A 'partner' transmission has been identified by USA amateurs on 11.70MHz. One truly wonders what mind altering drugs the staff at MATIC have been taking to continue with this nonsense!

I mentioned in the April issue the antenna made from a 'slinky' spring. I wondered what the purpose of the spring was?

David Hall from Northumberland writes to confirm that the 'slinky' is no more than a toy, the sole purpose of which appears to be visually compelling when it is launched down a flight of stairs. I'm sure it has found greater purpose as an antenna.

German Red Cross

I know nothing about the German Red Cross organisation at all apart from the fact that they use h.f. radio. For some years they have been monitored using several digital modes including AMTOR but they are also audible from time-to-time in voice I.s.b. on 6.9985 and 6.999MHz.

My German is, to say the least, dated and non politically correct but for those ex-servicemen and others who speak that language, the traffic can sometimes be monitored during the day from about 1000 to roughly 1600UTC.

RAF Boulmer

A note from Tom, East Sussex reported that on the 29 March he was hearing an RAF exercise that was being controlled from RAF Boulmer. Tom was monitoring 4.484MHz for most of the day.

Target areas, height and distance reports were heard together with callsigns such as XZC and the like. All I know about this one was that it was an air defence exercise and

naturally it involved some AWACS aircraft and other assets. Another frequency in use on this occasion was 4.718MHz and the event appeared to have been controlled from RAF Boulmer. Tom's radio was an FT-817ND with a half-wave 15m dipole.

The FT-817 truly is a great radio for monitoring and for all of February and March an FT-817 has been the only set that I have had available to listen to utilities on. It has not let me down and although an FT-817 represents considerable financial outlay for a receiver I feel that it's well worth it.

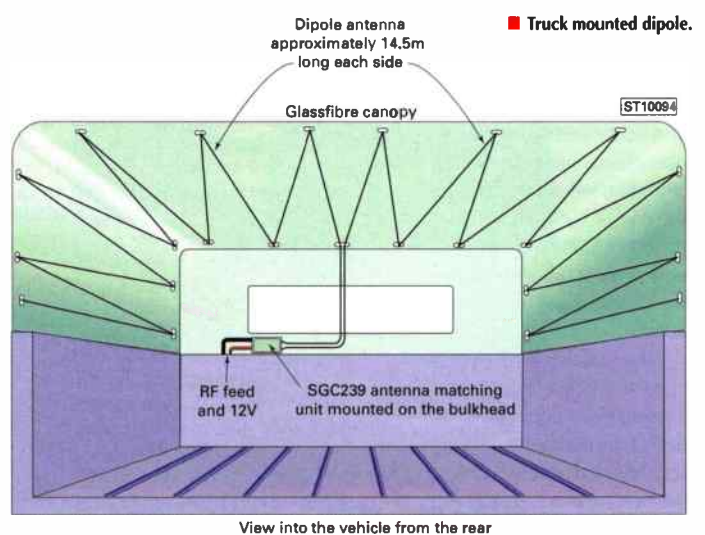
Some earlier model FT-817s suffer from a fault that destroys the transmit power amplifier. The problem is so common that some owners have formed a loose knit BFC or Blown Finals Club. The repair cost works out at about £160 and therefore there are some '817s around on the second-hand market that don't transmit but, of course, they receive just fine. Such a unit may represent a bargain receiver for a cost conscious monitor.

I'm just pleased that my main receiver the FT-920 is now back from repair having suffered a p.l.l. fault. I was like a kid with a new toy when it returned even though I've owned it for about six years. Although the '817 is great the FT-920 is so much easier to use and the d.s.p. can clear interference nicely.

NATO Exercise

There was a large NATO exercise held in the Ionian Sea from the 3-16 March. The Ionian Sea is the bit of northern Mediterranean that lies between the sole of Italy's boot and the Greek islands in the Kefalonia region. This was the 30th annual exercise now known as Noble Marlin and involved the forces of ten countries.

The exercise focussed on anti-submarine techniques. The frequency 4.7415MHz was in heavy use with others including 5.270, 6.7215 and 4.7785MHz being heard. Sporadic use of channels in the two and three megahertz ranges was also noted. For those who are interested the exercise, based at Sigonella, was formerly known as Dogfish.



Maritime

Beacons

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This time I am looking again at some of the history regarding maritime beacons. From their inception they have been a number of changes to them.

Alan Gale from Lancashire recently sent me an extract from a copy of the 1953 Admiralty List of Radio Signals Vol 2 that he managed to buy on eBay. He advises me that the callsigns used in the UK at that time had three letters and usually began with either G or M.

In the extract Alan sent me, I see that the Irish callsigns were also three letters commencing with E. In an example from the sample he forwarded, Kish Light beacon (located off Dublin) used the call EIX and was grouped with Skerries and Cregneish on 306.5kHz. Kish Light continued operation, although its frequency had changed to 312.6kHz and became a stand-alone beacon until mid-1992 when it was replaced by Baily Light, located at Howth Head outside Dublin.

Sometime in the late fifties or early sixties the idents were changed to two letters, unfortunately, I currently have no idea exactly when. Perhaps some of the former marine radio officers who read this column can recall an approximate year for this change and let me know?

Based on the information I have it would seem that beacon chains were in operation in the mid-1950's and continued to remain operational until the majority of chains were abolished at the end of 1992. Some 26 beacon chains were in operation at this time around the British Isles and European coast.

The majority of the chains consisted of six beacons on an assigned frequency with each transmitting its ident in an allocated minute before the next beacon would

activate. In addition some 16 Decca master chains were also operational in Europe. Some full or part beacon chains still remain in operation today, mainly in Russia and the Black Sea regions.

It proved possible to DX further afield after the chains had been removed and I was recently looking at the December 1996 Maritime Beacons column and about 180 reported marine beacons from across Europe. In 2000 we saw the wholesale closure of marine radio beacons across Europe in favour

of satellite navigation. A number of former marine NDBs were converted for use as DGPS correction stations using their existing transmitter equipment and frequencies.

First Timers

Three first timers have been heard here this quarter! In this day and age this is probably the maritime beacon equivalent of winning the lottery! The first one I bagged was underneath **BA** on **292.5** and after running some tight filtering I found it was **MT** from Svalbard, the most northerly maritime beacon in the world! The next one followed a few days later and almost by accident.

I had left the receiver on speaker monitoring **294.5** while I took a 'phone call and heard **ZM** from the Ukraine. This beacon sends its ident during one minute in every six and so emphasises the need for careful listening and monitoring each frequency for at least six minutes. The last new one was

received a few weeks later and was **MU** from Arctic Russia, again on **294.5**. Interestingly daylight checks during the period produced **FI** on **296.5** and **KA** on **305.0**, both of which are normally heard here during darkness.

The **309.5** Ukrainian chain has been received recently by several listeners across Europe, including **Giorgio Casu** in Sardinia, **Roelof Bakker** in the Netherlands, **Bo Nensén** in Sweden and **Patrick Vignoud** in the French Alps. Back in the UK **Arnie Nessbit** was using a FT-817 during the period for beacon DXing, again outdoors from some high ground. He advises me that the FT-817 is kept in one pocket while the tuner is kept in the other pocket to keep the batteries warm. He then goes up the hill to his Shepard's 'cluegh' where he can light a fire to keep warm due to the snow on the ground and erects a collapsible loop. Now that is real dedication to the hobby!

The new edition of my popular beacon booklet is now available, extending to almost 70 pages. Please contact me for details. Next time I hope to include details about using a handheld r.d.f. receiver. Until then, good listening and remember receipt of your marine beacon logs will be most welcome here.

LW Maritime Beacon Chart

kHz	C/S	Location	Country	DXer
283.5	NA	La Entallada	Canaries	A* B* C* F*
284.5	MA	Cabo Machicharo	Spain	A
287.3	IA	Llanes	Spain	A*
289.5	MY	Cabo Mayor	Spain	A
289.5	BT	Blargtangar	Iceland	A*
291.5	MN	Maslen Nos	Bulgaria	C*
292.5	BA	Estaca De Bares	Spain (N/W)	A B* C* D E* F*
292.5	MT	Kapp Martin Lt.	Svalbard	A*
293.5	MH	Mahon	Balearics	A*
294.0	FI	Cala Figuera	Majorca	A*
294.5	MU	Ostrov Mudyugskiy	Arctic Russia	A*
294.5	ZM	Ostrov Zmeinyy	Ukraine	A*
296.5	FI	Cabo Finisterre	Spain (N/West)	A B* C* D* F*
299.5	KN	Skrova	Norway	A* B* E
300.0	GA	Malaga	Spain (S/East)	A*
300.5	VI	Cabo Villano	Spain	A*
300.5	KS	Mys Kanin Nos	Russia	E
305.0	KA	Klaipeda Rear	Lithuania	A D F*
305.7	DA	Dalatangi	Iceland	B* D*
309.5	EYa	Mys Yevpatoriyskiy Lt.	Ukraine	B* C* E
309.5	SW	Mys Khersonesskiy	Ukraine	B* C* F*
309.5	TR	Mys Tarkhankutskiy	Ukraine	B* C* E F*
309.5	WR	Odesa/Vorontsovskiy Front	Ukraine	C* E F*
310.5	BR	El Burullus	Egypt	A*
312.5	BK	Balitsk	Baltic Russia	A* D* F*
312.5	BT	Mys Taran	Baltic Russia	A* D* F*
337.0	MY	Myggenaes	Faroes	A B D
372.0	OZN	Prins Christian Sund	Greenland	A* B*
381.0	AB	Akraberg	Faroes	A B D
404.0	NL	Noslo	Faroes	A B D F*

Entries marked * were logged during darkness. All others at dusk/dawn or during daylight.

- Robert Connolly, Kilkeel, N. Ireland. Equipment: Receiver: JRC NRD-525. Antenna: Datong AD-370 antenna & Timewave DSP-9+ filter.
- Roelof Bakker, Middelburg, Netherlands. Equipment: Active whip, active loop and two tuneable pre-amplifiers. "The output from the pre-amps is routed to a phasing unit and then into the main receiver, a Wandell & Goltermann SPM-3 selective level meter. The output from the SPM-3 at 1500Hz, is down converted to 500Hz. Here follows a Datong. FL-3 filter and/or a LC-filter with a bandwidth of 25Hz. With exception of the SPM-3 and the FL-3, the station is home made"
- Giorgio Casu, San Gavino Monreale, Sardinia. Equipment: Receiver: Icom 756 Proll Antenna: Wellbrook LF1010.
- Arnie Nessbit, near Whitby, England. Equipment: Receiver: FT-817. Antenna: Collapsible loop.
- Bo Nensén, Ornskoldsvik, Sweden. Equipment: Receiver AR7030+ with a 300Hz JRC c.w. filter (CFL-231). Antenna: Beverages 156° - 500 m, 222° - 760 m, 245° - 740m, 261° - 930m, 279° - 1270m, 296° - 1240m, 317° - 940m, 333° - 700m.
- Patrick Vignoud, French Alps. Equipment: Icom R75 and Wellbrook ALA100 loop, Timewave DSP599sx d.s.p. filter.

Satellite

TV News

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As mentioned last in last month's *SWM* his Holiness Pope John Paul II sadly passed away at the Vatican. His funeral on 8 April produced extreme activity for many days across many satellites. Though too many to list, a quick 'snapshot' at 1700, 1 April via *Eutelsat W2*, 16°E found 10 circuits in operation, mainly from the Vatican and the others from Poland the Pope's birthplace. Though most carried clear identifications such as 'SERVICE 1 VATICAN' or 'TVP SZCZECN', others such as 'RTL OFFROAD D220', were more difficult to identify. The 'RTL Offroad' truck kept appearing up to 8 April from various locations, mainly in Poland. I was a little uncertain on the relevance of a live Israeli outside broadcast at Jerusalem's 'Wailing Wall' on the eve of Pope Paul's funeral. At least two live reports in Hebrew were fed into the Israeli 2nd TV network over a *Eutelsat W2* circuit - 12.540GHz-H (5632+3/4) with the service identification of '0'.

On 21 March a massacre took place in a remote part of Minnesota USA. A 17 year old Jeff Weise grabbed his grandfather's gun and shot both him and his partner, he then drove to the Red Lake School on the Lake Chippewa reservation and shot students, a teacher and a guard, then himself a total of 10 deaths. The European feeder UP4 on *Eutelsat W1*, 10°E (10.972GHz-V, SR 4167 + FEC 3/4) carried the live on-site reports from the local police chief. The following day the regional FBI head gave a live press-call. The UP4/APTN feeder is perhaps the only source of live news footage now out of the USA, the others having hit the encrypt button. Most of the White House and other USA government department press meetings are carried on the frequency.

An easy to receive satellite when it's actually transmitting, is *Europe*Star-1* @ 45°E. The past weeks has seen several interesting circuits running. An early evening scan on 19 March found - 'GLOBECAST AFRICA' -11.607GHz-V and 'GLOBECAST AFR-TV' - 11.525GHz-V (both 5632+3/4) plus 'GCA1' - 11.516GHz-V (6109+3/4) - GCA1 = Globecast Africa 1. The latter was encrypted but the others were carrying pop concert content from Jo'burg. The concert called simply '46664', raising funds for AIDS in Africa, ran for 3-4 hours. It included guest visitor Nelson Mandela - The concert was named after Mandela's prison number.

GLOBECAST AFRICA re-appeared 31 March with a 2-way interview between Jo'burg and Stockholm late afternoon at 12.515GHz-V. Late that night another encrypted Globecast circuit was running at an unusual frequency of 11.589GHz-V (both 5632+3/4) - covering the Zimbabwe 'democratic elections' period. A final sighting for *Europe*Star* was the New Zealand v. South African ladies cricket mid afternoon of 7 April - 11.522GHz-V (6109+3/4). Normal Globecast downlinking on this satellite favours between 11.510-11.530GHz-V generally with 5632+3/4. *Europe*Star* is a very strong signal into the UK. An 800mm dish will easily resolve signals with a 0.3dB noise LNB, a struggle with a smaller dish - interesting that an even lower noise Ku band Universal LNB @ 0.2dB has recently been introduced.

Sat truck 'SCOPUS-E-1000' carried live World Cup Skiing from Hochfilzen. The Biathlon featured cross country skiing. **Roy Carman** (Dorking) watched this exciting event over 11.079GHz-H (6111+3/4) on *Eutelsat 10°E*. A few days later Roy caught a news feed on the nearby 10.971GHz-V (4167+5/6) frequency courtesy of 'SATLINK' showing the barriers being moved that separated the Palestinians and Israeli folk.

Extraordinary Sighting

Quite the most extraordinary sighting over the past few weeks must have been over *Atlantic Bird-1* (AB-1) @ 12.5°W on 7 April from about 1800. The infamous 5-ch Globecast bouquet @ 11.106GHz-H (20145+3/4) often carries political reports, car racing and PGA golf tournaments but the channel 2 content this day offered viewing of 'VNN LIVE EXERCISE' and the programme ran for two hours. This epic included news reports, news broadcasts, interviews, filmed items and 'commercials'. A lower scrolling frame advised exercise. The programme detailed the results of germ warfare on certain USA cities, WMD attack, water pollution, terrorist attacks, even the bombing of the Waterloo Station underground. As time passed details of deaths and injuries and how the local authorities were dealing with the emergencies. Another on-screen caption announced 'for official use only/UK restricted/protected other governments'. Clearly this was a rehearsal for disaster management purposes financed by the American government though this feed was intended for European recipients being transmitted in PAL, an on-screen website recommendation was vnn.com

AB-1 carries many BBC TV links for 'the regions'. Another of my snapshots on a pre-Easter 1830 slot 24 March discovered eight active satellite truck OB feeds between 1800-1900. Pictures of Luton Airport departure hall over 'UKI-690 ELSTREE' as folk fly to the sun (11.185-H, 4226+7/8, 'UKI-690 ELSTREE'). Other BBC regional sat feeds including Manchester, Newcastle and Leeds appeared between 11.045-11.072GHz-V and 11.167-11.185GHz-H, using both MPEG-2 and MPEG 4:2:2. This is a very active spot in the sky for evening regional TV. The BBC despatched UKI-366 to the cold and empty streets of Steyning for a couple of main news reports around 2200 25 March via *Eutelsat W2*, 16°E bird using 11.083GHz-H, 4226+7/8.

A few days later *W2* sprung to life with coverage of Maidstone Jail where the former pop personality Jonathan King was released. 'SKY NEWS LONDON CREW' caught pictures, a voice report aired at 0900, switched off the sat truck and drove back up the M20 to London. The report aired over 12.518GHz-H (5632+3/4). A warning. After the reports had been aired the engineer in the sat truck spooled his VTR machine on-air and played out content of Nias Island and an Iraqi bomb. Any enthusiast discovering this final Sky playout transmission may well have thought he was receiving a transmission from Iran or the distant Nias Island!

Though *AB-1* often carries American sports such as golf, car racing, American football and NBA basketball, **Alan Richards** (Skegness) found an Easter NBA basketball out of San Antonio, Texas - in a game versus Houston it was transmitted via the 42°E *Turksat/Eurasiasat* slot over NTV - 12.710GHz-V (2965+3/4), listed as 12.715GHz, in the clear. Nearby on 11.760GHz-V (2222+5/6) a new channel called 'Karadeniz', thought to originate from the town of Deniz in SW Turkey. Alan noted that *Sirius*, 5°E has been watching Dutch 'chariot' racing at 12.588GHz-V (6111+3/4) - previously at 12.606GHz-V - the 12.588 slot often carries Satellite Business TV (SBT).

French terrestrial digital TV transmitters receive their network feeds via the *Atlantic Bird-3* sat @ 5°W and if you look on the 11.590GHz-V slot (19636+2/3) you'll find these TV channels - France 2; France 3 Sat; France 4; France 5; ARTE; The Parliamentary Channel (LCP). The signals are very strong into the South UK on an 800mm dish, reports **Edmund Spicer** (Littlehampton). The French terrestrial digital TV network 'TNT-Television Numerique Terrestre' - opened 31 March, their equivalent of the UK's 'Freeview' digital TV terrestrial service.



The USA Department of State - TV channel (AB-1).



Fidel Castro, the Cuban president makes a speech (W1 10°E).



The '46664' concert for AIDS relief in J'burg, Nelson Mandela pops in (45°E).



Atlanta police chief updates the press and ch.2 TV (W1)



World Cup skiing from Hochfilzen - W1.



A fragile peace exists between the Israelis' and Palestinians as the barriers



New power boat on test in the Adriatic, via AB-2, 8°W.

Propagation

Forecasts

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

How to use the Propagation Charts

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

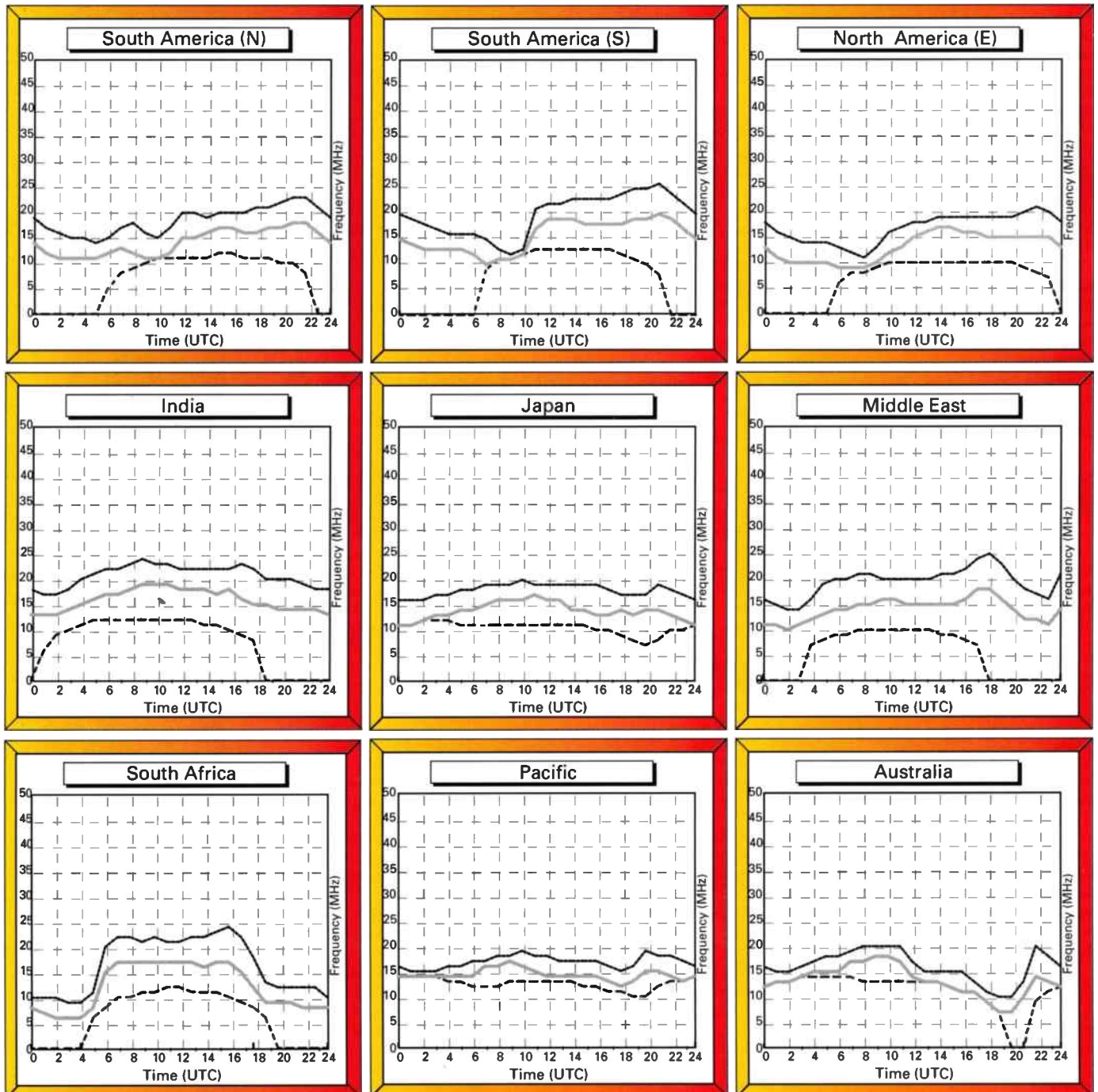
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50% probability of success for the path and time.

To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

June 2005
Circuits to London



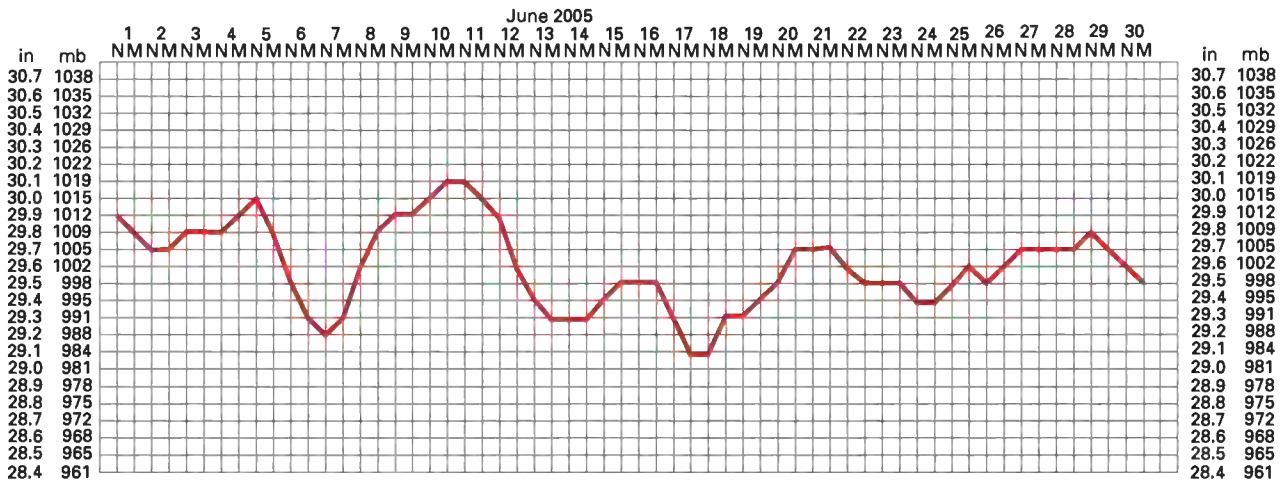
SK10089

Propagation

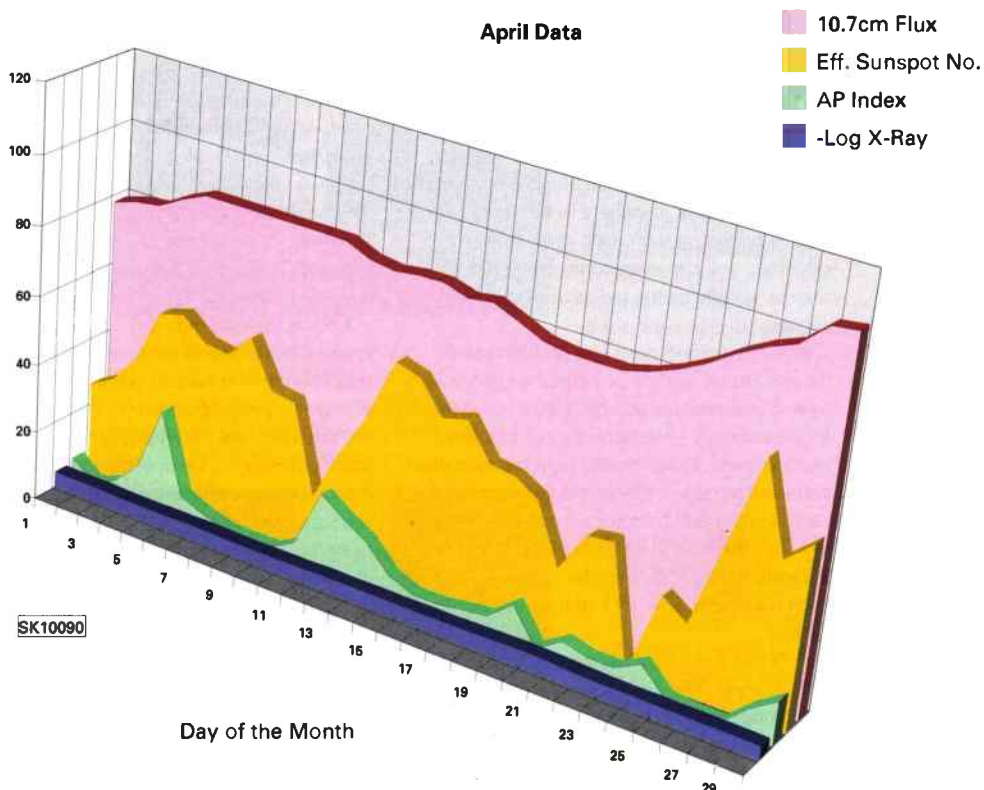
Extra

- **Kevin Nice** G3UNR, BR595787,
SWM Editorial Offices, Broadstone
- **E-mail** kevin.nice@pwpublishing.ltd.uk

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, June 2005.



April Data



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.

Decode

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- **E-mail** decode@pwpublishing.ltd.uk **Website** <http://www.mikespage.btinternet.co.uk>

The introduction of maritime Automatic Identification System (AIS) has created a lot of interest and I've had a few queries from readers, so I'll spend some time dealing with those in this month's 'Decode'. For those of you that haven't encountered this relatively new mode before I'll start with a quick introduction.

The AIS system has become a mandatory installation for most commercial ships. This is good news for us, because it means that most ships around our shores will be using AIS so, providing a good source of signals for us to decode! The transmission system used for AIS is based in the v.h.f. marine band and employs a sophisticated GMSK modulation system.

In addition to the special modulation, the transmissions are repeated across two marine band frequencies in an attempt to minimise interference problems. The two frequencies to watch are 161.975 and 162.025MHz - it doesn't matter which one you use. If you try listening you'll find that the messages are very short indeed. The typical message time is around 30ms so, it will probably sound more like a click or series of clicks than a conventional data signal.

Whilst you can receive AIS with a conventional receiver and soundcard combination it's worth considering a few changes. The GMSK modulation system used for AIS has significant low frequency content, so best results will be obtained when using a receiver with a direct discriminator output. There's nothing very special about the discriminator output, it's just the raw, unfiltered audio signal as it comes out of the discriminator chip. If you don't have that facility on your receiver, all is not lost as there are a number of sites on the Internet with details on how to create a discriminator output. The one recommended is to be found at: www.discriminator.nl/index-en.html

In most modifications it's just a question of finding the chip or test-point with the raw output and connecting that to the outside world via a 10kΩ resistor. The website mentioned shows internal photos of a number of popular receivers with clear instructions on how to find the right connection. Some of the examples also include ingenious techniques for getting the signal out of the receiver as well. I suppose the only downside of this great mode is that fact that you have to be reasonably close to commercial shipping in order to receive the signals to start with.

Maybe someone out there will soon put a website together that's a bit like the AISLive site

so we can monitor shipping from all around the World? If you don't live near to the coast you could always go out mobile with your laptop and scanner to find a few signals.

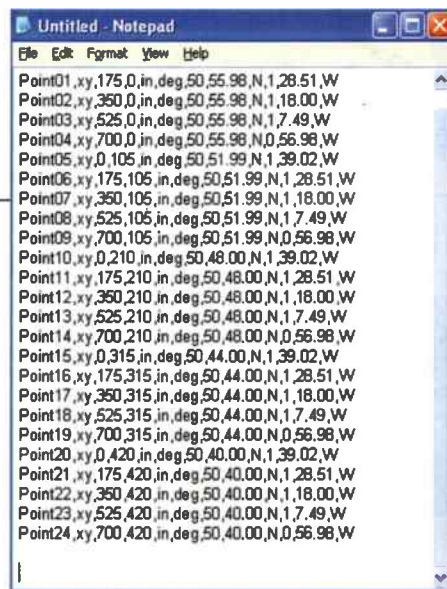
AIS Maps

One of the great features of *Shipplotter*, is its use of the freely available Digital Chart of the World. This is an excellent resource that provides sophisticated vector mapping so you can quickly create maps of just about anywhere in the world. You don't get street or contour detail but you do get great outlines that are ideal for integration with other software so you can plot data on a map. It goes without saying that writing programs that make use of the data is a fairly specialised skill. If you want to have a dabble there are a number of products around that let you create custom maps from the main chart source data. One of the most popular is the *Mapserver* software that's available from the University of Minnesota. <http://mapserver.gis.umn.edu/>

If you follow the Downloads link you will be directed to the *Mapserver* site where you can download all the supporting software you need to produce web maps and associated data plots. However, if you are a mere mortal you'd probably prefer someone else did all the hard work so you can just quickly and easily get hold of the maps you need. Thanks to the efforts of **Hal Mueller** at Mobile Geographics (www.mobilegeographics.com) all the work has been done and you just need to follow a few simple steps to create a *Shipplotter* format map of just about anywhere in the World. As well as providing such wide geographic coverage, you can even control the scale of the map by specifying the radius from the map centre.

As a few readers have had problems using the site I think it might be helpful if I run through the process step-by-step to make sure it's clear. Before you start entering data you need to know a few details about the map that you want to create. Key points to know are the Latitude (Lat) and Longitude (Lon) and the radius of the map in nautical miles. If you're not used to nautical miles the conversion is each nautical mile is 1.15 statute mile or 1.8km.

Let's use a practical example to show you how it works. The nearest port to my home is Southampton so I could really do with a map that's centered on the Solent but covers Southampton water including the container berths and the waters out past the Isle of Wight. The ideal is a map centred on a Lat of 50.8°N



■ Map data pasted into Notepad.

and a Lon of 1.3°W with a radius of eight nautical miles.

To enter this information into the map site just type '50.8' in the Lat box and '-1.3' into the Lon box (but without quote marks of course). The negative signs in the Lon value, is required to show that the bearing is to the west of the Greenwich meridian. If you're entering coordinates to the east, then just type in the numbers. The next step is to type the radius into the appropriate box and click the Redraw button. If all has gone well you should see the map presented on the screen. If it appears to be the wrong area just double check you put the numbers in the right boxes - if you can see the Indian Ocean, but you were expecting the UK you've almost certainly reversed the Lat and Lon data - I know, I did it!

If you don't know the precise Lat and Lon, don't panic! There are several ways to get the information. The most likely way is to guess, enter the data and then adjust till you get the map you want. A slightly smarter way is to make use of www.multimap.co.uk If you type in the name of the town you want you just have to scroll down to the Map Information box and you find the Lat and Lon listed for you. The info in brackets on the site is even in the right format with a minus sign for westerly longitude

Getting the right map displayed on the website is only the first step in the process and there are a couple of other actions to complete before you can start plotting AIS signals on your new map. The first task is to save the map graphic itself. To do this you move your cursor over the map and right-click then choose Save Picture As... Although the Map site says save the map as a JPG, you may not have that option available so use the drop-down (Save as type) box and choose BMP (bitmap). You need to save this file in the Chart folder of the *Shipplotter* installation. For most people that will be found in the folder called: C:\Program Files \COAA\ShipPlotter \Chart.

Make sure you give the file a sensible name, such as 'Southampton' in our case. To complement the map graphic you also need to save the coordinates as this is the vital information that the software uses to plot the data in the right

Passage
Estuary
River/fjord
Strait

■ Map data
selected from
website.

```
Point00,xy,0,0,in,deg,50,55.98,N,1,39.02,W  
Point01,xy,175,0,in,deg,50,55.98,N,1,28.51,W  
Point02,xy,350,0,in,deg,50,55.98,N,1,18.00,W  
Point03,xy,525,0,in,deg,50,55.98,N,1,7.49,W  
Point04,xy,700,0,in,deg,50,55.98,N,0,56.98,W  
Point05,xy,0,105,in,deg,50,51.99,N,1,39.02,W  
Point06,xy,175,105,in,deg,50,51.99,N,1,28.51,W  
Point07,xy,350,105,in,deg,50,51.99,N,1,18.00,W  
Point08,xy,525,105,in,deg,50,51.99,N,1,7.49,W  
Point09,xy,700,105,in,deg,50,51.99,N,0,56.98,W  
Point10,xy,0,210,in,deg,50,48.00,N,1,39.02,W  
Point11,xy,175,210,in,deg,50,48.00,N,1,28.51,W  
Point12,xy,350,210,in,deg,50,48.00,N,1,18.00,W  
Point13,xy,525,210,in,deg,50,48.00,N,1,7.49,W  
Point14,xy,700,210,in,deg,50,48.00,N,0,56.98,W  
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Point19,xy,700,315,in,deg,50,44.00,N,0,56.98,W  
Point20,xy,0,420,in,deg,50,40.00,N,1,39.02,W  
Point21,xy,175,420,in,deg,50,40.00,N,1,28.51,W  
Point22,xy,350,420,in,deg,50,40.00,N,1,18.00,W  
Point23,xy,525,420,in,deg,50,40.00,N,1,7.49,W  
Point24,xy,700,420,in,deg,50,40.00,N,0,56.98,W
```

This page generates background maps for use with COAA's AIS software [Shipplotter](#).

At the moment, you must save the maps and calibration points manually from your web browser. Choose your own name for the image, e.g. "Gibraltar". Save the image map as "gibraltar.jpg", and save the calibration points (below the map) as "gibraltar.clb". Place both files in the "Chart" folder of shipplotter.

image size (pixels) width: height:
map center (decimal degrees, negative for west/south) lat: lon:
map radius (NM):

■ Shipplotter custom map data entry.

The original source of the data is the US NIMA VMAP (popularly known as the Digital Chart of the World). The maps you see here are rendered with the

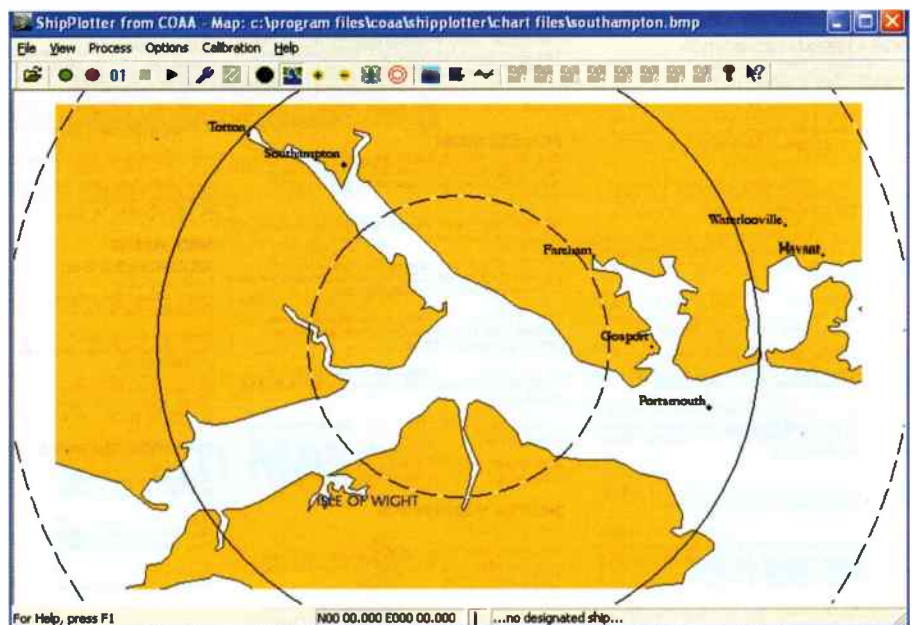
place on the graphic. From the letters I've seen this seems to be the area that causes confusion. Let's start by clearly identifying the data. The section you need is the lines of data that start with the word Point. Move your mouse to the start of the first row, then click and hold whilst dragging your cursor to the end of the last line. This will highlight all the data.

Once the text has been highlighted, move the mouse cursor over the highlighted area, right-click and choose copy - this puts all the data on the clip board. The next step is to create a file to hold the data and store it in the charts folder with the graphic. The simplest way to create a folder is to use the very basic Notepad program that's bundled with all versions of Windows. The Notepad application can normally be found in the Programs>Accessories option from the Start menu.

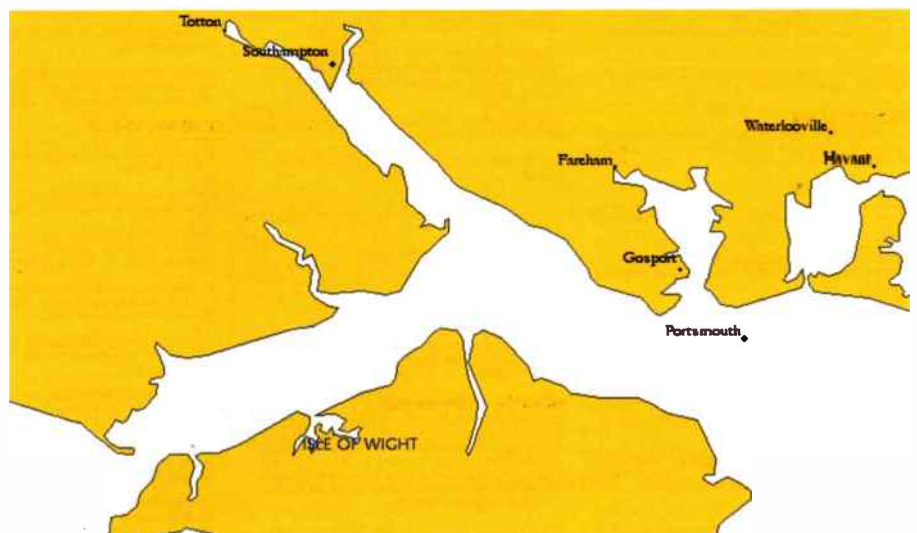
When you've found the Notepad program and you're running it, left-click your mouse to put the cursor at the start of the new document, then right-click to choose paste, an action that moves the data into the document. The next step is to save this document in the appropriate place so Shipplotter can find and use it. So, take your cursor back up to the File menu and choose Save As. Now use the Save in dialogue at the top to find your way to the chart folder within the Shipplotter main folder as described earlier.

This data file we're creating has to have the same name as the map file, but with a .clb extension (final letters). So, in the Save As box choose All Files and leave the encoding as ANSI. In the File Name box type-in your file name followed by '.clb', e.g. Southampton.clb - then hit the Save button: That should be it! So, now open-up Shipplotter again and choose File>Open>New Chart to select your Southampton chart and take a look.

Well, that's it for this month. If you have any problems with this, or discover any better ways of building Shipplotter maps please drop me a line so I can share the information with other readers.



■ The newly saved map in action with Shipplotter.



■ Web generated map of the Solent, which was saved as SouthamptonMap.bmp.

Amateur

Bands

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A lot of hot air has been expended recently over the catastrophe that some people are predicting will befall amateur radio following Ofcom's 'Spectrum Framework Review'. All sorts of rumours are being mischievously circulated by those who would like to acquire a commercial benefit from the licensing revenue.

Monetary interest rather than the welfare of amateur radio appears to be the motivation behind some of the more lurid scare stories that are being propagated in documents that are so 'sexed-up' a political spin doctor would be proud of them. There's nothing like the lure of money for bringing out the worst in some people.

What's it All About?

So, what is the review all about? Well, Ofcom, which regulates the UK's use of the radio spectrum, is looking at how it could manage this important resource in the future. In order to determine what use it should be put to, Ofcom has suggested three options :

1. Maintain the status quo, leaving the regulator to manage the radio spectrum in a similar fashion to the way it has been done for the last 100 years. This is the 'command and control' option.
2. The radio spectrum is 'market managed' within the boundaries of terms in the licences as set by Ofcom.
3. Nobody controls who uses the spectrum, but power constraints or other mechanisms restrict usage to reduce the probability of interference. This last option is known as 'licence-exempt use', which is not the same as licence free.

As an indication of the sort of use the licence exempt parts of the band would be put to, Ofcom states that within those sections of the spectrum transmit power levels need to be kept low, normally restricting services to ranges of less than around 100m. We are talking Wireless LANs (Local Area Networks), Bluetooth, and the like. Nothing to do with amateur radio.

Multi-option Approach

Whatever happens, the whole of the spectrum will not end up being managed in the same way. Ofcom anticipate that by

2010 roughly 71% would be market managed, 22% under command and control, and 7% licence exempt. Amateur radio could end up in the market managed sector, but even before the review started Ofcom recognised that there would be difficulties with the full application of market mechanisms in some areas.

One of those areas is where signals cross international boundaries, which sounds a lot like amateur radio to me. Ofcom also states that such an area will continue to require some degree of direct management for the foreseeable future, but that it will aim, wherever possible, to deregulate and release market pressure. It is also considering the possibilities of removing the need to have a licence in areas such as amateur and maritime operation, although technology and usage restrictions will continue to apply.

And the problem is? Amateurs might not have to pay an annual licence fee, although all the current rules about qualifications and operating will remain. Ever mindful that there's no such thing as a free lunch, what's the catch?

De-licensing Works Elsewhere

In Canada, where 'de-licensing' as they term it, has recently been introduced, I couldn't find anyone to say a bad word about it. None of the concerns currently being expressed in the UK have materialised over there. Industry Canada (IC, equivalent to our DTI) tells me that there's no problem with amateurs failing to update the authorities with any changes of address.

Perhaps that's because it's easy for anyone to check up, as IC maintains a searchable on-line database of radio amateurs, which is updated daily, and searchable via the Radio Amateurs of Canada website. Take a look at www.rac.ca/callbook/ We could do with that over here!

New Zealand is to introduce de-licensing later this year. The only major concern expressed over there was that those areas of amateur radio that would continue to be licensed annually e.g. repeaters and beacons, might have seen a big rise in the license fee to cover the missing revenue from individual amateurs. In the end the annual rate for has been set at NZ\$50.00 - a little under £40.00.

Whilst a lower fee would no doubt have been preferred, it's not high enough to place a financial block on running repeaters

and the like. And with a free individual license, users will have no excuses not to put a few pounds towards the running costs and to the repeater and beacon keepers.

Scare Stories

However, the word that's being used in the UK to try to whip-up the storm in the amateur radio teacup is 'de-regulation', which, compared to going licence-free, is a completely different ball game. If we are to believe some of the hype, de-regulation will be the kiss of death to everything the radio amateur holds dear. The scenario being presented by some, is that one day quite soon Ofcom will say to the UK population "That's it chaps, we're off. The amateur radio spectrum's all yours. Do whatever you like", and the whole UK amateur radio structure will collapse. Unlikely somehow!

It's Ofcom's request, as part of its review, for opinions on the possible licence exemption for radio amateurs in the longer term that these doom merchants have latched onto, treating the question as a statement of intent. What Ofcom has said is that "WT Act licence exemption (deregulation) for radio amateurs is not currently practical". Pretty clear, I'd say.

My take on Ofcom's position is that they're saying "We've got this idea about how to manage the radio spectrum, but it doesn't work with the amateur bands. As things stand, we can't see how it will ever work, but things change, and we'll have a look every so often anyway. Meanwhile, do you have any bright ideas about how we might get it to work?" My guess is that the question is only being asked in order for Ofcom to comply with directives from HMG to consult as widely as possible.

No Catches

Putting the de-regulation issue firmly to one side, on the face of it the Ofcom review has no catches for amateur radio. Radio amateurs will win as they won't have to pay an annual fee.

The authorities will win as they'll lose an administrative task that probably isn't particularly cost effective. Things could always turn out differently, but there's no evidence from elsewhere to indicate that they will. Keeping one's eye on the ball is always important, but the amateur radio leg of the de-regulation contest hasn't been arranged yet, let alone kicked off.

International Radio Clubs



Royal Air Force Amateur Radio Society (RAFARS - G8FC, G8RAF)

Details from the Administrator, HQ RAFARS, RAF Cosford, Wolverhampton WV7 3EX. Tel: (01902) 372722, E-mail: administrator@rafars.org

Royal Navy Amateur Radio Society (RNARS - GB3RN, G3CRS, G1BZU)

Enquiries to Secretary Philip Manning G1LKJ/M3LKJ, 1 Waverley Gardens, Ash Vale, Surrey GU12 5JP. Tel: (01252) 334929, E-mail: g1lkj@amsat.org or visit www.rnars.org.uk

Royal Signals Amateur Radio Society (RSARS - G4RS)

More information from General Secretary, HQ RSARS, Cole Block, Blandford Camp, Dorset DT1 8RH. Tel: (01258) 482814, E-mail: gensec@rsars.org.uk or visit www.rsars.org.uk

The Medium Wave Circle

Details from c/o C. Rooms, 59 Moat Lane, Luton LU3 1UU. E-mail: contact@mwcircle.org

World Association of Christian Radio Amateurs & Listeners M1CRA

Details from Membership Secretary Derek Chivers G3XNX, 51 Alma Road, Brixham, South Devon TQ5 8QR. Tel: (01803) 854504 or visit www.wacral.org

AMSAT-UK (G0AUK)

Information from Jim Heck G3WGM, Badgers, Letton Close, Blandford, Dorset BH11 7SS. E-mail: g3wgm@amsat.org or visit www.uk.amsat.org

British Amateur Radio Teledata Group (BARTG - G4ATG, GB2ATG)

Contact Membership Secretary Andrew Thomas G8GNI, M5AEX, Dome School House, 103 High Street, Stony Stratford, Buckinghamshire MK11 1AT, E-mail: members@bartg.demon.co.uk or visit www.bartg.demon.co.uk

British Amateur Television Club (BATC - RS38114)

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British DX Club (BDXC-UK)

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Danish Shortwave Club

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Further details from John Taylor-Cram, 7



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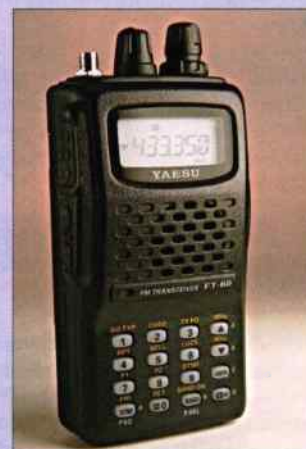
- Yaesu's FT-60 dual-band hand-held is put through its paces by **Kevin Nice G3UNR**.
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