

Written By Enthusiasts For Enthusiasts

The
SHORT WAVE
Magazine
SWM

FREE!
MilAir
Datacard

& Scanning Scene

Airband

Special Issue



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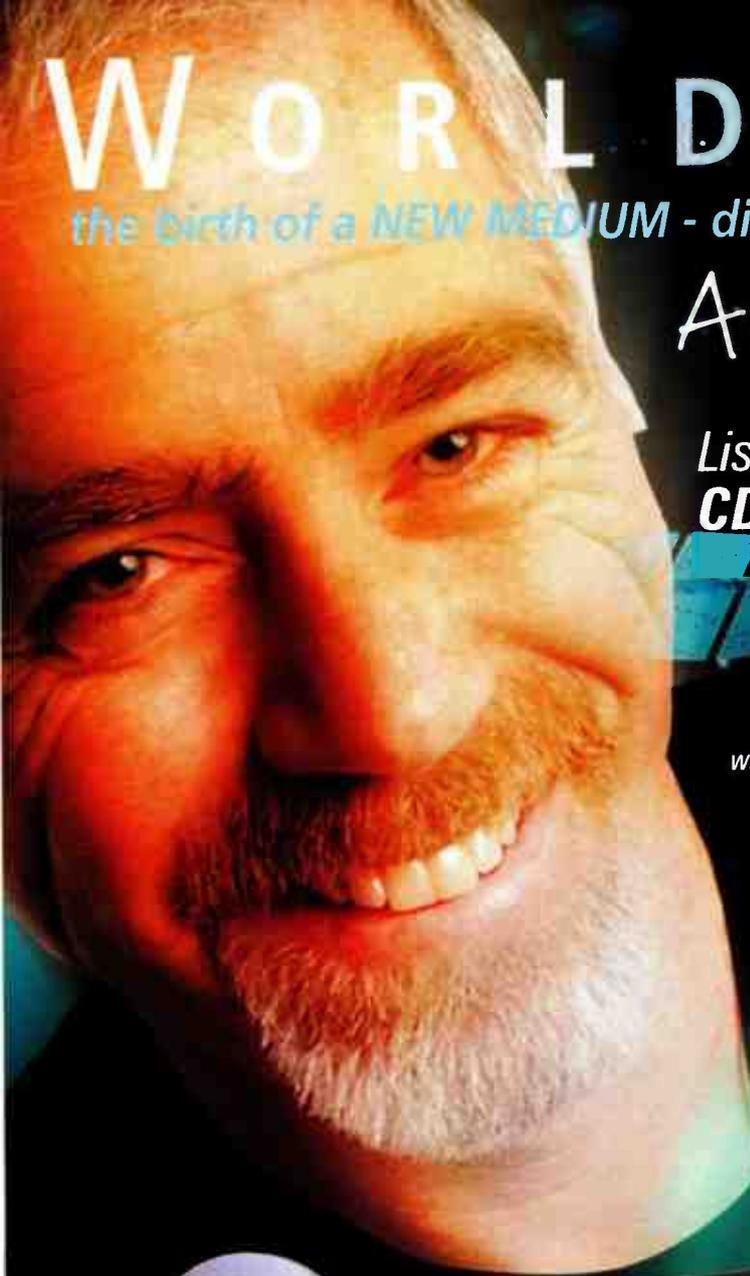
**Morse Assistant -
Project Concluded**
**JW's current commercial
classic - Racal RA3791**

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World Radio History



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features

Cover subject: A Russian Mig-29 engulfed in a fireball, plunges to the ground after colliding with his partner aircraft at IAT '93. The falling aircraft is about to sever part of the tail of the Belgian Hercules before exploding in the woods. The pilots ejected safely and fortunately no-one was hurt. Photo: Peter Bond

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Following the recent announcement from AOR (UK) Ltd., regarding their new venture with one of the USA's most enterprising amateur radio companies, Kevin Nice managed to have a chat with Sales Director Richard Hillier to get the low-down on just what TenTec direct is all about.



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John Wilson scrutinises a classic current receiver from the Racal stable that is still current production. Here's one commercial receiver that shouldn't pose any problems to obtain!

26 MORSE ASSISTANT - FINAL PART

Graham Sutton G4EWW completes the Morse decoder project for use by PC owners.

30 DRM REVEALED - CONCLUSION

Last month, Don Messer of IBB and Peter Jackson of Merlin Communications International Ltd. began an in-depth presentation of the technical progress of a Standardised Digital Radio Broadcasting System that allows f.m. quality on the current a.m. broadcasting bands. This month Don and Peter conclude their enlightening feature.



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SKY HIGH SPECIAL BY PETER BOND

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Peter starts off his 'Special' in nostalgia mode before taking a brief look back at how our interest in aviation started and also takes a look at a couple of notable air events of the past.

38 DISCRETE & UNPUBLISHED

It has been a while since Peter took a general look at the world of u.h.f. discrete frequencies. So, to complement this month's free Airband Data Card which lists the primary ATC frequencies, this 'Special' acts as a reminder to airband regulars and an introduction to those new to the hobby in the past few years.

42 AIRBAND RADIOS

Finally, Peter takes a brief historical look back at airband radios and their development since the mid eighties and secondly, he answers a commonly asked question about the best airband radio available today.

46 SKY HIGH - THE COLUMN

Peter's regular monthly column.



SWM Services

Subscriptions

Subscriptions are available at £36 per annum to UK addresses, £43 in Europe and £48 (Airsaver), £54 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £60 (UK) £73 (Europe) and £81 (rest of world), £93 (airmail).

Components For SWM Projects

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

Photocopies & Back Issues

We have a selection of back issues, covering the past three years of *SWM*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *SWM* are £3.25 each and photocopies are £3.25 per article.

Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for *SWM/PW* is also available from the Editorial Offices for £1 inc P&P.

Placing An Order

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

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Technical Help

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

regular columns

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COMING NEXT MONTH IN SWM SEPTEMBER 2002

* contents subject to change

★ Decode Special with Mike Richards

★ JW reviews the TenTec RX-350

★ What Does It All Mean? Our guide to abbreviations and acronyms

★ and much more...

QSL

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

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



TOP QSL

Dear Sir

I have just taken up the hobby of scanning, I am 67 years old by the way! I purchased an Icom IC-R2 from a dealer in Poole. I said I wanted a decent one and that is the one I chose. I am a total novice and I honestly don't know an air band from a hair band! I don't know any of the 'jargon' or technical terms associated with the hobby. Could you please help?

The instruction manual that came with it, well, you need a science degree to understand it! I purchased the *UK Scanning Directory* at the same time as my scanner, that is where I got your firm's name and address from. I do so hope you can help me to get started with my scanner. I paid what is to me a small fortune, so I want to be able to use it and hopefully you will be able to advise me.

I look forward to your comments when you can find time.

James B. Lee
Dorset

James, a very big welcome to the radio hobby. You have already taken two good steps in the right direction, you read SWM and you've bought yourself a competent scanner. In common with most specialised hobbies, radio has a language all of its own. Time, patience and enthusiasm are what's needed. Fortunately, we are including a guide to abbreviations and terms next month in SWM. You may also find that a book such as Scanners 4, which is available from the SWM Book Store, see page 66 of this magazine. Enjoy your new found hobby. - Ed.

Dear Sir

I received the July issue of *Short Wave Magazine* on Monday 24th June 2002. I was interested to see the article on Zenith Trans-Oceanic short wave receivers which I thought were very good, but John Wilson made a mistake about the Sony Earth Orbiter short wave radio receiver - it was known as the Sony CRF-5090, not the CRF-5100.

I also have a question. I have a Yupiteru MVT-7100 scanner and I have seen this advertised as both the MVT-7100EX and MVT-7100EU. What is the different between the two type numbers?

Gordon Rennie
Surrey

Many thanks for the update regarding the Earth Orbiter, I will pass this info on to JW. Regarding the MVT-7100, this radio has enjoyed many differing suffices over the years. These are only marketing related. I'm informed by the official UK importer that there are no electrical differences between sets. - Ed.

Dear Sir

What good luck to be the winner of the UBC280XLT Sportcat scanner! Even the photograph in the July issue of SWM is a good one of me! Scanning is an aspect of the radio hobby that is new to me, so I am learning by trial and error. The *Scanning Scene* supplement couldn't have been timed better. Once again, many thanks.

David J. Morris
Poole

You are very welcome David, everyone at SWM hopes you thoroughly enjoy your prize. Perhaps you'll keep us up-to-date with your progress. - Ed.

Dear Sir

Thank you for a very interesting magazine. I enjoyed the articles on digital radio. Could we have some information concerning the differences between satellite and terrestrial services and/or television. Are there plans for converters for existing receivers? Thanks.

D. Higbid
Sheffield

The difference between terrestrial and satellite delivered digital TV services are the frequencies used for the transmission to the end users. Terrestrial digital TV uses the same bands as current analogue TV, i.e. 470-970MHz. It is received with a conventional Yagi or similar antenna. Satellite digital TV is broadcast in the Ku-band i.e. 11.7-12.5GHz due to the attenuation over the path from the satellite a dish with rather more gain than a Yagi is required. Both of these services require a set-top box to convert the digitally encoded service in to analogue video or r.f. suitable for the TV set.

Radio is a different matter, though there are 'radio stations' available with digital TV packages. For instance Sky provide BBC radio stations and many more depending on the contract a customer takes.

Radio broadcasting has three main current possibilities, WorldSpace, satellite radio which utilises L-band, for which you currently require a dedicated receiver. DAB which uses 220MHz and was the subject of an in-depth feature in June SWM. This too requires a dedicated receiver, though there are computer cards that are available for sub £50. Lastly there is DRM which is still in development and is covered last month and in this magazine. Software is going to be available from DRM for home use. I hope this brief summary is a help. - Ed.

ed's comments

News Media & Specialist Subjects

Recently there have been two instances of the national press, radio and TV having rather slack news days that have resulted in them all carrying stories related to our hobby.

The first was relating to occasional SWM contributor John Locker and his concerns regarding how NATO distributes their live video captured by remote controlled surveillance aircraft. The other, PROMA's Paul Wey, who apparently was tricked into an interview with the BBC which captured his thoughts on how close quarter security communications should be encrypted. Both of these 'stories' have been totally misrepresented by the media. There seems to be some naive belief that those agencies who are making transmissions in the clear are unaware of their actions and the consequences - nonsense!

Both examples cited relate to information that expires the instant it's used. Encryption would have added nothing whatsoever.

The mishandling of specialist subjects by the news and entertainment media is a frequent topic of discussion here in the Editorial Offices, we often cringe at the poorly researched material on a regular basis. I'm sure that we are not alone. My guess is that anyone with in-depth knowledge of any particular subject also feels this way.



RIAT Winners

There is a last minute change to the list of lucky winners for this year's Air Tattoo. One of the winners, Tony Rigby, contacted me to say he'd had an argument with a lawn mower and would be unable to make the trip. Tony has kindly donated his prize to F. Poulton of Burnley, the next to be drawn. I hope that all of our winners have a very enjoyable visit to the show. Get well soon Tony.

July

I'm glad to announce that the £1500 prize competition entries have been flooding in! It's good to see that there is so much interest in the great prize line-up. What is also interesting is the distribution of selected radios.

Unfortunately, we announced that this issue would contain 'What Does It All Mean?' a guide to terms and abbreviations, this was not possible and the feature will be included next month.

W4 73 Kevin

Communiqué

News and Products

Vintage Fair

This year the **National Vintage Communications Fair (NVCF)** celebrates its 10th anniversary (1992-2002) on **Sunday 15th September 2002** at Hall 11, National Exhibition Centre, Birmingham. Doors open at 1030 till 1600 and admission is £5 (under 14s free).

The NVCF is recognised as the UK's leading vintage communications fair, aimed specifically at collectors of early radios, Bakelite and candlestick telephones, fifties television sets, old wind-up gramophones and classic valve audio equipment, etc., all saved from a bygone era and lovingly restored. The NVCF also caters for those interested in furnishing 20th century period homes and interiors and supplying the film and TV industry with authentic and genuine props.

The Fair is held twice a year at the NEC and is supported by over 300 stallholders from all over the world. Several collectors' clubs and magazines also exhibit at the fair and are available to give helpful advice on the practical side of the hobby.

More information from organiser **Jonathan Hill, Sunrise Press, 13 Belmont Road, Exeter, Devon EX1 2HF, Tel: (01392) 411565** or visit www.angelfire.com/tx/sunpress or E-mail: sun.press@btinternet.com

Tattoo Winners

Congratulations to the following 15 *SWM* readers who have won tickets to the Royal International Air Tattoo which is being held over the weekend of 20/21 July 2002. Thanks to *SWM* and RIAT they will be enjoying free entry to the show. The tickets will be sent direct from the Tattoo organisers to all 15 winners. We hope you enjoy the show.

H. Lopes, Portugal	R. de Vlieg, The Netherlands
L. Clarke, Gwent	R. Eckett, Hants
J. Keenan, N. Ireland	C. Barrett, Aberdare
D. Scott, Northumberland	P. Marshall, Suffolk
C. Crooks, Berkshire	K. Hemsley, Nottingham
D. Stephenson, Bristol	A. Rigby, France
R. Clift, West Midlands	R. Hyland, Bournemouth
D. Roberts, Worcestershire	



RAE Course

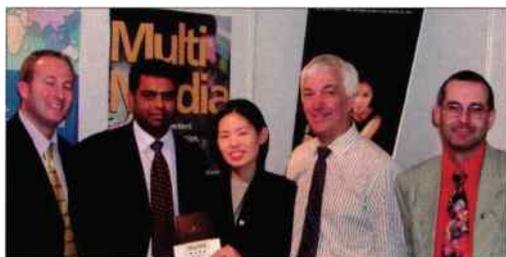
An RAE course will be held in Orpington, Kent, at Newstead Wood Girls School, Avebury Road, Orpington on Monday evenings from 1930 to 2130 commencing **16th September 2002** and leading to the May 2003 City & Guilds exam which will be held on site. Enrolment through Bromley Adult Education College, Widmore Centre, Widmore Road, Bromley. Telephone **0208-460 0020** for more information.

New Joyear Worldspace Radio

Korean radio manufacturer Joyear visited the UK recently to show off their new Worldspace WS2000 portable radio. They also took the opportunity to confirm the appointment of Nevada as UK distributors for the Joyear Worldspace products.

The Joyear WS2000 is an exciting new Worldspace receiver that won the Grand Prize at the Korean Industrial Design award for 2001. It's small, stylish and light enough to travel the world. An easy-to-aim removable antenna is provided with a 2.5m extension cable to enable clear reception of the satellite programming. The radio has 10 presets, last station memory recall and a comprehensive I.c.d.

The set will sell for £129. Further details are available at www.worldspaceradios.co.uk or by calling Nevada on **(02392) 313090**.



(L to R) Dale Bradley, Dipak Naran (Worldspace UK), Helen Choi (Joyear), Mike Devereux, Phil Jeffery (Nevada) with the new Joyear WS2000.

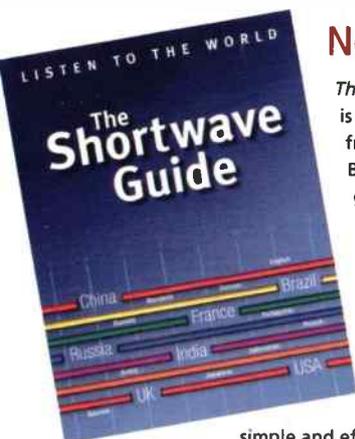
New Guide

The Shortwave Guide is now available from the *SWM* Book Store. This guide uses colour bar-graphs to show broadcasts in different languages from around the world. It provides a colourful,

simple and effective way for the listener to see at a glance the broadcasts being beamed to their area of the world in a particular language at a particular time. The languages are clearly shown by different colour bars, so scanning the pages for broadcasts is easy.

The Shortwave Guide contains the summer short wave schedules, a simple guide to short wave listening, domestic short wave broadcasts, contact details for the main international broadcasters, colour maps showing transmitter sites, other useful reference material and lots more.

For short wave listeners, this is an indispensable new tool for their hobby and for DXers it is an invaluable, simple source for the summer schedules, so it will appeal to both markets. Order your copy from the *SWM* Book Store for **£12.99**.



Foundation Licence Course

Thirteen young people took part in the first Foundation Licence Course run at The Scout Association Headquarters campsite, Gilwell Park, Chingford, London E4. The four day residential course, using the facilities at GB2GP, was run by Scout Leaders **Mike Anderson M5ACX, Rex Hunt G0CLR** and **Colin Carr G7UVV**. They were assisted by **Lynne Anderson** both as organiser and as a student - she took notes whilst doing the cooking!

The participants came from places as far afield as Bedford, Basingstoke, Bournemouth, Dereham, Stevenage and West London. As well as the facilities at the Gilwell Park amateur radio demonstration station, considerable use was made of G0CLR's impressive rolling radio station cunningly disguised as a Land Rover.

The course pass rate was over 95% and the Scouts were looking forward to using their newly acquired licences to take part in the 45th Jamboree on the Air over the weekend of **19-20 October 2002**.



RadioFest 2002

The **Ontario DX Association** was formed back in 1974 and is now the largest radio monitoring organisation in Canada with over 600 members world-wide. This year's convention - RadioFest - and their annual draw, Raffle 2002, is to be held over the weekend of **20/21/22 September 2002**.

Friday will begin with a cheese and wine reception in the evening, Saturday will feature a silent auction, displays, club items on sale, guest speakers and panel discussions and the draw for the raffle will conclude on Sunday. More information on ODXA's web site www.odxa.on.ca or check out their magazine *Listening In* for regular updates.



Ed's One to One

Following the recent announcement from AOR (UK) Ltd., regarding their new venture with one of the USA's most enterprising Amateur radio companies, Kevin Nice managed to have a chat with Sales Director Richard Hillier to get the low-down on just what TenTec Direct is all about.

"Hi Richard congratulations to AOR (UK) on the recent deal with TenTec. As you know we've recently reviewed two rather different TenTec receivers in Short Wave Magazine. Our readers will therefore be aware of the name, but who are TenTec?"

"TenTec has been around for quite some time, founded in the USA in 1968 many amateur radio and commercial products have been produced. More than ever leading edge technology (such as d.s.p.) has been employed in the design and manufacture of amateur radio and commercial radio products produced by TenTec. Despite being a technology leader in the USA, their equipment is not as well known in the UK, this is about to change with the formation of a UK sales office, TenTec DIRECT, UK.

TenTec is headed by Jack Burchfield (President). Vice President Gary Barbour, AC4DL heads d.s.p. development with Scott Robbins handling daily business as the Amateur Radio Products Manager in the USA. There are around 75 USA staff working from the factory located in the foothills of the Great Smoky Mountains."

"So just how will the new UK sales set-up work?"

"With the release of the RX-320 and RX-350 short wave receivers to the UK, Ten-Tec is providing a renewed commitment to the UK market with the formation of a UK sales office Ten-Tec DIRECT.

Ten-Tec DIRECT in the UK, supported by the USA factory, delivers advanced products (CE approved) at attractive prices. This is fully backed by meaningful pre-sales and after-sales support stretching back to the factory in the USA. Ten-Tec is confident of success in the UK due to a new business alliance with AOR UK LTD, whose excellent reputation and support are well known and products compliment the Ten-Tec line."

"That all sound great for those wanting to acquire TenTec radios this side of the 'pond', when will UK customers be able to buy direct?"

"The UK sales office becomes active from the end of July 2002."

"I understand that TenTec operate rather differently to the Japanese radio manufacturers. Can you elaborate a little?"

"TenTec is proud to be an independent and self-sufficient company, all TenTec products are designed, manufactured and internationally distributed from the 40000 square foot facility in the USA. Out-sourcing is not the way business is conducted in the USA.

In-house facilities include engineering, p.c.b. manufacturing, plastic moulding, sheet metal fabrication and finishing as well as electronic assembly and testing. The facility is so capable, tooling is produced in the well

equipped tool and die shop (engineering products are even sold).

TenTec equipment is designed, built and shipped in-house with unique manufacturing and design skills used to produce World Class short wave receivers, Amateur Radio, commercial and OEM products. The unique combination of in-house processes ensures our ability to produce equipment of highest quality, reliability and value."

"It's interesting that you mention the whole range of TenTec products, will the whole product range be available from TenTec DIRECT UK?"

"Over the years, TenTec products have been available in the UK in a rather low-key fashion. The CE requirements for electrical

testing has required manufacturers (including TenTec) to reassess the product range. Initially, the short wave receivers RX-320, RX-340 and RX-350 will be promoted in the UK (all CE approved).

In addition, TenTec has very capable amateur radio products in the JUPITER h.f. transceiver, PEGASUS transceiver, OMNI VI PLUS transceiver and others including linear amplifiers. The potential exists for transceivers to be assessed in respect of suitability for the UK market in the coming months.

A range of low cost 'kits' is also manufactured with technical support offered via E-mail support direct from the factory in the USA. This represents further scope for roll-out in the coming months.

All-in-all, it's an exciting time and will be fuelled by the response of UK customers."

"You've mentioned that d.s.p. plays a major role in TenTec products. It is clear that they have significant resources in this increasingly important area. Tell us more about TenTec's approach."

"Gary Barbour has been instrumental in embedding d.s.p. into the current product range. Why d.s.p.? The, 'big picture' benefit is cleaner signal readability, eliminate heterodynes and limit spurious broadband noise instantly by pushing buttons. In the case of the RX-350, take advantage of the wide variety of d.s.p. filter choices built-in to the receiver to suppress undesired adjacent interference. Use these same filters to tailor the response of the receiver to your needs - from a wide 8kHz for pleasing s.a.m. or a.m. audio to a tiny 300Hz for digging weak c.w. and digital mode signals out of the noise. There are 34 of them built-in, not just two or three and not sold as options!

With the recent demise a USA d.s.p. radio manufacture, TenTec has welcomed another very experienced d.s.p. programmer to the TenTec R&D team. Gary Barbour commented that it is so unusual for developers to 'share code' that this marriage of experience has produced great results, the RX-350 certainly

demonstrates this.

Intermediate frequency d.s.p. allows Flash ROM updating of your receiver with the latest features and functions - free! If new functions and features are added to the RX-350, simply visit our website, download the latest version of the receiver, connect it via a serial port cable to your RX-350 and broadly speaking, it's as if your radio rolled off the assembly line minutes earlier."



TenTec's Dolly Parton Parkway HQ.

"I gather that TenTec DIRECT UK will operate rather differently to traditional radio retail, how will customers buy radios?"

"TenTec products are manufactured and supplied directly, largely speaking this means there is no middle-man...so the result is quality and features as an attractive price with meaningful support.

Price

VP Gary Barbour.

transparency in the UK means that you can be sure that you are getting excellent products at the lowest prices...no need to hassle over direct imports or concerns of dealing with distant companies. Orders may be placed with the UK sales office by 'phone, the Internet,

mail or personal callers, the usual methods of payment are acceptable including credit card and SSL facility via the website. The TenTec UK sales office is open Monday - Friday 0900 to 1700.

Our address is: Richard Hillier G4NAD TenTec DIRECT, 4E East Mill, Bridgefoot, Belper, Derbyshire DE56 2UA Tel: (01773) 880788 FAX: (01773) 880780 E-mail: tentec@aoruk.com and website www.aoruk.com/tentec

All equipment is UK specification CE approved with 12 month warranty supported in the UK, products held in UK stock for immediate despatch.

Of course the 'distant selling' laws ensure your peace of mind when dealing with reputable companies via mail order.

For product information, visit the TenTec UK web site or call for leaflets.

"Many thanks for your time Richard, I hope that the TenTec Direct proves to be a great success."

"Thank you Kevin for the opportunity to tell everyone about what's coming up. With great reviews and customer feedback, you can judge the products for yourself. As you've said the RX-340 & RX-320 have been reviewed in SWM and since you've told me the RX-350 review is scheduled for publication in the September SWM, we look forward to reading its conclusions."

SWM

...America's Best!



TEN-TEC



TenTec President Jack Burchfield.

Nine Day Expo

Thousands of enthusiasts interested in the story of the White Star Liner, RMS *Titanic* will be heading for Dundee in August for a nine-day Expo to commemorate the 90th anniversary of the tragic loss of the liner. The exhibition, being promoted by the Maritime Volunteer Service, is to be held at Dundee's City Quay from **August 10th to 18th** and will be the biggest *Titanic* Expo ever staged in Europe. It will feature artefacts, memorabilia, pictures and visuals of the stricken vessel, as well as presentations from the major *Titanic* societies, videos of never before seen footage of the wreck and lectures by world authorities on the *Titanic*.

The public will be able to meet people who are involved with the salvage and protection of the wreck, as well as get a real insight into and meet the people involved with the conservation work and archive material.

The event was recently launched at City Quay to coincide with the setting-up of a web site for the event - www.Titanic-in-Dunee.co.uk Ticket prices were also announced recently - £8 for adults, £5 for children and concessions and £20 for two adults and two children.

The event will be staged in Shed 25 at City Quay. It is also confirmed that there will be a major outdoor festival provided by all sectors of the armed forces, which will include simulators from both the Royal Navy and Royal Airforce, as well as various displays from other branches of the services, RNLI and Coastguard, bands from the Sea Cadet Corps and much more.

V. Lt. Cdr Brian Callison, Head of Unit, MVS Tay said today, "This event is going to reflect the very special place that the ship holds in the hearts and minds of the public at large. More details from **Tom Harrison GM3NHQ** on (01382) 730627.

Radio & Computer Rally

The **Waterside (New Forest) Amateur Radio Society** are holding their Radio & Computer Rally on Sunday **15th September 2002** at the Applemore College, near Hythe, Hampshire (off A326 Southampton to Fawley Road, at Tesco Superstore - follow the yellow signs from the M27 or A35). Doors open from 1000 and the entrance fee is just £2. Talk-in on 2m, two indoor halls and field traders, refreshments and special interest groups, along with free parking. More information from **Bill Simmons G0XAZ** on **0238-078 3170** or E-mail: bill.simmons@southernwater.co.uk

Eliminate that Noise!

Do you dream of crystal clear radio communications? Then this could be the answer...

Manufactured by **bhi Ltd.** and now sold through Adur Communications the new **NES10-2** Noise Eliminating Speaker incorporates digital signal processing technology to remove unwanted background noise from speech. This compact, easy-to-install speaker has been designed to greatly improve the clarity and intelligibility of speech in a variety of radio applications including Radio Amateur base stations, CB, marine communications and taxi base stations. It not only removes unwanted interference from the radio signal, but also truck, car engines and road and wind noise.



NES10-2 features include:

- Fully adaptive noise cancelling
- Noise cancellation typically 20dB
- 8 user selectable noise cancelling levels
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- Input sensitivity control
- Optional power supply

The NES10-2 is available now from **Adur Communications Belmont Buildings, The Street, Bamber, Steyning, West Sussex BN44 3WE, Tel: (01903) 879526, FAX: (01903) 879527** or direct from **bhi Ltd.** You can contact bhi Ltd. on (01293) 530147 or via their website at www.bhinstrumentation.co.uk

The recommended price of the NES10-2 and power supply is £118.45 inc. VAT and postage, but if you quote **SWM** when ordering (before 22 August 2002) you can buy the speaker and power supply at the very special all inclusive price of **£99.95!**

New Premises

Tecstar Electronics Ltd. is pleased to announce its move to larger, purpose designed premises, which will provide a number of up-to-date benefits, including a large warehouse area and a state-of-the-art development, all air conditioned. Tecstar plans to maintain its current growth with the introduction of more than 20 new products during 2002, impressive by any standards.

For more information, contact Tecstar Electronics Ltd. at **Tecstar House, Bramley Road, St. Ives, Cambs PE27 3WS, Tel: (01480) 399499, FAX: (01480) 399503** or visit www.tecstar.co.uk

rallies

July 28: The Leeds & DARS are holding their twice yearly traditional outdoor rally and car boot sale at the Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds. More information from **J.A. Mortimer MOJAM** on (01943) 874650.

July 28: Rugby Amateur Transmitting Society Annual Rally will take place at the B.P Truckstop on the A5 north from M1 J18. More information from **Peter Wells** on (01455) 552449 or E-mail: rally@rugby-ats.co.uk

August 4: The Lorn ARS Radio Rally is to be held at Benderloch Victory Halls, (eight miles north of Oban (Argy)) on the A828. Talk-in on h.f. and v.h.f. Doors open at 1030 for 1100. Details from **Shirley GM0ERV** on (01631) 566518 or s.maclennan@freeuk.com or from **John GM8MLH** (MM3MLH) on (01838) 200461.

August 9: The Cockenzie & Port Seton Amateur Radio Club are holding their 9th Annual Junk Night from 1830 till 2130 at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, East Lothian. Bring along your own 'junk' and sell it yourself. There will be a raffle at approximately 2100. Refreshments will be available and there will be disabled access. £1 entrance fee. *All money donated to the British Heart Foundation.* **Bob Glasgow GM4UYZ** on (01875) 811723 or E-mail: bob.gm4uyz@btinternet.com or bob.glasgow@icl.com

August 11: The Flight Refuelling ARS Hamfest takes place at Merley, nr. Wimborne, Dorset. Entry £2, under 14s free. Please have correct entry money ready at gate. **Keith G1VHG** on (01202) 577937 or E-mail: keith@g1vhg.frreeserve.co.uk website: www.frars.org.uk

August 25: The MKARS 16th Rally is to be held at St Paul's School, Phoenix Drive, Leaden Hall. Doors open at 0700 for traders, 0900 for buyers. Talk-in on 145.550. More information about bookings from **Dave** on (01908) 501310 or www.qsl.net/g3hiu/rally.html or rally@bletchley.net

August 25: The Coleraine & District Amateur Radio Society are holding their annual radio & computer rally at the Bohill Hotel, Cloyfin Road, Coleraine. Doors open at 1200, 1130 for disabled visitors. **Peter M10CIB** on (02870) 351335 or **Jim G140RI** on (02870) 352393.

August 26: The Huntingdonshire Amateur Radio Society are holding their annual Bank Holiday Monday Rally at Ernulf Community School, St. Neots, Cambridgeshire (near Tesco Superstore on A428). Doors open from 1000 till 1400 and admission is £1.50. Hot and cold refreshments will be available. There will also be a hall and car boot on hard standing. Talk-in on S22. **Peter Herbert M5ABN** on (01480) 457347 (between 1800 and 2200) or E-mail: peterherbert@aol.com

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wider coverage all mode receiver 100 kHz - 3000 MHz with RS232 port



```
ADJ
2VFO NFM 14.0k
V-A 145.2100
V-B 76.1000
S - - - - -
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DUP AUT
2VFO NFM 20.0k
V-A 439.9000
V-B 88.0000
-
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AFC AUT
2VFO NFM 20.0k
V-A 1295.0000
V-B 88.0000
-
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```
COPY 232C
LOAD SAVE
ALL-DATA
Next
```

```
AUT
SCAN-GROUP 1
ABCDEFGHIJ
abcdefghij
BANK LINK
```

```
AUT
2VFO AM 25.0k
V-A 123.5000
M-WRITE E25
PROTECT OFF
```

```
HLD
80.000 ↔ 10M
MKR 80.000
```

```
AUT
EDIT MEM-CH
MEM LSB 0.05k
@29 14.200
BANK/CH SEL
```

The **AR8600 Mark2** is an amazingly versatile receiver which can be used mobile, base or trans-portable... powered from an external 12V d.c. power supply, 12V vehicle or from an optional internally fitted NiCad battery pack. Due to continuous development of our products, the AR8600 Mark2 has been enhanced in several areas. The upper frequency range has been extended to 3000MHz (3.0GHz), lower band sensitivity has been increased (now officially covering to 100kHz) with an enhancement to short wave performance by the addition of further bandpass filters and revision to I.F. filters. **Mini-Circuits RMS1 / RMS2 mixers** have been employed with active SPM aerial switching devices (not diode-switching) abundantly employed throughout the signal path. [Technical boffins will recognise the significance of such devices in minimising signal loss & maximum spurious free range, and will be versed with the quality of Mini-Circuits parts]. The AR8600 Mark2 provides remarkable short wave performance, making other similar wide band competitors mediocre by comparison. When the AR8600 Mark2 arrived in the UK, short wave listeners were amazed at how the AR8600 Mark2 sounds so much like a dedicated short wave receiver with pleasant audio on SSB and good CW tone with Radio Japan rolling in on a simple telescopic whip, much less like the usual expectations of a scanning receiver!

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

Many microprocessor features have been adopted from the trendsetting AR8200 Series-2 hand portable receiver, with the addition of a lamp dimmer and squelch operated lamp. The AR8600 Mark2 RF front-end is an all new design with additional RF bandpass filters, sharper I.F. filters, SPM aerial switching devices for minimal signal path loss and Mini-Circuits mixers. RF preselection is provided through the crowded areas of VHF and UHF to ensure the highest levels of adjacent channel rejection with software spuri cancellation. In addition to a hinged telescopic whip aerial, the AR8600 Mark2 is supplied with a detachable plug in medium wave bar aerial which locates on the rear chassis of the receiver for localised medium wave monitoring. An additional BNC socket is mounted on the rear chassis providing 10.7MHz i.f. output.

The all important 8.33 kHz airband channel step is correctly implemented (eight-and-one-third, 33, 66, 00). Channel steps are provided in a menu and may be programmed. Step may be programmed by the operator in any receive mode using multiples of 50 Hz in any mode (i.e. 5 kHz, 12.5 kHz or even 1.25 kHz). Extensive step-adjust and frequency offset facilities are also provided (as per AR5000) to ensure tracking of the most obscure band plans, AFC (Automatic Frequency Control) is included for spot on tuning ensuring that nothing is missed.

A wide frequency coverage is provided from 100 kHz to 3000 MHz (no gaps). All mode receive: WFM, NFM, SPM (Super Narrow FM), WAM, AM, NAM (Wide, standard, Narrow AM), USB, LSB & CW. A 3.0 kHz SSB filter is employed with true carrier re-insertion resulting in non-offset frequency readout for easy tuning of SSB transmissions. Optional substitute SSB and AM Collins mechanical filters are also available. An attenuator and noise limiter are also featured.

Computer control is available via a standard 9-pin RS232 D-type connector on the rear chassis, just a standard RS232 cable is required for connection to a PC, the extensive RS232 command list is printed in the operating manual. A FREE software package is available as a download from the AOR web sites, this provides frequency control & management, searching, scanning, logging with support for geographic data from a GPS and audio recording to disk.

In addition, 'optional internal SLOT CARDS' (which fit into the rear chassis of the AR8600 Mark2) extend the capabilities even further, five cards may be fitted with two operational simultaneously ●Memory slot card (increase storage to 4,000 memories, 160 search banks). ●CTCSS slot card squelch & search. ●Record chip slot card (records up to 20 seconds of audio) with 'continuous loop' capability. ●Tone eliminator slot card. ●Voice inverter card. The slot cards are common to the AR8600, AR8600 Mark2, AR8200 and AR8200 Series-2.

Portable operation is a reality, when the optional BP8600 battery is fitted, several hours operation is provided away from the base or vehicle power supplies. (Note, considering the BP8600, a 15V regulated d.c. supply is recommended for charging purposes so that the battery obtains a full charge, full charging time 48 hours. This may also be used as a power supply).

Supplied with: comprehensive operating manual, RA8600 whip aerial, MW bar aerial, d.c. lead with cigar plug.



Extensive product information available from the AOR UK web site. Promotions and special prices for SSL credit card orders.

www.aoruk.com

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 info@aoruk.com www.aoruk.com E80E

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■ E-MAIL: gdexter@pwpublishing.ltd.uk

Bandscan America

The Chinese government is trying to fight off the very unwelcome broadcasts of the United States government's Radio Free Asia beamed at the mainland from Tinian in the Northern Marianas Islands. A Chinese jammer has been noticed on RFA frequencies for the past several months. The intentional interference consists of Chinese instrumental music, as though from one of their operas, running (without announcements) for an entire hour and then repeating with the start of a new hour.

The jamming station is believed to be located at the Chinese city of Lingshi and is often heard with quite strong signals in North America, even during the local daylight hours. Apparently RFA isn't the only target against which the Chinese are using the jammer. We've noted it trying to block signals from some of the anti-Beijing clandestine broadcasters as well.

Good News

Some very good news on the short wave front is the return, albeit rather tentatively, of high frequency broadcasts from Greenland! At a mere 100W, though, it should be quite a challenge to hear. The government broadcaster Kalaallit Nunaata Radioa is being aired in u.s.b. on 3.812, from 1330 to 1430 and 2000-2200 - times which, for most if not all of North America, make reception in the summer impossible.

The winter months may allow some chance at 1330 - we'll just have to hope that the broadcasts are still on by then. They're described as 'unofficial' which, considering the frequency, power and mode involved might indicate that it is a broadcast over some sort of utility station (although we find nothing listed for that frequency). The transmitter is said to be located at Tasiilaq on Greenland's eastern coast. Word is that the government is giving serious consideration to returning to short wave; the switch some years ago to just using medium wave and v.h.f. (f.m.) has resulted in decreased coverage.

Two Names

It's rather rare for new short wave stations to appear in the southern part of South America, but Argentina has recently become home to a new one. It even has two names! Radio Bularte is operating on 6.215 from 1000 to 0300 using one kilowatt. 'Bularte' is the name they use when broadcasting in Portuguese. In Spanish they use the name Radio Maranatha. The station is located in Puerto Iguazu, on the Argentine side of the famous Iguazu falls. The address is **Radio Balaarta, Casilla de Correo 45, 3370 Puerto Iguazu, Provincia de Misiones, Argentina.**

In Brazil, Radio Ribeirao Preto has returned to the air. It's on 3.205 with one kilowatt and normally scheduled from 0600 to 0300. They can be reached at **C.P. 1252, 14025-000 Ribeirao Preto, SP, Brazil.**

La Voz Resistencia, the station of the Colombian narco-guerrilla force, was destroyed by the Colombian military a few months ago. For all of the money the FARC group must have, they don't seem to spend very much of it on their broadcast voice because it has always had a quite limited schedule, running over what must be fairly low power transmitters. Reception in North America has always been difficult, amounting to just a few loggings per year, even under the best of conditions.

FARC (Revolutionary Armed Forces of Colombia) controls an



area within the country about the size of Switzerland and apparently does have transmitters at other sites. Reception of the FARC broadcasts was usually around 1130 on a variable frequency around 6.250MHz. To our knowledge, the station was not reported in North America during the last DX season.

New Channel

Radio Exterior de Espana has opened up a new channel for its Cariari, Costa Rica relay site, now using 3.250 during the North American evenings. El Salvador has been a short wave desert for many years but, for a time during the spring, a small oasis sprang up in the form of transmissions from a medium wave station called Radio Imperial in the town of San Miguel. These broadcasts were showing up irregularly on variable 17.835 at various times of the day and night, although we've seen no loggings of this recently. It may have been some kind of utility relay.

Another sporadically active Latin is Radio Cosmopolita in Quito, Ecuador. It's been heard on occasion on 5.900, running in upper sideband with Quichua language programming. This is some sort of link transmission not intended for a general audience.

The US religious broadcaster WJCR has been sold to another religious group and has now taken the call WJIE, operating on 7.490.

Positive View

With little fanfare, the US government has launched its radio effort aimed at creating a more positive view of the United States in the Arab world. Radio Sawa came on the air in early May. This 24 hour-a-day Arab language service is relayed via several satellites, as well as f.m. stations in Kuwait, Jordan and the UAE and over IBB/VOA facilities.

The current schedule for the short wave broadcasts runs as follows: 6.040 from 1700-2100 (via Kavala, Greece); 6.160 from 2000-2100 (Kavala); 7.105 from 1700-2100 (Kavala); 7.255 from 0400-0600 (Briech, Morocco); 9.505 from 1800-2100 (Wooferton, England); 9.620 from 2000-2100 (Kavala); 9.660 from 0730-0830 (Wooferton); 9.680 from 0400-0600 (Kavala); 9.715 from 0730-0830 (Kavala); 9.765 from 0730-0830 (Wooferton); 11.670 from 0400-0600 (Kavala); 11.820 from 0730-0830 (Wooferton); 11.825 from 1800-2100 (Kavala); 11.895 from 2000-2100 (Kavala); 11.910 from 0730-0830 (Kavala); 11.995 from 0730-0830 (Kavala); 15.205 from 0730-0830 (Kavala); 15.355 from 0730-0830 (Kavala); 15.380 from 0400-0600 (Iranawilla, Sri Lanka) and 15.545 from 1800-2100 (Iranawilla). In IBB-speak, the broadcasts are referred to as 'MERN' - Middle East Radio Network.

This VOA QSL from 1992 featured the maiden launch of the Discovery Space Shuttle.



WJCR World Wide



WJCR World Wide P. O. Box 91 10100 ST 42700 USA

WJCR in Kentucky is now WJIE.



Here's one of a long series of Adventist World Radio QSLs, issued by its now silent station in Costa Rica.

Station News

The Guyana Broadcasting Corporation, on the air as the Voice of Guyana, is being heard again on slightly variable 3.290 with English and Hindi broadcasts noted as early as 0200 and as late as 0930.

La Voz Evangelica in Honduras has returned to the air after an absence. But they still haven't fixed the transmitter. It's still on 4.819 or a fraction above, rather than the assigned frequency of 4.820.

Long active La Voz del Napo in Tena, Ecuador (3.280) has been sold to a Catholic group and now goes by the name Radio Maria Ecuador.

A still unsolved mystery station was puzzling North American DXers during the spring. It was being heard on 6.715 upper sideband with Evangelical Christian programming - in Korean - as early as 1900, continuing until past 2300 (it didn't seem to be on daily). Seasonal propagation changes have made reception of this virtually impossible during the summer months and it's anyone's guess as to whether it will still be operating when the arrival of fall improves chances for reception again.

Radiodifusion America in Asuncion, Paraguay, is reported to be gearing up for regular short wave broadcasts. It will probably settle on 7.300, or a frequency as high as 7.740 (or somewhere in between). Unfortunately, the power won't be very high, which will help put it in the same difficult category as the handful of other Paraguayan stations are (with the exception of Radio Nacional - 9.737).

That will do it for this time. We'll be back in three months with another look at short wave news and views from the Americas. Until then - good listening!

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

LM&S



Several listeners, some new to this hobby, have enquired recently about sending reception reports to me for inclusion in Long, Medium & Short ('LM&S'), so a few words about this column and the information required may be appropriate here before detailing the latest reception in the official broadcast bands.

Because the information in 'LM&S' is based upon reports of actual reception instead of broadcast schedules and information from guide books, every valid up-to-date report is of interest. Some listeners contribute to 'LM&S' on a monthly basis, whereas others do so from time to time. A lot of information has to be packed into the four pages allocated to 'LM&S' each month by the SWM Editor. The small print used in the charts is not popular, but it does enable the maximum amount of information to be presented.

There are usually some references to long wave (l.w.) and medium wave (m.w.) reception in the text and all of the short wave (s.w.) information is detailed therein - this results in a balance between text and charts. Each listener's name is given only once in bold type, but his/her location may be repeated in other sections of the text.

The times quoted in 'LM&S' refer to Universal Time Co-ordinated (UTC), which is the time system adopted by the international broadcasters. For most purposes, UTC can be regarded as being the same as Greenwich Mean Time (GMT), but not British Summer Time (BST), which is one hour ahead of UTC/GMT. Unlike local time systems, UTC is not altered during the year. It uses the twenty-four hour clock system, whereby 8am is 0800; 12 noon is 1200; 3.15pm is 1515; 7.30pm is 1930; 10.45pm is 2245 and midnight is 0000.

If you would like to contribute to 'LM&S', please set out any l.w. & m.w. entries in the same way as the 'LM&S' charts - use a * to indicate reception after dark, but be sure to state the date and time for anything unusual. For the s.w. entries please group them by band, starting with the highest frequency one. Always quote times in UTC (=GMT) and include a SINPO rating whenever possible.

Details of your receiver and antenna would be appreciated for the quarterly equipment list. Please post your report to me at the above address during the first week of the month following reception. The full addresses of all contributors are treated as confidential here.

Since the inception of this column in 1987, several listeners have sent regular monthly reports to me. Among them has been George Millmore, but I have recently been informed that he died during the early hours of June 3. He was 86. From his vantage point at Wootton on the Isle of Wight, George searched the long and medium wave bands and over the years his extensive logs made a splendid contribution to 'LM&S'. They will be greatly missed. His final logs, which were compiled during May, have been included in the charts herein with the consent of his widow Molly.

Long Wave Reports

Note: l.w. & m.w. frequencies in

kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during May.

During some nights in May **Simon Hockenhull** (E.Bristol) found the propagation conditions good. He logged the Rikisutvarpid (RUV) outlets at Gufuskalar, W.Iceland (300kW) on **189kHz** as SINPO 25443 at 0142UTC and Eidar, E.Iceland (100kW) on **207kHz** as 22332 at 0141; also Tipaza, Algeria on **252kHz** as 42442 at 0011 by using the directional antenna in his receiver to null-out the co-channel transmission from Clarkestown, Eire.

In view of the reports of an unknown station which some listeners have heard from time to time under RMC via Roumoules, S.France on **216kHz** Simon decided to check the frequency an hour or so after dark during May. When the co-channel transmission became audible, he used a second receiver to compare it with other broadcasts in the band. He found that Allouis on **162kHz** was identical, which confirmed his suspicions that the mystery signal was due to the 'Luxembourg effect' (see 'LM&S', SWM April 2002).

Over in Co.Down **Eddie McKeown** (Newry) logged sixteen stations which included RUV via Gufuskalar on **189kHz** (SINPO 34232 at 0120) and via Eidar on **207** (11421 at 0103); also Sasnovy, Belarus on **279**, (25342 at 2200) - see chart.

During the evening of the 28th **Sheila Hughes** (Morden) heard a broadcast under DLF via Donebach, Germany on **153kHz**. It proved to be from Bod, Romania and rated 22212 at 2130.

Medium Wave Reports

The band was searched after dark by some listeners for the sky waves from the many m.w. stations in the Middle East, N.Africa, Europe and Scandinavia - see chart. Those from the BSKSA 1600kW outlet at Dammam, Saudi Arabia on **1440kHz** were received on five occasions during the month by Simon Hockenhull, but on average he found the conditions at night less favourable than usual. The majority of the entries in the extensive report compiled by Eddie McKeown were received in 'full darkness'.

The search for distant local radio stations was enjoyed by several listeners. All forty-nine of the entries in the interesting log from **Fred Wilmshurst** (Northampton) were received during daylight - see chart.

During the early evening of May 20, Simon Hockenhull concentrated on **1584kHz**. By making use of the directional properties of the built-in antenna in his portable radio, he managed to identify BBC R.Shropshire via Woofferton (0.3kW); BBC R.Notttingham via Clipstone (1kW); also ILR London Turkish Radio (0.2kW), which share that frequency.

Whilst checking the local radio scene in Newry, Eddie McKeown noticed that the two London outlets of ILR R.Liberty on 963 (1kW) and 972 (0.95kW) managed to block out the sky waves from Pori, Finland (600kW) on 963 and Hamburg, Germany (100kW) on 972 until well after dusk!

Short Wave Reports

Since the introduction of the summer transmission schedules on March 31 only Radio France International (RFI) has been taking advantage of the propagation conditions prevailing in the **25MHz (11m)** band. It is not known here how well their transmissions on **25.820** (Fr, Eng to E/C.Africa 0830-1300) have reached the target area, but it seems likely that reception will have been good except during

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Donebach DLF	Germany	500	A,B,C,D,E*,FG
153	Bod	Romania	1200	A*,B*
162	Allouis	France	2000	C,D,E*,FG
171	Nador Medi-1	Morocco	2000	A*
171	B'shakovo etc.	Russia	1200	B*,D*
177	Oranienburg	Germany	500	A*,C,E*,G*
183	Saarlouis	Germany	2000	C,D,E*,FG*
189	Gufuskalar	W.Iceland	150	A*,C*
198	Droitwich BBC	UK	500	B,C,D,G
207	Munich DLF	Germany	500	A*,C,D,E*,FG*
207	Eidar	E.Iceland	100	A*,C*
216	Roumoules RMC	S.France	1400	A,C,D,E*,G*
225	Polskie R-1	Poland	?	A*,B*,C*,D*,F*,G*
234	Beidweiler	Luxembourg	2000	C,D,E*,FG
243	Kalundborg	Denmark	300	A,B,C,D*
252	Tipaza	Algeria	1500	A*,D*
252	Team Talk 252	Eire	500	B,C,D,E*,FG
261	Burg(R.Ropa)	Germany	86	D*
261	Taldom Moscow	Russia	2500	A*,C*,E*
270	Topolna	Czech Rep	1500	A*,B*,C*,D*,E*,G*
279	Sasnovy	Belarus	500	A*,C*,D*,G*

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

Listeners:-

- (A) Simon Hockenhull, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) Eddie McKeown, Newry.
- (D) George Millmore, Wootton, IOW.
- (E) Fred Pallant, Storrington.
- (F) Thomas Williams, Truro.
- (G) Fred Wilmshurst, Northampton.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	Oxer
3.230	SABC Meyerton	S.Africa	1957	H
3.240	TWR Shona	Swaziland	0300	G
3.255	BBC via Meyerton	S.Africa	1957	B,G,H
3.270	Nambian BC,Windhoek	Namibia	0303	G
3.300	R.Cultural	Guatemala	0430	G
3.316	SLBS Goderich	Sierra Leone	2015	B,G,H
3.320	SABC (RSG) Meyerton	S.Africa	1956	B,H
3.365	GBC R-2	Ghana	2016	B,H
3.915	BBC via Kranji	Singapore	2057	FG
3.955	R.Korea via Skelton	England	2100	C,G,I
3.955	R.Taipei via Skelton	England	1800	A,C,F,G,I
3.975	R.Budapest	Hungary	2102	C,G
3.985	Nexus, Milan	Italy	2034	G
3.985	China R.Int via SRI	Switzerland	2300	B
3.995	DW via Julich?	Germany	2215	G,J
4.005	Vatican R.	Italy	2035	G
4.750	PBS Hailar	China	2228	E
4.760	ELWA Monrovia	Liberia	2036	G
4.770	FRCN Kaduna	Nigeria	1911	E,H
4.775	TWR Manzini	Swaziland	0355	B
4.783	RTM Bamako	Mali	2005	H
4.790	Azad Kashmir R.	Pakistan	0008	G
4.800	CPBS 2 Beijing	China	2215	B,E,G
4.815	R.Difusora, Londrina	Brazil	2315	B
4.820	R.Botswana, Gaborone	Botswana	0306	G
4.820	Xizang, Lhasa	China	2305	B,G
4.820	La Voz Evangelica	Honduras	0445	B,E
4.825	R.Cancao Nova	Brazil	0435	B
4.830	R.Tachira	Venezuela	0435	G
4.832	R.Litoral, La Ceiba	Honduras	0425	B,E
4.835	R.Tezulutlan, Coban	Guatemala	0330	E
4.835	RTM Bamako	Mali	2003	E,G,H,J
4.840	AIR Bombay	India	0009	G
4.845	DRTM Nouakchott	Mauritania	2003	E,E,G,H
4.860	AIR Delhi	India	1910	A,E,H
4.885	R.Clube do Para	Brazil	2310	B,G
4.885	KBC East Sce Nairobi	Kenya	1856	H
4.890	RFI Paris	via Gabon	0358	E,G
4.915	R.Anhanguera	Brazil	0530	B,E
4.915	R.Difusora, Macepa	Brazil	0620	E
4.915	GBC-1, Accra	Ghana	2019	E,G,H
4.915	KBC Cent Sce Nairobi	Kenya	1856	H
4.920	R.Quito, Quito	Ecuador	0430	E
4.920	AIR Chennai	India	0030	E
4.930	AIR Shimla	India	1924	H
4.950	R.Nacional, Mulvenos	Angola	1930	I
4.950	AIR Srinagar	India	0035	E
4.950	VOA via Sao Tome	Sao Tome	2020	D,G,H
4.960	VDA via Sao Tome	Sao Tome	0439	G
4.965	Christian Voice	Zambia	1910	E <small>logged on 4970</small>
4.975	R.Uganda, Kampala	Uganda	2020	A,G,H
4.980	Ecos del Torbes	Venezuela	0012	E,G
4.985	R.Brazil Central	Brazil	0004	B,E,G
5.025	R.Parakou	Benin	1903	H
5.025	R.Rebelde, Habana	Cuba	0309	B,G
5.050	R.Tanzania	Tanzania	2022	G,H

DXers:-

- (A) Michael Casey, NE.Manchester.
- (B) Jim Edwards, Wigan.
- (C) Stan Evans, Herstmonceux.
- (D) Bill Griffith, W.London.
- (E) David Hall, Morpeth.
- (F) Simon Hockenhill, E.Bristol.
- (G) Eddie McKeown, Newry.
- (H) Fred Pallant, Storrington.
- (I) Clare Pinder, Appleby.
- (J) Thomas Williams, Truro.

periods of high solar activity. Reports on the reception of the RFI transmissions from listeners in Africa and other areas would be very welcome here - please post them to me at the above address.

Some UK listeners monitor the RFI transmissions on a daily basis, but reception here is unreliable. The SINPO ratings quoted in the latest reports were 25422 at 0935UTC in E.Bristol; 24222 at 1017 by **Thomas Williams** in Truro; 25343 at 1224 in Northampton; 24122 at 1238 in Newry.

Good reception over long distances has been noted in the **21MHz (13m)** band. During the early morning R.Australia's broadcast to Pacific areas via Shepparton on **21.725** (Eng 0200-0900) was rated 44444 at 0805 by **Bill Griffith** in W.London. From 0900 they beam to Asia via Shepparton on **21.820** (Eng 0900-1400) - it was rated 35233 at 0904 in Newry & 44444 at 1025 by **David Hall** in Morpeth.

Other broadcasters taking advantage of the propagation conditions in this band during the day include R.Finland via Pori **21.670** (Eng to Asia, Australia 0630-0700), rated 54554 at 0650 by **Stan Evans** in Herstmonceux; BBC via Rampisham, UK **21.830** (Eng to S.Asia 0800-0900), noted as 'a near perfect signal' at 0830

by **Tim Cooke** in Bath; Swiss R.Int via Sottens **21.770** (Eng, It, Ger, Fr to Near East, Africa 0830-1030) 34333 at 0838 by **Rhoderick Illman** in Oxted; DW via Kigali, Rwanda **21.560** (Eng to Africa 0900-0945) 44333 at 0905 in Morden; R.Pakistan, Islamabad **21.465** (Ur, Eng to Eur 0700?-1100) 33333 at 0942 in Truro; VOIRI Tehran **21.730** (Eng to Asia 1100-1230) 34444 at 1115 in Northampton; also VOIRI **21.470** (Eng to Asia 1100-1230) 24332 at 1125 by **Peter Pollard** in Rugby; Channel Africa via Meyerton, S.Africa **21.725** (Eng to W.Africa 1300-1455, Sat/Sun) 34233 at 1303 in Newry; BBC via Ascension Is **21.470** (Eng to S.Africa 1300-1900) 25422 at 1305 in E.Bristol; WYFR Okeechobee, USA **21.455** (Eng to Eur, Africa 1600-1800) 44444 at 1613 by **Vera Brindley** in Woodhall Spa; Swiss R.Int via Sottens **21.720** (It, Ar, Eng, Fr to Near East, Africa 1630-1815) 55555 at 1730 by **Clare Pinder** in Appleby; WYFR Okeechobee, USA **21.525** (Fr to Eur, Africa 2000-2100?) 43533 at 2000 by **Bernard Curtis**, whilst on holiday near Newquay, Cornwall; HCJB Quito, Ecuador **21.455** (Eng [u.s.b.]) 55434 at 2040 by **Bernard Curtis** in Stalbridge.

The occupants of the **18MHz (15m)** band include R.Sweden **18.960** (Eng to N.America

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	A,B,D,E
603	C.G.Litt'orne	I	0.10	B*,D,E
630	R.Bedfordshire(3CR)	B	0.20	A,B*,D,E
630	R.Cornwall	B	2.00	D
657	R.Clwyd	B	2.00	D,E
657	R.Cornwall	B	0.50	D
666	Cl.Gold 666, Exeter	I	0.34	A,D,E
729	BBC Essex	B	0.20	D,E
738	Hereford/Worcester	B	0.037	A,D,E
756	The Magic 756,Powys	I	0.63	D,E
765	BBC Essex	B	0.50	D,E
774	R.Kent	B	0.70	D,E
774	Cl.Gold 774, Glos	I	0.14	D,E
792	Cl.Gold 792, Bedford	I	0.27	B,D,E
801	R.Devon	B	2.00	A,D
828	Cl.Gold 828, Luton	I	0.20	B,E
828	Asian Netwk Sedgley	B	0.20	A
828	Cl.G 828 Bourne'm th	I	0.27	A,D
837	Asian Netwk Leics	B	0.45	A,D,E
855	R.Devon	B	1.00	D
855	Sunshine 855,Ludlow	I	0.15	A,E
873	R.Norfolk, W.Lynn	B	0.30	D,E
936	Brunel CG, W.Wilts	I	0.18	D,E
945	Cl.Gold GEM, Derby	I	0.20	E
945	Capital G, Bexhill	I	0.75	D
954	Cl.Gold 954, Torquay	I	0.32	D
954	Cl.Gold 954, H'ford	I	0.16	A,E
963	Liberty R, Hackney	I	1.00	B,C*,D,E
972	Liberty R, Southall	I	1.00	A,B,C*,D,E
990	R.Devon, E.Devon	B	1.00	A,D
990	Cl.G, Wolverhampton	I	0.09	E
999	C.Gold GEM Nott'ham	I	0.25	E
999	R.Solent	B	1.00	B,D
1017	Cl.G,WABC, Shr'shire	I	0.70	A,C*,E
1026	R.Cambridgeshire	B	0.50	E
1026	R.Jersey	B	1.00	A,D
1035	RTL C'try(Ritz)1035	I	1.00	B*,D,E
1116	R.Derby	B	1.20	E
1116	R.Guernsey	B	0.50	D
1116	Valley R, Ebbw Vale	I	0.50	A
1152	LBC 1152 AM	I	23.50	D,E
1152	Cl.G, Birmingham	I	3.00	A,E
1161	R.Bedfordshire(3CR)	B	0.10	E
1161	Southern Counties R	B	1.00	D
1170	Capital G, Ports'm'th	I	0.50	D
1170	Swansea Snd, Swansea	I	0.58	A
1170	1170AM, High Wycombe	I	0.25	E
1242	Capital G, Maidstone	I	0.32	D
1260	Brunel CG, Bristol	I	1.60	D
1260	SabrasSnd, Leicester	I	0.29	E
1278	Cl.Gold 1278 W.York	I	0.43	C*
1296	Radio XL, Birmingham	I	5.00	D,E
1305	Premier via ?	I	0.50	D,E
1305	Touch AM, Newport	I	0.20	D
1323	Capital G, Southwick	I	0.50	D
1332	Premier, Battersea	I	1.00	D
1332	Cl.Gold 1332, Pt'bo	I	0.60	E
1332	Wiltshire Sound	B	0.30	D
1359	Cl.Gold 1359, C'try	I	0.27	E
1359	R.Solent, Bournem'th	B	0.85	D
1368	R.Lincolnshire	B	2.00	E
1368	Southern Counties R	B	0.50	B*,D
1368	Wiltshire Sound	B	0.10	D
1413	R.Gloucester via ?	B	?	E
1413	Premier via ?	I	0.50	D
1431	Cl.Gold, Reading	I	0.14	D,E
1449	Asian Netwk, Peterbro.	B	0.15	E
1458	R.Devon	B	2.00	D
1458	Sunrise, London	I	50.00	A*,D,E
1458	Asian Netwk Langley	B	5.00	A,E
1485	Cl.Gold, Newbury	I	1.00	E
1485	R.Merseyside	B	1.20	A,D
1485	Southern Counties R	B	1.00	B,D
1503	R.Stoke-on-Trent	B	1.00	B*,D*,E
1521	Breeze, Reigate	I	0.64	A*,B,D,E
1530	Cl.Gold Worcester	I	0.52	E
1548	R.Bristol	B	5.00	D
1548	Capital G, London	I	97.50	D
1557	Cl.Gold 1557, N.hant	I	0.76	E
1557	Capital G, So'ton	I	0.50	B,D
1566	CountySnd, Guildford	I	0.50	A*,D
1584	London Turkish R	I	0.20	A,B*
1584	R.Nottingham	B	1.00	A,B*,E
1584	R.Shropshire	B	0.50	A
1602	R.Kent	B	0.25	D,E

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

Listeners:-

- (A) Simon Hockenhill, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) Eddie McKeown, Newry.
- (D) George Milhurst, Wootton, IoW.
- (E) Fred Williams, Northampton.



1230-1300, 1330-1400, 1430-1500), rated 44444 at 1239 in Woodhall Spa & 35422 at 1355 in E.Bristol; Christian Science Herald via WSHB Cypress Creek **18.910** (Fr, Eng to E/S.Africa 1600-2200?) 44323 at 1645 in Morden & 32222 at 2032 in Truro; Family R, WYFR via Okeechobee FL, USA **18.980** (Eng to Eur, Africa 1600-2200) 45434 at 2000 in Newquay. It is a pity they are using amplitude modulation (a.m.) instead of single sideband (s.s.b.), as planned for this band in the future.

There is a high level of activity in the **17MHz (16m)** band. During the morning R.Australia's broadcasts to Asia via Shepparton on **17.750** (Eng 0000-0500, 0600-1100) have been reaching the UK. They were rated 34433 at 0720 in E.Bristol & 34232 at 0832 in Newry.

Also mentioned in the reports were AWR via Moosbrunn, Austria **17.780** (Eng to W.Africa 0830-0930), rated 44444 at 0830 in Morden; BBC via Ascension Is **17.830** (Eng to Africa 0700-2100) 34322 at 0908 in Oxted; R.Bulgaria, Sofia **17.500** (Eng to Eur 1100-1200) 34433 at 1120 in Rugby; R.Finland via Pori **17.670** (Eng to N.America 1230-1300, Mon-Sat) 54444 at 1235 in Herstmonceux; Voice of Turkey **17.830** (Eng to Eur, Asia, Australia 1230-1300) 44444 at 1300 in Woodhall Spa; BBC via Seychelles **17.885** (Eng to E/S.Africa 0800-1400) 24122 at 1312 in Newry; R.Japan via Ascension Is **17.790** (Fr, Swah to Africa 1230-1330) 44444 at 1315 in Morpeth; Channel Africa via Meyerton **17.770** (Eng to Africa 1500-1530) 32233 at 1500 by **Gerald**

Guest in Dudley; Swiss R.Int (SRI) via Julich, Germany **17.735** (It, Ar, Eng, Fr to Nr East, Africa 1630-1815) 33222 at 1730 in Appleby; Israel R, Jerusalem **17.545** (Eng to Eur, N.America 1900-1930?) 45554 at 1900 by **John Parry** in Larnaca, Cyprus & 45544 at 1921 in Northampton; R.Canada Int (RCI) via Sackville **17.870** (Eng to Eur 2000-?) 34444 at 2009 by **Fred Pallant** in Storrington; World Harvest R. (WHRI) via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600-2300?) 44444 at 2030 in Truro; HCJB Quito, Ecuador **17.660** (Eng to Eur 2000-2200) 55434 at 2045 in Stalbridge.

Good reception from many areas has been noted in the **15MHz (19m)** band. If you would like to listen to R.New Zealand's early morning broadcasts this band could provide the best reception. Their transmission to Pacific areas on **15.340** (Eng 0500-0800) was rated 34333 at 0502 in Morpeth. Much later, their broadcast to Pacific areas on **15.160** (Eng 1851-2215) was 33323 at 1900 in Dudley & 22442 at 1905 in Larnaca, Cyprus.

R.Australia's broadcasts have been reaching the UK well on three frequencies from Shepparton: **15.515** (Eng to Pacific, N.America 02007-0700) 43433 at 0625 in Herstmonceux; **15.415** (Eng to E/SE.Asia 0600-0900), rated 34543 at 0829 by **Michael Casey** in Manchester; **15.240** (Eng to Pacific, E.Asia 0000-1000) 33333 at 0850 in Truro.

Also mentioned in the reports were the Voice of Nigeria via Ikorodu **15.120** (Eng), rated 44444

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
531	Ain Beida	Algeria	600/300	A*	1197	Virgin via ?	UK	?	B* C.E.F.
531	Berg	Germany	20	B*	1206	Bordeaux	France	100	A* B* C* E* F*
531	RNE5 via ?	Spain	?	C	1215	Virgin via ?	UK	?	B* C.F.
531	Beromunster	Switzerland	500	B* C*	1224	Lelystad	Holland	50	A* B* C*
540	Wavre	Belgium	150/50	B* C* F*	1233	Virgin via ?	UK	?	B* F.
540	Sidi Bennour	Morocco	600	C*	1242	Marseille	France	150	A*
549	Les Trembles	Algeria	600	C*	1242	Virgin via ?	UK	?	B*
549	Thurnau (DLF)	Germany	200	C* F*	1251	Huisberg	Netherlands	10	B* C*
558	Espoo	Finland	50	B* C*	1260	SER via ?	Spain	?	B* C*
567	Tullamore(RTE1)	Eire	500	A.B.C.F.	1269	Neumunster(DLF)	Germany	600	A* B* C* F*
576	Muhlacker(SDR)	Germany	500	B* C* F*	1278	Dublin(Cork(RTE2))	Eire	10	A.C* F*
576	Barcelona(RNE5)	Spain	50	B* C*	1278	Strasbourg	France	300	A*
585	Paris(FIP)	France	8	B* C	1287	RFE via ?	Czech Rep.	?	B* C* F
585	Madrid(RNE1)	Spain	200	A* B* C* F*	1287	Lerida(SER)	Spain	10	F*
594	Frankfurt(HR)	Germany	1000/400	B* C* F*	1296	Valencia(COPE)	Spain	10	F*
594	Muge	Portugal	100	B*	1296	Orfordness(BBC)	UK	500	B*
603	Lyon	France	300	A* B* C	1305	RNE5 via ?	Spain	?	B*
603	Sevilla(RNE5)	Spain	50	B*	1314	Kvitsoy	Norway	1200	A* B* C* F*
603	Newcastle(BBC)	UK	2	B	1323	W'brunn (VOR)	Germany	800/150	B* F.
612	Athlone(RTE2)	Eire	100	A.B.C.F.	1332	Rome	Italy	300	B* C*
612	Sebba Aioun	Morocco	300	A*	1341	Lisnagarvey(BBC)	N.Ireland	100	A* C* F
621	Wavre	Belgium	80	B* F*	1359	Madrid(RNE-FS)	Spain	600	B* C*
621	Barcelona(OCR)	Spain	50	B* C*	1368	Foxdale(Manx R)	Is of Man	20	A* B* C* F*
630	Vigra	Norway	100	A* B* C*	1377	Lille	France	300	A.B* C.F.
630	Tunis-Djedeida	Tunisia	600	B*	1386	Bolshakovo	Russia	1200	B* C* F.
639	Praha(Libice)	Czech	1500	B* F*	1395	TVR via Flake	Albania	500	B*
639	RNE1 via ?	Spain	?	A* B* C* F*	1395	Lopic	Netherlands	120/40	B* C
648	RNE1 via ?	Spain	10	B*	1404	Brest	France	20	B* C* F*
648	Orfordness(BBC)	UK	500	A.B* C.F.	1413	RNE5 via ?	Spain	?	B*
657	Madrid(RNE5)	Spain	20	A* B* C* F*	1422	Heusweiler(DLF)	Germany	1200/600	A* B* C* F.
657	Wrexham(BBC/Wales)	UK	2	A.B* F.	1440	Marmach(RTL)	Luxembourg	1200	B* C.E.F.
666	Messkirch(Rohrd(SWF))	Germany	150	B* F*	1440	Damman	Saudi Arabia	1600	A* B*
666	Sitkuni(R Vilnius)	Lithuania	500	B*	1449	Squinzano (RAI)	Italy	50	B* C*
666	Lisboa	Portugal	135	B*	1467	Monte Carlo(TWR)	Monaco	1000/400	B* C* F.
675	R10 FM	Holland	120	A.B* C.F.	1476	Wien-Bisamberg	Austria	600	B* C* D* F*
684	Sevilla(RNE1)	Spain	500	B* C*	1485	SER via ?	Spain	?	C*
684	Avala(Beograd-1)	Yugoslavia	2000	C*	1494	Clermont-Ferrand	France	20	B* C* F*
693	Tortosa(RNE1)	Spain	2	B*	1494	Krasnyy Bor	Russia	1200	B*
693	Droitwich(BBC)	UK	150	C.F.	1512	Wolvertem	Belgium	300	B* C* D* E* F.
711	Rennes 1	France	300	A.B* C.F.	1521	Kosice(Citacice)	Slovakia	600	B* C* F*
720	Lisnagarvey(BBC4)	N.Ireland	10	A* C*	1530	Vatican R	Italy	150/450	C* F.
720	Crystal Palace BBC4	UK	0.75	A.C.F.	1539	Mainflingen(ERF)	Germany	350/700	B* C* F.
729	Cork(RTE1)	Eire	10	B* C.	1539	SER via ?	Spain	?	F*
729	RNE1 via ?	Spain	?	B* F*	1575	Genova	Italy	50	C* F*
738	Paris	France	4	B* C.	1575	SER via ?	Spain	5	B* C*
738	Barcelona(RNE1)	Spain	500	A* B* C* F*	1584	SER via ?	Spain	2	C*
747	Flevo(NOS-1)	Holland	400	A.B* C.F.	1602	SER via ?	Spain	?	C*
756	Braunschweig(DLF)	Germany	800/200	B* F*	1602	Vitoria(EI)	Spain	10	B* C* F*
756	Bilbao(EI)	Spain	5	B*	1611	Vatican R	Italy	15	F
756	Redruth(BBC)	UK	2	C					
765	Sottens	Switzerland	500	B* C*					
774	Enniskillen(BBC)	N.Ireland	1	B					
774	RNE1 via ?	Spain	?	B* F*					
783	Leipzig(MDR)	Germany	100	B*					
792	Limoges	France	300	A* B* C					
792	Lingen(NDR)	Germany	5	B*					
801	Munchen-Ismaning	Germany	300	B* C*					
810	Volgograd	Russia	150	C*					
810	Madrid(SER)	Spain	20	B*					
810	Westerglen(BBC/Scott)	UK	100	A* B* C* F*					
819	Batra	Egypt	450	C*					
819	S.Sebastian(EI)	Spain	5	B*					
828	Hannover(NDR)	Germany	100/5	B*					
828	Heinenoord(CI.Rock)	Holland	20	B*					
837	Nancy	France	200	A* B* C					
837	COPE via ?	Spain	?	B* C*					
846	Rome	Italy	1200	A* B*					
855	Berlin	Germany	100	B*					
855	RNE1 via ?	Spain	?	B* C* F*					
864	Paris	France	300	B* C* F*					
873	Frankfurt(AFN)	Germany	150	A* B* C*					
873	Zaragoza(SER)	Spain	20	B*					
873	Enniskillen(R.U.I)	UK	1	B					
882	COPE via ?	Spain	?	B*					
882	Washford(BBC/Wales)	UK	100	B.C.F.					
891	Algiers	Algeria	600/300	A* B* C*					
891	Huisberg	Netherlands	20	B*					
900	Brno(CRo2)	Czech Rep.	25	B* C*					
900	Milan	Italy	600	A* B*					
909	B'mans Pk(BBC5)	UK	140	C.F.					
918	Domzale	Slovenia	600/100	A* B* C* F*					
918	Madrid(R.Int)	Spain	20	B*					
927	Wolvertem	Belgium	300	A* B* C.F.					
936	Bremen	Germany	100	B* C*					
936	Venezia	Italy	20	C*					
945	Toulouse	France	300	A* B* C*					
954	Brno (CRo2)	Czech Rep.	200	B* C*					
954	Madrid(CI)	Spain	20	C* F*					
963	Pori	Finland	600	A* B* C*					
972	Hamburg(NDR)	Germany	100	A* B* C*					
981	Alger	Algeria	600/300	A* C*					
990	Berlin	Germany	100	B* C*					
990	R.Bilbao(SER)	Spain	10	B*					
999	Schwerin (RIAS)	Germany	20	B* F*					
999	Madrid(COPE)	Spain	50	F*					
1008	Flevo(NOS-5)	Holland	400	A* B* C.F.					
1017	Rheinsender(SWF)	Germany	600	A* B* C* F*					
1035	Lisbon	Portugal	120	B*					
1044	Dresden(MDR)	Germany	20	B* C*					
1044	Sebba-Aioun	Morocco	300	B* C*					
1053	Talk Sport via ?	UK	?	B.C.F.					
1062	Kalundborg	Denmark	250	A* B* C* F*					
1071	Bilbao(EI)	Spain	5	B* F*					
1071	Talk Sport via ?	UK	?	B* F.					
1080	SER via ?	Spain	?	B* C*					
1089	Talk Sport via ?	UK	?	B.C.F.					
1098	Nitra(Jarok)	Slovakia	1500	A* B* C* F.					
1107	AFN via ?	Germany	10	A* B*					
1107	Talk Sport via ?	UK	?	B.C.F.					
1125	La Louviere	Belgium	20	B*					
1125	Deanovec	Croatia	100	A*					
1125	RNE5 via ?	Spain	?	C*					
1125	Llandrindod Wells	UK	1	B*					
1134	Zadar(Croatian R)	Croatia	600/1200	A* B* C* F.					
1143	Stuttgart(AFN)	Germany	10	B*					
1143	COPE via ?	Spain	2	C*					
1152	RNE5 via ?	Spain	10	B* C*					
1179	Solvesborg	Sweden	600	B* C* E* F*					
1188	Kuurne	Belgium	5	B* C*					
1188	Marcali(VOA/RFE)	Hungary	500	A* B* E* F*					
1197	Munich(VOA)	Germany	300	B* E* F*					

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

Listeners:-

- (A) Simon Hockenhill, E.Bristol.
- (B) Eddie McKeown, Newry.
- (C) George Millmore, Wootton loW.
- (D) Clare Pinder, Appleby.
- (E) Harry Richards, Barton-on-Humber.
- (F) Fred Wilmshurst, Northampton.

at 0514 in Newry; BBC via Singapore **15.360** (Eng to E.Asia 0500-0900?) 43333 at 0831 in Oxted; KTWR Guam, Pacific **15.330** (Eng to Asia 0815-0930) 45233 at 0833 in Newry; China R.Int via ? **15.210** (Eng to Australia 1000-1100) was 44333 at 1015 in Morden; R.Finland via Pori **15.400** (Eng to N.America 1230-1300) 32333 at 1247 in Woodhall Spa; WEWN Vandiver, USA **15.745** (Eng to Eur, Africa 1000-2100?) 44344 at 1333 in Rugby; WWCR Nashville, USA **15.825** (Eng to N.America, Eur 1100-2200) 55445 at 1915 in Stalbridge; R.Kuwait **15.505** (Ar to Eur, N.America 1745-2300) 35544 at 2021 in Storrington; RCI via Sackville **15.325** (Eng to Eur, M.East, Africa 2000-2200) 55445 at 2000 in Newquay & 35433 at 2112 in E.Bristol; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 35444 at 2203 in Northampton.

In the **13MHz (22m)** band the Voice of Croatia via Julich **13.820** (Various [News in Eng at 0840] to Australia) was 43333 at 0840 in Morden; Croatian R, Zargreb **13.830** (Cr to Eur) 34343 at 0936 in Oxted & 54554 at 1100 in W.London; R.Austria Int via Moosbrunn **13.730** (Eng to Eur, M.East, Africa 1130-1200) 34343 at 1128 in Rugby; R.Prague, Czech Rep. **13.580** (Eng to Eur, Asia 1300-1329) 44434 at 1328 in Woodhall Spa; R.Austria Int via Moosbrunn **13.730** (Eng to Eur, M.East, Africa 1330-1400) 55544 at 1340 in Northampton; BBC via Rampisham, UK **13.745** (Russ to Russia) 55555 at 1840 in Stalbridge; Swiss R.Int via Sottens **13.645** (It, Ar, Eng, Ger, Fr to M.East, Africa 1830-2130) 44433 at 1945 in Truro; Voice of Vietnam, Hanoi **13.740** (Eng, Fr to Eur 2030-2130) 45544 at 2040 in Northampton; R.Damascus, Syria **13.610** (Eng to Eur 2005-2105) 24322 at 2058 in Newry; R.Australia via Darwin **13.620** (Eng to SE.Asia 2200*-0000 [* often starts late]) 44333 at 2200 in Appleby.

R.New Zealand has also been reaching Europe quite well in the **11MHz (25m)** band. Their early morning broadcast to Pacific areas on **11.820** (Eng 0459-0658) was rated 22552 at 0505 in Larnaca, Cyprus; 43444 at 0545 in Stalbridge, also 35233 at 0618 in Newry.

R.Australia has been heard on two frequencies from Shepparton: **11.660** (Eng to Asia 1430-1700) 45434 at 1530 in E.Bristol; **11.880** (Eng to Pacific, N.America 1700-2200) 34233 at 2128 in Newry.

Also noted in the reports were HCJB Quito, Ecuador **11.680** (Eng to Eur 0600-0800), rated 54445 at 0600 in Newquay; BBC via Woofferton, UK **12.095** (Eng to Eur 0600-1900) 44344 at 0835 in Oxted; R.Nederlands via Petropavlovsk, Russia **12.065** (Eng to Asia, Far,East, Pacific 0930-1130) 34333 at 0930 in Morden; R.Prague, Czech Rep **11.615** (Eng to Eur 1030-1100) 44444 at 1030 in Dudley; AWR via Agat, Guam **11.980** (Eng to Far East 1330-1400) 24132 at 1350 in Newry; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1300-1730) 44333 at 1601 in Woodhall Spa; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 55544 at 1855 in Herstmonceux & 44444 at 1905 in Rugby; Israel R, Jerusalem **11.605** (Eng to Eur, N.America 1900-1930) 54444 at 1900 in Appleby; Voice of Mediterranean, Malta via Russia? **12.060** (Eng to Eur, N.Africa 1900-2000) 33323 at 1945 in Truro; China R.Int via ? **11.790** (Eng to Eur 2000-2200) 44544 at 2020 in Northampton.

R.New Zealand has also been reaching the UK in the **9MHz (31m)** band. Their 100kW transmission to Pacific areas from Rangitaiki, N.Island on **9.885** (Eng 0659-1105) was rated 24322 at 0910 in Oxted. R.Australia has been received here on two frequencies from Shepparton: **9.475** (Eng to Asia 1100-1400, 1530-1900), rated 34333 at 1549 in E.Bristol; **9.500** (Eng to Asia, Eur 1900-2130) 43333 at 1905 in Stalbridge & 43333 at 2100 in Appleby.

Many other broadcasters use this band. They include R.Havana Cuba **9.820** (Eng to C/N.America 0100?-0700), rated 43433 at 0415 in Morpeth; WYFR Okeechobee, USA **9.355** (Eng to Eur, M.East 0300?-

0800?) 44444 at 0519 in Newry; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 55544 at 0935 in Herstmonceux; R.Nederlands via Wertachtal, Germany **9.860** (Eng to Eur 1030-1225) 34333 at 1110 in Rugby; R.Polonia (Polish R, Warsaw) **9.525** (Eng to Eur 1200-1300) 44343 at 1235 in Northampton; R.Vlaanderen, Belgium **9.925** (Eng to Eur 1730-1800) 44444 at 1730 in Dudley; R.Mediterranee Int, Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0100) 54554 at 1745 in W.London; R.Vlaanderen, Belgium **9.925** (Eng to Eur 1930-2000) SIO 333 at 1934 by **Francis Hearne** in N.Bristol; Voice of Armenia, Yerevan **9.960** (Eng to Eur 1940-2000) 54444 at 1940 in Morden; TWR via Meyerton, S.Africa **9.510** (Fulani to W.Africa 1830-2045) 32342 at 1959 in Storrington; Voice of Russia **9.480** (Eng ?-2100) 33333 at 2000 in Newquay; R.Bulgaria, Sofia **9.400** (Eng to Eur 2100-2200) SIO 333 at 2141 in N.Bristol; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2245) 22222 at 2225 in Truro; WBCQ Monticello, Maine USA **9.335** (Eng to N.America 2100?-1100?) 34132 at 2237 in Newry.

Some of the broadcasts in the **7MHz (41m)** band are intended for listeners in Europe. Those mentioned in the reports came from R.Japan via Woofferton, UK **7.230** (Eng 0500-0700), rated 55544 at 0610 in Herstmonceux; Family R. (WYFR) via Okeechobee FL, USA **7.355** (Eng 0600-0800) 45544 at 0610 in Northampton; Sudwestfunk via Rohrdorf **7.265** (Ger 24hrs) 44434 at 0841 in Oxted; R.Slovakia Int. **7.345** (Eng 1630-1700) 44444 at 1637 in Woodhall Spa; R.Slovakia Int. **7.345** (Eng 1830-1900) SIO 333 at 1838 in N.Bristol; R.Thailand, Udorn Thani **7.155** (Eng 1900-2000) 42233 at 1905 in Truro; R.Budapest, Hungary **7.130** (Eng 1900-1930) 34444 at 1913 in Rugby; R.Polonia (Polish R), Warsaw **7.165** (Eng 1930-2030) 33332 at 2000 in Morden; R.Minsk, Belarus **7.210** (Eng 1930-2030) 43333 at 2040 in Morden; RCI via Skelton, UK **7.235** (Eng 2100-2130) 45444 at 2129 in E.Bristol; AIR via Bangalore **7.410** (Eng, Hind 1745-2230) 43444 at 2205 in Stalbridge.

While beaming to other areas R.For Peace Int. (RFPI), Costa Rica **7.445** (Eng to N.America 0200?-1000?) rated 24444 at 0753 in Northampton; R.Nederlands via Madagascar **7.120** (Eng to Africa 1730-2025) 44333 at 1800 in Newry; R.Tirana, Albania **7.160** (Eng to N.America) 32333 at 0159 in W.London.

Many of the broadcasts in the **6MHz (49m)** band are intended for listeners in Europe. Those mentioned in the reports came from R.Vlaanderen Int via Julich, Germany **5.985** (Eng 0700-0730), rated 55555 at 0710 in Herstmonceux & 55444 in Manchester; Deutschland R, Berlin **6.005** (Ger 24hrs) 42443 at 0731 in Oxted; TWR Monaco via Germany? **6.045** (Eng 0655-0800) 55545 at 0755 in Stalbridge; R.Slovakia Int. **6.055** (Eng 1630-1700) 44444 at 1635 in Morden; Deutsch Welle (DW) via Julich **6.140** (Eng Service) 33333 at 1825 in Rugby; RAI Rome **5.970** (Eng 1935-1955) 54333 at 1935 in Appleby; R.Sweden, Stockholm **6.065** (Eng 1930-2000) 45544 at 1936 in Northampton; R.Canada Int via UK? **5.995** (Fr, Eng 1900-2100) 53355 at 2000 in Dudley; R.Canada Int via Sweden **5.850** (Eng 2000-2130, Fr 2130-2200) 45544 at 2058 in E.Bristol; R.Japan via Skelton, UK **6.180** (Eng 2100-2200) SIO 444 at 2157 in N.Bristol; VOA via ? **5.855** (Eng 2200-?) 42333 at 2202 in Truro.

Also logged by listeners in the UK were some of the broadcasts in this band to other areas. They originated from R.Nederlands via Bonaire, Ned.Antilles **6.165** (Eng to N.America 2330-0125), rated 44232 at 2330 in Newry; R.Havana, Cuba **6.000** (Eng to N.America 0100-0500) 33433 at 0149 in Newry; R.Tirana, Albania **6.115** (Eng to N.America) 32333 at 0155 in W.London; American Forces Network (AFN) via Puerto Rico **6.458** (Eng [u.s.b.]) 44343 at 0410 in Morpeth; WHRI South Bend, USA **5.745** (Eng to N.America 2000?-1000?) 24332 at 0710 in Oxted; WEWN Birmingham, USA **5.825** (Eng to N.America 0000?-1300?) 24333 at 0718 in Oxted; WWCR Nashville, USA **5.935** (Eng to N.America 0000?-1400?) 24332 at 0718 in Oxted.



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

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Off The Record

Long wave station TeamTalk 252, the successor to Atlantic 252, appear to have suffered a huge drop in their audience research figures reaching virtually an all time low. This news may be a little misleading as a part of the last quarter involved test transmissions that were not representative of their normal output. A lot of interest is being shown in the progress of TeamTalk 252 as speculation exists whether the use of what can be a rather noisy long wave band is still a viable proposition. Recent reports suggest that TeamTalk may themselves be taken over due to their finances being over stretched since they took over the running of the long wave station.

Construct A Tower

The Isle Of Man Broadcasting Company are still forging ahead with plans to construct a slender looking tower in Ramsey Bay on which to base their 500kW transmitter. Music Mann 279 would probably have been on air by now, had it not been for a constant stream of planning objections from local residents. It is thought such a station would provide a huge boost to the island's economy, much of which depends on tourism and sport.

During the middle 1960s the pirate radio ship *MV Caroline*, anchored off the Manx coast in Ramsey Bay, broadcast commercials on behalf of the Isle Of Man Tourist Board to most of Northern England. Paul Rusling says that his high power Manx station will be audible throughout the UK and not be controlled by Britain's Radio Authority.

Music Mann 279 is licensed by the IoM Communications Commission and will just be required to comply with a code of practice requiring broadcasts from the station to be legal, decent, honest and truthful. As a tribute to Radio Caroline North, Paul Rusling has suggested calling his offshore broadcasting platform *Caroline Island*, but by all accounts nobody will actually live there.



Radio 270

Radio 270 was a small ship based station that broadcast from off the Yorkshire coast between 1966 and 1967. It was one of Britain's

smallest pop pirates based on a former Dutch fishing trawler called *Ocean 7*. Until now, very little has been published about this station, but in this book, Bob Preedy does a wonderful job in portraying the station as it was, including the triumphs and catastrophes. It's all here, the colossal business uncertainties and acquisition of the ship that was really too small, plus mass disc-jockey resignations! *Radio 270 - Life On The Ocean Waves* is produced as a soft back; 96 pages, with many black and white photographs of the ship and the people involved. It is £6.99 from bookshops or £8 including packing and postage from **R.E. Preedy, Wetherby LS22 6WG**.

Land-based Pirates

Radio Benelux was raided by German communications officials just before 0900 on Sunday 12th May while transmitting on 7.450MHz. In the London area, Radio Enigma 846 are hoping to be back on air for Sunday 6th October.

Another London based station *Swinging Radio England* is off air after two raids earlier this year. Several listeners had reported their concern over the constant use of offensive language and outrageously camp behaviour from some presenters on this station. SRE have now issued a press release blaming a rival free radio station in London for making unprecedented attacks against them and were now closing down.

Tony Randall, Dave Doubledex and Dave Martin thanked all their loyal supporters for their assistance in the past and wished them well in the future. It was just over a year ago that Radio Free London closed in very

similar circumstances. Another station, Radio Argus, has also temporarily suspended their London area broadcasts.

In-House Audio

Whether you listen to radio using a communications receiver, or perhaps a satellite or DAB receiver, you invariably have the problem of not being able to move the receiver easily about the house. Even if you can shift the receiver, the antenna and connection leads can literally tie you down. The answer is to have speakers in other areas of the house so you can monitor your sound source whilst doing other things.

Running cables with switches

and speakers to each area is seldom a serious solution. There are various methods of overcoming this problem including little f.m. transmitters that can be received on any radio in the building and possibly beyond. There are also various brands of cordless

speakers and headphones that are available at wildly differing prices and levels of performance.

If fidelity is not a problem, the so-called baby alarms could be a possible solution. I am interested in hearing from readers who have experienced this difficulty and overcome it, as my YL is convinced I would be more use around the house if I could monitor the shack from the kitchen sink. I am sure many readers could benefit from an affordable and efficient legal internal relay system, any ideas?

No Licence For Caroline

Radio Caroline had planned to hold a regional meeting at Herne Bay, Kent on 25th May, however this was cancelled at the very last moment. The event was to have had live entertainment and a disco road show in the pub garden, as a wedding reception was to be booked for the interior of the premises. Unfortunately the pub did not possess the appropriate music and entertainments licence required by Canterbury City Council resulting in them sending a stiffly worded letter to the landlord. Possibly a neighbour had anticipated there being a lot of noise.

Somehow I do find it hard to be sympathetic to people that cannot organise a booze-up in a pub! A low-key event did take place with a few enthusiasts and some station presenters, it has been suggested that another meeting will be held shortly, presumably at another venue.

Pirate Radio Websites

There are many websites that carry old pirate radio information, here are a few:-

www.earthradio.co.uk
www.radio1000.co.uk
www.radiocaroline.co.uk
www.offshoreechos.com
www.offshoreradio.co.uk

The offshore radio site has some new pictures of the of the Thames Estuary forts under construction at Gravesend and also some internal photographs of Radio City. The Offshore Echo site has also been updated to include a brief history and pictures of the pre-war Radio Normandy. If you are looking for detailed information on current pirate broadcasting you could visit www.pir8radio.co.uk - this contains just about anything you need to know and perhaps a little bit more!

Radio Spectrum Tax

The government are considering proposals for the introduction of a radio spectrum tax to encourage the efficient use of radio and TV frequencies. These charges, if implemented, could cost the BBC 10% of their licence fee. Alternatives would be to pass this extra charge on to licence payers or possibly curtail terrestrial transmissions to sparsely populated areas.

The BBC would be unaffected until after its Royal Charter expires in 2006, but commercial companies could be subject to any change much sooner. Despite the ITV Digital fiasco the government still intends to start switching off analogue TV transmitters between 2006 and 2010. Free to air stations (non subscription stations) should be accessible by simply using a converter box next to an ordinary analogue TV and in most cases the existing antenna should be adequate.

Radio Mi Amigo

The Radio Authority website shows that a 28 day short term RSL licence has been granted to Radio Mi Amigo for a broadcast from 18th July to 14th August 2002. The transmission will come from Harwich on 1503kHz. Mi Amigo was the name of one of the former Radio Caroline ships that sank in the Thames estuary on 20th March 1980. The previous RSL broadcasts from Harwich have been based on a former lightship LV No. 18, berthed at an old railway pier in the harbour.

An interesting point is that 1503kHz is also to be used for a new Access Radio experimental station in East London.

Pirates Logbook

Here is a brief list of some of the most frequently reported short wave Sunday morning pirates, several are active on other days especially bank holidays.

(MHz)	Station
5.970	Ozone Radio
6.210	Radio Argus
6.220	Laser Hot Hits
6.274	Radio Casanova
6.286	West Coast Radio
6.295	Reflections Europe
6.305	Radio Victoria
7.440	Radio Pandora
7.449	Transatlantic Radio
7.525	Weekend Music Radio

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

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A superb performance portable/base synthesized world receiver with true SSB and 40Hz tuning for ultra clean reception. The same radio is sold under the Roberts name at nearly twice the price. Other features include RDS facility, 306 memories and FM stereo through headphones. The ATS-909 represents superb value for money.

OUR PRICE **£139.00** P&P £10

Optional power supply.....£16.95
HD-1010 mono/stereo headphones.....£9.99

2 YR GEE ICOM IC-R75



The short wave receiver for the true enthusiast.
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● Synchronous AM detection
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HD-1010 mono/stereo headphones.....£9.99

REALISTIC DX-394



★ Superb performance SW receiver ★ 0.2-30MHz (all mode)
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Short Wave Magazine, August 2002

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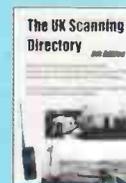
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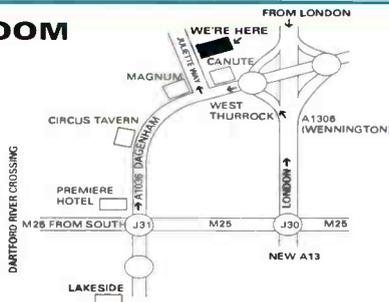
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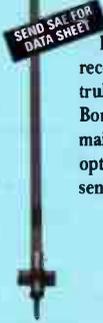
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PROFESSIONAL QUALITY **£79.95** P&P £10.00

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Can be used in reverse

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

Allows two antennas to be connected to one receiver without interaction. **£54.95**
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QS-300



A fully adjustable desk top stand for use with all hand-helds. Fitted coaxial lead with BNC + SO239 connections.

OUR PRICE **£10.00** P&P £3.00

SP-3 (PROFESSIONAL)

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

Can be used in reverse **£59.95** P&P £3.50

SP-1 TWO WAY COMBINER (PROFESSIONAL)

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

Can be used in reverse **£59.95** P&P £3.50

Racal's DSP based RA3791 continued

dissimilar as to make them appear, at least internally, unrelated to each other. The 3700 series used a modular approach with each section of the receiver constructed as an enclosed 'brick' which plugged into a plate containing the inter-unit wiring, with r.f. cabling connected via short links at the module rear end. This gave flexibility for the manufacturer and end user in that a receiver could be configured to meet particular requirements or specifications. The 'brick' approach was also used in the Cubic 3030 which I reviewed some time ago, and which resulted in some heartache when I found that one of the front-end preselector ranges was dead. In order to repair the unit I had to make up two 37-way ribbon extensions to allow me to actually work on the circuit board, and I cursed the designer!!! The RA3700 brochure tells us however that:

"All fault finding to component level can be carried out with the modules plugged in, using the receiver as a test bed. Only standard proprietary workshop test equipment is required".

Well, that's a relief. The RA3790 by contrast is constructed as horizontal printed circuit boards with none of the 'brick' enclosures of the RA3700. This gives a much lighter receiver and it's rather a shock at first when you pick up a '3790 and realise just how lightweight it is. In the case (weak pun) of the receiver I tested, the outer enclosure was much heavier than the actual receiver.

The major electrical difference between the two receiver series lies in the abandonment of traditional i.f. filtering and the adoption of d.s.p. in the RA3790 receivers to provide a wide range of receiver bandwidths, both as a standard set or programmable from the front panel. The d.s.p.

system also provides pass band tuning, notch filtering and digitally derived a.g.c. If you are in the fortunate position of being able to locate and purchase a '3700 series receiver, remember that the 3701(/2/3/4) and 3791(/2/3/4) are very different animals, even though the front panels look identical. Just to explain the last number sequence, the '1' is a single receiver with front panel controls, the '2' is a dual receiver with front panel controls, and the '3' and '4' are corresponding single and dual receivers for remote control use - in other words the front panel is a blank sheet, devoid of any user controls. On to the RA3791.

Classic Racal

The front panel is classic Racal with three l.c.d. panels along the top and a large tuning knob more or less in the middle, flanked by two keypads using the same style and size of buttons used by Racal since the RA1792 - probably because you can't improve on a good design. As I have said before, Racal provide controls that can be

used by a normal human being without the need for sharpened fingertips or 20/20 eyesight. The displays are illuminated and extremely clear and unambiguous, with each panel displaying a group of related information legends. The left hand display shows receiver frequency down to 1Hz, together with memory channel and receiver bus address. These receivers can be used as master or slave units, so a legend at the bottom of the frequency tells you if the receiver is operating as master or slave. Not having two of these beasts together I have no idea how close the phase relationship might be between multiple receivers, but when used in space or frequency diversity applications perhaps the phase cannot matter. However, in a d.f. system it would be important, so perhaps anyone out there with such knowledge can communicate it to us?

The central display panel carries a horizontal bar graph which can be switched to read a.f. output (in dBm) or r.f. input levels (in 10 dBµV steps). I checked the accuracy of the

r.f. steps during my normal testing schedule and found that the meter was spot on all the way to 70dBµV and then became 1dB adrift, shown up by the display changing from reading 80 with an applied signal of 90dB and switching to 90 with an applied signal of 91dBµV, but that could well have been within my own equipment uncertainty of measurement. Accuracy aside, I still prefer a wagging meter pointer even if that is an analogue representation of a meter such as the displays used by JRC. The display also gives an f.s.k. tuning scale when the f.s.k. option is fitted, and finally tells you what the main tuning knob is supposed to be doing, i.e. tuning the receiver, changing channels or tuning the b.f.o.

Extremely Comprehensive

The right hand display is extremely comprehensive, being concerned with showing a mass of functions selected by the four top keys on the associated keypad. These are labelled M1 to M4 and control four menu trees covering 24 functions in all. I won't list them all but believe me if you need to know what's going on inside the RA3791 then the information is all there to use. In normal use, the display shows operating mode, receiver bandwidth, a.g.c. settings, b.f.o. offset and antenna selection. Mode selection is by separate keys for each mode, so no scrolling around 'carousels' is needed. Mode selection calls up a standard receiver set-up for bandwidth, b.f.o. setting, tune rate and so on, but every parameter is user programmable so that you can have your own particular favourite operating conditions set up and ready for use. Selection of a.g.c. setting is performed with up/down keys, and once again you can change any of the a.g.c.



parameters to suit yourself and store them as defaults. Similarly, i.f. bandwidth settings are selected by up/down keys, with standard bandwidths of 2.7kHz asymmetrical for u.s.b. and l.s.b., and symmetrical filters of 300Hz, 1, 3, 6 and 12kHz for other modes. These are only the default filter bandwidths, and because of the d.s.b. system up to 100 other filter settings can be programmed and stored by use of a bandwidth menu function. Added to this are facilities for passband tuning (but only in u.s.b./l.s.b.) and a digital notch filter with variable bandwidth. For anyone contemplating buying one of these receivers you should note that later versions include an automatic 'seek and destroy' notch filter, and a handbook note says that this was implemented from Issue 7 of P90550 68k software, and Issue 6 of P90553 d.s.p. software. A further note says that the auto notch is only available if the Digital i.f./a.f. hardware option (DSP3) is fitted to the receiver. Don't ask me to elaborate on this - I am simply telling you what is in the handbook for your information. Once again I have to state my slight irritation that facilities like this have to be accessed through a menu, but that's only because I am treating the RA3791 as a hobby receiver and not as a professional user's radio where the sub-functions may well not be needed.

From the same keypad the user can select an all mode squelch system but there is also a 'COR' (carrier operated relay) function which provides voltage free contacts for external device switching. Finally, the 'MAN' button provides a

fully manual gain control or a 'pedestal' combined a.g.c./manual gain control which is the favoured method for listening to strong s.s.b. speech and suppressing background noise. I remember writing about this some years ago (February '96 and January '01 issues), so if you want further explanation do dig out those copies of *Short Wave Magazine*. The left hand keypad is concerned with frequency and channel entry and has the familiar 'telephone' numerical layout, together with keys for channel, scan and store for the 100 memory channels available, each containing full receiver settings. A recall key instantly restores the last receiver operating conditions to the front panel, so if you wander off into the menus and need to get back, a single press of 'RCL' will get you there. Tuning rate is selectable by +/- keys, as is the b.f.o. offset frequency, whilst another +/- key selects or changes the scan or sweep direction. Full control is given over memory channel scanning, and a frequency sweep function is comprehensively programmable with start/stop frequencies, dwell time and frequency sweep increments. It's hard to imagine any facility which has not been

provided by the RA3791, but for a complex receiver the panel layout and general handling are really simple and clear to use.

American Weighting

The main tuning control is not weighted as well as the RA1792 and can feel a bit 'dead' in the American style, but the tuning rates are selectable from a default list ranging from 1Hz to 1kHz, with the option of choosing the number of steps per revolution of the tuning knob and a further selectable option of having variable rate tuning or programmable selection from the keypad of any particular tuning increments, such as 9kHz for l.w. and m.w. listening. Once again, every possibility seems to have been covered by Racal, and I could go on and on about these but it would take up too much space and almost certainly become boring. So - on to a bit of internal detail and measurements.

Circuit architecture at the front-end is typical of the Racal receivers developed from the landmark RA1770 series, with substantial front-end overload protection together with switchable attenuator and r.f. amplifier before the input signals are

fed to the first mixer. I noted that the RA3700 series brochure contains a mention of a sub-octave front-end filter module available as an option, but could find no reference to a similar unit for the RA3791. The first mixer is a typical 'bomb-proof' high level switching type employing four BSV81 devices with push pull oscillator drive from a synthesiser covering 40.032 to 70.032MHz giving a receiver tuning range from 0 to 30MHz with a first i.f. of 40.032MHz. Although this means that the receiver can tune down to zero frequency, the specification given by Racal states a range from 15kHz to 30MHz - and it really does work well at all frequencies.

The synthesiser is very clean, and comparison of **Fig. 1** with the results shown in my review of the RA1772 (*SWM* January '02 issue **Fig. 3** and **Fig. 4**) clearly shows the advances made by Racal in this area. Although still not as good as a crystal oscillator within 20kHz of the carrier frequency, the noise drops off to a very low level further away, and the final noise floor is the equal of a crystal. The cleanliness shows up in the reciprocal mixing measurements later. I saw that the synthesiser design was patent protected by Racal so probably there is something special about it. The fact that the synthesiser is a single loop design which nevertheless produces 1Hz tuning steps tells the knowledgeable that it's quite clever.

Output from the first mixer at 40.032MHz is fed through a 12kHz wide crystal filter followed by an a.g.c. controlled i.f. amplifiers, a second crystal filter at 40.032MHz and a second a.g.c. controlled amplifier



Racal's DSP based RA3791 continued

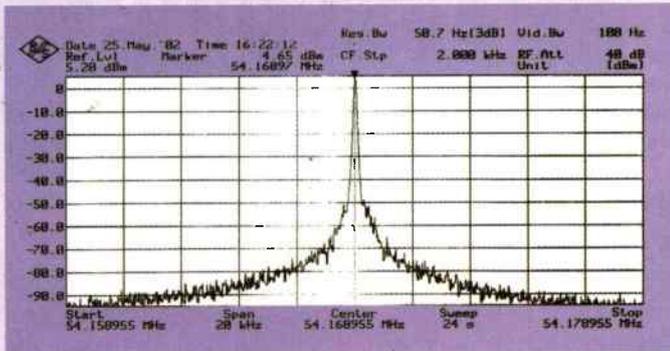


Fig. 1: RA3791 first oscillator purity.

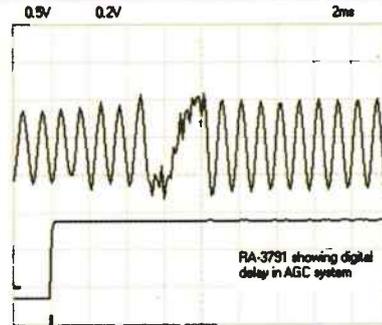


Fig. 2: A 6ms delay between the start of the r.f. burst and the application of a.g.c.

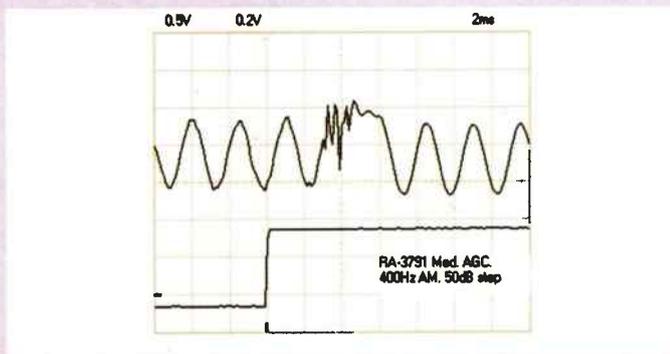


Fig. 3: The same effect occurs on an a.m. signal.

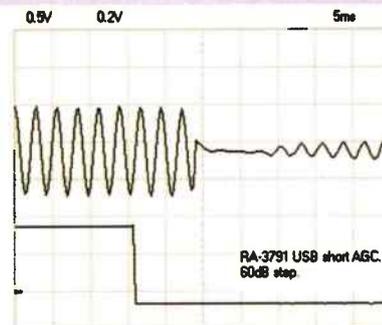


Fig. 4: After the end of the burst the a.f. output from the RA3791 decays almost 10ms after the r.f. burst ceased.

to the second mixer where the i.f. is converted down to 32kHz before feeding the d.s.p. system. As I have said before in these reviews, once the signal gets into the hands of the algorithm writers I have to bow out and acknowledge that I am lost. However, my ears are still as good as ever and I think I know when a receiver is producing a well controlled, pleasant to listen to audio output. Digital Signal Processing can be extremely good at the task of demodulating a wide variety of signals, but it has proved in the past to be equally bad, with strange 'crunching' noises apparent in adjacent channels, very particularly in the a.m. broadcast bands. Time to do some measuring and listening.

Remarkably Flat

As one might expect, the RA3791 more than meets its published specification. Sensitivity with the r.f. amplifier switched on was remarkably flat all across the

tuning range of the receiver, with results of -123dBm for 12dB SINAD in a 2.7kHz bandwidth on s.s.b., with a

figure of -114dBm in a.m. with 60% modulation at 1kHz in a 6kHz bandwidth. Noise floor of the receiver was -134dBm with the r.f. amplifier on, and -127dBm with the amplifier switched off. Measured third order dynamic range was in excess of 100dB with or without the amplifier, and the third order intercept point was greater than +30dBm. Second order dynamic range using 6.5 and 7MHz input signals, resolving the product at 13.5MHz was also greater than 100dB with

a second order intercept point of +74dBm (amplifier on) and +84dBm (amplifier off). The reciprocal mixing performance

the RA3791 was equal to or better than the TS-900, so the '3791 is quite a performer in this area, although checking the figures for the Collins 515-1 confirmed the superiority of a crystal oscillator when within 20kHz of a signal.

The a.g.c. performance was checked using my r.f. burst technique and produced the by now expected results for receivers in which the a.g.c. is digitally derived. A 6ms delay between the start of the r.f. burst at the antenna and the application of a.g.c. to the receiver, resulting in an uncontrolled 'squawk' in the audio output can be seen in Fig. 2. The actual level control is excellent, because the input change is 60dB, with the a.f. output changing hardly at all. The same effect occurs on an a.m. signal as can be seen in Fig. 3, but at the end of the burst the audio output from the receiver decays almost 10ms after the r.f. burst has ended, as seen in Fig. 4. The a.g.c. recovery is very smooth and overall the RA3791 performs very well indeed,



was good, with the following results:

Spacing (kHz)	dBc/Hz
5	-120
10	-130
20	-140
50	-151
100	-157

I re-measured my TS-900 at the same time and compared the results. At 5kHz spacing the TS-900 was 16dBc/Hz quieter than the RA3791; at 20kHz it was 7dB better, but at spacings wider than 20kHz

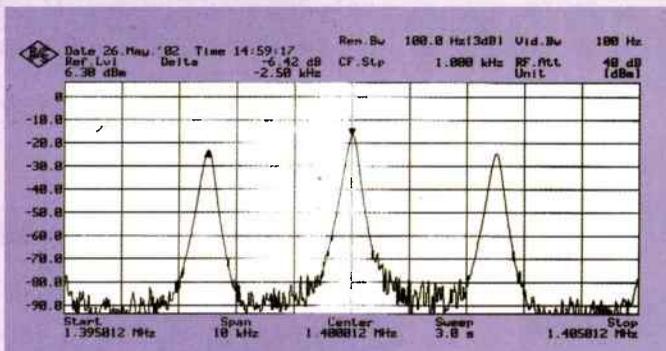


Fig. 5: RA3791 i.f. output with r.f. input at 909kHz.

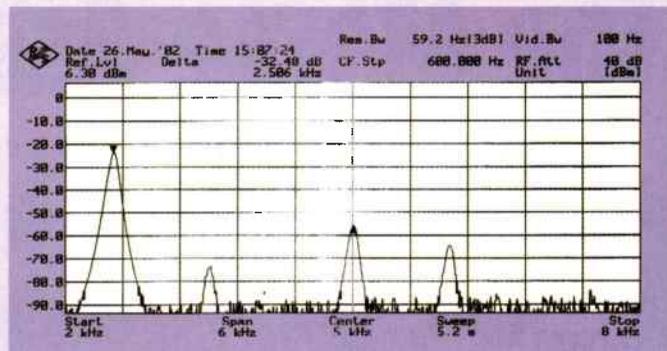


Fig. 6: Audio output with RA3791 tuned to 909kHz.

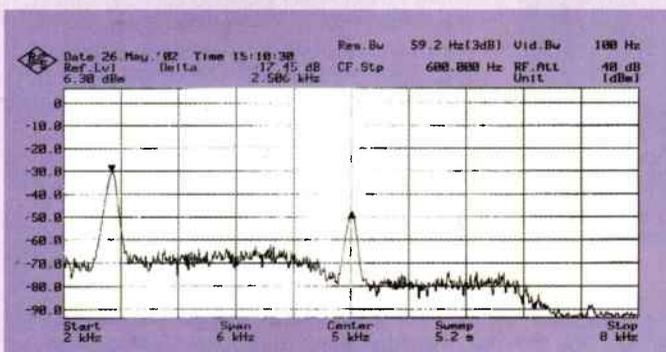


Fig. 7: Audio output with RA3791 tuned to 922kHz.

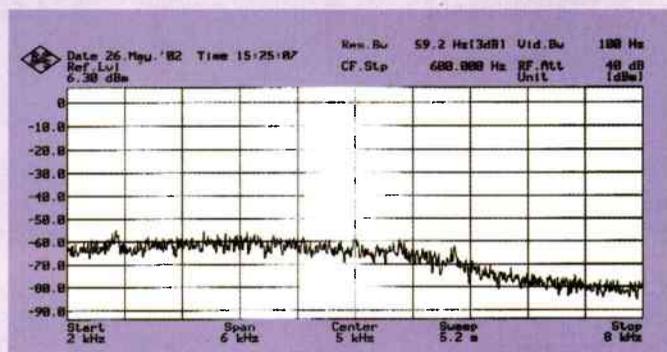


Fig. 8: Audio output with AR7030 tuned to 922kHz.

with the 'squawk' not being too intrusive. However, one other effect of d.s.p. is the aforementioned adjacent channel 'crunching' so I headed for 909kHz and tuned carefully to each side of the Radio Five Live station to see if I could hear the continental stations on 900 and 918kHz. Sadly the 'crunching' effect was much in evidence and extended to 922kHz above the signal and to 896kHz below, a spread of 26kHz.

I have mentioned this effect several times in the past, but this time I decided to try to simulate the condition and see if I could generate a test configuration, which would allow me to compare other receivers and show the results to you. I used an H-P 8657A signal generator and modulated it in a.m. to a depth of 80%, since it was on heavy modulation peaks that I could hear the 'crunching'. As the RA3791 has a 1.4MHz output port derived by a D/A conversion after the d.s.p. I first looked at what was coming out before the

demodulation process. The plot **Fig. 5** shows the 909kHz carrier with the two sidebands at 2.5kHz each side of it. Then to the audio output as shown in **Fig. 6** where you can see the 2.5kHz audio and some second harmonic distortion at 5kHz together with some nasty little spurs at non-

related frequencies. I then tuned the RA3791 to 922kHz and as you can see in **Fig. 7**, there were still high levels of audio at 2.5 and 5kHz even though the receiver was tuned 13kHz off channel. Just to hammer home the point about d.s.p. effects, I connected an AOR AR7030 to

the same signal and plotted its audio output. It is clear from **Fig. 8** that there is only the slightest trace of audio at 2.5kHz and in real use there is no sign of the 909kHz signal when the AR7030 is tuned to 922kHz. Therefore - the 'monkey chatter' effect does exist and now I can demonstrate its presence and level. With more time to spare I would like to see if this effect only occurs with an a.m. signal, but I was being pressed to return the RA3791 to its owner so couldn't carry out any more work at this time - but I will in the future. Watch this space and in the meantime take a second look at **Fig. 7** and **Fig. 8** to see the difference between a receiver using d.s.p. and a receiver using 'conventional' demodulation. One final thing that came out of my tests was that the effects are worse with higher modulation frequencies, so I need to chase that particular bunny down its burrow as well.

Overall Conclusions

The RA3791 is a terrific receiver and I envy anyone who has one in his or her possession. It's light in weight but heavy on performance and would make a logical step up from the RA1792 for those who can afford the change. There is hardly a single feature, which has not been provided for the user although one would have to watch the options fitted when purchasing. Needless to say this receiver takes repair out of the hands of the average hobby owner because so much of it involves firmware analysis and the individual chips used are probably very specific to Racal and virtually unavailable at low cost. The built-in test equipment (BITE) facilities which I haven't mentioned in the review are extremely comprehensive, but what does one do when the BITE says that the receiver has failed one of the multiple tests - cry? In view of my comments about d.s.p., I would like to have the opportunity to compare an RA3701 and check how the conventional filtering handles the 900/909/918kHz test. Perhaps one day. For the time being I wish you all happy listening, whether that be using a 1952 Zenith Transoceanic or an RA3791.

SWM

The Morse Assistant



The completed prototype has been working reliably for many months.

A Morse Reader Program and PC Interface Part 2

Graham Sutton G4EVW concludes the Morse reading constructional project for those with an urge to build. This project works in conjunction with a PC. The required software is available from *SWM*, by post or from our web site. This project is quite complex and is therefore aimed a fairly experienced constructor.

Character Decoding

The program avoids using a dit-dah buffer (and the consequent need to wait until the inter-character space occurs before decoding the whole character), by using a numerical indexing method. As each element is received, it is identified as a Dit or a Dah.

A character index is then updated by first adding its previous contents to itself. Then, if the element is a Dah, the index is further incremented by one. A Dit adds zero to the total.

In Basic code this is: (noting that true = -1)

Char = Char + Char - (Dah)

where Dah = - 1 (If Dah is True)

or Dah = 0 (If Dah is False)

As soon as the last element has been processed, the character index will be pointing to the position of the required character in a defined string of all possible characters.

The first part of this string is as follows:

x\$ = " etianmsur ... etc."

note the space after the opening apostrophe.

Consider the character 'a' (Dit-Dah). The character index is initially set to 1. The first Dit causes the index to be set to (1+1+0) = 2. The dah updates the index to (2+2+1) = 5. So the letter 'a' is positioned as the 5th character in the working character string.

The letter 'e' (Dit), is simply (1+1+0) = 2. Therefore, 'e' is in the second position of the string.

In this way, any character can be quickly located using the MID\$ function of Basic, from within the working character string.

The 'end of work' sign (●●● - ● -) is represented in the character string by the character '# '.

Sound

The normal Basic sound facilities are not quick enough to follow fast Morse, so it was necessary to program the computer Timer chip directly.

The timer clock rate is 1.19318MHz. Channel 2 of the timer is used. A count is loaded into the Channel 2 register calculated from:

Count = (1,193,180 / frequency)

The timer port 43H is readied to accept the count by the command :

OUT &H43, &HB6

The low order byte of port 42H is then set to:

Count MOD 256

and the high order byte is set to:

Count / 256

A tone of 666.666Hz was used to make these values simple, so that;

(Count = 1193180 / 666.666 = 1792. Then low order byte = 1792 MOD 256 = 0, and the high order byte = 1792 / 256 = 7).

The timer counter is then set by:

OUT &H42, &H0 ' load low order byte
OUT &H42, &H7 ' load high order byte

The count is decremented at each cycle until it reaches zero; then a pulse is sent to the sound circuitry and the timer starts counting down again. The result is that the timer sends out a series of pulses which activate the speaker at the chosen frequency.

The tone can be rapidly turned on and off by setting the low order bits 0 and 1 of port 61H.

Thus:

op = INP(&H61)
reads the current status of port 61H.
onp = op OR &H3
sets bits 0 and 1 to turn sound on.
ofp = op AND &HFC
sets the bits to turn the sound off.

A command **OUT &H61, onp** will start the tone, and **OUT &H61, ofp** will stop it again.

Note that **INP** and **OUT** commands are not provided in the 'Visual' programming languages for Windows, so the routines have been written in assembler, and incorporated in the Basic and Delphi programs.

The Algorithm

The program logic is outlined in **Fig. 2.8**. The *QuickBasic* and *Delphi* source code, and compiled versions for *DOS*, *Windows 3.11*, and *Windows 95/98* are included with the program.

It is possible to run the source code from *QBasic* (as supplied free with *DOS 6* and above) at reduced speed.

Just recently I've also written a version in *IBasic* which doesn't mess with *Windows* installations.

If you have not built the interface unit, you can check out the program by using a Morse key and 9V battery connected via a 2kΩ resistor to the computer serial port - see **Fig. 2.8**.

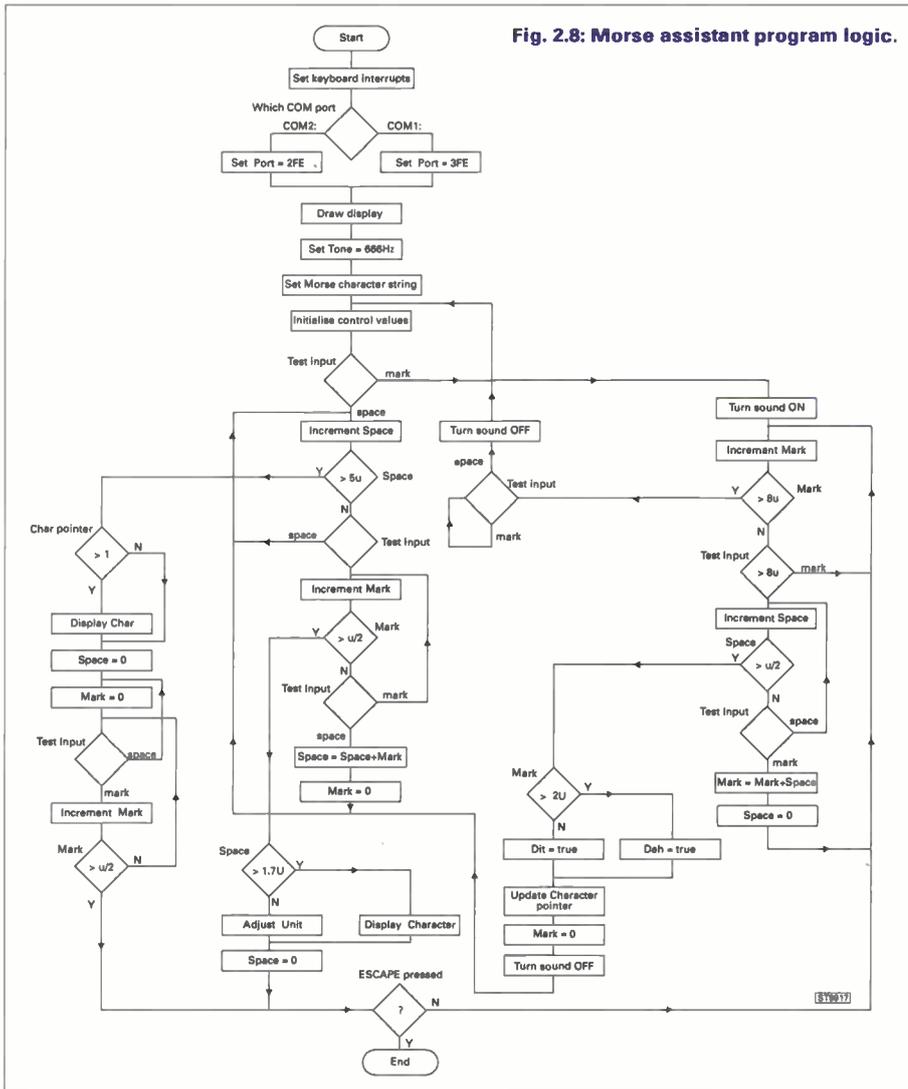


Fig. 2.8: Morse assistant program logic.

mark - space stabilising setting. Adjust the two controls in combination, to give stable results for your machine.

In Use

Like most useful listening accessories, there is a definite knack to using the Morse Assistant. Having spent some time decoding amateur band Morse with the assistant, *SWM* Editor Kevin Nice has some tips on adjusting the controls and decoding Morse successfully.

"I started off blind with no instructions on setting up the Morse Assistant. First thing to do was connect the mains to the interface box, the audio from my receiver and the data lead from the MA to my PC's serial port.

After tuning around for a suitable signal I inserted the quarter inch jack plug into the headphones socket of my receiver, this mutes the receiver's internal speaker, the audio was clearly heard coming from the Morse Assistant's speaker instead.

If I build one myself, I'll definitely include a 'phones socket. Once I'd loaded the *Morse Assistant* software on my PC, which was simply a case of copying the files to a suitable folder, I ran the Delphi version by double clicking on the *CW* icon. The program loads and requests that you specify either COM1: or COM2:, once the selection is made a 'decode' button appears, when pressed you are transferred to the decode window.

This is the time to twiddle to produce a stream of characters appearing in the lower text box. As I said, I started the exercise with no instructions on tuning and adjusting. I tried various different setting on the interface box, quite quickly the correct method became apparent. The best results are achieved by using the audio filter chain. These have quite a narrow bandwidth so receiver tuning is quite critical. The Morse Assistant produces a sidetone which is derived from the digital output that goes to the computer for processing. The sidetone is mixed with the live audio coming from the Morse Assistant's speaker when the front panel 'Audio' Switch is on. When tuned correctly the sidetone can be identified by its slightly raspy note."

The program attempts to evaluate the average speed of the Morse being received. If the speed changes by a large amount, the automatic speed adjustment may not be able to lock on to the code again. If this happens in the



Fig. 2.9: The Port selection screen.

DOS version, pressing the '+' key or '-' key on the keyboard will adjust the space unit value, until code lock is regained.

In the *Windows* version of the program, speed-adjustments are provided for the number of COM port reads (the Port Read factor), and the 'Dit' timing units (the Space Unit Mid value). These should provide adequate range to achieve accurate copy on a wide range of machine speeds.

An estimated 'Words per Minute' value is displayed along with the current number of 'reads' per inter-element space value corresponding to the 'Dit' timing variable 'u'.

The software exhibits a capture range for code at a given speed, where the built-in adjustment of the space count 'u' stabilises for good copy. If the Morse speed is outside this range, a sequence of 'e' or 't' characters appear.



Fig. 2.10: Decoding amateur Morse.

It is then necessary to use the speed adjustment controls to move the program into its 'capture' range.

Adjust the Port Read Factor, and the Space Units Mid Value, to obtain the most reliable copy for your computer.

The Read Factor acts like an anti contact-bounce or noise filter, and the Units setting as a

Ommitted last month

The serial port connections are as follows:

	9-pin	25-pin
Clear to Send (CTS)	8	5
Signal Ground	5	7

To obtain the software for the Morse Assistant you can either download it from the *SWM* website at www.pwpublishing.ltd.uk/swm/downloads/morse.html or by sending a £1 coin to **Morse Assistant, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW**. In return we will send you a CD containing all the versions of the program. **SWM**



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 • 2000 Memories • Optional digital voice recorder
 • Large digital display • Super HF performance
 • Ultra sensitive • Fully programmable

YAESU VR-500



This lovely little scanner from Yaesu offers superb performance.
 • 100kHz - 1300MHz
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 • 100 Skip channels
 • 10 Search bands
 • 8 Character alphanumeric display
 • Band scope Priority monitoring
 • PC programmable
 • Smart search feature
 • Alpha numeric recall
 • Size 58 x 95 x 24mm

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30kHz - 60MHz



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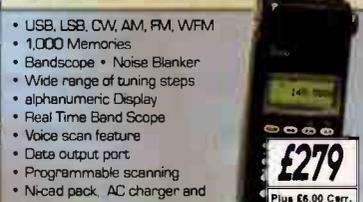
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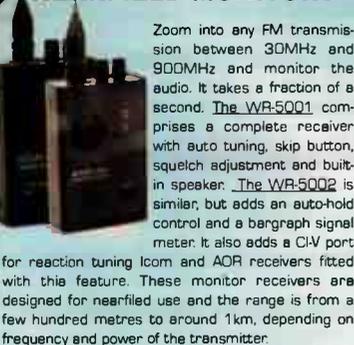


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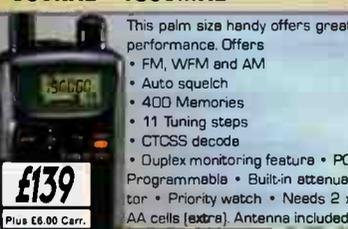


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DRM Revealed:

Conclusion

Last month Don Messer of IBB and Peter Jackson of Merlin Communications International Ltd. began an in-depth presentation of the technical progress of a Standardised Digital Radio Broadcasting System that the authors say will revolutionise the current a.m. broadcasting bands. This month we conclude this enlightening feature.

Single Frequency Network and Mobile Testing

Testing has also been done, and is continuing, on the single frequency network and mobile reception properties of the DRM system. This is taking place in both Germany and the United Kingdom.

United Kingdom

A separate set of tests using a short wave SFN is being carried out in the UK. These tests use a frequency in the 26MHz broadcast band and a comparatively low power of around 10W digital power per transmitter. The transmitters are based at the apexes of a triangle with approximately 10km sides. A small van has been equipped with both Fraunhofer IIS-A and BBC DRM receivers, together with a GPS receiver allowing positional information to be logged.

The digital signal is generated in a single Thales DRM exciter unit, based at one of the three transmitter sites chosen for the SFN (see Fig. 2.3 for schematic). This signal is directly transmitted using a Yaesu FT-840 transceiver, which receives a reference frequency from an external HP signal generator, in turn locked to a GPS reference source. The same DRM signal is also transmitted from the site using a second Yaesu FT-840 on a frequency in the 18MHz SW band. This transmission is received at the other two sites and re-transmitted, using additional Yaesu transceivers, on the same frequency of 26MHz as is being transmitted from the main site. Because a GPS reference is used at all three sites the three transmissions are synchronous in frequency, although there will be a small timing difference due to the signal transit time between the main site and sites two and

three. However, as the distance is small (c10km) this represents only a fraction of the OFDM signal guard interval and does not significantly affect the performance of the SFN.

The propagation at 26MHz is largely line of site, rather than true ground wave, and so behaviour is

of being able to use the 20kHz DRM mode to provide a high quality stereo service.

Initial testing, using just the main site, shows that the service reliability depends mainly on the constellation chosen (64 or 16QAM) and the protection level. The length of interleaving chosen

around the route with the single transmitter powered. The primary difference in the coverage obtained is due to the choice of constellation for the main service channel (MSC) data. With 16QAM in use it can be seen that coverage is improved over that of 64QAM, mainly due to the lower

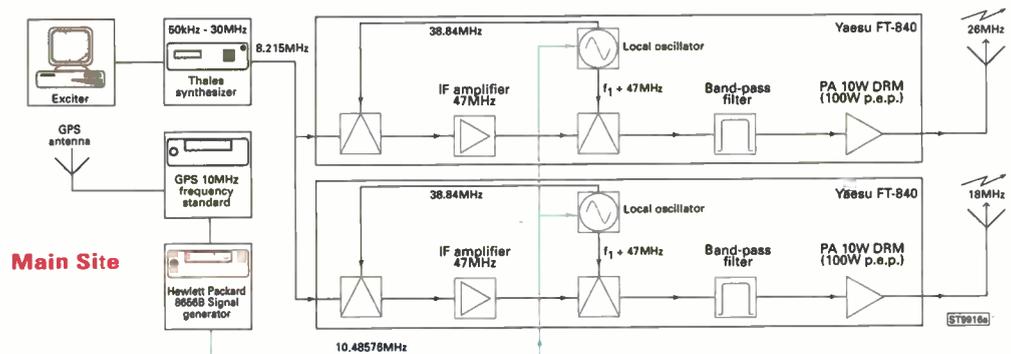
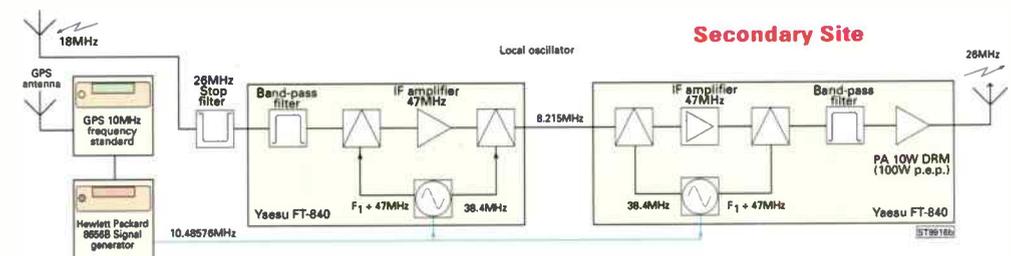


Fig. 2.3: Schematic for the low power short wave SFN. The HP generator is used to replace the internal Yaesu crystal oscillator, due to it not being sufficiently stable to operate three transmitters as an SFN.



more like that of an f.m. signal. The advantage of using the 26MHz broadcast band for testing in the UK is that it is largely unused within Europe, due to its unsuitability for long distance propagation during most of the 11 year sun spot cycle, particularly in the higher latitudes. However, relatively low cost equipment is available to transmit in this band (such as the Yaesu FT-840 transceivers being used) and therefore it is believed this could make such a system viable for low cost, low power community type stations. Also, because the band is largely empty of services in Europe, there is the possibility

so far seems to be less important, although the routes surveyed so far have no significant bridges or tunnels, which might well be relevant. Further survey work during 2002 will determine whether there is the expected improvement to be gained from the addition of the second and third transmitters to form the three transmitter SFN.

The map, Fig. 2.4, shows the route taken in the initial mobile testing of the 26MHz transmissions. The three transmitter sites are marked as red points. The additional plots (Fig. 2.5 and Fig. 2.6) show the reception results of driving

SNR that is required to resolve the transmission.

Moving from a Standard to a Broadcasting Service

An important milestone for DRM was the creation of a standard for the 'signal on the air' during September 2001. In addition, regulatory efforts are being made within the ITU that are paving the way for permission to broadcast digital signals in all three frequency band regions allocated to the broadcasting service - short wave, medium wave and long wave.

Therefore, the focus of activity

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SKY High special

In The Beginning

In this year's 'Sky High' Special, Peter Bond starts off in nostalgia mode, before moving onto the world of u.h.f. discrete frequencies and finishing up with a look at airband radios.

For this section of the airband special, the Editor has kindly let me go into nostalgia mode to take a brief look back at how our interests in aviation started and to take a look at a couple of notable air events of the past. He has also given me the opportunity to include a Photo Special to illustrate some of those past events.

The intense British interest in aviation seems to have almost started with the invention of the aeroplane. The use of aircraft during the First World War brought their importance to the forefront and consequently the nineteen twenties saw a manufacturing explosion in the aviation industry in both the civil and military arenas. It was not long before the first air shows appeared in the twenties and thousands, possibly tens of

thousands of people would flock to see spectacular displays such as the Hendon Air Pageants.

The actual hobby of aircraft spotting, I must assume, evolved from the activities of the Royal Observer Corps during the

those that appeared in the Observers series of books which were first published in the early fifties.

For those of us of a certain age, the first aircraft book many of us would have owned was the

Observers Book of Aircraft, I still have all my copies given to me by my Dad, starting with 1959, (I was five). How times have changed when you look at some of the shadowy, grainy, slightly out of focus pictures, covertly taken of Russian built aircraft in these books. Nowadays, you can't go to any major airshow

without falling over a variety of Migs or Sukhois!

Commemorative Airshows

It was not long after the Second World War that commemorative airshows started to appear and in

particular the September Battle of Britain shows. There was a time that these Battle of Britain Shows were held at a significant number of airfields all around the country, but this has sadly dwindled over the years and as far as I am aware, there is now only one left annually at Leuchars.

As I recollect, the first air show that I ever attended was at Biggin Hill in 1960 and my one distinct memory of that day is of three operational Mosquitos that were in the flying display, (that dates me). On start up, one of the Mosquitos had a brief engine fire, which caused a minor panic on the ramp, sadly I was too young to have a camera in those days.

Having been an avid collector of books and magazines connected with aviation, I still have the programmes from some of those early airshows. Illustrated with this article is part of the flying programme from the 1963 and 1964 Biggin Hill BOB flying



Argentinean AF IA.58 Pucara demonstrating at Farnborough in 1978. The RAF were to fly a couple of these aircraft a few years later!

Second World War. With Radar still very much in its infancy, the work of the ROC units positioned around the coast of the UK to identify and count inbound enemy aircraft was very important. The aircraft ID cards used were three-dimensional silhouettes similar to

displays, the list of aircraft reads like a modern museum inventory, (unfortunately).

From the 1963 flying display listing you will see the 'Firebirds', who were the RAF aerobatic team from 56 Squadron at Wattisham. This was perhaps unbelievably an aerobatic team containing nine, (yes nine), Lightning F.1As! I believe that they only flew for one season as it was decided that the Lightning, (not surprisingly), was unsuitable for formation aerobatics.

Their opening manoeuvre was to have seven aircraft perform a slow fly-by in arrow formation, they were throttled right back with the undercarriage down, (known by some as 'Dangling the Dunlops'). Just after they had passed, the two remaining Lightnings ran in from behind the unsuspecting crowd at full tilt with afterburners blazing, they then pulled up into a steep climb through about 10,000 feet, directly above the airfield. The noise and the shock wave from the afterburners was incredible, kids were screaming, people were fainting and in some cases a change of underwear was almost needed - they were the days! Such manoeuvres at air shows are of course banned these days.

Exercises

Another favourite from the seventies and eighties was a trip around the airfields during the memorable

exercises such as Priory or Elder Forest, unfortunately exercises of this size will almost certainly not be seen again. It's hard to believe that exercises such as Priory could be held up to three times a year, these days we are lucky to see three exercises of any sort in a year. Unfortunately, our involvement in the various conflicts of recent years has meant that a number of planned exercises in the UK have been postponed or cancelled.

Exercise Priory was a test of the nation's air defences involving almost all of the RAF's Interceptor bases with the attackers played by the USAF and other European armys, many of which were based

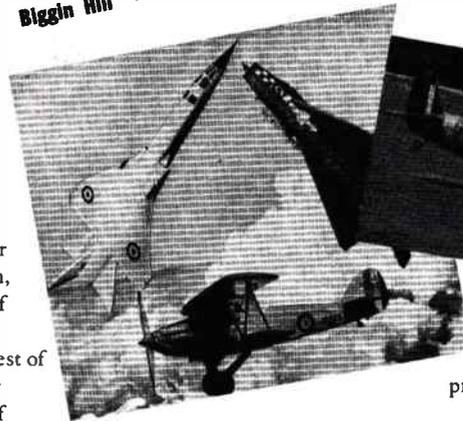
in the UK for the exercise. For many enthusiasts it became a two day mad dash around the airfields of East Anglia and Lincolnshire to try and see as many of the participants as possible. Being primarily a photographer, I learnt very early in the game that it was far better to stay put at an airfield for long periods, by this method you would not only get to photograph the based and visiting aircraft, but also the attackers. (This would exclude the French Air Force Mirage 4s who always seemed to miss the airfield by a small margin!). Oh to have had a radio in those days!

Another great Exercise, or more correctly a competition, that was held on a number of occasions was Excalibur at Lakenheath. Possibly the finest of these competitions, certainly from a photographic point of view, was Excalibur VII, held in July 1990, which took place during glorious 80°F weather. This was a competition held

movements. They were great days, it seems like a long time ago and yet it was a mere twelve years ago! It is sad to think that just two of these airfields still host USAF Fighter

the days when you could drive vehicles onto the grass area under the approach to Runway 24, when we arrived at 0730 there was

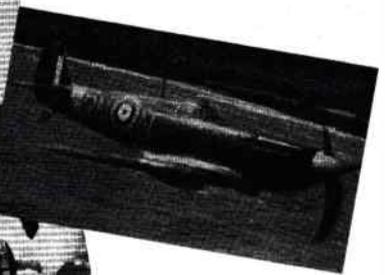
PROGRAMME
ROYAL AIR FORCE
Biggin Hill - 19th September 1964



Squadrons and many are now closed!

News of the Excalibur competition was hardly a secret, if

PROGRAMME
ROYAL AIR FORCE
Biggin Hill - 14th September 1963



already around 100 vehicles present.

By 0900 people were fighting over what grass area was left and there must have been over 500 cars and around 1200 aviation enthusiasts present. The base

security pulled up by the fence on several occasions, but did not know what to make of it, I think they thought they had been invaded! Exercises and Deployments always attracted crowd of spotters, but I think this

Rare Illushin IL-96 on approach to the Paris Air Show in 1993.



Russian TU-95MS Bear-H makes a flypast before landing at IAT 93.



between the various United States Air Force Europe Squadrons and attracted contestants from all the units and a variety of aircraft types. For the 1990 competition participants included A-10As from Alconbury and Woodbridge, F-4Gs and RF-4s from Spangdahlem and Zweibrücken, F-15Cs from Bitburg and Soesterburg, F-16Cs from Hahn, Ramstein and Spangdahlem and F-111s from Lakenheath and Upper Heyford.

In total over 60 aircraft were involved, including visiting aircraft from most of units plus some VIP and transport

fact the USAF were to open the base for two hours for a photo call the morning after the event, so with fine weather a good turnout from the enthusiasts was expected. We had camped overnight in Mildenhall and were consequently up early to get to Lakenheath to book a good spot. Now these were

had to be the single largest turnout for any one event!

As I said at the beginning, this was only a brief look back, but is primarily an opportunity to present a series of photographs from some of the great aviation events of the last three decades.

SWM

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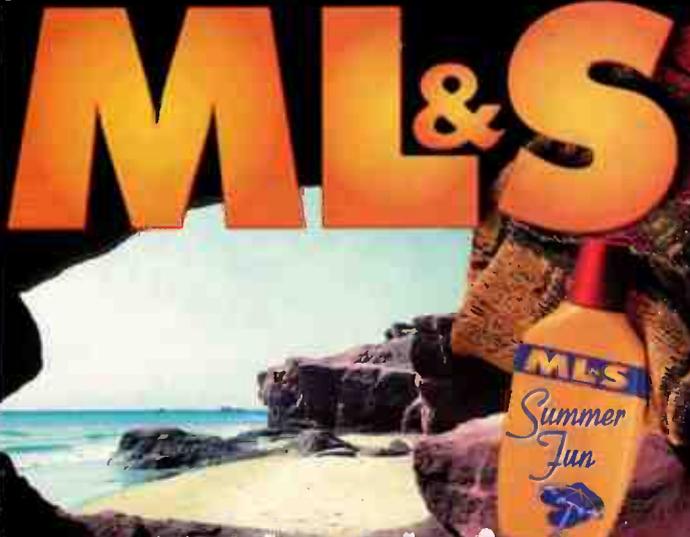
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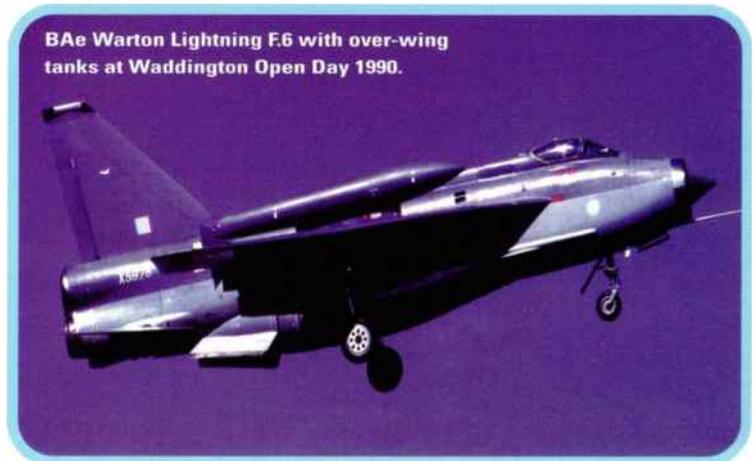
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Discrete And Unpublished?



BAe Warton Lightning F.6 with over-wing tanks at Waddington Open Day 1990.

It has been several years since I last took a general look at the world of u.h.f. discrete frequencies. So to complement this month's free Airband Data Card which lists the primary ATC frequencies, I thought this 'Sky High' Special would be the ideal opportunity for a review. This will act as a reminder to our airband regulars and an introduction to those new to the hobby in the past few years.

Despite the increased security of the past year after September 11th, with the demise of the Iron Curtain we have generally seen a moderate reduction of security with regards to aircraft enthusiasts at UK airfields over the past 20 years. Within the airband world, the restrictions and changes of the past are no longer so prevalent.

The big change around of both published and discreet u.h.f. frequencies which used to happen every four or five years now appears to be a thing of the past with the last of those such changes being 10 years ago in May 1992. Changes to the Tactical Air Designators, (TADS), which used to occur on a regular basis are now a much more occasional event.

Tactical Air Designators (TADS)

Just the word TADS invokes all sorts of passions amongst military airband listeners. In the seventies, the cold war was still on-going and documents such as TAD lists were classed as top secret and were kept in a locked safe and were signed in

and out by aircrew. During the mid-late eighties a small number of lists appeared, usually gleaned from official sources and were treated by enthusiasts like gold dust and were rarely shared except with close and trusted friends. Consequently, for those of us who were around in that era, the occasional appearance of TAD lists in the modern day still produces a small amount of paranoia.

So what is the situation today. As far as I am aware, TAD lists have been declassified to the point that aircrews on the odd occasion have been persuaded to part with them. (I don't recommend that you all go asking for them). The Internet has seen a few lists posted which were mainly out-of-date and news groups cautiously report small groups of TADS/Frequencies.

Books and magazines have regularly avoided the publication of complete lists with both frequency and TAD numbers, but just the frequencies associated with the TADS are published in books such as *Airwaves 2002*. This seems to be an accepted practice and is a good start for anyone interested in this sort of monitoring.

If someone were to publish a full listing, it is likely that it would be ignored by those in power, but what many enthusiasts fear is that it would provoke a change in frequencies and we could be back to square one. As one of the old school, perhaps I am still paranoid, but I would still rather keep the *Status Quo!* Time will tell.

What Are TADS?

Primarily, the TADS are operated under the umbrella of the UK air defence system UK ASACS, Air Surveillance and Control System, (formally UKADGE). This system is split into two primary Control and Reporting Centres at Neatishead in the South and Buchan in the North, there is a standby Centre at Boulmer which is also the Fighter Control School. The number of Reporting Posts has been reduced in recent years to Benbecula and Saxa Vord in the North and Portreath and Staxton Wold in the South, whilst RAF Valley operates some Fighter Control.

There are 148 v.h.f./u.h.f. Primary Tactical Air Designator Channels allocated within the UK, of these usually about 140-145 are in use at any one time, with the others kept as spares. The idea is that a TAD number can be passed to an aircraft rather than the frequency being spoken in the clear and so they can pass undetected to the new tactical frequency, which is fine if no-one knows the tie-up!

The TADS encompass many of the activities within military air operations and Air Defence Radar such as Air Refuelling, Fighter Control, Air to Air, Ground Controlled Interception, etc. The first 18 designators TAD 001-018, are used for NATO ATC and other Common frequencies, Distress and Search and Rescue.

A good starting point for anyone wanting some interesting

listening is TAD 014, 364.2 the NATO MAGIC AWACS ICF, (Initial Contact Frequency). The remaining frequencies TAD 019-148 are mainly shared between the two Control Centres and the other activities detailed above.

I have checked my own notes and my *SWM* reports for the first six months of 2002 and the following is a list of the Air Defence Radar TAD frequencies that have been reported as active during that period. This is only a guide line to the recently active frequencies and is by no means a complete listing, but it will give the listener a good starting point to enter the world of listening to UK Air Defence Radar, (ADR).

Buchan/North

240.3, 244.325, 250.125, 252.4, 258.95, 268.6, 270.025, 276.175, 279.225, 281.1, 282.2, 283.65, 285.0, 299.5, 336.2, 340.9, 355.725, 362.475, 367.325 and 373.55MHz.

Neatishead/South

241.275, 242.275, 251.75, 252.0, 260.15, 265.9, 267.475, 275.75, 279.725, 284.975, 311.5, 314.025, 317.55, 357.7, 363.675, 369.125, 373.1, 378.675, 389.875 and 399.1MHz.

Also worthy of note is the TAD 500 range, these are noted regularly up to TAD 516, but some reports indicate that they go up to at least TAD 521. They are used mainly by NATO AWACS, callsign 'MAGIC',

for both voice communications and also Alligator Playground LINK-11 data transmissions and can be heard in use on many occasions, but especially during exercises, etc.

Royal Navy Fighter Control can also be heard amongst this TAD range. Frequencies in this TAD 500 range, heard so far this year have included 248.7, 256.45, 263.45, 277.4, 300.3, 307.6, 359.7, 364.1, 378.1, 386.2 and 397.75MHz. I will take a look at some of the other TAD ranges in a future 'Sky High' column.

Air Refuelling

The UK has 14 Primary Air Refuelling Areas around the UK which are numbered in a clockwise direction, starting with AARA 1 over Scotland. AARA 2 to 9 are over the North Sea, AARA 10 over the Southwest of England and AARA 11 and 12 North off the Cornish coast at the entrance to the Bristol Channel. AARA 13 is between the Isle of Man and the UK mainland and the final area AARA 14 is once again over Scotland.

There was a time when all the areas appeared to have frequencies allocated with a couple of common standby frequencies, but that no longer seems true, (unless you know differently).

According to information sent to me over the past year, plus information from Internet newsgroups, it appears that some of these frequencies are hardly ever noted, whilst others are heard fairly regularly. The primary AARA frequencies are/were as follows with comments included to indicate activity noted in the past year. As ever, your comments would be welcome.

MHz	Comments
258.725	Noted once in AARA 12
290.975	No reports
293.525	Noted once in Scottish airspace
296.4	No reports
297.75	Reported in use in European areas
299.6	NATO Common noted regularly
308.0	NATO Common - mainly Dutch areas
312.15	Many reports - mainly USAF Aircraft in AARA 7
315.825	Two reports - one in AARA 8 - One off Scotland
315.925	Two reports in AARA 13
316.35	No reports
340.7	No reports
340.75	Two reports one in AARA 10

There are also six primary frequencies used for Air Refuelling by the RAF which are all allocated

TAD numbers under the UK ASACS network. They are

MHz	Channel	TAD
300.1	Ch 1	TAD 041
259.675	Ch 2	TAD 091
296.825	Ch 3	TAD 057
380.975	Ch 4	TAD 064
296.775	Ch 5	TAD 076
380.925	Ch 6	TAD 071

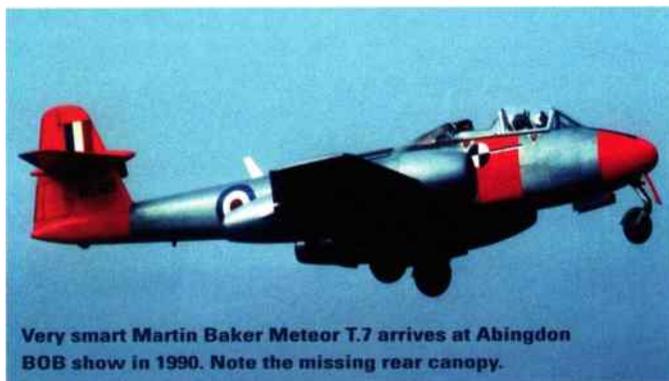
In addition to these frequencies, Air Refuelling over the North Sea using the Flamborough Track can be heard on 249.775 (Primary) and 300.125 (Secondary). In addition to the above frequencies, there are a large number of Air Refuelling frequencies in use for Ferry Flights, Coronet Deployments, etc., but are too numerous to be included here.

Operations

For the last section of this look at discrete frequencies, I thought I would take a look at the primary RAF and FAA Squadron Operations frequencies, this is something that I haven't previously covered. The distinction between Operations and Air to Air frequencies can sometimes be confused by airband listeners with aircraft using their base Ops frequency for Air to Air when out on a mission. The frequencies listed below are those generally accepted as their Primary Squadron Ops frequencies.

You will note that 11 Squadron at Leeming has been reported as both Javelin and Diamond? Also, 54 Squadron at Coltishall has been reported as Lion and Audax Ops. The information has been collated from a variety of sources and as you can see there are a couple of queries, so any additions

or corrections would be useful. (I will include any updates in a future 'Sky High'). SWM



Very smart Martin Baker Meteor T.7 arrives at Abingdon BOB show in 1990. Note the missing rear canopy.

Royal Air Force

1 Sqn/Moonshine Ops	368.3	Cottesmore
2 Sqn/Melbourne	356.775	Marham
2 Sqn/Cropper Ops	342.0	Marham
3 Sqn/Cockatrice Ops	344.75	Cottesmore
4 Sqn/Skeleton Ops	255.85	Cottesmore
5 Sqn/Maple Ops	254.675	Coningsby
6 Sqn/Canopener Ops	268.6	Coltishall
7 Sqn/? Ops	251.3	Odiham
8 Sqn/Raven Ops	318.1	Waddington
9 Sqn/Gotham Ops	298.0	Marham
9 Sqn/Possibly Air/Air ?	388.75	Marham
11 Sqn/Javelin/Diamond	300.875	Leeming
12 Sqn/Oxide Ops	315.675	Lossiemouth
13 Sqn/Dagger Ops	282.05	Marham
13 Sqn/Stoat Ops	376.825	Marham
14 Sqn/Bastion Ops	297.1	Lossiemouth
14 Sqn/No Longer In Use?	260.925	Lossiemouth
15 (R) Sqn/Roebuck Ops	262.725	Lossiemouth
16 (R) Sqn/Smokey Ops	396.75	Coltishall
18 Sqn/Topic Ops	260.2	Odiham
20 (R) Sqn/Wildcat Ops	362.9	Wittering
25 Sqn/Vampire Ops	277.25	Leeming
27 Sqn/? Ops	259.6	Odiham
28 Sqn/Merlin Ops	360.65	Benson
31 Sqn/Goldstar Ops	232.875	Marham
41 Sqn/Redbird Ops	255.75	Coltishall
43 Sqn/Chequers Ops	277.3	Leuchars
54 Sqn/Lion/Audax Ops	372.35	Coltishall
56 (R) Sqn/Phoenix Ops	369.9	Coningsby
100 Sqn/Boneyard Ops	261.075	Leeming
111 Sqn/Sabre Ops	275.9	Leuchars
617 Sqn/Blackdog Ops	366.225	Lossiemouth
Etps/Tester/Oscar Ops	300.25	Boscombe Down
Wing Ops/Brize Ops	130.075	Brize Norton
Wing Ops/Seagull	268.7	Coningsby
Ops Standby/Withdrawn ?	290.85	Coningsby
Tornado F3 Ocu/Tonic	365.05	Coningsby
Wing Ops/Seagull Ops	358.475	Kinloss
Wing Ops/Raptor Ops	356.725	Leeming
Wing Ops/Focus Ops	285.025	Leuchars
Wing Ops/Costa C	379.95	Lossiemouth
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Wing Ops	374.5	Waddington
FAA		
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750 Sqn/Still In Use ?	340.125	Culdrose
750 Sqn	300.55	Culdrose
771 Sqn/Still In Use ?	387.5	Culdrose
810 Sqn	307.8	Culdrose
810 Sqn	372.275	Culdrose
815 Sqn	283.6	Yeovilton
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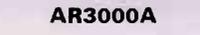
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ALINCO	DJ-557 270W WIDE BAND TRANSCIVER	£200.00
ALINCO	DR-590 DUAL BAND MOBILE	£175.00
ALINCO	DR-605 DUAL BAND MOBILE TRANSCIVER	£230.00
ALINCO	DX-707 100W MOBILE / HF	£399.00
ALINCO	DX-707H TRANSCIVER	£475.00
ALPHA	87A FULLY AUTOMATIC AMP	£3,350.00
AMERTRON	QSK-5 2.5kw QSK SWITCH	£199.00
AOR	AR-2002 BASE SCANNER	£199.00
AOR	AR-3000A RECEIVER	£495.00
AOR	AR-5000 RECEIVER	£1,199.00
AOR	AR-7030 REMOTE CONTROL RECEIVER	£595.00
AOR	AR-8000 HANDY RECEIVER	£199.00
AOR	AR-8200 MK1 HANDY RECEIVER	£260.00
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Airband Radios

Several years ago I wrote 'Wideband Receivers - Past, Present & Future - Part 1'. This article was a general look at airband radios up to the mid eighties and it was always my intention to follow it up, but for a variety of reasons, it has not happened until now.

First off I take a brief historical look back at airband radios and their development since the mid eighties and secondly I will do something that I once vowed I would never do. I will answer the question that I am asked most of all in my correspondence. What do I think is the best base station airband radio available today?

To Set The Scene

Let's take that step back into recent history. It was only 18 years ago in 1984 that the world of airband listening was turned on its head overnight. A small black box appeared on the airband scene, the likes of which many people thought would never be available to the aviation enthusiast. To set the scene, in 1984 the Iron Curtain was still in place, the Berlin Wall was still a symbol of the barrier between east and west and security at UK military airfields was not quite as strict as the seventies, but could still be fairly rigid.

Aircraft enthusiasts regularly visited bases around the country and whilst photography was generally tolerated, it was not uncommon to get a visit from the military or local police who would politely check out what you were up to - occasionally not so politely. With security and other factors in mind, most aviation enthusiasts would have been rather cautious about owning a radio that was capable of receiving u.h.f. airband transmissions. It was not an uncommon view that owning such a radio, (should one be available),

might actually be illegal.

In early 1984, airband radios were still fairly basic analogue units with the ability to receive v.h.f. signals only. Whilst h.f. and ham radios had progressed significantly, the days of digital readouts and scanning channels were only just about to arrive in the airband world. As an example, my hand-held at the time was a Signal 517, this had an analogue rotary tuning control and had sockets for three fixed frequency plug in v.h.f. crystals - how different it is today!

The little black box that I refer to was of course the now legendary AOR AR2001. By modern standards, it's 20 memory channels and snail like scan speed seem laughable, but back then it was seen by many as the pot of gold at the end of the rainbow. Not only did it have a digital readout and the ability to store frequencies in memory, but it also unleashed many enthusiasts into the world of military u.h.f. listening, something many thought would never happen. It was not long before many aviation enthusiasts became radio enthusiasts and so it was a very progressive move by AOR to introduce this revolutionary new radio into the UK.

The Floodgates Open

With the AR2001 firmly implanted in radio history as the first digital scanning receiver, the situation was set for the floodgates to open. Yaesu soon followed with the FRG-9600, which had a wider frequency range and an increase to 100 memories. Apart from a.m. and f.m., the '9600 could also resolve single side band and so it was not long before a UK company fitted h.f. converters to give it an even wider frequency range. Although this was a conversion rather than part of

manufacturing design, in a way it did signal a trend in wideband receivers over the next few years. Let me explain.

During the late eighties and early nineties, it was my firm belief that some manufacturers partially lost their way, one of the biggest problems being that radios were being asked to do too much. The trend, particularly with hand-held scanners, was to dramatically increase the frequency range and the facilities at the expense of the general performance of the receiver. This has resulted in manufacturers producing some radios that were a 'Jack of all trades and master of none'. Having said that, the range of frequencies that they were being designed to receive would have been considered by some to be within the realms of science fiction just 25 years previous.

In the end, good sensitivity and selectivity are in my mind the most important aspects of a radio and in some cases this was being degraded by the attempts to cram an enormous amount into one little box. It's all very well producing a radio that has a range of 2 to 2500MHz if it is poor at handling weak signals in the popular bands or suffers bad cross band interference. As a generalisation, these comments apply to radios in the medium to lower end of the market, you cannot expect budget radios to perform like the AOR AR5000 and the Icom IC-R8500, (although the gap is slowly closing).

At the time, I felt that by reducing the frequency coverage and concentrating on the signal quality was the way forward. With this in mind, I know that manufacturers would quote problems such as financial restraints, manufacturing costs, units produced, anticipated market, etc., but let's not forget

that this was my dream for the future with perhaps a possibility of reality. In the current era, reality is here and we now have radios that perform very well across the spectrum.

One manufacturer who did go down this path of producing specialist radios was Yupiteru. Whilst producing wideband hand-helds such as the MVT-7000 and the excellent '7100, they also produced specialist radios such as the VT-225 which was aimed at the v.h.f./u.h.f. airband market.

Perhaps the classic example of a specialist radio was the Signal R-535 which was designed to operate on v.h.f. and the u.h.f. airband between 225 and 380MHz, (expandable to 400MHz, see my 'Sky High' column). Although it was quite basic with an unusual, but easily learnt method of frequency entry, it was very sensitive on the u.h.f. airband and even today can give my IC-R8500 a run for its money. Sadly, Signal was a small Japanese company and although a successor to the R-535 was considered, it was deemed to not be economically viable and so the R-535 was to be their last radio.

Memories & Flexibility

In my opinion, the most important aspect of a radio after its general performance is the number of memories and the flexibility to use them. I have always felt that the best format for airband listening was a higher number of banks with fewer memories, the ability to link them is also a necessity. It was to be some while before this sort of flexibility was to become the norm. For example, AOR brought in two very good radios with the AR2002 and the AR3000A, but with still only 20 memories on the AR2002 and four banks of 100 in the AR3000A, that flexibility was

still not available. (It still didn't stop me owning an AR3000A for five years though).

Some of the US makes such as Realistic started to reduce the size of memory banks, but it was really only with the arrival of the Icom IC-R7100 that we started to get real memory flexibility. Another item that I felt was always annoying on the airbands was the inability on many sets to alter the delay setting. On many radios, this was set to two seconds which was often too short a period as many pilots, especially in military, can take longer than that to reply. Consequently, the second part of the transmission could be missed, but not with modern radios! All those features I dreamed of 10 years ago are now with us and some of the current radios are an airband listener's dream.

The Present Day

So we come to the big question. In my opinion what is the best radio overall for airband listening? Now I must point out that the conclusions are purely my

v.h.f./u.h.f. and remains popular with military enthusiasts, but is now a dated design and lacks the facilities/specifications of modern machines. The AOR AR3000A and the Icom IC-R7100 would grace any airband listening post, their performance on the airbands is good and is very similar for both radios. Perhaps an unfair comparison, but between the two I would give my vote to the IC-R7100 as it has a greater number of memories which are more flexible to us. (Still banks of 100 memories, but with a select facility allowing scan memory selection throughout all the banks).

Top Three

The first thing I had to do was to compare the two big boys, (I am excluding the mortgage priced Icom IC-R9000). I already own an Icom IC-R8500, AOR UK very kindly agreed to loan me an AR5000 so I could run them side by side for three weeks. They were

their performance being almost identical, it was on u.h.f. where I noticed the difference. Whilst searching 225-400MHz the Icom repeatedly stopped on Lyneham ATIS whereas the AR5000 missed it. Lyneham is some 160km distant from my location and can only be heard during periods of high

but it was a close run thing!

That leaves one radio to mention in the top three and that is the AOR AR8600. This little radio was quite a revelation to me, the performance on both airbands is very good, there are plenty of memories and memory banks and like its big brother and the



Italian company demonstrator MB-339C at the Paris Air Salon in 1987.

pressure and good propagation. I put both sets onto the ATIS frequency of 277.925 and whilst on the Icom the broadcast was faint, it could clearly be heard. On the AR5000, there was a faint signal, but the voice broadcast

IC-R8500, a large number of operational parameters can be changed. Its compact size means that it can operate as a base station, go mobile in the car or go walk-about using the optional internal NiCad battery giving up to five hours use.



French Mirage F1C in Tiger markings at Fairford 1991.

personal opinion based on actual listening on the v.h.f./u.h.f. airbands. I have taken all the relevant factors into account and it is based on radios that I have owned or had a chance to operate over the past 18 years, (which numbers quite a few).

Over the years I have not had the opportunity to operate radios from Uniden/Bearcat and only a couple from Realistic. Others from firms such as Standard, Kenwood and Yupiteru have only made brief forays in the base station market and so most of the above do not appear in the text.

There were several contenders that did not make it into the top three. The Signal R-535 is still a great little performer on

fed from the same antenna through a antenna splitter and the radio leads were swapped several times to make the test completely fair. Now this is not meant to be a comprehensive review, that has already been covered in SWM in the past.

The purpose of this exercise was purely for me to decide if one radio overall was better than the other on the airbands. Both radios are superb performers and have extensive facilities for storing, searching and scanning memories. They are both highly specified and should satisfy the needs of any airband enthusiast.

So to the crunch, how did they compare in use? On v.h.f., both radios performed very well with

could not be resolved. (It is worth noting that all wideband receivers exhibit this kind of characteristic, due to differing architecture. It has also been observed that the reactance of the antenna system can play a role, simply changing the length of coaxial cable can make 6dB difference due to effect on the front-end band-pass filters. No doubt there are other spot frequencies at which the AR5000 would perform better. - Ed.)

I repeated this test on a number of distant frequencies throughout the u.h.f. band and overall the IC-R8500 did perform fractionally better. Consequently, on the basis of the slightly better u.h.f. performance, better quality audio and more straightforward operation the Icom gets my vote -

Final Result

So to the final result. The best base station in my opinion for airband listening is the Icom IC-R8500 which just pips the AOR AR5000. But I am also going to cheat and place the AOR AR8600 in joint first place as the best overall airband radio. I made this decision of its performance, specifications, the flexibility to go mobile and the fact that it is a more affordable price. (It will be interesting to see how the

Mark 2 AR8600 performs, I have no doubt that SWM will have their hands on one shortly).

As I stated previously, these are only my personal observations based on many years of listening. If the winners come from the upper price range, I make no apologies, if you want the best airband radio then you will have to part with a sizeable chunk of that hard earned cash. Don't forget there are some good second-hand buys to be made. I am sure some of you may have differing views to mine, so if there is a radio that you feel performs well on the airbands, but is not mentioned here, please drop me a line explaining your reasons. Good airband listening.

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- Clear audio, even at maximum level of 2 watts!

The IC-R75 is a dedicated HF+50 MHz, all-mode unit with frequency coverage stretching from 30kHz to 60MHz in USB, LSB, CW, RTTY, AM, FM and S-AM. The compact IC-R75 241(W) x 94(H) x 229(D) mm. is an extremely sensitive receiver crammed full of features but the small dimensions give complete installation flexibility for base or mobile operation.

The user-friendly front panel has a large, clear, alphanumeric LCD display showing the frequency or '6+2' character

channel name. The panel's numeric keypad allows direct frequency entry or memory channel selection. The SQL control may be configured to adjust RF gain and/or squelch threshold.

Other IC-R75 features include; 2 programmable scan edges, 99 memory channels, an internal clock with ON/OFF timer functions and three speed-selectable scan functions; namely program scan, memory scan and priority scan - what a terrific receiver!



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■ E-MAIL: scanning@pwpublishing.ltd.uk

Scanning Scene

Firstly, does anyone have any idea what this gadget is? It's green therefore you can bet that it's something military. It appears to contain two u.h.f. transmitters. One is on 450MHz and the other is on 470MHz. Both transmitters are diplexed into one antenna and the unit seems to be intended to transmit on both frequencies at once. Part of the unit may contain an ultrasonic transducer. Could it be part of a military jamming unit or perhaps something involved with bomb disposal. It's certainly an interesting item of equipment that has clearly been manufactured for UK Government use. I don't think that it's current equipment, but it would be good to know just for what it was intended. Any ideas?

Telephone Conversation

Do you listen to military air activity? If so, you may have tuned your radio around the 382-383MHz area and found f.m. signals. Listen carefully and you have probably heard what sounds like a telephone conversation. You would be right. There are some long range cordless 'phones on the market that I understand work very well indeed. They are small and are packaged in an attractive way.

The base stations for these units operate in the range 382 to 383MHz and the handsets operate between 256 and 257MHz. The base units have a power output of 300mW and the handsets chuck out 100mW. It doesn't sound much, but the base station range seems to be pretty good. The sets that I have seen are made by Sanyo. Of course they are not legal in Britain and have been marketed in Eastern Europe and in some parts of Asia as far as I am aware.

It will not surprise you to know that many of these illegal cordless 'phones are now in use in the UK and a search through those frequencies may well turn up a couple of transmissions if you are in a populated area. It's not the

Tornado pilot ordering a pizza, it's someone on an illegal 'phone.

Unusual Mode

Another strange thing that has been overheard in some parts of the UK are normal f.m. 1200 baud AX25 type packet transmissions on 43.41125MHz. The traffic has been extremely tedious with short lists of letters and numbers being received. The signals have been received in different parts of Europe and may emanate either from there or from North Africa. It's an unusual mode for that frequency and may eventually yield something of interest.

New System

The Metropolitan Police are to get a new call handling system. Communications for the Met. are currently handled by 32 small control rooms. These will be reduced and all the dispatching will be done from three centres at Lambeth, Hendon and Bow by 2006. I guess that this will interface with the Met's Airwave roll out, now scheduled for 2004.

The whole kit and caboodle is going to cost something over £162 million and eventually officers will be using Mobile Data Terminals in vehicles. This allows them to be sent

This fashion for call centre consolidation is not limited to the capital city. Other forces are going down this route and reducing the locations in which they have control room facilities. For reasons of security and system redundancy there will always have to be a minimum of three call/dispatch centres geographically distant from each other for the purposes of police operations. In America and Canada many emergency services have pooled their dispatch resources and there is some support within the Home Office for this to occur here, but at the moment it does not appear to be happening.

I am willing to bet that in twenty years some bright spark in the higher echelons of the police will fall out of bed one morning with the light of inspiration glowing in his forehead. "Golly" he'll say, "Why don't we close all those big impersonal call centres and have lots of little control rooms in local police stations so that when someone 'phones up the police they can get through to their local station in Gerrards Cross instead of being routed to Milton Keynes". And they'll spend another few hundred million and everyone will be happy for a while. Just you wait and see.

Hand-Helds

Yesterday, I was stationary in a queue of traffic for around twenty minutes. The fellows repairing the surface were using hand-held radio sets. It's quite often the case that contractors use Short Term Hire frequencies for these operations. In case you happen to be holed up watching a red traffic light and you want to hear if the road gang are making disparaging remarks about the state of your old car (they did about mine), it may be worth

Table 1:
Short Term Hire
Frequencies (MHz)

87.875	163.850
159.1875	163.950
159.250	163.925
159.350	163.9875
159.4875	164.000
159.500	164.0875
159.625	164.125
159.6875	164.1875
163.2875	169.1375
163.6875	169.1625
163.750	All are f.m

As the summer is here these frequencies may also be found in use at county fairs and similar events. Listen carefully and you may get inside information that'll give you the edge in the 'Bowling For A Pig' competition.

Deployable Manpower

The government have announced that the Territorial Army are to provide deployable manpower to assist the civil authorities should a terrorist action take place in the UK.

This may indicate that the 'MOULD' system may become more active with exercise traffic and, should there be an incident, with 'live' communications. All other land based military communications systems may also exhibit increased use. It certainly is not my intention to reveal army or security force frequencies, a careful and methodical search may reveal them.

I believe that Customs and Excise are still using their old u.h.f. frequencies in some parts of the country. It seems, however, that the communications are encrypted. Their 440MHz channels have been heard carrying this traffic. It may be that the frequencies have already

passed to another user who is utilising digital scrambling, but I don't think so. The C & E APC025 roll out is still ongoing, but until it is complete, they are still having to rely on the old u.h.f. channels in more remote areas, but

the engineers are gradually getting the equipment installed in the hilltop sites.

Enjoy the summer while it lasts. I'm off to check out my standby generator before the weather gets too grim.

SWM

Scanning Scene



to routine jobs and to interrogate the Police National Computer and other databases from the cars. It has the added advantage of keeping voice talkgroups clear of routine traffic and, of course, clear of PNC checks on people and vehicles. It's also alleged that this will allow around 800 officers to be deployed on the ground as the centres will be almost entirely staffed by civilian employees.

popping these frequencies into the handy scanner. I can't guarantee that these will be in use, but I have usually found that I can hear the road gang's radios on one of these while I'm waiting in the queue. Health Warning... Sometimes there's a whole lot of cussin'.

Sky High

One of the most memorable Air/Sea rescues in recent years took place overnight on the 22/23 May. The yacht *Persuader* was on-route from the Antigua to Plymouth when it sailed into a large depression with Storm Force 10 winds and 9 metre seas, (9m from the top to the bottom of the swell!). Located about 770km Southwest of Lands End, they had already survived two large waves, when they were hit by a wave described as 18m high which dis-masted and rolled the 37 tonne, 20m yacht! With two members of the crew injured, they launched an EPIRB (Emergency Position Indicating Radio Beacon), which was picked up and relayed to Falmouth Coastguard who then proceeded to co-ordinate the rescue.

With the help of several other readers who have E-mailed me, I have put together the following report of the Rescue. Unless otherwise stated, all communications reported here were heard on 5.680MHz, Kinloss Rescue and all timings are UTC. A Nimrod from the Maritime Wing at Kinloss was scrambled with the callsign RESCUE 51, (shame they didn't keep the Nimrods at St. Mawgan). RESCUE 51 was on scene around 1830 and continued to issue a SURPIC, (surface picture), back to Kinloss Rescue. The Nimrod continued to give situation reports throughout the rescue until it was released to refuel at 0200, when it was replaced by a second Nimrod, callsign RESCUE 52.

Realising that the boat was well beyond the range of the UK rescue helicopters, an emergency call for help was put out to the USAF at RAF Mildenhall. At 2130, four aircraft from the 353rd Special Operations Group were launched from Mildenhall, two Pave Low MH-53Ms with the callsigns RESCUE 56 and 57 and two MC-130s in support with the callsigns RESCUE 58 and 59. At 2215, the two MH-53s called Brize radar on 127.25 and reported they were heading for a 'real world' SAR, approximately 480km off the Cornish Coast. The two MH-53s were directed by Kinloss to the damaged yacht at position, N4654.84, W01436.44 and were asked for an ETA which was given as 0413.

In-flight refuelling became one of the major elements of this rescue. Having put together several reports, by my calculations the two MH-53s were refuelled eleven times by the MC-130s, one five times and the other six. At 2355, Rescue 58 landed at St. Mawgan to take on 4500kg of fuel, leaving Rescue 59 in the air to be refuelled airborne. I'm not going to list all the refuelling activity, but one worth mentioning was at about 0110, Rescue 56 and 57 were refuelled by RESCUE 58 and 59 at position N4814 W10120, and at the same time QUID 98 was also heard up on 275.475 on route to GAPLI and was to refuel one or both of the MC-130s at position N4918 W00818.

At 0145, Kinloss Rescue report the new position of the yacht as N4658.92 W01403.32, heading east at

five knots. Confirmation was passed that the casualties will be taken to St. Mawgan. Several more air refuellings are made before the MH-53s reach the yacht. The helicopters are on scene by 0430 after seven hours in the air and for the next hour or so the aircrew battle with mountainous seas to get the casualties on board.

The winch-man from RESCUE 56 finds himself 3m underwater one minute and 4.5m in the air the next, but still manages to get aboard the yacht. A problem with his winch means that he is temporarily stranded until RESCUE 57 can eventually lift off the survivors and their colleague. With the rescue completed, the two MH-53s head for St. Mawgan arriving at 0830 after eleven hours in the air! RESCUE 59 also lands at St. Mawgan to re-fuel whilst RESCUE 58 heads back to Mildenhall.

As previously mentioned, most of the communications I noted were on h.f. 5.680MHz, but I have listed here some of the other frequencies noted in use by 'Sky High' readers.

MHz	Unit	Use	Comments
123.1	SAR	v.h.f. common	Used by Rescue 51/52 to all aircraft
247.225	352 SOG	Air/Air	Used by Rescue 58/59
282.8	SAR	u.h.f. common	Used by Rescue 51/52 to all aircraft
340.425	352 SOG	Ops used as Air/Air	Used by Rescue 56/57/58/59

Considering the adverse weather conditions, repeated air refuelling, the difficulty of the rescue and eleven hours in the air the aircrew of the 352nd SOG are to be congratulated for an excellent rescue - a very long day at the office!

Signal R-535

I have had an E-mail from Peter who describes himself as 'desperate of Dunstable'. Peter has used a Yupiteru MVT-7100 for three years for his airband listening, but having read a lot of favourable comments about the radio, he wanted to get a Signal R-535 to act as a base station. Peter comments that they are few and far between on the second-hand market and are often snapped up quickly. After looking for a while in SWM's 'Trading Post', he eventually found one in his local paper at the bargain price of £130. His question to me was, I am sure I read somewhere that there is a way of extending the u.h.f. coverage from 380 to 400MHz, but could I tell him how it was done?

Well I hope you appreciate this Peter and anyone else who could use this information as I searched long and hard to find the answer. Back in the archives on my old computer from 1997, I eventually found the solution - I am not sure of the origin of the information, (possibly Lowe Electronics), but the document I found lists the following procedure:

- 1) Select any memory channel whilst in the MANU mode.
- 2) Set the R-535 to SEEK mode and then turn the squelch control fully anti-clockwise

RAE Varsity T.1 from Bedford at Abingdon BOB show 1978.

- 3) Enter 220.1000MHz into 'F-Start' and 220.0000MHz into 'F-End' and 0.1000MHz into 'F-Step'.
- 4) Press the 'Up-Arrow' Key twice and you will see 416.508MHz in the display.
- 5) Press the MODE key to place the receiver to the MANU mode.
- 6) Press the SHIFT and ENT keys simultaneously and the display will show 424.700MHz which will now be stored in the memory channel you selected in step 1.
- 7) Select the next memory channel you wish to fill, by using the Up-Arrow and Down-Arrow keys. If the frequency in the new memory channel is less than 380MHz, press the SHIFT and UHF keys simultaneously and the display will revert to the last u.h.f. frequency, (in other words higher than 380MHz), that you entered.
- 8) From this frequency you can Decrease the frequency by use of the Right-arrow and Down-arrow keys until the frequency shows the next desired frequency you want to store. Press the SHIFT and ENTER keys simultaneously to enter this frequency into the chosen memory channel. Note that you can only decrease the frequency from high to low, if you pass the desired frequency you will have to go back to step (2).

Once you have done this, you can apparently only operate in MANU and SCAN modes above 380MHz, SEEK will not operate above 380MHz. That should be the R-535 re-configured - I am not fond of passing on information that I haven't tried myself, so try this procedure at your own risk!

Queens Jubilee Flypast

The Queens Golden Jubilee Fly-Past on Tuesday 4th June 2002 seems to have had numerous scanners working in overdrive. I am pleased to say that with the help of **Bill L**, **Bill P**, **Roger**, **Andy** and **Martin** who have all E-mailed me, I can present a fairly comprehensive review of the aircraft that took part. I don't normally include aircraft serials, but as the combined reports were quite comprehensive on this occasion, I thought I would, see the table to the right.

Bill L reports that a VC-10, callsign LION 21 was heard refuelling some of the Tornado's possibly over the North Sea. **Martin** reports that he also heard the callsigns WHIP 01 and 02 which from the sound of their transmissions may have been RAF Hawks, he was uncertain if they were connected with the flypast. The callsigns CLARET, (first noted May 10th May) and WHIP are both new to me, CLARET is believed to have been allocated purely for the fly-past.

As usual, if you can add to or correct this report we would like to hear from you. Apart from London Military frequencies, the following were noted in use during the fly-past, 268.6 Coltishall Wing Air to Air, 244.55 56 Sqn Air to Air, 243.45 Red Arrows Air to Air and 125.35 Red arrows to Concorde Air to Air.



C-17A Globemaster ZZ174	99 Sqn	Callsign WINDSOR LEAD
Tristar KC.1 ZD950	216 Sqn	Callsign FAGAN
Tornado GR.4 ZA564/DK	31 Sqn	Callsign ROCKET 1
Tornado GR.4 ZA547/DC	31 Sqn	Callsign ROCKET 2
Tornado GR.4 ZA553/DI aircraft)	31 Sqn	Callsign ROCKET 3 (spare
Sentry AEW.1 ZH101/01	8/23 Sqn	Callsign SENTRY
Tornado F.3T ZE965/WT	56 (R) Sqn	Callsign WARLORD 1
Tornado F.3T ZE256/TP	56 (R) Sqn	Callsign WARLORD 2
Tornado F.3 ZH556/OT aircraft)	56 (R) Sqn	Callsign WARLORD 3 (spare
VC.10 C.1K XV109	10 Sqn	Callsign MADRAS
Jaguar GR.3 XZ391/EB	6 Sqn	Callsign BOXER 1
Jaguar GR.3 XX116/EO	6 Sqn	Callsign BOXER 2
Jaguar GR.3 XZ103/FP aircraft) -	41 Sqn	Callsign BOXER 3 (spare needs confirmation
Nimrod MR.2 XV241/41	Kinloss MW	Callsign NIMROD
Canberra PR.9 XH134/AB	39 (1 PRU) Sqn	Callsign BENGAL 1
Canberra PR.9 XH135/ ?? possibly AC)	39 (1 PRU) Sqn	Callsign BENGAL 2 (code
BAe.146 CC.2 ZE700	32 (R) Sqn	Callsign CLARET 1
BAe.125 CC.3 ZD620	32 (R) Sqn	Callsign CLARET 2
BAe.125 CC.3 ZD704	32 (R) Sqn	Callsign CLARET 3
Typhoon ZH588	BAe Systems	Callsign OCTANE
BAC Concorde G-BOAD Delta	British Airways	Callsign CONCORDE Alpha
Hawk T.1 x 9	Red Arrows	Callsign RED ARROWS
Backup/Photo-ship		
AS.335 F.2 ZJ140 WEATHER	32 (R) Sqn	Callsign WINDSOR
AS.355 F.2ZJ139	32 (R) Sqn	Callsign WINDSOR PHOTO

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It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. (Ideal for the New Beginner and the Experienced Listener alike).

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N TYPE for RG213£2.50 each
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■ ROGER BUNNEY, 35 GRAYLING MEAD, FISHLAKE, ROMSEY, HANTS SO51 7RU

Satellite TV News

Early June and it's Golden Jubilee time! In fact, I tend to echo the comments of another sat-zapper in that the satellite air-waves seemed rather less active than anticipated, perhaps much of the celebrations being in London would have terrestrial connects via established fibre optic points - or using the broadcasters' own microwave link gear.

One Stateside outbound NTSC circuit on *NSS-K*, 21.5°W, June 2nd - an interview discussing Buckingham Palace activity from a commentary box viewpoint just outside the palace clearly showed a fire engine entering the gates, then a camera panning to smoke pouring from the roof! Live on truck UKI-195, 11.547GHz-H (SR 5632 + FEC 3/4).

Monday perhaps produced the most dramatic London events of the Jubilee, massive crowds, the concert *et al*. Checking on *Eutelsat W2*, 16°E and 'DSNG SKY NEWS', 'SKY 3', 'UKI-784' (flashing idents inlaid on colour bars) was active all day Monday through to Tuesday with live interviews and commentary feeding into the Sky News channel itself. Interesting that the service ident 'UKI-784 C1 4.2.2' suggested MPEG 4:2:2 was in use, but clearly the usual MPEG-2 was transmitted. This at 12.522GHz-H, 5632+3/4.

Noting MPEG 4:2:2 above, I can now confirm that Meridian TV are using 4:2:2 on their Southampton/Newbury satellite links into their *Meridian Tonight* programme at 1800 over the 'BT TES-43' truck, 10.988GHz-V, whereas Meridian's South-East Maidstone area feeds over 'Meridian8MBIT TES9' and Anglia's 'BT TES-42' trucks still have user friendly MPEG-2 at 10.983 and 10.974GHz both vertical and 5632+3/4, all these regional feeds are carried on *Intelsat 801* at 31.5°W - they're not too strong a signal. Several domestic market MPEG-2 models will lock and give recognisable pictures on 4:2:2 - I'm advised.

I started penning these lines on June 11th and the *Europe*Star-1*, 45°E wavelength is very active with feeds. The Afghan assembly met this day to decide on the administration structure for the country post conflict...the BBC were feeding live interviews into the UK via 'Globecast Newsforce' capacity on UKI-579 11.556GHz-V, Fox News on the usual 11.675GHz-V and APTN Kabul popped up at 11.471GHz-V.

NASA-TV has again been carrying excellent pictures of the latest Shuttle flight up to the *International Space Station*, June, week two, showing the astronauts constructing sections to be bolted onto the main structure. Images from the space 'helmet-cam' were remarkable showing the sections in great detail with the ever present mass of our Earth below. The Johnson Space Centre 'production' appeared for several days during the flight over Globecast capacity on *NSS-K*, channel 3 at 11.590GHz-V, SR 20145 + FEC 3/4 - the usual Globecast parameters.

I normally don't mention radio reception via satellite - there are hundreds of radio channels sufficient to create another specialist column - but of interest is a sighting (or hearing!) by **Edmund Spicer** (W. Sussex) who found the IRN (Independent Radio News) downlink on *Intelsat 707* @ 1°W - 11.549GHz-H (SR 3149 + FEC 3/4). On this channel he found the IRN news programme output, test one (a test sine wave whistle around 440Hz), various commercials, 'Stereo-3' and other programming, the latter though intermittently.

Another 'newie' for Edmund was *Intelsat 705* at 18°W - this is a lower strength signal, at best 45dBW in the South UK. Again, of curiosity were 'Channel 5 Regions 3 and 4' on this satellite at good levels - 11.525GHz-V (SR 12225 + 3/4) - though encrypted - the EPG suggests that these are FTA (free to air). Reason for Edmund's improved results is the purchase of a brand new 800mm dish, stand and related hardware for £40 - thanks to his local Safeway's customers' post card sales board!

BFBS, the 'British Forces Broadcast Service' that appears on both *Eutelsat W3*, 7°E (11.449GHz-V, 27500+3/4 - also

listed 11.324GHz-V) and *Telstar-11*, 37.5°W (11.561GHz-V, 5998+0.5) in recent times has been alternating either clear or encrypted, the norm is encrypted. BFBS radio offers dedicated programming to various UK forces locations around the world, e.g. Belize, Falklands, NI, Balkans, Gibraltar, etc. - for more information check out BFBS on the 'net. And the Stefan Hagendorn website advises that the USA based Iranian TV channel NITV has popped up on *Telstar-12* @ 15°W, 12.608GHz-H, rather a wanderin' star.

NSS-K is a hot bird and my favourite - there's always something downlinking if not more test patterns! President Bush's European Tour '02 and having left Paris and the now triumphant Chirac - having knocked out Monsieur Le-Pen - the American President arrives in Rome May 27th. Using the Reuters 11.462GHz-V lease we find 'ITA64 ROMA' is fired up showing the Italian Presidential guard in ceremonial gear, Mr. Bush arriving at the press reception venue in his American armour plated car - flown to Europe for his tour - a press photocall and the political elite then depart for eats. Test pattern inlay 'ROME POOL FEED, PATH#1' though no sign of 'PATH #2' on *NSS-K*.

Following a memory crash on my Pace dish positioner, I fumbled the unit back into life and checked readout calibration v satellite angle settings evening of May 23rd. For West I went onto *Intelsat 801*, 31.5°W and quickly found a signal at 10.997GHz-V, 5632+3/4. Picture content made me pause...this service identified as '801.CANAL210F14' with on-screen inlay idents on colour bars 'TF1 SNG LCI VIDEOMOBILE', then 'EMERAINVILLE', then 'AMBASSADE ISRAEL 23/05', then pictures. TF1 is the French 1st TV channel and LCI is the French equivalent of Sky News (La Chaine Info).

Live pictures from two cameras revealed what initially resembled a motorway crash, many police, taped-off road, queues of vehicles, breakdown lorry and even a helicopter at low level. More pictures showed a small lorry with a smouldering round hole in its side and a second smaller van half off the road. Pictures cut soon after 1800 hours preceded with the alternating colour bars. Emerainville is a small town to the SE of Paris, but the 'Ambassade Israel' suggested perhaps a terrorist action, quickly checking on our local Sky News revealed nothing, nor was anything reported in the media the next day, a complete mystery! Certainly 'something' had happened...

The *Eutelsat 'SESAT'* bird over at 36°E is one satellite that is perhaps sadly overlooked, though very little seems to happen on it! **Roy Carman** (Dorking) found a 'Fox News' feed early May at 10.967GHz-V (5632+3/4) content was the unfortunate situation of Israel and Palestine, Colin Powell was calling once more for another Middle East Peace Conference - will there ever be peace in this turbulent part of the Middle East?

Roy also noted the vintage *Astra 1-A* - of Sky's first analogue services, now parked in a well earned semi-retirement in the *Sirius 5°E* slot. 'Channel D TV' was the NTSC offering on a usually encrypted but May 10th in the clear - programme content featured German folk music - china tankards held by plump Germans in leather shorts and full cleavaged pigtailed women - all with red cheeks singing loudly. Channel D TV appears 11.374GHz-V (SR 2170 + 3/4).

The Potters Bar rail disaster, May 10th, of course brought out the press and wheeled out the satellite uplink trucks. *Eutelsat 2F3* @ 21.5°E was busy with news feeds on 11.088GHz-H and 11.048GHz-H and *W2*, 16°E at 12.554GHz-H, 12.561GHz-H, coverage of the crash site, a press conference and from a nearby hospital treating the walking and carried wounded. The 16°E 12.561GHz-H was the UKI-784 with service ident 'C1 4.2.2'.



ITN vtr clock via *Europe*Star-1* @ 45°E.



A live outside broadcast from Pakistan featured most of their armed forces, tanks, helis, parachutists, troops and this odd collection of juvenile marchers! On *Europe*Star-1*.



A corporate identification (commercial presentation) via *NSS-K*, other details unknown.



Action shot of the *Preakness Stakes* race from Pimlico, Maryland, USA.



Camera pans during Balkans air surveillance to show aircraft wing, via *Telstar-11*, 37.5°W.



Paris is lit up on election night, on *Intelsat 801*.



A fixed camera shows workmen at the site of the New York Twin Towers deep below ground level slowly raking over all soil for personal possessions and human remains, a 2nd examination is carried out when soil and other debris is removed to a 'dumping' site, via *NSS-K* Reuters lease.

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DX Television

The build-up to the Sporadic-E season seemed painfully slow and disappointing, but on reflection, a varied selection of signals was received once it reached full swing from the middle of May. Reception has favoured Central Europe, The Baltics and Scandinavia with fewer openings to the south, even though TVE-1 (Spain) is still on-air. Austria (ORF-1) has been identified on Channel E2a from Jauerling, so it is comforting to know that it has not yet closed.

Reception Reports

An opening on 8 May produced steady Norwegian programme schedules on E3 from 1000. A mystery logo was seen on E2 and E3, consisting of two words, one above the other, in the top-right of the screen. Portugal has introduced a new logo, maybe this was it.

At 0640 on the 10th, **Vincent Richardson** (Dolgarrog) captured a weak E2 picture sporting a large '1' in the top-left. This resembled the German ARD '1' logo but an additional light disc, possibly a clock, was present in the lower-right of the screen.

On the 15th **Tom Crane** (Hawkwell) noted good pictures from LRT-1 (Lithuania) from 1930 on R2. **John Lees** (Cheltenham) sent an E-mail to say there was 'nothing doing so far this season' but as soon as it was despatched, LRT-1 magically appeared!

Icelandic signals from RUV on E4 have already been evident. On the 19th **Peter Barber** (Coventry) saw cartoons and later a large mid-screen logo followed by repeated schedules and previews. **Stephen Michie** (Bristol) noted the station at noon the following day with trivia quiz text pages.

The 18th was an excellent day with multiple signals emerging by mid-morning. The sighting of an Arabic signal on E2 between 1900-1920 with an offset of 48.239MHz, strongly suggests Iran.

On the 20th Tom Crane detected a second weak vision carrier around 47.964MHz during the reception of Italian private station Tele A+. Tom identified Estonian TV (ETV) on the 22nd from the Narva 120kW outlet.

System Change

Slovakian TV appears to have reduced its sound spacing to 5.5MHz. **Peter Barclay** (Sunderland) discovered this on the 22nd at 1038 during a soap opera and pop music show from Bratislava on R2. Baltic countries are undergoing similar standard changes, with PAL colour replacing SECAM. The v.h.f. channel allocations are unaffected.

Best Days

The 23rd proved very productive from 0900 with over three hours of intense DX from Italy, Sweden, Finland, Ukraine, Estonia, Lithuania and Belarus. In addition, Peter Barclay identified three different Russian services: ORT-1 on R3 at 1031, RTR on R2 at 1055 and St. Petersburg TV on R3 at 1155. At 1131 on R2 the Ukrainian (YT-1) 'G-204' test card appeared with a Kiev identification and a 1kHz tone.

There was an excellent all-day opening on the 26th with a display of activity from 0700 until well into the evening. Countries logged included Estonia, Ukraine, Hungary (MTV-1 and RTL KLUB), Croatia, Italy, Czech Republic, Lithuania, Slovenia, Austria, Russia (RTR), Albania and Corsica. Serbia was tentatively received by Stephen Michie who noticed a large square logo in the top-right of the picture.

Tropospheric Reception

A late evening opening on the 5th brought in Norwegian signals for **George Garden** (Edinburgh). From 2130, NRK-1 was present on E7 and E8, NRK-2 on E41 and TV-2 on E44 from Bokn with its '2' logo. Conditions improved with good sound and colour from TV Norge on E34.

Unusual Test Card

We have reports of an FuBK test card on R1 with an identification resembling 'NTV'. A similar test card was used for special tests last year from Simferopol, in the Ukraine. NTV shares the channel with 'Inter'.

Moon-bounce

An experienced Australian DXer has recently detected what could be u.h.f. TV vision carriers from the USA via moon-bounce. Although it sounds incredible, there is no reason why this is not possible. After all, TV and radio signals are reflected off mountains, creating severe multi-path problems, so why not the surface of the moon? The most crucial factor must be the critical positioning of the moon for signal reflection to take place. Fortunately, in Australia, the band is void of TV transmissions below 526MHz, so experiments can take place.

FM Reports

The f.m. band was affected during many openings. On the 21st Greek f.m. stations were audible around mid-afternoon. **Simon Hockenull** (Bristol) reported a Finnish opening on the 22nd at 1035, which produced classical music from YLE on 87.90, 88.00 and 88.50MHz. The RDS display was 'YLENYKS2'. On the 26th between 1800 and 1840, Italian f.m. stations were heard up to 89, including 87.80MHz (RDS: KISS KISS) with Italian pop music and on 87.60MHz (RDS: RAI MF1) with speech.

Patrick Wylie (Co. Antrim) has noticed that ABC, from Donegal, on 103.9MHz, with their disco dance format, has now disappeared off the dial. Meanwhile, Kiss FM, serving Ulster and Leinster, have abandoned 106.0 in favour of 105.8MHz and is sending out a good signal on this new frequency. Patrick has discovered an unidentified station on 107.0MHz in Gaelic, but with a Northern Irish accent. The antenna direction suggests that its location is Derry.

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to: **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS**. We can also use off-air pictures stored as JPG files on PC disks and good-quality video recordings. Our DXTV and Archive TV website can be found at: www.test-cards.fsnet.co.uk All times quoted in *SWM* are in UTC.

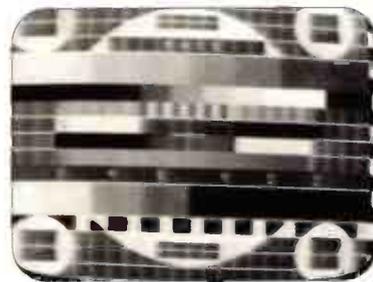


Fig. 1: Ukrainian G-204 test card with a Kiev identification.



Fig. 2: Novosti News programme from Russia.



Fig. 3: The Dutch modified PM5544 test card with wide-screen 16:9 aspect ratio.



Fig. 4: One of the eight new BBC-1 Identification Symbols, introduced on March 29th, 2002. This one is called 'Capoeira'.

■ MIKE RICHARDS G4WNC, 49 CLOUGHS ROAD, RINGWOOD, HANTS BH24 1UU

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Decode

First off some tips regarding that essential element of all computers - memory. RAM represents an easy, cost effective and simple way to improve your shack computer's performance. Then, swiftly onto a primer for NAVTEX reception and decoding.

Memory Loss?

If you're a Windows based PC user and your computer is a few years old, you are probably starting to find that your machine is struggling a bit with some of the more modern applications. There are lots of things you can do to overcome this and many people jump straight to thoughts of getting a newer faster processor. Think again.

Upgrading the processor to a faster model probably won't get you a proportional increase in perceived speed. A much better option for most is to increase the amount of RAM memory and what makes this a particularly attractive proposition is the current low price of memory.

When I bought my current PC a few years

ago, memory was extremely expensive and I distinctly remember thinking hard about splashing out to get 128MB instead of the then standard 64MB. Now that same memory has plummeted in price and you can pick-up a 128MB SD100 RAM SIMM for around £30.

Now you could be tempted to get loads of RAM and expect a huge increase in performance - don't. Most of the test results I've seen show that moving to 256MB gives the best improvement and the gains just about stop by the time you add another 128 to give 384MB. In many cases, the difference between 384 and 512MB would go unnoticed. The only exception to this may be if you use a specific program

that is very RAM hungry, possibly *Photoshop* with very large image files.

Having decided to upgrade, you need to choose the appropriate RAM, for this you will need the manual for your motherboard. This will normally detail the type and size of memory modules that can be accommodated. You will also need to know what you already have installed and the original handbook should tell you that. If you're not completely sure what to get, just take your motherboard manual or even your PC along to your PC shop and they will be able to guide you.

If you're not sure what you're doing, find someone who does. Should you decide to do it yourself, you might like to learn from my experience. I followed all the above guidance and bought myself some new 128MB PC100 RAM and quickly took the PC apart to get stuck into the upgrade.

The RAM slot was easily found and the new RAM gently eased into the appropriate slot. Right that's it, power up and away we go. Not so easy - power up followed by a repeating beep from the motherboard and a crash on startup. This is where you get that awful sinking feeling that maybe you put the chip in backwards and done something awful to the motherboard or, worse still, the processor. I took out the new RAM in case it was faulty still had the beeps. This is where you really start to worry.

At this point I remembered that the beeps would be the BIOS Power On Self Test (POST) trying to tell what the problem was the different beeps are meant to give an indication of what the BIOS doesn't like. I checked the manual, no mention of the beeps, so I needed to go online to get the info, but my PC was dead!

The moral of the story is make sure you have the beep codes for your BIOS before you touch the motherboard. A great site for this information is <http://www.bioscentral.com> They have details of a huge range of test sequences and the beep codes. Looking-up my problem shows that the continuous beeps were an indication of a memory problem and that I ought to check the seating of the chips. I did that and all was well. If you're thinking of upgrading your memory, you need to do it now as the prices are really starting to increase rapidly.

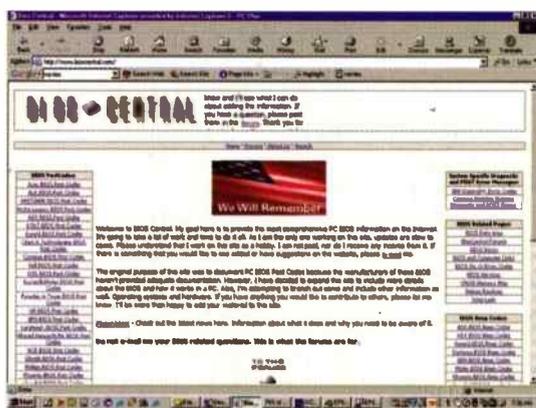
NAVTEX Primer & Quickstart

NAVTEX has been around for many years now and still plays a key role in the dissemination of navigational information in European coastal waters. The waters around the UK are extremely busy with a huge range of shipping traffic from super-tankers down to small pleasure craft. Not surprisingly, there are a huge number of navigational hazards to be dealt with, many of which are temporary so won't be found on any charts.

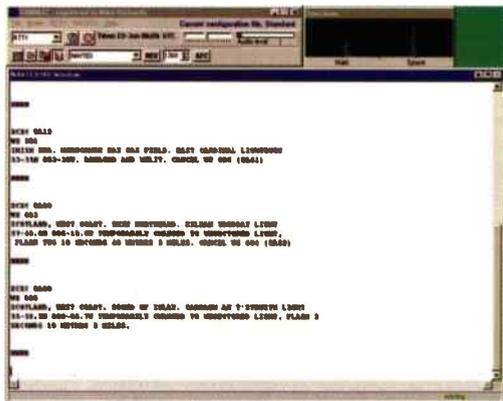
The solution to communicating this type of information has been the development of NAVigational TEXT, i.e. NAVTEX. This is a very simple system that operates on 518kHz using Narrow Band Direct Printing (NBDP) - almost identical to SITOR broadcast mode. Because the system uses just one frequency, ships use a dedicated receiver for this service that is usually integrated with a small printer giving a very neat self-contained navigational warning system. (SWM published a design for a dedicated NAVTEX receiver in the July 1997 issue - Ed.).

You can pick-up a dedicated NAVTEX system for around £250, so making it popular with small boat owners as well as commercial operators. In addition to receiving navigational warnings, the system is supplemented by a huge range of maritime information including local weather forecasts.

With the service operating on just one frequency,



BIOS central for your beep codes!



Receiving NAVTEX messages with JVComm32

there has to be some organised system to prevent stations from transmitting at the same time. The solution is to allocate time slots to each station. In **Table 1** I've shown the time slots and station identifiers for those stations that may be heard from the UK. You will note that each station has a single alphabetic identification character. This is sent at the start of the transmission along with another letter that is used to show the type of message.

Here's a sample message followed by a copy broken down into its components - my additions are in brackets.

ZCZC OA39

WZ 975

NORTH CHANNEL, OUTER APPROACHES. ROCKALL TROUGH. YELLOW BUOY WITH 2000 METRES OF MOORINGS AND FLOATS ATTACHED ADRIFT IN 55-51N 011-24W AT 211530Z JUN. CANCEL WZ 957 (OA30).

NNNN

Message Analysis:

ZCZC (denotes the message start) O (station identifier - Portpatrick) A (message type Nav warning in this case) 39 (serial number)

WZ 975 (message number)

NORTH CHANNEL, OUTER APPROACHES. ROCKALL TROUGH. YELLOW BUOY WITH 2000 METRES OF MOORINGS AND FLOATS ATTACHED ADRIFT IN 55-51N 011-24W AT 211530Z JUN. CANCEL WZ 957 (OA30). (message text)

NNNN (denotes the end of the message)

NAVTEX Quickstart

For this Quickstart, I've continued to use the new *JVComm32* mainly because it is an excellent package that covers all the basic modes extremely well. Here are the things you need to receive NAVTEX:

PC Requirements: Pentium PC 100MHz plus, 32MB RAM, 800 x 600 graphics, 16 bit soundcard. *Windows, 95, 98* or *NT 4.**

Computer to Radio Interface: Audio lead.
Software: *JVComm32*

*Note: very few decoding programs work with the versions of Windows post *Windows 98SE*. I find that *Windows 98SE* is the most stable platform operating system to use.

Here is the step by step process:

- 1) Download the software using the following link, select the latest version of the program from the supplied list:
<http://www.pervisell.com/download/jvc32/>
You will be prompted to choose a directory to save to file - make a note of this.
- 2) Install the software by double-clicking on the file you've just downloaded and follow the instructions.
- 3) Connect the 'line-out' or 'tape-out' of your receiver to the 'line-in' on your soundcard.
- 4) Tune your receiver to 518kHz and set the receive mode to u.s.b.

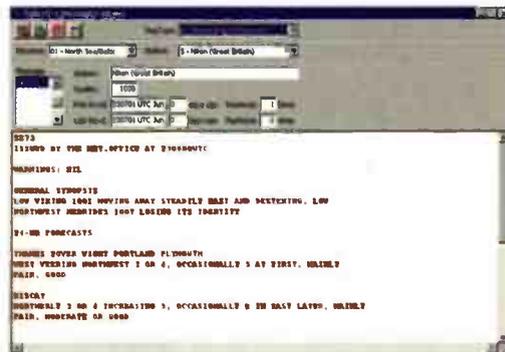
5) Use the START, Programs, *JVComm32* to run *JVComm32*.

6) With the program running press Alt + C to bring up the configuration menu.

7) Click the Interface Tab and make sure the soundcard and chosen input is selected.

8) Finding a NAVTEX signal is pretty simple just tune to 518kHz and wait! In practice you will need to tune just below 518kHz. If you are using a conventional receiver set to u.s.b. mode, try tuning to 516.6kHz *JVComm32* should recognise the incoming signal and lock-on. You need to check-out **Table 2** for the transmission schedules, but the strongest signals around the UK are probably Portpatrick, Cullercoats and Niton. If you don't seem to be getting a signal through, go back to the Configuration screen Alt +C and double check you have selected the right input. If this is OK, choose Start Settings Control Panel and double click the Multimedia icon. Click Record and make sure the volume slider for the input you're using is around the mid-point. If this doesn't work you've probably got a problem with your connecting lead.

9) Once you are receiving messages successfully, you can use *JVComm32's* impressive Selective Message Viewer (I/h tab under the file menu) to filter messages. That's it - you are now in business to receive NAVTEX!



JVComm32 set to filter-out weather reports from Niton Radio.

Table 1: NAVTEX Stations & Schedules.

Ident	Broadcast Time	Station
B	0010, 0410, 0810, 1210, 1610, 2010	Bodoe Radio (Norway)
G	0100, 0500, 0900, 1300, 1700, 2100	Cullercoats (Great Britain)
H	0110, 0510, 0910, 1310, 1710, 2110	Bjuroklub (Sweden)
K	0140, 0540, 0940, 1340, 1740, 2140	Niton/Channel (Great Britain)
L	0150, 0550, 0950, 1350, 1750, 2150	Rogaland (Norway)
M	0200, 0600, 1000, 1400, 1800, 2200	Oostende/Thames (Belgium)
N	0210, 0610, 1010, 1410, 1810, 2210	Oerlandet (Norway)
O	0220, 0620, 1020, 1420, 1820, 2220	Portpatrick (Great Britain)
P	0230, 0630, 1030, 1430, 1830, 2230	Netherlands Coastguard (Netherlands)
T	0310, 0710, 1110, 1510, 1910, 2310	Oostende (Belgium)
V	0330, 0730, 1130, 1530, 1930, 2330	Vardoe (Norway)

Table 2: NAVTEX Message Types.

Message Ident	Message Type
A	Navigational Warnings
B	Meteorological Warnings
C	Ice Reports
D	Search & Rescue Information
E	Meteorological Forecasts
F	Pilot Service Messages
G	Decca Messages
H	Loran Messages
I	Omega Messages
J	Satnav Messages
K	Other electronic navaid messages
L	Additional navigational messages
V to Y	Special Services
Z	No message on hand

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SSB Utilities

June's 'SSB Special' in *SWM* appears to have been well received by the readers, and I even received a few letters and E-mails with comments. It generated a few questions from readers who wanted clarification on several points.



Graham Tanner's Revco Angler portable short wave antenna. The 45m roll of antenna wire is to the left, and plugs into the balun (top right). From the balun, the signal splits to either the BNC connector (black lead) or crocodile clip (green lead).

Reader **Calum Reid** sent an E-mail asking about one of the callsigns listed in the article about the German Air Force. Calum says that he has 'DHJ59' as the callsign used by the German Navy station at Nordholz, but in the article I said that it was 'DHO24'. I believe that the DHJ59 callsigns are only used within the German Navy h.f. network, and they use the DHO24 callsign when operating in the Air Force Network.

Calum says that the German Navy have been very busy on **6.727MHz** in recent months, although he does say that most of the traffic is simply 'ops normal' and 'did you receive my RATT' style of message. The 'ops normal' messages were usually to a tactical callsign, but some just ask for a message to be 'relayed to Nordholz wing ops'.

Calum also took the opportunity to ask a question about another frequent user of 6.727MHz. The Norwegian Air Force also uses this frequency, and there are usually two stations that are heard most often - stations with the callsigns 'LBJ' and 'JWT'. Well Calum, callsign 'LBJ' is used by the Norwegian Navy at Harstad Naval Base, while 'JWT' is Stavanger Naval Base. The latest *Ferrell's Confidential Frequency List* has the following frequencies for these two stations:

Norwegian Navy	
JWT	2.680, 2.687, 3.038, 3.122, 5.7075, 11.180
LBJ	2.687, 6.727

(all freqs are MHz u.s.b.)

New Book

Last year I mentioned a new frequency guide from MGT Publishing called *Military Air Scan*, and I am pleased to report that the 2002 edition is now available. The new edition contains almost the same sections as last year's edition, although the book is now bigger and spiral-bound.

The book is divided into several major sections covering various frequencies (including h.f., v.h.f. and u.h.f.), a listing of military aviation callsigns, a list of military aircraft serial-numbers (including the British and US forces), a list of military and government aircraft with selcall codes, a long list of military codewords and abbreviations and a very large listing of ICAO four-letter airfield designators. I have supplied some information for the book (principally a number of h.f. frequencies, but also a few u.h.f. ground services for various airfields), and my name appears in the list of contributors.

For those who are interested in listening to military aviation on any part of the radio spectrum, this book will have something to interest you. Because of the way that the book is laid out, it is easy to find frequencies for any given location in the UK, and the associated maps give

a good indication of the most useful frequencies for your own local area. Whether you want to listen to local frequencies, airways frequencies, or distant traffic via h.f., there are frequencies for all interests.

At the very back of the book is a final section which contains all the frequencies listed in ascending order, so if you come across signals that you are not sure about, you can easily check to see if it is 'known' or 'new'.

Military Air Scan 2002 costs £15.99 and is available from **MGT Publishing, PO Box 564, Norwich NR7 8DD**, (also available from the *SWM* Book Store).

Letters

The first letter this month is from **Allen White** in Derbyshire. He wants to know about the frequencies used by the Space Shuttle and the *International Space Station (ISS)*. As I have mentioned several times in the past, neither of these two spacecraft use h.f., and they only occasionally use v.h.f. or u.h.f. various satellite comms, and are only audible when they are in range of the UK.

As this column is devoted to h.f. communications I will have to leave this subject to Lawrence Harris and his monthly 'Info in Orbit' column. The frequencies used by these spacecraft are mentioned every few months, so it really is worthwhile reading what Lawrence has to say on the subject.

The next letter comes from **Mr. C.W. Baker** from Surrey who has a question concerning the article that I wrote about my trip to Goa (*SWM* May 2002). In the article I mentioned a 'Revco' Angler portable antenna which I used, and this can be seen coiled up in the middle of the picture on the final page of the article. Mr. Baker would like to know about the 'Revco' Angler portable antenna that I used while I was there, as he would like to acquire one. I bought my antenna during the late 1990s from a radio rally; seem to remember that it was at the London Amateur Radio Show at Picketts Lock. It was not very expensive.

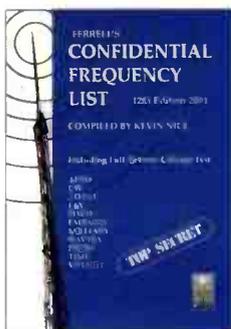
The supplier was Garex Electronics who, in last month's *SWM*, announced that they have recently recommenced trading. The 'Angler' costs £19.95 and has a specified operating frequency range of 100kHz to 1GHz. The 'Angler' is actually two antennas in one, a 14m section for h.f. and a 0.9m section for v.h.f./u.h.f. Garex can be contacted at **PO Box 52, Exeter EX4 5FD**. They also have a web site detailing all their products, see www.garex.co.uk

I have only used my 'Angler' once and that was while I was in Goa, so I have not performed any comparative tests against other antennas. I have seen advertisements for other similar antennas, usually titled 'spy wire' or something similar, and I imagine that they are similar to my 'Angler'.

Looking through the latest *SWM*, I can see similar antennas advertised by Haydon Communications ('EMF Antenna') and Waters & Stanton ('WDP-30'), but I have not seen or tried either, so I cannot comment on their suitability. Perhaps I should try one of these other antennas and compare them, unless one of you has already tried this and can provide me with details of the results.

One comment made by Mr. Baker was that he had no means of erecting an outside antenna. However, the 'Angler' is not really intended as a permanent external antenna. When I used my 'Angler' in India, I was restricted to draping it around the inside of my hotel room, but it should have been suspended outside (and I am sure that the results would have been better, too).

The 'long wire' part of the 'Angler' is about 14m long and although it can be placed inside a room or house, it will work much better when outside. In the past I have achieved acceptable results using just 10m of multi-strand wire suspended around the inside of a hotel room. Does anyone have any recommendations for a simple indoor antenna (not an active antenna) which Mr. Baker can try?



Web Watch

Waters & Stanton PLC - <http://www.wsplc.com>
 MGT Publishing - <http://www.mgtpublishing.com>
 German Navy DHJ59 antenna pictures -
<http://longwave.bei.t-online.de/pictures.html>

■ CLIVE HARDY G4SLU, SWM, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW

■ E-MAIL: clive@pwpublishing.ltd.uk

Amateur Bands

In essence, amateur satellites are flying repeaters and are not as difficult to receive as might be thought. A couple operate using f.m. with their inputs in the 2m band, and outputs on 70cm. They orbit the globe once every 100 minutes or so. Opinions seem divided on the minimum equipment specification that's required to receive the downlinks, with hand-helds and rubber duckies being cited at one end, and super sensitive receivers with Yagis at the other.

Either way, the important thing is to know where the satellite is, as it can't be heard when it's on the far side of the globe, whatever equipment you use! To know where the satellite is there's no real alternative but to use a computer program. The web site www.rtty.co.uk has good information about the satellites, plus some freeware tracking software called *WXtrack* available for download. The program displays the satellites' positions, tracks and radio footprints on a very pretty map of the world.

Back to the equipment. It is just possible to hear satellites using fixed vertical antennas and a scanner. However, a hand-held and rubber duck antenna will do the job better. That's because it can be moved around for the antenna to be continuously aligned on the satellite at the correct polarisation. Unless you live in a glass dome, you'll have to take your hand-held outside to receive the satellite.

Unsurprisingly, I've had most success with a 9-element beam antenna pointed at the satellite. With that I've received S9 signals from UO-14 (UoSat *Oscar 14*) on 435.070MHz, hearing stations from all over Europe during a typical 14 minute pass.

The equipment that's more likely to be used by amateurs, and even more likely to succeed, is that used by **Pete Evans MW0CXH** in South Wales, who is a regular on the *Oscar 14* satellite. He has a TS-2000 radio connected to his antenna system which consists of two crossed Yagis. One is for transmit on the 145MHz band, the other for receive on 70cm, and both are mounted on a computer controlled pan and tilt rotator that keeps the antennas pointed at the satellite throughout each pass.

Pete is entirely self taught in the art of satellite working, and in the true spirit of amateur radio, would be more than happy to advise anyone contemplating satellite operating. He's QTHR and at m0cxh@qsl.net

Listening Tips

When listening for the satellites, keep the squelch open as the signals can often be too weak to lift it. It's also probably a good idea to listen using headphones if you're outside and you don't want the neighbours to notice your strange behaviour! Most important! Don't forget the Doppler effect, which is the shift in the received frequency of transmissions between objects moving relative to each other. Set the tuning steps to 1kHz if possible, (5kHz will do) and tune 10kHz high of the nominal receive frequency at the start of the pass. Tune down as the pass continues to about 10kHz low of

the nominal receive frequency at the end of the pass. With a 20kHz range for the receive frequency, it's as important to be on the right frequency as to have the antenna properly aligned.

Where's That?

Sometimes it's difficult to be certain about the location of a callsign, particularly when it's out of the normally used prefix series for a country. Be confused no more! There's a very useful site at

<http://www.ac6v.com/prefixes.htm#PRI> which has all the international prefixes, plus some very handy information about their allocations within the countries.

Just to make life interesting, non standard callsigns are often used by contest stations. As examples of confusing callsigns, the following were heard by **Philip Davies** during the CQ WPX contest last March. Test yourself on these callsigns. One at least should be easy if you read last month's column! Answers, with the more usual prefixes at the end. No looking until you've made your guesses!

AN1QA	7S2E	H6C	H22H	AT0D
TM5C	CQ1P	AY8A	ZV2V	OT2A

International Lighthouse/ Lightship Weekend 2002

This mix of sea and radio waves happens over the weekend of the 17th and 18th of August and it is anticipated that a few hundred lighthouses and lightships all around the world will be on the air. The event runs for the whole 48 hours of the weekend. Interest in these locations for special events is on the increase, as evidenced by the formation of the British

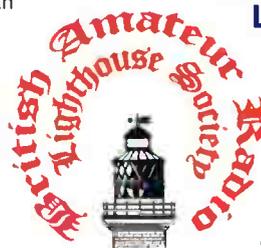
Amateur Radio Lighthouse Society in March of this year. For more information about BARLS look at <http://www.barls.fsnet.co.uk/> or contact Steve Bryan G0SGB who is QTHR and at steve@g0gsb.freemove.co.uk

What's Ahead?

Jim Todd and his wife Carol just might operate from Taongi Island and Ujelang Islands in the Marshall Group, Micronesia, as V73KZ and V73SX from late July if permission is granted. Listen out for them on the ANZA net on 21.205MHz at 0450UTC, the Southern Cross net on 14.2265 at 1100, or the Bill Bennett Family net on 14.245MHz at 1400 where Jim and Carol quite often appear.

Myanmar, formerly Burma, should see XY3C, XY5T and XY7V operating from Yangon, formerly Rangoon and Ngapali on the country's western facing Arakan coast between the 2nd and 22nd August. Visit <http://www.dxpedition.de/myanmar2000/> for the DXpedition.

Finally, Per OZ1DGQ should be active from Laeso Island off Denmark's north east coast until the 20th August, or possibly later. Thanks again to 425DXNews.



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Info in Orbit

NOAA-17 - The Newest WXSAT

NOAA-17 was launched on 24 June at 1823 and watched by many of us on NASA TV via the Internet. Keplers were issued around 0800 by Dave Cawley of Timestep in time for me to receive the morning passes. Unexpectedly, the h.r.p.t. frequency was 1702MHz and not 1698MHz, as previously announced!

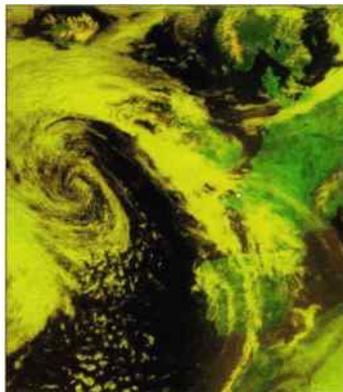


Fig. 1: My second FENGYUN-1D image 1002 17 May.



Fig. 2: FENGYUN-1D 1100 29 May from Cedric Roberts.



Fig. 3 NOAA-16 0256 16 June channel 2 (visible-light).

E-mail Jolt

Reading my E-mails on 16th May gave me a jolt. One was from **Bob Christy**, sent via the 'hearsat' (as in *hear satellites*) mailing list on the Internet. This is a group (of which I am a member) that posts messages concerning the reception of satellite signals. He confirmed reception of a 180MHz beacon from the newly launched Chinese weather satellite (WXSAT) FENGYUN-1D. I had forgotten the earlier Chinese

announcement that they planned to launch FENGYUN-1D "sometime in spring 2002".

Anticipating the launch of NOAA-M (to be renamed NOAA-17) on 24 June and MSG-1 in August, I had overlooked the Chinese factor.

The text explained that at 0150 on May 15, China launched a pair of observation satellites, one meteorological and one for oceanographic monitoring:

<http://www.spacedaily.com/news/020515060004.5uag85lm.html>

Bob detailed his measurements: FENGYUN-1D transmits a c.w. carrier at 180.007MHz. There are two telemetry side channels at ± 5 kHz from the centre frequency and two further c.w. carriers at ± 10 kHz. The signal structure is similar to FENGYUN-1C. Bob's first observation was at two and a half minutes to midnight (UTC) that day.

Bob's E-mail gave me a jolt! I checked the NASA site OIG - Orbital Information Group - and Dr Kelso's Keplers site -

<http://www.celestrak.com/NORAD/elements/> - and downloaded the 'new launches' set of Kepler elements.

FENGYUN-1D was included. I started my satellite tracking program and edited in the new data. The launch had been the previous day - Wednesday - and I had no information about when the onboard equipment might be switched on - but experience with NOAA operations suggested to me that it might be soon. The first

UK pass would be at about 0820 so I waited at the computer in advance. Recent FENGYUN WXSATS

have provided h.r.p.t. only, and if my Kepler elements were wrong, it was possible for it to transmit data without my ever seeing it. But they were right! Within a minute or two I was amazed to see the *data lock* light up on the receiver - set on 1700.5MHz. The signal seemed quite strong in comparison with FENGYUN-1C.

After E-mailing the appropriate lists to confirm reception of this early transmission, I left the system set up for the high pass and went off to work, after copying the first pass on to a disk (for later printing). At work, I see members of the public who visit our UK-online centre that I help run in Southampton. I regularly take pictures from the WXSATS, and they are always a talking point with visitors. The initial reaction is one of assuming that I 'downloaded this from the Internet' and can I show them 'where'. When I explain that I actually received it with home equipment, it is jaw-dropping time!

I returned mid-afternoon to find the most superb h.r.p.t. picture that I have ever received - see Fig. 1 - on the screen.

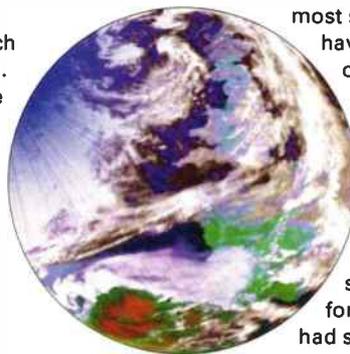


Fig. 4: NOAA-121621 received on 3 June by Lee Carberry - and processed extensively in Paint-Shop Pro!

The next day I hit problems. Either the satellite was in trouble or my equipment was faulty. In fact, it later emerged that neither of these were the problem - I was using Kepler elements for payload 'A' and should have been using those for payload 'B'. Unknown to me, I had stopped receiving E-mails from

the 'wxsat-l' list in which discussion about wrongly identified payloads was ongoing.

An E-mail from **Arne van Belle**, the Co-ordinator Radio Observers, Werkgroep Kunstmanen, Holland, solved the problem. After changing the Keplers to payload 'B', tracking was once more perfect.

During the early-orbit phase, on board systems have to be out-gassed so that surface contaminants can evaporate. For a period of two or three weeks, surfaces are allowed to 'acclimatise'. After this spell of out-gassing, the satellite's thermal imagers are cooled and the infra-red imaging system switched on. The production of artificial colour normally depends on using thermal band information, so with this being absent for the early orbit phase, **Cedric Roberts** used channels 2 (visible light), 10 and 9 (ocean colour) for his synthesis.

FENGYUN-1D Basic Details

The satellite is in an orbit similar to that of its sister FENGYUN-1C: sun-synchronous, but displaced so that it passes over a little later.

The imaging sensor is called the *Multichannel*

Visible and IR Scan Radiometer (MVISR).

Nadir resolution is 1.1km - identical to NOAA WXSATs.

Channel	Wavelength (µm)	Primary use
1	0.58 - 0.68	Daytime cloud, ice and snow, vegetation
2	0.84 - 0.89	Daytime cloud, vegetation, water vapour calibration
3	3.55 - 3.95	Night cloud
4	10.3 - 11.3	day/night cloud
5	11.5 - 12.5	day/night cloud
6	1.58 - 1.64	Soil humidity, ice/snow separation
7	0.43 - 0.48	Ocean colour
8	0.48 - 0.53	Ocean colour
9	0.53 - 0.58	Ocean colour
10	0.90 - 0.985	Water vapour

The wavelength is listed in microns (micro-metres). Transmission of h.r.p.t. is officially on 1700.5MHz, with 1704.5MHz as back-up. My thanks to Mike Kenny of Satellite Engineering, Bureau of Meteorology, Melbourne, Australia for providing technical details.

Final FENGYUN-1D news: the infra-red sensors were switched on shortly before the 1910 pass over Britain on 15 June.

Overnight Sunshine

As at near mid-June, the skies are becoming crowded! With no fewer than six WXSATs transmitting h.r.p.t. and NOAA-M imminent (launch on 24 June), it is an active time. In the northern hemisphere, all overnight images include a zone of sunlight around the north pole seen in the visible-light channels. I assembled a collection of these nocturnal images; NOAA-16, passing south-bound around 0200, shows northern-hemisphere overnight sunshine to best effect.

Correspondence

Figure 4 is possibly the most unusual WXSAT image published in this column. **Lee Carberry** of Stockton-on-Tees recorded an a.p.t. image from NOAA-12 and initially processed it with WXSAT. He then performed some imaginative image processing with *Paintshop Pro*, creating a sphere and adding artificial colouring. Lee uses an RX2 receiver (the model produced by the Remote Imaging Group), and a crossed dipole mounted in the loft. Lee has trees in the garden that prevent him receiving clear pictures north of the Hebrides. Lee tells me that programs "like *Photo-suite* have some really useful tools for erasing interference", and adds that he uses them all the time.

Vortices Off Africa

David Whelan of Huddersfield downloaded **Fig. 5** from Dundee University's web site on Sunday 26 May. It is the METEOSAT-7 Primary Data image from 1800 and shows some interesting swirls - van Karman vortices - over the Canary Islands. They looked unusual and David wondered

whether they indicated any significant weather.

The image is one of the three visible-light Primary Data images transmitted by METEOSAT-7 each day without encryption. It also reminds me that I should be setting up my Primary Data equipment that has remained boxed since the house move of last July!

The NOAA Satellite Active Archive (SAA) provides access to Internet users wishing to retrieve moderate resolution images from virtually anywhere around the world recently covered by NOAA WXSATs. **David Taylor** retrieved an early morning image - see **Fig. 6** - of Svalbard (Spitsbergen) from the SAA, originating from NOAA-16 at 0322, on 26 May. This is during the 24-hour daylight period enjoyed by Svalbard in the summer, being north of the Arctic Circle. David comments "the low angle of the lighting helps to bring out the mountains very clearly. To the north-east, pack ice can be seen, and to the south the small island known as Bear Island can be located by its effect on the clouds where a rather nice pair of 'tracks' has formed".

Equipment Compatibility?

In a recent 'Info', I pointed out the equipment specification announced by EUMETSAT as being necessary for reception of MSG-1 - the first of the new European all-digital geo-stationary WXSATs. It was the reference to pre-amplifiers and dishes that caught my attention: the possibility of using the low-noise pre-amp that many WXSAT hobbyists already have in use, typically for h.r.p.t. reception. I invited Dave Cawley, Managing Director of Timestep, to comment on potential compatibility:

"I have just read with interest your column in June SWM. The Timestep LNA in common with a few others is perfectly suitable for MSG. EUMETSAT has suggested that a 1.8m dish for LRIT (would be possible), but it must be remembered that they also suggested a 1.8m dish for the current WEFAX, and we all know that WEFAX can be received with a well optimised 600mm dish. NOAA has recently said that its new LRIT data stream should be receivable on a 1m dish. Those users currently using a Timestep 900mm prime focus dish and Timestep LNA should be able to use these for LRIT transmissions".

Interference Problem Solved!

The saga of the interference received at **Kevin Hughes's** station in Tamworth was being identified as we went to press last month. Since late last year he had been suffering from severe and permanent interference to his a.p.t. images - in the form of wavy lines. They were always worse at the start and end, and noticeably worse for NOAA-14 passes on 137.62MHz. Interference was audible, as a noise underneath the previously crystal clear tones of the satellites.

Suspecting that his roof-mounted turnstile and



Fig. 5: METEOSAT-7 1800 26 May. (Copyright © 2002 EUMETSAT. This image is published by kind permission of EUMETSAT and the NERC Satellite Receiving Station, University of Dundee).



Fig. 6: NOAA-16 0322UTC 26 May - an SAA image from David Taylor.



Fig. 7: (before) NOAA-12 31 January showing severe interference at Kevin's station.

QFH could have been damaged by weather, he checked them, despite removing all corrosion, there was no improvement. He decided to replace both antennas and their entire runs of coaxial cable. Kevin bought a Paul Hayes QFH antenna (actually built by Paul), and a second-hand Timestep turnstile. He connected the QFH and the turnstile to separate receivers, but this made virtually no difference, so he then referred the matter to the RIG list (one of the Internet WXSAT mailing forums) for comments. It was generally agreed that the wavy lines appeared to be a result of 50Hz mains interference. Paul Hayes suggested using a portable a.m. radio as a direction finder to locate the cause of the problem.

After checking throughout his home with the 'direction finder', and having disconnected all electrical items one by one - without any success - he decided to shut off the power supply to the entire house at the mains. There was no change whatsoever. Kevin decided to call in the electricity supply company to ask for their help in tracing the problem. One of their Power Quality Engineers visited in February and, following a thorough investigation (which included connecting a 'power quality analyser unit' to the mains inlet for five days and recording the results), he advised that the interference was not a mains power problem, but was 'airborne' and 'very severe'; he suggested consider calling in the Radiocommunications Agency.

Kevin did so, explaining that he was 'registered' with NOAA to receive images from the US satellites. Soon after writing to them, he received a call saying that the 137MHz satellite band is considered a 'protected' band so they would be investigating. A few days later, two of their investigators called, bringing r.f. detection and direction finding equipment. Their visit did not coincide with any receivable satellite pass so a further visit was arranged. A weekday morning at 0715 was booked so that they could hear and see the problem 'live'.

They arrived with a Land Rover covered in antennas and full of expensive radio gear. Kevin shut down the power to his house and they then powered his computer, a.p.t. receiver, and various other items directly from the vehicle using a power inverter. They could now clearly see and hear that the problem was not of Kevin's making, and set off around the area with direction-finding antennas, headphones and receivers. They later reported hearing a 'peculiar' signal around 137MHz, which was not a pager, but did sound like some sort of data signal - and which should most certainly not be there. They went off to investigate further.

Kevin has a number of receivers and scanners including an Icom PCR1000 unit which, when operated using *TalkPCR* software, incorporates a spectrum analyser function. He set this scanning from 137 to 138MHz. As soon as the first scan was complete, a prominent 'hump' was evident around 137.5MHz so he narrowed the scanning range. By adjusting the analyser settings, he eventually found that the signal was centred on 137.64MHz. The familiar 'crackling' noise was heard when pointing the mouse on various parts of the signal hump. He checked the signal over a period of days, it stayed firm. After printing out the analyser

graphs obtained while using various antennas, he telephoned the RA and told them of the findings with the PCR1000. They arranged another visit to see the results - and the PCR1000 in action.

They arrived and powered the 'shack' equipment with a petrol generator (apparently confiscated from a pirate radio station raided the previous evening!). Although the PCR1000 showed the signal, surprisingly neither the £10,000 Rhode & Schwarz mini-port receiver, nor the Racal Spectrum Analyser Unit did so! Armed with their own receivers set to 137.64MHz, they soon found themselves pointing their direction-finding antennas in the direction of a huge Safeway distribution centre located about 4km from Kevin's house. They were able to hear the infamous crackling noise on their own equipment, so headed off to Safeway to investigate further.

Later, Kevin received the call he had been hoping for. The lads from the RA believed that they had found the cause of the problem: a faulty component within a closed circuit security TV camera at the Safeway site! The camera could not be switched off, so a replacement part was ordered.

Following the arrival and fitting of the camera component - under the watchful eye of the RA lads - the interference ceased immediately! Kevin reports clear images with absolutely no 'wavy lines' for the first time in six months. He has written to the RA to express his sincere thanks for their efforts. I love a happy ending!

Fig. 10: NOAA-17 h.r.p.t. image from 1120 pass (as Fig. 9).

Fig. 8: NOAA-1527 May after the 'fix'.



Fig. 9: NOAA-17 a.p.t. image showing the 1120 pass on 25 June, one of the early passes over Britain. The sections are channels 1 and 2 - visible-light. The infra-red sensors are out-gassed for two weeks before



Frequencies - New Look List

With an increasing number of WXSAT transmission options, I am providing a comprehensive list of the satellites available to European monitors.

a.p.t.

NOAA-12 and NOAA-15 transmit a.p.t. on 137.50MHz.
 NOAA-14 transmits a.p.t. on 137.62MHz.
 NOAA-M (-17 from late 24 June) scheduled to use 137.62MHz.
 NOAAs transmit beacon data on 137.77 or 136.77MHz.
 METEOR 3-5 usually transmits on 137.30MHz when in sunlight.
 METEOR 2-21 may transmit on 137.85MHz when METEOR 3-5 is switched off.

h.r.p.t.

NOAA-12 and NOAA-16 transmit h.r.p.t. on 1698.0MHz.
 NOAA-14 transmits on 1707MHz.
 NOAA-15 transmits on 1702.5MHz.
 NOAA-17 is scheduled to transmit on 1698.0MHz from 25 June at 2108UTC.
 FENGYUN-1C and -1D transmit on 1704.5MHz.

Geostationary

METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX and 1691.0MHz for Primary Data.

All times mentioned in SWM are UTC.

Timestep



PROsat for Windows is used by most leading weather satellite enthusiasts. They have grown up using Timestep products and now rely on the superior image quality and ease of use provided by PROsat for Windows. Features such as real time reception, auto-scheduling, temperature readout, totally automatic reception of all NOAA's and Soviet satellites and automatic animation have made PROsat the preferred package. For weather satellite systems contact :

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 Tel: 01803 833366 Fax: 01803 839498
 www.time-step.com email information@time-step.com

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How to use the Propagation Charts

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

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

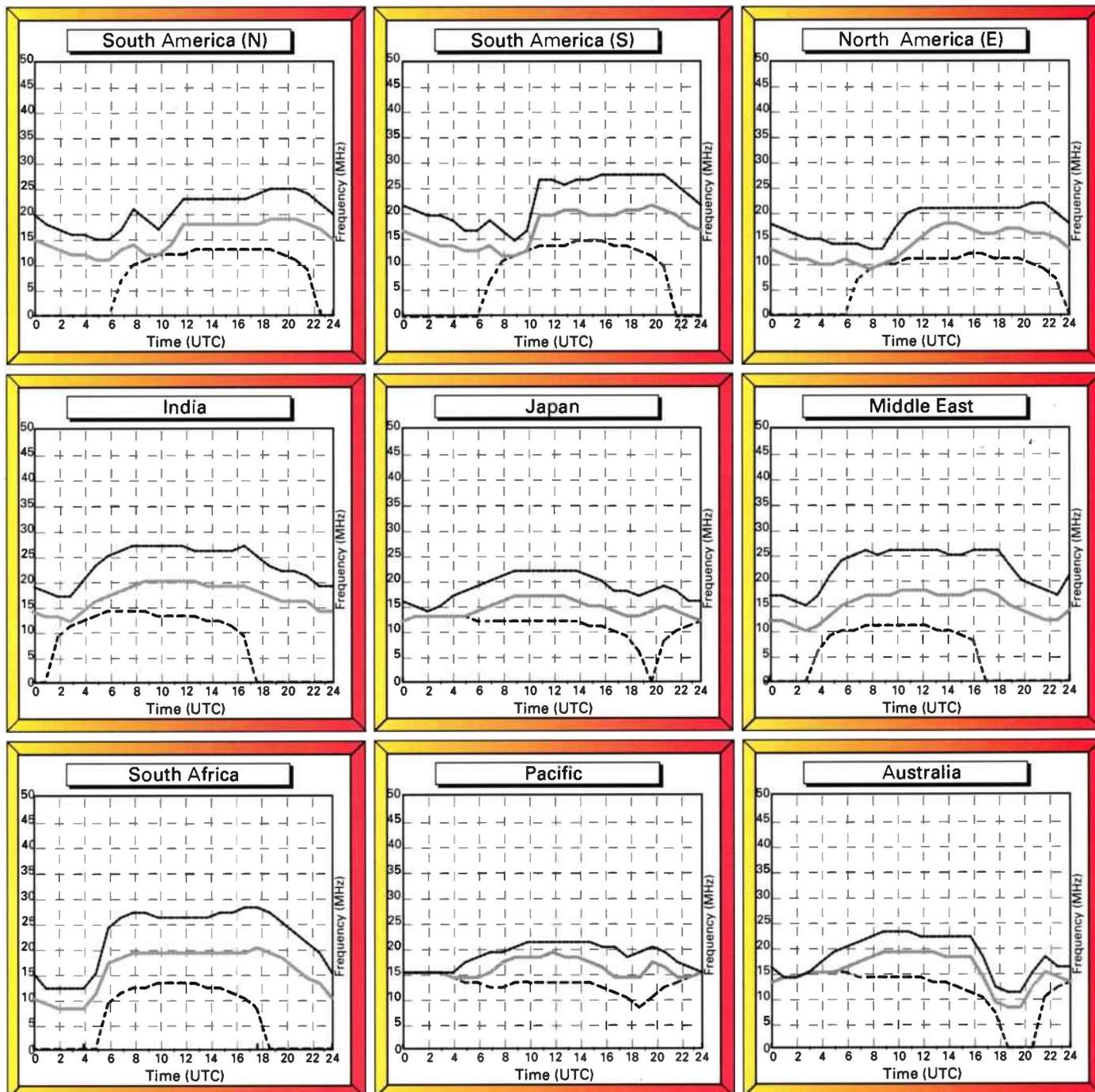
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

probability of success for the path and time.

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

Good luck and happy listening.

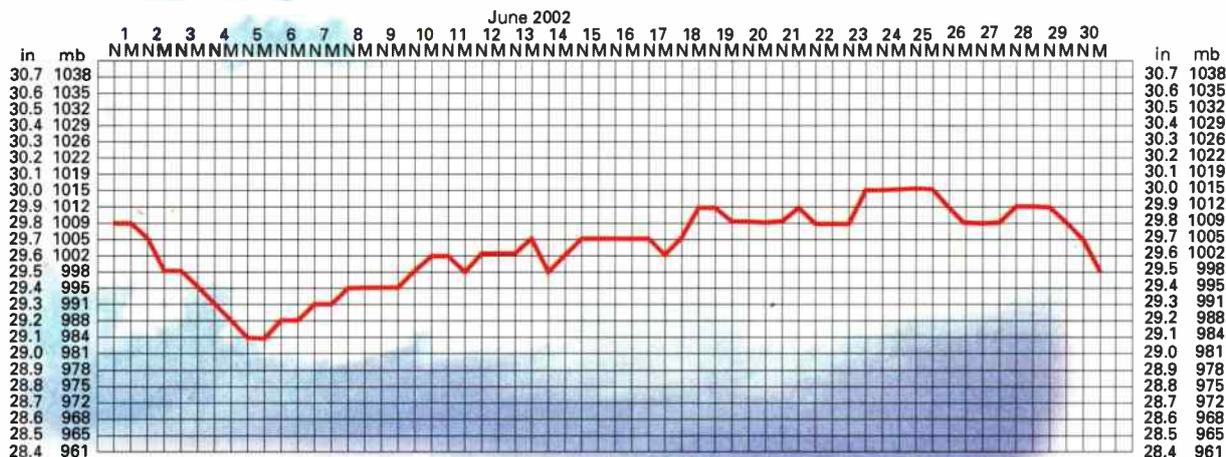
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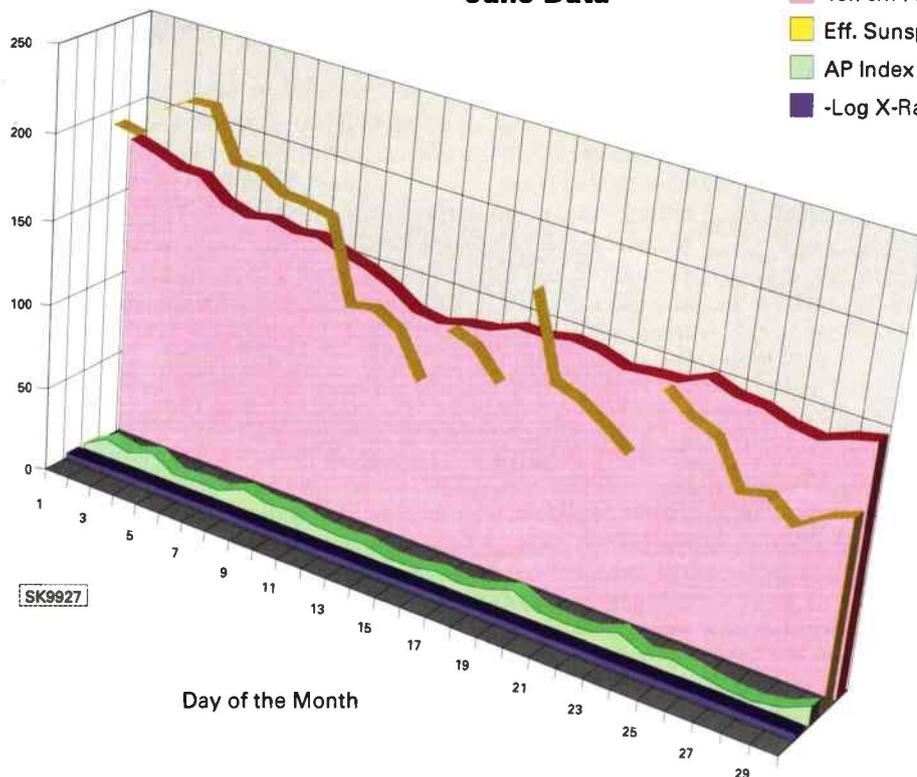
Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, June 2002.



June Data

- 10.7cm Flux
- Eff. Sunspot No.
- AP Index
- Log X-Ray



guide to the chart

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

The K and AP indices are measures of geomagnetic activity.

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

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

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

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Attention-123!

ENIGMA Control List

We have never before revealed this list in the pages of *SWM* and we thought that perhaps it would help readers learn the wide range of stations still active, their 'family groups' and basic characteristics. First of all, all stations are given a prefix as follows:- M = Morse, E = English, G = German, S = all Slavic languages, V = any other transmissions which cannot be classified as being either Morse or voice, e.g. Polytone.

Normally these prefixes are followed by a serial number identifying a particular station. Following this, there may be an alphabetic suffix, usually A, B, C, etc. This refers to a particular format variant of the same station. This, very briefly, explains how the ENIGMA station naming system operates. For fuller details (and the reasoning behind it), please consult our two booklets. The following is the list of known families (f = single group, F = paired, Ff = triple - format variants not given here.

Family	Organisation/Country	Members
I	KGB/GRU/FSB/SOUD	1a: M14, E6, E17, E20, G6, S6, S25, V6, V23
	FAPSI	1b: M12, E7, G7, S7, V7, XP
		1c: M18, M21, M32, M42, MX, S13, S14, S28, S30, X6
II	CIA/NSA?	E5, E14, E21, G5, V5, V14
III	E. Europe	M3, E11, G10, G11, S11, S12, S26
IV	Austria	M2, E12, G12, V12, V18
V	CIA (E. Europe destabilising ops)	E13, G13
VI	BND (FRG)	M15, G14, G15, G16, E16
VII	E. Europe	M17, S1, S2, E1, X1
VIII	Yugoslavia	M27, S8
IX	Czech	IXa: M7, M10, G18, S10
		IXb: M6, S5, S15, S16
		IXc: M39, S17, S18, S19, S31
X	MI6/SIS (UK)	M5, E3
XI	Central Europe	M4, G2, E23
XII	Egypt	E9, V8
XIII	Central Europe	M29, G4
XIV	Russia	M1, M45, M50, S21, S27
XV	E. Europe	M13, E18, G22, S4
XVI	Romania	M48, M63, V1, V17?
XVII	DDR	M41?, M49, G17, G3, G8
XVIII	Cuba	M8, E17y (Russian), V2
XIX	France	M16, M33, M51

All other stations (a large number), not listed here, have not been identified as belonging to any of the above families, although many may well do. All stations still believed to be active are marked above in bold typeface. Other stations which

should be mentioned here, purely because of their high levels of activity are **M23** (Western: British?), **M26** and **M34** (unknown origin), **M53** (N. Korean?), **M76** (European?), **MX** (Russian), **E10** (Israelia Mossad), **E15** (Egyptian?), **E25** (in Arabic) and **V13** (Taiwan).

Starting with Morse stations, those currently operating include:

Family	Ref	Comments	Counterparts
I	M1	2-tone MCW, hand-keyed, 5F, ends 3F 2 or 3F 000	S21
	M1a	end-of-month variants	
	M1b	as M1a, but with message	
	M1c	other (non-scheduled) variants, usually only 10 grps	
	M1d	1kHz MCW, auto-keyed	
III	M3	5f, ends == 000	E11, G11, S11
	M3a	with triplet element: 111 or 333	
IXa	M7	MCW, tone sequence, 5F, ends 2F 2F 000	S10, M10
XVIII	M8	cut numbers, ends AR AR AR SK SK SK	V2
	M8a	3 msgs, each 150 grps	V2a
IXa	M10	5F, ends == 2F 2 or 3F 000	S10d
	M10a	ends triplet 000	
	M10b	additional grps, ends triplet 000	
	M10c	5Ff headers x 3 (encrypted)	S10
	M10d	GC sent 3 times, hand-keyed, no ending	
	M10e	5Ff headers x 3, GC 3 times, ends == 000	S10e

We'll continue the Control List in future issues. Meanwhile, if any readers would like to contact ENIGMA 2000's groupsite, here's the address:

<http://groups.yahoo.com/group/enigma2000> The Newsletter can be downloaded from there as well as the Control List, etc. Incidentally, since the 1st May the Czech control station, **S17c**, now transmits daily on the new frequency of 6.760MHz at the usual time, but reception in UK is poor due to QRM.

I mentioned a very long running M23 schedule (579) last time around. GD of Portsmouth writes in to say that **M3**'s daily 287 schedule at 1630 (at present 7.377MHz) has been around since 1997. Actually, I have logs of it dating back to as long ago as 1995, but these were later in the evening at 2000. Nor am I certain that it has continued without a break since then, so I'm not sure whether we can count this as the same schedule. Be that as it may, 287 has never yet been known to send a message!

Also reported is an **M13** schedule (303) which on 18th and 19th May sent an enormously long message of **469** groups (Message Serial No. 266). I wonder how long this took, for this station sends very slowly! This schedule appears on the first and third Saturday and Sunday of each month at 0230, using Schedule No. 767 for normal length messages and 303 for long ones. March/April frequency: 5.867MHz; May/June: 6.715MHz. So, look higher for July/August - probably we'll find it around 7.600 to 7.900MHz.

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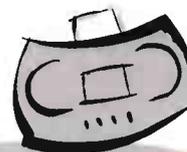
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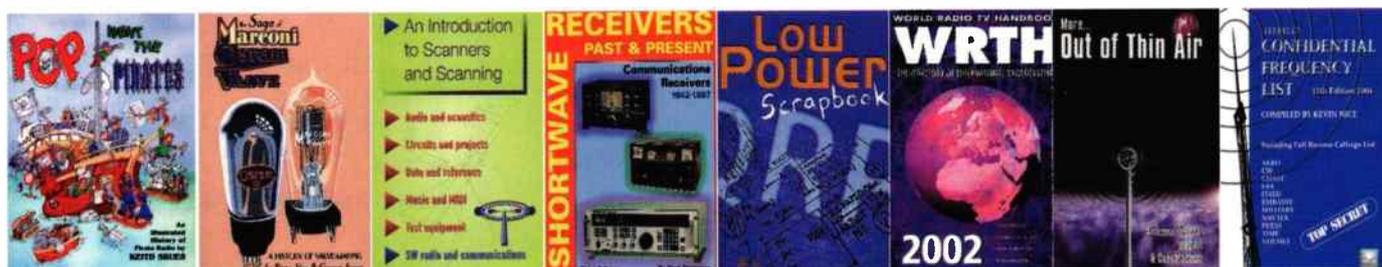
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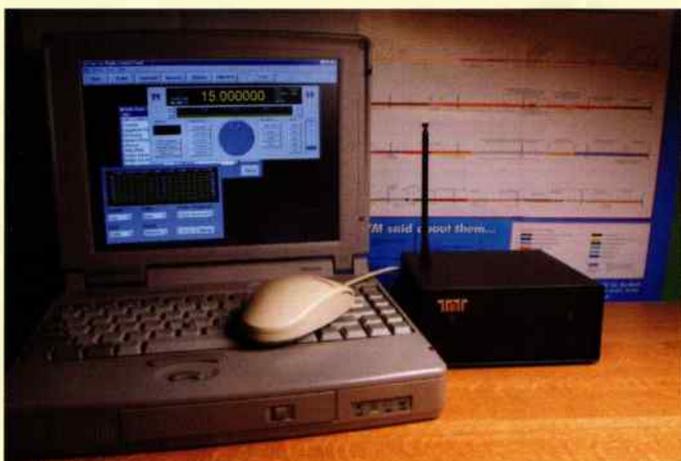
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