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shortwave magazine

July 1995 £2.25 ISSN 0037 - 4261



Reviewed:

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100th issue in the
Editor's hotseat!*

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Cover Subject

The Purple Station main transmitting mast of the Decca Navigator, English Chain. Photograph reproduced by courtesy of Racal-Decca.



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Good Listening

SWM SERVICES

Subscriptions

Subscriptions are available at £25 per annum to UK addresses, £28 in Europe and £30 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 £42(UK) £47 (Europe) and £51 (rest of world).

Components for SWM Projects

In general all components used in constructing SWM projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

The printed circuit boards for SWM projects are available from the SWM PCB Service, Badger Boards, 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: 0121 - 384 2473.

Photocopies and 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, or whatever 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 are £2.30 each, photocopies are also £2.30 per article, plus £0.50 for subsequent parts of serial articles.

Binders, each taking one volume are available for £5.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for back numbers, binders and items from our Book Service should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling.

Credit card orders (Access, Mastercard, Eurocard 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 Poole (01202) 659950.

Technical Help

We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. If you require help with problems relating to topics covered by SWM, please write to the Editorial Offices, we will do our best to help and reply by mail.

editorial

The Internet

Now that we have had some experience with our Internet address for E-mail I feel that it is essential or me to make some observations on how it is working.

Editing and publishing a magazine, such as SWM, in today's economic climate is far from easy. One of the major headaches is finding the time to answer the mail - of any type - with the Editorial staffing levels needed to work within tight budgets. All letters that come into the Editorial Offices are logged in the Post Book, read and sorted into categories - those that need an immediate answer, those that need an answer sometime, those that are suitable for the 'Letters' pages and those that are sent for information only.

The first category will be replied to in accordance with their urgency. The second type are placed in a queue to be answered as and when time is available for the necessary research to be carried out - it takes many hours to search through the archives for articles and projects that may, or may not, have been published in the 58 years since SWM was launched. The third category will appear in print at some time while to the writers of the fourth type I would say "thank you, but you may not get a reply". As an aside, if you write to the magazine but do not want your letter considered for publications, you must mark it 'not for publication'.

However, E-mail has added a fifth category. Senders of E-mail seem to expect that they are entitled to a reply come what may! In the Editorial Offices, E-mail has to be treated no differently to ordinary mail. It needs to be down-loaded, printed out and logged into the Post Book before being distributed to the addressee. It then is put into one of the four categories above.

Imagine this scenario - Johnny Listener sends me an E-mail via the Internet, expecting an instant reply. It is downloaded during either the morning or afternoon-Internet session. The message reads "Hi Dick, Just testing your Internet address". I open the message on my Mac, read it, prepare a reply - "Hi Johnny, thanks for the message - it works" - and get it sent back to Johnny. Johnny now reads it and, of course, replies with another message, to which I reply because it is expected.... What a waste of time and money - 'nuff said!

Other Hobbies

It is some time now since SWM carried an article on other hobbies. In this issue I am pleased to present the other interest of our Decode expert, Mike Richards L.R.P.S. I don't know where he finds the time for serious photography as his Decode readers keep him fully occupied - let alone earning a living to keep Elaine and the little Richards in the manner to which they are accustomed!



Dick Ganderton G8VHF

Dick Ganderton G8VHF

letters

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to any other magazines. The views expressed in letters published in this magazine are not necessarily those of *Short Wave Magazine*.

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER US PUBLISHED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE

Dear Sir

I found your recent report on the Howes AB118 active airband antenna very interesting. So much so, that I bought the ready-made version the very next day. I work at Stansted Airport and follow the airband mode with much interest.

However, my biggest problem so far has been to find a base antenna, that can supply the performance requires. In my quest for such a unit, I have constructed many variants and spent much money, all to no avail.

My worst problem was overkill from other signals. I'm not more than 20km from Stansted, but nevertheless, I have still found it very difficult to find a good all round clear signal. That is however, (thanks to yourself and Howes) no longer the case.

This AB118 is excellent. I have received signals at home, from works vehicles on the apron and runway areas, that have been not heard whilst on duty at work. As you can imagine, this is very pleasing. The signals are all clear and strength 5 in most cases.

I am not very electrically minded, but, however, did not find the final assembly too difficult. Thanks to your excellent well put together article and Howe's instructions, I have since passed my opinion to Howes as well.

Anyway, enough said. Ten out of ten to SWM and Bob Sayers.

**S. J. Gildersleve
Chipping Ongar**

Just goes to show how important an effective antenna is. Pleased to have pointed you in the right direction.

Dear Sir

I wish to make contact with anyone in Leeds with a computer controlling an h.f. receiver and also an a.m./f.m. receiver, that would be willing to show a 48 year old what can be gained by using a computer in this way. I have an AOR 3030 plus a Yaesu 965, both of which have a computer port, my main interest in airband. Please would any one who is interested in offering me assistance telephone **0113-270 7964**.

**John
Leeds**

Dear Sir

Home Insurances for Radio Enthusiasts

The letter from Mr M. Gardiner of Hedge End in the April 1995 of *Short Wave Magazine* gives great cause for concern.

It is very surprising that a Home Contents Policy excludes equipment whilst within the four walls of the house for any hobby - other than when there is a more specific insurance available, such as for cars, boat and aircraft.

Whilst some insurers will ask for specific information relating to the total value of 'valuables' (and not all insurers will consider electronic equipment to be valuables), I would always recommend that the insurers be alerted to any disproportionate value of any items non-essential to daily living.

For example, if you insured the contents of your home for only £10 000 and you anticipate that this includes a collection of Royal Doulton figurines at £5 000 this could be determined to be a material fact, which for your own satisfaction you should check is covered.

'All Risks' cover would ordinarily be available for items of electronic transmitting/listening equipment, subject to their being specified within the Policy. 'All Risks' cover will include damage or loss whilst away from the home. My advice is to contact your local Insurance Broker and discuss your specific requirements. Please be aware that not all insurance intermediaries are qualified as Insurance Brokers.

David J. Morris ACII

Chartered Insurance Practitioner

J. L. Morris (Insurance Brokers) Limited
Bournemouth

Dear Sir

I wonder if any readers could suggest a supply of computer software and hardware for my Commodore 64 computer?

I wish to locate programs for SSTV (Slow Scan TV), FAX and Packet Radio.

All the adverts in *SWM*, etc. are only for IBM Compatible machines, not C64. Can anyone help?

Adrian G71QJ

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.

Dear Sir

Having just picked up my copy of May *SWM*. I was interested to see a letter from Mr Joe Maitland of Milton Keynes, regarding the Realistic DX390. I purchased this particular model from my local 'Tandy' store in Middlesbrough about two and half years ago. At the time, I was a complete newcomer to listening. I had been introduced by a colleague at work. I find the receiver quite satisfactory for almost all my monitoring, except between 520-1710kHz, here I feel that the performance could be better. I use about 8m of wire end fed via a 3.5mm jack plug. Though I don't use an a.t.u.. If Joe wishes I have the manual printed in English and French which he may borrow.

Finally many congratulations on your excellent magazine, which I look forward to every month - long may it continue. My best wishes to you all.

Dave Neale
Middlesbrough

*Thank you for your kind compliments about *SWM*, we try very hard to produce a magazine which has wide appeal. If you send your manual to me at the Editorial Offices, then we can forward it to Joe, thanks for the kind offer - KN.*

Dear Sir

My heartfelt sympathies go out to the gentleman from Didcot who suffers data noise when using his receiver. Although Fire Brigades do use data between the base and their appliances, I wonder if the interference experienced is from the Mercury National Paging Network.

The frequencies used by Mercury are 138.0750 and 138.1750MHz nationally, can and do cause interference to most wideband receivers.

As a radio amateur, this causes great problems on the 2m band and I know I am not alone, many amateurs suffer this interference as well. I have also heard some p.m.r. equipment experience this burst of data, especially when in close proximity to the transmitting antennas.

However, the local Fire Brigade, who were one of the first in the country to use data transmissions I am pleased to say, do not affect me or any others I have spoken to, including those near to a Fire Station.

I hope that this letter is of some help to your readers who may be experiencing bursts of data across the v.h.f. spectrum or when listening to the airband.

I wonder if I could be cheeky and plug through this letter this year's Amateur Radio Station at the Town and County Festival, Stoneleigh, Warwickshire, during the August Bank Holiday weekend (26-29 August). The callsign to listen out for will be GB4TCF. We will be operating on the usual h.f. bands, 2m, possibly 70cm 'phone and packet on 2m and 70cm. Due to some major changes to the Royal Showground, we have moved from our usual location to a superb building overlooking the Grand Ring on Avenue F between 6 and 7th Street.

Mike Beaumont G4VCX
Coventry

Cheeky, yes, but there's the plug - might even see you there! - KN. On the interference point, I look forward to hearing from readers regarding their specific interference problems. If there is a large response, then we might be able to persue this cause.

Dear Sir

I have read with interest some of your readers' views on reception qualities for various makes of receivers. As everyone well knows, what one person thinks of as a marvellous piece of equipment, could be treated as a glorified baked bean can by another!

I have owned a Philips D2935 receiver for about five years and although it is getting a bit long in the tooth, I would be hard pushed to get such great audio quality from a cheap up-to-date radio. Many radio friends have told me that the D2935 is not a DX machine, being rather too cheap and cheerful for the serious listener. Fair comment maybe, but I have logged (and have had reception reports verified) a.m. stations in North America, such as WTOP Washington, WEVD New York and WSSH Boston, by using the built-in rod antenna only!

A Drake SW8 and a Kiwa medium wave loop would be nice, but I think I'll be using my trusty bargain basement Philips for a few more years yet!

Tony Vaughan
Southampton

Tony, you only have to look at the equipment list in Brian Oddy's 'LM&S' column on page 79 to see that you don't need exotic equipment to receive DX stations. What you do need is a location with a low background noise level and a lot of patience. Many hours of 'dial searching' are needed to catch that elusive station as I'm sure you're already aware. However please don't let me put you off the higher specification receiver. The benefits of the feature loaded r.x. are many fold. Such niceties as digital displays, high quality, low noise synthesisers, variable i.f. bandwidths, variable tuning rates and so on are well worth having. There is no substitute for patience and tenacity though! - KN.

International HF Convention

The 1995 International HF Convention is being organised by the HF Committee of the RSGB in association with the HF Contest & IOTA Committees, and the Chiltern DX Club. The Convention to be held on Saturday 9 and Sunday 10 September 1995, is located at The Beaumont Conference Centre, just a few minutes drive from the M25 and Heathrow Airport. Nearby is Windsor, with its famous castle and shopping facilities a must.

There is an extensive programme planned, with talks on topics such as DXpeditions, equipment, EMC, antennas and DXing, etc. There will be the latest amateur radio software available plus equipment displays by major manufacturers, a Young Amateur of the Year award and a programme for the ladies, plus a Saturday evening DX dinner.

A full Convention Prospectus will be available shortly, which will include an advance booking form. Send an s.a.e. to **Marcia Brimson, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE** for more information.

SAIL 1995

From the 10-14 August, Amsterdam will be visited by the most beautiful tall ships and sailing boats of the world. Just as in 1990, de radioclub Amstelland will have three stations on the air during this event.

The callsigns of the three stations are **PA6AMS**, **PA6TER** and **PA6DAM** and the club will be operating on h.f., v.h.f. and u.h.f., from 0800 until 2000UTC.

There is a full colour certificate available, which pictures the Dutch East Indian Track Ship *Amsterdam*. To obtain this certificate there are a number of conditions to be complied with:

1. You must contact all three stations.
2. You must send, with your request, you must send a photocopy of your log.
3. SWLs must report the PA6 station and the station it was in contact with.

The cost of the certificate is US\$6. This must be enclosed in the envelope with your request (no IRCs or cheques). The certificate manager is **Rob de Visser PA3AGT, Gloriant straat 17, 1055 CV, Amsterdam**.

The final date for applying for this certificate is 30 September 1995.



(Left to right) Gareth Williams, Chester LIONS, Tony Lewis G6LBC, Graham Pemberton G7NEH, Peter Baston GW0PJA, Clive Trotman GW4YKL (RSGB President) and Gordon Smith, Lord Mayor of Chester.

RAYNET Rescue

At the Lord Mayor's Show and Festival of Transport, held on the Roodee Race Course at Chester on Sunday 14 May 1995, the President of the RSGB, Clive Trotman GW4YKL, made a presentation, recognising the efforts of three members of West Cheshire RAYNET in effecting the rescue of 12 year old Alfie McLelland, a young North Wales cyclist, from a swollen river, after he had plunged down a mountain side at Loggerheads Visitor Centre, near Mold, in December 1993.

The three involved were **Tony Lewis G6LBC** of Chester, **Graham Pemberton G7NEH** of Tarvin and **Peter Baston GW0PJA** of Penn-y-fford. Clive Trotman made a short speech praising their efforts, then presented each of them with framed RSGB certificates, incorporating a letter of commendation, along with a personal keepsake from Alfie, in the form of a small, engraved plaque.

If you would like more information, you can contact **David G. C. Hicks G6IFA at 12 Toll Bar Road, Christleton, Chester CH3 5QX** or **Paul Mann G7OJA** (West Cheshire RAYNET Group Controller) on **0151-327 4720 (home)** or **(01925) 730777 (office)**.

New BBC Relay Station

Ceremonies to mark the building of the new BBC short wave relay station 12km north of Nakhon Sawan took place on Monday May 8. The transmitter is being built with co-operation between the BBC World Service and the Government of the Kingdom of Thailand.

The new relay station, when built, will be within range of BBC radio programmes relayed from Nakhon Sawan, improving audibility for more than two billion people, some 40% of the world's population. The £30m (1155m Baht) relay station with four 250kW transmitters will serve large parts of South Asia and China.

When the station is fully operational, it will carry BBC radio broadcasts in up to ten languages, including English, and will reach potential radio listeners everywhere from Bombay to Beijing. The project will also provide employment for local Thai people.

On completion of the station, there will be just two British staff based at the transmitter site, including the station manager. Also, an on-site programme will train Thais to operate and maintain the station.



Villagers gathered at the site for the BBC World Service's new relay transmitter in Thailand. Bob Phillis, Chairman of BBC Worldwide, is standing second from left, front row.

As part of the overall agreement, the BBC World Service is supplying a broadcast training package for the Public Relations Department and Radio Thailand. It includes funding for a National Institute of Broadcast Training, plus a 20 year training programme for Radio Thailand staff in both Bangkok and the United Kingdom. The first of the training programmes took place in Bangkok earlier this year.

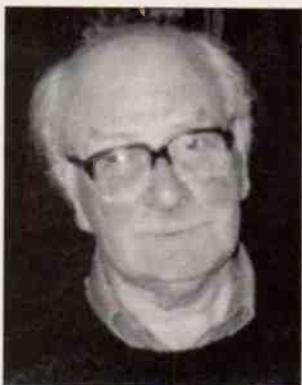
Obituary

We were recently informed of the sad death of *SWM* author Bill Wilson

Bill Wilson was born on the Isle of Lewis in 1927, the seventh child of a lighthouse keeper. In 1932 his family moved to Aberdeen where he later attended Aberdeen Central School. In 1952 he obtained his Diploma in Art and Design from Gray's School of Art. He received a Royal Society of Arts Bursary in 1951, the first time this award had been made to a student from a Scottish art college. His working life was spent as a teacher of art and design in Aberdeen City schools. He was appointed Principal Teacher of Art very early in his teaching career. In 1987 he was seconded to Grampian Region Schools as graphic designer for the Education Resources Department.

In his art school days Bill developed a flair for the design and construction of radio equipment without any formal training in electrical or electronic engineering. Although never a licensed radio amateur, he was a long standing member of Aberdeen Amateur Radio Society and was always keen to assist and encourage younger members and anyone who displayed a willingness to learn. Bill has maintained an avid and evolving interest in both amateur and professional radio and electronics design. His articles for *SWM* combined his graphic skills with his creative electronics design abilities and were usually illustrated with his own diagrams and photographs.

Bill is survived by his wife Joan, sons John and Robin, and daughter Liz.



Mauritron Mania

The Catalogue of Technical Books, edition 24, by Mauritron Technical Services has recently landed on the *SWM* Newsdesk. It's packed with details of service manuals for most equipment, videos, televisions,

cameras, amateur radio equipment, music systems, test equipment, kitchen appliances, the list is endless!

Mauritron also inform us that they have an Index of their service manuals on floppy disc for use in your PC. There is a listing of thousands of manuals by make model, type of equipment, price, etc. It's an essential aid if you need information regularly.

Mauritron can be reached at **8 Cherry Tree Road, Chinnor, Oxfordshire OX9 4QY. Tel: (01844) 351694 or Fax: (01844) 352554.**

Short Wave Magazine, July 1995



news

Radio and TV DX News

Attention all TVDXers - the infamous 'D100' DX TV receiver system unit has now been upgraded, there are two models available. The 'Super-2', £129.95 inc. p.s.u. and P&P (UK), features auto bandwidth - the received bandwidth varies relating to signal strength to optimise weak signal reception with a narrow bandwidth, widening to offer greater quality as the signal strength increases. Improved calibration at u.h.f. is available with a split band technique which also creates coverage across the gaps above 100MHz and above Band 3 to 300MHz, useful for overseas readers with non-European allocations. The 'Super-X', £138.95 inc. p.s.u. and UK P&P, has additional features, including breakout points for tuning voltage measurement. All the selectivity/audio subcarrier tune/bandscan still included. Full information is available from **HS Publications, 7 Epping Close, Mackworth Estate, Derby DE3 4HR** (include SAE) or Tel: (01332) 381699 at sensible hours.

The BBC Digital Audio Broadcasting (DAB) service opens September 1995 initially across London but spreading to 60% UK population within three years. Eddystone Radio Ltd (now part of GEC) will be manufacturing and installing the first phase of the transmission network which operates in the upper part of Band 3 (the old 405 line ITV band).

Television will arrive for the first time in the Solomon Islands in Autumn 1995, with a small studio established in the capital town of Honiara.

Racal are now offering a radio system that will transmit quality video images over established narrow band radio channels using compression methods differing from the well known MPEG. The effective transmit range is similar to voice and both colour images and SSTV can be sent using this method with ranges up to 4 times that of conventional wideband TV transmission. Racal suggest that the product will be available early 1996.

Vodafone have received a town planning award following their utilisation of Horton Tower, Cranborne, in Dorset. This is a grade II 17th century listed building which required major repairs, Vodafone wanted the site for cellular antennas - they paid the cash, strapped on their antenna cluster and collected the award.

The York police are several steps ahead of scanner wielding criminals, all police officers are now using Hutchinson Telecom Message personal pagers accessing the Paknet packet data network which cannot be monitored on

conventional scanners. The system provides single officer communication access, routing to all officers 'on the beat' or localised area contact. Scanners in York cannot receive police communications so advises the press release - an interesting comment is that all pubs seeking licence renewal must take membership on the paging network allowing a 'pubnet' exchange of troublesome customers.

'Kosmos 10' is a new TV station operating in Moscow on ch.R51 during the 1900-2300 local time spot and can be received up to 25km distant currently though an increased in e.r.p. is anticipated later next year.

Telenor that operate the NRK/TV2/P4 transmitters in Norway comment the reason for Band 1 closedown is that Norway's Telecomms. administration sought ending of Band 1 TV to use the band for other services. Additionally the technical quality seen on the new TV2 u.h.f. network was better than the NRK system, mainly due to lack of Band 1 interference. It is deemed essential that NRK programming enjoys optimum quality and hence the move to u.h.f. In 1995 3 parallel operating u.h.f. transmitters at Band 1 sites will be opened and gradually more u.h.f. outlets will be commissioned at all Band 1 sites. No Band 1 transmitters will close before Summer 1997. Recent discussions over frequency allocations within the amateur radio service in Europe suggest that the present 430-440MHz band be reduced by 2MHz each end and that all ATV fast scan TV move to frequencies about 1GHz. A small allocation at 40.68 and around 60MHz (once TV in Band 1 has ceased!) to be established for beacon use as an aid to propagation research.

Israel and Jordan may open a joint cultural TV channel (similar to the Arte Franco/German offering) initially transmitting up to 3 hours daytime in Hebrew and Arabic. Finance will be obtained from respective governments and possible a licence fee, application for US and European funding may be made later.

The Polish radio/TV licensing authorities are inviting tenders for more local and regional transmitters with up to 370 radio frequencies and 30 TV channels on offer. In the first round of broadcast licences applications some 18 months ago 140 permits were granted.

The upcoming solar cycle 23 is predicted as peaking Autumn 1999 or just into the new century year 2000 with a smoothed high predicted just under 200 spots.

National Transmitter News

May 9, Orpington, Kent, a new television relay transmitter opened, provided jointly by the BBC and the ITC. The station is located on a 45m mast, adjacent to the railway line near the bridge over Sevenoaks Road. It is designed to bring good television and teletext reception to about 1800 people to the west of Sevenoaks Road. It covers from Station Road in the north to Oakleigh Gardens in the South, and extends westwards to the Tubbenden Lane/Tubbenden Close area, plus Sevenoaks Road itself in the area around Orpington Hospital.

Viewers wishing to use the new Orpington relay should consult a local television dealer or aerial contractor, but reception advice is also available from ITC Engineering and BBC Engineering Information at the addresses below.

Station Details

Channels:	BBC 1 (South East)	55
	BBC 2	62
	ITV (LWT/Carlton)	59
	Channel4	66
Antenna Group:	C/D	
Polarisation:	Vertical	
Effective Radiated Power:	15W	

Reception advice is available from either:

BBC Engineering Information Villiers House The Broadway Ealing London W5 2PA Tel: 0181-231 9191	ITC Engineering Information Kings Worthy Court Kings Worthy Winchester Hants SO23 7DA Tel: (01962) 848647.
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Oops

If you are planning on building the Super-Regenerative VHF Receiver from the May and June issue, you will need the correct p.c.b. artwork. Unfortunately the gremlins were at play again and made some of the tracks appear white! The corrected artwork can be found on page 71 in this issue.

grassroots

* Short Wave Magazine & Practical Wireless in attendance

rallies

* **June 23-25:** Ham Radio '95 Friedrichshafen, Germany. The largest amateur radio show in Europe, and well worth a visit. The Flea Market alone is worth the journey and Friedrichshafen, situated on the Bodensee - Lake Constance to the English - and within easy reach of Austria and Switzerland, is a fantastic area for a holiday.

* **June 25:** The 38th Longleat Amateur Radio Rally. Trade stands, club stands, free parking, catering and bar on site. Large Bring & Buy. £2.50 entrance fee for adults, £2 for OAPs and 50p for children. Further details from **Gordon Lindsay GOKGL** on 0117-940 2950.

July 2: The 6th York Radio Rally will be held in the Tattersall Building, York Racecourse, York. Doors open at 10.30am. Admission is £1.50. Children accompanied with adult FREE. Ample free parking. Amateur radio, electronics and computers. Morse tests and Repeater Groups. Refreshments and licensed bar. Talk-in on S22. **Dave Moreland G7FGA** (01904) 790079.

* **July 8:** Cornish Radio Rally & Computer Fair. For further information contact **Ken G0FC** on (01209) 821073.

July 9: The 1995 Sussex Amateur Radio and Computer Fair will be held at Brighton Racecourse, Sussex. Doors open at 10.30am to 4pm. This event brings together the best in amateur radio and computer technology. Admission is £1.50. There will be a free car park, a giant Bring & Buy, a bar and a talk-in on S22. Further details from **Ron Bray G8VEH, QTHR** on (01903) 763978 or (01273) 417756 office hours.

July 9: The Horncastle Amateur Radio and Computer Fair will be holding their Rally at the Grammar School Sports Hall. Horncastle is half way between Lincoln and Skegness on the A158 trunk road. For more information, you can ring **Tony Nightingale** on (01507) 522482.

July 9: The Galway Radio Experimenters Club are holding their annual radio rally at the Convent of Mercy School, Newtownsmyth, Galways. Admission is only £1 and refreshments will be available. There will be an abundance of equipment on radio, computers and electronics. More information can be obtained from **John Walsh** (Secretary) on 010-353-93-24913.

July 16: The Norfolk RAYNET Barford Rally will be held at the Village Hall, Barford, on B1108, Norwich to Watton Road. Doors open 10.30am to 3.30pm. There will be trade stands, a raffle and refreshments. Free car parking and talk-in on S22. Further details on (01603) 625833 daytime or (01626) 820820 evenings.

July 16: The 12th McMichael Rally and Car Boot Sale will take place at the Haymill Youth and Community Centre, Burnham Lane, Slough, near Burnham Railway Station. Talk-in on S22. Doors open at 10.30am. Admission is £1.50. For more details contact **Dave G3SET** on (01628) 486554.

July 23: Britain's biggest Outdoor and Leisure Show is due to take place at Powderham Castle, Nr. Exeter, Devon between 10am and 6pm. The show is situated in the grounds of the magnificent Powderham Castle on the edge of the River Exe. The show has a variety of different sections to cater for all, new and used sailing and power boats, used boat jumble, new equipment and lots more. There is to be an amateur radio section (new and used equipment) and a special event station is planned. Any enquiries to: **The Outdoor Boat and Leisure Show Ltd.**, c/o The Estate Office, Powderham Castle, Exeter, Devon EX6 8JQ or you can ring (01626) 890243.

July 29: Computer Fairs (Northern) held at the Clayton Arms Sports Hall, Fulwood Park Road, Boundary Park, Oldham (next to Oldham Athletic Football Club). There is free parking. There will be a Bring & Buy stall and computer games, etc. Admission is £2 for adults, £1 children/OAPs and £5 for families. Doors open 10am to 3pm. 0161-627 2502.

* **July 30:** Scarborough Amateur Radio Society will be holding their Radio Electronics and Computer Rally at the Spa, South Foreshore, Scarborough. Doors open at 11am. There will be many traders a Bring & Buy, refreshments and a bar. **Ross Neilson G4ZNE** on (01377) 257074.

July 30: The Rugby ATS are holding their 7th annual Amateur Radio Rally at the BP Truckstop on the A5, three miles east of Rugby and just 2.5 miles north west from junction 18 on the M1 motorway. Doors open from 10am and admission is £1 per car. Facilities include a good cafeteria and toilets. Talk-in on S22 by GB7RRR. **Peter** (01455) 552449.

* **August 6:** The RSGB Woburn Rally is being held at Woburn Abbey, Bedfordshire. Further details from **Norman Miller G3MNV** on (01277) 225563.

* **August 13:** Flight Refuelling ARS Hamfest '95 will take place at the Flight Refuelling Sports Ground, Merley, Wimborne. The event will run from 10am to 5pm and will include the usual mix of traders, Bring & Buy, craft exhibitors, car boot sale and field events. Talk-in on S22. New traffic routing - please follow signs. **Richard Hogan G4VCQ** (01202) 691021.

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

AVON

Bristol International RC: Tuesdays, 8pm. The Fighting Cocks Public House, Hengrave. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers can get together and have a good night and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. June 27 - Half yearly AGM, July 25 - The Internet. Dave Bailey G4NKT. 0117-967 2124.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridger Farm House, East Dundry Rd, Whitchurch. June 25 - Longleat Rally, 28th - Judging of home construction contest, July 5 - 10m activity evening, 12th - Gardening with aerials and flowers, 19th - Club 'Bullseye' contest, 26th - 70cm activity evening and committee meeting. For more information ring (01275) 834282 on a Wednesday evening. G1GSN. (01462) 700618

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 8pm. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). July 5 - Operating techniques, 19th - Discussion evening. Ivan Eamus G3KLT. (01296) 437720.

DERBYSHIRE

Derby & DARS: Wednesdays, 7.30pm. 119 Green Lane, Derby. July 5 - Junk sale, 19th - The Internet - how it works - illustrated talk by Cindy Copsey of INNOTS. Mrs Hayley Winfield, 2 Hills Cottages, Crich, Matlock, Derbyshire DE4 5DD. (01773) 856904.

South Normanton & Alfreton DARC: The Community Centre, New Street, South Normanton, Derbyshire. June 26 - Night on the air 'High Ordish', July 3 - 70cms fox hunt (bring in the Novices), 10th - Talk on Barundi by Lorri Partington, 17th - Junk sale, 24th - Railways and the mail - talk by Harold Wilson. Helen Coleyshaw 2EIAWJ (01332) 881549.

DEVON

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. June 23 - Modern telecommunications by John G3YCH, July 21 - Talk on Japanese intercept (secret Morse code). Peter G4UTO. (01603) 864528.

DORSET

Blackmore Vale ARS: 2nd & 4th Tuesdays, 8pm. Shaftesbury School, Dorset. June 27 - Radio operation/project night, July 11 - Satellite working and demonstration by Geoff Chapman G7RMG, 25th - Club BBQ. Stuart G7JIF (01953) 814055.

EDINBURGH

Lothians RS: 2nd & 4th Wednesdays, 7.30pm. Orwell Lodge Hotel, Polworth Terrace, Edinburgh. June 28 - Skittles night, Sheep's Heid, Duddingston, members and partners. GM4DJ, QTHR on 0131-337 7311.

GRAMPIAN REGION

Aberdeen ARS: Fridays, 8pm. RC Hall, 70 Cairngorm Crescent, Kincorth. June 30 - VHF fox hunt, July 7 - Junk sale. Martin GMOJCN. (01569) 731177.

GREATER LONDON

Crystal Palace & DRC: 3rd Saturdays, 7.30pm. All Saints Church Parish Rooms, Beulah Hill, London SE19. July 1/2 - VHF Field Day contest weekend. Wif G3DSC on 0181-699 5732 or Bob on (01737) 552170.

Edgeware & DRS: Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. June 22 - VHF Field Day briefing, July 1/2 VHF Field Day. Rod Bishop. 0181-204 1868.

Club Secretaries:

Send all details of your club's up-and-coming events to: Lorna Mower, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Please tell us your County and keep the details as brief as possible.

Southgate ARC: 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. June 22 - ROTA, July 13 - Hints & tips from Industry for home-brew by Mr George Squires "Squibb's" G7HGS, 27th - ROTA. M. E. Viney G0ANN. (01707) 850146.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. June 30 - How does it work, questions and answers, July 14 - Construction display, general activity. (01737) 351313.

HAMPSHIRE

Hordean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. June 27 - Microwave communications operating, July 4 - Natter night, 25th - Low power radios for telemetry. S. Swain (01705) 472846.

Winchester ARC: 3rd Fridays, Red Cross Centre, Durgate House, North Walls, Winchester. 7.30pm. July 21 - Dave Dickson G0AYD on antennas. P. Simpkins G3MCL (01962) 865814.

HEREFORD & WORCESTER

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. June 27 - How to go about d.f. hunting, July 11 - 2m d.f. hunt (mobile), 25th - Talk on test equipment. Barry Taylor. (01527) 542266.

HERTFORDSHIRE

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. June 22 - BBQ at Tolmers Scout Camp, July 6 - Night on the air, 20th - Visit to Herefordshire Police HQ. Visitors very welcome. Dave G1CAY on (01992) 460841.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. July 18 - Short talks. A Messenger G0TLK. 0181-777 0420

Maidstone YMCA ARS: Fridays, 8pm. YMCA Sports Centre, Melrose Close, Maidstone, Kent, ME15 6BD. June 23 - Operator training, hands on evening. (01622) 743317.

Medway AR & TS: Fridays, 7.30pm. Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. June 23 - BBQ with Colin G3VVT and Roman evening with Gloria G3VUN. G3VUN, 40 Linwood Avenue, Strood, Rochester, Kent ME2 3TR. (01634) 710023.

LANCASHIRE

Bury RS: Tuesdays, 8pm. The Mosses Centre, Cecil Street, Bury. June 27 - Technical forum and QSO level c.w. class, July 4 - Committee, 25th - Shack night and beginners c.w. class. Laurence G4KLT. 0161-762 9308.

LINCOLNSHIRE

Lincoln SW Club: Wednesdays, 8pm. City Engineer's Club, Waterside South, Lincoln. June 28 - 'The man who was Q' a video and talk by Mrs Fraser-Smith, the widow of the James Bond star. (01427) 788356.

MERSEYSIDE

Wirral ARS: 1st & 3rd Wednesdays at Ivy Farm, Arrowe Park, Birkenhead, Wirral. Informal natter nights on each Tuesday. July 5 - Manned d.f. (2m), 19th - Noises by G. Adams G3LEQ. A. Seed G3FOO on 0151-644 6094.

NORFOLK

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bigbold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. June 28 - From *Boys Own Paper* to *RadCom*, amateur radio

remembrances by Victor Brand G3JNB, July 5 - Night on the air/construction RRP/Morse practice, 12th - DF hunt, 19th - Night on the air/construction RRP/Morse practice, 26th - Video of Old Norwic Jack G3NJO. Mike G4EOL (01603) 789792.

NOTTINGHAMSHIRE

Mansfield ARS: 2nd Mondays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. July 10 - Parachute mobile - a novel way of transmitting whilst parachuting to earth - illustrated talk by Roy Andreang G4CMT. Mick G0UYQ, QTHR on (01623) 792243 or Howard G1JGY, QTHR, (01623) 423697.

OXFORD

Oxford & DARS: 2nd and 4th Thursdays, 7.30pm. The Grove House Club, Grove Street, off Banbury Road, Summertown, Oxford. D.A. Walker G3BLS on (01865) 247311.

Vale of White Horse: 1st Tuesday of each month. 8pm at The Fox, Steventon. Ian White. (01235) 531559.

SHROPSHIRE

Salop ARS: Thursdays, 8pm. Oak Hotel, Shrewsbury. June 29 - NFD preparation night, July 1/2 - NFD, 6th - RAE tuition and workshop evening, 13th - Packet radio with S.P.U.G., 20th - 4th foxhunt. Ian Davies G7SBD, QTHR. (01743) 463711.

SOMERSET

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. June 29 - Committee meeting and club station on the air, July 6 - A QRP Expedition to Hem Island by G3KSK, 13th - Alternative hobbies by G3KSK, 20th - Two metre rigs by G7SDO, 27th - Committee meeting and club station on the air. Cedric White, QTHR. (01258) 473845.

WARWICKSHIRE

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. June 26 - Top Band fox hunt, July 10 - Summer social, 24th - Construction competition. Martin Rhodes G3XZO. (01789) 740073.

WEST MIDLANDS

Sandwell ARC: The Broadway, Warley. RAE class on Monday nights, Morse class on Wednesday nights and RAE Novice class on Thursday nights. Three operating shacks, h.f./v.h.f./u.h.f., Phone, c.w., RTTY, AMTOR, Packet, all bands. Talks, outings, contest and demonstrations. For further information please ring 0121-552 4619/0121-552 4902.

WEST YORKSHIRE

Denby Dale ARS: Wednesdays, 8.30pm. Pie Hall, Wakefield Road, Denby Dale, West Yorkshire. Denby Dale ARS also provides RAE, Morse and Novice RAE classes and is a registered City & Guilds examinations centre for both the RAE and Novice RAE exams. July 5 - Simple and unusual aereals by Gerald G3SDY, 19th - 'Free & Easy' Huddersfield holiday by Paul G0LVF. Further details from the examinations secretary Brenda G4OTE on (01484) 424776 or secretary Kevin G1FYS on (01484) 547553 for club activities.

Keighley ARS: The Ingrow Cricket Club, Ingrow, Keighley. Thursdays, 8pm. June 29 - Cameo evening, July 6 - Natter night, 13th - Packet on the air, 20th - Natter night, 27th - Fox hunt. Kathy G0RLO. (01274) 496222.

Wakefield & DRS: Tuesdays, 8pm. The Ossett Community Centre, Prospect Road, Ossett. July 4 - Video show (Northern Cross Rally), 11th - Treasure hunt, 18th - Pressure Vessels by G7JTH, 25th - On the air. Bob 0113-282 5519 or G3WWF@GB7WRG.

Elaine Richards
PO Box 1863,
Ringwood,
Hants BH24 3XD.

junior listener

Your New Scanner

Are you still trying to get some good results with that scanner you were given at Christmas? You are not the only one. Still, there is a book that can help. I've recently got a copy of *Scanning Secrets* and I'm sure it was written for the newcomer into the hobby.

Let me quote a bit from the introduction and we'll see just how many readers are included. 'OK, so you have your receiver, you've read the instruction book, now what? You've got lots of questions to ask and quite a few things you don't understand. But who to turn to? Take heart, you are not alone, there are thousands of listeners in the world who want to enjoy their hobby but find they need some help or guidance.'

I was really pleased to see that the book is written in a very 'chatty' style, no over complicating of things just to sound clever. To use a well-worn phrase, it was very user friendly. The legality of scanning is very sensibly explained as were things like the difference between scanning and searching, which is something I was a little unclear about.

A large part of the book is taken up with explanations of the various users of the bands, and what to listen for if you are interested in that user. I rather like the marine band and so was interested in seeing what there was written.

Well, the book tells you about v.h.f. radio lighthouses, d.f. services, DECCA navigators, search and rescue and a whole lot more. There is even a chapter about some of the different scanners you will see advertised. There is often a photograph, the specification and a few lines of description about the radio.

If you've got a birthday coming up then I would suggest you put this one on the list, otherwise you may just have to treat yourself to some holiday reading. If you are interested in reading the book then it costs £16.95 plus £1 postage and packing from the SWM Book Store (see pages 87-90.)

Competition Winners



Many thanks for all your entries to the competition and many thanks to Maplin Electronics for the six prizes. The winners are: Peter Carter, Maggie Levett, Gareth Thompson, Andrew Provins, James Alexander and Keith Nolan. The Editorial Offices will be dispatching your headsets as soon as possible. As soon as we can rustle up some more prizes more competitions will follow.

Reporting Your Reception

Once you have started filling in your log book with broadcast stations, amateur stations or whatever else you listen to, what else can you do. Well you can obviously send QSL cards to the stations you have heard and that can be encouraging when you start receiving cards in return. But there is more. Have you tried sending in a report to the various columns in *Short Wave Magazine*, or to one of the specialist listening groups like the ISWL or BDXC? If you have been hearing broadcast stations, why not drop a line to Brian Oddy for his 'Long Medium and Short' column. Write out the best of your log (neatly) with any comments you think will be helpful. Don't forget to add details of your

station and perhaps some details about yourself. For those who log amateur stations, then Paul Essery will be delighted to hear from a new listener. These authors (and others like them) rely on readers to provide them with the details for their columns. Those names you see each month in the magazine aren't a list of professional listeners, they are just like you. Not everyone has logs a mile long full of the most exotic DX, most readers have spent many hours trying to hear just which station is which. You can provide a valuable input to the magazine even if you are only just starting out in the hobby, years of radio experience or your age is no bar when it comes to reporting your

Awards

What better way to celebrate starting out in a hobby than getting a certificate or two for your achievements. The ISWL have sent me details of their award schemes, so I thought I'd mention a few. The States Award: You can get this for verified contact with or reception of stations in the 50 states of the USA. European Award: You need verified contact or reception reports of 50 different countries within the continent of Europe. If you are a broadcast band listener then you only require 35 countries. Century Club: For verified contact/reception of 100 countries as defined on the ISWL Countries List, with additional stickers available for each extra 25 countries up to a maximum of 350. If you want to try for an award, contact: Herbert Yeldham, Awards & Contests manager ISWL, Belle Fleurs, Wade Reach, Walton-on-the-Naze, Essex CO14 8RG.



findings. I look forward to seeing lots of new names appearing over the next few months - give it a try.

Number Stations

I think just about everyone who starts in this hobby gets interested in number stations at some time or another. Sometimes you stay interested in them and go on to learn a lot more about them.

Now, a number station is a clandestine station with an unknown operator reading out seemingly meaningless numbers. Well, that's the best way I can describe them. They are variously described as being MOSSAD stations, or they were East German stations sending secret messages to agents under

cover in foreign countries, or any number of other explanations. Anyway, I've seen a FAX regarding a CD of recordings of these stations spanning 30 years. Apparently, the signals will be presented as received and also in a de-noised version. The company creating this disc are looking for recordings of these stations, especially ones that are no longer transmitting. When you were first interested did you make any recordings? Why not contact Irdial-Discs, Attn. Numbers, PO Box 424, London SW3 5DY.

LISTENING TO

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New from Kiwa Electronics - the Medium Wave Loop

The loop antenna no serious MW DXer will want to be without
Table top installation
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Just £349.00

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Effectively reduces power line noise, computer noise, TV timebase noise and many other interference signals.

See the review in this issue!

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INTERNET ADDRESS:

orders@lowe.demon.co.uk
info@lowe.demon.co.uk
New check out Lowes new pages on the World Wide Web
<http://www.demon.co.uk/lowe/index.html>

BERKSHIRE

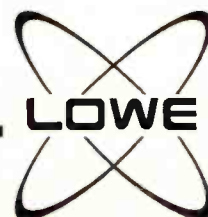
3 Weavers Walk
Northbrook Street
Newbury
Tel: (01635) 522122

NORTH EAST

Mitford House
Newcastle Int. Airport
Newcastle Upon Tyne
Tel: (01661) 860418

WALES & WEST

79/81 Gloucester Rd
Patchway
Bristol
Tel: 0117-931 5263



Low

Chesterfield Road

THE WORLD



Lowe Electronics jump start the frog!

"What a difference! There is no comparison! ...The Kiwa filters have turned the Yaesu into a real DX rig." Elton Byington - DX Ontario

Tests on the FRG100 have show that the -6dB bandwidths of the AM filters are typically wider than the published specifications. A test sample showed 9.1kHz and 7.5kHz where the specifications read 6 and 4kHz respectively. For many people this has put them off considering the FRG100 as a replacement for older equipment, quite a shame as the basic receiver and the operating facilities represent very good value.



The FRG100 is probably one of these products where a little bit of money spent will make quite a difference to those who do need the extra performance and for those people, we are pleased to announce the FRG100DX. The FRG100DX will already have the new filters fitted by Lowe Electronics and each will be provided with its own test certificate during the course of our modifications and alignment.

Kiwa Electronics in the USA have specialised in filter upgrades for a number of years and as their newly appointed European distributor, we are pleased to be able to offer their highly acclaimed upgrades for the FRG100. Kiwa's IF filter upgrade dramatically improves both wide and narrow band performance of the FRG100 receiver by replacing both AM filters with superior modules offering a tremendous improvement in selectivity.

Each replacement filter uses Filter Module technology for precise filter requirements. Each module is constructed of three cascaded ceramic filters with input and output buffer amplifiers for maximum performance. Other features include zero insertion loss and a guaranteed shape factor (-60dB/6- 6dB BW ratio) of less than 1.8, typically less than 1.65. For the 6kHz filter we've chosen a 6kHz model from Kiwa Electronics.

This gives a performance almost equal to Yaesu's 4kHz (!) This will make quite a difference to selectivity and you'll notice an immediate improvement in performance. This is ideal for general listening right across the short-wave bands and in particular on medium wave.

For the DX chaser, we've chosen to replace Yaesu's 4kHz with Kiwa's 3.5kHz filter offering once again a huge leap in performance. We feel this is a great choice for the avid broadcast band DXer as it offers the best compromise between fidelity and digging the signal out of strong interference.

SOUTH EAST

Communications Hse.
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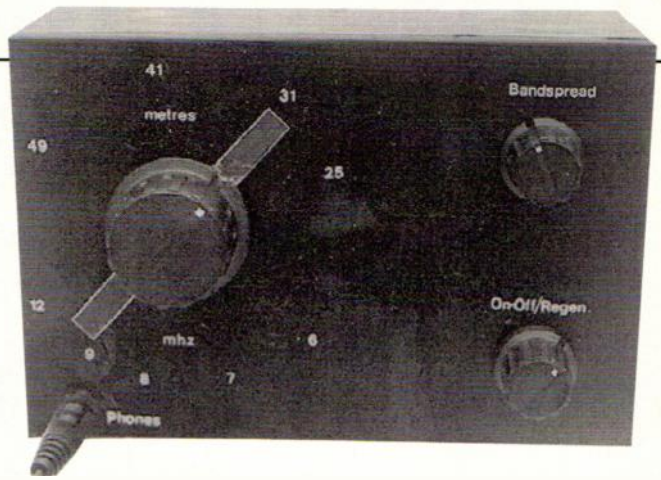
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A '1.5 volt' Valve Short Wave Radio



Brian Adkinson is back with another project - this time a one-valve radio designed to run from a single 1.5 volt cell!

For those who fancy building a valved radio but don't fancy the prospect of the attendant high voltages normally associated with them, this has to be the ultimate 'safe' radio as the primary voltage supply is just 1.5volts! The receiver is based around a single 'battery' valve. Readers of my previous article published in the October '92 issue of *SWM* will know that I have a fascination with simple radios of this type and in particular those using valves. I never cease to be amazed at the results that can, with patience, be obtained from such simple designs. It has to be admitted that this is partly due, in no small way, to the high power of many short wave stations. Even so, the 'regenerative' detector, of which this is a typical example, was first used with great success in the twenties when transmitter power was measured in watts and kilowatts - not megawatts!

The valve chosen for this

particular receiver is the DL96. The DL96 was the 'power output' valve in a set of four that were originally designed for 'portable' superhet receivers of the 1950s.

For the benefit of those not familiar with these particular valves, the '96' series of valves were the culmination of many years of refinement of battery valves, i.e. those designed with suitably modest power requirements for use in portable, battery powered radios. In particular the heater or 'filament', as it tends to be referred to when talking of directly heated valves, was one of the main areas where low power consumption, consistent with satisfactory performance and service life, was the aim.

Direct heating of the emissive surface (the cathode) is the first obvious saving in power as there is no separate cathode to heat up, it then being a case of designing valves with ever smaller filament currents. (The DL96 draws 50mA).

Most of the radios using

these valves were of the 'attache case' type with a lift up lid that had built into it a frame antenna. Some of the later types became 'upright' and did begin to resemble more modern designs using ferrite rod antennas, etc. but, were still 'power hungry' and inefficient by transistor standards.

With the h.t. and l.t. batteries fighting it out to see which one could run down first, these radios were definitely not for 'idly' leaving on in the background (the l.t. battery usually won, by the way). Mind you, with the price of batteries now, I think we're rapidly getting back to those days!

Smaller valves were made during the fifties, with filament currents as low as 7.5mA and operating from 0.5V, but were designed mainly for use in hearing aids and were certainly not capable of producing enough power to operate a loudspeaker.

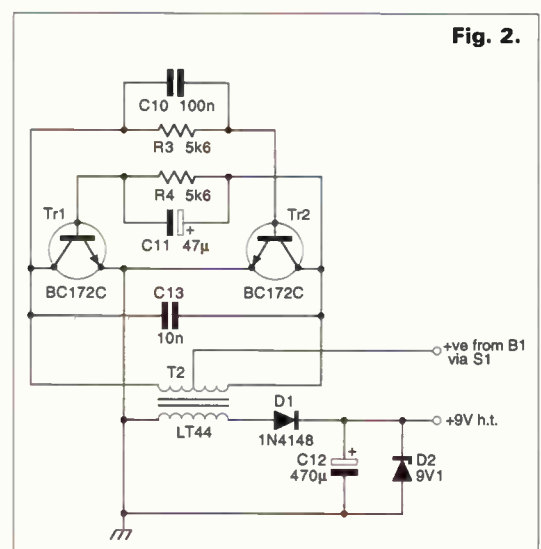
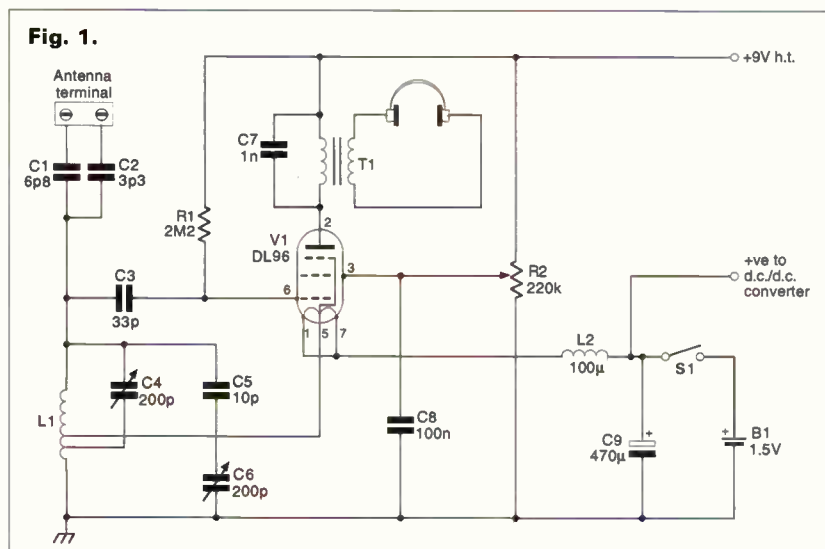
These hearing aid types might have formed the basis for an interesting article using

'midget' (as everything small was called then) valves for a tiny headphone receiver, but unfortunately are no longer held in sufficiently large quantities to guarantee supply. To the best of my knowledge there were never any true 'pocket' or hand-held receivers made until transistors arrived.

The '1.5V valved receiver like many others, now 'adorns' my bedside table and, as I'm sure my wife would agree, another home-made radio is just what the bedroom needs along with the antennas, earth wires, headphones and other 'passion killers' that keep me 'tethered' to the bed on listening nights.

Circuit Description

The receiver, the circuit of which is shown in Fig. 1, is of conventional design where regenerative feedback is taken from the cathode of the valve, which here is also the heater, and is reapplied to the grid via the tuning coil. Potentiometer



R2 adjusts the gain of V1 and hence the feedback available giving a smooth method of adjustment with no backlash. Frequency coverage of the receiver is approximately 5 to 13MHz.

The 'grid leak' resistor R1 would normally be returned to pins 1 & 7 of V1, but at the low voltages used here it was found beneficial to connect it directly to the 'h.t. rail', thereby increasing the emission of V1 to a small extent with a subsequent improvement in audio gain. Under these conditions the grid current was measured at less than 5µA, so very little was being 'stolen' from the anode and no harm will come to the valve itself.

Although the use of an audio output valve as an r.f. detector may seem unusual, it was actually found to give far better results, at the low anode voltage used here, than a valve specifically designed for r.f. applications. In fact, almost all types of audio valves will work well as regenerative detectors and, as in this case, give a better level of audio output when operating on low voltages.

Although the DL96 is a 'battery' valve it is still designed to work at anode voltages of 60V or more. Considering it only gets a mere 9V in this circuit it still manages quite comfortable headphone listening provided that a well sited antenna, not shorter than about 8m is used.

The DC to DC Converter

The use of a single 1.5V cell to operate a valve can only be achieved with a bit of 'cheating'. Valves are essentially high impedance, voltage operated devices and, as such, generally give poor amplification at 'transistor' voltage levels. The transistor, which is a low impedance current operated device, can still deliver useful (ear splitting!) power outputs at 3V or less.

The 'cheat' here is to use a small d.c. to d.c. converter which takes its power from the filament supply battery to generate about 10V for the 'high voltage' supply.

Obviously you don't get 'owt for nowt' and the trade-off for the novelty of a single cell valve radio is some additional burden on the l.t. battery plus, of course, the slight extra complexity of the converter. At a converter efficiency of less than 50% the extra current needed to produce the h.t. is about another 8mA. An alkaline 'D' cell will still give only a marginally shorter life with this extra load and should still manage well over 100hrs. A nickel cadmium rechargeable battery is not recommended.

The inverter used is a simple multivibrator operating at a frequency of about 150Hz. The circuit is shown in Fig. 2. It will not be damaged by a short circuit on the output as under these conditions it simply shuts down.

Transformer T2 is a driver type usually associated with the older - non d.c. coupled - transistor output stages. Here it is connected 'backwards' in order to step up the output and, after rectification by D1, produce the necessary h.t. for the receiver. As there is no automatic 'regulation' as such for the converter, the output voltage varies widely with changes in load. Adjusting the regeneration control in this receiver has the effect of altering the screen grid voltage and hence anode current of V1. Therefore, simple 'top cut' regulation is provided by the zener diode D2 to prevent the output rising with a new battery or the 'regen control set low, and falling with a discharged battery or the 'regen set high. With no load the output rises to nearly 20V. Not very helpful when we're trying to make critical adjustments and winkle out a weak signal!

As the output from the converter is not symmetrical it is imperative that it is built using only the specified components and that T2 is wired correctly and the correct capacitors across R1 and R2 are wired exactly as shown in Fig. 3. If the windings are not connected as shown, the output voltage will be much lower and the receiver will not work at all. The transistors are not that critical and any medium gain low power silicon transistor such as the BC108,

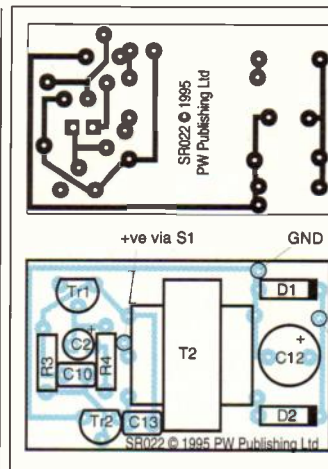


Fig. 3: The full size artwork required to produce your own p.c.b. for the d.c.-d.c. converter. Required to generate the 'h.t.' for this novel design if you aren't up to producing your own p.c.b.s then Badger Boards, 80 Clarence Road, Erdington, Birmingham, B23 6AR. Tel: 0121-384 2473, Fax: 0121-628 7354, can supply the ready made board.

BC109, BC171 (A,B, or C gain groups) can be used. Two prototype converters were built using different transistors and gave almost identical results. Do not use a power rectifier diode such as one from the 1N4000 series in place of 1N4148 as the output will be slightly lower and there will be a premature fall off in performance as the battery runs down. Although the main switching frequency of the converter is low some reliance is placed on the fast pulse edges to produce an adequate output from an input of 1.5V or less.

A stabilised output of 9V was still obtained at a battery voltage of 1.15V, by which time the heater volts for the valve are below that required for good performance anyway.

The output voltage can be measured to confirm correct operation before installation in the radio but note that even quite a sensitive meter will load the output sufficiently to give a 'false' reading. It is best measured with a moving coil meter of not less than '20000 ohms per volt' or, ideally, a digital meter. Even using a much lower value for R2, the regeneration control, will reduce the available output which is why a high value was chosen. Note that the output might not be precisely 9V but slightly lower. This is not a fault, but due to the slight difference between individual zener diodes, which is more noticeable at the very low applied current.

Output ripple from the converter was measured at less than 10mV on full load. If any buzzing can be heard through the headphones, it will be

caused by mutual coupling between T1 and T2. This can easily be eliminated by changing the orientation of the converter board by 90 degrees or by mounting it sideways so that T2 faces outwards. In the prototype buzz from the converter was barely discernable even with no signal being received.

If the constructor does not wish to use the converter the receiver can be operated with a PP3 h.t. battery which will give many hundreds of hours of use. In the case of battery operation it is advisable to retain the h.t. decoupling capacitor (C12, 470µF in the converter parts list) and connect this directly from h.t. to ground. The other half of the on-off switch S1 should then be used to switch the h.t. as well as l.t. supply.

Construction

In a simple receiver of this sort it is important to optimise all the components in order to wring out the last ounce of performance. Although none of the components and values specified are unduly critical they have been carefully selected to operate with this particular valve and for best results they should be adhered to. Direct equivalents for the DL96 are the 1P1, 3C4, and N25.

The prototype was built into a metal chassis with lid, measuring 150 x 100 x 60mm and this allowed plenty of room to mount the components. None of the wiring is particularly critical except that between L1, C4 and C6, which should be kept reasonably

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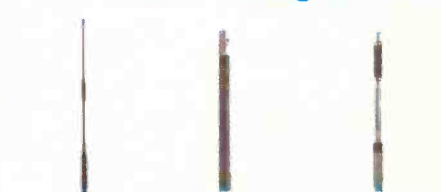
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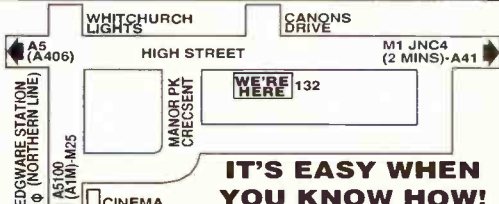
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short and direct.

The tuning coil L1 has been designed for maximum *Q* or 'goodness' at about mid-band with the specified diameter former and gauge of wire. Small alterations should not affect performance or frequency coverage much, but large deviations are not recommended.

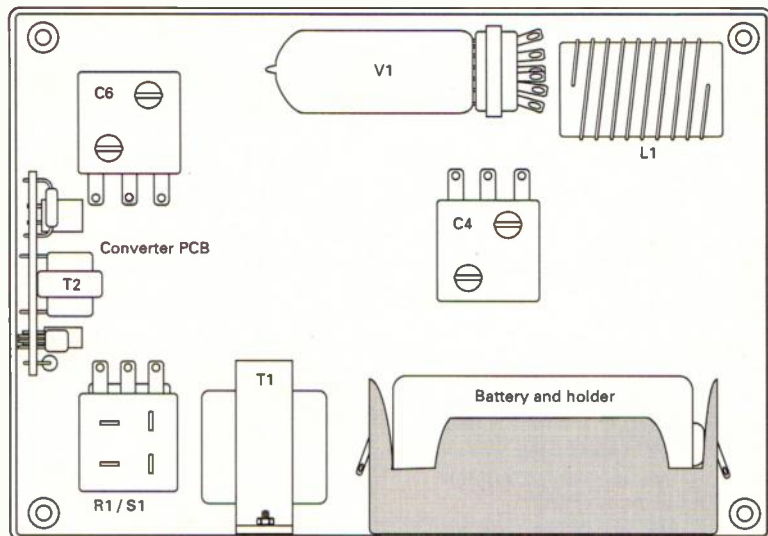
The Coil

L1 was wound on a plastics former measuring about 15mm in diameter and using 22s.w.g. enamelled copper wire (22s.w.g. is the normal diameter of 'thin' solder). Card or thick paper could also be used to make a cylinder for the former. The winding consists of 18 turns close wound in a clockwise direction with the cathode feedback tap taken off at the 5th turn. Under certain combinations of valves and components it might be necessary to alter this tap to the 4th or 6th turn in order to obtain correct regeneration and this can be done by gently prising the adjacent turns apart with a non-metallic object, scraping off the insulation on the new turn with a knife or scapel and resoldering the tap to it. Moving the tap up the coil away from ground increases the feedback and moving it down the opposite.

The criteria for judging whether or not this is necessary is to connect the receiver to its normal antenna (which loads the tuned circuit and affects the regeneration setting) and, with a new battery installed, check that the valve can be adjusted into oscillation at all parts of the band with the 'regen' control set between approximately sixty and eighty percent of its travel. Bear in mind this setting will alter according to the frequency being tuned to.

The aim is to obtain the desired 'near point of oscillation and hence maximum sensitivity and selectivity' with the screen volts on V1 neither far too low, which will affect audio amplification, or near maximum which will leave little adjustment left to compensate for battery ageing.

Fig. 4: This is how it all fits together in the case. Layout is important, so don't stray from this guide.



The coil is soldered directly to C4 and a solid piece of wire taken from the tap on it to pin 5 of the valve base. These three connections should prove enough to hold L1 in place without any additional fixings. After soldering the coil in place pull it away from the front panel as far as possible to avoid damping and detuning effects.

On no account should L2 be omitted, as at radio frequencies it effectively decouples the battery from the cathode of V1. If left out, V1 will not work as a regenerative detector. Its value of 100µH is not particularly critical, but values much in excess of 1mH may cause an unacceptable voltage drop.

The main and fine tuning capacitors are both small plastics cased types as used in portable radios. These are much cheaper than the air spaced capacitors normally specified. Air spaced capacitors may be used if desired but allowance will need to be made for the extra room they will take up. I would recommend 'surplus' types such as those available from J. Birkett (address in parts list) or other suppliers of surplus stock. The exact capacitance is not too important as long as the maximum is equal to or greater than 200pF. If only 2-gang capacitors are available, such as 200pF + 300pF, then either section can be used, the larger allowing the receiver to tune to a lower frequency. Adequate regeneration may not be possible at these lower frequencies without alterations to the feedback tap mentioned above.

Long Screws

Although the tuning capacitors have fixing holes drilled in them do not use the shortest countersunk screw that is supplied by Maplin as it is still too long and will foul and possibly damage the plates. Instead, I glued C4 and C6 in place using a 'soup' of a small amount of Superglue and Evostick impact adhesive. The two glues were, in practice, kept away from one another on different parts of the capacitor body. One allows a 'quickfit' and the other a gives long term durability.

Before fitting C4 and C6 the two built-in trimmers on each one must be set to minimum capacitance. These can be adjusted using a medium sized watchmaker's screwdriver. The trimmers are at minimum capacitance when the two plates of the capacitor are fully adjacent to one another. Adjustment rotates one of the plates, and the correct position for this can quite easily be judged by viewing it through the opaque plastics housing whilst turning the screw. The two capacitors should have small shaft extensions supplied with them and these should be fitted and secured with screws.

Note that on C4, the main tuning capacitor, the two sections (outer tags) are wired in parallel and therefore connected together whilst on C6 only one section is used (either one). On both capacitors the centre tag is earth.

As mentioned, C6 is used for fine tuning and will be found useful, particularly at the

higher frequencies. To reduce cost it is the same type as C4 and therefore its capacitance is far too high. To make it function as a bandsread capacitor a low value, fixed capacitor is connected in series with it. The disadvantage of putting a capacitor in series with C6 in order to obtain a smaller variable capacitor is some non-linearity in its effect. This effect, however, detracts very little from its usefulness

Headphones

The output transformer T1 was selected empirically as the best match to the valve but depending on the headphones used the secondary connections will need experimentation with to obtain best output. As a guide, headphones measuring 30Ω or less per 'phone should be tried across one half of the transformer (the centre tap wire is a different colour to the other two) and 'phones above this value tried across the whole winding. The phone jack is a stereo type (3.5mm or 0.25in depending on headphones to be used) and the two 'phones are then connected in parallel by shorting the left and right connections together on the socket. The receiver gave good results with standard full size (modern low impedance) headphones as well as miniature personal stereo types. If the 'phones measure much less than 10Ω each, T1 would probably be better substituted with a transformer having a 3-0-3V secondary.

Again, try either one half or the whole winding for best results.

After removing - by cutting off with sidecutters - the metal fixing rim or skirt on the valve base in order to reduce its diameter, V1 was plugged into the base and then the two stuck to the top of the case using double-sided sticky pads. Although this is hardly the standard way for mounting valves it greatly simplified and speeded up mounting of V1 and suited my slothful nature. If necessary, V1 can easily be freed off for replacement although as its combined screen and anode current is less than 300µA it is unlikely to need frequent replacement - if ever! The d.c. to d.c. converter board was also fixed to the side of the case using this method.

The battery box, converter board, C4, C6, R2, V1, L1 and T1 are positioned as shown in Fig. 4. The two outer terminals on R2 can be used as common points for circuit ground and h.t. and the screen decoupling capacitor C8 can be soldered directly from its wiper terminal to the grounded side. Capacitor C9 can likewise be wired directly from S1 to the ground side of R2.

No direct connection is made between circuit ground and the metal case which helps to reduce the effects of hand capacitance.

The main tuning pointer was made out of a piece of a clear plastics audio cassette box cut with a hacksaw. This was then cut down the middle and each half glued with Superglue to the underside of the larger, tuning knob. Letraset was used to mark the frequencies and control functions.

Using the Receiver

In this type of receiver the regeneration level is affected by the h.t. voltage to the anode of the valve, the screen grid (grid 2) voltage, the position of the 'cathode' tap on the coil and the degree of antenna coupling to the tuned circuit. With the last effect - antenna coupling - the higher

the value of the coupling capacitor or the longer the antenna the more the tuned circuit is damped and the harder regeneration is to obtain. Also, with excessive coupling, selectivity is affected, particularly at the higher frequencies. For these reasons the correct value capacitor for the approximate length of antenna must be selected in order to optimise results. If the coupling is too small, the above problems won't occur but you won't pick up much either! Therefore, a compromise has to be reached. It is best to try the maximum coupling first and if results are bad reduce it from there.

As, in general terms, the higher frequencies are livelier during the day and fade out at night and visa versa with the lower frequencies, a switch of coupling between day or evening use is the best idea. There is no reason why a small toggle switch should not be fitted to the back of the receiver in order to facilitate this and make operation more convenient. As there are two capacitors connected to the antenna terminal there is the possibility of three values, by selecting one, the other or both in parallel.

My standard, test, 'bedroom' antenna is about 6m long (in fact you could say I've got a test bed. Test bed - get it? Oh - never mind!) and I've found that connection to C1 gives optimum results. A proper ground can also be connected to the case which although not directly connected to the receiver ground will, by capacitive coupling, improve reception considerably on the 49 metre band. A ground will also stop hand capacitance effects completely, but as it effectively increases the antenna capacitance, again, a reduction here with C1 or C2 may be needed to get proper regeneration and selectivity. With antennas in excess of about 12m and a ground connection it may be necessary to use the C2 terminal and reduce the value of C2 to 2.2pF. ■

You Will Need

Receiver

Resistors

Carbon film 0.25W, 5%
2.2MΩ 1 R1

Potentiometers 0.25in shaft

220kΩ log 1 R2 (with S1 Maplin FW46A)

Capacitors

Low voltage ceramic

3.3pF 1 C2
6.8pF 1 C1
10pF 1 C5
33pF 1 C3
1nF 1 C7
100nF 1 C8

Electrolytic axial leads

470µF 16V 1 C9

Variable

140 + 60pF 2 C4, C6 (see text)

Valves

DL96 1 V1 (see text)

Miscellaneous

Transformer 240V/6-0-6V 250mA T1 (see text); Switch d.p.s.t. (S1) see text; Plastics case (Maplin XB68Y); Knobs (2) (Maplin FK40T); Knob (Maplin); Battery box; Antenna Connector (Maplin FK16S); Headphone Socket to suit; Coil L1 (See text).

Converter

Resistors

Carbon film 0.25W, 5%
5.6kΩ 2 R3,R4

Capacitors

Low voltage ceramic

10nF 1 C13
100nF 1 C10

Electrolytic, p.c.b. type

47µF 16V 1 C11
470µF 16V 1 C12

Semiconductors

Diodes

1N4148 1 D1 (see text)
BZY88C9V1 1 D2 (400mW zenner)

Transistors

BC172C 2 Tr1,Tr2 (see text)

Miscellaneous

Transformer LT44 (T2) Maplin HX82D; Printed circuit board.

Sources of components

The DL96 can be obtained from either:

Colomor Electronics, 170 Goldhawk Road, London W12 8HN. or

Langrex Supplies, 1 Mayo Road, Croydon, Surrey CR0 2QP.

The valve base can be obtained from:

J. Birkett, 25 The Strait, Lincoln LN21JF. Tel: (01522)

520767. As there could be a minimum order value it might be advisable to ring first.

Alternatively a B7G base might still be obtainable from an old television or radio set.

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- ★ 1000 memories

Price.....£449. **£399**



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Computer interface for AR8000/AR2700 (software required for computer control) .. **£99**

PC MANAGER

PC Based DOS management for the AR8000 Price..... **£49**

AR2700 - NEW

Why not Part Exchange your old handheld or pay by 3 post dated cheques for this new handheld that has optional

- ★ Voice Recording
- ★ Computer Control
- ★ Data Clone

Price.....£299. **£289**



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AR2700 fitted with Voice Rec. Chip.

Price..... **£329**

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Base scanner covers 100 KHz - 2036 MHz receives AM/FM/SSB plus many more features including computer control Price.....£999. (Special) **£899**

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- ★ 200 memories
- ★ Fast Scan/Search

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NEVADA MS1000

Our own superb base scanner with many features.

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- ★ 1000 Memories
- ★ Auto Tape Switch
- ★ Audio Squelch

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SKY SCAN DESK TOP

A wide band antenna for use at home. Covers 25 - 1300 MHz c/w base, coax & BNC connector. Height 36". Can be used on your car when static..... **£49.00**



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- ★ Fitted cable & BNC Connector..... **£29.95**



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Discreet but effective wide band mobile antenna 25-1300 MHz supplied with cable/BNC connector.

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- ★ 4M Coaxial Cable
- ★ Fitted BNC..... **£19.95**



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SCANMASTER SP-55

A low noise pre-amplifier with even better performance, improved circuit design & selectable band pass filters to optimise the receiving range of your choice. 25-1500, variable gain & attenuation. Powered from batteries or 12V DC..... **£69.95**



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SCANMASTER BASE STAND

A fully adjustable desktop stand for use with all handhelds fitted BNC and Coaxial fly lead..... **£19.95**



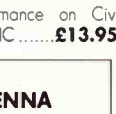
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A variable 30dB notch covers 85 to 170 MHz to eliminate music, tones, and voices that break through onto the frequency you are listening to. With low insertion loss the filter can be left in line and helps reduce interference from shortwave broadcasts below 1.7MHz..... **£29.90** .P&P £2.75



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- ★ Designed to commercial standards
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- ★ Covers 108 to 136 MHz
- ★ Transmit up to 1KW
- ★ 1.05mtrs long
- ★ SO239 type VHF connector

Introductory Price..... **£59.95** .P&P £4.75



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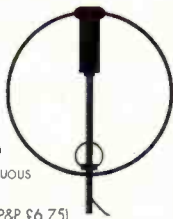
A top class portable Short Wave Receiver with VHF airband and FM coverage. Drake have incorporated a quality large front-mounted speaker, direct frequency access keypad, four antenna inputs and complete portability with fitted telescopic whip antenna an optical NiCads. 70 programmable memories, clock, synchronous AM detector. **£649**



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- ★ (3 - 30) MHz Coverage
- ★ 200W PEP Power
- ★ Remotely Tuned
- ★ Flexible for Loft Mounting & Portable Operation
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Our new Drae magnetic loops use high quality semi rigid 13mm Japanese Ultra Low Loss cable for the radiating element, making loft mounting & portable operation possible. Packs easily away into the Car Boot. Fibreglass construction ensures full weatherproofing. Comparisons of the Drae loops with 32mm Aluminium loops have shown no significant differences.



MODEL ML80

Freq: [7 - 30] MHz continuous
Diameter: 80cms
Price: **£169.95** (P&P £5.75)

MODEL ML170

Freq: [3 - 10.3] MHz continuous
Diameter: 1.7 mtrs
Price: **£189.95** (P&P £6.75)

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(100KHz - 30MHz) **£96.95**



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Switch your receiver between 2 ant. with this high quality switch.
CX201 PL259 Sockets. **£18.95**
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A new handheld with "Jetscan" giving an incredible 100 ch/second sampling.
★ 100 Memories
★ 66 - 956 MHz (with Gaps)
★ Data Skip control
★ AM/FM Modes (self selects AM on Airband)
★ Supplied with Nicads
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★ 200 Memories ★ 12 Volt
★ 66 - 956 MHz (with Gaps) ★ AM/FM
★ 5 year memory back-up
Price: **£235**



RECEIVERS

- YAESU FRG-100** Entry Model £499
KENWOOD R5000 Competition Class. £945
LOWE
HF-225 Receiver £499.00
D-225 Synchronous DET £45.95
HF-150 Receiver £399.00
HF-150M Marine Version £429.00
IF-150 RS232 I/Face HF-150 £34.95
PR150 Pre Selector £205.00
SP150 Spkr c/w filter + meter £189.00
Key Pad For Direct Freq. Entry £39.95

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- RC817** Multi band radio £169.99
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- ATS803** Portable with SSB £129.95
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SCANNING RECEIVERS

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AOR AR1500 £249
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BLACK JAGUAR BJ200 £130
COMMTEL COM 204 £175
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JIM M-75 £49
JIM M-100 £55
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REALISTIC PRO-50 £95
TRIDENT TR-980 £165
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YUPITERU MVT-6000 £195
YUPITERU MVT-7000 £199
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YUPITERU VT-125 £125
YUPITERU VT-225 £175

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ICOM R70E RX £395
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SONY PRO 80 £130
SONY ICF 7600D £75
STEEPLETONE MBR7 £45
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- ★ 1 MHz - 2.8 GHz
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- Special Offer** ~~£169.95~~ **£139.95**
Carrying case for 3300 Counter **£14.95**

OPTO SCOUT

This New mini counters got the lot - it will even tune the AR8000/AR2700 to the frequency captured or recalled from its memory!



- ★ 10 MHz - 2.8 GHz
 - ★ 400 Memories
 - ★ Remote Tunes Radios
 - ★ Digital Filter & Auto Capture
 - ★ 16 Segment Bargraph for Signal Level
 - ★ Software Supplied For PC Upload
 - ★ Supplied c/w Ant, NiCads & Charger
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OPTO INTERCEPTORS

These clever units instantly lock on to any close strong signal, allowing instant monitoring. Ideal for use at airports, sporting events, on cruise ships or anywhere two way communicators are in use!

R10 - FM

- ★ Receives FM from 30-2000 MHz in less than 1 second!
 - ★ Deviation Check facility
 - ★ Fully Automatic
 - ★ Earphone supplied
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R20 - AM

- ★ Interceptor/Bug detector
 - ★ 500 KHz - 3000 MHz
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 - ★ FM detection
 - ★ Field strength indicator
 - ★ 9V battery operation
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DC440 DECODER

A new decoder that displays DTMF, CTCSS + DCS tone frequencies. Computer part for logging/control **£233**

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Computer control Interface - allows up to 4 Opto items to be linked to a PC. **£79.95**

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SHOWROOMS:- 1A MUNSTER ROAD, PORTSMOUTH PO2 9BS

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A Day An The Life of A Radio Inspector

Ronnie, Freelance Radio Inspector

Kilocycle Ken has another problem to deal with this month. J. Edward Brown tells the story.

There was excitement in the square. Ronnie, the freelance radio inspector had gone crazy, although it was said that Ronnie had always been crazy. Ronnie had climbed the yellow construction crane atop the new office building that was replacing the old chief Post Office.

Ronnie was an ex Post Office Radio Inspector, compulsory retired on medical grounds. He hung out in the square, customarily wearing an old pair of blue tram conductor's trousers with a red stripe and metal bicycle clips, a blue peaked cap with Radio & TV Interference Inspector lettered across the front on a strip of cardboard. He had an ID with his photograph and the legend, "All classes of radio and television interference investigated promptly, difficult cases a speciality".

He wore transistorised radios, currently a Bearcat, a Sangean short wave receiver and a hand-held Trident scanner, over a long gaberdine raincoat covering a network of wires. On his head he wore a large pair of old-fashioned Bakelite cap headphones with a leather headband, but over a pair of Japanese miniature earpieces inserted directly into

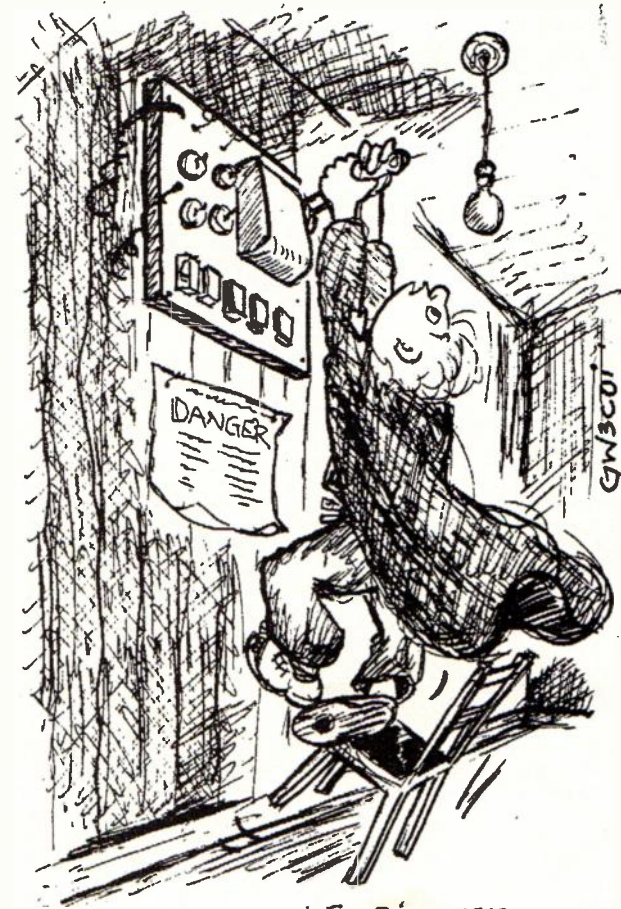
each year.

Ronnie would mount his bicycle and plug into his equipment like an astronaut connecting himself into his capsule life support system.

Ronnie went about his work on an old balloon-tired Empire bicycle painted red, fitted with an acetylene lamp with red and green bezels for night investigations. Mounted on the handlebars was a Panasonic brand, liquid crystal display, miniature, Japanese television receiver, a home-made field strength meter in a pink plastics soap container, his television receiving licence displayed in a plastics sleeve. A large wire loop for direction finding, wound on a wooden former, was mounted on the handlebars, a wire antenna stretched from a bamboo stick above the front forks to another on the rear carrier where there was also a discone antenna.

Ronnie was a nuisance and Kilocycle Ken, the Senior Radio Inspector, usually avoided him, difficult when Ronnie came into the office with his monthly report written on a telegram form and his radio interference complaints recorded on post office savings withdrawal forms, television interference complaints on deposit forms.

Ronnie was a city character



who had been interviewed on radio and television. He had explained himself, "I make sure the kilohertz go through, don't get battered about. The wavelengths must waggle without interference. I am no Moses parting the waves, but if they get a bit frothy on top, as they do at times from interference, I try to smooth them down".

Which in many ways was a good explanation of what Kilocycle Ken and other professional radio inspectors did.

"It is dangerous work labouring in the kilohertz field. There is a very narrow gap between stations and it's hard work to keep them apart. There are narrow gaps on the dial and one false move and that frequency can come crashing down on you, and there's nothing worse than 1500 or 1600 kilohertz falling on you, that's why I like to work at the low end of the broadcast dial where the kilohertz aren't so many.

"On television, on channel one, with 54 million hertz, or 500 million hertz for the high channel numbers, that's big stuff indeed, takes a lot of experience to keep them free of interference. The television transmitters are very high powered, a hundred thousand watts pulsing out at you, and there you are, standing on the corner of a wavelength watching them go by on the meter. A false step and it's a dark screen".

Ronnie was a very sensitive man, which was why he had been invalidated out of the service with a mental problem. He shook and shivered as interference assaulted his ears. "Pollution of the airwaves should be outlawed" was his cry.

His eyes burned with the fire of eliminating all QRM as he searched out power leaks with more diligence than a post office radio inspector who waited until an actual complaint was made. He knew every power board engineer and

faultman, though some of them tried to hide when they saw Ronnie coming. And he knew every radio inspector, though they tended to depart in the other direction if they spotted him.

The police inspector in charge of the armed offender's squad shouted through a loud hailer, "Ronnie, come down or we shoot".

There were police cars with flashing lights, the communications van, a bus, police with rifles and flak jackets.

"Ronnie could stay up there for days," the police inspector said worriedly.

"Get a helicopter," a sergeant advised.

"I could get him down," Kilocycle Ken said.

Kilocycle Ken was known to the Inspector because of his work in trying to stop people listening to police communications. "I could climb up and talk to him".

"It's a job for a trained negotiator," the police sergeant said.

"He was one of your mob, before he went funny in the head," the Inspector said, nodding.

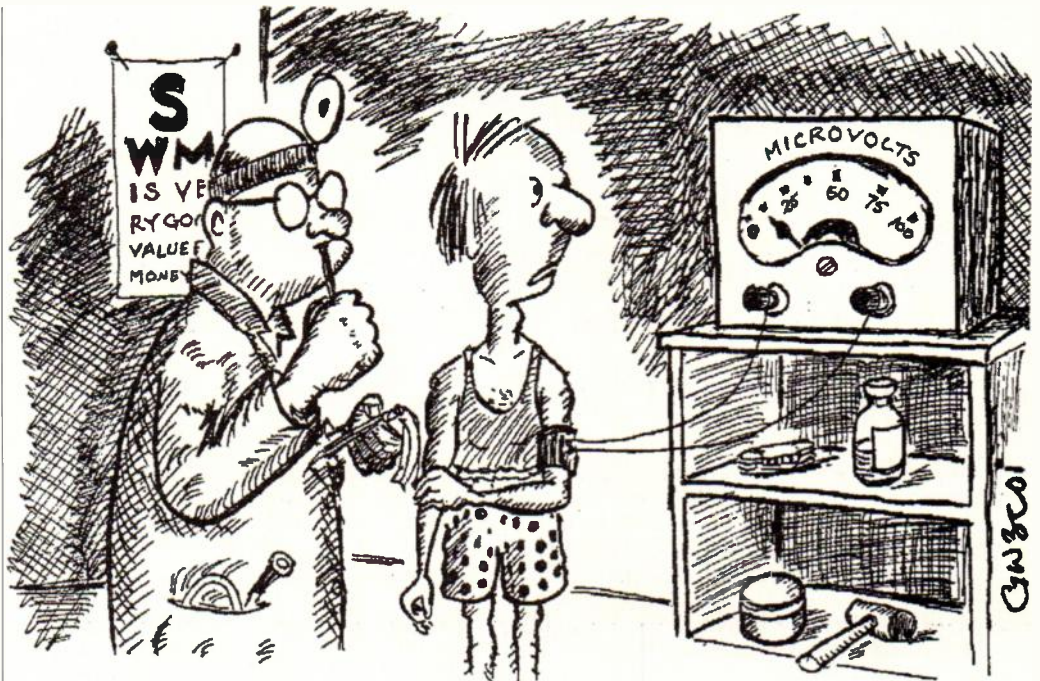
The old post office building had been knocked down and Ronnie had been sad. He had warmed his back against its old bricks for years, and now he and all the other people were moved. A corrugated iron fence had been erected and a big hole dug.

But the crane had attracted Ronnie, he watched it as it hauled itself into the sky. "If the crane could be used for QRM detection, my old bicycle could be retired. I'd clean up all QRM once and for all. My mission would be accomplished. The city would be free of interference for all decent licence-holding television viewers and radio listeners to live, look and listen."

"Why is he up there?" the Inspector asked.

Kilocycle Ken said, "He has said to me that the crane would make a wonderful rotating radio direction finding platform".

Ronnie had people who believed in him, who knew he wasn't a quack, he had cured their radio and television interference. He had a regular round of customers who allowed him to tap their power poles and listen to their radios



and was given a cup of tea and a sandwich or a slice of cake for his trouble.

Kilocycle Ken didn't want to see him hurt. Why, one day he might be as made as Ronnie.

"Okay," the Inspector said.

Kilocycle Ken climbed up on the bogie and onto the ladder. The tower was now ten floors above ground level. Kilocycle Ken felt exposed, even though the ladder was within the lattice work.

He got to the top and rapped on the crane driver's cabin trap door, in Morse code, "Let me in - KK".

The door opened.

"You've come up in the world," Kilocycle Ken said.

Ronnie grinned, he didn't usually smile at all, he always said that radio and television interference was nothing to laugh about.

"To work!" Ronnie shouted. "I need you to record the details".

Ronnie had a pencil and a sheaf of deposit and withdrawal forms. He was shaking with the impinging of QRM on his ears, but he concentrated on the meters and dials. He had his television set and his radios. He had a street map of the city, coloured pins. And an oscilloscope connected to the power mains.

"Interference! Bad! Coming from the sixth power pole from the corner of Bellini St., a set of three disc strain insulators there causing trouble".

Kilocycle Ken wrote.

Ronnie pushed a lever and the crane turned. "Binders on old wire at Douglas Place, or could be that new aluminium wire, not twisted properly, can only tell by visual inspection".

He adjusted the oscilloscope. "A butter warmer in a refrigerator at 7 Boys Avenue, Mrs Scott has turned it up too high to warm the butter for her husband's sandwiches".

Ronnie called, "Fluorescent lights at 22 Mackie Drive. Why have they got lights on in the middle of the day?"

"Mullins, an amateur at 67 Faass Street, talking to Australia on 40 metres, spurious emissions!"

"The old Burdick diathermy machine at the Hospital. There!"

"And that tyre factory plastics pre-heater". Ronnie was swinging the crane like a madman. He couldn't possibly deduce this information from the oscilloscope or his equipment. "I'm triangulating by phased reflections in this quadrant".

Kilocycle Ken sighed.

"Mrs Jagger is using that new cake mixer over on Lee Street, must call on her next week, makes a good coconut layer cake, very chewy".

"There's the thermostats on the fish tanks at Den Exeter's place, always identifiable, something positive will have to be done about them".

"Ahh, why is Lomax shaving at this hour? Up late last night. And dialling impulses from Hack's house, talking to his

girlfriend".

The police were shouting at them through loudhailers, but Ronnie was changing wavebands, adjusting his volumes, rotating the crane. "A new source". He studied the television screen and the oscilloscope. There was something on the oscilloscope. "What is it?" Ronnie cried.

Kilocycle Ken didn't know. He was almost totally confused.

Ronnie shouted, "That blonde waitress at the hotel, with her aunt's old sewing machine, making a bikini".

Kilocycle Ken decided that was enough. "Come down now, I think your work is complete, you have identified many sources".

"You will do work on them?" Ronnie asked.

"I promise".

And Ronnie dropped dead, just like that. Too much excitement, too many sources of QRM.

Ronnie had a big funeral, many of his complainants attended the service.

Ronnie was right about the sources too, but they'd been there for years. He was right about the blonde waitress too. Kilocycle Ken thought it would have been a fitting touch if she had worn the bikini at the funeral service, but it wouldn't have been dignified.

It did cross Kilocycle Ken's mind to ride the Empire bicycle in the funeral procession, but that would have been too much.

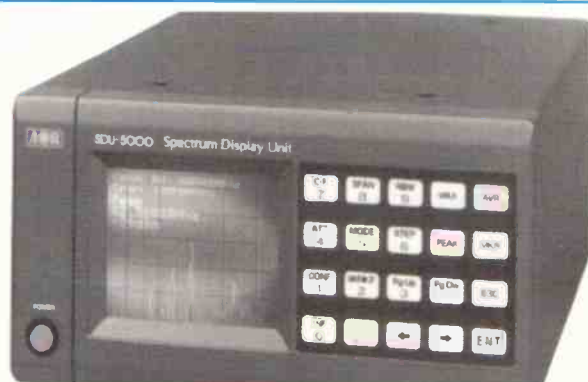


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LOOK & LISTEN !!! with the SDU5000 + AOR AR3000A (AR3000), ICOM R7100, R7000 & R9000



For many years spectrum display units (SDU) have been used by government and commercial organisations to aid the location of elusive transmissions. Due to the high price such equipment has never been within the reach of the average listener. However times have changed and new technology coupled to the innovation of AOR has lead to a great reduction in size and price, placing the SDU5000 within the grasp of many serious listeners.

Usually when tuning, searching or scanning using a traditional receiver only one frequency is monitored at any instant, however the SDU5000 provides a visual display of activity not only on the frequency being monitored but up to 5 MHz above and below as well. This ensures that even a brief nearby transmission will be "captured" and nothing can escape undetected. The SDU5000 is so effective at locating brief transmissions that it is in daily use by frequency management organisations and even in the front line of many military "hot spots" and exercises.

The SDU5000 remains compact due to the use of an internal 3.1" (79mm) HQM simple matrix 16 colour LCD 192 dot x 210 dot. An external home colour television with video input may also be connected (PAL or NTSC). The SDU5000 may be used with a number of receivers (which have a 10.7 MHz I.F. output) and **THE LATEST FIRMWARE** will support the AOR AR3000A and ICOM R7000, R7100 & R9000 without the need to change the ROM. The receiver's RS232 remote port connects directly to the SDU5000 (ICOM CT17 or Siskin communication interface is also required if using an ICOM receiver). A small modification is required to the AOR receivers.

An IBM PC compatible **WINDOWS SDU5000** package is also planned for later in the year. **Supplied accessories:** 9 - 25 D type RS232 lead suitable for connection to the AR3000A or ICOM CT17, DC lead, BNC-BNC patch lead, mains power supply & operating manual. Please phone or write for the colour leaflet... AS REVIEWED IN JANUARY 1995 SHORT WAVE MAGAZINE.

SDU5000 £775 Special package AR3000A PLUS & SDU5000 £1729

REACTION TUNE ensures that you hear it FIRST!

NEW OPTOELECTRONICS Scout & AOR AR2700 / AR8000 receiver

If portability is of prime concern and "hand carry" is the only possibility then the **Scout** may help you locate those elusive transmissions when visiting airshows, motorsport events etc. The **Scout** is similar to a conventional frequency counter in that it measures the frequency of any transmission from 10MHz to 1.4GHz which is 10dB to 15dB higher than the ambient RF background level. However, the **Scout** distinguishes itself from a traditional frequency counter by being able to differentiate between random noise and coherent RF transmissions. This exclusive feature developed by OPTOELECTRONICS is called **DIGITAL FILTER & AUDIO CAPTURE**. Its this feature which enables the **Scout** to record the frequency of transmissions automatically as an embedded microprocessor evaluates each measurement to determine when and which RF frequency is dominant.

Of particular interest to operators of the AR2700 & AR8000 is the ability to connect the **Scout** directly to the receiver (small modification required) so that active frequencies are automatically fed to the AOR receiver which immediately jumps to the active frequency reported by the **Scout**, this feature is called **REACTION TUNE**. Previously the **Scout**

would only connect with the ICOM R7000, R7100, R9000 and Pro-2005/6 ALL OF WHICH ARE BASE STATION UNITS. OPTOELECTRONICS have acknowledged AOR's innovation of computer control in hand held receivers (CURRENTLY ONLY OFFERED BY AOR) and have added support to the **Scout** making it possible to take the system portable so the full potential may be exploited. Another strong plus for the AOR is the AUTOMODE BANDPLAN DATA programmed into the AOR receivers, this ensures that when an active frequency is reported by the **Scout**, the AOR receiver will automatically change to the correct mode - again, not available on other brands.

Specific applications include compact "go anywhere" use where previously unreported frequencies may be in use at airshows, motorsport events etc. As the **Scout** effectively reviews a tremendous frequency range "in one go", that elusive transmission may be easily located and **REACTION TUNE** ensures that you hear it FIRST!

Scout £449 (Modification to AR2700 / AR8000 £25 plus carriage)
Special package of AR8000 + Scout £849



CR8000 tape interface / lead

The CR8000 tape lead / interface is now available for the AR8000 receiver. The interface comprises of a neat black plastic box with a ribbon cable for connection to the AR8000 receiver and two leads for connection to a tape recorder. The tape leads terminate in a 3.5mm mono jack plug for audio output and a 2.5mm mono jack plug for motor control. The CR8000 is compatible with a wide range of tape recorders using low voltage DC motor switching or VOR / VOX voice activation. The interface is powered from the AR8000 so that no additional battery or power supply is required.

CR8000 £44.90 + £2 P&P

SC8000 soft leatherette case £17.95 + £1.50 P&P

Software control for the AR3000A, AR3000, AR3030, AR8000 & AR2700

* DEMO DISKS AVAILABLE *
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TIP OF THE MONTH AR8000 fast scanning of 50+ channels per second???

The AR8000 and AR2700 have been designed to be as programmable as possible following requests from listeners and enthusiasts, one innovation being the SPECIAL FUNCTIONS of the latest AOR receivers. Special functions are provided so that you may tailor the receiver "specifically" to your particular application such as FASTER SCANNING or positive locking on certain types of transmission, this is unique to AOR.

The DEFAULT values have been chosen to ensure the receivers operate reliably regardless of the chosen frequencies in memory. Of course should you have a specific application such as listening to only a small bandwidth (for example when at an airfield where signal strength is relatively high) a significant increase in scanning / search speed may be achieved. Carefully program the memories to a small frequency range in ascending numeric order no more than a few MHz apart (also okay when searching) then reduce the PLL LOCK and SQUELCH DETECT times. Continue to reduce the PLL LOCK DETECT time and SQUELCH DETECT time until the receiver fails to stop on busy channels or shows a "PLL ERROR" message... then increase the value slightly and try again.

With the above in mind, the suggested maximum of 30 increments per second "may" be increased to 50+ increments per second (dependant on step size - 5kHz during search seems best) with values of 00mS for PLL LOCK DETECT and 01mS for SQUELCH DETECT... **It must be stressed that the results vary between sets.** Quite simply, faster scan & search rates reduce the chance of missing a special "one in a million transmission" and is particularly useful for locating unlisted frequencies. It is worth experimenting with the AR2700 too. **Of course for "general" monitoring you will need to revert to the original settings.**

For reference, the current defaults are:

AR8000 (page 99 sections 17-1 to 17-5)
PLL LOCK DETECT 05mS
SQUELCH DETECT 30mS
AUDIO WAIT 0.3S - set to 0.5 for best results around 900 MHz
AUDIO LEVEL 0A - suggested range 05 to 1A. 05 and 17 are good on certain types of transmission.
AUDIO WAIT 200mS

AR2700 (page 61 section 16-4)
SQUELCH DETECT 15
PLL LOCK DETECT 04

INTERMEDIATE FREQUENCIES

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601	108.000.00
602	165.000.00
(was 147.000.00 on earlier units)	
603	470.000.00
604	1013.000.00
605	1300.000.00
606	-----

There are no guarantees of extra speed, usually speed is somewhere upward from 18 channels per second... its got to be worth a go??? Perhaps we should hold a competition for the fastest unit in the land! If you find this column useful please let us know and we may make it a regular feature.

AR8000 (& AR2700) - PC-MANAGER is an optional DOS utility for memory & search bank management. The software (which works in conjunction with the optional CU8232 interface) permits upload, download, editing, renumbering, saving of data, editing of auto-mode bandplan data plus a built-in terminal driver. It is planned to add support for the AR2700 during the summer (the AR2700 may also require the optional IF-ADP lead). A WINDOWS based package is also under development and should become available during the summer months. Full features will be provided including scanning, searching, spectrum display, recording to disk etc. **CU8232 interface £99 + £3 P&P PC-MANAGER £49 + £3 P&P**

AR3000A & AR3000 SEARCHLIGHT is a PC WINDOWS based software package enabling control of frequency, mode, attenuator, scanning, searching, upload, download, spectrum analysis, recording to disk. **AORSC** is a PC DOS based control package with bandplan data and integrated logbook. **SEARCHLIGHT £99 + £3 P&P AORSC £75 + £3 P&P**

AR3030 CONCERTO is a PC WINDOWS based software package adding further versatility. Duplex frequencies may be held in software memories along with text comments for easy identification. Control of frequency, mode, attenuator, filter selection etc are available along with a spectrum display. **CONCERTO £49 + £3 P&P**



AR8000 receiver - hand held all mode receiver with twin frequency display, alphanumeric text comments and optional computer control. £425



AR2700 receiver - hand held receiver with optional voice record module and computer control. £285

AR3000A receiver - base / mobile all mode true base station. £955
AR3000A PLUS receiver - enhanced version of the AR3000A with WEFAX, narrow AM filter, SDU "ready" etc. £1039



AR3030 receiver - all mode short wave receiver. £665

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LOWE HF225E Europa gen cov RX	£490
LOWE PR150 short wave preselector	£170
AOR AR2000 hand held VHF / UHF receiver, very good cond	£195
AOR AR2800 base / mobile receiver, very good cond	£275
AOR AR2002 base / mobile receiver	£249
AOR AR3030 gen cov RX - Ex-demo, mint condition. 12 month warr	£599
WIN WIN108 VHF airband receiver with soft case	£75
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AEA FAX III

Lawrence Harris puts aside his normal FAX software and looks at the latest offering from Skyview Systems - the AEA FAX III.

The FAX (facsimile) software that I normally use is a little old. I had been looking at advertisements for AEA FAX II, when AEA FAX III arrived through the post for review. Some background information might help to put this product in perspective.

Most s.w.l.s are familiar with the variety of transmissions available for monitoring on suitable general purpose h.f. (0 to 30MHz) receivers. These can tune to literally hundreds of transmissions, such as FAX, RTTY, NAVTEX and Morse code.

To actually decode the transmissions, some means is required to extract encoded information from the signal. Several products are able to present data in a meaningful manner.

For newcomers to the field of FAX reception wondering what is available, the following list of image types may whet your appetite:

Forecast maps and charts,
surface weather conditions
Ice charts and navigation hazards
GOES/GMS/METEOSAT satellite images
Radar/precipitation maps
Press photos and schedules.

FAX transmissions, therefore, take many forms. Press pictures may be transmitted in grey scale and weather charts comprise black and white lines showing pressure isobars.

AEA FAX III is capable of decoding all the above, plus the other (text) transmission types. It includes the necessary interface to connect to your PC.

Signal types that can be

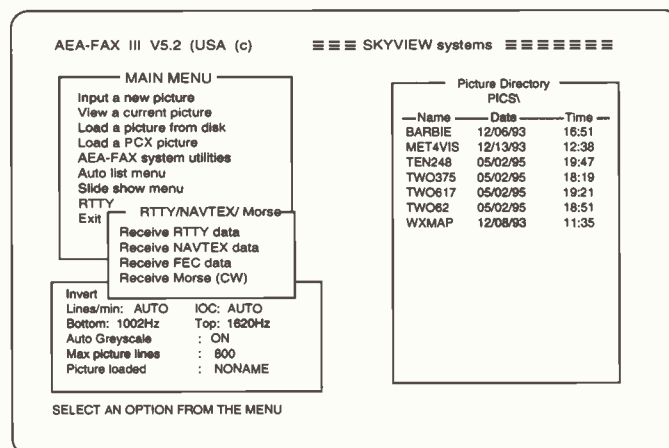


Fig. 1: Main Menu.

decoded include: FAX: 60 to 240 lpm; IOC 288, 352 and 576. RTTY: Baudot, ASCII; Selcall detection. FEC: SITOR-B/AMTOR-B/NAVTEX. CW: Morse Code.

Hardware Requirements

The hardware specifications should not cause a problem. One PC with at least 2.5Mb free disk space, running DOS 2.1 (remember that?) or later, and a serial interface for the data input. Most computers have two serial ports, one for the mouse and a second for serial data.

For these tests I used my 1386DX, with maths co-processor. My Lowe HF-225 general purpose receiver, fed by a random length external antenna, provided input to the AEA FAX hardware, which fed data to the second serial port.

The software can control certain receivers, see unattended picture capture. But to accomplish this, you need a third serial port, or the one normally used for mouse operation.

Installation

The software is supplied on both 3.5 and 5.25in disks, and

installation was problem-free, using the batch file provided. If you use COM port 2 for your serial data input, this must be specified at 'run-time' by entering the command line FAX/2.

I prepared a batch file to include the command. If you do not specify the correct port, the software cannot see the data coming in. There are facilities to help identify any problems.

The PC needs at least 530Kb of free memory in which to run the program. The use of MEMMAKER with later versions of DOS (the DOS memory manager) can ensure this is available. Avoid running TSRs (terminate and stay resident programs) and over 600Kb should be free.

I did use one TSR, a screen grabber to save selected graphics images for inclusion with this review. Changing screen colours allows customisation of the program, and there is a screen saver.

Main Menu

Running the program produces the Main Menu screen, Fig 1, where you choose reception mode. For immediate reception of FAX input, a new picture is

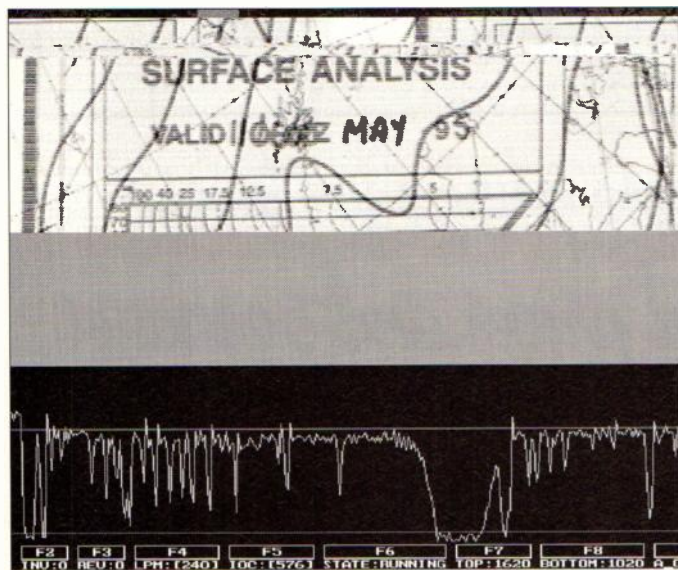


Fig. 2: Live reception; the top is adjusted to synchronise the picture. Scope shows FAX data.

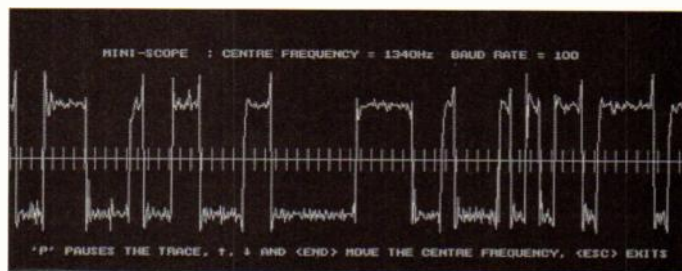


Fig. 3: (Left) Colour palette selection to colour FAX.

Fig. 4: (Above) RTTY signal format after signal conditioning.

selected. To decode RTTY, the RTTY/NAVTEX/Morse option is selected. Menu selections are made using either the mouse or keyboard.

The options are mostly self explanatory. You can view or save the current FAX picture, or load one previously obtained. A timetable for future FAX reception can be selected using the Autolist menu, and 'slide-show' sequences can be prepared. More on these options later.

General system settings are displayed in the lower box. The large box on the right shows current picture files in one of the picture directories, and a status line on the bottom bar guides the user with instructions.

Useful file management facilities are available to optimise the directory structure. There are directories for the program's own image formats, and for converted PCX and GIF formats. The software ensures full transferability to other image processing or printing software.

FAX Signals

Users familiar with utility transmissions know that FAX signals have a specific format. Special tones signal the start, end, and characteristics of an image. Two other parameters, the Index of Co-operation (IOC) and the number of lines per minute (LPM) are also included.

This information forms part of the transmission, enabling FAX software to

receive pictures automatically. Each should be correctly aligned (synchronised) and have good grey scale resolution.

There are hundreds of utility stations, and the book includes a brief list based on reception in the USA. A separate booklet with further information is also included.

I tuned into several FAX stations, selecting those having reasonable signal quality. Reception depends on the type of antenna, time of day, frequency band, the distance of the transmitting station and the state of the ionosphere (which reflects h.f. signals).

The state of the ionosphere depends on the season of the year and the level and type of solar activity! Consequently, with so many variables, it is only experience which helps one predict bands and stations likely to provide the best signals.

From the Main Menu, selecting Input starts signal decoding. Without having made any adjustments, the first picture may not be optimised.

Non-aligned (skew) pictures are normally due to computer timing errors. Correction is made using keys for both coarse and fine adjustment, and the software remembers these settings.

Small Oscilloscope

Pressing 'm' from any reception mode displays a small oscilloscope showing the demodulated scan line in

realtime, together with current white and black thresholds, **Fig 2.**

You can adjust these thresholds using the F7 and F8 keys (with shift if required), optimising picture quality. Pressing F6 to display sync. causes the software to calculate the best tone levels, thereby saving manual adjustment.

Other parameters can be set using the remaining function keys, as illustrated in the picture. These allow the adjustment of picture quality in realtime, but are automatically set when using the auto-start mode.

Instant adjustments available include left-right scroll (cursor keys), black-white inversion (F2), reverse scan direction (F3), LPM and IOC (F4 and F5 - normally left to software), and grey scale (F9).

The F6 key switches between software running, synchronising or wait-to-start, and a good incoming signal lets the software do a brilliant job, leaving you to just sit, watch and enjoy!

Unattended Picture Capture

If one particular station transmits images of interest, you can use the software to create a timetable to collect these images. Transmissions are usually done to a schedule.

From the Main Menu select the Autolist menu, which offers a further selection. Several timetables can be produced.

The manual provides full instructions for editing and, on your return, a set of correctly captured images should be stored. Use of the timetable assumes your computer clock is set reasonably accurately.

This option also offers a special feature, the ability to tune certain receivers to specific frequencies when the correct connections are made. If your receiver can be controlled this way, you can use a serial connection from your computer. This requires either temporary removal of the mouse, or the fitting of a third serial port to your computer.

Built-in Database

The program comes with a number of FAX stations, schedules and transmission frequencies already set-up. You can add to the database by selecting Edit a FAX schedule (from the Autolist Menu on the Main Menu), then create a personalised list of your favourite sessions.

Station details are stored individually, and the database can be accessed by station or frequency. Utilities are provided for database management and display colours can be adjusted. But more importantly, stations can be added, deleted or edited.

Image Processing

The majority of image decoding programs include basic image processing. The most important option (in my

view) is the ability to convert pictures from the program's own format, to one of the standard formats.

The AEA FAX III can convert to both PCX and GIF, thereby ensuring transportability.

Image processing can be done on images in AEA FAX format, but not on PCX or GIF files. Normal practice would be to use basic enhancement processes before converting the picture.

Facilities include image scrolling, horizontal alignment, zooming, picture inversion (flip) and colour inversion (invert), rotate, mirror, intensity adjustment, colour palette change, cropping and file conversion.

Picture skew cannot be corrected after image collection, but adjusting this forms one of the first tasks after software installation. Pictures collected with wrong IOC settings (therefore looking squashed or stretched) cannot be adjusted (at least within this package).

Routine image collection should be done automatically, so this problem should not occur.

Other Facilities

Any image can have its palette changed. Pressing <home> when a picture is displayed, brings up the colour palette, Fig 3. There are four colour palettes, and each can be modified. Infra-red satellite images can reveal thermal variations by creating a red shades palette.

Images can be cropped or converted. Pressing CTRL-X, produces an adjustable rectangle in which the selected area can be saved in PCX format. I used this and found it simple but effective. Conversion to GIF is started by using CTRL-G.

Using unattended picture capture you can schedule collection of a sequence of METEOSAT images. These can then be viewed sequentially as a slide-show or animation. Several such sequences can be compiled.

Four printer options are provided: Epson 9 and 24-pin, HP Laserjet 150 and 300 dpi. I did a trial print using my

Panasonic 24-pin printer and the result was fine.

Decoding RTTY

Things have advanced since I bought my first piece of hardware for decoding RTTY (radio teletype) and Morse many years ago. My main interest was monitoring Russian RTTY stations for announcements about their space programmes.

There are several RTTY modes (see specifications). The mode FEC (Forward Error Correction) was developed to increase the reliability of RTTY transmissions.

The mode RTTY uses two different audio tones. The lower frequency represents a mark (1), the upper frequency, a space (0). The frequency difference is termed the shift.

Amateurs usually use shifts of 170Hz and commercial traffic 425 or 850Hz. Combinations of data bits represent letters of the alphabet.

From the Main Menu, the option RTTY/NAVTEX/Morse is selected, and the required choice then made. This assumes you can recognise the type of signal being transmitted.

For the beginner, help is at hand. Whatever selection you make, the Miniscope facility is available, Fig 4, and displays the form of the demodulated scan line.

The book shows the different forms of oscilloscope trace obtained from each type of signal. Under the title 'Signal Code Analysis', the book explains how to identify unrecognised transmission signals, that is, whether RTTY, NAVTEX or another mode. This method uses the FAX option and the resultant picture often indicates which mode is in use.

By adjusting receiver tuning, signal conditioning electronics optimise the signal so that it sits uniformly about the centre line. Software auto-tracks the signal. It was very impressive watching this happen while slowly re-tuning. Adjustments can be made by toggling auto-track off.

Several function keys are programmed, as shown in Fig 4. Baud rate can be estimated by pressing CTRL-F3 and new

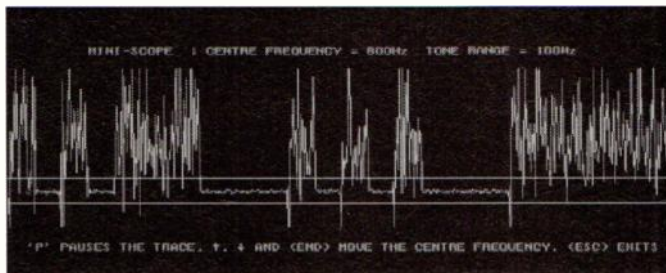


Fig. 5: Miniscope display of a.c.w. signal.



Fig. 6: Sample FAX as received

Baud rates edited into the SPEED.CFG file. What more do you need?

Automatic Collection

The software includes the RTTY Selcall (Selective Calling) Auto-start mode, in which data collection to the buffer starts only when a specific text string is found. This has many applications, such as the selective data collection of TBUS (satellite predictions) transmissions.

NAVTEX is a version of FEC and the program includes a feature to receive those messages containing specific types of information. This RTTY decoding facility is probably the best of those that I have seen.

Conclusions

This program may represent the state-of-the-art in utility station decoding software. It includes virtually every facility that one might want, and some that you did not know

you needed!

With such a well written manual, a complete beginner can be up and running within a few minutes. It deals with the topic of decoding short wave data and provides an explanation of FAX weather charts to help with their interpretation. Highly recommended.

Thanks go to **Martin Lynch at the Amateur Radio Exchange Centre, 140-142 Northfield Avenue, Ealing, London W13 9SB** for the loan of the review package. The AEA FAXIII costs £139.00.



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Realistic PRO-50

Our scanning columnist, John Griffiths takes a rest from studying and takes a long look at the Realistic PRO-50 hand-held scanner.

I believe that I'm on record somewhere as saying that I generally like Realistic products, but that I dislike having to programme in frequencies. If you are a scanner owner who has an opportunity to play about with new machines then you'll understand what I'm on about. If you aren't - and you are the owner of a machine that 'hunts' down frequencies and holds them - then you're not old enough to remember the first scanners on the market. Back when Adam was a lad!

I also believe that I've said one of the most useful, and robust, scanners I owned was a Realistic PRO-43. A ten channel, base entry hand-held with amazing stability. Good audio and at a price low enough to appeal to those who just want to test the water or have a useful stand-by set.

Impressions

The first time I used the receiver, I was asked what I wanted with a mobile 'phone' - it just happens to look like one. In response to the quip - aimed at me by a fellow student who, as impoverished as I am, views any materialistic item as a sign of bourgeois capitalism and not in keeping with the ethos of a college environment - I thought that it wasn't a bad thing. It really does look similar to a portable 'phone. What's more, with scanners attracting their share of notoriety, the disguise will possibly lessen the chances of it catching the eye of the local police and you having your collar felt.

Styled attractively in Realistic's universal dark grey, the comparatively large speaker mounted in the upper half of the front panel, discrete buttons in a slightly recessed panel, it gives the impression of looking a bit like the many poser 'phones on the market. With two chunky knobs on the top

panel and a standard, if portly, rubber antenna fitted with a BNC connector, the set crosses the divide between radio and scanner with a soupcon of 'phone chucked in for good measure. All very nice. A belt clip mounted to the rear is up to Realistic's good, solid standards and knocks many fitted by other companies into the proverbial cocked hat. The set, I believe, is rugged enough to last the pace. If, like me, you expect your sets to be go anywhere types, then this will not disappoint you at all. Like the PRO-43, this will give years of good, reliable service - and take the knocks that are part and parcel of scanner ownership.

Sea Trials

For the set's baptism of fire I took it on a day out to Cowes, on the Isle of Wight. As I am in the last throes of submitting a 20 000 word project for my Diploma. here at college, days out are considered rare. A trip to the environment that used to be my element is, in my opinion, the best place to test anything.

On arrival at Southampton I programmed in the most used marine v.h.f. channels and set the scanner up. The port is busy with lots of traffic to-ing and fro-ing including many of the yachts and pleasure craft that use the Solent as a playground before moving out into the real water of The Channel just around the back of the Isle of Wight. Commercial shipping notwithstanding, the Military Port at Marchwood is also within easy v.h.f. range. I was not disappointed.

The set displayed a stable ability to capture and reproduce signals, faithfully responding to the frequency and with clear, punchy audio that impressed me. As a grizzled ex-RNLI crewman with radio as my *forté*, I tend to compare sets with the Icom sets used by the

RNLI - and of which I have always had an extremely high opinion. Anything able to operate in a lifeboat has to be more than just good!

I was, however, frustrated by the programming. With 20 channels, which should ordinarily be enough, but no 'scan and seek' facility, I was unable to test the set out on the Isle of Wight ferry I took from Southampton to Cowes. Crew members marshalling the vehicles on the car deck were all equipped with handholds - but I still don't know what frequency they were using! It is in that situation, perhaps, that the limitations of 20 set channels will lose the scanner some appeal. Although, of course, if you knew the frequencies you could always programme them in beforehand.

Oh, and if reviewers read the handbook they'd find out other things too. More later!

However, I was impressed with what I had put in, and also with the battery life. Kevin Nice, the Assistant Editor had left some dry cells in the battery compartment which, after just one hour of pre-trip use, had gone down quickly. The set is fitted with a little icon on the l.c.d. display - which flashes a 'B' at you to tell you it's on its last legs - so you'll know when it's time to change. I charged up six NiCads for the day and slapped them in. With almost continuous use on the docks and on the ferry over plus a couple of lazy hours paddling on the beach just monitoring, the set was still active when I got back to Buckinghamshire later that night. Not bad considering how some scanners eat power faster than Power Rangers eat National Grids!

Shore Based

After trying out the sets ability to recharge from an external



source - it has both a PWR and a CHG jack - I decided to use one of the facilities I'd missed first time around. The set had a Search facility! Too much time wrestling with words on the project had obviously taken its toll on me.

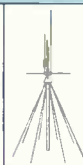
Oxfordshire and Buckinghamshire are surrounded by air bases. It was in this area that I decided to try the set out. Here it becomes important to add that - at least for civilian airband enthusiasts anyway - the PRO-50 is not for you. Coverage is from discontinuous from 68 to 512MHz, military airband is available, as are 2m and 70cm amateur bands and p.m.r. For more details see the specifications panel.

I set in a lower limit of 66MHz, followed the very simple programming instructions, and sat back to listen in. The scanner then went right through its entire range, quickly picking up signals - and making me feel a fool for not having read the instructions in the first place! This facility makes it a breeze to use, and improves its appeal. After all, you can now use it in a much wider context and have got, in effect, 20 active memories plus a Search, or general, scanning facility. Not bad, not bad!

After some short bursts of activity I decided to try it out on Military Air and see what it



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
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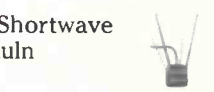
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came up with - flanking it with both my 'standards' used in scanner tests, a VT-225 and the evergreen AOR AR-2000. It was a bit like being back on Ops. but when you have a 'radio ear' it is easy enough to differentiate between one set and the other. Believe me.

On Search, the set counted down from 512MHz in 12.5kHz steps. The mode is f.m. and the speed is some 16 channels a second. When it caught a signal the PRO-50 locked in fast, and with a delay time of some two seconds, held the signal long enough for a visual reference of the displayed frequency to be taken. Inputting that into one of the 20 available memory channels was simplicity itself. You select the channel number from the front panel by pressing MANUAL, then a channel digit, eg. 5, press PGM, press O/MON - which sets the channel indicator flashing - followed by L-OUT/ENT and that is it. One stored channel ready for recall during SCAN. This sort of ease of operation makes a scanner like the PRO-50 easy to use and should win it a lot of friends in these days of complication. It's a lesson that previous review sets - like the Maruhama RT-618 - had and one that endears itself to reviewers and users who want to 'open the box and go'.

In comparison with my other two sets it appeared to 'go the distance' and, whilst not being as selective on MilAir as the VT-225, coped well with the signals I monitored for the review. It sounded better than my AR-2000 - which makes me think it's time I thought seriously about changing it!

Conclusion

If I was to be objective, then I'd say that the set has a future. However, as a first time set, it will probably be left behind if airband is an issue with a prospective buyer. That's a shortfall Realistic may well wish to address in the future. The lack of ability to select of either a.m. or f.m. throughout the whole frequency range is a minus point, as is an inability to define channel steps. However, the set is pre-programmed to step correctly through bands. For instance 5kHz steps between 148-174MHz.

The a.m. reception isn't a real

problem. I had no difficulty following a conversation - using a.m. - on 154.950MHz. Likewise, listening to an amateur repeater on R4 - 145.700MHz between G3BLX and G4FBA, both mobile and heading south was excellent. It's f.m. - just in case someone thinks I'd forgotten! I can see it filling a niche for an experienced user who wants a good, reliable monitor for 20 set channels - say the Military Airband enthusiast who has, perhaps, a set of most listened to frequencies and wishes to keep them thus releasing another set for searching. Again, the dedicated Marine band monitor will want this to add to their set up. I know that if money wasn't a problem for me then I'd certainly give this consideration as a stand-by set for my 20 most used channels.

Shortcomings? No earpiece, no case - but that's all. It's a bright, clear and easy to use set with the added bonus of having permanent markers under the l.c.d. display showing channel, MHz and kHz - which confuses many users. It uses the division dot to split the frequency and should help identification and reporting of frequencies.

Acid Test

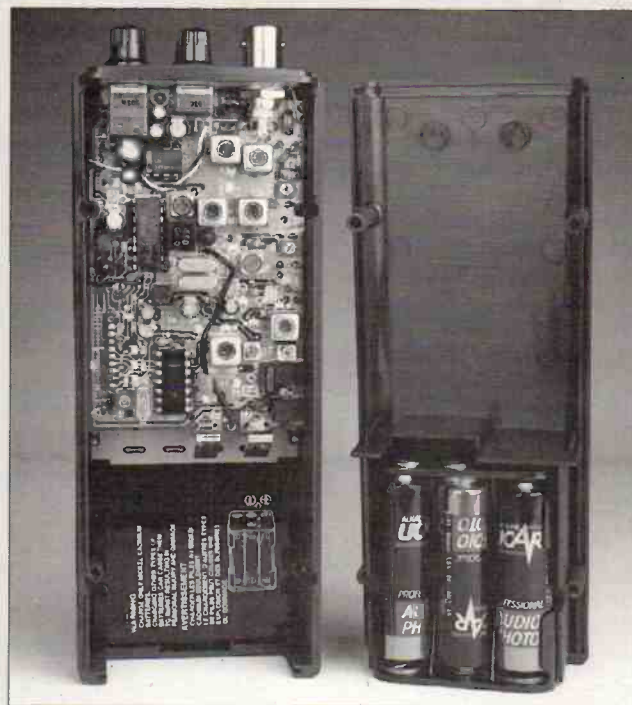
The acid test of any review is whether the set would be good enough to be bought by the reviewer. Well I'd have one. I liked the ergonomics of it, the feel and the weight. I liked, too, its ability to reproduce audio and the very sharp squelch - reportedly 1.0µV threshold and (S+N)/N 25dB 'tight'. Yes, it's technical but it's also very good! The VT-225, for example, is 0.5µV and S/N 10dB - so you work out how good the PRO-50 is against a piece of kit like the 225! Not bad, if you are having trouble!

Again, tech-spec's against an industry standard set like the '225 show a credible performance.

Would I buy it? The answer has to be yes. I would. I know that reviewers enthuse about sets - wouldn't you if you got one on loan? - but I like to think that I'm fair when it comes to appraising a set. If I don't like it, I'll say so.

Truth is, I do like it, lots. I also think new entrants into scanning will like it too, providing they

Specifications



Frequency coverage:	68 - 88MHz	5kHz steps
	137 - 144MHz	5kHz steps
	144 - 148MHz	5kHz steps
	148 - 174MHz	5kHz steps
	380 - 450MHz	12.5kHz steps
	450 - 470MHz	12.5kHz steps
	470 - 512MHz	12.5kHz steps

Channels:	20
Modes:	n.b.f.m.
Sensitivity:	1.0µV @ 20dB S/N

Scan and Search Rate:	16 channels/second
Selectivity:	-6dB @ ±10kHz
	-50dB @ ±20kHz

Antenna Impedance:	50Ω
Audio Output:	200mW (10% t.h.d.)
Speaker:	36mm 8Ω
Power Requirements:	6xAA internal cells NiCad or Alkaline
	+9V d.c. with suitable p.s.u. (not supplied)

Current consumption:	65mA squelched - standby
Dimensions:	160x60x44mm (hwxwd) inc knobs and belt clip excluding antenna.
Weight:	260g excluding antenna and batteries.

know its limitations on civair band and contentious areas. As a first time buy it's a good little set. As a second - or standby - monitor it's also good. Providing Realistic can keep this standard up I think they'll be on to a winner. In an age of highly technical scanners requiring an immense amount of time to programme, the PRO-50 is simple - what's more, can be used within about an hour of opening the box. That, in my opinion, is a very important

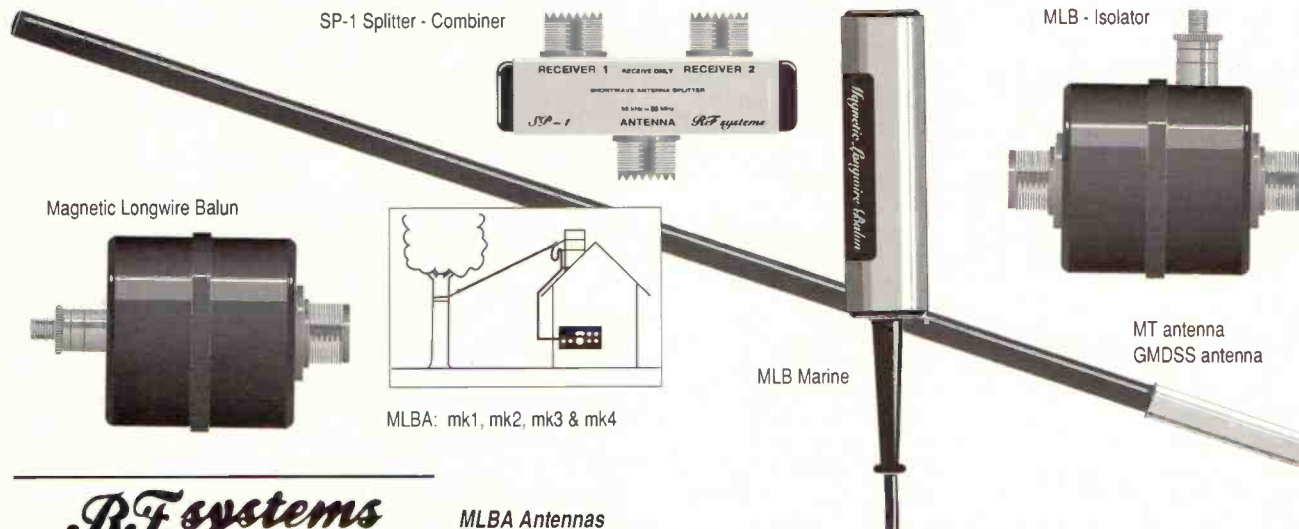
consideration.

Unless, of course, your friendly neighbourhood Assistant Editor forgets to load good batteries! (*But then, what radio enthusiast worth his salt hasn't got some NiCads to hand, eh John? - KN*)

Thanks to **Link Electronics, 216 Lincoln Road, Millfield, Peterborough PE1 2NE. Tel: (01733) 345731, Fax: (01733) 346770**, for the loan of the review scanner. The PRO-50 currently costs £99.99. ■

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MLB Isolator

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MT Antenna

The Magnetic Transfer Antenna is a 2 metre long mast without radials. Great reception from 0.5 - 30 MHz without an antenna tuner. Elliptical polarisation gives reception of both horizontally and vertically polarised stations. Passive, so no overload or intermodulation problems. MT technology ensures noise and interference suppression. Does not attract attention, so ideal for the apartment!

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BARTG

So you're intested in the data modes and you bought the SWM Decode Special. You may have noticed the omission of any mention of the British Amateur Radio Teletype Group. We didn't have space in that issue to feature the following introduction by the BARTG President Alan Hobbs.

The first introduction to non-voice transmissions for many radio amateurs, apart from the well known Morse code, came during the 1939-45 war when many servicemen were introduced to the teleprinter, both in its more common land-line form, and in the rapidly increasing use of teleprinting over radio. This form of transmission was often known as RATT, which stood for RAdio TeLeType, after the north American equipment maker of teleprinter equipment. This interest in radio teleprinting, which later came to be known as RTTY (Radio Teletypewriter TelegraphY) continued after the cessation of hostilities, although it had to remain dormant for some time until the opportunity arose to acquire some of these amazing machines at amateur prices.

Formed in 1959

The British Amateur Radio Teletype Group was formed, as a not-for-profit organisation, by a small group of enthusiasts in the summer of 1959 in order to try to get some RTTY activity going in the British Isles. However, shortly after announcing their intentions and existence in the radio press, the Honorary Secretary of BARTG Arthur C. Gee, G2UK, was informed in a letter from the British agents of the Teletype Corporation of America that the word 'Teletype' is a registered trade name and could not be used in the title of the group. After some discussion, it was

decided to change the name to the British Amateur Radio Teletypewriter Group, which managed to retain the original acronym.

At first, the group consisted of only a small number of enthusiasts in East Anglia, but it soon grew to over 100 members, and very early in its existence began to show some practical results. Confirmation was obtained from the GPO (the then radio amateur licensing authority) that radio teleprinting by frequency shift keying (f.s.k.) was permissible under the terms of the British amateur radio transmitting licence. A cheap source of teleprinters suitable for amateur use was located, purchased, and then distributed to members of the group. Technical information on RTTY was obtained from many sources, including active members, and was published in the amateur radio journals.

The culmination of these activities was that the first British RTTY QSOs took place in September 1959 between Bill Brennan, G3CQE in Norwich, Peter Carnochan, G3IAO, and Arthur C. Gee, G2UK in Lowestoft.

Regular News Sheet

The purpose of the group was for amateurs to help other amateurs. A regular news sheet began to be published giving up to date information on the RTTY scene in Britain and Europe, and the group was able to obtain supplies of the paper



tape and paper rolls which were devoured by these ever hungry machines. Sources of supplies of teleprinters, and associated equipment, were circulated to members by the Newsflash service which was run by Arthur Owen, G2FUD, and other specialised and hard to find items were made available at discount prices.

In the 36 years since BARTG was formed, the data scene has changed beyond recognition. The early to mid 1980s saw the beginnings of the micro-computer boom, which marked the introduction of the first of the more exotic data modes, and began the eventual demise of the mechanical teleprinter. The data radio amateur now has the choice of: RTTY, Amtor, Packet, Facter, G-Tor, Clover, etc. All of these different modes can easily be operated from a standard PC, perhaps with the addition of an external unit of some form to carry out part of the signal processing, which may be either analogue or digital, or both. Due to the ease of operation of this form of equipment, there are now very few mechanical teleprinters in regular use, although they still have a fascination for many amateurs.

During the same period, BARTG has changed to reflect the new modes which became available to the radio amateur, and the name of the organisation is now the British Amateur Radio Teledata Group, but the purpose of the group has not changed, some of the rôles follow.

- It is still run by radio amateurs for radio amateurs on a not-for-profit basis, and encourages and supports the use of all the data modes.
- BARTG publishes a quarterly journal *Datacom* which usually runs to around 100 pages.
- The organisation supplies the 'Multyterm' ready built terminal unit, which fully complies with EMC standard EN 50082-1.
- Also supplies printed circuit boards for data modems and other specialised data accessories.
- Provides software for some of the different data modes to suit commonly available computers.
- Runs an annual rally at the Sandown Park exhibition centre devoted to the data modes.
- BARTG is affiliated to the Radio Society of Great Britain, and through the RSGB to the International Amateur Radio Union.

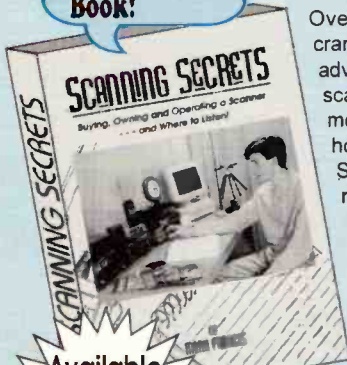
For further information about joining BARTG, please contact the Membership Secretary, Peter Adams, G6LZB, 464 Whippendell Road, Watford, Hertfordshire, WD1 7PT. For further information about BARTG in general, please contact the Honorary Secretary, Ian Brothwell, G4EAN, 56 Arnot Hill Road, Arnold, Nottingham, NG5 6LQ. ■

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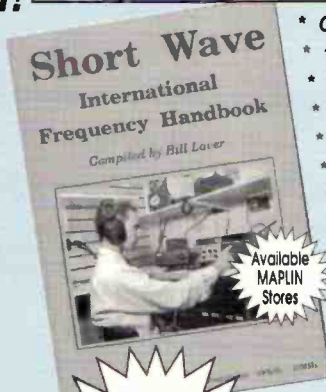
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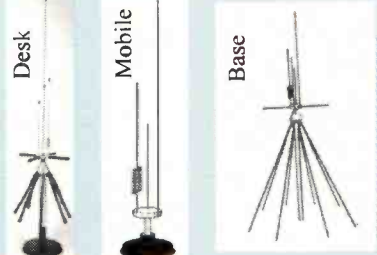
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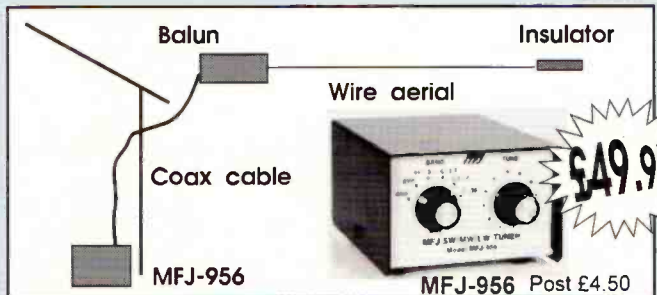


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Radio Secrets of Station X

In the concluding part of Radio Secrets of the War, David White G3ZPA talks of the most secret station of all, Station X at Bletchley Park. He'll also be back later in the year with more fascinating radio facts from the war time era.

We have previously discussed the role of the Y stations of all three of the armed services where the gathered intelligence was passed to. The Navy and Army had their own military intelligence centres and the RAF also sent everything to the Air Ministry.

The Special Operations Executive had their headquarters located at 64 Baker Street in London and had 200 telephone lines running into it by 1944. The Radio Security Service (RSS) had its headquarters at PO Box 25 at Barnet in Herts - but where did all the intelligence end up?

It was sent by telephone, despatch rider and landline teleprinter to the most secret station of all and one which the enemy never discovered at any

time throughout the whole six years of the war. This was Station X, located in a large country mansion set in 55 acres of beautiful country grounds, a mere ten minutes walk from Bletchley railway station in North Buckinghamshire.

The government purchased the house and land known as Bletchley Park from the then owners Sir Herbert and Fanny Leon in May 1938. In June of that year, they set about transforming the once quiet parkland into the Government Code and Cipher School (GC&CS) and it became a place of mysterious comings and goings, puzzling the occupants of this small market town, which is now part of the new town of Milton Keynes.

Lots of hurriedly erected fences, coils of barbed wire and many wooden huts only heightened the sense of

speculation, as no news ever leaked out. Many excellent mathematicians were recruited into this service to work on decryption of messages and the whole park was ready when war was declared on 3 September 1939.

Stroke Of Fortune

A good stroke of fortune in July 1939 was the secret meeting of intelligence officers from Portland, France and Britain in the Pyry Forest in Poland, where an early copy of an Enigma code ciphering machine and all their knowledge of it was handed over by the Poles.

This was a scoop indeed, at the eleventh hour before war was declared. It meant that the British authorities were at an advantage straight away as they had the main key to all the military traffic, being passed by the Germans.

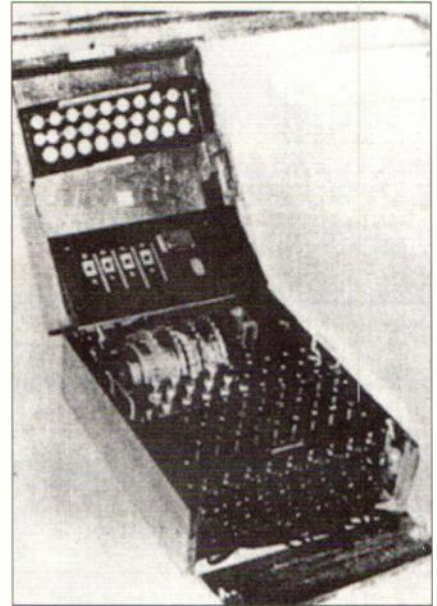
Despite all this, not much was gleaned throughout the period of the Phoney War (September 1939 to May 1940)

as Germany was still sending its messages via courier or landline teleprinter, and hence difficult to intercept. Once the invasion of Europe had started in earnest, then as the lines of communication became more stretched the Germans resorted increasingly to radio transmissions for their messages.

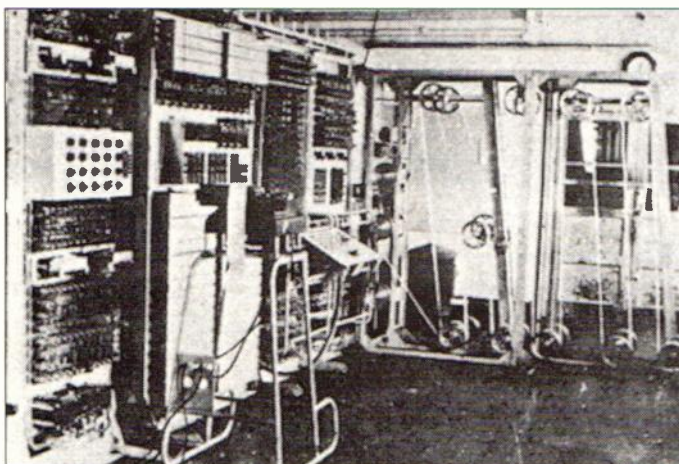
Inevitably, the interception rate went up from the special Y monitoring stations and an increasing number of teleprinter lines was set up between these Y stations and Station X at Bletchley Park, which eventually totalled 100 of the Creed model 7B teleprinters. This was a very reliable machine and ran at a speed of 66 words per minute.

Surprise Raid

Another Enigma machine was captured by the Navy in 1941 in a surprise raid on a German so-called weather ship near Iceland, which had been heard transmitting coded telemetry, not the sort of thing that



1941 German Navy 4-rotor Enigma code ciphering machine.



The world's first electronic computer, 'COLOSSUS' located at Bletchley Park - 1943.

the War - Part 4

weather ships usually did.

The attack was so swift that the crew were captured before they could alert anyone. The Cipher machine was captured and the vessel was quickly scuttled. The Germans took several days to find out that their ship must have been overcome by bad weather or possibly captured, but even then did not believe that the Enigma machine could not have been destroyed first.

When the invasion of the Low Countries and France took place, it was Bletchley Park that revealed the position of the assembled force for the invasion of England at Dunkirk. This enabled the British forces to attack them continuously until further decrypted messages revealed that Hitler had decided to abandon the invasion.

COLOSSUS

A mathematical machine was bought into use at Bletchley and they were called BOMBE units. Many of these were constructed and sent out to stations at Gayhurst in North Bucks and Eastcote in Middlesex. But it was the General Post Office at Dollis Hill in London who was asked in 1942 to supply some technicians to assist with special decrypting machines that another giant stride forward was made.

Work began on a special machine, which for the first time was not electro-mechanical. A

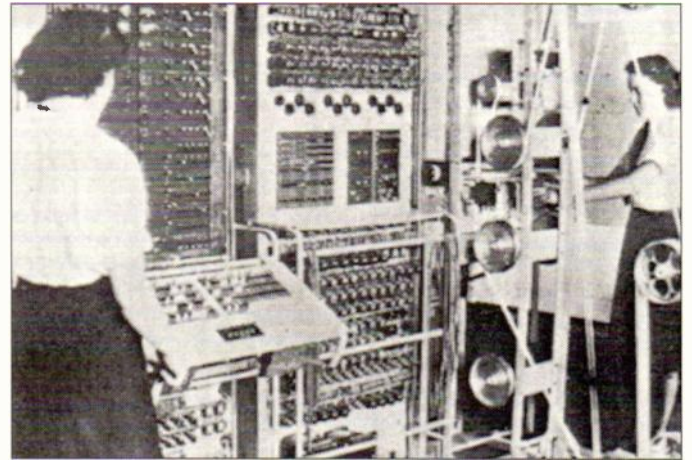
very practical electronics man, Tom Flowers, stated that the electric motor synchronisation of coded tapes was really very slow and he said it could be done many times faster electronically by radio valves.

The result of a lot of work in 1943 produced the world's first digital electronic computer using 1500 radio valves. Because it was so large and had so many of these valves, they decided to call it COLOSSUS. As the war progressed, a further ten of these were built, all slightly different, depending on the requirements of the code breaking team that were using it.

These later computers used over 2000 valves, an absolutely astonishing achievement, considering it used a number of electro-mechanical relays and was all direct coupled d.c. logic. Surprisingly, valve failures were not as common as one would think and they gave a fantastic performance from 1943 until the end of the war.

Constantly Modified

Even though the Germans constantly modified their Enigma machines, it was not long before the Station X code breakers managed to crack the new system. Out of all types of coded messages that were sent by all the branches of the combined forces of the Germans, Italians and the Japanese, nearly all were



COLOSSUS at Bletchley Park, 1943.

broken, except for the Italian Navy and the Gestapo cipher.

As the war progressed, more and more buildings were erected in Station X to supplement the wooden huts which had first been put up. These were of blast-proof material and concrete and were so strong that most of them are still standing today.

By 1944, over 12 000 people were employed on deciphering and the volume of people going in and out of Bletchley Park was enormous. The Prime Minister, Winston Churchill, visited there several times and stated that this place was his Ultra Secret!

The number of motorcycle despatch riders going through the gate at any time of the day or night was up to 40 every hour, so many were the messages being passed. During the D-Day invasion period, nearly 18 000 messages a day were being sent out from Bletchley Park. All the Y Monitoring stations were working at full stretch and all leave was cancelled for this period.

Secret Kept

For over 30 years, Station X kept its secret, although after the war most of it was transferred to a new service called the Government Communications Headquarters (GCHQ) and which was located in another part of

the country. A small team remained on until the park was finally decommissioned in 1987 and almost completely abandoned by 1989.

Open to the Public

A trust was set up in 1992 to try and save this most historic and vital secret station for posterity. This has now been achieved and the site is now open to the public every other Saturday and Sunday throughout the year to see the original wartime buildings, all the wartime equipment including the British Typex and Enigma cipher machines along with a working Y station and other military equipment.

Re-construction Project

Although Winston Churchill ordered all the COLOSSUS machines to be destroyed at the end of the war, a project is well under way to re-construct the world's first electronic computer, parts of which can already be seen working.

You can see some of the fascinating items mentioned in this series for yourself. Bletchley Park House, museum and grounds are open to the public. It has just been host to the Bletchley Park Amateur Radio & Computer Rally, which was held the weekend of June 17. ■



The mansion at Bletchley Park, Buckinghamshire.

Pop Went The Pirates

Andy Cadier reminisces on the golden days when the 'pirates ruled the waves'. Having met the author and worked on-board the floating stations, who better to review this interesting volume than Andy?

The first time I saw Keith Skues was in the summer of 1967. We were both about two miles out in the North Sea off the Essex coast. He was travelling on the Radio London supply tender *Offshore 1*, while I myself was heading in the opposite direction in sister vessel *Offshore 2*.

For a few moments the two boats stopped about ten metres apart, each falling and rising in turn, due to the heavy swell. Keith was known to be writing a book about pirate radio and a shouted ship-to-ship conversation took place between the DJs of Radio London and Radio 355.

The law that was intended to bring an end to offshore radio pirates was about to take effect and Keith was keen to gather as much information as possible before everyone went their separate ways. The roar of marine diesel engines brought an abrupt end to our brief meeting, but we parted well assured that all of us involved in the so-called pop pirates would be included in this exciting forthcoming book.

Well, 1968 came and went, but there was still no sign of Keith's *Pop Went The Pirates*. I was probably not alone in thinking that the book would never materialise, particularly as the author was now in the employ of the then freshly launched BBC Radio 1. This station had been politically constructed to replace the offshore stations and was known not to be exactly sympathetic to the thoughts and aspirations of radio pirates.

Pleasant Surprise

It was a very pleasant surprise, and possibly something of a shock, when in 1993, a mere 25 years later, I received a letter

informing me that *Pop Went The Pirates* was going at full steam ahead. The new publication was now to be over twice its original size and fully up-dated to cover recent pirate radio happenings.

The Foreword does explain exactly why the book was not published when originally intended, just after the Marine Offences (Broadcasting) Act became law in 1967. It magnificently sets the scene of the teenage revolution that took place in the middle 60s, with young people doing their own thing.

The invention of the transistorised radio, known then as a 'tranny', made music easily portable. Rock and Roll had arrived in a big way, but the very formal BBC was simply not in tune with the current trend, indeed she had literally missed the boat!

Pop Pirates

The pop pirates moved in with programmes young people could identify with, winning the ears and hearts of millions. If you are able to remember further back to the stations that broadcast to Britain from the Continent during the 1930s, these are here too.

Radio Normandy on 266 metres, Poste Parisien 328 metres, Radio Toulouse, Radio Lyons and Radio Luxembourg to name just a few. Even these stations had their operations deliberately frustrated by the British authorities, they were considered unauthorised and were denied telephone land lines to broadcast live events. So these were possibly pirates, too!

As one would expect, a lot of space is devoted to the marine pirates of the 60s with Wonderful Radio London, affectionately known as Big L, Radio Caroline, Radio City, Radio 390. Remember Swinging Radio

England and Britain Radio - later to become Radio 355 and 227, also Yorkshire's Radio 270, Radio Scotland and tiny Radio Essex? All of these and many others are covered in great detail.

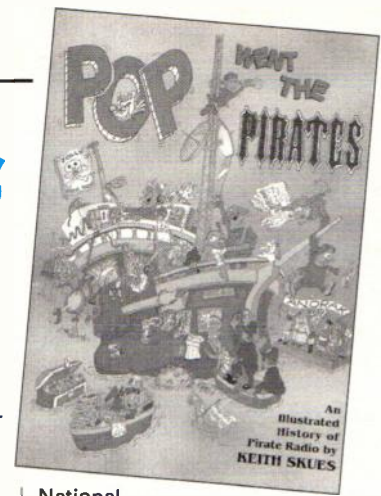
There are vast quantities of photographs and information on pirate radio and its personalities, even I have a mention under my clandestine broadcasting name of Martin Kayne. Reading these biographies it becomes apparent just how many radio engineers, presenters, and mariners involved with the pirates gained their respective skills while serving in HM Forces.

I suppose if you include the government surplus equipment used by the smaller stations, plus the conveniently placed ex-military forts located offshore, some credit, if that's the word, should go to the Ministry of Defence for helping to make it all possible. If you operate offshore to exclude yourself from the law, you also lose the protection of the law.

Unfortunate Episodes

There are several sad and unfortunate episodes verging on an element of gang warfare, which took place surrounding one or two of the pirate stations, which did the free radio cause considerable harm. This contrasts sharply with the usual happy memories of laying on the beach in the summer sunshine listening to fun loving DJs playing the latest hits. There were competitions, promotional stickers, posters and dances featuring your favourite pirate presenters, making each station a living factory of fun.

Two official organisations that did not withdraw their services to the pirates were HM Coastguard and the Royal



National Lifeboat Institution. A chapter called 'Riders In The Storm' relates the assistance given by the Coastguard and the RNLI to the pirate radio stations. It also includes several dramatic rescues in which lives would have almost certainly been lost had it not been for the vigilance, courage and skill of the marine rescue services.

Not only does *Pop Went The Pirates* give the pirates' view, but it also gives the official government position taken from speeches and press reports made at the time. For me, it recaptures the excitement and freedom of being in my teens and twenties during the 60s, a period in my life when, it seemed, every day was an adventure.

Popular Alternative

It did change the whole face of broadcasting. Those involved in commercial radio today accept that the origins of British commercial radio was started by people risking their necks in ships and structures on the high seas. Thanks to *Pop Went The Pirates* this whole era of people seeking to provide a popular alternative radio service, under quite considerable opposition, will be remembered. I don't suppose we will ever see or hear the like of it again.

For any radio enthusiast who has any interest in broadcasting history this book is a must. Keith did suggest to me that after reading it, that it could be used as a door stop! In actual fact, apart from being a good read, it is also an excellent reference book and occupies a very important place among my radio related treasures. ■

Pop Went The Pirates is our subs club offer this month. To order your copy see page 91.

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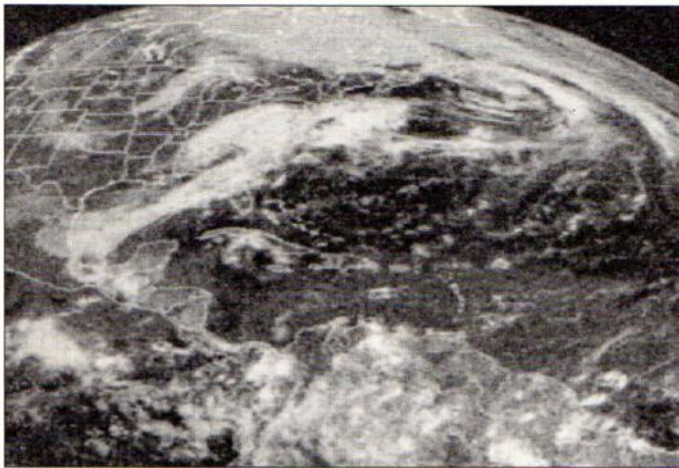
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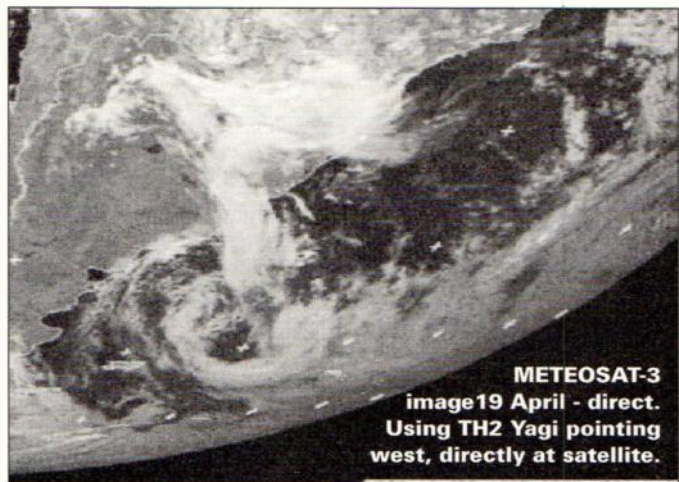
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PDUS & WEFAX System



GOES-8 image 24 April - direct. Using TH2 Yagi pointing west, directly at satellite.

Lawrence Harris, our 'Info in Orbit' specialist, has been looking at three new products for the WXSAT enthusiast from TH2 Imaging.



METEOSAT-3 image 19 April - direct. Using TH2 Yagi pointing west, directly at satellite.

Before describing any of the modules, some background information might help beginners to put these products into perspective. All three products are used for specific weather satellite (WXSAT) operations.

METEOSAT-5 is one of several WXSATs in geostationary orbit, and provides Europe, and many outside countries, with an almost continuous stream of WEFAX images and other data. It provides two WEFAX data streams, channel A1 on 1691MHz and channel A2 on 1694.50MHz. The latter is mainly used for Primary Data, but some WEFAX format images - such as those received by other WXSATs - GOES and GMS - positioned elsewhere around the globe, are included and re-transmitted at scheduled times.

To receive METEOSAT WEFAX telemetry, a suitable Yagi or dish is required. This review starts with the TH2 Yagi, one of only a few retailed in the UK. It is designed to receive telemetry at a strength suitable for WEFAX decoding, the most common application for METEOSAT users. When a 1691MHz Yagi or dish is

pointed towards METEOSAT-5 (positioned near longitude 0° west, at an elevation of around 32°) the s.h.f. (super high frequency) signal should be received. From this point, two options are available for subsequent signal processing.

One option involves using a high quality pre-amp to amplify the 1691MHz signal, then feeding this to a direct 1691/1694.5MHz METEOSAT receiver. The other option is for those who prefer to use the same v.h.f. receiver for both METEOSAT and the polar orbiters. As well as providing inputs for signals from the polar orbiters - NOAA, METEOR and OKEAN - such receivers may provide a separate 137.50MHz input for METEOSAT WEFAX from a down-converter. The latter takes the 1691/1694.5MHz signal from the antenna and converts it to 137.50MHz, for input to such a receiver. This method works because the signal modulation technique used for METEOSAT WEFAX is essentially the same as that used by the polar orbiters. The down-converter reviewed here is of this type.

The software copes with most polar orbiting WXSATs, as well as METEOSAT, and is reviewed later.

METEOSAT TH2 Yagi

For the frequencies (1691/1694.5MHz) used by METEOSAT for WEFAX data transmissions, either dish or Yagi antennas are suitable, each having benefits and drawbacks. For WEFAX images, a dish size of about 1m will suffice when just one METEOSAT is transmitting data. During those few occasions when the backup METEOSAT is undergoing tests, some interference may be seen because of the proximity of both METEOSATs.

The opportunity to review the TH2 Imaging Yagi, was welcome. The design is credited to Henry Neale G3REH, and is quoted as having a forward gain of about 21-22dBi. This is the measure of the signal increase above that provided by an isotropic antenna. The Yagi was received in kit form - something of a surprise as I had assumed it would arrive in two pieces to be bolted together. However, with the contents already carefully labelled, and an instruction sheet included, I set about construction.

Construction

The main boom comes in two sections to be connected together via a short length of square cross-section rod. Before doing this, the packets of circular copper elements, of differing sizes, were checked and laid along the boom in numerical order. Each section was identified from the instruction sheet, and the three rods were pre-drilled and mostly ready to use. Some minor cleaning was necessary, then the unit was fitted together. The elements were slotted into the holes in the sequence given, and the reflector plate fitted where indicated. Construction should not be a problem for even the most non-mechanically minded of users!

A mounting bracket was provided, which enables the antenna - rather long, at 3m, in its completed form - to be fitted to a suitable mount. When antenna construction was completed, the next instruction caused me to groan. An 'N'-type plug had to be fitted! I can do most construction projects, but N-type plugs are in a world of

their own! There are variations, each requiring different lengths of coaxial cable and braid to be prepared - without the correct instructions, you are in for problems!

In the absence of instructions I located one of my own, old instruction sheets. After spending an hour or so carefully cutting and soldering, I finished the connection. Please, TH2 - ensure this is already done for the user!

The instructions suggest that when construction and testing of the unit has been completed, joints can be waterproofed and lacquered or varnished.

Testing

The proof of the equipment is whether it works or not. For my first test, I used only the first section of the antenna, therefore excluding the extension unit. I was interested to see what signal strength might be received with this shortened length, and to compare it directly with my present system, which uses a dish, 1691MHz high-quality pre-amp, and direct METEOSAT receiver. This latter takes the amplified 1691MHz signal for decoding, so does not use a down-converter.

I started my system receiving METEOSAT pictures, then switched from the dish to the half-length Yagi for a first try. No problems. With the Yagi pointing in the general direction of METEOSAT, I immediately heard a convincing signal, which, when decoded, produced clear pictures. Careful examination showed some noise was present; I adjusted the Yagi for best reception and checked again. Noise was still present but not a serious problem. For a fair comparison, I fitted the full length of the Yagi, and the 3dB increase (double the signal) removed virtually all traces of noise.

Without doubt, this Yagi



**Down-converter
(taken with CCD camera).**

worked very well; then I remembered METEOSAT-3. Over to the west, at low elevation from the UK, this WXSAT has been operating under the control of the USA, imaging the Americas, while the GOES program of replacing the old satellites proceeded. If you check the position of METEOSAT-3 using a suitable graphical satellite predictions program, hour-by-hour, you can see that it remains above the horizon of some western counties. I pointed the Yagi westwards and waited. After some minutes the tones of the satellite were heard. These allowed me to optimise pointing, and a set of good images was obtained. The ease of position adjustment was evident, so optimising was done within a couple of minutes.

This Yagi convinced me that it is a worthwhile consideration as an alternative to using a dish. All things being equal, my preference now would be to use this Yagi, though at around £80, it is not cheap. Low wind resistance and little environmental impact are in its favour. Yes, I really liked this model; it is a pity I do not get to keep the products tested! Further tests were conducted with the down-converter.

Down-converter

The 1691/1694.5 to 137.50MHz down-converter is manufactured by Martelec Communications Systems as their model MSC30. This type of down-converter is in common use with many METEOSAT systems and

forms a critical component in such a system. The unit is described as featuring modern, low-noise, NE32184A HEMT GaAsf.e.t. (gallium arsenide field-effect transistors) and MMIC technology to produce a high-gain, consistent with the low-noise figure.

Specifications quote a typical insertion gain of 55dB and noise figure of 0.7dB, indicating suitability for METEOSAT WEFAX operation. An additional feature is on-board temperature control for high stability of the crystal oscillators. The unit is of rugged construction, the model that I used being of die-cast metal, obviously designed for outdoor use.

Connections

The down-converter has an N-type socket, so can be connected directly to the output of a Yagi. In many cases, a short length of high quality cable may be required. If not purchased, this cable must be carefully constructed, with a length not exceeding about 3m. In practice, short 0.5m lengths should be adequate to allow mounting of the down-converter to the dish, or near the boom of the Yagi.

A feed is required to take the 137.50MHz output signal indoors to your WXSAT receiver. Most 50Ω cable of the narrow type is suitable.

As is essential with down-converters, two channels (A1 and A2) are provided. It is important to be able to switch easily between the two, and on this unit this is done in either of two ways; powering the unit via the d.c.

connector, using different pins for either channel, or by voltage change applied to the central conductor of the BNC output connector. Voltages above 13.8V enable channel A1, and voltages below, enable A2. There is provision to change this threshold voltage. I preferred to use the separate d.c. connector alternative.

Testing

No matter how impressive the specifications, the real test is always the final picture. Having spent I cannot guess how many hours over the years monitoring METEOSAT images, I was ready to cast a critical eye on the result.

The down-converter was connected directly to the Yagi, having established that impedances were matched. Having the use of two METEOSAT receivers, I set-up both systems side-by-side. The result was an almost identical picture quality from the TH2 Yagi and down-converter, and my own direct 1691MHz receiver and decoder. After once more optimising alignment of the Yagi, I left both systems running.

Some METEOSAT images, those with extensive sky views, provide opportunities for good checks on picture quality because they reveal the presence of any noise. I examined the images from both systems. They were very good, perhaps my own having a slight edge. In the worst images, I counted an average of three noise pixels per picture from my own system, perhaps four or five from the TH2 system. Under normal conditions this should not be noticed.

Conclusion

The unit comes with adequate instructions for use, and worked well with the TH2 Imaging Yagi. Pricing seems fairly average at about £170 plus VAT.

TH2SAT Software

Some years ago I reviewed TH2's WXSAT decoding software; I made a point of not looking back to read my impressions of that time. Firstly, the manual is all that a manual should be - comprehensive, clearly and concisely written, I cannot criticise it at all.

The software comes on a 3.5in disk with an installation routine. This did not work for me (!) so I installed it manually - just file copying. A half-card is supplied and should be fitted in a suitable 8-bit or 16-bit expansion slot inside the computer. Provision is made for changing the base address of the card, should this be necessary, but no changes were required for operation on my 486SX computer. The card is fitted with an audio input connector, to take the output signal from the WXSAT receiver.

The set-up program configures video mode, the video card and its base address. Twelve common choices of video card are available, with display options extending from VGA at 300 by 300 pixels, up to high resolution SVGA at 1024 by 768, depending on your card and its memory provision; you can check with TH2SAT whether yours is included.

Setting-up

For the best results, some one-off adjustments need to be made. The software allocates a different satellite mode to each format: NOAA visible, infra-red, METEOR visible, infra-red, and METEOSAT. For the first 'pass' taken in each mode, the input level must be adjusted. It is initially set at 99 (maximum), so the first time receive is selected, synchronisation may be virtually random, and produce a nearly-white image. By tapping the [-] (minus) key, input level for this mode is reduced and the number of grey levels (one



factor affecting picture quality) can be maximised. One advantage of this software design is that each mode can be separately optimised; for example, METEOR WXSATs have a different grey scale response than NOAA pictures, and, at least at my station, slightly higher power levels. Because they are individually adjustable, there should be a reduced need for later image processing.

After this input level adjustment, it is useful to terminate data collection by pressing [Escape], then restarting. This should now produce a properly synchronised image. This process can be repeated for each mode.

Limitations

It is at this stage that what was for me the biggest problem arose. The software is designed to take sufficient data to form one frame (image). Once the screen is full, image collection ceases. You must do a quick-save before restarting image collection, or lose the remainder of the pass. The other limitation (for NOAA passes) may be realised by the need to select either visible or infra-red NOAA image sections - but not both. Given that most computers have 4Mb of RAM available, perhaps even more, and a fair sized hard disk, I put the questions concerning these seemingly unnecessary limits on the amount of continuous data collected during a pass, to TH2. Tony Howe explained that they felt a principal selling point with the software was its ease of use.

They had considered adding full pass capture, but wanted to avoid adding another level of complexity. That is a fair point, as long as potential purchasers are aware of the implications.

Tony also pointed out that the software performs well on the most basic 286/386 computer, even when only fitted with 1Mb RAM. Where RAM is in short supply, data can be written to disk. A minimum specification 286 computer with 1Mb RAM is adequate for this software.

Menu Driven

The program is based on a set of menus, all sitting in the middle of the screen. This was the second of my few criticisms. I prefer menus to form one edge of the display so that the picture is not obstructed. Menus are removed by pressing V (view), and recalled by tapping any key. On each side of the screen there is a vertical bar, showing the current palette (grey scale or colour selection), which reflects any changes made.

There are five menus, normally activated by function keys F1 to F5, each providing logical groups of functions:

- F1 gives the Main Menu
- F2 gives the Image Processing Menu.
- F3 gives the Palette Menu
- F4 is for unattended operations
- F5 is for animation.

The main menu is used to receive, load, save and quick-save the image. Other options here are zoom and unzoom, select satellite and

video mode, and one or two minor operations. Also displayed is the disk free space and input level. Some of this information seemed surplus to normal requirements, occupying space that I would rather see devoted to the image.

The software does not include a satellite predictions module - a common exclusion from such software - but this can be obtained from a number of sources - see 'Info in Orbit'. To obtain the best performance from the program, you need to know which satellite is expected, or to at least recognise its signal when first heard, in order to select the correct satellite mode.

Synchronisation Choices

Every satellite a.p.t. (picture) signal includes a tone of specific frequency, indicating the start of the picture line. METEOSAT has an additional tone marking the start of an individual four-minute frame. In each satellite mode, when Receive is selected, the software waits for the appropriate line synchronisation tone, so all images should synchronise properly from the start. You can force image collection by pressing control. This helps when setting up METEOSAT signal input levels, or when you just miss the start of the image.

By convention, all WXSATs amplitude modulate picture data onto a 2.4kHz sub-carrier. This is why any a.p.t. satellite decoding system can theoretically decode all WXSAT pictures. Unfortunately, it is not quite as straight-forward as that! CIS WXSATs do not all use a stable 2.4kHz sub-carrier; METEOR series 2 WXSATs are notorious for the variability of their sub-carrier, requiring a change of decoding method to produce synchronised (straight-edged) pictures.

Continued on page 56

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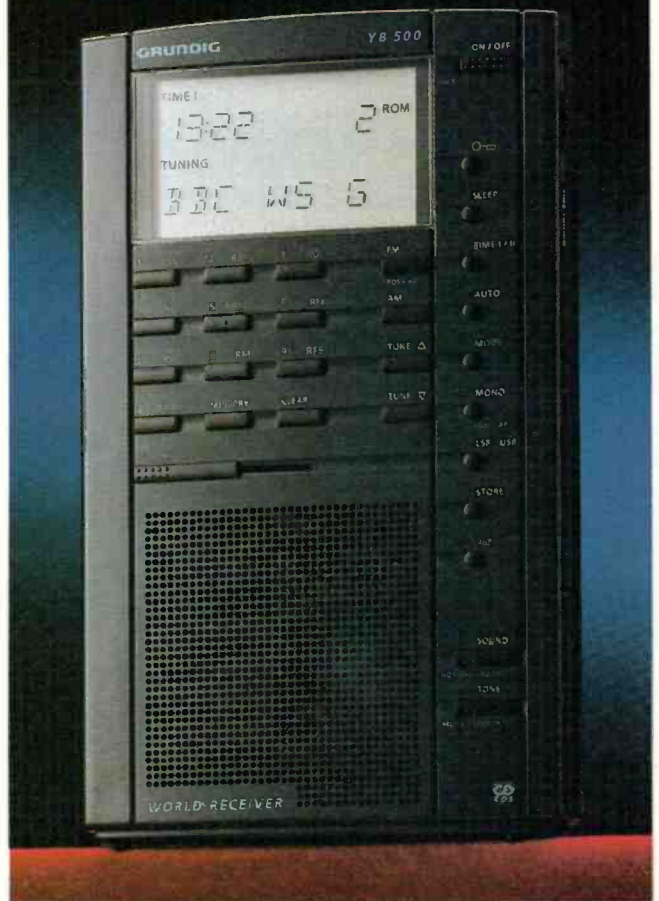
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AOR 3000A PLUS

Modified by the boys at AOR UK, the new 3000A plus provides even greater performance and capabilities. Five modifications including wider FM filter for WEFAX, 10.7MHz I.F. output for driving the SDU5000 plus more, the extra facilities are certainly worthwhile.

The AR3000A plus is available from stock. **RRP £1099. See special purchase offer with the SDU5000!**

AOR SDU5000

Designed primarily with the AR3000A in mind, the SDU5000 enables the user to "view" up to 10 MHz of the selected band selected on a LCD colour display. Even small signals can be seen with ease, making it invaluable for the serious VHF/UHF monitoring station.

AOR SDU5000 RRP £799. BUY BOTH THE AOR3000 plus and the SDU5000 for only £1660, saving £238!! Super low finance plan also available!

AR8000 UK

Designed for the world market, the AR8000 covers just about everything that is transmitted in the entire usable radio spectrum. The ONLY scanner to cover 500kHz-1.9GHz in your hand, its been our best seller for some months now. **LOOK AT THE SPECIAL JULY PRICE!! AR8000 RRP £449. ML PRICE £399, saving £50!**



MVT7100

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These two twins are the very best for scanning the Air Band. The VT-225 covers both the Civil & Military frequencies and the smaller VT-125, Civil only.

VT-125 £179.95
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Kenwood R-5000

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AOR-3030

A Japanese receiver with an American appearance, the AR-3030 is a real alternative to the normal layout of receivers. It works well too!

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Lowe HF Europa

An HF-225 with all the options, plus better AM selectivity. **RRP £699, or Deposit £99, and 12 payments of £50 per month FREE FINANCE.**

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Lowe HF-225

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Drake R8E

The Drake is my own personal favourite. It doesn't look or feel like a normal receiver, but the PassBand tuning and American designed filters win me over every time. If you can afford that little extra, then go for it!
RRP £1199. Deposit £179, 12 x £85.



Control software for ICR-7100

Supplied with computer interface, the new ICRC-7100 will allow full computer control of the Icom ICR-7100. **Only £49.95**

New

LOWE HF-150 & "FRIENDS"

The British "Quad" of Radio Communications, Lowe Electronics are flying the U.K. flag, thanks to the excellent value for money, advanced circuit design and overall packaging of their receiver range.

This month, Martin Lynch is offering the "HF-150 Stack", not only on FREE FINANCE, but offering a FREE KEYPAD for every complete system ordered during JULY '95.



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SP-150 RRP £219
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plus 12 x £66.66.

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Features

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- Tuning step size is 8Hz
- Back-lit display
- Display resolution now 100Hz
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- Memory channels also store frequency, mode, filter selection and attenuator setting
- Computer control is standard via built-in RS232 port

Options

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- Whip Amplifier
- DC lead

- Clock with two independent timers
- RS232 reads to and from the radio for upload/download of memory data
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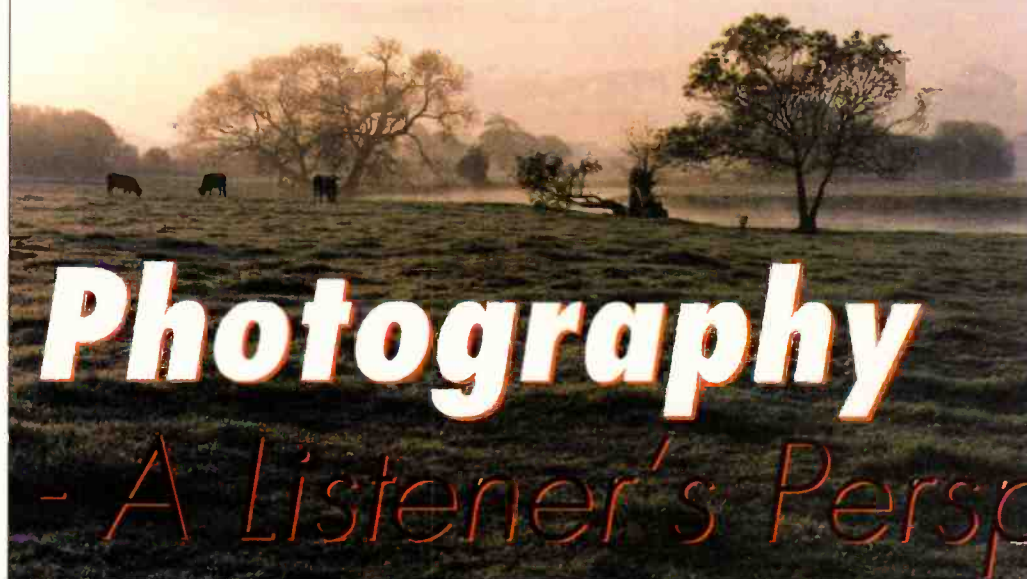
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...the secret of great landscape shots is to thoroughly know the area and spend lots of time just sitting observing the way the light plays across the scene at different times of day... Photograph M.Richards LRPS



Photography

- A Listener's Perspective

Our Decode columnist Mike Richards is also a photographer of no mean standing.

With the warm sunny weather and long balmy evenings, it becomes increasingly difficult to build-up enthusiasm to stay in the shack. This is made even worse as you have to draw the curtains to cut out the sun so you can read the receiver's display! If you add to this the family pressure to join in the fun, it's no surprise that the hobby gets scant attention at this time of year. If, like me, you're lost without a hobby, then photography could well be well worth considering.

You can actually draw a lot of analogies between these two, apparently dissimilar, hobbies. For a start they both involve the use of what can loosely be called toys - high tech gizmos that are great for impressing friends!. Both hobbies can also be approached in many different ways. There are those that are primarily interested in the workings of the equipment used for hobby. For example, many photographers get great pleasure in experimenting with different types of equipment with an ultimate desire to own a Hasselblad camera. This is mirrored in the radio world with those that strive to own the best receiving equipment. You can balance this with those that regard the camera or receiver simply as a necessary tool to capture a special moment in time or to hear the Shuttle astronauts as they circumnavigate the Earth.

Another common discipline between the hobbies is a requirement for great patience. You will all be only too well

aware of all the fruitless logging sessions that come before you finally receive that station you've been searching out, or decode that illusive data signal. This is much the same with photography. I tend to specialise in landscape work which, you would think, gives you all the time in the world. I've found that this is really not the case and the lighting conditions that produce the really special shot often only exist for a few minutes. In my view, the secret of great landscape shots is to thoroughly know the area and spend lots of time just sitting observing the way the light plays across the scene at different times of day. Once you've planned the scene and the required lighting conditions you then watch and wait till everything just falls into place - It's in that final panic that you make the fatal mistake and set the wrong shutter speed!

Beginning

If you're beginning to think that maybe there is something in this photography, let me give a few hints on where to begin. The first thing you need is to grasp the basics and understand the photographic process and how the camera controls effect the final image. Whilst it's very tempting to go out and get an all singing, all dancing point and shoot camera, it's very difficult for the new user to work out just what's gone wrong with the inevitable failures.

By far the best way to start is with a basic, manual, single lens reflex (SLR) camera with interchangeable lenses. I would also recommend buying second-

hand, at least until you've discovered the type of photography that most interests you. One of the classic models, for those new to photography, is the Pentax K-1000. You should find plenty on the second-hand market and there are loads of K mount lenses to be had at very good prices. The camera is an extremely robust mechanical unit that has a fine reputation. As an added bonus, this model makes an excellent second body, should you get really serious about the hobby.

Before you get too involved, you need a source of information so that you can start learning the photographic process, or at least have a reasonable overview. The way you do this depends very much on where you live and your preferred method of learning. I think almost every town has a

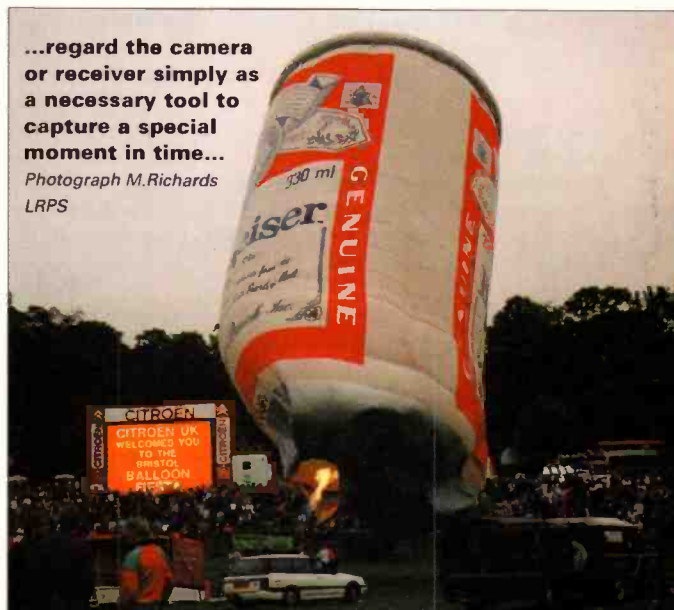
photographic club of one form or another and this can be the best way to learn. The clubs are usually very friendly and pleased to see new faces joining into the hobby. In addition to being able to offer help and advice, most clubs have their own studio and darkroom facilities so you can process your pictures whilst learning the hobby.

If you'd rather not get involved with clubs there are a wealth of excellent books available for those new to photography. These can be found at most of the major booksellers and the larger photographic shops.

Whatever your area of interest within the hobby, there's no doubt that both photography and radio give you an insight to a secret world that so many miss.

...regard the camera or receiver simply as a necessary tool to capture a special moment in time...

Photograph M.Richards LRPS



FURTHER AIRBAND READING

If you want to find out more about airband related subjects then the books mentioned on this page will help you.

The Worldwide Aeronautical HF Radio Handbook

Martyn R Cooke

124 pages

Available from the SWM Book Service £6.95 plus P&P.

This book sets out to list h.f. frequencies used by aircraft and aeronautical ground stations. To make the book simple to use it is divided into sections, each dealing with a particular subject - military, civil, etc. Brief explanations of each service as well as frequencies are given.

The Airband Jargon Book

Ron Swinburne

72 pages

Available from the SWM Book Service £6.95 plus P&P.

Intended to give the newcomer to airband listening some guidance on what to expect and how to get the best from airband, this new and expanded version now has an inbuilt *Armchair Pilot's Guide* to give the reader some insight into the flight instrumentation of a light aircraft and what it's like to fly one.

Air Band Radio Handbook 5th Edition

David J Smith

190 pages

Available from the SWM Book Service £8.99 plus P&P.

The author is an Air traffic controller by profession and in this fully revised and updated version of this popular book he explains the intricacies of air traffic control, its jargon, how to listen and what type of radio is needed.

Comprehensive, up-to-date lists of h.f., v.h.f. and u.h.f. airband frequencies are given and the book is full of useful information.

The Worldwide Aeronautical Communications Frequency Directory

260 pages

Robert E Evans

Available from the SWM Book Service £19.95 plus P&P.

This book covers aeronautical radio communications, both voice and digital, within the h.f. and v.h.f./u.h.f. bands. Commercial, military and para-military operations are all covered.

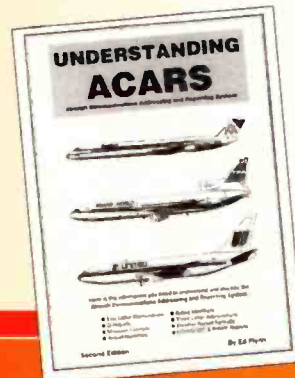
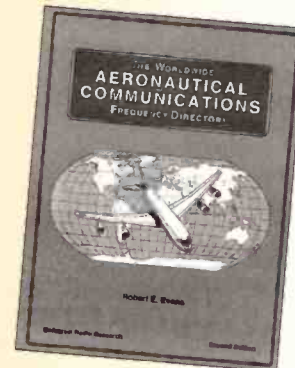
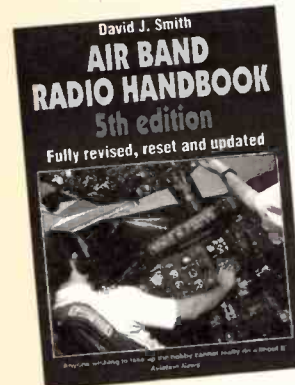
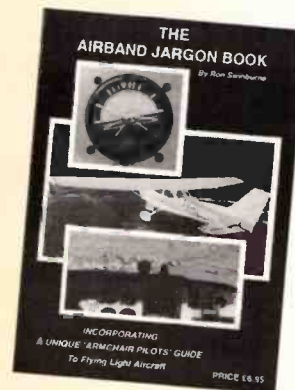
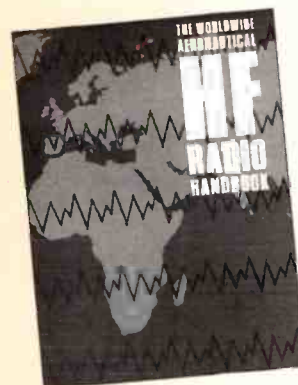
Understanding ACARS Second Edition

Ed Flynn

80 pages

Available from the SWM Book Service £9.95 plus P&P.

This book gives you the information needed to understand and decode the Aircraft Communications Addressing and Reporting System - known as ACARS. The equipment needed to receive and decode ACARS transmissions is described along with descriptions of some of the currently available units.



To order your books please use the form on page 91.

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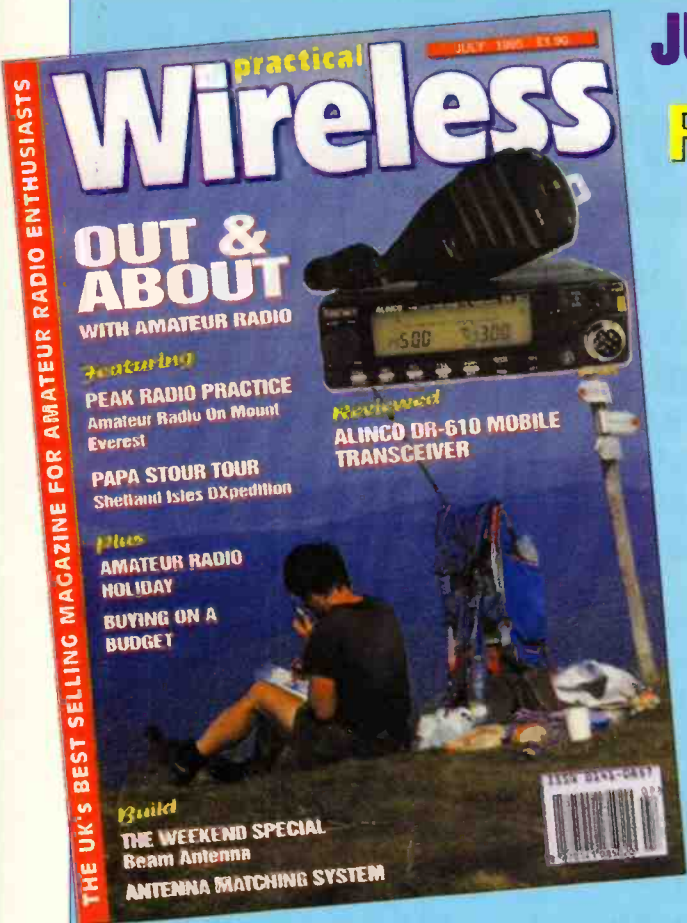


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 - ★ What A Good Idea! A selection of antenna-related ideas and projects by various authors.
 - ★ Review - 'Alinco's Award Winner' - Rob Mannion G3XFD tries out the newly-introduced h.f. plus 50MHz mini-mobile multi-mode transceiver and he's obviously Impressed!
 - ★ John Goodall GOSKR looks at the various antenna accessories on the market and tries out an interesting trapped dipole system.

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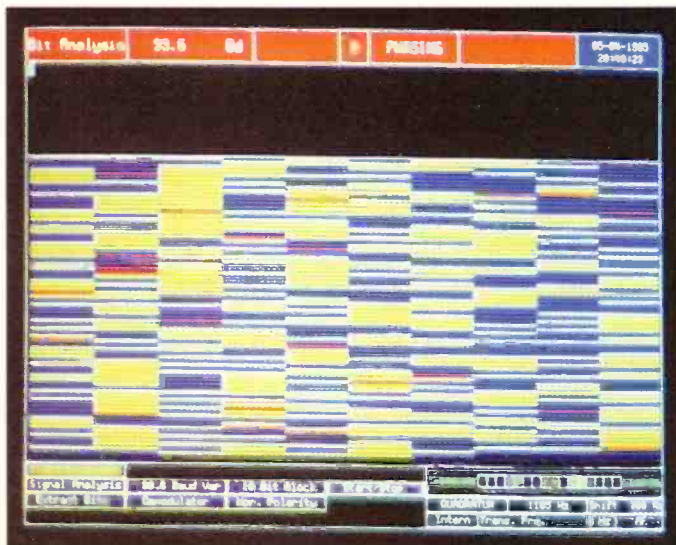
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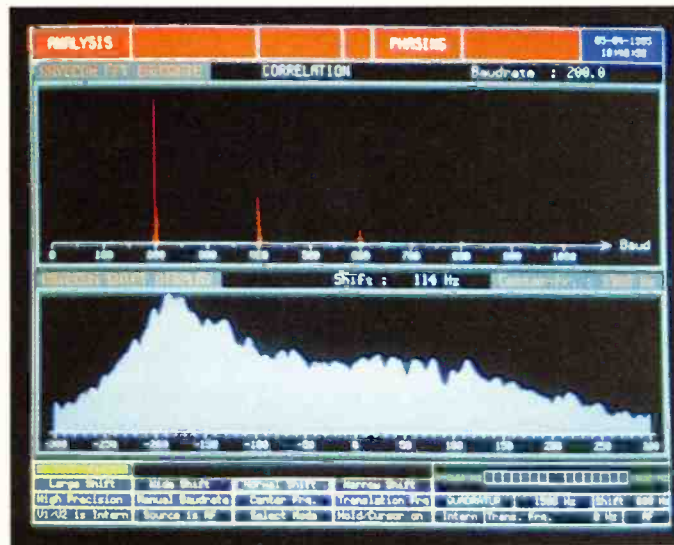
- Spare Parts Survey - which parts from where and at what price.
- Buying A Used Car - tips on buying a bargain.
- Cam Belt Swap - Morris Ital.
- Superservice - Vauxhall Belmont.
- Project Citroën - drive shaft boot replacement.
- Spare Wheel Security - secure that spare wheel.
- Door Lock Repair - how to repair a typical damaged door lock yourself.
- Car Clinic - Five pages of your car queries answered.



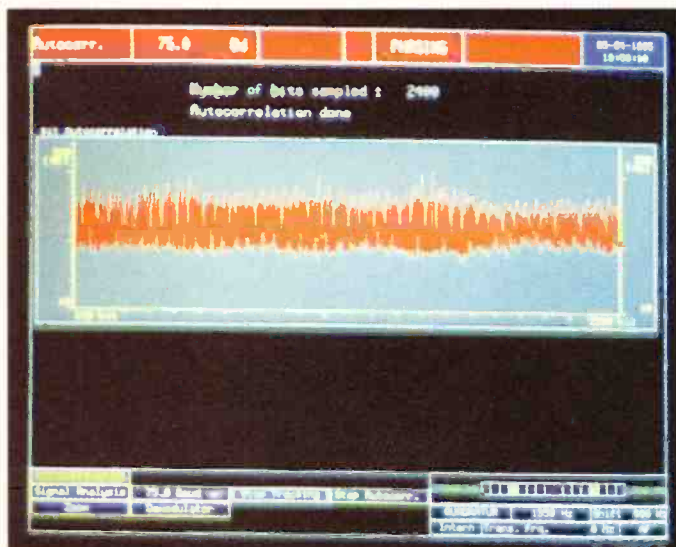
OUT NOW!



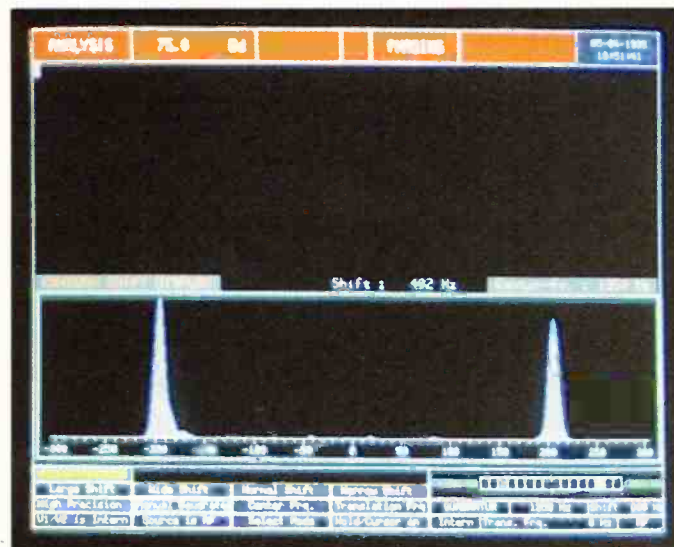
Bit analysis.



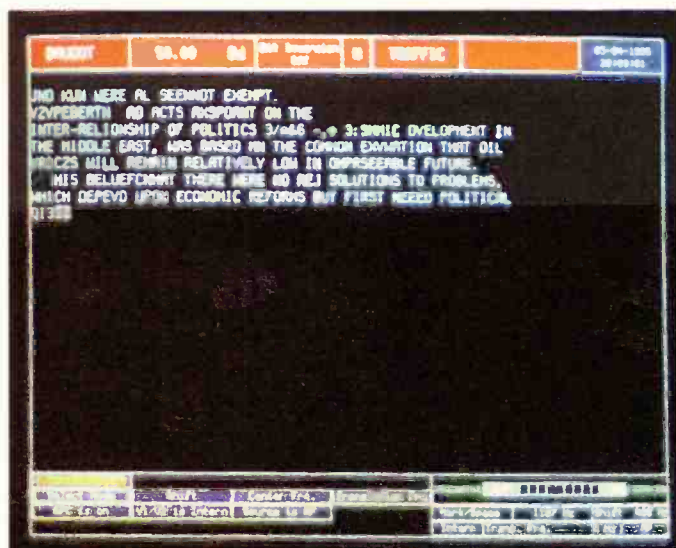
Signal analysis.



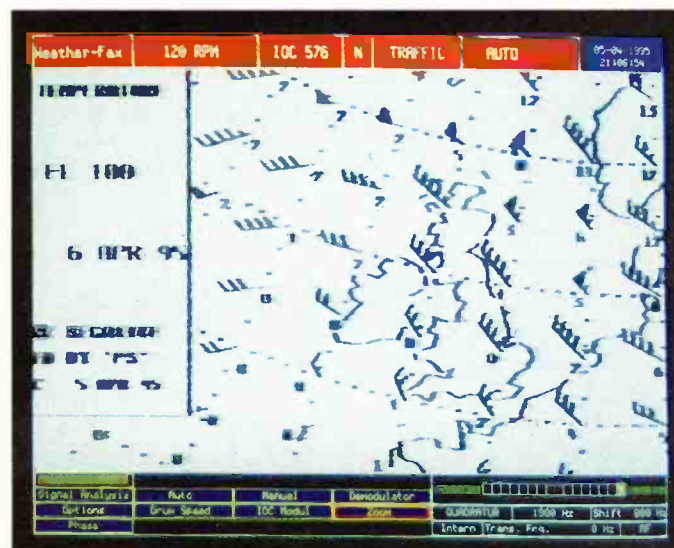
Auto correction screen.



Analysis, RTTY signal.



RTTY receive screen.



Fax reception, zoomed image.

All photos Mike Richards



To: dick@pwpub.demon.co.uk

Subject: Russian Radios

I've just read the letter in *SWM* from a reader trying to obtain a Russian radio, (Selena? Vega?)

It occurs to me that, if such radios survived the fall of Communism, the most likely place in the UK to find them would be Technical and Optical Equipment (TOE) who used to have a shop in High Holborn. TOE were the UK importer for most Russian technical stuff. They handled radios, microscopes, cameras (the ubiquitous Zenith range) and supplied the UK retail trade. A

recent London *Phone Book* lists them as being at 69 Lawrence Road, N15. 0181-800 8088.

Finally, BARTG can currently be contacted via my own account: **ibx @ cs.nott.ac.uk**, but we're looking at the possibility of BARTG having an account in its own right.

73, Ian Brothwell G4EAN
via the Internet

*Ian, Secretary of BARTG, can be contacted at **ibx@cs.nott.ac.uk**. Ed.*

Subject: Mr. Miller's letter on d.i.y.

I have just picked up the April issue of *SWM* (my third 'cos I'm new to the game) and as I recently purchased an MVT7100 as my introduction to radio listening I have been interested in the letters on short wave use of this set. I have to agree with your comment at the end of Mr. Miller's letter. There's absolutely nothing wrong with a bit of DIY!

My wife won't let me get away with spending too much on this hobby so I have to be careful with the pennies! Therefore I decided on a 'cheap' version of the Waters & Stanton kit. I must start out by saying that I haven't yet had time to put my 'bits' into operation but I think they fulfill the Waters & Stanton conditions for short wave listening and I look forward to trying them soon.

Firstly, £20 for a bit of wire - come off it. I reckon for receiving you don't need this. We aren't desperate for absolute impedance match (the balun and tuner take care of that). I will be using some single strand connecting wire (about £6 for 100m from Cirkit - at that price I don't mind if it is damaged by the wind!). The balun you have to buy (£20). The a.t.u. is home made from a design in a book called *Practical Wire Aerials* (I think) which I borrowed from the local library. This set up is for receiving so doesn't need wide spaced capacitors. I expected to have to buy the capacitors for about £20 from Maplin Electronics, but picked up a pair at Pickets Lock for £7. Switches and knobs and coil formers from the scrap box. Plastics case from Cirkit (about £6) - Total cost about £40.

It would have been nice not to have to have spent this money but I feel a lot better knowing that I've saved £100 - now what can I buy with that?

By the way I have just made a couple of flexible whip antennas (for 430MHz and 1.2GHz) as well. These are made by soldering 0.75mm stainless steel wire into a BNC plug, insulating the inner with a bit of plastics tube (or coaxial inner insulation) and then crimping silicone rubber tube overall (to stop me poking my eye out!). The end is sealed with Araldite filled with talcum powder (any perfume will do!). How much has this saved me?

Thanks for an interesting magazine.

David Guest,
via the Internet

Practical Wire Aerials by John Heys G3BDQ is available from the SWM Book Store at £8.50 plus £1.00 P&P. (See page 87). It's good to hear from someone who is actually getting out of their armchair and trying out some of the ideas from these pages. Ed.

Subject: SWM and the Internet

As a regular reader of your magazine for the past eight years, I must say how much I enjoy reading it, the 'SSB Utility Listening' & 'Scanning' columns especially.

I read with great joy this month that you are now on the Internet. There are a lot of groups on the net that deal with radio, and I'm sure they will all be pleased that you're here, especially the UK groups, like the one I have recently created, **alt.radio.scanner.uk**. We discuss any scanner related topics relevant to the UK scanner scene. The groups that existed before were good, but dealt mainly with scanning in the USA.

But there's still the grey area dealing with frequencies, like the letter you had from the Radio Communications Agency recently. Some of us have posted frequencies to the newsgroup, but I feel some people don't want to do this in case of any repercussions. Some people say it's fine to post lists, because the *UK Scanning Directory* has done so. As long as we state that it's illegal to listen to them.

I would be interest to hear your views on this matter?
Also are you going to have an E-mail section in *SWM* for people sending you mail, like the letters page?

All the best and keep up the good work.

Paul Jones
UK Scanner Users
via the Internet

Our E-mail address is another way of contacting the magazine. However, it is not intended to replace normal postal methods, Ed.

Subject: Hamster Article

Enjoyed the feature by Bill on this remarkable device. Sounds just the job for us shy creatures who never get invited to join in the chat on the nets. Especially as I do not have a Marble Toilet (my shack is in fact, the loo) so now I shall be able to sound far more up market and should be able to make a lot more superior contacts.

Can't wait till April 1st to place my order!

Best regards and 73s
de Mike Roedel G7UAB.
via the Internet

Readers will be sad to learn that Bill Wilson died in May. Bill's various articles, both spoof and serious, were always well received and many readers were looking forward to the '3-chip panadaptor' that he was working on. Ed.

Subject: Net Groups, etc

Welcome to the Internet. I bought a Sony SW100 recently to pick up on s.w.l.ing - I used to listen to s.w. and build crystal sets 40 years ago. I have been reading *SWM* most months and find it the best of the bunch.

I have been browsing the net for a while but haven't, so far, stumbled across a newsgroup for s.w.l.s. Those I have found seem littered with scanner owners, rather than broadcast listeners. Have you any tips on that side or any sites with an s.w.l. data repository? Many companies, large and small, are getting pages on the web.

The growth rate in net connections is considerable at the present time and far from pushing out s.w.l.ing, as I think some may suspect, it will, in my opinion, increase the interest because it opens up a massive audience at virtually no cost in almost real time. I think that Demon have plans to offer their members a free page at some stage.
David Smith

Continued from page 44

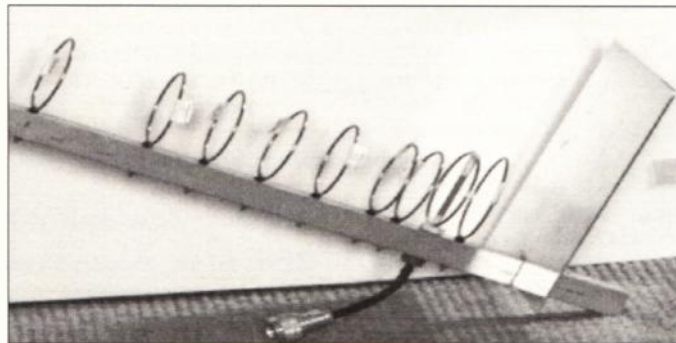
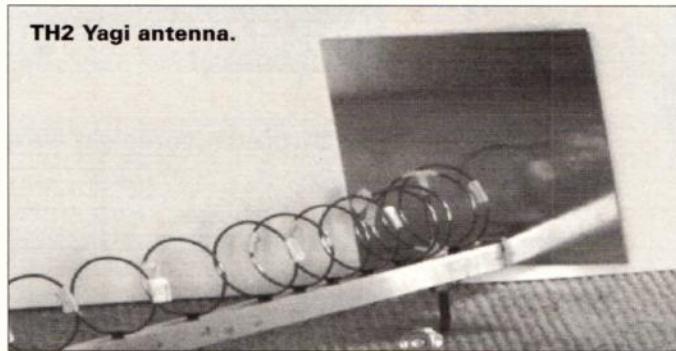
TH2SAT provide a valuable realtime choice of synchronisation - internal crystal or satellite. The * (asterisk) key toggles crystal sync. on and off. When receiving NOAA imagery (with its stable sub-carrier) the internal crystal sync. can be switched off, resulting in a nicely aligned image. METEOSAT frames do not require this feature. Later series 3 METEORs, such as METEOR 3-5, use stable sub-carriers, consequently producing stable pictures.

The crystal option can be useful for NOAA and METEOR pictures near the start and end of passes, where the v.h.f. signal is affected by horizon interference. Selecting crystal sync. for the first minute or two can help maintain alignment. If the image still refuses to sync. properly, it can be aligned using either of the [shift] keys. All in all, image synchronisation is completely catered for by the software.

Once the input level for METEOSAT images has been set, reception can be left in continuous (or cycling) mode. Each frame overwrites the previous image as it is received. Images from all WXSATs can be programmed for collection in advance - see unattended operations.

Image Export

The availability of software for graphics printing and DTP (desk-top-publishing) means that it is important for any image-producing program to provide a conversion facility. TH2SAT allows conversion to the well-known PCX image format, at the Load image option in the main menu. I used this to export a PCX file, which I then imported into one of my image processing programs, which includes high quality printing software. You cannot print directly from TH2SAT.



Saving the Image

Two save options are provided: a quick-save routine, which gives the image a logical filename based on the satellite mode, date, and image sequence number, and normal save, which requests a filename. In either case the file extension (.IMO, 2 or 4) is fixed by the video mode chosen. Quick-save is useful for saving individual image frames during a pass.

Zoom Control

From the main menu, the image can be examined in greater detail using the zoom option. A selected quarter of the screen image can be zoomed to the limit of the pixels. The picture is held in extended memory (RAM) or on the hard disk where necessary. Further zooming is possible, but the image becomes coarse. The higher the resolution available from your video card, the greater the zoom level usable before the picture breaks. You should use the highest video mode supported by your card. The original image data is unaffected and can be unzoomed.

Image Processing Menu

Several well-known functions are available for routine post-pass image processing. Most do not affect the data displayed, but it is always good practice to save the image before experimenting. Standard facilities include contrast stretching and equalisation, 3D projection, negative, and three filters. Some selections offer further choices. Before any contrast changes are made, the histogram option shows how the grey-level content of the image stands. A histogram showing most pixels bunched in a narrow range (such as a poorly adjusted infra-red image) implies that improvements can be made.

By setting the original signal level carefully, there should be a limited need for later processing. However, the effects of filter use are of great interest - so I experimented.

The 3D projection effect allows separate settings of intensity and mode, providing various extremes, from gentle to pronounced. The mode option offers a choice of effect dependent on grey level, for example the exponential value

accentuates whiter areas, making clouds appear high above the land. Clever stuff!

The high-pass filter affects those components of the picture having higher frequencies, for example the edges of features. Sharp boundaries, such as coasts and mountain peaks can be accentuated. Again there is a choice of intensity; soft, medium and hard. The median filter option reduces noise, and can be used to remove the country outlines on METEOSAT images.

Flip image is used to invert (north-to-south) images, for instance NOAA morning passes.

Colour

Adding artificial colour to WXSAT images is popular and TH2SAT have simplified the process whilst allowing considerable control over the exact level of colour. From the Palette menu (F3), a selection of five palettes are available for visible-light images, and a further three for infra-red. These are merely starting palettes. After selection, extensive changes can be made - the exact pixel intensity level at which a colour boundary occurs, being easily adjusted. This means that where clouds appear with the wrong colour, they can be corrected, to a large extent, by using the alter colour boundaries option.

The extended use of function keys provides control over colour levels, so we can minimise unwanted blue land and green clouds, by precisely adjusting the relevant boundary. Additionally, while these changes are being made, the [+] and [-] keys, together with others, can be used to modify brightness and colour balance. Or you can revert to monochrome!

Adjustment can be made to infra-red images, displaying them in various palettes; standard uses blue to red; two other palettes use pastel sequences of differing vigour!

Unattended Operations

The Unattended Options menu (F4) provides a facility to program the software to collect future passes of any selected satellite. Satellite mode must be set in advance, so this limits the program to one satellite for one session. For both NOAA and METEOR passes, which can last up to 18 minutes, the period of data collection can be adjusted, resulting in two or three frames being collected per pass.

One significant application for unattended operations is when collecting METEOSAT frames. A time plan is produced by entering the times of future satellite passes - for one satellite - using the prefix T when 'tomorrow' is being set. In this way, later passes of NOAA or METEOR WXSATs can be scheduled. In the case of METEOSAT, which uses a fixed schedule for

transmissions, the time plan can be retained for daily use, or as required, and allows collections of any METEOSAT image to be acquired. Frames are stored in full resolution.

Animation Menu

The Animations option (F5) enables the user to set up animation sequences using images already captured. The method by which the sequence is produced, is unusual. An animation sequence is one file containing all images for that sequence, and is created by the create animation sequence option. Image area, contrast and palette must be set first, then those images required for animation are selected. The whole sequence is saved, after which it can be viewed.

Many options are available to optimise the animation effect. When the

sequence is satisfactory, it can be left running and the original component images deleted, if required.

My only criticism of the process is that it does not self-update, so if you wish the next METEOSAT frame to be added to the sequence, you must set the software to collect it. I put this to Tony Howe and he explained that their use of captured full resolution images means that the original images can be re-used to create further types of animation sequence - zoomed section, different palette and so on. Tony comments that the majority of users are more concerned with picture quality, rather than additional features which are rarely used.

Conclusions

To adequately review a software package, it must be used over an extended time. I spent much time trying

almost all of the options, and have described most of those which I felt were of importance to the WXSAT hobbyist. The package has other useful features not detailed here.

Current users of TH2SAT system may notice that I have not covered every feature. The idea of this review is to convey the range and theme of the software for potential users. With several types of software available for decoding WXSAT pictures, TH2SAT are in a competitive market, where different systems offer differing features.

The newcomer having a computer of limited specification could find this an attractive proposition; those with the latest high-spec machines could also find it eminently suitable.

The units were kindly loaned by **TH2 Imaging, 34 Princes Gardens, Margate, Kent CT9 3AR. Tel: (01843) 223831.** ■

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Aerial Techniques

Reflections

As I write this column in early May, the local and national media are fully occupied with news about the preparations for 'VE' and 'VJ' days and I feel sure that a good number of our readers will be involved in many of the forthcoming events.

Museum's Rare Sets

In February, **Karl Langer** (Cape Town, South Africa) spent a whole week at the National War Museum in Johannesburg examining their collection of military radio equipment. Some of their sets were stored in a large container that had remained unopened for the past 50 years. With the help of friends, Karl unpacked the equipment and to their delight found some very rare pieces of gear. Among these were the British Army Wireless Sets. No. 1, **Fig. 1**, No. 9, No. 11 and No. 21, **Fig. 2** and a 'Short Wave Receiver', covering 250 to 3100 metres, built by the Marconi Wireless Telegraph Co. of America, in 1917, for the US Navy. The Nos. 1 and 11 sets are dated 1936 and 1939 respectively. The latter was the predecessor to the famous '19' set used in armoured cars and tanks during the Second World War and beyond.

It's thanks to Karl and the museum that we have the opportunity to take a closer look at WS 1. This transmitter/receiver, shown in **Fig. 1** with its lower front 'flap' down, has the on/off and send/receive switch on the right of the meter, the receiver controls, marked 'Detector Tuning' and 'Reaction' at the top of the right hand panel, a large 'Master Oscillator' tuner for the transmitter on the left of the meter and two knobs for separately 'peaking' the antenna to the sender and receiver in the centre of the panel. Standard jack sockets are provided for a microphone and two pairs of headphones and the Morse key, which slides out for use, is fitted just left of centre behind the flap.

Karl, seen with a friend's collection in **Fig. 3**, became interested in vintage and military radio as a young lad in 1945 when he saw some of the equipment being used by the British and Canadian troops when they liberated Holland.

Manpack

Also in February, he found a number of 'TECO' manpack-sets, **Fig. 4**, for sale in a Pretoria scrap-yard. Karl understands that these sets were built in South Africa in 1941, when supplies of infantry communications equipment was difficult from the UK and issued to the South African troops who were engaged in the North African campaign.

Karl would like to know more about Wireless Sets Nos. 9 and 21 and when they came into service. If any of the military wireless enthusiasts among you can help, he will be pleased to hear from you. His address is, 34 Ritchie Street, University Estate 7925, Cape Town, South Africa.

It's good to know that these rare sets have been preserved for posterity, in such fine condition, by the museum because we will never see the likes of these manufactured again.

Observations

During his daily solar observations in March, **Ron Livesey** (Edinburgh) using a 2.5in refractor telescope and a 4.0in projection screen, located one active area on the sun's disc on days 9, 15-18, 27, 29 and 31, two on the 8th, 22nd-24th and 26th, three on the 6th and four on days 2, 4, 5 and 7.

From his observatory in Selsey, **Patrick Moore** kindly sent a drawing, **Fig. 5**, of the sunspots that were seen on his projection screen at 1225 on March 8.

Aurora

Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of aurora described as 'glow' for the overnight period on March 4/5 and 26/27, 'quiet arc or band' on 1/2, 3/4, 4/5, 11/12 and 28/29, 'rayed arc or band' on 11/12, 'ray bundles' on 11/12, 19/20 and 26/27 and 'active moving forms, flaming, flickering or pulsating' on 4/5 and 11/12, from observers in Denmark, Isle of Man and Scotland. The strange effect that

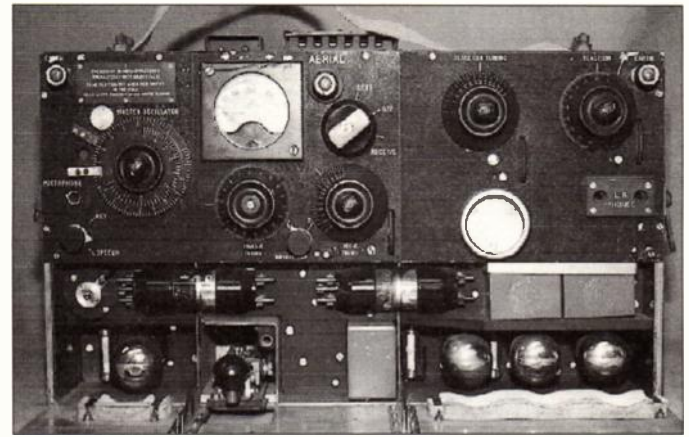


Fig. 1

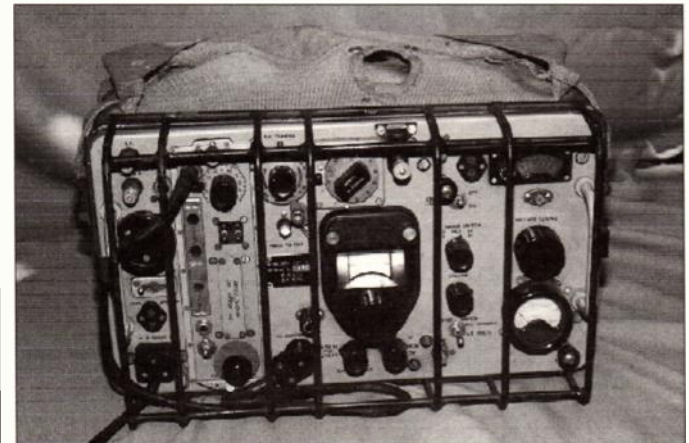


Fig. 2

aurora has on v.h.f. radio signals was detected in the UK on the 11th, 12th and 26th. Both visual and radio auroral reports are welcomed by Ron at Flat 1/2, East Parkside, Edinburgh EH16 5XJ.

Magnetic

The magnetometers used by **John Fletcher** (Tuffley), **Tony Hopwood** (Upton-on-Severn), **Karl Lewis** (Saltash), **Ron Livesey**, **David Pettitt** (Carlisle), **Tony Rickwood** (Gillingham) and **Tom Rackham** (Goostrey), between them recorded strong disturbances to the earth's magnetic field on March 4, 11, 12 and 13 and lesser events on days 1, 2, 9, 10, 14, 16 and 26. Ron Livesey visited the magnetometry section of The British Geological Survey's open day on March 26. "Dr Kerridge and his colleagues demonstrated how with international communication links it was possible to bring up on the video screen or print out real time magnetograms from observatories all over the world," wrote Ron in his March report to the BAA. The bonus of his visit came when he watched the precursor storm of the 26/27 aurora building up at Lerwick and then confirm it on his own

equipment when he arrived home.

Weather

"The weather here has been quite good for most of the month," wrote **Arthur Grainger** (Carstairs Junction) at the end of April. "There was a brief cold snap after Easter, bringing with it some snow, but better weather returned soon after," he added.

During April I recorded a mere 0.65in of rain compared to 3.45in for the same period in 1994. Most of this amount fell on the 22nd with a little on the 19th and 24th. The month was generally dry and, apart from a few frosts, mild and often warm. Joan and I had a coach tour of the Isle of Wight on the 20th and the rising pressure ensured that we enjoyed a bright sunny day. In fact the sea between Portsmouth and the Island was so calm that reflections of the clouds could be seen in the water. This made our ferry crossing, about 45 minutes each way, both interesting and enjoyable.

The daily atmospheric pressure readings for the period March 26 to April 25, seen in **Fig. 6**, were taken at noon and midnight from Arthur Grainger's barometer (dotted trace) up north in Lanarkshire and my own barograph down south in Sussex.



Fig. 3

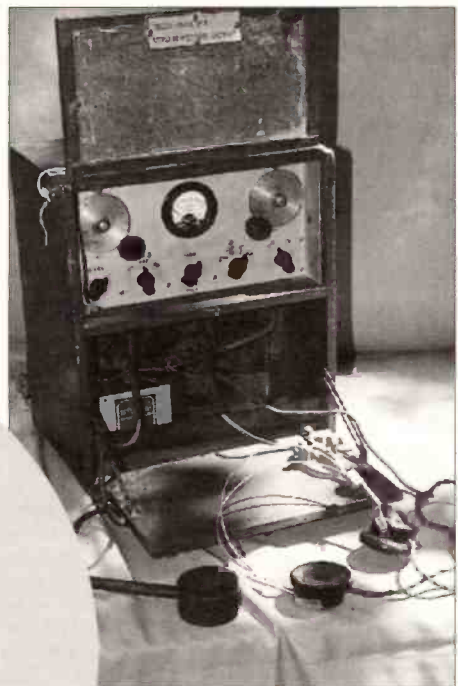


Fig. 4

Tropospheric

"DX wise, April wasn't too bad," wrote **Richard Wood** (Redditch) and added, "French stations were received at full strength at the beginning of the month." These conditions enabled Richard to see u.h.f. TV signals from France for the first time. His Band II DX included France Info (105.5MHz) and Orchard FM (102.6MHz) on the 2nd, RTL2 (around 106MHz) on the 5th, Melody FM (105.4MHz) on the 6th, RTL2 again on the 22nd and a variety of French stations between 105 and 108MHz, at good strength, around 2330 on the 26th.

During April, Arthur Grainger, was delighted to add Virgin FM (105.8MHz), from London, to his new DX list, however, the best of all for him was Viking FM (96.9MHz) from Hull which he, quite rightly, considers a really good catch because, the more local, Borders offers him a very strong signal on 96.8MHz. The opening must have been good between Hull and Scotland Arthur for the more distant station to 'punch' its way through.

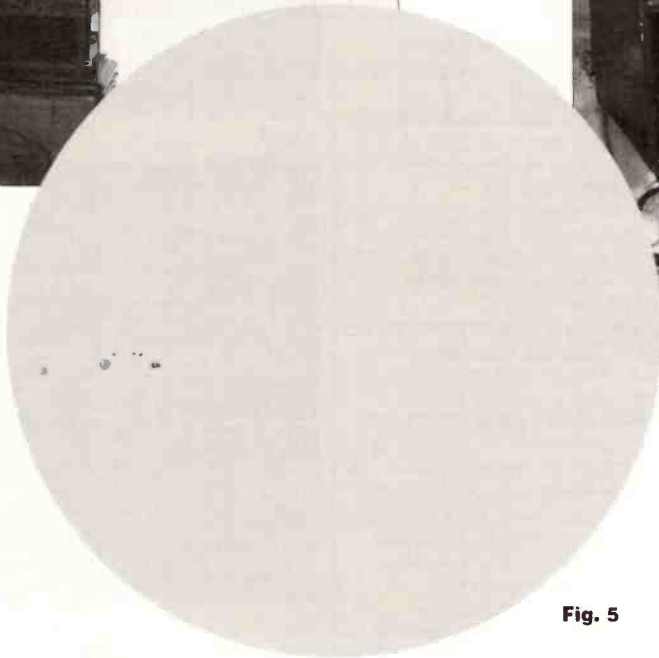


Fig. 5

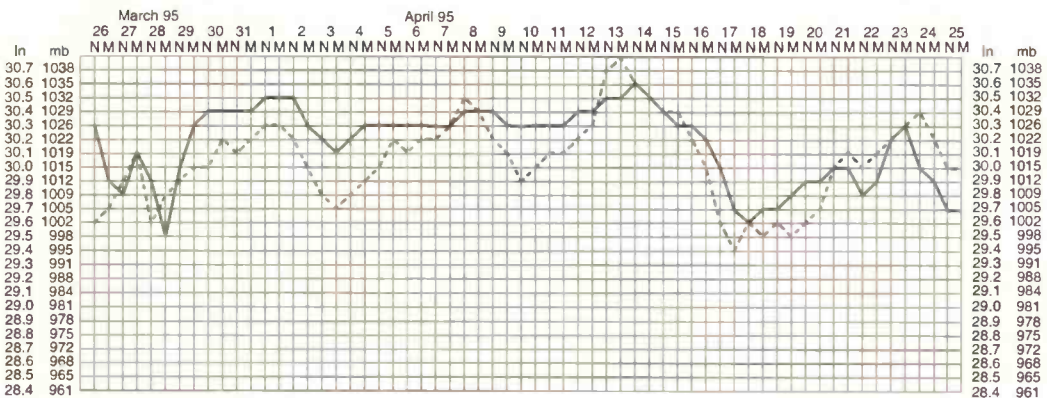


Fig. 6

DEAR NEWSAGENT

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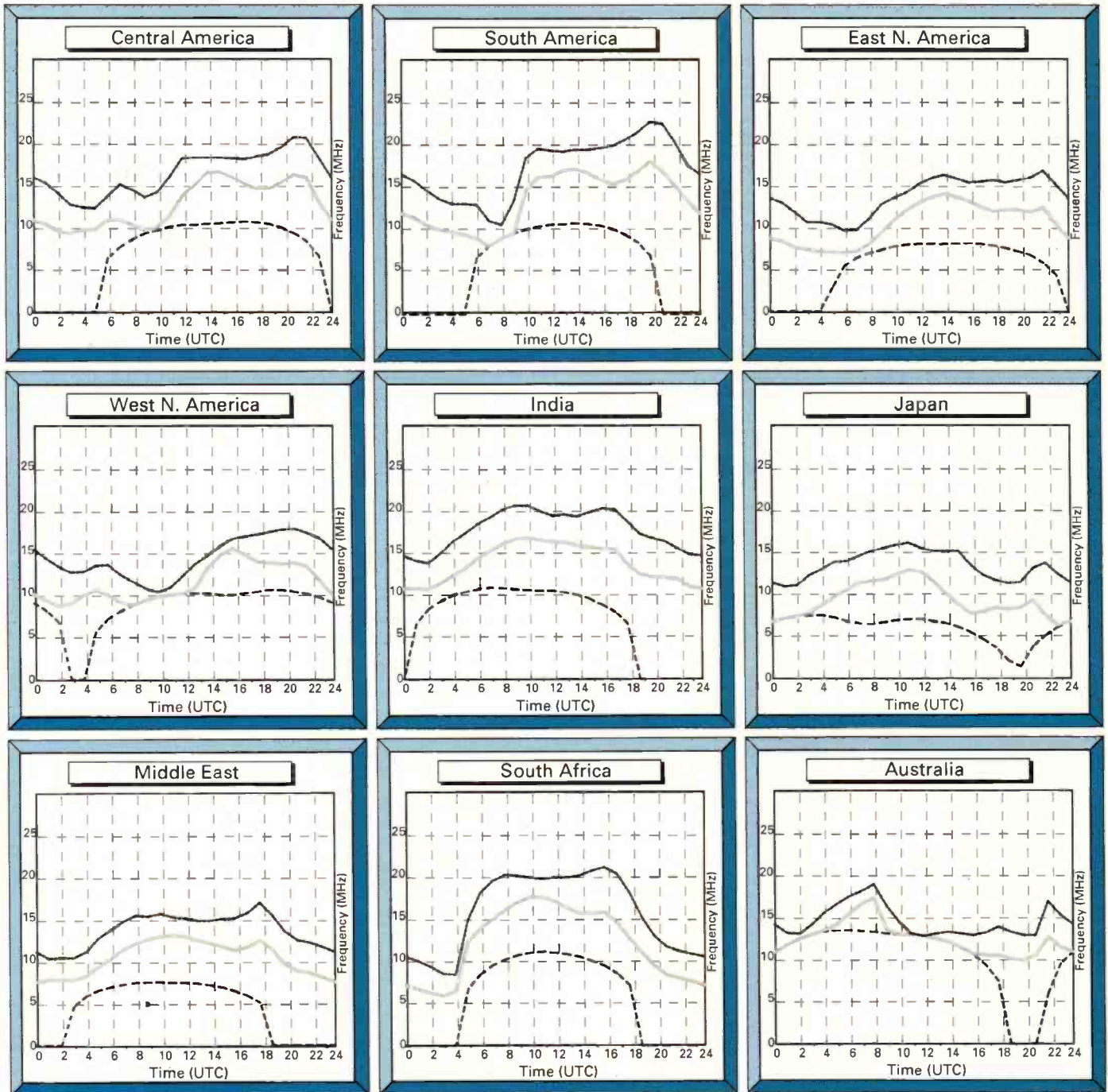


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**HAVING
DIFFICULTY
FINDING
SWM?**

World Propagation Forecasts July

Circuits to London



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.

Bandscan

Europe

The BBC World Service laid the foundation stone of its new short wave relay station in Thailand on May 8. The station at Nakhon Sawan, which will be on the air shortly before the BBC loses its Hong Kong relay in the summer of 1997, can reach 40% of the world's population, from China through to India, and should improve reception dramatically in much of the Asia Pacific region. Four 250kW transmitters and a range of curtain antennas are being installed at the station.

Meanwhile, Radio France Internationale is also thinking about joining the world's radio stations that have relays in Thailand. Discussions are underway between the French and Thai governments, and the station is optimistic that it can be on the air by 1998.

English from RFI is at:

1200-1300 on 11.615, 13.625, 15.325 and 15.530MHz
 1400-1500 on 7.11, 15.405 and 17.56MHz
 1600-1700 on 6.175, 11.615, 11.70, 12.015, 15.21, 15.46, 15.53 and 17.56MHz
 1700-1730 on 15.21 and 15.46MHz

Closer to home, RFI has joined the ranks of f.m. broadcasters in the German capital. On May 19 it inaugurated a transmitter on 106MHz, carrying programmes from Paris in French and German.

The station has installed a studio in collaboration with Berlin broadcaster SFB on the famous Unter Den Linden. Like the commemorations last year of D-Day, RFI had a relay in London on 106.2MHz for the weeks around VE-Day.

Also in Berlin, the Voice of America is also now on f.m. through a partnership with Capital Radio (no relation to the London station of the same name). Radio Charlie is the name of the new station which is heard on 87.9MHz.

A number of regular VoA programmes are carried on Radio Charlie, including *Talk to America*, *Communications World* and *VoA Today*, as well as programmes from US National Public Radio like *All Things Considered*.

Internet News

Barely a day goes by without some mention in the press and media about the Internet and the global superhighway. Radio stations worldwide are taking the hype seriously

and getting themselves hooked up in increasing numbers. That means listeners do not have to rely solely on short wave or satellite to receive news and information.

A number of European stations are talking about starting computerised information services, including Radio France Internationale. RFI is already attracting 5 000 visits every day to its site on the Internet, and during the recent French elections they added extra information for cybersurfers.

Radio Prague is also heavily into the Internet. If you have E-mail facilities, you can subscribe to the station's news broadcasts in text form. Send a message to cr@radio.anet.cz with 'Subscribe' in the subject line stating you want to receive the news transcripts in either English, Czech, German, Spanish or French. The station will then E-mail you the scripts.

Radio Netherlands has five pages on the World Wide Web with frequency and programme information, and the station plans to add electronic versions of its free booklets such as *Antenna Advice*. The station's electronic address is <http://www.rnw.nl/rnw>.

Services Ended

Less happy news from the Voice of Russia. In April, eight language services ended: Swahili and Hausa to Africa, Tamil and Sinhala to Sri Lanka and India, Indonesian, Khmer and Nepalese to Asia and Swedish. The station blamed savage budget cutbacks, and simultaneously reduced the number of hours of French, Spanish and Portuguese services.

That means that Moscow now broadcasts in just 30 languages, down from 46 last summer and well in excess of 70 during the last years of the Cold War. If you want to tune in to Moscow, English is still on the air 24 hours a day, and some key listening times are:

1800 on 9.48, 9.82, 9.83, 9.88, 11.63, 11.675, 11.89, 11.945 & 12.03MHz
 1900 on 7.35, 9.48, 9.88, 11.63, 11.675, 11.715, 11.775, 11.89, 11.91, 11.945, 15.105
 2000 on 7.35, 9.74, 9.82, 9.88, 11.63, 11.675
 2100 on 7.35, 9.48, 9.60, 9.71, 9.82, 11.63, 11.73, 11.75, 11.89MHz & 1494kHz
 2200 on 9.53, 11.73, 11.75

In this column in the April edition of *SWM*, I reported on Prague-based

Below: detail from Radio Austria International QSL card, showing traditional Austrian costume



Radio Metropolis. Metropolis, a local English-language f.m. station, had launched a short wave service amid much fanfare, and were seeking reception reports from listeners worldwide. The station was short-lived, for in mid-April the Czech authorities announced that Metropolis, along with four other Prague radio stations, was losing its licence to operate from the end of the year.

In fact, Metropolis had disappeared from the short wave bands some weeks before that announcement, and listeners who sent in reception reports are still waiting for QSL cards. If you get a verification from the station, hang on to it, for it could be worth something in a few years time!

Situation Deteriorated

As I write this column, the situation in the former Yugoslavia has deteriorated dramatically, with UN peacekeepers being taken hostage by Bosnian Serbs. While the crisis could be over by the time you read this, the area is still worth monitoring.

Radio Yugoslavia is reported to have started using Bosnian short wave transmitters again. Spanish and Russian is heard from Yugoslavia via the Bosnia facility at Bijeljina. Listen out on 6.10MHz (probably from Serbia) and 7.165, 6.005, 11.755, 7.22, 11.835 and 9.72MHz.

In Croatia, short wave English language transmissions can be heard



Radio Nederland

on 7.37 and 5.895MHz for ten minutes every hour overnight.

YLE Radio Finland is moving resources from short wave in to satellite transmission. It can be heard 24 hours a day on Eutelsat II F1 at 13° East, 11.163GHz and the audio subcarrier at 8.10MHz.

English is on the air to Europe at:

0430 on 15.44MHz u.s.b.
 0645 on 6.12, 9.55, 11.755MHz
 1330 on 11.90, 15.40
 1900 on 9.73, 15.44
 2130 on 6.12, 9.73, 11.755, 15.44MHz and 963 and 558kHz medium wave

New Station

Look out for the launch of a new radio station from one of Europe's smallest nations this August - the country's first. Radio L will launch from Liechtenstein on August 15 in the f.m. band and will be audible in parts of Switzerland, Austria and Germany, and of course throughout the whole Principality.

The frequencies will be 89.2, 95.0, 96.9, 100.37 and 106.0MHz, and the station's address is Radio L, FL 9495 Triesen, Liechtenstein. If you hear this station, please write to me here at Bandscan Europe.

That's all the room I have for this month's look at the international radio scene in Europe. Join me in October's edition for more. Until then, good listening.

Amateur Bands Round-up

Listening to the Amateurs

A few days ago, **Alan Lowcock** wrote from Derbyshire, and the gist of his letter was that he wondered why he wasn't hearing all the distant stuff he heard reported in this column. Alan and I were colleagues forty-plus years ago, so I wrote a personal answer; but perhaps the question can be aired here.

A complete set-up comprises antenna and ground with its feeder; a matching device with a short connection into the receiver, which may or may not be festooned with add-on units; and finally the operator himself, often described by wives and girlfriends as 'the nut behind the tuning knob.' Each has a part to play.

Say the antenna is an end-fed wire and earth. The bit above ground has an image in the ground, just like a pin stuck on a mirror, and we feed the receiver from the junction between the antenna and its image. Now stick the pin on, say, a beer mat; the 'image' has disappeared. Thus, work done on the earthing system is equivalent to silencing the mirror. It also explains why people by the seaside can hear things denied to someone inland, other things being equal.

Our antenna picks up power from the wanted distant signal. If we fit an antenna tuning device, and adjust it properly, we transfer all the signal picked up by the antenna system into the receiver; we have **matched** our antenna-and-feeder system.

The receiver has three main qualities: sensitivity, which in any reasonable receiver is better than we need up to 30MHz; stability, after a reasonable warm-up period - nice to have but not too important for a listener with a hand on the tuning knob; and selectivity, the ability of the receiver to separate the wanted signal from other transmissions on nearby frequencies. Notice, this is **not** the same as the tuning rate of the dial!

Finally the operator. His skill supplements the rest. A fine operator with a one-transistor receiver will log more than a tyro with a new box costing a thousand pounds. He will know that, for example, most of the DX lies essentially to our east or to our west, and he will set up an antenna with that in mind; he listens for DX after dark on the low bands, and in daylight on the high bands. He can happily decipher signals that the tyro can't copy, and so on.

'The nut behind the tuning knob' is most important!

Letters

Maybole, in Ayrshire is the home of **Ian Macalister**, who seems to have

concentrated his efforts on 21, 18 and 14MHz. New countries have been few and far between; VP8CQS in South Shetland, TN2M, XT/TU5BA, 9MOA (Spratly) and 5W1AU in Western Samoa. While WHOAAV on January 31 was viewed with suspicion as the operator was said to have left the Marianas by then.

'Goodies' now; on 3.5MHz ZL2SN, WA7TZY, ZL1AXQ and JAs; on 7MHz Y11SAS, XQ8AB and a brace of JAs. On 14MHz Ian nobbled 9K2F (Faylakah Is), VP8SGP (S. Georgia), 4E9RG, 9M8DJ, 3B8GF, TT8AB, AT3D/MM near the Laccadives, R0/UR8LV at Cape Celuskin, the BS7H expedition, TR8IG, PX0UP (Rasa Is) and P29JC.

In the 18MHz region, V2/VE3ODC, ZS5VDK, WA6BEX and JAs; 21MHz was a bit kinder, giving out T12CF, 5U7AA, 4M8I, KB0NL in N Dakota, 5N3/SP5XAR, J55UAB, HZ1AB and S79MX. However, 24MHz had only 9G1BJ, Z21CS, CP8XA and P40MR.

That 'ZC6B' in Gaza was another manifestation of Slim; KC0PA/SO was not valid and has since been heard using the call 4U/KC0PA. To be legal, an SO call must be issued from a specific office in Spain.

Finally, the reason why the Pacific is so poorly represented in logs is simply that, apart from JA, there just aren't many operators! Try around 0800 or 1800 on the short path, or maybe 2000 by long path; but remember if you have to get up early, they have to stay up late!

Now we come to **T. Ibbitson** in Wakefield, who has a Tokyo-Hypower transverter feeding the output of a half-sized G5RV into an FT-290. A couple of weeks with this unpromising set-up - but ten years of B-licence experience behind him - resulted in s.s.b. from SV5TS (Rhodes) and CT3FT (Madeira) on 21MHz, while 14MHz showed VK5FOX, CU7BA (Azores), EA9KQ (Melilla), RA9DX, 5B4WN in Nicosia, ZA1AJ, 4J0/U9IZ, W1TJB in Maine and K4GXA. Down again to 7MHz where LX95VEC, F9LM, IK1LOC and OZ4LAT were noted.

There was an aurora on April 7; alerted by clubmate G7PBY that it was being noted on 50 and 144MHz, **G3ZHE** in Warrington had a ball between 1615 and 1730 on 28MHz, when he raised OHORJ, OF1AA, GOOPB, G8VG, LA2IG, GOIVZ, GI3RXV, SM3AOH, G4UZN and ON7PQ; all on c.w. The auroral note varied between a 'growl' on the UK stations up to a squeak on some of the others; indeed on the SM3AOH signal it was varying from letter to letter as well as having a deep fade.

Albert included a sketch of his antenna that shows ninety feet of top

section, fed by 28 feet of open-wire feeder, and a KW Z-Match to transform it to 50Ω for the FT-767. Note the dimensions quoted; clearly the antenna is 'tailored' to the site, and reliance placed on a wide-range matching system.

In Derby, **Ian Hatton** has an HF5B two-element five-band antenna up at 10m, and he has now got an IC-736 covering the h.f. bands and 6m. On 28MHz he found LU8ADX, PT7CB, ZS7J, ZD8Z, CE8EIO, 9G1BJ, FH5CQ, 5T5JC, 5Z4DU, 5X4D, 5Z4PL, ZP6KR, ZS5NK, LU4HH, CE8SFG, PQ0MM, S92SS (Sao Tome), EL2PP, VP2EN, CE6EZ and ZP5JLT. Ian must have caught every lift on 28MHz throughout the month!

On 21MHz, he snagged S79PT, 4U/KC0PA (Western Sahara), ZD7CTO, PZ1EO, 5T0AS, 9Q5TR, 9J2AE, TR8/F5JDG, EL2PP, YC7XUR, 5N0JHE, V52UTR, S92YL, EY8AF, VP8CQG, ZF8/ZF2JC, KG6DX (Guam), VP2EN, J28FD, 5H3CK (Mafia Is, IOTA AF-054), 6W6JX, C6AHN, D68QM and much more. Down to 18MHz where Ws in Iowa and Wyoming were noted, plus UA0SJ, C6ARC, G3UXO/MM on the QE2, 9M6/HB9TL, KP4IX, TL8AJ, 5T0AS 7Q7JL, FY5GF and others went in the log.

For 14MHz we must pick and choose; W7MBS in Utah, BS7H on Scarborough Reef, ZD7DP, VP5/KB4IRS (Providenciales Is), 3D2CT (Conway Reef), VE6BW and many others. Down to 7MHz and we find CE8EIO, UN7TX, YB0BAQ, J28FD, TR8SF, VK2ANS, LU3FA, CX2TL, YB2MQ, 9Q5TT, PZ1EL, 5T0AS, JW8GV, 5V7MD, 9X/SM5DIC, T12CF, TL8CK, AP2NJ, FM5DN, PY0ZFB, BG7DU, T12CCC and H13CAE. Finally, on Eighty Ian notes 6W6/K3IPK, V31B, VP2MEM, VK7BC, HP2DFU, ZL7AXQ, LU8EEM, EL2PP, WA6F, W6EA, TG9GI, HK4DHR, T15RLI, 8R7AK, KP2AD, XE7MD, V44KBT, XE7VIC, HR2BDC and LU7DFA.

Now on to **Frank Lennon** in Hyde, Cheshire. Frank asks about 'phasing' of antennas. Basically, if you take, say a couple of dipoles, both centre fed, and drive them in such a manner that they are (1) out of phase by a specified amount and (2) receiving equal amounts of power, then you can predict the pattern that would result. Since neither of these criteria is easily met at h.f., such phased antennas are usually a flop. Back to lists; Frank heard LY7A late one evening on Top band, and on 3.5MHz 5N0GC, AB4RU, N4KW, VK7BC, WB4MBC, YV5DPO, GB2IWM, T15RLI, 9K2MU, CE1IDM, and VK6ACY. Skipping 7MHz, on 14MHz we see such as W7ZQ, N7ML, AA6AC, VP9ID, FS5PL, KL7XD, KL7DTH, VQ9XX

(Diego Garcia), 9Y4SF, HC6FG, 9M2CW, JA7UJ, 9M8DM, EY8MM, YB5AQQ, HS0/P/G4UAV, BV5DI, 9N1RHM, A71A, 9J2SZQ, 5T5JC, 9G1BS, 8R1WD and ZS4AA, with 18MHz showing WORCW and W7LR.

Mark Borthwick (Hawick) comments that late April is the time of year when the IOTA signals come out again. Meanwhile he has an enormous list, starting on 7MHz with SU7MT, 4U0ITU, DA0IMD (Borkum Is), VK5BC and VK4MZA. 14MHz showed with 5T5s, 4X4s, PT7SY, PYS, ZV5LL, ZPs, YVs, LUs, CE7AOY, BV4AS, VU2DK, 9K2HN, ZLs, Vks, CX2CS, OD5NH, 9Y4SF (Trinidad Is), V73C (Marshall Is), 9H4W on Gozo, VQ9XX (Diego Garcia), S92CW (Sao Tome), VP9ID, CT3/DK9DAM, ID8/IK8VRS, ZB2s, A71A, HV3SJ, BS7H (Scarborough Reef), XX9AS, ET3BN, YB3OSE, JA7AGO, EA9s, EA8GTA, V31DX, ZA1AJ, VO1SA, CN2SM, VE3FRF, 9G1BS, HS0/G0HHF, Ws assorted and smaller fry. At 18MHz we see 4X4s again, A45ZZ, 9K2ZZ, 9H1GX, G4JMB/MM on the QE2, and various Ws. Finally 21MHz for ZB2JO, 9K2s, SV8AXZ (Zante Is), 4X6ZK, ZS6PJH, 9H1EL, OY9JD, 6VUJ, 5N0GC, VE3FRW and various Ws.

D. L. McLean in Yeovil has a super antenna system, yet he heard nothing on either 28 or 24MHz in April. On 18MHz there were a few short-path openings to JA, BV, etc., around 1100, and N. Americans were around from noon to 2300 on a few days. S. Americans were noted in the evenings. On 21MHz, little was heard except Africans after 1600. 14MHz was the best place to be with the short path to Asia good on the short path from 1500, while at the same time signals were also good from the West Coast of USA and Canada; later signals from S. America were noted.

QSL Addresses

All from Ted Trowell.
 BV7WB via Box 14023, Taiwan.
 FG5ED Box 747 Papitre, Guadeloupe.
 J20SF via F5LBM.
 9Q5MRC via G3MRC.
 EX0A via DF8WS.
 9X/ON4WV via ON5NT.
 J28GR PO Box 183, Frejus, France.
 YS1ZV via KB5IPQ.
 SV0HS/SV9 via DJ8MT.
 7Z500 via W1AF.
 9H3TY via DL7VRO.
 YI9CW via Box 11 Warsaw.
 JW0I via Box 280115, Berlin.
 ZB2JK via Box 292 Gibraltar.
 VP8CQS via DL1EHH.
 9K2ZC via KC4ELO.
 5T0AS via IT9AZS.
 SV5TH to Box 282 Rhodes.

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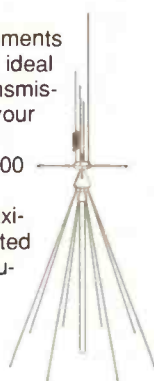
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Satellite TV News

The Latest from the Clarke Belt

Several of our readers have commented on the new Indian language programming now downlinking from the Russian Gorizont bird at 11°W. APNA TV is described as a new near Global satellite channel offering non-English programming from 3 Russian craft, the channel will specialise in general entertainment for the whole family and is transmitted in Hindi, Urdu, Tamil, Punjabi, Bengali and other Indian dialects. The first test transmissions across Asia opened February 14 from Rimsat and Gorizont craft (130 and 103°E respectively) operating in C Band and with European coverage end April from Gorizont in Ku band at 11.525GHz circular. APNA airs during the European evening ending at midnight UK time (there is sometimes seen a 'JVC rewind' caption after closedown!). Programme origination is from London-based 'Media Moguls' of 42 Theobald Road WC1X 8NW.

Satellite Sightings

After the good news that **Ian Waller** won a planning appeal to re-install his large dish after enforcement action to dismantle same, Ian has resumed his Clarke Belt scanning. The 20°E Arabsat 1D-R gave an exotic reception with a test card ex-Qatar for a footie match between Australia and Cameroon. The Caribbean Satellite Corporation were also seen early May with a feed out of Puerto Rico on the TDRS bird at 41°W using 4.12GHz. End of April also saw the 20th anniversary of the US withdrawal from Vietnam and several satellite viewers received a direct output from WTN Saigon on a second hop into Europe via PAS-1 at 45°W, this however in Ku band, 11.639GHz horizontal.

May 1st saw a new channel open up on Eutelsat II F3 at 16°E precisely 12.559GHz horizontal. TV 10 Gold is similar to the UK's UK Gold with family entertainment, dated comedy and drama shown the second (or 3rd) time round, much of it in English or American. This seemed good news but several days into the service pictures inverted and many (Astra) receivers cannot reverse video polarity unfortunately. A very simple form of 'scrambling' used in the late 1980's on the Premiere film channel and never used these days! TV 10 Gold airs during the daytime and evening - at closedown typically 2200-2300ish a music channel The Music Factory opens up and continues throughout the night until

TV Ten reopens the next day - also now inverted but unencrypted.

An unexplained sighting for me occurred May 8 at 2100BST with the Air Force Satellite News on the 37°W Orion at 11620GHz, various news packages were fed with gaps and clocks, no announcements - the experience terminated abruptly - just like that - so I have no idea of the American source or destination, can anyone help please?

Our old friend **Aidan Murphy** (Co. Meath, Eire) is in the process of fitting a 2nd actuator to his dish, this to provide elevation adjustment for optimising reception from inclined orbiting satellites such as the vintage Eutelsat I F5 and Russian Gorizont birds. Aidan is seeking comment from any reader using inclined orbit elevation control and feel free to ring him on +3531 82504414 after 1900 hours. Aidan writes a popular satellite news column in the monthly *IRTS Newsletter*.

Bandula Gunasekera (Sri Lanka) is our Central Asian contact and has gone into the satellite receiver production business (on the side from his normal more dignified bank duties!) and is making u.h.f. satellite receivers for the Ekran bird though a later version from that I offered as a free photocopy last year. Over 50 have been made in the Spring and more orders follow. The NAM TV channel didn't continue on Ekran but Tamil Bimbam is now testing (May 2) 1900-2200 local mainly with Tamil songs uplinking from Tamil Nada, India. The Ekran 754MHz channel recently featured topless dancing girls as a late night midnight show - indicative of the free market forces in Russia these days. It's fingers cross in Sri Lanka for PAS-4 launching since it will provide hopefully high levels Ku Band signals in a region that is dominated with C Band (4GHz) offerings.

Whilst in a 4GHz C Band mood, **Bob French** (Warks) has just ordered from Japan a large horizon-to-horizon tracking mount for his large C Band dish incorporating inclined orbit tracking. The latter facility is actioned by taking a feed from his receiver's a.g.c. into the tracking controller. Bob will then have a full 90° E/W tracking horizon subject to trees and hopefully will take him into real exotic 'DX' satellite signals. If you want to avoid paying Sky Sports subs for the West Indian cricket tours then tune into Intelsat 603 - 34°W at 4.185 RHC as this carries the Sky cricket feed! You'll need a 3-4m dish and C Band feed/LNB not forgetting planning permission.

John Locker (Wirral) noticed many outbound feeds of the VE day celebrations/rememberance services for North America and Asia, NBC were feeding back to New York on Intelsat K and Intelsat 601, additionally other broadcasters were using Intelsat 603, Hispasat and Orion Atlantic. Indicative of Orion's activity were six active (TV analogue) transponders one morning plus S meter deflections suggested numerous digital offerings - digital TV signals are almost invisible on the screen but will give an S-meter deflection. Music Channel VH-1 is currently 'beaming down' from Orion, also on the new Hot Bird and not forgetting Astra so Europe is well covered. John also suggests checking out the elderly Intelsat 515 18°W as he caught a BBC Paris feed using sound in syncs at 11.160GHz horizontal one day, unusual since the Telecom 1C 3°E bird is the favourite hopping off point. With things hotting up in Croatia/Bosnia another logging in the Locker chronicles was a Sarajevo feed using DFS-2 Kopernikus at 28°E - 11.525GHz horizontal, yet another craft often overlooked (my excuse is that it's behind a belt of trees!).

Just a sampler of a month's life in the Clarke Belt, there's much not detailed!

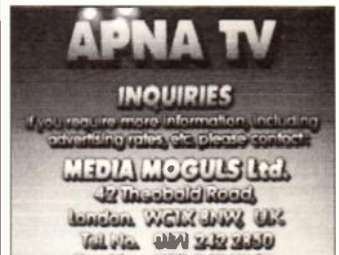
I've recently completed an article for *Television* magazine detailing the construction of an outboard LNB supply providing switched stabilised 14/18V for LNB powering + band change-over and also incorporating a simple magnetic polariser control circuit for skewing vertical to horizontal polarity continuously on the dish ferrite polariser. The circuits were constructed within a basic 13.8V CB mains p.s.u. as supplied by Maplin. If anyone would like a copy of just the circuit (no descriptive text), send a 19p stamp together with a stamped self-addressed envelope to the address at the head of the column.



Satellite news gathering vehicle (SNG) identification card from an intrax unit operating from Belgium on Eutelsat II F1 from John Locker.



C Band 'DX' reception from Arabsat prior to an international football match from Ian Waller.



APNA TV is the Indian language TV service available in Europe via the 11°W Russian satellite (11.525GHz) during the evenings from John Locker.



A Starbird (SNG facility company) test card seen via PAS-1 at 45°W from Ian Waller



The Music Factory is now transmitting through the night on Eutelsat II F3 16°E though now with inverted video - 12.560GHz.



Dutch SNG facility VTM are having problems with audio (SCPC = single carrier per channel) and advise the distant studio on picture!

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01...
... 000 TO 153 SYNOPTIC REPORT E
7... TIME 0830 UTC DUTCH STATION
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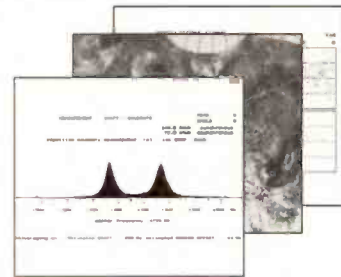
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If you monitor Short Wave RTTY you will already know all about Baudot, Amort, Packet and CW. You may have already had success with decoding ARO-M2 & M4, ARO-E/E3, ARO6-90, ARQ-S, SWED-ARO, FEC-A, FEC-S, Factor etc. but what about all the other signals that are still undecodable with your present 'sophisticated' setup. Perhaps you have even tried to get a sensible analysis of the signal and found it too difficult. Well Hoka Electronics have the answer! There are some well known (and expensive!) RTTY decoders which still have limited facilities and difficult upgrade methods, but then there is CODE-3 from Hoka Electronics! It's up to you to make the choice - but it will be easy once you know more about CODE-3. CODE-3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 512k of free DOS memory, a CGA monitor and a serial port. The CODE-3 hardware includes its own digital FSK Converter unit with built-in VDE safety approved 230V AC power supply and RS232 cable, ready to use. CODE-3 now includes two new exciting hardware and software developments - a fully automatic software tuned audio bandpass filter and a new 'all-in-one' automatic classification system. Press one key and CODE-3 will measure baud speed (to 0.0001 resolution) and shift (to 1Hz) then analyse the bitstream and (if it is a recognised system) drop straight into decoding the signal within seconds of tuning in. CODE-3 decodes more systems than any other commercially available decoder - in fact most more expensive decoders have no means of even identifying ANY received signals! Why spend more money on FEWER features? CODE-3 is the most sophisticated decoder available and the best news of all is that the latest version of this now famous Dutch decoder is available now. Just look at the list of features (ALL FEC systems are decoded with error correction fully implemented - unlike other more expensive decoders than only do some!)



SYSTEMS:

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- DUP-ARQ Aretac 1/8- 125/250 Baud Simplex ARQ
- Tempex - 100 Baud FT80N Simplex ARQ
- ASCII - CCITT 8, variable character lengths/parity
- ARQ6-90/98 - 200 Baud Simplex ARQ
- SI-ARQ/ARO-S - ARQ1000 simplex
- SWED-ARQ/ARO-SWE - CCR 518 variant
- ARQ E/ARO1000 Duplex
- ARO-N - ARO1000 Duplex variant
- ARO-E3 - CCR 519 variant
- POL-ARQ - 100 Baud Duplex ARQ
- TM242/ARQ 242 - CCR 242 with 1/8th channel
- TDMS2/ARQ242 - CCR 342 with 1/8th channels
- FEC-A - FEC100A/FEC101
- FEC-S - FEC1000 simplex
- Helicoder - Surchi/Asynch
- Sitor RAW - (Retamal Sitor but without synchronisation)
- ARO6-70
- Baudot FT80N
- Factor - Anasaur (still special commercial variants)

ANALYSIS:

- Shift & Baudspeed to 0.0001 Baud
- Sitor - CCR 625/476-4, ARQ
- Decisecode (frequency vs. time)
- Automatic System identification

OPTIONS:

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- HC-ARQ - MHG-FEC
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All systems are preset with most commonly seen setting but all can be changed at will. Baud speed to any value between 25-500 Baud, shift from 20 to 1000 Hz, Multi-channel systems display ALL channels on screen at the same time. Split screen with one window continuously displaying channel control signal status e.g. idle Alphas/Beta/RQ's etc., along with all system parameter settings e.g. Unshift on space. Shift on Space. (great for morse). Multiple carriage returns inhibit, auto receiver drift compensation, printer on system sub-mode.

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SSB Utility Listening

HF Sideband

This month, we have a quick look at the latest *High In the Sky*, and some news about RAF frequency changes. Last month, I said that I would be talking about a way of finding out more about flights heard on h.f., this has been held-over until later.

HITS

As promised last month, here is a brief look at the latest edition of *High in the Sky*.

The latest edition was available during early May, and costs £6.95. Due to the increase in size (mainly due to the increase in information being logged and sent to the authors), the book is now spiral-bound. This means that the book will now lay flat on your desktop without being weighed-down with various paper-weights, and it will stay open at any page without springing closed. There are also a limited number of copies available in a loose-leaf binder format allowing you to add-in extra pages of information as it becomes available, or to insert your own pages of information.

The new edition comprises ten chapters (or sections), and two of these are sub-divided into sub-sections. The first seven sections are an introduction of radios, antenna and radio communications, information about airways, sections covering v.h.f. and h.f. aeronautical communications, and a brief look at ACARS. The majority of the book is taken-up by section eight, which lists all known Selcalls in three different sequences (by airline/operator, by Selcall and by registration). The ninth section is devoted to Selcalls used by executive jets; these are treated separately, since these Selcalls are not always fixed. The first seven sections have been completely rewritten from the previous edition. They contain the all-important frequency listings for the aeronautical networks, airlines, the military and the commercial networks.

The main part of the book comprises a huge listing of Selcalls. At the start of this section is a chart that shows how the amount of Selcall information has increased from less than 1000 (1st edition) to over 7000 (5th edition). The actual listing is in three parts (as mentioned above), with three columns of information across the page. In this edition, the three columns have been separated by a vertical line, which makes the information easier to read.

Unfortunately, the first few sections of the book appear to have

missed-out on the proof-reading stage, as there are several references to diagrams and charts which do not exist in the book. In the listing of Airline high frequencies, there are entries for the German airline Lufthansa, but they shut-down their network in December 1994 and now use Stockholm or Berne Radio. Another major oversight is the listing of military high frequencies. As usual, this contains the standard list of USAF GHFS and Canadian Forces MAC stations, but lists their old frequencies. As has been mentioned several times this year already, they changed many of the high frequencies in December 1994.

All in all, the book is still very useful, as most people will buy it for the Selcall listings, not its frequency listings; since the Selcall list occupies two-thirds of the book, the text at the front is not so important. The latest edition of *High in the Sky* is available from the *SWM* 'Book Store'. The spiral bound edition costs £6.95, and the loose-leaf edition costs £9.95.

RAF Changes

As expected, the Royal Air Force recently changed its high frequencies to conform with the 3kHz spacing band-plan. I have yet to hear exactly when the change occurred, but all the new frequencies were in use by May 1.

Soon after the changes took place, I acquired a copy of the latest *RAF En-Route Supplement*, which contains a listing of the RAF Flight Watch Centres. Here are details of the new/current RAF frequencies: STCICS 'Architect' 2.591, 4.540, 5.714, 6.739, 8.190, 9.031, 11.205, 11.247, 13.257, 15.031, 18.018. Ascension 'Haven' 4.742 (2000-0800), 9.031 (0800-2000), 11.247. Cyprus 'Cyprus' 4.730, 9.031 (1600-0500), 11.247, 18.018 (0500-1600). Gibraltar 'Gibraltar' 4.742 (2000-0700), 11.247 (0700-2000) Mount Pleasant 'Viper' any of the above

Note: all frequencies are in MHz u.s.b., all times are UTC.

All these frequencies are being continuously monitored, except for those with times listed. Most have moved no more than 1 or 2kHz from their previous frequency, but 11.234MHz has jumped to 11.247MHz. Also, STCICS appear to have stopped using 23.220MHz, but this may be due to the current

position in the sunspot cycle.

In a similar more, the RAF VOLMET service has also changed frequencies, almost certainly for the same reason. In the case of the VOLMET service, the change in frequency has been more substantial. The 4.722MHz frequency has moved to 4.739MHz, while 11.200MHz has moved to 11.178MHz. These moves mean that some frequencies adjacent to the old frequencies are

now much more audible in the UK, as sensitive receivers are not overloaded by the powerful RAF transmitters.

The RAF VOLMET transmissions now include a number of non-standard airfields in the broadcast, that reflects the areas where the RAF are now operating from. There are several airfields in Italy listed that the RAF are using in connection with the situation in Bosnia.

Traffic Log

(all frequencies are MHz u.s.b., unless stated; times are UTC)

- | | |
|---------|--|
| 4.378 | (19/3 11.15) Berne Radio (HEB14) transmitting a message saying "This is Berne Radio Maritime Service calling". |
| 5.628 | (3/4 20.46) An unknown VOLMET broadcast using a computer generated electronic voice with a far eastern accent. The weather report was for RKPK, which is Kimhae Intl in the Republic of Korea. This is one of the NP (North Pacific) network of frequencies, but I have never heard VOLMET broadcasts before. |
| 5.696 | (6/4 17.02) RNAS Culdrose Ops transmitting the message "Culdrose is now closed, and is scheduled to re-open tomorrow at 0800 Zulu". |
| 6.712 | (6/4 17.02) Striker 137 working Air Force Perth (Australia), receiving a Met Report for Darwin at 17.30. '137 reported that they were 'Ops Normal at position 13°31'S 122°16'E, and would call again at 1900Z. At 1905, both stations were in contact again for another 'Ops Normal call; Striker 137 said they would call again at 1950Z. I have checked this lat/long in a good atlas; it is near the Sandy Island and Scott Reef off the northern coast of Western Australia. (19/4) French Forces station 'Circus Orange' working 'Circus Vert', reporting the arrival of a French Air Force transport flight into Dakar. The message was sent just 5 minutes after the aircraft arrived, so it is almost certain that 'Circus Orange' is situated in Dakar. Does anyone know where the other 'Circus' stations are based. |
| 8.3915 | This is a recently active 'Bosnia Naval blockade' frequency. There are many stations, all controlled by 'Red Crown' (usually a US Navy ship in the Adriatic Sea), who are tracking land, sea and air targets. The interception is being done by aircraft from various nations, including France, Italy, Spain, UK and the USA. |
| 8.942 | (30/4 18.26) Petro 45 working Manilla ATC, who requested that '45 contact Honolulu ATC on 11.384 primary or 17.904 secondary. Also heard were several other Far East ATC stations, including Singapore, Ho Chi Minh City and Hong Kong. |
| 11.1753 | (17/4 08.27) Station 'Cyrano' working an unidentified French ground station. Cyrano asked if the ground station had received messages 1 and 2. They said they had. Cyrano is the callsign usually associated with French Air Force E-3 AWACS aircraft. |
| 11.384 | (30/4 18.29) Petro 45 working Honolulu ATC, up from 8.942MHz. Honolulu was inaudible, but Petro 45 was just audible above the noise; fortunately, Petro 45 read-back his clearance. Honolulu ATC requested that Petro 45 contact Manilla ATC on 8.903MHz. |

Airband

It seems as though half the light aircraft in the country will descend on Cranfield for the annual Popular Flying Association (PFA) Rally that this year is to be held over the weekend of July 1. Many of you will receive this issue of *SWM* just in time to attend the Rally. Chris and I will be there, so if you want to meet up, give me a ring ('phone number at end of this article).

Two parallel runways 04/22 will be available, one being a short grass strip. Tower is on 122.85 (hard runway), 123.2 (grass) and a.t.i.s. will be on 130.675 (arrival) and 121.875MHz (departure). On the ground, aircraft might display letters G or H (waiting to depart from grass or hard runway) or D (disabled passenger requires to alight on a hard parking stand). A trade-orientated air display will be held on the Sunday between about 1345-1530 local. If flying in, please read *AIC* 28/1995.

Follow-Ups

Let's see if I can help two of our 'SSB Utility' listeners (*SWM* May '95 page 59). **Kenneth P.** (Exeter) might find Paris VOLMET in English on 126.0 and French on 125.15MHz, but remember that these are not likely to reach the UK at ground level unless there's a propagation 'lift' on. **D. C. Stewart** could try Canada Map Office, Dept. of Energy, Mines and Resources, 615 Booth Street, Ottawa, Ontario K1A 0E9, Canada, which is the procurement address given in an old copy of *Canada Flight Supplement*.

Interference to aircraft systems has been mentioned a few times in previous 'Airbands' and now **Roger Preston** (Rickmansworth) and **Mark Zee** (Waterford, Eire, under airway UG1) draw attention to an article in *The Sunday Times* of 30/4/95. The article lists various items of consumer electronics that have caused abnormal behaviour of the aircraft in which they were being operated. A shame that the facts look a bit muddled to me, but I suppose the authors wanted to simplify things for the 'average' reader! For example, the microprocessor in a cellular radio (mobile 'phone) is bad enough, but there is no mention of the emissions around the 0.9 or 1.8GHz area. This is a pity since the underlying message is an important one: do **not** operate electronic equipment when in flight except low-powered wrist-watches and l.c.d. calculators. Cellular radios must be switched off -

or, better still, take the battery out.

Roger mentions the compass. In fact there are two in most large aircraft. The conventional magnetic compass is only needed as a cross-check and in case the main electronic compass fails. The electronic compass consists of an electrical coil hanging in a wing-tip and that picks up the earth's magnetic field as the aircraft moves. North Atlantic flights don't get close enough to the pole as to cause problems with this equipment.

You Write

On the subject of propagation lifts again, v.h.f. signals from unusually great distances (including from Great Britain) reach Mark sometimes. As he observes, likely weather conditions for this are when high pressure predominates, causing a sustained tropospheric duct. The effect is sometimes most marked as the cyclone decays but is spoiled once fronts start to encroach. I'm pleased that Suckling are expanding successfully, their Dornier 228s plying regularly between Waterford and Luton.

Mark says that 123.45 is the unofficial air-to-air 'chat' channel, but beware that this has been allocated to an aerodrome in the UK, so 131.8MHz has now been provided for the same purpose when flying over the North Atlantic. Local news: the 21 i.l.s./d.m.e. at Waterford (110.9MHz) have had their Morse identification call signs changed from WTD to IWD (note the convention that an i.l.s. ident has I as its first letter).

Can anyone supply USA accident investigation details, or occurrence reports, to **Robert Hall** (Capetown, South Africa)? He believes that a United flight ran into trouble near Bermuda around April 26. Any details and I'll print them in this column. Robert passes on his 'local' h.f. company frequency: Springbok 8.933MHz u.s.b.

Lots of activity in the air over Lancaster is reported by **Maxwell Mark**. I'm not sure exactly which routes you're seeing going by your description, Maxwell, but it's easy to mis-judge direction when looking at high-altitude aircraft that are actually many miles away rather than overhead. Anyway, here are some possibilities. Heading south-west to the Isle of Man is W911D but I'm not sure if it would be beyond your visible horizon. Other nearby airways are UA1, UA2 and UA25. Possible frequencies are 126.875, 128.05,



Yakovlev Yak-52.

Christine Mlynek.



Mooney M.20F.

Christine Mlynek.

129.1, 131.05, 134.425, 135.575 and 136.2MHz. Hope you managed the RAE, let us know your call sign when it arrives!

What might **D. S. Hughes** (Bedford) find of an aeronautical interest on a visit to Welshpool? Airway A25 runs north/south directly overhead (125.1, 133.6 and 136.4MHz) and Welshpool Aerodrome is on 123.25MHz. Military low flying aircraft are below radar and radio range, and there isn't a concentration of this activity near you. North Wales Military Training Area is too far to the west to be visible to you, but is active 0800-1800 local time on weekdays between FL320-450. It won't be controlled by the Lower Airspace Radar Service (LARS) because it's above FL95 but the nearest LARS to you will be Shawbury (120.775MHz), you are outside of Valley's coverage. Other possibilities are London Mil 235.05 (Upper) or 275.475MHz (South).

Frequency and Operational News

From the CAA comes *AIC* 20/1995 announcing another slight change to Royal Flight call signs. The Flight actually ceased to exist (it previously operated out of Benson) but 32 (The Royal) Squadron has taken over its duties at Northolt. The Kitty call sign will now be allocated when positioning but not for other purposes. This means that training flights, for example, will instead operate under the ubiquitous Ascot call sign.

I'm sure that readers of this

column know what a *NOTAM* is. From now on, urgent information (such as airspace restrictions, Royal Flights and unexpected frequency changes) will be sent over the AFTN 'teleprinter' network (Aeronautical Fixed Telecommunications Network). When more notice can be given, amendments to the UK Aeronautical Information Publication (*AIP*) will be sent by post thus replacing the Class II *NOTAM*. Actually, today's AFTN owes more to computers and Modems than it does to the clattering teleprinters of yesteryear. I miss the sound of the printer, the miles of paper tape, the smell of the hot oil...

Information Sources

Roger Preston is studying ACARS (Aircraft Communications Addressing and Reporting System), and notes that American and European message contents aren't always the same. ICAO four-letter aerodrome identifiers appear in some messages. One publication that decodes these is the *Aerad En Route Supplement* (in separate volumes for each part of the world). *Aerad* sell to the public by mail order, for their address send a stamped/addressed envelope to the magazine's offices at Broadstone and request the *Airband Factsheet*.

One item that appears in ACARS and other reports is the aerodrome weather, either as a METAR (actual weather) or TAF (forecast). Here's a fictitious example.

EGLL SA290900 0900Z 27005KT
9999 SCT035 18/16 Q1012 NOSIG

This means: EGLL (ICAO code for Heathrow) on Saturday 29th at 0900 (0900Z means UTC). Wind from 270° at 05 knots, visibility 10km or more, scattered cloud base 3500ft above ground, temperature 18/dew-point 16°C, QNH 1012mb, NO SIGNificant weather (so no thunderstorms for example).

Don't forget to order the latest copy of *High in the Sky* from The SWM Book Store (see pages 86-90), price £6.95 plus £1 P&P. Remember that you're buying this so as to identify the registration of an aircraft once its Selcall code is known. I can't recommend it too highly for this purpose. I was disappointed that the introductory text gave a poor impression, the accompanying diagrams being omitted altogether! There were misconceptions as to what s.s.b. is (described as 'half a sine wave'), the differences between altitude and flight level as well as ground speed and true airspeed, and squawk codes were apparently not understood. As I say, just give those first few pages a miss and you'll find the rest of the book indispensable.

In the Cockpit

Just room to continue my series on the Automatic Direction Finder (ADF) and the way in which it shows its

information on the Radio Magnetic Indicator (RMI). I started this explanation in April, and on page 68 of that issue you'll see a photo of an RMI.

At the time, I was trying to fly towards a beacon that was tuned in on the No. 2 pointer (the one with two parallel arms). As you see the RMI in the April edition, the aircraft's heading (at 12 o'clock on the dial) is due east but the pointer tells me that the beacon is just a little left, on 080C. Am I going to reach it?

I started off flying towards it with a heading of 080° but soon found that the pointer started to move. It began to go to the right of my heading, towards east and then 100°. What was wrong? The wind from my right, about 120°, was blowing me off course. If I carried on like this, I wouldn't overfly the beacon, but would pass it - it would go over my right shoulder (right abeam, as they say).

To correct this I turned a little right and flew towards the wind's direction. After a while, the beam pointer moved back to where you see it now. If I carried on allowing this, I would miss the beacon again but this time it would go past my left shoulder. I'd over-corrected.

Turning the heading back a little to the left (but not too much!) solves the problem. The beacon remains on a bearing of 080° from me and so I'll

Abbreviations

AIC	Aeronautical Information Circular
°C	degrees Celsius
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
FL	flight level
ft	feet
GHZ	gigahertz
h.f.	high frequency
ICAO	International Civil Aviation Organisation
i.l.s.	instrument landing system
l.c.d.	liquid crystal display
mb	millibars
MHZ	megahertz
Mil	Military
NOTAM	NOTice to AirMen (includes AirWomen)
QNH	altimeter pressure setting, reads height above sea level
RAE	Radio Amateurs' Examination
Selcall	selective calling
s.s.b.	single sideband
u.s.b.	upper sideband
UTC	Universal Co-ordinated Time
v.h.f.	very high frequency

pass over it. I'm twisted a bit to the right, facing east (090°) so as to compensate for the wind. To an observer on the ground, standing next to the beacon's antenna, I'm coming towards the beacon but my nose is pointing to one side. This gives the appearance of acting like a crab - scuttling off in one direction yet facing a different way. The next

time I have space, I'll introduce a new topic from in the cockpit.

The next two deadlines (for topical information) are July 14 and August 11. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information and enquiries: 0181-958 5113 (before 2130 local please).

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Hardware pack: £13.90


Morse Oscillator Kit: £9.80
Hardware pack: £10.10


Speech Processor Kit: £16.80
Hardware Pack: £11.90

Digital Readout Kit: £49.90
Hardware Pack: £24.90



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73 from Dave G4KQH, Technical Manager.

Scanning

Frequency lists are always a popular item of discussion between enthusiasts and there are many on the market that are freely available. My own preference has been to use those by Tim Anderson but, in the past, I've also made mention of other sources. Paul Wey being one.

This month I've had some good lists through from Paul, who runs *The UK Scanning Enthusiasts Frequency Guide* and also updates same. In the past, Paul's sent on useful data that enthusiasts would find invaluable to the hobby as he covers most of the allocations from the lo-v.h.f. end to s.h.f. Certainly, if you're serious about scanning then you should look at what Paul's got available.

This month's catch came in sections 1 and 3, with other peripherals attached like TAD lists and spectrum charts showing allocations. In it, I've discovered frequencies that I would really have to work at finding otherwise! How do I rate it? Brilliant! Where Tim Anderson does it on disc, Paul does it in booklet form and - in true enthusiast fashion - backs up his catches with having listened to them himself. If, for example, a channel is allocated to a particular user but nothing was heard through monitoring, then he says so. This is, I think, really refreshing as you can spend many hours listening - or sitting - on a channel just to hear no activity! Paul tends to back up what he puts down with having tried it himself. What better recommendation is there?

To tickle the taste buds of users who wish to try Paul's lists out, I'm revealing some information that I've logged myself - and which are therefore verified by me. They are:

Gen Info: All USAFE Base comms are now in the 406 - 420MHz band.

UK Mil a.m. no longer in use. Try f.m. - also, though same band are using different frequencies and/or channels.

NATO TacComms carried out below 72.5MHz. Paul does travel, so the frequencies are accurate - and the list is well worth a look at. Currently, I don't know the price but I'm sure that you can obtain this from Paul at 2 Icknield Way, Baldock, Hertfordshire SG7 5AJ.

The list will appeal nation-wide.

Letters

A letter now from **Duncan Oldham** of Scarborough. Duncan wrote in to

ask why there isn't a specialist scanning magazine available. Well, this magazine is the best general publication available, Duncan - and competition isn't always a good thing! Scanning, by virtue of its sensitivity, is a bit of a grey area and *SWM* does provide a good platform for the hobby. I'd go so far as to say that the coverage is enough - writing once a month can sometimes be hard, although normally coverage is pretty good. To sustain a specialist magazine takes some doing and *SWM* is the leader on this aspect of radio! I could not envisage a full-time magazine myself. The legalities being what they are, I believe that such a specialist publication would have to be discrete enough to satisfy the watchdogs that what was being covered was legal. Again, a grey area - but leads nicely into the next bit of your letter!

Duncan reports he was prosecuted some time ago for having mobile telephone frequencies in his scanner, as well as police channels. He was 17 at the time and learned his lesson! He asks that readers are made aware that you can be stopped if the police suspect that there is something wrong with your vehicle, such as an obligatory light not working. If you carry a scanner in the car, the police will presume you're up to no good, will check to see if the antenna is connected and if power is on to the unit - either battery or other source - and that will usually mean a seizure. Get a receipt, he says! So, yes, it does happen.

Duncan also asks for help: Do fire brigades have hand-helds and if so, where do they operate? Duncan also asks if anyone has heard BA - Breathing Apparatus - comms and, if so, where? All answers to the column please!

Now, an interesting letter from **P. Beaumont** of Upper Norwood in London in reply to Wynn Davies's letter about NiCads. It's suggested that a measurement is taken of the cells after a recharge and to measure the terminal voltage after a 14 hour charge period. The charge should be 1.2/1.25V. Any affected cell will be lower than this and should be regarded as duff and taken out. However, don't throw it away! There is a test that can be done, **but care should be taken!**

Using a p.s.u. capable of about an output of 5 to 8A at 9 to 12V - car battery charger - and observing polarity i.e. positive to positive and negative to negative, **briefly** - 1 second only - touch the leads to the cell. **Take care here!** You will feel

heat and vibration.

Measure the terminal voltage again. If 1.2 or 1.25V, the cell can be recharged as normal. If not, try above again. If, however, the cell doesn't measure after the second attempt then it is duff and should be gashed out. Just a hint here, but the writer has maintained NiCads for 10 years like this...far in excess of the recommended 500 charges only!

NiCads not holding their charge, say suffering a 60% loss over a two week period are hopeless. Nothing can be done. However, Paul does say he now uses ordinary dry-cells and charges them up in a dry cell charger - available most places - and has maintained these same sets for two years to date. He uses these in an MVT-7100 that is in daily use - so it's a cheap option. Just to get technical here. The 'kicking' of NiCads is a trade trick, and what it does is to break the whiskers. I hear the sceptics ask? What, free and extended power - it should be! Paul signs off with MISCT after his name - that's good enough for me!

Maxwell Mark of Lancaster writes to ask if anyone has information on Ambulance frequencies for Cumbria. Having monitored 166.625MHz for a while, and heard nothing, he wonders where they are operating. He also asks why he can hear mobile and base stations on the mobile repeater and sometimes can't. Frequency here being 166.525MHz. If you have information on Cumbria Ambulances, write in. As for the repeater, one very simple explanation is that it could be tropospheric propagation - a lift - and extending v.h.f. range. There are many reasons, Max - not all obvious!

On the subject of ambulances, **A. A. Williams** of London writes in with updates for London. Having seen the list I can confirm that LAS have their own codes, which differ from those previously printed here. I can, however, give you hand-set Channel 1 on 459.7770MHz and Ch.2 on 459.8250MHz - though this appears as various security allocated in other publications. Mr. Williams goes on to say he recalls listening to the famous *Flying Enterprise* drama in the 1950s on a home-brewed short wave set. I don't recall it, but do know of it. Captain Carlsson staying to the last and the Dutch tug *Utrecht* of Wijsmuller BV being involved in what was a national drama. You go on to give info on making your own short wave receiver from home-made coils on the card centres from toilet rolls and old four-pin valve bases - which is quite an achievement. I wonder if anyone has

made their own scanner? (*I remember the Flying Enterprise saga well - and I used to wind my coils on toilet roll centres. Sadly, the modern loo roll has been so highly 'value engineered' that it is useless for such esoteric activities! - Ed.*)

Now, News for Military Monitors!

A publication currently doing the rounds is *SIGNET*, which appears six times a year, and is concerned with mil monitoring. I have yet to see one, but have heard they are extremely good and up-to-date. Any of the Editorial Staff wishing to send on a review copy can do so - I'll be pleased to feature it in here. Available at £6.00 pa, it can be bought from: *SIGNET*, 19 Crescent Road, Hunstanton, Norfolk PE36 5BU.

Some goodies that I've heard about are as follows:
Joint Maritime Course at RAF Kinloss on 06/94.
265.825 Ship/Air.
265.900 AWACS Co-ordinating.
278.300 Ship/Air.
281.725 Naval Exercises.
354.850 As above.
312.075 Stud 4 Cottesmore.
312.500 Stud 4 Waddington.
380.950 Stud 9 Wittering.

So, as you can see, pretty good stuff! The frequencies are allocated elsewhere - for example, 278.300MHz being listed variously as Portland Area Frequency, whilst 354.850MHz is completely new! If you're into milnets, then this sounds like it's for you.

Publications - whether published on a pro basis or in 'fanzone' style - are always good sources of information. Another, perhaps less well-known source, would be clubs. I've been thinking that it may well be an idea to start a club list/publication list in the column and if you're interested then drop me a line with details of what it is you do. Maybe you're an amateur radio club with a scanning section or a CB club with the same. Perhaps you log frequencies and want to exchange them in a particular area for example, aircraft frequencies. Whatever, then drop me a line and I'll see if we can't get something organised for scanning UK and enthusiasts likewise. This column is YOUR place for exchange information - let's try and use it.

If anyone is up and running on the 'Net' and has scanner info, why not send it in? I'm not on the 'Net' -



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Info In Orbit

It might seem peculiar to those new to WXSAT monitoring to hear that you can receive visible light images around midnight, but during summer months in the northern hemisphere, the sun remains above the horizon at the north pole, so WXSATs passing over see an illuminated landscape (icescape?). Consequently, NOAA WXSATs transmit visible light imagery for the few minutes that they take to pass over the polar regions. Similarly, METEOR WXSATs can be heard transmitting images for a few minutes while they are near the north pole. What a pity that the METEORs are not currently transmitting infra-red images. They were of such good quality.

Current WXSATs

For some weeks now we have had a steady supply of weather pictures from the same five WXSATs. NOAA-9 resumed operations when its pass times finished clashing with those of NOAA-14. The orbits of these two WXSATs are quite far apart, to the extent that NOAA-9 is still passing south-bound over the UK during the middle of the day, around the time that NOAA-14 is starting its north-bound midday passes. Consequently, there are occasions when the two meet up while going in opposite directions!

Both NOAA 10 and 11 are out of commission. NOAA-11 ceased operational data collection on April 10 at 1830UTC and is now in a standby mode. NOAA-12 is the only WXSAT now operating on 137.50MHz.

Some reports have come in concerning reception from OKEAN-4 (also known as 1-7). Telemetry from OKEAN remains sporadic on 137.40MHz, and is normally restricted to some (easterly) passes where control is probably being maintained by the ground station in Russia.

Seasonal Thermal Effects

At this time of year, infra-red images show effects of seasonal temperature changes. During winter and early spring the Atlantic is warmer than the average land temperature, so it appears darker than land, on infra-red images. On a warm sunny day in spring, land heats up quickly, so the actual thermal difference between land and sea may be fairly small - the images show little detail and can appear 'washed-out'. By night, land cools down quickly so thermal differences again increase. By late spring, land heats up very quickly, darkening on i.r. images. Night-time images then look thin because both

land and sea have similar temperatures. By mid-summer the temperature differences are great, and daytime i.r. images show considerable detail.

Readers' Letters

It has been some time since **Lester Jones** wrote to 'Info', but having replaced his original BBC computer with a '386 PC, he is now monitoring METEOSAT images. Lester uses a Dartcom 137MHz receiver built from a kit, and fed from a dish, and presumably down-converter (to convert the 1691.0MHz signal to 137MHz). The dish is about 0.9m diameter and, as Lester comments, susceptible to interference from METEOSAT-6 ranging tests. Beginners may not realise that while we get images from METEOSAT-5, METEOSAT-6 is positioned nearby, and is sometimes switched on for distance (ranging) monitoring, at which times signals from both WXSATs may be received on small dish systems.

Lester sent a selection of GIF images on disk - SWM can now take such images, as well as the usual printed type - from which I have selected the whole-disc CTOT image - see **Fig. 1**. Looking at the original GIF colour, I was momentarily puzzled; there was no colour-bleed - the effect of adding artificial colour to such images usually results in some areas of green cloud or other obvious colour anomalies. In fact, Lester is using JVFAX v7 software that uses mask techniques to eliminate this problem. JVFAX requires a decoder to interface to the PC and Lester finds the Martelec decoder to work well. I reviewed this product in a recent edition.

Roger Ray is a regular contributor to 'Info' and has sent a set of NOAA-14 infra-red images taken last November/December, and processed with JVFAX (version 7) software. Roger uses his lap-top computer for the polar orbiters (NOAA and METEOR) because he finds it generates less noise than the desk-top computer. Britain enjoying a sunny November day can be seen in **Fig. 2**. The original has artificial colour added and looks like a sunny summer's day!

Nigel Tucker of Harare is in the Zimbabwe Radio Society, in which most members apparently use a program called PC Weathersat for WXSAT decoding. I do not recall that name, and wondered whether it has a different name in Britain. Nigel comments that he has not heard METEOR 3-5 operating over Zimbabwe so wondered whether it was switched off after leaving Europe. I am fairly

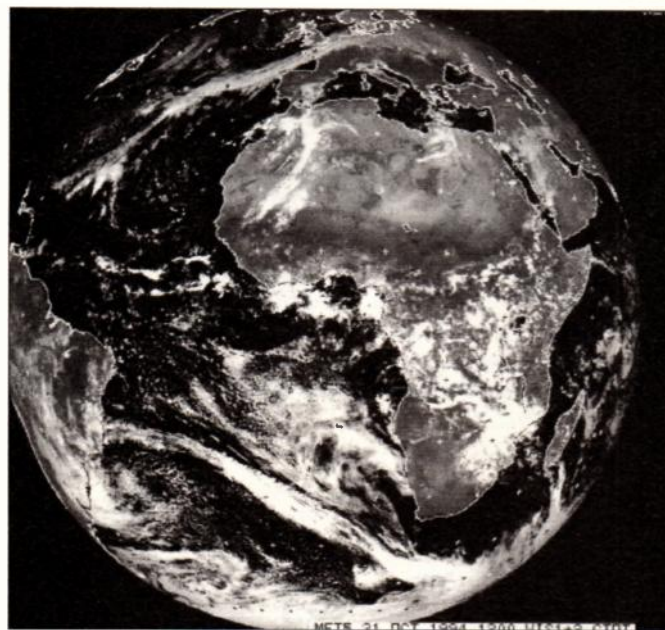


Fig. 1: METEOSAT-5 visible-light whole disc (CTOT) image from Lester Jones.



Fig. 2: NOAA-14 infra-red from Roger Ray.

certain that it does transmit continuously while in sunlight, wherever it is, but of course one can never be sure with METEORs. I shall make some enquiries. Finally, Nigel is one of many people asking for information about books on weather satellites. My own tome is currently with the publisher for examination.

Shuttle/MIR

Sue and John Locker of Newton in Wirral have sent a comprehensive list of broadcasting modes likely to be employed during the MIR/Shuttle link-up, currently scheduled for June but, as I write this, expected to be delayed. Their list includes frequencies of transmissions likely to carry live or recorded video of the link-up. The following frequencies in the 2m band are used as indicated:

121.75, 130.1625MHz, 145.325, 145.625MHz (possible ship-to-ship) 145.550 voice and packet 143.625 ground control

I maintain an up-to-date schedule of all Shuttle missions and payloads and will append to it some of the frequencies used for transmissions, for those wanting to tune in. To obtain a copy of the list please send one s.a.e. plus 20p coin (or an extra stamp) towards the cost of data collection.

Japanese Meteorology - GMS

Japan's NASDA space agency launched the third H-II launch vehicle carrying Geostationary Meteorological Satellite 5 (GMS-5, their latest WXSAT) from Tanegashima on March 17 at 2001UTC. The first stage flew a suborbital trajectory, and the LE-5A second stage completed its first burn to enter a 322 x 336km x 28.5° orbit, deploying the SFU (Space Flyer Unit) satellite at 2014UTC. The LE-5A then ignited again to enter geostationary transfer orbit, and at 2028UTC the second payload, GMS-5, separated into a 329 x 36669km x 28.5° orbit.

GMS-5 carries a Star 27 solid motor, intended to place it in geostationary orbit. The satellite has visible and infra-red radiometers and will continue the Japanese Meteorological Agency's operational WXSAT system. Nominal longitude of GMS-4 (the current WXSAT) is 140° east (over the equator).

GMS-5 low resolution (WEFAX) telemetry is on 1691.0MHz. This is a relatively standard WEFAX signal (amplitude modulation of a 2.4kHz sub-carrier, that frequency modulates the r.f.), but has one unusual characteristic - the r.f. bandwidth is 260kHz.

GMS has a schedule that includes a full disc scan 8 times per day (every three hours), two successive full discs (for wind calculation) 4 times per day, and hourly northern hemisphere half

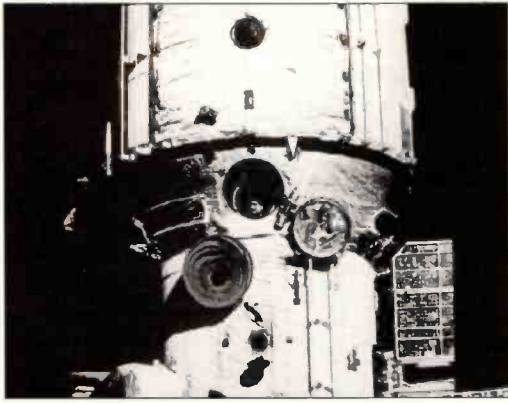


Fig. 3: View of MIR from the Shuttle during recent approach; from Sue and John Locker, courtesy NASA.

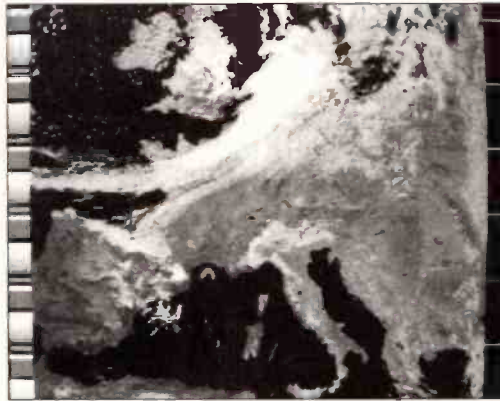


Fig. 4: NOAA-13 visible image (1993) from Brian Dudman.

discs. The standard observations start at 33 minutes after the hour. A few scan lines lag between the observation and transmission to the main processing site and retransmission to the users.

The addition of two more IR channels on GMS-5 may cause a change of schedule. GMS-5 is now undergoing checkout but the exact date of switchover of operations from GMS-4 to GMS-5 is not known. GMS-4 will be kept as a backup for GMS-5 as long as possible. My thanks to **Kjell Magnussen** for most of this information.

METEOSAT-5 transmits selected GMS-4 images on channel A2 (1694.5MHz) in WEFAX format; if you receive METEOSAT WEFAX, you should be able to receive these images. We can expect to see a transfer to GMS-5 when the long check-out procedure is complete.

Satellite Tracking Software

Several of these shareware/public domain programs are becoming popular with satellite enthusiasts. Here is a summary:

Birddog

As mentioned a month or so back, the latest version of Birddog runs on most machines, but a few readers have identified some problems. Birddog does not run on my 486SX, nor on some other 486SX machines, as reported by some readers. It runs well on my 386DX and shows a world map with a selection of satellite tracks. Most well known features are available on this new version.

PC-Track

I obtained a new version of PC-Track recently and this seems to hold the record - running on every machine that I have tested. Computers with the 80286 processor may be reluctant, according to a friend of mine who tested it on his 286.

STS-ORBIT PLUS

There is a new version of this impressive program, which runs on most machines, including my 486SX but stubbornly refused to last more than 20 seconds on my 386DX, which has an IIT co-processor. This turned out to be significant! I contacted the program's author and was pleased to receive a response in less than 24 hours (E-mail). **David H. Ransom, Jr.** of Spacelink at NASA, told me that

a number of co-pro chips manufactured by IIT and ULSI (and possibly Cyrix) were found to be faulty, causing STSPLUS to crash. It seems that IIT have corrected the problem and now use STSPLUS themselves to validate their co-processors!

David spent much time investigating the running of STSPLUS and tells me that where it does not run, he believes the machine is invariably to blame. A letter from **K Feller** seems to confirm this with his comments that STS works well on his 386SX and 386DX each without a co-pro fitted.

Satellit

This program was written by three German students for PC operation and was kindly sent to me by **Les Hamilton** of Aberdeen. The program works until August (when there may be a new version) and ran very well on my computer. It provides a Mercator map of the world as well as full predictions capability. Registration details are included with the program.

The GOES Programme

NASA launched the first GOES (Geostationary Operational Environmental Satellite) for NOAA (National Oceanographic and Atmospheric Administration) in 1975, and followed it with another launch in 1977. Currently, the United States is operating GOES-7 and GOES-8, supported by Europe's METEOSAT-3.

The United States normally operates two meteorological satellites in geostationary orbit over the equator. The GOES-East WXSAT position is at 75° and GOES-West is at 135°. Each satellite views almost a third of the earth's surface: one monitors North and South America and most of the Atlantic Ocean, the other monitors North America and the Pacific Ocean basin. The two send full-globe pictures of the earth, day and night. Following the failure of GOES-6 in 1989, the United States had only one operational satellite, GOES-7, so that was re-positioned midway over the USA.

In August 1991, METEOSAT-3 was moved from 5° west to 50° west, over the equator, to supplement NOAA's GOES constellation. In February 1993 it was moved to 75° west. METEOSAT-3 served as Europe's operational satellite until June 1989, when it was replaced by METEOSAT-4. It was developed for and operated by, the

European Space Agency (ESA) on behalf of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT).

The GOES WXSATs aid forecasters in providing better advanced warnings of thunderstorms, flash floods, hurricanes, and other severe weather. Improved forecasts save lives, preserve property, and benefit agricultural and commercial interests.

The newly operational GOES-8 provides meteorologists and hydrologists with detailed weather measurements, more frequent imagery and new types of atmospheric soundings. When combined with that from new Doppler radars, data gathered from GOES-8 makes possible revolutionary flood and water management systems devised by American National Weather Service hydrologists, and greatly aiding managers as they make critical decisions about allocating precious water resources, particularly those of its western states.

From my home in Plymouth I can receive WEFAX telemetry from GOES-8, which is a few degrees above my western horizon. Images are sometimes corrupted by METEOSAT-3 which transmits nearby, but is due to be switched off at the end of May.

GOES-J (9 after launch)

The Atlas first stage fuel for the AC-77 wet countdown dress rehearsal was loaded, and countdown for launch began on Wednesday May 3. Loading of the cryogenic liquid hydrogen and oxygen followed and a simulated launch was held. At Astrotech, the GOES-J spacecraft was fuelled with its hydrazine attitude control propellant in early May. The spacecraft was placed on the Atlas 1 payload adapter and then encapsulated into the nose fairing. The spacecraft left Astrotech for Launch Complex 36 on Saturday morning May 6, for mating to the rocket at sunrise.

A series of launch postponements for GOES-J occurred due to battery constraints, then excessive wind at the launch site.

GOES-J was successfully launched from Cape Canaveral on 23 May. Foolowing several delays, the launch carried the much-needed geostationary WXSAT into orbit, where it was renamed GOES-9.

(CIS/Russian) Contacts

My enquiries of the Russian Space Research Institute - Institut Kosmicheskikh Issledovanii - have demonstrated as never before, the willingness of Soviet scientists to provide information on the Russian/CIS space programme. I have recently exchanged greetings and corresponded with **Michael Zakharov**, who has very kindly provided me with information sources and data concerning the CIS satellite programme. In fact the amount of information made available to me would fill this column!

Somewhat to my surprise, Michael told me that CIS scientists monitor HRPT (NOAA high resolution telemetry). Documentation on METEOR WXSATs indicates that they have high resolution scanning equipment on-board, though I have not heard of anyone monitoring such telemetry. It appears that the scientists plan to make the HRPT data available free for the scientific, research and educational community. This seems to be an exciting foretaste of CIS developments! I am making further enquiries on behalf of 'Info' readers. As at late May I have just received the first h.r.p.t. images from the Institute. More next edition.

Kepler Elements

Different options are available:

1: For a print-out of the latest WXSAT elements and MIR, send an s.a.e. and separate, extra stamp. Transmission frequencies are included when operating. This data originates from NASA.

2: I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (plus four self-addressed, stamped envelopes) for four editions. Foreign requests should enclose four IRCs.

3: You can have a computer disk file containing recent elements for the WXSATs, and a large ASCII file containing elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers for the WXSATs, Amateur Radio satellites, and others of general interest. Please enclose £2 with your PC-formatted disk and s.a.e.

Software Offers

If you would like a copy of any of the shareware/public domain software mentioned in this column (JVFX v7, PC-Track, STSPLUS, Birddog, Satellit) please send me a 3.5in HD disk per program with pre-paid return package and 50p per program (or maximum £1.50) towards data collection costs.

Frequencies

NOAAs 9, 14 a.p.t. on 137.62MHz, NOAA 12 on 137.50MHz, NOAA beacons on 136.77 and 137.77MHz, METEORs use 137.30 and 137.85MHz and OKEAN-4 may use 137.40MHz occasionally.

Timestep

PROsat II is used by most leading Weather Satellite enthusiasts. They have come to rely on the vastly superior features of **PROsat II**. Features such as 1,000 frame full screen full colour animate, 3D, direct temperature readout, latitude-longitude overlays and country outlines from NOAA, and Windows export make Timestep products preferred by most serious users. All satellites are catered for including the awkward Japanese GMS and the very infrequent Soviet Okean series. All current SVGA cards are supported. NOAA images contain full resolution visible and infrared data in a stunning 2.4Mb file!

If you really are serious about Weather Satellites, phone or write us now for a colour catalogue and find out why the world's experts including Arthur C. Clarke use and recommend our equipment.



Advanced Weather Satellite users will by now have read about our new **TRACK II** prediction software. Full screen colour graphics and 6 simultaneous satellites are just some of the amazing features. For the ultimate in detail we offer **HRPT** digital systems with five 1.1km ground sensors, towns and rivers are clearly visible. For everyday use we also have the **PDUS** digital Meteosat system that takes 2.5km data every 30 minutes. Timestep **PDUS** colour animate is used several times a day by Anglia Television because of its very high resolution combined with spectacular colour. Forecasters will appreciate temperature calibrated 30 minute interval images.

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SPECIAL PRICE £34.95

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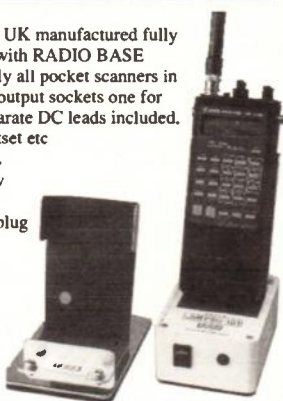
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NEW PSU-101 Mk1VC

SKY-NEWS

SYNOP now available for most PC decoders

SkyComm have released a new version of the popular Skyview Systems SYNOP program aimed at users of third party decoders.

The 5 figure groups that many people decode from a RTTY signal can now be turned into impressive weather maps by using "Weather Chart", developed from their present SYNOP product.

So if you can decode RTTY and save it to disk using your PC, then you can now have ability to convert those 5 figure groups to intelligent data.

Skyview WeatherChart
Only £49.95

Icom Control Software with New Interface

Computer aided control of Icom receivers will now be a lot more affordable thanks to the latest version of ICRX from Skyview Systems.

The latest version is supplied complete with RS232 interface known as the IF-ICOM, which is contained within a 25 pin D-Type connector.

ICRX provides a host of features including signal meter, frequency control, large frequency display, squelch and a data base memory management system.

ICRX £44.95
IF-ICOM £24.95

Skyview Communications

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Decode

All the Data Modes

This month I've had several readers write asking for help with home-built interfaces for HAMCOMM and JVFAX.

Unfortunately, there is very little help that I can offer via a letter other than to confirm that the circuit diagrams are correct and that the design has been built successfully by many people. The most common tale is that the constructor has checked and double checked his work, but still the unit fails to operate.

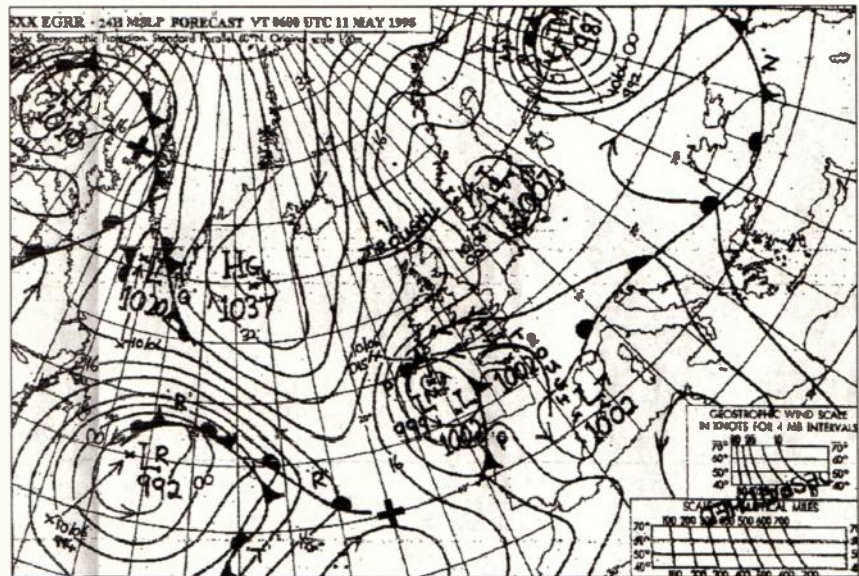
Having tackled many home construction projects myself, I have sympathy with this situation as all constructors have experienced it at some point. However, through my experience, I think that in every one of these cases the problem turned out to be human error on my part! The difficulty comes from checking your own work. What usually happens is that you have made a very basic mistake and continue to make that same mistake every time you check. The best answer is to get someone else to check your work for you. Failing that, try leaving the project for a few days and then completely recheck your work.

Interference Aid

The elimination of interference continues to be one of the most common problems for Decode listeners and is generally made worse by the introduction of any computer based equipment into the shack. Whilst my *FactPack-1* offers a logical approach to the problem, I receive many novel ideas from readers. The latest to arrive in my mailbox is an interference sniffer from **Tony Blythe** of Kirkbymoorside. Like all the best ideas, his is remarkably simple, yet very effective. To make the sniffer you first need a convenient length (around 1m should suit most stations) of good quality coaxial cable, e.g. RG58. At one end you will need to fit a plug to suit the antenna socket of your receiver. At the other end of the cable you need to strip back and insulate about 150mm of the outer screened braid. You then leave the inner conductor insulated and add some tape to the end to make sure the inner can't make direct electrical contact. What you are actually making is a lead with a 150mm antenna at the end.

Once construction is complete, you power-up your station and tune your receiver to whatever was the most troublesome frequency band. With everything ready, you now search around your station with the tip of the sniffer, looking for areas that

Fig. 1:
24hr.
forecast from
Bracknell
10 May 1995.
4.61MHz



cause the most noise. You should use the probe all around your station and particularly along any connecting leads such as those used for printers and other peripheral devices.

Of course, finding the interference is just an important first step in the process and you will need to use *FactPack-1* or some other guidance to work out exactly what to do next. My thanks go to Tony for taking the time to write in with this excellent idea. If you have any bright ideas that have worked for you, please drop me a line with the details.

Frequency Databases

In my review of the Klingenfuss *1995 Super Frequency List 1* complained that the database software was crying out for some attention to provide better viewing for the user and also to allow direct control of the receiver. Well, **Roy Tait** of Hamilton has come up with the goods and has sent me a demonstration copy of what he thinks the database should look like. As this is just a demo, it had to be supplied on floppy disks (six in all). Roy has used the standard Borland Database engine so the installation had to be carried out in two stages. Although the complete package used some 10Mb of disk space, this is insignificant if delivered on a CD-ROM with around 600+Mbs available!

The presentation of the new software was excellent and you were presented with a conventional looking Windows application with friendly menu options all backed-up with a number of push buttons. The main frequency display was very clear and showed 15 frequencies at a time which was very good. You could choose to sort the list by frequency, callsign, name, country or mode all at the press of a button. Moving through the frequencies could either be done using the normal Windows scroll bars or by using tape recorder style forward

and reverse arrows. Roy has also combined the main list and the former utility list so that switching between the two can be done at the press of a button.

The program also includes a search function that will search through any of the fields for the text you enter. This is great for quickly finding a station when you only know the call or part of the call. Closely associated with the ability to search is the bookmark facility. This is just as the name implies and allows you to tag up to nine frequencies for later retrieval. This retrieval is done via nine push-buttons at the bottom of the screen. This is great for FAX monitoring where you can tag the available frequencies then quickly step between them to find the one providing the best reception.

The real prize in this implementation of the frequency list is its ability to automatically tune the receiver. This can be set so that the receiver tunes-in whenever you double click the mouse or you can use the tracking mode. In this mode, the receiver automatically tunes to whatever frequency is highlighted on the display. To make this part of the program as flexible as possible, Roy has included a configuration screen where you can set the COM port and communication address for your receiver system. In the demo version of the program Roy has supplied support for the NRD-525, NRD-535, Icom R-71 and the Lowe HF-150. However, he feels it would be simple to add support for most of the receivers that boast external control facilities.

There are lots of opportunities to expand this program, particularly with regard to the on-line help facilities. With the massive storage space available on a CD-ROM it would be quite easy to integrate the frequency list with a list of abbreviations and audio samples of the various modes. Just imagine how useful that would be for the new listener. You could just click on an entry see what all the abbreviations mean and hear a sample of the

signal so you know what you're looking for! That's what I call multi-media!

Having thoroughly whetted your appetites, I have to say that the program is not yet available. Roy has sent samples of his work to Joerg and we now need to wait and see the outcome. Whatever happens, I believe it's only a matter of time before someone releases an interactive list with this level of versatility.

FrequencyManager

A readily available alternative to the Klingenfuss list is the *FrequencyManager* program from Ingenieurburo fur Satellitentechnik!! Although a commercial offering, it's also available in shareware form with a limited range of frequencies, so can be tried quite cheaply. The program doesn't offer the sophistication of Roy's Windows based system, but it is less demanding on the PC as it runs under DOS. This means it will run quite happily on some of the older and slower machines that many readers use. The actual system requirements are: '286 or better processor, 590Kb free RAM and 10Mb free disk space. The program is usually supplied in a compressed format and comes with its own installation routine that creates the appropriate directory and installs all the necessary files. One odd point with this routine was the strange mixture of German and English language. Whilst the main program uses predominantly English dialogue, the installation routine has most of the menu choices and warning messages in German. Fortunately, because of the common origins of many German and English words, it's usually quite easy to interpret the messages.

Once the program is loaded and running you are presented with a main display showing sixteen frequencies with supporting data. Included in the review copy were

frequency, callsign, mode, baud rate, country, user and message contents. As you would expect from this sort of program, the listing was very comprehensive with over 21 000 utility frequencies in the full, registered, list. Moving around the database could be done in a number of ways. The most obvious was to use the up and down arrow keys to move the highlighted bar to the required frequency. This operation could be speeded-up by using the page-up and down keys to change frequency by the screen-full, i.e. sixteen frequencies at a time. An alternative navigational system was provided in the form of a set of on-screen buttons that could be operated by the mouse. These were marked in much the same way as a tape recorder's forward and reverse wind buttons.

This comprehensive frequency data is further supplemented with an on-line help system that boasted a wide range of services.

In addition to giving basic help, there was a wide range of information services available. The range available was very comprehensive and included lists of callsign allocations, emissions classes, frequency allocations, ICAO, weather observing stations, abbreviations, Arabic translations and several more.

As you can see the list is very comprehensive and extremely useful. If you have CompuServe access, FrequencyManager can be downloaded from the Hamnet forum. For those without on-line facilities the only option I'm aware of is to buy a registered copy at \$50US from Ingenieurburo fur Satellitentechnik, Muhlenweg 11, 24217 Stakendorf, Germany.

Digital Signal Processing

Having investigated this technology for my 'Bits & Bytes' column in our sister publication *Practical Wireless*, I've discovered a few items that may well be of interest to Decode readers. You will no doubt have noticed the increasing number of filters appearing that use digital signal processing (d.s.p.) to provide high quality performance. Through my research, I've been looking for ways in which d.s.p. can be employed without the expense of a complete ready built unit. The answer seems to be to either use the d.s.p. starter kit produced by Texas Instruments or to use the d.s.p. potential of some types of computer sound board. The Texas route is probably best suited to those with some constructional experience as the unit is supplied as an assembled but un-cased printed circuit board.

If you happen to have a computer sound board that features an AdSP processor chip, you have d.s.p. processing at your fingertips. One of the best and most popular examples of this type of board is the Orchid SoundWave 32. The beauty

of these systems is the way in which new software can be downloaded into the on-board processor to completely change its functionality. One of the main exponents of amateur applications using this technology is **Johan Ferrer KC7WW**. He has produced a suite of application that include audio filtering plus AMTOR, PACTOR and RTTY receive systems. Rather than go into great detail here, I've produced a compilation of Johan's PC based work on a new disk that's included in this month's readers' offers. The disk includes applications for both sound boards and the Texas starter kit. If there's sufficient interest I'll produce a follow-up article with a few more details on the workings of d.s.p. based systems.

Multi-Scan Decoder

Amdat of Bristol have just sent me a review copy of their latest decoding system. The new Multi-Scan features FAX, SSTV, RTTY and AMTOR and boasts a very good user interface. One big plus point is that the software is also supplied in a shareware form so you even have the chance to try before you buy. I'll give full details and a mini-review next month so look out for that. In the meantime if you want more details or just can't wait, you can contact Amdat direct at 4 Northville Road, Northville, Bristol BS7 0RG. Tel: 0117-969 9352.

MAC Software

Mike Gathergood has recently sent me an E-mail outlining a new source of radio related software for Mac computers. The software listed here, plus much more, is currently held on the Internet in the amateur radio archives supported by Demon. The Internet address for this site is ftp.demon.co.uk and the subdirectory is /pub/ham/mac. For those readers without net access, Mike is currently working on copying these files to The CQ Centre BBS on Slough (01753) 595468. Access is free, and the system currently supports all speeds up to 14.4bps. For best results, callers should use ANSI-BBS emulation, 8 data bits, 1 stop bit, no parity, and preferably Z-Modem download protocol (though X-modem and Y-modem are also supported). Here's a selection of programs that may be of particular interest to Decode readers. MacFAX2 v1.1.sea: 20K Will allow you to receive WEFAX pictures in your PK-232.

MAC SHORTWAVE v1.sea: 90K Shortwave propagation predictor. PACKET(1-18).sea: 43K Introduction to packet radio - Parts 1 to 18 by Larry Kenney, WB9LOZ RADFAX 09.sea: 173K WEFAX programme that uses the mic. input on new Mac. No other hardware required, just plug output from your h.f. rig into Mac mic. socket and away you go.

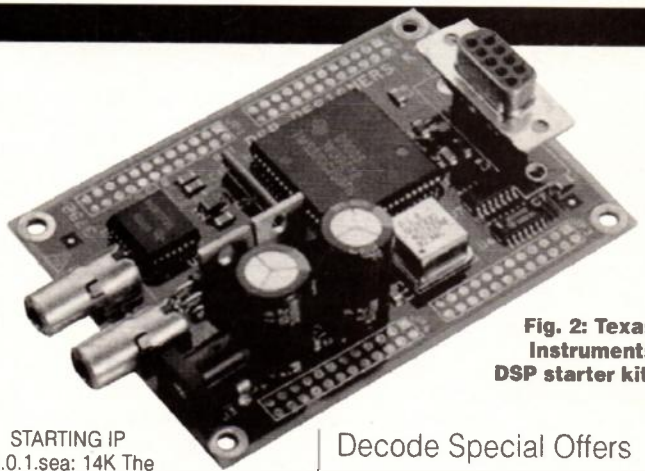


Fig. 2: Texas Instruments DSP starter kit.

STARTING IP v3.0.1.sea: 14K The Getting Started with (Mac) TCP/IP text file for beginners WORLD RADIO V1.8.sea: 260K Radio control programme for Kenwood radios includes, Kenwood Radio Interface, Station Log Database, World Map Display, DX Call Sign List, Antenna Rotor Control, Radio Memory List, UTC Clock Display, very nice. FREQVALET DEMO VERSION.:203K Provides frequencies and DX program info for short wave radio listeners. The program databases update automatically at 15, 30, or 60 minute intervals, thus providing a continuous display of broadcasts on-the-air at any given time in a spreadsheet like format. Features include sorting of data, scanning, and on-screen changing of databases. The program will convert Tom Sundstrom's dBase short wave broadcast listing to FreqValet format and will do the same for Shortwave Navigator users. Separate cards are provided for DX Programs, Ship to Shore, and Utility broadcasts. Computer control modules are available at extra cost for the Drake R8, Kenwood R-5000, JRC NRD-525, and NRD-535 receivers.

Decode Special Offers

Here's a summary of the special offers currently available to Decode readers.

IBM PC Software: JVFAX 7: (FAX and SSTV transceiver), HAMCOMM 3 (RTTY, ASCII and AMTOR transceiver), DSP Starter (Selection of digital signal processing routines).

Literature: Day Watson *Beginners List, Decode List, Complex Modes List, FactPack - 1 Interference, FactPack 2 - Decoding Accessories, FactPack 3 - Starting-Out, FactPack 4 - HAMCOMM/JVFAX Primer, FactPack 6 - Internet Starter*. To receive any of these offers just send a self addressed sticky label plus 50p per item or £1.50 for 4, £2.50 for 6 or £3.00 for 8 items, £4.00 for 9 or more items. If you're ordering JVFAX or HAMCOMM you will also need to send a blank formatted 720Kb disk for each program or just one 1.4Mb disk. For the new d.s.p. starter you will need to send one 1.4Mb formatted disk.

Frequency List

This month's frequency selection that comes courtesy of Day Watson, Martin van Duinen, Robert Hall and many others who prefer to remain anonymous.

Freq (MHz)	Mode	Speed	Shift	Call	Time	Notes
0.1342	FAX	120	576	DCF54	-	Offenbach Met
0.1473	RTTY	50	85	DDH47	-	Hamburg Met
3.196	RTTY	50	500	-	-	Prague Met
4.6015	SITOR	100	170	-	-	Irish Navy
5.1849	FAX	120	576	LRO69	-	Buenos Aries Met
5.240	RTTY	50	500	YZI213	-	Tanjung Met
5.7525	ARQ-A	100	170	-	1200	Swiss diplo
5.7567	ARQ-E3	192	400	RFTJ	-	FF Dakar
5.938	ARQ-E	192	400	-	-	Unid
6.860	ROU-FEC	164.5	400	-	1305	Coded
6.9185	FAX	120	576	ECA7	-	Madrid Met
7.35072	Coquelet 8	26.67	8.3	-	1330	Algiers
7.9377	ARQ-342	200	400	RFFP	-	FF Paris
9.3179	FAX	120	576	NRK	-	USN Keflavik
11.085	FEC-A	192	400	RFGW	-	MFA Paris
13.073	ARQ-E	288	-	-	0810	Coded msg
13.93639	Coquelet 8	26.67	8.3	-	1445	Algiers
14.681	ROU-FEC	164.5	400	V5G	-	MFA Bucharest
16.1171	RTTY	50	400	6VK317	1620	Dakar
16.1832	RTTY	100	400	5YE	1223	Nairobi Met
16.3345	ROU-FEC	164.5	400	V5G	-	MFA Bucharest
18.040	RTTY	50	1000	TCY4	-	AA Ankara
19.6217	TWINPLEX	192	400	OZU25	1234	MFA Copenhagen
20.700	SW-ARQ	100	362	SAM	1058	MFA Stockholm

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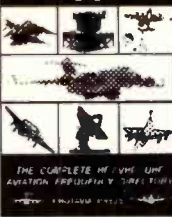
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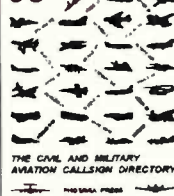
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SHORT WAVE MAGAZINE

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Orders and remittances should be sent to; **Badger Boards, 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: 021-384 2473**, marking your envelope SWM PCB Service. Cheques should be crossed and made payable to **Badger Boards**. When ordering please state the Article Title as well as the Board Number. Please print your name and address clearly in block capitals and do not enclose any other correspondence with your order.

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LM&S

Long, Medium and Short Waves

The information in this series is based on actual reception by listeners in the UK and other countries. Their reports are compiled in the four week period prior to preparing the LM&S data.

New contributors to the series are always welcome. Reports should only refer to official broadcasters and they should be sent direct to me at the above address. Please be sure to state your name, address and post code on all correspondence.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, logs compiled in the four week period ending April 29.

Whilst visiting Grantown-on-Spey in the Highland region of Scotland over Easter, **John Stevens** (Largs) made good use of his car radio to compare reception in the area with that at home. The first thing he noticed when tuning around this band was that the signal from Atlantic 252 was much weaker than at home, where it completely swamps adjacent channels. Much to his surprise he found he could hear transmissions on 243 and 261kHz! The broadcast on 261 was in German and it proved to be from Burg, a station he has been unable to hear in Largs. He logged it as SIO211 at 1230UTC.

Encouraged by this, John decided to check the band after dark in the hope of picking up the sky waves from some more distant stations. At 2015 he heard Topolna, Czech Rep on 270, rated SIO333. He then tuned to 279 and logged Minsk, Belarus as SIO211 at 2020. Reception seemed so much better than at home and that made him wonder if the hills around Largs make it a poor listening place.

Medium Wave Reports

There were no reports of m.w. signals reaching the UK over transatlantic paths at night during April, but the sky waves from some stations in Africa and the Middle East did arrive here.

On April 19 **George Millmore** (Wootton, IoW) picked up for the first time a broadcast in Arabic from the BSKSA 2000kW outlet in Jeddah on 648, rated SIO222 at 2050. He was also able to hear their outlets at Dammam (100kW) on 783, Dammam (1600kW) on 1440 and Duba (2000kW) on 1521.

Down in Bridgwater **Darren Beasley** also explored the band after dark. His impressive log included the SER 10kW outlet at Las Palmas, Gran Canaria on 1008, which is

approximately 2575km from Bridgwater. Perhaps even more remarkable was the reception on 1368 of weak sky waves from the KBC 20kW outlet at Nakuru, Kenya by **Eddie McKeown** in Newry at 0220 on the 29th. At best they rated 15221.

Broadcasts from some local radio stations also reached distant places in the UK after dark. Up in Lanarkshire, **Arthur Grainger** (Carstairs Junction) received the sky waves from several stations in southern England, including BBC Essex via Chelmsford (0.5kW) on 765, BBC R.Bristol via Taunton (0.63kW) on 1323, ILR South Coast R. via Southampton (0.5kW) on 1557 and BBC R.Kent via Rusthall (0.25kW) on 1602.

During daylight the ground waves from some local radio stations travelled remarkable distances - for example, those from BBC Essex via Chelmsford on 765 were received by **Tom Smyth** in Co.Fermanagh! Good reception of Spectrum Radio via Lots Road, London on 558 has been noted by **Roy Patrick** in Derby, but after dark the sky waves from a group of Spanish stations (RNE5) on 558 cause co-channel interference.

While searching the band in E.Grinstead, **John Wells** noticed that some local radio idents had changed - CD603 was announced as 'Boss 603 Classic Hits', WGMS as 'Classic Gold 1332' and R210 as 'Classic Gold 1431'. In Morden, **Sheila Hughes** heard a DJ on ILR R.Trent (Gem AM) 954 use the name 'Solid Gold Radio'.

Owing to an increasing level of electrical noise in Bushey Heath **Gerry Haynes** has given up searching for weak m.w. signals. He has also encountered a problem with his Kiwa loop, which is incapable of handling the potent signal from the local Sunrise Radio transmitter on 1458. He says "this completely negates its use as a DX tool as the only way to prevent overloading is to switch sensitivity to 'local', which reduces sensitivity far too much for DX". No such problems exist at his residence in Talgarth, Powys, so he intends to restrict his m.w. DXing activity to that location. Whilst there he compiled an impressive local radio log, see chart.

Short Wave Reports

Conditions in the **25MHz (11m)** band are now unpredictable, consequently it has been vacated by all international broadcasters.

Although conditions in the **21MHz (13m)** band vary considerably from day to day it is still being used by some broadcasters. Some mornings it has been possible to receive the

Long Wave Chart

Freq kHz	Station	Country (kW)	Power	Listener
153	Bechar	Algeria	1000	C*,E*
153	Donebach	Germany	500	B*,C*,D,E,F*,H
162	Allouis	France	2000	B,C,D,E,F*,G,H,J
171	Nador Medi-1	Morocco	2000	D*,E*,F*,H
171	Kaliningrad	Russia	1000	C*,D,E,F*
177	Oranienburg	Germany	750	C*,D,F*
183	Saarouis	Germany	2000	B,C,D,E,F*,G,H,J
198	Droitwich BBC	UK	50	B,C,D,F*,G,J
198	St.Petersburg	Russia	150	C*
207	Munich	Germany	500	C*,D,E*,F*
207	Azilel	Morocco	800	C*,E*
216	Roumoules RMC	S.France	1400	B,C,D,E,F*,H
225	Raszyn Resv	Poland	7	B*,C*,D,E*,F*,H
234	Beidweiler	Luxembourg	2000	B*,C,D,E,F*,H,J
234	St.Petersburg	Russia	1000	F*
243	Kalundborg	Denmark	300	B,C,D,E,F*,J
252	Tipaza	Algeria	1500	B*,C*,D,E*
252	Atlantic 252	S.Ireland	500	A*,B*,C,D,E,F*,G,H,J
261	Burg(R.Ropa)	Germany	200	E*,F*,J
261	Taldom Moscow	Russia	2000	B*,C*,D*,E*,F*
270	Topolna	Czech Rep	1500	B*,C*,D,E,F*,G*,J*
279	Minsk	Belarus	500	C*,D*,E*,F*,J*

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

Listeners:

A:	Tim Allison, Middlesbrough.	F:	Harry Richards, Barton-on-Humber.
B:	Sheila Hughes, Morden.	G:	Tom Smyth, Co.Fermanagh.
C:	Eddie McKeown, Newry.	H:	John Stevens, Largs.
D:	George Millmore, Wootton, IoW.	I:	John Stevens, Grantown-on-Spey.
E:	Fred Pallant, Storrington.	J:	Norman Thompson, Oadby.

broadcasts from R.Pakistan, Islamabad 21.580 (Ur to M.East 0430-0630) rated 45554 at 0505 by **John Parry** in Larnaca; R.Japan via Moyabi 21.640 (Jap to Eu, M.East 0800-0900) 34333 at 0859 by **Tim Allison** in Middlesbrough; R.Australia via Darwin 21.725 (Eng to Asia 0630-1100) 33333 at 0950 by **Thomas Williams** in Truro and 22222 at 1030 by **Robert Connolly** in Killeel; UAER, Dubai 21.605 (Eng to Eu 1030-1055) 35543 at 1054 in Bridgwater; BSKSA Saudi Arabia 21.495 (Ar [Holy Koran] to SE.Asia 0900-1200) 24332 at 1109 by **Rhoderick Ilman** in Oxted; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) 55434 at 1140 by **Jim Cash** in Nevja, S.Spain.

After mid-day they came from RFI via Issoudun 21.620 (Fr to E.Africa 0700?-1555), 25222 at 1241 in Newry; UAER, Dubai 21.605 (Eng to Eu 1330-1355) 44444 at 1351 by **Vera Brindley** in Woodhall Spa; BBC via Limassol 21.470 (Eng to E.Africa 1300-1700) 44454 at 1444 by **John Eaton** in Woking; WYFR via Okeechobee 21.500 (Eng to Eu 1600-1800?) 25322 at 1601 in Bushey Heath and 21.745 (Eng to Eu 1600-2200?) 35333 at 1838 by **Michael Griffin** in Ross-on-Wye.

Daily propagation variations have also been evident in the **17MHz (16m)** band. When favourable, the Voice of Russia, Moscow 17.840 (Eng [WS] 0600-?) was SIO444 at 0815 by **Francis Hearne** in N.Bristol; R.Pakistan, Islamabad 17.900 (Eng to Eu 0800-0845) 54444 at 0820 by **Chris Shorten** in Norwich; R.Vlaanderen Int, Belgium 17.595 (Du to Africa 0900-1100) 24332 at 0910 in Bridgwater; R.Austria Int via Moosbrunn 17.870 (Ger, Eng to Aust 0800-1100) 22332 at 1031 in Middlesbrough; R.Tunisia Int via Sfax 17.500 (Ar [Nat Network] 0600-1700) 25232 at 1035 by **Paul Bowery** in Burnham-on-Crouch; DW via Meyerton? 17.800 (Eng to W.Africa 1100-1150) 44333 at 1121 in Bushey Heath; Israel R, Jerusalem 17.575 (Eng, Fr to Eu, Asia, Pacific 1100-1200) SIO333 at 1130 in Largs; BBC

via Skelton 17.705 (Eng to N/C.Africa 0900-1615) 32322 in S.Spain; R.Tashkent, Uzbekistan 17.815 (Eng to S.Asia 1200-1228) 45533 at 1200 by **Ross Lockley** in Broxbourne.

Later, RFI via Issoudun? 17.560 (Eng to M.East 1400-1500) was 32342 at 1406 in Ross-on-Wye; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2100) SIO222 at 1528 by **Julian Wood** in Elgin; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) 44334 at 1550 by **Peter Pollard** in Rugby; VOA via Tangier 17.895 (Eng to Africa 1600-1900) 32222 at 1730 in Killeel & via ? 17.725 (Eng to Africa 2000-2128) 35444 at 2033 by **Fred Pallant** in Storrington; RNB Brazil 17.750 (Port to Africa 1800-1920) 34433 at 1848 in Oxted; R.Nederlands via Bonaire 17.605 (Eng to W.Africa 1830-2025) 34233 at 1933 in Newry; RCI via Sackville 17.820 (Fr, Eng to Eu, M.East, Africa 1930-2130) 33333 at 1950 by **Bernard Curtis** in Stalbridge.

Frequent propagation changes have also affected reception in the **15MHz (19m)** band, but many broadcasts could usually be heard quite well. In the morning R.Pyongyang, Korea 15.180 (Eng to SE.Asia 0800-0850) was 25222 at 0840 in Burnham-on-Crouch; R.Pakistan, Islamabad 15.625 (Eng to Eu 0800-0848) 33543 at 0845 in Bridgwater; AWR via Slovakia 15.620 (Eng to Africa 0900-1000) 55555 at 0900 by **Clare Pinder** in Appleby; Israel R, Jerusalem 15.640 (Eng to Eu, Asia 1000-1030) 55434 at 1003 in Ross-on-Wye; AIR via ? 15.050 (Eng to NE.Asia 1000-1100) 34333 at 1038 in Woodhall Spa; WEWN Birmingham 15.695 (Slov?, Eng, Lith to Eu 1100?-1500) 33323 at 1125 in Rugby; BBC via Limassol 15.575 (Eng to E/N.Africa, W.Asia, M.East 0400-1500) 32222 at 1035 in Stalbridge, via Woolferton & Skelton 15.070 (Eng to Eu, M.East, N/C.Africa 0600-2130) 24332 at 1146 in Middlesbrough and 54444 at 1150 in S.Spain.

After mid-day UAER, Dubai 15.395 (Eng to Eu 1330-1355) was 54444 at

Medium Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener	Freq kHz	Station	Country	Power (kW)	Listener	Freq kHz	Station	Country	Power (kW)	Listener
531	Ain Beida	Algeria	600	B*,C*,J*	882	Washford (BBCWales)	UK	100	C,F*,J,M,O*,P*	1388	Foxdale(Manx R)	IOM	20	A*,F*,J*,N
531	Leipzig	Germany	100	C*,H*,I*	891	Algiers	Algeria	600/300	B*,C*,F*,H*,J*	1377	Lille	France	300	C,G,H*,I
531	RNE5 via ?	Spain	?	B*,H*,I*	891	Hilzenberg	Netherlands	20	C*,H*,I*	1386	Nakuru(KBC)	Kenya	20	H*
540	Wavre	Belgium	150/50	C,F,H*,I,O	900	Puizen	Czech Rep	40	I*	1386	Bolshakovo	Russia	2500	A*,B*,C*,H*,J*
540	Sidi Bennour	Morocco	500	B*,I*	900	Milan	Italy	600	B*,C*,H*,J*,D*,P*	1395	Lushnje(Tirana)	Albania	1000	A*,H*,I*
540	Vitoria(EI)	Spain	10	B*	900	COPE via ?	Spain	?	B*,H*,I*	1395	Ufa	Russia	?	H*
549	Les Trembles	Algeria	600	B*,C*,H*,I*	909	COPE via ?	Spain	?	B*,H*,I*	1404	Brest	France	20	B*,H*,I
549	Thurmuu (DLF)	Germany	200	C,H*,I	909	B'mans Pt(BBCS)	UK	140	C,I,M,O*	1413	RNE5 via ?	Spain	?	B*,H*,I*
558	Espoo	Finland	100	I*,D*	918	Plesivect(SlovenrR)	Yugoslavia	600/100	B*,C*,H*,I*,O*	1422	Alger	Algeria	50/25	B*,H*,I*
558	Rostock(NDR)	Germany	20	H*	918	Madrid(R.Int)	Spain	20	B*,H*	1431	Heusweiler(DLF)	Germany	1200/600	H*,I*
558	RNE5 via ?	Spain	?	B*,H*,I*,M,D*	927	Wolvertem	Belgium	300	C,G,H*,I,D*	1431	Nikolayev	Ukraine	400	H*
567	Berlin	Germany	100	H*	936	Bremen	Germany	100	C*,H*,I*	1440	Marnach(RTL)	Luxembourg	1200	C,G,H*,I,L
567	Tullamore(RTE1)	Ireland (S)	500	C,F,G,I,M	936	Venezia	Italy	20	C*,I*	1440	Damman	S. Arabia	1600	B*,H*,I*,L*
567	RNE5 via ?	Spain	?	B*,D	936	RNE5 via ?	Spain	?	B*,H*,I*	1449	Squinzano	Italy	50	B*,I*
576	Muhlacker(SDR)	Germany	500	C,H*,I*	945	Toulouse	France	300	G,I*,D*	1449	Redmoss(BBC)	UK	2	H*
576	Riga	Latvia	500	H*	954	Brno(Dobrochov)	Czech Rep.	200	C*	1467	Monte Carlo(TWR)	Monaco	1000/400	H*,I*
576	Barcelona(RNE5)	Spain	50	B*,I*	954	Madrid(CI)	Spain	20	B*,H*,I*	1485	SER via ?	Spain	?	B*
585	Paris(FIP)	France	8	C,I	963	Pori	Finland	600	B*,C*,H*,M*	1494	Clermont-Ferrand	France	20	H*
585	Madrid(RNE1)	Spain	200	B*,F*,H*,J,M	972	Tir Chonail	Ireland (S)	10	I*	1494	St.Petersburg	Russia	1000	B*,F*,H*,I*
585	Gafsa	Tunisia	350	I*	972	Hamburg(NDR)	Germany	300	H*,I*	1503	Stargard	Poland	300	I*
585	Dumfries(BBCScot)	UK	?	D,F*,H	972	RNE1 via ?	Spain	?	B*,H*	1503	RNE5 via ?	Spain	?	B*
594	Frankfurt(HR)	Germany	1000/400	C,H*,I*	981	Alger	Algeria	600/300	B*,C*,F*,H*,I*	1512	Wolvertem	Belgium	600	C,F,H*,I,K*,M*,N*
594	Oujda-1	Morocco	100	B*,I*	990	Berlin	Germany	300	C*,H*,I*	1512	Jeddah	S. Arabia	1000	H*
594	Muge	Portugal	100	B*,C*,H*,I*	990	R.Bilbao(SER)	Spain	10	B*,H*,I*	1521	Kosice(Cizatice)	Slovakia	600	B*,H
603	Lyon	France	300	D	999	Schwerin (RIAS)	Germany	20	H*	1521	Duba	S. Arabia	2000	B*,I*
603	Sevilla(RNE5)	Spain	50	B*,H*,I*	999	Madrid(COPE)	Spain	50	B*,H*	1530	Vatican R	Italy	150/450	B*,F*,H*,I*
603	Newcastle(BBC)	UK	2	D	1008	Las Palmas(SER)	Gr. Canaria	10	B*	1539	Valladolid(SER)	Spain	5	H*
612	Athlone(RTE2)	Ireland (S)	100	I,M	1008	Flevo(Hilv-5)	Holland	400	C,G,H*,I*	1566	Stax	Tunisia	1200	B*,C*,F*,H*,I*
612	Sebba Aioun	Morocco	300	B*	1017	Rheinsender(SWF)	Germany	600	C*,F*,H*,I*,M	1566	Ddessa	Ukraine	7	H*
612	RNE1 via ?	Spain	10	B*,I*	1017	RNE5 via ?	Spain	?	H*,I	1575	Genova	Italy	50	B*,H*,I*
612	Sarajevo	Yugoslavia	600	C*	1026	SER via ?	Spain	?	B*,H*,I*	1575	SER via ?	Spain	5	B*,I*
621	Wavre	Belgium	80	C,H*,I,D	1035	Tallinn	Estonia	500	I*	1584	SER via ?	Spain	2	B*,I*
621	Barcelona(OCR)	Spain	50	B*,H*,I*	1035	Lisbon(Prog3)	Portugal	120	B*,H*,I*	1602	SER via ?	Spain	?	B*,H*,I*
630	Vigra	Norway	100	B*,H*,I*,D*	1044	Dresden	Germany	250	C*,H*,I*	1602	Vitoria(EI)	Spain	10	B*,I*
630	Tunis-Djedeida	Tunisia	600	B*,C*,H*,I*	1044	Sebba-Aioun	Morocco	300	B*,H*,I*	1611	Vatican R	Italy	15	H*,J,N
639	Praha(Liblice)	Czech	1500	B*,C*,H*,I*	1044	S.Sebastian(SER)	Spain	10	H*					
639	RNE1 via ?	Spain	?	B*,H*,I	1053	Zaragoza(COPE)	Spain	10	H*					
648	Jeddah	S. Arabia	2000	I*	1053	Talk Radio UK via ?	UK	?	C,F*,I,L					
648	RNE1 via ?	Spain	10	B*,H*,I*	1062	Kalundborg	Denmark	250	B*,C,G,H*,I					
648	Orfordness(BBC)	UK	500	C,F,I,O	1062	R.Uno via ?	Italy	?	C*					
657	Neubrandenburg (NDR)	Germany	250	H*	1062	Norte	Portugal	100	H*					
657	Napoli	Italy	120	C*,I*	1071	Brest	France	20	I					
657	Madrid(RNE5)	Spain	20	B*,F*,H*,I*	1071	France-Inter via ?	France	?	C,G,H*					
657	Wrexham (BBCWales)	UK	2	C,D,F*,D*	1071	Lille	France	40	B*					
666	Messkirch(Rohrd (SWF))	Germany	300/180	H*	1071	Riga	Latvia	50	I*					
666	R.Vilnius	Lithuania	500	C*	1071	Bilbao(EI)	Spain	5	I*					
666	Lisboa	Portugal	135	B*,H*,I*	1071	Talk R.UK(N'castle)	UK	?	F*					
675	Marseille	France	600	C*,H*,I*,O*	1080	Katowice	Poland	1500	B*,C*,F*,H*,I*					
675	Lopic(R10 Gold)	Holland	120	B*,C,G,H*,I,L,O	1080	SER via ?	Spain	?	B*,H*,I*					
684	Sevilla(RNE1)	Spain	500	B*,H*,I*	1089	Krasnodar	Russia	300	H*					
684	Avale(Beograd-1)	Yugoslavia	2000	B*,C*,H*,I*	1089	Talk Radio UK via ?	UK	?	C,F*,J,L,M,N					
693	Burghead(BBC5)	UK	50	M	1098	Nitra(Jarok)	Slovakia	1500	B*,C*,H*,I*					
693	Droitwich(BBC5)	UK	150	C,I,O	1098	RNE5 via ?	Spain	?	B*,H*,I*					
702	Flensburg(NDR)	Germany	5	C*,H*	1098	AFN via ?	Germany	10	B*,C*,F*,H*					
702	Zamora(RNE1)	Spain	10	B*,I*	1107	Sitkuna	Lithuania	150	I*					
711	Rennes 1	France	300	C,H*,I	1107	RNE5 via ?	Spain	?	B*,H*					
711	Laayoune	Morocco	600	B*,C*,I*	1107	Talk R.UK via ?	UK	?	C,F,G,I					
711	Murcia(COPE)	Spain	5	B*	1116	Bari	Italy	150	B*,C*,H*,I*					
720	Langenberg	Germany	200	I	1116	Portovedra(SER)	Spain	5	B*,H*					
720	Lisnagarvey(BBC4)	Ireland (N)	10	I*,M,D	1125	La Louviere	Belgium	20	C,H*,I					
720	Norte	Portugal	100	B*,C*,H*,I*	1125	RNE5 via ?	Spain	?	B*,H*,I*					
720	Lots Rd,Ldn(BBC4)	UK	0.5	C,I	1134	COPE via ?	Spain	?	B*,H*,I*					
729	Cork(RTE1)	Ireland (S)	10	M*	1134	Zadar(Croatian R)	Yugoslavia	600/1200	B*,C*,F*,H*,I*					
729	RNE1 via ?	Spain	?	B*,H*,I*	1143	Stuttgart(AFN)	Germany	10	B*,C*,F*,H*,I*					
738	Paris	France	4	C,H*,I,O	1143	COPE via ?	Spain	2	B*,H*,I*					
738	Poznan	Poland	300	I*	1152	RNE5 via ?	Spain	10	B*,I*					
738	Barcelona(RNE1)	Spain	500	B*,G,H*,I*,M*,O*	1161	Strasbourg(Flint)	France	200	C*,H*,I*					
747	Flevo(Hilv2)	Holland	400	B*,C,G,H*,I,O	1170	Vila Real	Portugal	10	H*					
747	Cadiz(RNE5)	Spain	10	I*	1179	Solvesborg	Sweden	600	C*,G,H*,I*,N*,P*					
756	Braunschweig(DLF)	Germany	800/200	C,H*,I*,O	1188	Kuurne	Belgium	5	C*,G,H*,I					
756	Bilbao(EI)	Spain	5	B*,I*	1188	Reichenbach(MDR)	Germany	5	C*					
756	Redruth(BBC)	UK	2	I	1188	Szolnok	Hungary	135	C*,H*					
765	Sottens	Switzerland	500	B*,H*,I*,O	1197	Munich(VOA)	Germany	300	H*					
774	Enniskillen(BBC)	Ireland (N)	1	M	1197	Virgin via ?	UK	?	C,I					
774	RNE1 via ?	Spain	?	B*,H*,I*,O	1206	Bordeaux	France	100	H*					
783	Burg	Germany	1000	C*,H*	1206	Wroclaw	Poland	200	C*,I*					
783	Miramar(R.Porto)	Portugal	100	B*,H*,I*	1215	COPE via ?	Spain	?	H*					
783	Dammam	S. Arabia	100	F*,I*	1215	Virgin via ?	UK	?	C,I,L,M,N					
792	Limoges	France	300	B*,I,D*	1224	Vidin	Bulgaria	500	I*					
792	Lingen(NDR)	Germany	5	H*	1224	Virgin via ?	UK	?	B*,I*,M					
792	Sevilla(SER)	Spain	20	B*,H*,I*	1233	Virgin via ?	Belgium	5	B*,H*,I*					
792	Londonderry(BBC)	UK	1	O	1233	Nitra	Slovakia	40	H*					
801	Munchen-Ismaning	Germany	300	C*,H*,I*	1233	Virgin via ?	UK	?	B*,C,I					
801	RNE1 via ?	Spain	?	B*,H*,I*	1242	Marseille	France	150	H*					
810	Madrid(SER)	Spain	20	B*,H*,I*	1242	Virgin via ?	UK	?	B*					
810	Burghead (BBCScot)	UK	100	M	1251	Marcali	Hungary	500	C*,H*					
810	Westerglen (BBCScot)	UK	100	C,F*,I*,O*,P*	1251	Hilzenberg	Netherlands	10	B*,H*					
819	Batra	Egypt	450	C*,F*,I*	1260	SER via ?	Spain	?	B*,H*,I*					
819	Toulouse	France	50	C,H*	1260	Guildford (V)	UK	?	C,G,I					
819	Warsaw	Poland	300	B*,I*,O*	1269	Neumunster(DLF)	Germany	600	C,H*,I*					
828	Hannover(NDR)	Germany	100/5	H*,O*	1278	COPE via ?	Spain	?	B*,H*					
828	Barcelona(SER)	Spain	50	B*	1278	Strasbourg	France	300	H*,I					
837	Nancy	France	200	H*,I,D*	1278	Dublin(Cork(RTE2))	Ireland (S)	10	C*,I*,M*					
837	COPE via ?	Spain	?	B*,H*,I*	1287	RFE via ?	Czech Rep.	400	B*,C*,H*,I*					
846	Rome	Italy	540	B*,C,G,H*,I*	1287	Lerida(SER)	Spain	10	B*,H*					
855	Berlin	Germany	100	C*,H*,M*	1296	Valencia(COPE)	Spain	10	B*,H*,I*					
855	RNE1 via ?	Spain	?	B*,C*,H*,I*	1296	Orfordness(BBC)	UK	500	C*					
864	Santah	Egypt	500	B*,C*,F*,I*	1305	Rzeszow	Poland	100	C*,H*,I*					
864	Paris	France	300	C*,H*,I*,M*	1305	RNE5 via ?	Spain	?	B*,H*,I*					
864	Socuellamos(RNE1)	Spain	2	I*	1314	Kvitsoy	Norway	1200	C,H*,I,K,L,M					
873	Frankfurt(AFN)	Germany	150	C,H*,I*,L	1323	Wachenbrunn(VoR)	Germany	1000/150	B*,C*,H*,M*					
873	Zaragoza(SER)	Spain	20	B*,I*	1332	Rome	Italy	300	B*,F*,H*,I*					
882	COPE via ?	Spain	?	B*,F*,H*,I*,O*	1341	Lakhegy	Hungary	300	H*					
					1341	Lisnagarvey(BBC)	Ireland (N)	100	F*,I*,M					
					1341	Tarrasa(SER)	Spain	2	B*,I*					
					1350	Nancy/Nice	France	100	H*,I*					
					1350	Cesvaine/Kuldiga	Latvia	50	I*					
					1359	Arganda (RNE-FS)	Spain	600	B*,H*,I*					

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

- Listeners:**
A: Tim Allison, Middlesbrough.
B: Darren Beasley, Bridgwater.
C: Paul Bowery, Burnham-on-Crouch.
D: Noel Carrington, Sutton-in-Ashfield.
E: Francis Hearne, N.Bristol.
F: Sheila Hughes, Morden.
G: Rhoderick Illman, Oxted.
H: Eddie McKeown, Newry.
I: George Millmore, Wootton Bassett.
J: John Parry, Larnaca, Cyprus.
K: Clare Pinder, Appleby.
L: Harry Richards, Barton-on-Humber.
M: Tom Smyth, Co.Fermanagh.
N: John Stevens, Largs.
O: Norman Thompson, Gaddy.
P: Thomas Williams, Truro.

1300 in Broxbourne; BSKSA Riyadh 15.060 (Ar to N.Africa 0900-1500) SIO222 at 1452 in Woking; BBC via Seychelles 15.420 (Som, Eng, Swa to E.Africa 1300-1700) SIO322 at 1510 by **Philip Rambaut** in Macclesfield; R.Japan via Moyabi 15.355 (Eng to S.Africa 1500-1600) 33443 at 1536 in W

Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener	Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R	I	7.50	B,D,K,L,M,P,Q	1161	Southern Counties R	B	1.00	B,F*,H,K,L,O*,Q
585	R.Solway	B	2.00	E,F,M	1161	Tay AM	I	1.40	E,F*
603	Cheltenham(CD603)	I	0.10	D,K,Q	1161	Humberdale(Gt.Yks)	I	0.35	A,D,F,M
603	Invicta SG (Coast)	I	0.10	B,F*,K,L,M,P,Q	1170	GNR Teeside	I	0.32	C,E,F
630	R.Bedfordshire(3CR)	B	0.20	A,B,D,F,K,L,M,O,P,Q	1170	Hi Wycombe 1170AM	I	?	F,L,P,Q
630	R.Cornwall	B	2.00	F*,K	1170	Portsmouth(SCR)	I	0.12	F*,K,L,Q
657	R.Chwyd	B	2.00	E,F,K,M,N*,P,Q	1170	R.Orwell(SCR)	I	0.28	B,F
657	R.Cornwall	B	0.50	F*,K	1170	Signal RIS Gold	I	0.20	D,F,O
666	Gemini AM	I	0.34	F,K,H,L,Q	1170	Swansea Sound	I	0.58	E*
666	R.York	B	0.80	B,D,E,F,H,M	1242	Invicta Snd(Coast)	I	0.32	B,F*,L,O,P,Q
729	BBC Essex	B	0.20	A,B,E*,F,H,K,L,M,P,Q	1242	Isle of Wight R	I	0.50	F,K,Q
738	Hereford/Worcester	B	0.037	D,F,K,Q	1251	Saxon R(SCR)	I	0.76	B,E*,F,L,M,Q
756	R.Cumbria	B	1.00	A,E,F,J	1260	Brunel R(Ci.Gold)	I	1.60	C,F,K,L,N*
756	R.Malwyn	I	0.63	D,F,K,Q	1260	Marcher Snd(Gold)	I	0.64	D,E,F
765	BBC Essex	B	0.50	A,B,C,D,E*,F,H,K,L,M,P,Q	1260	Sunrise R, Midlands	I	0.29	E,F*,P,Q
774	Gloucester(3CSG)	I	0.14	D,F,K,Q	1260	R.York	B	0.50	E,F*
774	R.Kent	B	0.70	B,F,K,L,P,Q	1278	Bradford(Gt.Yks)	I	0.43	A,F,L,M,N
774	R.Leeds	B	0.50	A,C,D,F,M	1305	Barnsley(Gt.Yks)	I	0.15	A,D,E*,F,M
792	Chiltern(S.Gold)	I	0.27	B,D,F,K,L,M,P,Q	1305	Touch R	I	0.20	K,F,Q
792	R.Foyle	B	1.00	E,F,N	1323	R.Bristol(Som.Snd)	B	0.63	F,Q
801	R.Devon & Dorset	B	2.00	D,F*,K,Q	1323	Brighton(SCR)	I	0.50	B,F,K,L,P,Q
828	Chiltern(S.Gold)	I	0.20	B,F,G,P,Q	1332	Hereford R(WGMS)	I	0.60	A,B,D,E*,F,J*,K,L,M,P,Q
828	R.Aire(Magic828)	I	0.12	F,M	1332	Wiltshire Sound	B	0.30	E*,F,J*,K,L,Q
828	2CR(Ci.Gold)	I	0.27	F,G,K,Q	1359	Essex R(BreezeAM)	I	0.28	B,F*,H,L,P,Q
837	R.Cumbria/Furness	B	1.50	E,F	1359	Mercia Snd(Xtra-AM)	I	0.27	F,O
837	R.Leicester	B	0.45	B,D,F,K,M,P,Q	1359	Red Dragon(Touch R)	I	0.20	F,G
855	R.Devon & Dorset	B	1.00	F,K	1359	R.Solent	B	0.85	E*,F,K,Q
855	R.Lancashire	B	1.50	D,E,F,J*,M	1368	R.Lincolnshire	B	2.00	A,E,F,M,O,Q
855	R.Norfolk	B	1.50	A,B,E*,K,L,M,P,Q	1368	Southern Counties R	B	0.50	B,F*,H,K,L,P,Q
855	Sunshine R	I	0.15	B,F,Q	1368	Wiltshire Sound	B	0.10	F,G,K,L
873	R.Norfolk	B	0.30	A,B,D,E*,F,K,L,M,P,Q	1431	Essex R(BreezeAM)	I	0.35	B,E*,F*,H,J*,L,P,Q
936	Brunel R(Ci.Gold)	I	0.18	F,K,L,O,Q	1431	R 210(Ci.Gold)	I	0.14	E,F,H,J*,K,L,M,Q
945	R.Trent(Gem AM)	I	0.20	A,B,D,E*,F,H*,J*,K,M,P,Q	1449	R.Peterboro/Cambs	B	0.15	B,F*,H,K,L,M
954	Gemini AM	I	0.32	F,H,K,L,Q	1458	Fortune	I	5.00	C,D,E,F,N
954	R.Wyvern(WYVN)	I	0.16	B*,D,E*,F,H*,K,M,Q	1458	R.Cumbria	B	0.50	E,F,J
990	WABC(Nice & Easy)	I	0.09	D,F,Q	1458	R.Devon & Dorset	B	2.00	F,K,Q
990	R.Aberdeen	B	1.00	L	1458	R.Newcastle	B	2.00	F
990	R.Devon & Dorset	B	1.00	F,K,L,Q	1458	Sunrise R	I	50.00	B,E,F*,H,K,L,M,P,Q
990	Hallam R(Gt.Yks)	I	0.25	D,F*,M	1476	Guildford(M.Xtra)	I	0.50	B,D,E,F,H,J*,K,L,P,Q
999	R.Solent	B	1.00	B,F,K,N*,Q	1485	R.Humberdale(Hull)	B	1.00	A,F,M
999	R.Trent(Gem AM)	I	0.25	B,F,L,M,P,Q	1485	R.Merseyside	B	1.20	C,D,E*,F,J,N
999	Red Rose(Gold)	I	0.80	D,E,F,J	1485	Southern Counties R	B	1.00	B,F,H,K,L,P,Q
1017	Beacon R(WABC)	I	0.70	A,D,E,F,K,L,M,N*,O,Q	1503	R.Stoke-on-Trent	B	1.00	A,D,E,F*,J*,K,M,Q
1026	Downtown R	I	1.70	E,F,N	1521	Reigate(M.Xtra)	I	0.64	B,D,E,F*,H,J*,K,L,P,Q
1026	R.Cambridgeshire	B	0.50	A,B,D,E,F,H,L,M,P,Q	1530	Huddersfld(Gt.Yks)	I	0.74	A,C,D,E,F,M
1026	R.Jersey	B	1.00	E,F,K,Q	1530	R.Essex	I	0.15	B,E,F,H,I,K,L,P,Q
1035	Country 1035	I	?	B,E*,F*,K,L,N,P,Q	1530	R.Wyvern(WYVN)	I	0.52	E,F,K
1035	NorthSound Two	I	0.78	A,E*,F	1548	Capital R(Cap G)	I	97.50	B,E*,F,K,L,P
1035	R.Sheffield	B	1.00	D,F,M	1548	R.Bristol	B	5.00	F,K,Q
1035	West Sound AM	I	0.32	E,F*	1548	Liverpool(City G)	I	4.40	E*,F,N
1107	Moray Firth R	I	1.50	E,F*,J*	1548	R.Forth(Max AM)	I	2.20	E
1116	R.Derby	B	1.20	B,D,E*,F,H,L,M,P,Q	1548	Sheffield(Gt.Yks)	I	0.74	F,M
1116	R.Guernsey	B	0.50	F,H,K,Q	1548	Norhants R(S.Gold)	I	0.76	D,E*,F,J*,M
1152	BRMB(Xtra-AM)	I	3.00	F	1557	Southampton(SCR)	I	0.50	E*,F,K,L,Q
1152	Great North R(GNR)	I	1.80	F	1557	R.Lancashire	B	0.25	A,C,D,F,J
1152	LBC(LondonNewstalk)	I	23.50	B,F*,K,L,N*,P,Q	1557	Tending(Mellow)	I	0.0	B,E*,F,L,Q
1152	Piccadilly R(Gold)	I	1.50	D,F	1584	Kettering(KCBC)	I	0.04	F,L,M,P,Q
1152	Plymouth Snd(Ci.G)	I	0.32	F	1584	R.Nottingham	B	1.00	A,B*,D,E,F,H*,J*,N,Q
1152	R.Broadland	I	0.83	B,F*,J*,Q	1584	R.Shropshire	B	0.50	E,F,H*,K
1152	R.Clyde(Clyde 2)	I	3.06	F	1584	R.Tay	I	0.21	E,F*,H*,J*
1161	Brunel R(Ci.Gold)	I	0.16	F,K,Q	1602	R.Kent	B	0.25	B,E,F*,J*,I,K,L,P,Q
1161	R.Bedfordshire(3CR)	B	0.10	F*,L,P,Q					

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

Listeners:

- A Tim Allison, Middlebrough.
- B Paul Bowery, Burnham-on-Crouch.
- C Darren Coward, Grange-Over-Sands.
- D Martin Dale, Stockport.
- E Arthur Grainger, Carstairs Junction.
- F Gerry Haynes, Talgarth, Powys.
- G Francis Hearne, N.Bristol.
- H Sheila Hughes, Morden.
- I Rhoderick Illman, Oxted.
- J Eddie McKeown, Newry.
- K George Millmore, Wootton, IoW.
- L Martin Price, Shrewsbury.
- M Harry Richards, Barton-on-Humber.
- N Tom Smyth, Co.Fermanagh.
- O Norman Thompson, Dadby.
- P Phil Townsend, E.London.
- Q John Wells, East Grinstead.

Pacific areas have reached the UK. Their 100kW signal from Rangitaki on 9.700 (Eng 0717-1206) was 33233 at 0745 in Rugby, SIO322 at 0851 in Macclesfield and 25312 at 0930 in Newry. Also heard in the morning were R.Rumbos, Caracus 9.660 (Sp 24hrs) 33233 at 0600 in Woking; R.Netherlands via Bonaire 9.700 (Eng to Pacific areas [u.s.b. + p.c.] 0730-0825) 22232 by **Norman Thompson** in Oadby & via Nauen 9.650 (Eng to Eu 1130-1325) 55544 at 1135 in Middlesbrough; R.Prague, Czech Rep. 9.505 (Eng to Eu 1030-1057) 43334 at 1050 in Stalbridge; RFI via Allouis? 9.805 (Eng to Eu 1200-1300) SIO323 at 1200 in Co.Fermanagh.

After mid-day, the BBC via Skelton 9.410 (Eng to Eu, N/C.Africa 0200-2230) was 55434 at 1210 in S.Spain; SRI via Lenk 9.535 (Eng to Eu 1230-1300) 55444 at 1250 in Bushey Heath; R.Singapore Int. 9.530 (Eng to Asia 1100-1400) SIO232 at 1350 in Scalloway; R.Jordan via Al Karanah 9.560 (Eng to Eu, N.Africa 1500-1730) 43433 at 1500 in Broxbourne; R.Omdurman, Sudan 9.200 (Eng 1800-1900) 34323 at 1800 in Burnham-on-Crouch; Voice of Vietnam, Hanoi 9.840 (Eng to Eu 1800-1830) 22222 at 1800 in Morden; R.Netherlands via Flevo 9.860/9.895 (Eng to S/E.W.Africa 1830-2125) 24232 at 1835 in Oxted; AIR via Delhi? 9.950 (Eng to N.Africa, M.East 1745-1945) 34443 at 1910 in Ross-on-Wye; R.Portugal via Sines? 9.815 (Eng to Eu 1900-1930 Mon-Fri) 53553 at 1920 in Bridgwater; R.Bulgaria, Sofia 9.700 (Eng to Eu 1900-2000) 44344 at 1932 in Woodhall Spa; RAI Rome 9.575 (Eng to Eu 1935-1955) 43533 at 1940 in Wallsend; R.Thailand, Bangkok 9.555 (Eng to Eu? 2030-2045) 33333 at 2030 in Truro; VOA via Gloria 9.760 (Eng to Eur, N.Africa M.East 1700-2100) 32222 at 2055 in E.Worthing; R.Cairo via Abis 9.900 (Eng to Eu 2115-2245) 32222 at 2115 in Appleyby; China R.Int. Beijing 9.920 (Eng to Eu 2000-2155) 54344 at 2140 in Norwich; R.Nac del Paraguay 9.735 (Sp 0800-0400) 24543 at 2210 in Guildford; UAER, Abu Dhabi 9.605 (Eng to W.USA 2200-0000) SIO333 at 2231 in Elgin; Vatican R, Italy 9.600 (Eng to Asia 2245-2305) SIO333 at 2245 in N.Bristol; CBC N.Quebec 9.625 (Fr, Eng, Inuk, Cree, Atti to N.Am 1155-0610) 33443 at 2245 in Kilkeel.

Some of the **7MHz (41m)** signals to Europe come from R.Prague via Litomysl 7.345 (Eng 0600-0627) 55555 at 0600 in Norwich; BBC via Woolferton 7.325 (Eng 0700-0915, also to N.Africa, M.East) SIO322 at 0700 in

(Eng to N.Am 1300-1400) 42422 at 1309 in Bushey Heath; R.Netherlands via Flevo 13.700 (Eng to S.Asia, M.East 1330-1425) 35433 at 1330 in Newry; R.Pyongyang, Korea 13.760 (Eng to S.Asia 1300-1350) 33433 at 1335 in Bridgwater & 13.785 (Eng to Eu, M.East, Africa 1500-1550) 34433 at 1500 in Broxbourne; R.Kuwait via Kabd 13.620 (Ar to Eu, N.Am 1305-1600) 34333 at 1515 in Woking; UAER, Dubai 13.675 (Ar, Eng to Eu 0615-1645) SIO444 at 1525 in Macclesfield; R.Denmark via RNI 13.805 (Da to ? 1530-1600) SIO444 at 1545 in Scalloway.

Later, it was often possible to receive VOA via Seleb-Phikwe, 13.710 (Eng to Africa 1630-1900) 43443 at 1755 in Kilkeel; R.Vlaanderen Int, Belgium 13.685 (Eng to N.Am 1800-1830) 34433 at 1800 in Morden; DW via Sines? 13.780 (Ger to Africa? 1800?-2030?) 24332 at 1832 in Oxted; R.Netherlands via Flevo 13.700 (Eng to S/E.W.Africa 1830-1925) 54444 at 1840 in Norwich; WHRI South Bend 13.760 (Eng to E.USA, Eu 1600-2200) 34444 at 2031 by **Ron Damp** in E.Worthing; RCI via Sackville 13.650 (Eng to Eu, M.East, Africa 2000-2130) 44444 at 2125 in Rugby; WWCR

Nashville 13.845 (Eng to E.USA 1400-0100) 24222 at 2145 in Woodhall Spa.

In the **11MHz (25m)** band R.New Zealand's broadcasts to Pacific areas sometimes reached the UK. In Wallsend their 100kW transmission on 11.900 (Eng 0459-0716) peaked 35543 at 0705. Later, 11.910 (Eng 1850-2050) was 22222 at 1900 in Newry. More often R.Australia's broadcasts to Pacific areas were heard here. With favourable conditions their Shepparton signal on 11.695 (Eng 1430-1700) was 44343 at 1427 in Ross-on-Wye. In contrast, their Camarvon signal to S.Asia on 11.660 (Eng 1430-2100) was 31333 at 1722 in Woodhall Spa.

Also noted in this band were R.Ulaanbaatar, Mongolia 12.000 (Eng to Asia 0910-0940) SIO222 at 0910 in Scalloway; R.Cairo via Abis 12.050 (Ar [Home Sce Relay]) 24443 at 1007 in Oxted; R.Korea Int via Sackville 11.715 (Eng to S.Am 1030-1100) 43333 at 1030 in Appleyby; R.Finland via Pori 11.900 (Eng to W.Eu, USA 1130-1155) 45444 at 1152 in Middlesbrough; Voice of the Mediterranean via Cyclops 11.925 (Eng, Ar to N.Africa 1400-1600) 54343 at 1400 in Bushey Heath; R.Pakistan, Islamabad 11.570

(Eng to M.East 1600-1630) 33333 at 1600 in Stalbridge; BBC via Skelton & Woolferton 12.095 (Eng to Eu, N.W.Africa 0400-2230) 55444 at 1201 in S.Spain, via Kranji 11.750 (Eng to Far East 1100-1800) 33223 at 1645 in Rugby & via Masirah Is 11.760 (Eng to M.East 0300-0915) 24222 at 0511 in Burnham-on-Crouch. Later, R.Netherlands via Flevo 11.655 (Eng to S/E.W.Africa 1730-2125) 32433 at 1859 in Bridgwater; R.Globo, Rio de Janeiro 11.805 (Port 0900-0330) 55544 at 1915 in Guildford; R.Kuwait via Kabd 11.990 (Eng to Eu, N.Am 1800-2100) 45554 at 1917 in Woking; R.Nac da Amazonia, Brazil 11.780 (Port 0900-0200) SIO333 at 2042 in Largs; AIR via Bangalore 11.620 (Eng, Hi to Eu 1745-2230) SIO333 at 2100 in Co.Fermanagh; R.Havana Cuba 11.720 (Eng to Eu 2100-2200) 44423 at 2130 in Morden; R.Yerevan, Armenia 11.920 (Arm, Eng to USA 2100-2200?) 45544 at 2130 in Broxbourne; BBC via Ascension Is 11.750 (Eng to S.Am 2000-0200) SIO222 at 2205 in Elgin; WWCR Nashville 12.160 (Eng to Eu? 1400?-0000?) 35333 at 2210 in Kilkeel.

Sometimes the **9MHz (31m)** broadcasts from R.New Zealand to

Tropical Bands Chart

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1726	G,H
2.325	ABC Tennant Creek	Australia	1824	G,H,L
2.340	Fujian 1, Fuzhou	China	2211	G
2.485	ABC Katherine	Australia	1824	H,L
2.850	KCBS Pyongyang	N.Korea	2110	G
3.200	TWR Manzini	Swaziland	1816	H
3.220	R.Kara, Lome	Togo	1921	L
3.223	AIR Simla	India	1640	D,H
3.230	ABC Alice Springs	Australia	2220	O
3.230	R.Sol de Los Andes	Peru	2332	D,F
3.230	SABC Oranje Meyerton	S.Africa	1754	D,H
3.240	TWR Shona	Swaziland	1822	H,P
3.245	AIR Lucknow	India	1638	D,H
3.250	R.Luz Y Vida	Honduras	0125	D
3.255	BBC via Maseru	Lesotho	1930	D,H,L,O,P
3.270	SWABC 1, Namibia	S.W.Africa	1920	D,H,L,P
3.290	SWABC 2, Namibia	S.W.Africa	2031	H,P
3.300	R.Cultural	Guatemala	0500	D,P
3.306	ZBC R-27	Zimbabwe	1920	H,L,O,P
3.315	AIR Bhopal	India	1628	D,H
3.320	R.France Int. via ?	France?	1913	H
3.325	R.Liberal	Brazil	0130	D
3.325	FRNC Lagos	Nigeria	1923	K,L,D,P
3.335	CBS Taipei	Taiwan	1840	L
3.345	AIR Jammu	India	1707	H
3.356	R.Botswana	Gabaron	1924	L
3.359	RTV Madagascar	Madagascar	1738	H
3.365	R.Rebelde, La Julia	Cuba	0115	D
3.365	GBC R-2	Ghana	2005	D,F,I,K,L,N,O,P
3.365	AIR Delhi	India	1618	H,O
3.375	R.Equatorial, Macapa	Brazil	0305	D
3.375	R.Nacional S.Gabriel	Brazil	0145	D,F,P
3.377	R.Nacional, Mullenvos	Angola	2126	H
3.380	NBC Blantyre	Malawi	2017	O,H,L
3.915	BBC via Kranji	Singapore	2110	E,K,L,D
3.945	AIR Gorakhpur	India	1531	H
3.955	BBC via Skelton	England	2212	B,D,K,Q
3.955	R.Budapest	Hungary	2212	E,K,Q
3.965	RFI Paris	France	2141	A,B,D,E,F,I,K,Q
3.970	RFE Biblis	Germany	2120	B,D,K,Q
3.975	BBC via Skelton	England	2045	D
3.975	R.Korea via Skelton	England	2045	J
3.975	R.Budapest	Hungary	1700	Q
3.980	VOA via Munich	Germany	1915	D,E,I,K,Q
3.985	China R via SRI	Switzerland	2100	B,D,E
3.985	SRI Beromunster	Switzerland	2002	D,J,K,Q
3.995	DW via Julich	Germany	2000	A,B,D,E,K,Q
3.995	R.Budapest	Hungary	1700	Q
4.500	Xinjiang BS, Urumqi	China	2330	G,K
4.735	Xinjiang, Urumqi	China	0013	D,G,K
4.750	R.Bertour	Cameroon	2030	D
4.750	Xizang BS, Lhasa	Tibet	0040	D
4.755	R.Educ CP Grande	Brazil	0045	C,D,F,I,P
4.760	AIR Port Blair	India	1608	H
4.760	ELWA Monrovia	Liberia	2141	K,L,N,P
4.765	R.Integracao	Brazil	0035	D
4.770	FRNC Kaduna	Nigeria	1926	O,K,L,M,O,P
4.775	AIR Guwahati	India	0050	D,H
4.775	R.Tarma	Peru	2303	D
4.777	R.Gabon, Libreville	Gabon	1741	D,L,P
4.783	RTM Bamako	Mali	2001	L
4.785	Zhejiang PBS,H'gzhou	China	0045	D
4.785	R.Tanzania	Tanzania	2210	K
4.790	Azad Kashmir R.	Pakistan	1711	?
4.790	R.Atlantida	Peru	2320	O
4.800	AIR Hyderabad	India	1640	H,P
4.800	LNBS Lesotho	Maseru	1945	D,H,L
4.805	R.Nac. Amazonas	Brazil	0019	D,I,K,M
4.810	R.San Martin Tara	Peru	0020	K
4.810	SABC Meyerton	S.Africa	2322	H,I,K,M,Q
4.815	R.diff TV Burkina	Duagadougou	1959	D
4.820	La Voz Evangelica	Honduras	0021	D,K
4.820	AIR Calcutta	India	1736	H,P
4.825	R.Cancao Nova	Brazil	0650	I
4.828	ZBC R-4	Zimbabwe	1930	H,L,P
4.830	R.Tachira	Venezuela	2325	D,F,G,I,K,M,O
4.832	R.Rejo	Costa Rica	0702	F
4.835	R.Tezulutlan, Coban	Guatemala	0100	D
4.835	RTM Bamako	Mali	2153	C,D,G,I,J,K,L,M,O,P
4.840	R.Interoceanica	Ecuador	0040	O
4.840	AIR Bombay	India	1725	D,H,P
4.845	RTM Kuala Lumpur	Malaysia	1635	H,P
4.845	ORTM Nouakchott	Mauritania	2152	D,K,L,O
4.850	R.Yaounde	Cameroon	2209	O,K,D
4.850	AIR Kohima	India	0050	D
4.855	R.Sana Yemem	Yemen	1958	J
4.860	AIR Kingsway(Feeder)	India	1815	H,L,D,P
4.865	PBS Lanzhou	China	2300	F,G,I,O
4.865	L.V. del Cinaruco	Colombia	0024	D,K
4.870	R.Cotonou	Benin	1847	LP
4.875	R.Bangladesh	Bangladesh	1531	H
4.885	Ondas del Meta	Colombia	0710	C
4.885	KBC East Sce Nairobi	Kenya	1853	L
4.890	R.Port Moresby	New Guinea	2003	H
4.895	Voz del Rio Arauca	Colombia	0055	D
4.895	Pakistan BC	Pakistan	1641	H
4.900	SLBC Colombo	Sri Lanka	1655	H
4.905	R.Nat.N'djamena	Chad	1847	D,J,L,O,P
4.910	AIR Jaipur	India	1735	H
4.910	R.Zambia, Lusaka	Zambia	2151	H,L
4.915	GBC-1, Accra	Ghana	2046	D,F,I,J,K,L,O,P
4.915	KBC Cent Sce Nairobi	Kenya	1913	L
4.920	R.Quito	Ecuador	0632	C,G
4.920	AIR Madras	India	1651	F,H,P
4.925	R.Nacional, Bata	Eq.Guinea	2005	H,K,L
4.927	RRI Jambi	Indonesia	2205	G
4.935	R.Difusora, Jatai	Brazil	0055	D

Freq MHz	Station	Country	UTC	DXer
4.935	XBC Gen Sce Nairobi	Kenya	1935	L
4.940	AIR Guwahati	India	1506	H
4.940	R.Abidjan	Ivory Coast	2045	D
4.950	R.Nacional, Mullenvos	Angola	2032	H
4.955	R.Cultura, Campos	Brazil	0105	D
4.965	R.Zambia, Lusaka	Zambia	1746	H
4.970	PBS Xinjiang	China	0028	K
4.970	R.Rumbos, Caracas	Venezuela	0015	D,K
4.975	R.Uganda, Kampala	Uganda	2054	D,K,L,O,P
4.980	Ecos del Torbes	Venezuela	2300	C,D,K,L,O,P
4.985	R.Brazil Central	Brazil	0055	D,O
4.990	AIR Ext.Service	India	0035	J,K
4.990	FRNC Lagos	Nigeria	2100	D,K,L
5.005	R.Nepal, Kathmandu	Nepal	1701	H,P
5.009	R.Madagasikara	Madagascar	1708	H
5.010	Guangxi 2, Nanning	China	0030	K
5.010	AIR Thiru' puram	India	0100	D
5.020	La V du Sahel,Niamey	Niger	2054	D,H,L,O,P
5.020	SLBC Tamil Home Sce	Sri-Lanka	1721	H
5.025	R.Parakou	Benin	2146	D,L,O,P
5.025	R.Rebelde, Habana	Cuba	2239	D,O
5.025	R.Quilabamba	Peru	2343	O
5.030	AWR Latin America	Costa Rica	2315	O
5.035	R.Aparecida	Brazil	0110	D
5.035	R.Bangui	C.Africa	2147	D,K,L,O,P
5.040	Voz del Upano, Macas	Ecuador	0125	D
5.047	R.Togo, Lome	Togo	2124	C,O,K,D,P
5.050	R.Tanzania	Tanzania	1939	L,O,P
5.055	RFO Cayenn(Matoury)	French Guiana	0110	D,P
5.055	TWR Manzini	Swaziland	0400	P
5.060	PBS Xinjiang, Urumqi	China	0105	D
5.065	R.Candip, Bunia	Zaire	1741	H
5.075	Caracol Bogota	Colombia	2300	C,D,G,K,Q

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

- DXers:**
- A Tim Allison, Middlesbrough.
 - B Charles Beantland, Gibraltar.
 - C Paul Bowery, Burnham-on-Crouch.
 - D Robert Connolly, Kilkeel.
 - E Bernard Curtis, Stalbridge.
 - F John Eaton, Woking.
 - G David Edwardson, Walsend.
 - H P. Gordon-Smith, Kingston, Moray.
 - I Sheila Hughes, Morden.
 - J Rhoderick Illman, Oxted.
 - K Eddie McKeown, Newry.
 - L Fred Pallant, Storrington.
 - M Roy Patrick, Derby.
 - N Clare Pinder, Appleby.
 - O Richard Reynolds, Guildford.
 - P John Slater, Scalloway.
 - Q Phil Townsend, E.London.

Co.Fermanagh; Monitor R.Int via WSHB 7.535 (Eng [Various Sat/Sun] 0400-0955) 33333 at 0815 in Truro; TWR Monte Carlo 7.160 (Ger 0830-0845) 34444 at 0830 in Oxted; WEWN Birmingham 7.465 (Eng 0830-1000) SIO211 at 0940 in Macclesfield; Polish R.Warsaw 7.285 (Eng 1700-1755) 53333 at 1726 in Bushey Heath; Slovak R.Int via Velke Kostolany 7.345 (Eng 1830-1900) 43443 at 1835 in Ross-on-Wye; R.Budapest, Hungary 7.130 (Eng 1900-1930) 43333 at 1900 in Morden; VOIRI Tehran 7.260 (Eng 1930-2027, also to M.East) 33222 at 1933 in Newry; DW via Sines? 7.170 (Eng 2000-2050) 32222 at 2005 in Rugby; AIR via Aligarh? 7.412 (Hi, Eng 1745-2230) 43333 at 2049 in E.Worthing; RCI via Skelton 7.235 (Eng 2000-2130, also to M.East, Africa) 55444 at 2122 in Middlesbrough; R.Ukraine Int, Kiev 7.285 (Eng 2100-2200?) 43333 at 2126 in Woodhall Spa; R.Romania Int, Bucharest 7.195 (Eng 2100-2156) SIO333 at 2145 in N.Bristol.

Whilst beaming to other areas VOA via Udorn 7.215 (Eng to S.Asia 1400-1800) was 43433 at 1608 in Burnham-on-Crouch; R.Nederlands via Talata Volon 7.120 (Eng to S/E.W.Africa 1730-2025) 43444 at 1930 in Appleby; R.Thailand, Bangkok 7.200 (Eng to ? 1900-2000) 42542 at 1930 in Bridgwater; WJCR Upton 7.490 (Eng to E.Asia 24hrs) 32222 at 2215 in Stourbridge; BBC via Kranji 7.110 (Eng to S.Asia 2300-0030) 33443 at 2300 in Kilkeel.

Many broadcasts in the **6MHz (49m)** band are intended for listeners in Europe. Some come from VOA via Wertachtal 5.995 (Eng 0400-0700) SIO444 at 0600 in Co.Fermanagh; SRI via Lenk 6.165 (Eng 0600-0630) SIO444 at 0600 in N.Bristol; HCJB Quito 6.205 (Eng 0700-0830) 22222 at 0800 in Truro; R.Bremen, Germany 6.190 (Ger) 44433 at 0843 in Oxted; WEWN Birmingham 5.825 (Eng ?-1000) SIO433 at 0855 in Macclesfield; R.Vlaanderen Int, Belgium 6.035 (Du, Eng, Fr, Ger 0800?-1200) 45444 at 1015 in Woking; R.Nederlands via Flevo 6.045 (Eng 1130-1325) 44434 at 1133 in Middlesbrough; RFI via Allouis 6.175 (Eng 1600-1700) 54544 at 1642 in Burnham-on-Crouch; R.Sweden via Karlsborg? 6.065 (Eng 1730-1800) 54444 at 1741 in Bushey Heath;

Quarterly list of equipment used

LM&S for \$ May, # June, * July 95.

- \$* Tim Allison, Middlesbrough: Lowe HF-225 + r.w.
- # Charles Beantland, Gibraltar: Sangean ATS-803 + a.t.u. + 6m wire or Howes AA2.
- \$* Darren Beasley, Bridgwater: Yaesu FRG-100 + a.t.u. + 15m wire or loop.
- \$* Paul Bowery, Burnham-on-Crouch: Sangean ATS-803A + 40m wire.
- # Vera Brindley, Woodhall Spa: Sangean ATS-803A; Sangean SW60 + r.w.
- \$ Kenneth Buck, Edinburgh: Lowe HF-225 + r.w. in loft or loop.
- * Noel Carrington, Sutton-in-Ashfield: Lowe HF-225 + r.w.
- \$ G.Carroll, Bournemouth: Realistic DX-440 + 10m Indoor wire.
- * Jim Cash, Nevja, S.Spain: Sony ICF-SW1E + r.w.
- \$ Bill Clark, Rotherham: Sony ICF-2001D + whip or r.w.
- \$* Robert Connolly, Kilkeel: Trio R-1000 + Sony AN-1.
- # Darren Coward, Grange-over-Sands: Trident TR-2400 + r.w.
- \$ Gary Crawford, Kennoway: Saisho SW-3000.
- \$* Bernard Curtis, Stalbridge: Tatum TMR-7602 + whip or loop.
- \$* Martin Dale, Stockport: Sangean ATS-803A or Codar CR-70A + Howes a.t.u. + 23m wire or CapCo loop.
- \$* Ron Damp, Worthing: Racal RA17 + Mag Balun + 14m wire or two-band Windom. Sangean ATS-803A + Hex loop.
- \$* John Eaton, Woking: Lowe HF-225 + a.t.u. + 23m wire.
- \$* David Edwardson, Walsend: Trio R-600 + invert V trap dipole or loop.
- \$* Peter Gordon-Smith, Kingston, Moray: Icom R-72 + a.t.u. + inverted V.
- \$* Arthur Grainger, Carstairs Junction: Lowe HF-225 or Pioneer F-502RS tuner + loop.
- \$* Michael Griffin, Ross-on-Wye: Lowe HF-225 + a.t.u. + 45m wire.
- \$* Gerry Haynes, Bushey Heath: Kenwood R-5000 + Mag Balun + 40m wire.
- # Gerry Haynes, Talgarth: Kenwood R-5000 + Kiwa loop.
- \$* Francis Hearne, N.Bristol: Sharp WOT370 + r.w.
- * Francis Hearne, Birmingham: Yoko portable.
- \$* Sheila Hughes, Morden: Sony ICF-7600DS + loop; Panasonic DR-48 + 15m invert L.
- \$* Rhoderick Illman, Oxted: Kenwood R-5000 + Mag Balun + r.w.
- \$ Stephen Jones, Oswestry: Matsui hi-fi.
- \$ Tony King, Swindon: Panasonic DR-49 + r.w. or Philips D-2935.
- # Chris Lawton, Stoke-on-Trent: Lowe SRX-50 + vertical wire.
- # Ross Lockley, Broxbourne: Realistic DX-300 + r.w.
- \$* Paul Logan, Lisnaskea: Yaesu FRG-8800 + a.t.u. + 100m wire.
- \$* Eddie McKeown, Newry: Tatum TMR-7602.
- # Mary McPhillips, Co.Monaghan: Grundig Satellit 700 + r.w.
- \$* George Millmore, Woolton, IoW: Racal RA-17L + loop or Sangean ATS-803A.
- \$* Fred Pallant, Storrington: Trio R-2000 + Howes CTU-8 a.t.u. + r.w.
- \$* John Parry, Larnaca, Cyprus: Realistic DX-400 + r.w.
- \$* Roy Patrick, Derby: Lowe HF-125 + 22m wire.
- \$* Clair Pinder, Appleby: JRC NRD-525 + Yaesu FRT-7700 + 16m wire.
- \$* Peter Pollard, Rugby: Sony ICF-2001D + AN-1 or r.w.
- \$* Martin Price, Shrewsbury: Lowe HF-150 + AD-270 or r.w. or Matsui MR-4099.
- \$* Philip Rambaat, Macclesfield: Int.Marine Radio R-700M + r.w.
- \$* Richard Reynolds, Guildford: Sangean ATS-803A + a.t.u. + 10m T.
- \$* Harry Richards, Barton-on-Humber: Grundig Satellit 700 + AD270 or r.w. or Grundig Yacht Boy or Matsui MR-4099.
- \$ John Sadler, Bishops Stortford: Panasonic DR-26 + a.t.u. + r.w.
- \$ Howard Seddon, Wigan: Icom R-71E + Mag Balun + r.w. or SRV
- \$* Chris Shorten, Norwich: Matsui MR-4099 + 10m wire.
- \$* John Slater, Scalloway, Shetland: Lowe HF-150 + 20m wire.
- \$* Tom Smyth, Co.Fermanagh: Sangean ATS-803A or Morphy Richards R191.
- \$* John Stevens, Largs: Hammarlund HQ 180 or Icom R-70 + loop or r.w.
- * John Stevens, Grantown-on-Spey: Car radio.
- \$ Andrew Stokes, Leicester: Lowe HF-150 + 15m wire.
- \$ George Tebbits, Penmaenmawr: Blaupunkt radiogram (circa 1968) + r.w.
- \$* Norman Thompson, Oadby: Matsui MR-4099 + 20m wire in loft.
- # Phil Townsend, London: Lowe HF-225 + loop or a.t.u. + r.w.
- \$* John Wells, E.Gristead: RCA AR-88D + Loop.
- \$* Thomas Williams, Truro: Gundig Yacht Boy 206.
- \$* Julian Wood, Elgin: Kenwood R-2000 + Yaesu FRT-7700 a.t.u. + 5m wire.

R.Finland via Pori 6.120 (Eng 1900-1930) 53553 at 1913 in Bridgwater; Polish R, Warsaw 6.095 (Eng 1930-2025) 33332 at 1945 in Ross-on-Wye; R.Prague, Czech Rep 5.930 (Eng 2000-2027) SIO544 at 2000 in Scalloway; China R.Int, Beijing 6.950 (Eng 2000-2157) 45444 at 2017 in Newry; R.Budapest, Hungary 5.935 (Eng 2100-2125) 44333 at 2100 in Morden; R.Yugoslavia 6.100 (Eng 2100-2127) 43433 at 2100 in Broxbourne; R.Korea via Kimjae 6.480 (Eng 2100-2200) 31333 at 2133 in Woodhall Spa & via Skelton 5.965 (Ger, Fr, Eng 2000-2230) 44444 at 2200 in Appleby; R.Japan via Skelton 6.165 (Jap, Eng 2200-0100) 4444 at 2300 in Kilkeel.

Off The Record

Monitoring the Pirates

I have just been reading a most interesting article by Dr. Kim Elliot, published in the 1995 *World Radio TV Handbook*. (Available from *SWM Book Service*). It is entitled *The Long Slow Fade* and, surprisingly enough, it has nothing to do with sunspots or propagation conditions. It actually provides a futuristic look into international broadcasting and suggests most of the major stations will gradually move to direct broadcast satellites. He says a possibility exists that some nations may ditch external radio completely and concentrate on global satellite TV.

The good news is that the author anticipates a reduction in the numbers of multi-megawatt transmitters and their eventual replacement by smaller low budget stations. The result being a reduction in interference and overcrowding and the provision of improved DX opportunities. Dr. Kim Elliott is a former university lecturer on mass communications and is the audience research officer with the Voice of America.

Carry On Caroline!

Peter Moore of Radio Caroline has received a fairly encouraging letter from the government department responsible for broadcasting policy. It is a political decision whether or not to licence independent s.w. stations in the UK. At present only the BBC, and certain foreign stations, are granted the use of short wave facilities in Britain.

The Radio Magazine, a broadcasting trade journal, has floated the idea of licensed s.w. radio among its readers and if sufficient support is shown, will form a pressure group in order to bring about this exciting new development in British broadcasting. All those interested in can contact *The Radio Magazine* at 25 High Street, Rothwell, Northants NN14 2BB.

Radiocommunications

Personally I was disappointed that the Radiocommunications Agency were unable to be more helpful, in their letter published in the March issue of *SWM*. Mr D. German of the RA simply stated the letter of the law, which was little benefit to those involved in a long and well established hobby. The hobby has only become long and well established as listeners to all radio services have been more or less left alone to do their own thing for a very long time. The authorities, have in the past, concentrated their activities on the perpetrators of illicit transmissions, rather than clobbering those that just

monitor them.

People listening to pirates in the privacy of their own 'boudoir' cannot as yet be detected, and would, I suppose, be unlikely to incriminate themselves. Those that go mobile, by car or on foot, particularly at a sensitive location, could unwittingly find themselves in an awkward position if challenged by law enforcement officers. The answers you give to their questions could make a difference in whether or not an offence has been committed. These questions have been taken directly from an RA guide intended for enforcement officers and are reproduced here to help you stay legal and for you appreciate the powers these officials actually have.

Do you own the equipment?
When and where did you first use it?
When and where did you last use it?
What have you been listening to?
Are you authorised to receive this broadcast?
Who programmed the frequencies into the scanner?
When were the frequencies programmed into the scanner?
Where and when did you obtain the radio?
How much did it cost and what make/model and serial number is it?

Section 79 of the *Telecommunications Act 1984* now permits seizure of the equipment upon suspicion of the commission of an offence! The radio can now be examined by officials to ascertain if any unauthorised channels have been entered into the memory. It is not necessary for a person to act on information received to commit an offence, to monitor a frequency you are not authorised to receive is sufficient to commit an offence.

Taken literally this suggests that you could in fact be prosecuted for receiving dead air on a vacant channel! Clearly the practice of entering unidentified stations in the memory, so you can come back to them later, could have far reaching consequences, as could frequencies programmed in whilst abroad on holiday.

I did write to the DTI via my MP, who happens to be the Home Secretary, asking why the millions that listened to past pirates were never threatened with prosecution. I also asked about the legality of tape recordings of past pirate transmissions, both of these queries were tactfully ignored in their reply. I suppose one saving factor is that the latest generation of scanners and portable digital telephones are beginning to look remarkably alike, so the use of hand-held equipment is becoming relatively inconspicuous.

Readers' Letters

A request for the address for Reflections Europe comes from **Bill Rowley** of Colchester, Essex. Alas we don't publish these addresses, but I can inform you in writing if you send a stamped addressed envelope.

Roger Cook of Bedford asks if I had noticed the change in TV licensing conditions? Apparently, prior to 1994 your licence was valid for the purpose of receiving television programme services transmitted for general reception. Now it states BBC, ITV, Channel 4, Satellite or Cable Television. He asks if this is to thwart reception of TV pirates? I have seen a pirate TV broadcast but modern electronic tuning means that few people actually scan the band for alternative activity, other than perhaps TVDXers.

The subject of Radio Caroline obtaining a licence in Essex has been raised by **Paul Graham**, who is a presenter with Mellow 1557. He says Mellow, and the other Essex stations, have already been relicensed for another eight years, so if there had been an opportunity it has clearly been missed.

A request for pirate radio frequencies comes from **Mr A. Reader** of Swindon, Wiltshire. Unfortunately, *SWM* cannot publish the details you ask for, I would suggest you try a private club that can cover this subject in greater detail like The British DX Club, 10 Hemdean Hill, Caversham, Reading RG4 7SB. A year's membership is just £9 and Alan Pennington's excellent 'Alternative Airwaves' contained in their monthly magazine will I am sure help.

Sean Cooper from Wells-next-the-Sea, in Norfolk says that Jolly Roger Radio are using a 130W transmitter into an inverted 'V' half-wave dipole. He also asks about me doing a feature on the famous London pirate of the 70s, Radio Jackie? Indeed I could, however there is a cassette recording called *On The Run*, that was produced by the pirate radio fraternity in the mid 70s. It runs for 90 minutes and contains some very interesting details of Radio Jackie and many other London pirates, complete with air checks. Another half-hour tape includes much of the *Phil Hazelton Show* on 227m from July 16 1978.

Stephen Smith comments that recently he received two Radio Lasers on adjacent frequencies at the same time, he wonders which was the real one? Knowing the rebroadcasting facilities that are commonly used they are probably both genuine and I suspect one of them was a relay via Jolly Roger Radio.

Short Wave Pirates Chart

Station	Monitors
Reflections Europe	A,B,D,E
Laser Hot Hits	A,B,C,D,E
Coast (relay of f.m. service)	A,B,C,E
Benelux	A
Jolly Roger	A,B,C,D,E
Northlight	A,B,D
Ozone	A,C,D,E
Crazy Wave	A,B,D,E,F
Moonlight	A,D,F
Europe/Sunshine	A,F
Weekend Music	A,B,C
Blackbeard	A,C
Dublin	A,B,E,F
Pandora	A,C,D
Titanic	A
Transatlantic	B,C,F
Torenvalk	B
Driland	A
Flying Dutchman	A
Southern Music	A
Piranha	B
(IRRS) Italy	B,D,F
Mariquita	F
(FRS) Holland	C,D,F
ABC International	A,E

- A: Free Radio Monitoring, Halesowen, W. Midlands.
- B: Bob Marsh, Bexleyheath, Kent.
- C: David Williams, Southampton, Hampshire.
- D: Ian Turner, Deal, Kent.
- E: Stephen Smith, Newtown Abbey, Co. Antrim.
- F: Bruno Pecolatto, Pont Canavese, Italy.

Pirate Crackdown

London's Hackney Borough Council are assisting the RA with their detection of f.m. pirate activity they suspect there are about seven regular local operators. Some use the council-owned tower blocks as transmitter sites, with studios located elsewhere.

Apparently, the RA have found radio devices concealed in many cunning places, including lift shafts, water tanks and sewerage pipes. The council say that in some cases serious damage has been caused to properties by radio pirates and they were prepared to evict tenants convicted of using their homes for unauthorised broadcasts. In London as a whole there are over 40 active pirate stations operating in the f.m. band, usually during evenings and weekends.

A Blast From The Past

A video on current release is the action thriller *Blown Away* featuring Tommy Lee Jones. A dramatic moment is when a derelict floating nightclub is torn apart by a massive explosion. The vessel involved was once called the *Lichfield 1* but was better known as the *Sarah* and once housed the pirate Radio New York International. The similar, but possibly less spectacular, demise of many other former pirate radio vessels are all mentioned in the book *Pop Went The Pirates* that I have reviewed on page 38.

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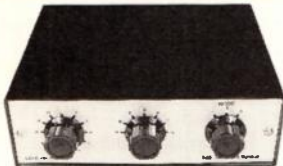
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AOR-2002 desk-top scanning receiver, 25-550, 800-1300 mgh plus 12V p.s.u., v.g.c., £225. Tel: Cornwall (01736) 757721.

AR-8000 scanner, scanning books, wide band active antenna, cabling and two whip aerials (scanner three months old), £350 the lot. Richard, Edinburgh. Tel: 0131-658 1806.

AR-8000, immaculate, boxed, pack used only for a few days, includes NiCads, AA8000 UK, rubber duck, belt holder, manual, plastics cover still on, also with leather carry case, all lot for only, £300. Tel: Slough (01628) 604455 after 5.45pm or (01753) 730579 between 11am to 1pm or (01753) 816306 at 5.30pm.

AR-88D, excellent condition, Racal RA-17 plus a.t.u., v.g.c., GEC BRT400D, good condition, open to any reasonable offer or PX for base scanner, 25-1300MHz. John, Rugby. Tel: (01788) 542627 after 7pm.

B40 general coverage receiver with manual, £60. Howes DXR20 receiver with CSL4 filter plus 160, 15 and 10m band modules, good condition, £65. Richard Hull, Glos. Tel: (01242) 239196.

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FAX II by ICS Skyview Systems, h.f. FAX, RTTY, FEC, NAVTEX, 16 grey level image manipulation, zoom, enhancing, print, save, auto capture, handbook, 5.25, 3.5

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