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shortwavemagazine

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- Listening through Anatolia
- Tuning Accurately
- John Wilson reflects on ICOM in the UK

BROADCAST SPECIAL

August 1996 £2.50 ISSN 0037 - 4261

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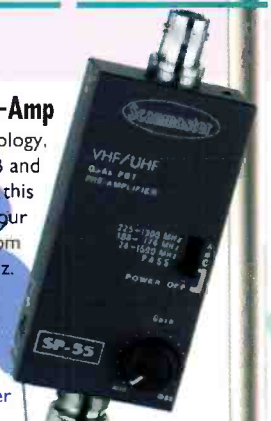

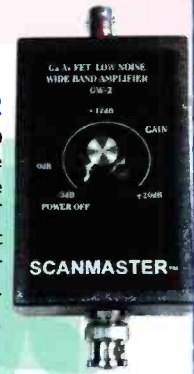

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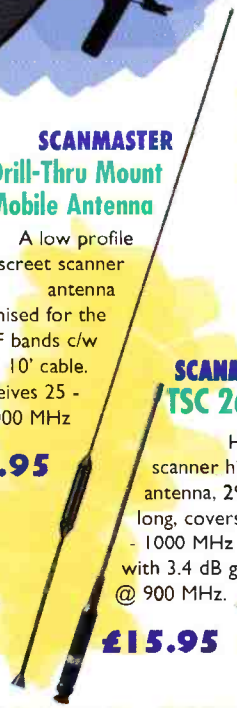

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- CI-V compliant Serial Data Interface with both TTL and RS232C levels
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**Software for mapping applications is planned by third party Software Design Companies. Inquire about the availability and specific Companies to contact.*

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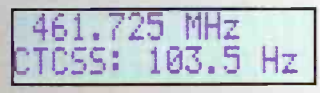
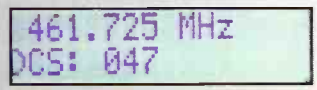
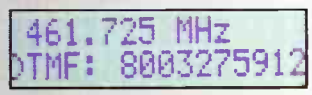


CTCSS Mode



DCS Mode



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Simply add the forename of the person you wish to contact. For example:
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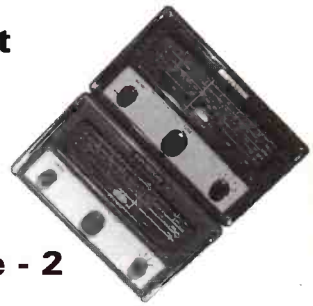
Cover Subject

Our cover this month shows what goes on behind the scenes at a large international broadcaster - in this case BBC World Service at Bush House.

contents



Regular Columns

Good Listening

SWM SERVICES

Subscriptions

Subscriptions are available at £25 per annum to UK addresses, £30 in Europe and £32 (Airsaver), £37 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £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 **£2.60** each, photocopies are also **£2.60** per article, plus **£1.00** 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.

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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 last six weeks or so have been quite hectic. In the middle of May I went to the Dayton Hamvention for the first time. Along with Rob Mannion, Editor of *Practical Wireless* and Kathy Moore we travelled with the *PW* party via New York. I found the Hamvention fascinating - rather like an oversize Leicester Show. Our booth - if they call a stand a booth what would Mystic Meg or Mr Punch use over there? - was in the ice rink, just as at Leicester.

I didn't manage to get round the Flea Market. In fact I was a bit dissapointed by it - but I gather that you need to be on site at 6.30am to stand any chance of getting the real goodies! If you have never been to Dayton I can recommend a visit. If you are an old hand then I don't need to persuade you.

At the end of June, Brown Owl and myself travelled to Friedrichshafen to man the *PW/SWM* stand at HamRadio 96. Situated almost on the Austrian and Swiss borders on the Bodensee, this is probably the most cosmopolitan amateur radio event anywhere. We met a Russian amateur who, along with three other amateurs, had driven from a town 500km south east of Moscow. It had taken them 48 hours of non-stop driving to get to the show!

At 9.00am, when the doors to Halle 7 opened, the stampede to get into Conrad's stand was a sight to behold - it was just like World War III - a mass of yellow supermarket baskets being used as battering rams to get into the 'bargains' first! I resisted the temptation to see what was inside, but George Dobbs and Dick Pascoe - both of the G-QRP Club - just couldn't resist and George came out clutching an electric desk fan to keep himelf cool. As ever, the Flea Market was brilliant, but you could spend just about all of the show searching for that elusive bit. Each year I reckon that what I want must be in there somewhere - if only I knew what it was that I wanted! Again, this is a show well worth visiting.

Distribution

Thanks to those of you who took the trouble to respond to my plea last month. Of course, one solution would be for you all to take out subscriptions, ensuring that you get your copy a few days earlier and also save some money into the bargain. This would keep Kathy happy as well as very busy!

Dick Ganderton G8VFH

LETTERS

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've just recently purchased the March issue of *SWM* in the US and am enjoying it very much. In your 'Communique' section on page 9 there's a brief on a new set of BT Phonecards to be issued commemorating radio history. A 'phone number is provided for purchase information, but not an address.

I'd appreciate it if you would either forward my interest in purchasing a set of cards, or provide me with an address to contact.

Katie McGee
Chicago
USA

Katie, we have contacted BT on your behalf, the address you require is; ***BT Phonecard Direct, PPO5 A25, Delta Point, 35 Wellesley Road, Croydon, Surrey CR9 2YZ*** - **KN**.

To: dick@pwpub.demon.co.uk
Subject: Computers and radios

Having read the pro's and con's about the use of computers and radio for quite some time now in the *SWM*, it has got to be the way forward. You will see from this E-mail that I am a computer user. Access to the Internet has made gathering information from others a real bonus, this surely can only be of good.

We must change with the times and not stick our heads in the sand otherwise we will be left behind. I think, that if the people who are opposed to using computers, just took the time out to try it with somebody who is willing to show them around the internet and then see what use it can be, they might just change their minds?

I use my computer for logging the civil and military airbands. I also run the ACARS flight data program (very good it is too - version 3 is out now).

I have been scanning and short wave listening for 15 years now and taking *SWM* for ten of them. This is not an E-mail from a computer **only** user, the use of computers does enhance your ability to communicate with the rest of the world.

There are plenty of radio groups using various on-line services and this gives you a great chance to get in touch without having to sit the RAE.

That last line might cause some upset.

Craig S...via the 'net

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.*

LETTERS

Dear Sir

Regarding John Wilson's article in the July issue of *Short Wave Magazine*, I thought you might be interested in my experiences with computers and radios. I started out in radio as a Wireless Operator in the RAF and from there I got my amateur radio licence in 1957.

I carried on with that until about eight years ago when I became very bored with and lost interest in amateur radio. I still kept my interest in radio and after reading several issues of *Short Wave Magazine* about four years ago, I decided to try as a short wave listener.

I was particularly interested in decoding as I had experience of RTTY in the RAF and for a time after that at home. Things were a bit different then, with 2 Creed 7B printers and various terminal units I had a roomful of equipment and the interference came from the mechanical noise of the printers.

I first purchased an FRG-100 receiver and after listening round for some time I realised how much RTTY and similar was on the bands. I then purchased a computer and a decoding program.

After reading in the various magazines about the noise from computers, I was almost afraid to switch it on as I could imagine having to go through all the procedures to try and reduce the noise. To my utter surprise when I switched the computer on there was not a trace of any interference and I could quite happily copy stations that were down in noise.

One of my interests is NAVTEX and to date I have copied 36 different stations, some as far away as Canada and Florida. I have since purchased another computer, a 486 and have the same results as before. I purchased both computers from Amstrad so I wonder if I have been lucky or does it depend on who makes them?

There are of course many others who are interested in decoding and they must all have got over any problems. When you mention the receiver card that goes inside the computer, I have thought the same thing, although the Hoka Code30 decoder is on a card that goes into the computer.

I am sorry to say that I still have no interest in amateur radio, there is so much to listen to on the short waves that I don't have time at present to do all I want to. Hope these comments are of some interest to you.

G. E. R. Denman
Portsmouth, Hants

Dear Sir

There have been letters in *SWM* lately on the subject of the ideal v.h.f. airband antenna. Perhaps I could give my views on this subject, based on over 20 years of airband listening with a variety of receivers, both general purpose and airband-dedicated scanners and several types of antennae.

Mr Dickinson, in July *SWM*, expresses concern about the mathematics of scaling a 145MHz Slim Jim to suit the airband. I think that there are other, more important, considerations to worry about in the search for wide-ranging reception and I would put precise antenna dimensions low on the list.

The 'talking' section of the airband extends from 118 to 136.975MHz. Scaling up a Slim Jim based on the lower end will result in an antenna 256mm (no far short of one foot) longer than once cut to the high frequency end. Where is one to wield the hacksaw? I made a highly successful airband Slim Jim based on the Fred Judd design in *Out Of Thin Air*, simply by increasing the given dimensions by the factor of 145 (the assumed design frequency) divided by 127 (the approximate centre of the band). Mounted on a 2m pole atop the chimney, this has withstood 16 years of rain, gales, ice and heat.

Although I am at an elevation of less than 10m a.m.s.l. and surrounded by low hills I can, on most days, receive ground transmissions from six airfields and from as many LATCC frequencies. These signals are more or less evenly spread out along the length of the band, but the 'centralised' Slim Jim copes with them all. On days of favourable atmospheric conditions I can also receive ground transmissions from Brest Control in Brittany. All these sites are below my horizon and thus well out of line-of-site.

The notion that line-of-site is necessary for v.h.f. reception is a bit of a myth. The Slim Jim has a very low, almost horizontal, angle of radiation and response, ideal for capturing distant ground stations.

Factors which I think are of far more importance than critical antenna dimensions are atmospheric conditions, the need to use an airband-dedicated a.m. receiver/scanner and awareness of the frequency offsets used by LATCC.

My experience of the first of these has been that where conditions are good, the signals will be received on any reasonable antenna and if they are poor, there will be little, if any, improvement from a better antenna, even if it is precisely resonant at the particular frequency being monitored.

A dedicated a.m. receiver will always be more sensitive than a broad band a.m./f.m. model and the ability to allow offset tuning as explained in the next paragraph is vital for good long distance ground reception. This facility has to be an overriding requirement in the choice of a receiver to be used for this purpose. A less sensitive receive which can be turned off the actual frequency might well be more effective than a more sensitive one that cannot.

It does not seem to be widely known that a lot of the LATCC transmitters do not operate at exactly the frequency stated in the various publications now available. Many frequencies are transmitted from two or three different sites and each transmitter is offset by up to 7.5kHz to avoid interaction. When there are two sites, neither is on the nominal frequency. When there are three sites one is on frequency and the other two are offset up and down of the nominal. If the signal is weak at the point of reception, it may not be heard at all at the nominal frequency but tweaking the receiver up or down a few kHz, perhaps by reducing the scan step rate, may well bring it in. I have never heard some stations at the nominal published frequency, but can almost always hear them at an offset.

I think that Mr Dickinson should delay no longer, but obtain a copy of *Out Of Thin Air* and proceed to construct his Slim Jim to about mid-airband dimensions, give or take a couple of inches either way. We cannot control the atmospheric conditions, but an 'approximate' Slim Jim, together with due regard to my points about dedicated receivers and frequency offsetting should give him the best results possible at his particular location.

Alan Jarvis
Cardiff

Dear Sir

Thank you for your detailed review of AOR's AR7030 in March *SWM*. The author, John Wilson, mentions 'a simple to understand document', namely a White Paper by Larry Magne entitled *How to interpret receiver specifications*.

Can you let me know where I can obtain a copy of the White Paper?

I eagerly look for SWM every month, I find it is filled with interesting material which never fails to be satisfy me when it arrives about the middle of each month.

A. G. Robertson
Perth
Western Australia

Dear Sir

One of the many pleasant features of your magazine is the reader's letters which appear commenting upon the excellent service which they receive from those organisations which advertise in *SWM*. I should like to add to these by mentioning Nevada Communications and Mike Honeywell in particular, for the very pleasant, friendly and effective manner in which they dealt with my queries concerning the performance of a Drake R8E receiver.

Nothing was too much trouble for Mike and I would like to thank him and to commend him and Nevada through your letters' page.

Joe Maitland
Hanslope

Dear Sir

With reference to Lee Dobson's enquiry in May *SWM*. Radio Iraq International is a most sporadic operator. During the Gulf War the Coalition air forces targeted transmitter and antenna sites quite effectively. Since the end of the conflict, only some irregular overseas broadcasting has been heard in English. With only limited facilities available, the Iraqi authorities seem to be concentrating on domestic and 'clandestine' broadcasts to its Arab neighbours, such as 'Mother of All Battles Radio' which has been heard well in Europe recently.

I hope this is of some help.

Tony Vaughan
Southampton

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.

GRASSROOTS

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.

* Short Wave Magazine & Practical Wireless in attendance

rallies

July 28: The Rugby ATS 8th Annual Radio Rally will be held at the BP Truckstop on the A5, three miles east of Rugby and just 2.5 miles North west from junction 18 of the M1 motorway. Doors open from 10am and admission is £1 per car and facilities include a good cafeteria and toilets. Talk-in on S22 by **GB8RRR.** Further details from **Peter** on **(01455) 552449** or **Steve** (for bookings) on **(01788) 824214.**

***July 28:** The Scarborough Amateur Radio Society Amateur Radio, Electronics and Computer Fair will be held at The Spa, South Foreshore, Scarborough. More details can be obtained from **Ross Neilson G4ZNZ** on **(01377) 257074.**

***August 4:** The RSGB Woburn Rally is being held at Woburn Abbey, Bedfordshire. Further details from **Norman Miller G3MVV on (01227) 225563.**

August 11: The 39th Annual Derby Mobile Rally takes place at the Littleover Community School, Pastures Hill, Littleover, Derby. Doors open at 9.30am. The school is located off the A5250 (Burton Road) south of Derby, one mile south of the village of Littleover and the A5111 Derby Ring Road. There will be a large flea market, tables by the hour, wide range of radio and computer traders, monster radio & computer junk sale run by the society - with silly prices, famous for many years, starts at 11am. There will also be a wide range of refreshments available. Ample accommodation if wet. **Martin G3SZJ, QTHR.** Tel/FAX: **(01332) 556875.**

***August 11:** Flight Refuelling ARS Hamfest 96 will take place at the Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. 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 will be on S22. **Richard Hogan G4VCQ** on **(01202) 691021.**

August 16: Cockenzie & Port Seton Amateur Radio Club Radio Junk Night will be held from 1830 to 2130 in the Cockenzie & Port Seton Community Centre. Bring along your own junk and sell it yourself. Tables will be provided free of charge on a first come first served basis. Entry fee £1 and refreshments will be available. All money raised to go to the British Heart Foundation. **Bob GM4UYZ** on **(01875) 811723.**

August 18: The Red Rose Rally is being held at Horwich Leisure Centre, Victoria Road, Horwich, Nr. Bolton of J6 M61. There will be a cafe, bar, Bring & Buy, RSGB stand, special interest groups, parking for 300 cars, free cash draw every hour, children's activity room up to seven years, supervised by parent. Doors open at 10.30am and admission is £1, free for children. Talk-in on S22. Albert **G7RZW** on **(01204) 62980.**

August 18: The 7th Great Eastern Rally is to be held at the Cattle Market, Hardwick Narrows, Kings Lynn. Doors open at 10am (9.45am for disabled visitors). There will be an outdoor car boot area, a spacious indoor area with national exhibitors, a Bring & Buy, talk-in on S22, free parking, refreshments on site, easy access for disabled. It is a good family day out with Sunday car boot nearby and close to Hunstanton Beach & Sandringham House. For bookings and information contact **G0BMS** on **(01553) 765614** or at **GB7OPC** or **E-mail leo@feline.conqueror.co.uk**

August 18: The Cardiff Amateur Radio & Computer Fair will be held at The Star Sports & Recreation Centre, Splott, Cardiff (M4 J32). Doors open 10.30am to 5pm. More details from **Stuart Robinson GW0WMT** on **(01222) 613070.**

August 25: The Galashiels and District Amateur Radio Society Open Day and rally will be held at a new and larger venue, The Volunteer Hall, St. John's Street, Galashiels from 11am to 4pm. There will be a Bring & Buy, refreshments and a raffle. Talk-in on S22. **(01896) 850245** or **(01896) 755943** evenings only.

August 25: East Coast Amateur Radio & Computer Rally, Clacton Leisure Centre, Vista Road, Clacton-on-Sea. Sharward Promotions, Upland Centre, 2 Upland Road, Ipswich, Suffolk IP4 5BT. Tel: **(01473) 272002.**

August 26: The Huntingdonshire Amateur Radio Society Annual Bank Holiday Monday Radio Rally is to be held at Ernulf Community School, St Neots, Cambridgeshire. Doors open at 10am and admission is £1. Refreshments available. Talk-in on S22. Further details from **David Leech G7DIU** on **(01480) 431333.**

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

Editor

Avon

Bristol International RC: Tuesdays, 8pm. The Black Horse Public House, West Street, Old Market, Bristol. 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 natter 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. July 30 - Half yearly meeting. Dave Bailey G4NKT. 0117-967 2124.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. July 31 - Computer shareware, free exchange, August 7 - 70cm activity evening, 14th - BBQ night, 21st - Club aerial check on emissions. For more information ring (01275) 834282 on a Wednesday evening.

Bedfordshire

Dunstable Downs RC: Fridays 8pm. Chews House, High Street South, Dunstable, Bedfordshire. New members and visitors welcome, just drop in or call Paul G7TSJ on (01582) 861936.

Derbyshire

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. August 7 - Rally preparation, club room, 11th - 39th Derby Mobile Rally. Martin Shardlow G3SZJ, 19 Portreath Drive, Allestree, Derby DE22 2BJ on (01332) 556875.

Devon

Exmouth ARC: Alternate Wednesdays at the Scout Hut, Marlpool Hill, Exmouth. July 31 - Fox hunt preparation evening, August 14 - Annual fox hunt competition. D. Fox G0NRR on (01395) 271880.

Plymouth RC: 1st & 3rd Tuesdays, 7.30pm. The Royal Fleet Club, Devonport, Plymouth. August 7 - HF s.s.b. field day, 11th - car boot sale. John Doherty G7HIK on (01752) 896501.

Fife

Dunfermline & DARC: Thursdays, 7.30pm. The former RAF radio station, Outh Muir, located by the A823 Dunfermline to Crief Road, one mile from the Knockhill Racing Circuit. July 25 - HF operating evening, August 1 - 2m d.f. hunt, 8th - VHF operating evening, 15th - Natter night, 22nd - TCP/IP - an insight, a talk by Russell Whitworth GM4CTP. Adrian Donaldson GM0SRD on (01383) 735967.

Greater London

Edgeware & DRS: Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. July 25 - CW training, August 22nd - SSB FD briefing. Stephen Slater on 0181-953 2164.

Southgate ARC: 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. July 25 - Coach trip to Martin Lynch, August 8 - Annual BBQ, to be held in the Spinny at Winchmore Hill Cricket Club, 22nd - Radio on the air, d.f. equipment check. M. E. Viney G0ANN. (01707) 850146.

Hampshire

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. August 6 - Natter night. S. Swain (01705) 472846.

Southampton ARC: Mondays, 7pm. This club is now up-and-running after some years of inactivity. New members welcome. Harold McIntyre on (01703) 737715.

Hereford & Worcester

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. August 13 - Night on the air. Barry Taylor. (01527) 542266.

Malvern Hills RAC: 2nd Tuesdays. Red Lion, St Annes Rd. Jim Davis G0OWS. (01684) 576538.

Hertfordshire

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. August 1 - Visit by AKD Products. Don G3JNJ on 0181-292 3678.

Isle of Man

Isle of Man ARS: 1st Mondays, 8pm Transport House, Fort St, Douglas. Other Mondays, 8.30pm, Royal Naval Assoc, Regent St, Douglas. Every Thursday, The Manx Legion, Peel, 9pm for an informal get together. Chris Wood GD6TWF, 2 Lyndale Avenue, Peel, Isle of Man.

Kent

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. August 20 - BBQ. A. Messenger G0TLK. 0181-777 0420

Lancashire

Wigan Douglas Valley ARS: 1st & 3rd Thursdays. Wigan Sea Cadet HQ, Training Ship Sceptre, Brookhouse Terrace, off Warrington Lane, Wigan. D. Snape G4GWG on (01942) 211397.

Preston ARS: Thursdays, 8pm. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood, Preston. August 1 - Fox hunt, seek and find competition, 15th - General discussion evening, natter, natter night and G3KUE on the air. Eric Eastwood G1WCQ. (01772) 686708.

Norfolk

Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. July 31 - Night on thr air, construction QRP and Morse practice, August 4 - Club trip to Woburn Rally, 7th - Construction projects, 14th - Night on the air, construction QRP and Morse practice, 21st - The Valve Story by Tony G3NHU. Mike G4EOL. (01603) 789792.

North Yorkshire

Hambleton ARS: More details from John G0VXH on (01845) 537547.

Nottinghamshire

Mansfield ARS: 2nd Mondays, 7.30pm. Pre-Ashfield Show update. August 12 - Foxhunt and BBQ (weather permitting). David Peat G0RDP on (01623) 631931.

Shropshire

Salop ARS: Thursdays, 8pm. The Telesports Club, Abbery Foregate, Shrewsbury. August 1 - Summer social - a chance for your other half to meet your radio friends, 8th - Telford Rally Group - a chance to volunteer your services to your rally, 15th - Fox hunt, a mstery fox. Ian Davies G7SBD, QTHR. (01743) 463711.

Somerset

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. July 25 - Club station on the air and a committee meeting. Cedric White, QTHR. (01258) 473845.

West Yorkshire

Wakefield & DRS: Tuesdays, 8pm. The Ossett Community Centre, Prospect Road, Ossett. July 30 - Rally discussion, August 6 - On the air, 13th - Cardio pulmonary resuscitation, 20th - An introduction to the new v.l.f. allocation. Bob 0113-282 5519 or G3WWF@GB7WRG.

JUNIOR LISTENER

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

I was right last month, the response from the broadcast stations didn't last!! This month I've only heard from two stations - Radio Budapest International has turned up trumps again and also HCJB.

During June there were a couple of interesting programmes aired on Radio Budapest International on Hungarian wines. Apparently, there have been vineyards in the Lake Balaton region for over 2000 years. The two presenters are travelling around the 21 Hungarian wine regions to prepare for these programmes - it must be really unpleasant work!!!! The frequencies for Radio Budapest haven't changed yet, any changes are likely to happen around about September. So, for the moment listen on: 3.975, 6.140, 7.130 or 9.835MHz between 1900 and 1930 or 3.975, 5.935, 7.250 and 9.835MHz between 2100-2130UTC.

HCJB is based in Ecuador and transmits in seventeen different languages. There are two main English broadcasts aimed at Europe, between 0700 and 0830 on 11.615MHz and between 1900 and 2200 on 15.540MHz. That's not to say you may not hear some of the other English broadcasts even though they are aimed at other continents. You could try: 0030-0700 on 9.745MHz; 0700-1130 on 5.9MHz; 1100-1500 on 12.005MHz; 1130-1600 on 15.115MHz.

Their QSL cards are worth collecting this year as each month sees a different card being sent out. When you collect all 12 and put them together they form a panoramic view of Quito in Ecuador. I've only got two so far, but they are very impressive, Quito looks like a very big city. Hopefully, before the end of the year I can collect a few more.

Programmes to make the effort to hear are *Ham Radio Today* at 0800 and 1930 on Wednesdays, *DX Partyline* at 0730 and 1900 on Saturdays and *Saludos Amigos* at 0800 and 1900 on Sundays. Of course, there are loads of other programmes, but these are my favourites.

Hopefully next month will bring a few more replies and some more station information.

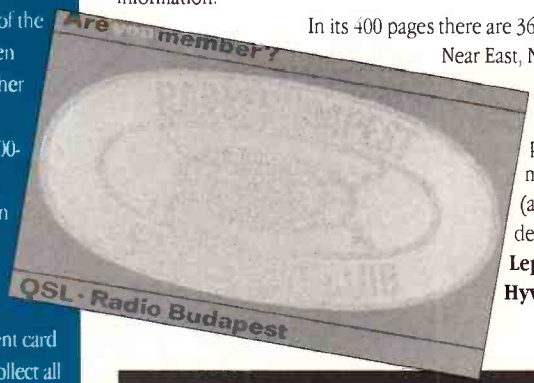
Short Wave Station Hangs On

Channel Africa has won a reprieve from the threat of closure that has been hanging over it since April. The government decided to continue supporting the station 'in a more rationalised form'. The government threatened to close this station as it couldn't afford to run it. The 130 staff employed there started a campaign to get the government to rethink the options, and asked private donors to bail the station out. Many other international broadcasters added their voices to the protest, including such stations as Voice of America and Radio France International. So did a huge number of the listeners of Channel Africa! So just in case the station doesn't last a lot longer, why not try and add it to your log now, when you QSL you can always add your support to the station to keep them on the air.

The threat of closure seems to be a familiar story these days, so many of the large international short wave stations are being 'streamlined' or 're-structured' to save costs. I do feel that unless governments of budget holders realise the worth of these stations, then sooner or later one of

New Book

I've heard about a new book that should be available by now, called the *European FM Handbook*. Apparently, it is supposed to contain details on the European f.m. broadcasting scene - frequencies, power, transmitter sites, networks, local stations, addresses, telephone and FAX numbers along with maps and other information.



In its 400 pages there are 36000 f.m. stations in Europe, Near East, Northern Africa and Greenland. It will cost $50 or equivalent including postage and packing. So if you would like more information on the book (and I haven't seen a copy, just details), then contact: **Timo Leponiemi, Box 7, FIN-05901 Hyvinkaa, Finland.**

Strange Callsigns

If you listen on the amateur bands trying to log as many countries as you can, perhaps for one of the many awards you can apply for, then contests are good times to listen as these events tend to concentrate the numbers of amateurs on the air at any one time. Contests also unearth a few of the more unusual locations too. You may start hearing what sounds like incomplete UK calls these days and wonder who they are and did you hear them correctly. Well, you probably did and unfortunately they are probably not anything rare or unusual.

The Radiocommunications Agency have devised a different system of callsigns for contest stations, mainly to speed up the transfer of details. Instead of a callsign like mine with a letter, a number and then three letters (G4LFM) these new contest calls will have a letter, a number and then only one letter (G4L) - much quicker to say or send in Morse particularly.

Of course, if the station in is one of the Regions - like Scotland, Jersey, Wales, etc., - then they have to insert their regional locator. So the callsign would read GJ4L. These callsigns are only being issued to radio clubs entering specific contests: ARRL DX s.s.b. and c.w., ARRL 28MHz DX CQ WPX s.s.b. and c.w., IARU Championship s.s.b. and c.w., CQ Worldwide s.s.b. and c.w. So keep your ears open and see how many of these new contest stations you can log.

Holiday Listening

When (or if) you're going away on holiday you don't need to miss your favourite programmes if you have access to a modern video recorder. One of the great benefits of the video recorder is its ability to make a number of pre-set recordings for up to two weeks in advance. Whilst this is great for catching regular TV programmes, you can also use the video to record the audio from your radio. You will need a recorder with an external audio input, so it will have to be fairly up-to-date.

However, you should find that most hi-fi recorders fit the bill. To use the system, you just connect the tape output of your receiver to the audio input socket of the video recorder. Next you tune the receiver to the required station and program the video for the required times. Of course, you will have to leave the receiver switched-on during the holiday. You can also use this technique to save your beauty sleep and record programmes that are broadcast in the small hours of the night.

Let me know if you try this out.

Unusual Frequency

Robin Harwood in Australia has left an interesting message on the Internet. On July 1 he was tuning around 8MHz and at 0530UTC came across a station on 8.445MHz. He decided the language was Turkish and the content too 'professional' for the station to be a pirate. When he checked the output of the Voice of Turkey on 9.445 and 9.460MHz he found that the programming was identical on 9.460 but there was no signal on 9.445MHz. It seems that the Voice of Turkey was transmitting on the wrong frequency. Did anyone else notice this and have you QSLed Voice of Turkey with the information. Let me know.

COMMUNIQUÉ

WACRAL Conference

The World Association of Christian Radio Amateurs and Listeners, invite all radio amateurs and SWLs to attend their 1996 residential conference.

The event is planned for the weekend of the 4th to the 6th October and will be held at the Forest Lodge Conference Centre, Kidderminster.

The event will provde the opportunity to meet other practising Christians and enjoy an exciting and varied programme of radio events, endless 'rag-chews', simple services and general fellowship.

The lectures this year include, 'Satellites on a shoestring!', 'Bows arrows and amateurs', 'Frequency management for FEBA' and from the eminent BMS eye surgeon, 'Mission and river blindness'.

On the QRP front there will be both a 'QRP for Christians' presentation and construction competition, where all will be encouraged to take part in a record breaking attempt to construct the square inch 'Oner' transmitter in under eight minutes!

The member's AGM will be held on the Saturday with the ever popular 'Silly prices surplus sale' also scheduled for that evening

Non-members are especially welcome to attend, together with spouses. The complete weekend fee, inclusive of all meals and accomodation in rooms for singles, couples and families, many *en-suite*, is £65 per person. To book or to obain more information, contact: **G4EZU (QTHR), Tel: (01474) 535686**, or if you're a licensed amateur radio operator, call in on the regular WACRAL net on Sundays 3.747MHz at 0800 and 1400.

New Frequency Standard

Just in from Hesing Technology is news of an improved version of the DK-3060 Instruments Standard Time and Frequency Receiver. The new version is known as the RBX 10-9TSID.

This enhanced unit will provide reference signals from 0.1Hz to 10MHz with the accuracy locked to MSF Standard Frequency transmitter located at Rugby on 60kHz. MSF has a frequency accuracy better than $\pm 2 \times 10^{-12}$. This gives the RBX 10-9TSID references the same degree of accuracy, which is traceable to National Standards.

The receiver's internal timebase has a stability of better than one part in 10^{-7} over a period of 100s. Ensuring that should there be a loss of signal from MSF, the resultant error would be minimal.

The unit has been designed to feature a very low level of phase noise. Typical jitter is less than 5ns peak-peak, with a frequency of a few hertz.

The receiver is of lightweight construction and is free standing, and so lending itself to mobile operation.

Optional is operation from an external battery, this provides a number of useful facilities, i.e. uninterrupted operation in the event of mains failure, reduction of interference carried via mains cables, free-standing operation without having to rely on external power supplies.

For more information contact: **Hesing Technology, 41 Bushmead Road, Eaton Socon, Cambridgeshire PE19 3BT. Tel: (01480) 386156, FAX: (01480) 386157.**

CBers Lose to Cellphones in Spectrum for Cash Battle

The Radiocommunications Agency has just announced that the 934MHz CB allocation is to be withdrawn with effect from 31 December 1996.

The specification to which all u.h.f. CB transceivers were manufacturer certified, was withdrawn back in 1988. Since that date no new equipment has been manufactured or imported.

The withdrawl is due to pressure on this part of the spectrum causased by the continued success of Digital Cellular 'phones (GSM).

The RA has recently granted permission for both Vodafone and Cellnet to operate in the band between 934-935MHz. The 934MHz CB equipment would be incompatible with this new use and therefore its use will not be allowed.

The remaining two CB sevices, the CEPT and the UK only 27/81 will continue to be available for use by CB Licence holders.

Lynch Stocks New DSP

DANMIKE

New from Europe, comes the Danish, commercial grade, all mode DSP unit. The Danmike DSP-NIR is now stocked by Martin Lynch & Son.

The DSP-NIR utilises a 16-bit processor and offers no less than 14 different filter options, including automatic multi-tone notch, digital linear phase filters with upto 60dB.

The DSP-NIR is claimed to improve short wave reception considerably. It is simply connected via the headphone socket or an external speaker output. The DSP-NIR has a built-in audio amplifier which produces 3.2W into a 4Ω load, there are also outputs for headphnes and high impeadance 'line' output. Filters are provided with optimised shape and width for s.s.b., c.w. RTTY, packet and SSTV. The Notch, PBT and Peak functions allow adjustments for optimum performance.

The DSP-NIR requires an external power source between 11 and 15V d.c. capable of supplying 500mA. The case dimension being 60 x 193 x 155mm (h w d). The unit wieghs in at 1.4kg. The price for the DSP-NIR is £329.95 inc VAT. For more information contact: **Martin Lynch & Son, 140-142 Northfield Avenue, Ealing, London W13 9SB, Tel: 0181-566 1120.**

Woodhouse Acquire Satellite Report

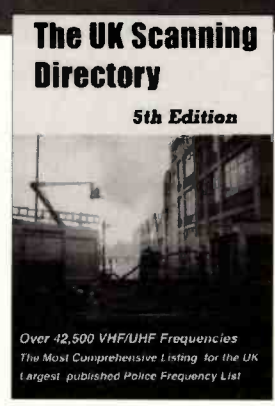
Weather Satellite Report, the USA based quarterly magazine specialising in earth and atmospheric imagery from space has been acquired by Woodhouse Communication of Michigan.

Weather Satellite Report, in its seventh year, was formerly published by R. Myers Communications. The title was changed from *Journal of the Enviromental Satellite Amateur Users Group*, in 1991.

The publication is claimed to be the major player for the discipline. Various types of imagery, including APT, HRPT, GOES and h.f. WEFAX are regular items. *WSR* is also a source of news of satellite launches, developing technologies, operational recap reports, general information and Keplerian element sets. The international magazine provides articles and images offering a broad perspective on the subject matter. For futher information contact: **Woodhouse Communication, PO Box 73, Plainwell, Mi 49004 0073, USA. Tel: +1 616 226 8873, FAX: +1 616 226 9073, E-mail View2Earth@aol.com**

Just Arrrived

NEW UK Scanning Directory



The latest version of the *UK Scanning Directory* is now available from the *SWM* Book Store.

This new edition now features some 42500 spot frequencies, contained within over 500 pages. The 5th *UK Scanning Directory* lists vital scanning frequencies between 25MHz and 1.8GHz.

The 'Book Store' has generously offered this popular and largest ever edition, post free for our UK readers (overseas readers please add £2.00 P&P).

So for £18.50 you can order your copy today. Contact the *SWM* Book Store hotline: **(01202) 659930**, or see page 83 of this issue.

COMMUNIQUÉ

ISWL Guides Aplenty

Two new invaluable ISWL booklets land on the *SWM* newsdesk this month.

The first is the amalgamation of two guides, the *Official ISWL/DXCC Country and Prefix Lsts* and the *ISWL Contest Country and Prefix Lists*. This latest publication is available from the ISWL Headquarters priced at £2.50 (IRCs or Postage Stamps to the value of £2.50 are also acceptable).

This new gude has been revised to accomodate the various new prefixes that have been released since the last edition.

To obtain your copy contact: **ISWL HQ, 3 Bromyard Drive, Chellaston, Derby DE73 1PF.**

The second is compiled by *SWM* contributor Peter Rayer. The booklet *Regular LF & HF Net Frequencies* is in its second edition. The guide lists amateur radio nets in both time and net name order.

Regular LF & HF Net Frequencies is an invaluable aid the award chaser. Compiled originally for Peter's own use the guide has proved to be very popular.

The guide is avaible from: **Peter G. Rayer, 6 Firbank Road, Bournemouth BH9 1EL.** Priced at £3.00 (UK) £3.25 (overseas), cheques to be drawn on a UK bank and made payable to, P.G. Rayer.

Car Keys & Trafficmate On The Move

There's good news for transmitting amateurs and other radio enthusiasts concerned at the recent bad publicity the hobby has been getting because of the interference caused to car 'radio keys' operating within the shared 430MHz Amateur Band.

In particular the British 'tabloid' press has been publishing ill-informed and poorly researched news stories, and the problem has drawn unfavourable comments from uninformed sources. But good news has now come in the form of a statement from the Director of the Radiocommunications Agency's Radio Investigation Service **Barry Maxwell**.

Rob Mannion G3XFD, Editor of our sister magazine *Practical Wireless*, contacted Barry directly to clarify the situation regarding u.h.f. car 'radio keys' and the 'Trafficmate' service.

Barry Maxwell stated that: "The Agency's position is that the industry was consulted when the 433MHz frequency band was introduced for vehicle security systems some years ago and they were fully aware at the time of other services using these frequencies. Vehicle security systems currently use the frequency band in the United Kingdom on a secondary basis, and 433MHz is a harmonised European frequency, introduced to cater for the specific needs of vehicles travelling throughout Europe.

The Agency recognises that interference may be caused to vehicle security systems by Amateur Radio beacons or repeaters, especially in remote areas. The Agency is working through the European routes available to try to find an alternative frequency on which vehicle security systems can operate. Until then it is the responsibility of the manufacturers to develop equipment that is able to operate on a frequency band shared with other users".

In a separate statement, the Radiocommunications Agency have announced forthcoming frequency changes for the u.h.f. based 'Trafficmate' radio information system which has been causing interference to the Amateur Radio service.

The RA statement says: "Trafficmaster are operating the 'Trafficmate' system on 433.92MHz at present and the system is required to comply with the spectrum management parameters on MPT 1340. This is a temporary frequency allocation and an alternative frequency has now been found for the 'Trafficmaster' network. All 'Trafficmate' transmitters and receivers will be required to operate on the new alternative frequency after the 31st of December 1998.

Radio and T3V DX News

TVDXers should keep a lookout during Silverstone race meetings as Independent Visage Productions have been contracted to offer the Silverstone trackside TV service. The transmissions on chs. E47/49 will cover the 800 acre site under an NTL seasonal broadcast licence intended for spectators' portable TVs and hospitality venue monitors. At least four of the 1996 meetings will be locally broadcast including the British Grand Prix and the British Touring Car Competition. We'd appreciate any readers reception reports from the North Bucks area!

The gradual move away from satellite TV reception to locally (vetted) terrestrial programming continues in Bahrain with a further ten TV channels being added to the present 20 channel package available via the local MMDS service (terrestrial microwave distribution at 2.5GHz). The new channels will add further subscription choice (PAY-TV) and derived largely from government endorsed programme sources including satellite.

The Swedish Kinnevik in partnership with the Latvian TV3 company failed in their attempt to win the franchise for the third national channel in the Baltic state, instead the channel has been awarded to local group LNT.

A giant medium wave transmitter is to be installed in South East Asia for the Voice of Vietnam by American company Harris Broadcast. The solid state transmitter will run 2MW, previously Harris had supplied their largest m.w. transmitter at 1MW to the Voice of America in Thailand.

Radio ABC

Radio ABC/Denmark Starts Short Wave Broadcasts

In Europe, short wave broadcasting has been dominated by governmental and religious radio stations for many years. But now there's a private station offering a fresh alternative.

Radio ABC in Denmark commenced regular transmissions on short wave Saturday June 23 1996. The station will be on the air every Sunday at 0900-1300 British time on the frequency of 7.570MHz in the 41 metre band. The programmes will be in English and will consist of music, entertainment and information. The official Danish Airplay Top 30 will be aired every Sunday at 1100-1200 British time.

Radio ABC is one of the most successful independent, commercial radio stations in Denmark. It started broadcasting in 1990 and now offers three different services in Danish, 'Radio ABC/Ostjylland', 'Radio ABC/Nordjylland' and 'Radio Alfa' on a number of f.m. frequencies for Eastern, Central and Northern Jutland. Radio ABC has the second highest daily audience of the commercial radio stations in Denmark, with 300000 listeners.

The new programmes from Radio ABC/Denmark on 7.570MHz, which are being transmitted from Kaliningrad in Russia with a power of 120kW, is expected to be heard all over Europe with very good quality. In recent years there have been a large increase in sales of portable World Band Receivers from companies like Sony, Grundig and Sangean, mostly of quite good quality, so Radio ABC/Denmark is expecting a large following to the new programmes.

Letters from listeners are welcome. The address is Radio ABC/Denmark, PO Box 174, DK-8900, Denmark.

Up-to-date information on Radio ABC and the new short wave broadcasts on 7.570MHz is available at **http://www.radioabc.dk**

LOWE ELEC

Shortwave, Airband and Scanner Superstore

THIS MONTH'S SCANNER SUPERDEALS

MVT7100EX

Now with CE Approval!

Customers will have noticed that the range of available scanners has been drying up over the last few weeks, basically because various importers seem to be dragging their heels over this vital issue.

We are pleased to announce the MVT7100EX is the ONLY scanner with SSB to pass the tests so far!

They are now available from stock right away but do get in quick as we expect demand to be very high!

JUST £349.00

SRX50

The SRX 50 is an ideal receiver for those wishing to discover the world of short wave broadcast stations. Despite its low price, the styling is elegant and the performance is equal to many other sets costing two to three times as much! The major short wave bands are covered allowing reception of many countries with built-in telescopic antenna. Local radio is also covered by the inclusion of Long Wave, Medium Wave and the VHF-FM broadcast band. Reception of VHF is in stereo through the supplied earphones. With a 24hr clock display with alarm and sleep timers, the SRX50 would make a great travelling companion too.

- Covers 5.9 to 15.5 MHz short wave
- Includes LW, MW and VHF FM
- Memory channels
- 24hr digital clock with alarm and sleep facility
- Telescopic whip
- Ferrite rod antenna for LW and MW
- Clear LCD digital frequency display
- UP/DOWN tuning control with search tuning

Just £39.95 plus £3.00 postage

NEW

Shortwave Eavesdropper CD ROM
Thousands of frequencies plus more!
Just £25.00

OPTO SCOUT JUST £399.00!

STOP PRESS!

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ICOM UK

This month our regular expert contributor John Wilson takes a reflective look at one of the major Japanese communication equipment players.

It has always seemed to me that ICOM, although producing a string of very good receivers - some of them unique, don't seem to have the prominence in the short wave listener market that they justly deserve. So I thought that a little of the early history of the company might be of interest to *Short Wave Magazine* readers, and since I am in the fortunate position of having been involved in those formative days, I may have some interesting tales to tell.

By one of those strange coincidences in life, Bill Lowe began trading as an amateur radio dealer from his garage in Matlock in the early 1960s at about the same time as a young Mr. Inoue started his company in Osaka and Mr. Hasegawa founded Yaesu Musen in Tokyo. At that time, these were the initial stirrings of what was to become a Japanese manufacturing dominance, and it wasn't long before Bill, who was probably the first importer to realise the quality of Japanese products, met and became a friend of Mr. Inoue. When the first Inoue samples came from Japan and I took a look at them, I was immediately impressed not only by the quality of engineering and production but also by the cleverness of the electrical design which bore the clear hallmarks of a very fine brain, and it wasn't long before we began importing and selling the Inoue range of equipment. Not that there was much of a range; we began in 1968 with the IC-700R receiver and shortly thereafter the matching IC-700T transmitter which together made a nice amateur band transceiver. No such thing as a general coverage short wave receiver from Inoue in those days for then, as now, he had a definite leaning towards amateur radio equipment. Before telling you why I thought that the IC-700R was brilliant, let me try to paint a picture of the radio hobby world in that year.

Oh, the swinging sixties!

In January 1968 the magazines carried advertising from G.W.Smith: Ah, do you remember that wonderful shop in Little Newport Street where you could find shelves full of brand new Partridge transformers and cheap components, and could be insulted to your face by assistants who couldn't care less if you stayed or went away. Derek Smith is reputed to have said that he didn't bother with time wasters because "A thousand mugs a week pass through this door". London hasn't changed much over the years has it? However, G.W.Smith were advertising the Trio 9R-59DE (£35) and JR-500S (£59), the Lafayette HA-350 (£67.10s) and HA-700 (36 Gns), alongside surplus B-40s and Collins TCS-12s. In June of that same year, B.H.Morris shook us up with the Trio TS-500 (£203), and of course KW Electronics were riding high on the KW-2000A (£220) and KW-201 (£105). If you think that the prices were low, the same magazines had jobs advertised for Degree qualified Experimental Officers for the Science Research Council at a salary of £809 p.a. rising to the dizzy heights of £1300, so the chap buying a KW-2000A had to spend four months gross pay to get it....You will also note the carefully pitched price for the TS-500 against the British KW-2000A.

So what about Inoue? In May 1968 we saw the first advertising mention of the IC-700R at £85, with the IC-700T at £80, and a package price including the power supply unit at £180. At this time, Bill Lowe was putting most of his efforts into the Sommerkamp equipment (made by Yaesu Musen but sold via Im. Sommerkamp in Germany; and that's another fascinating story), so the single model Inoue range took second place, even though it warranted one full page splash in the RSGB Bulletin in November of that year. But why did I like that little receiver?

Well, it was small and attractive; well laid out with a minimum of controls; ran from either 240V a.c. or 12Vd.c. and it performed really well. The front end design, bearing in mind all the current discussion about preselectors and their use, was brilliant. The preselector control covered the entire range from 3 to 30MHz and the cleverness was in the way Mr. Inoue had mechanically coupled a twin-gang tuning capacitor to a permeability tuned coil rack so that optimum L/C ratio was maintained across the range. I haven't seen another receiver since then which employed this innovative and very effective design; perhaps no-one else has been able to do it? The IC-700R was well to the fore in other areas of design, particularly in the prolific use of f.e.t.s which were then quite new devices. The r.f. stage used two MK-10 f.e.t.s in cascode (note, not 'cascade') configuration, and another advanced feature (for Japanese equipment) was the use of single conversion to a 9MHz i.f., where a very good crystal filter provided s.s.b. selectivity of a very high order (shape factor 1.8:1). No provision was made for an a.m. filter, although an a.m. detector was included and c.w. selectivity was taken care of by sharp audio filtering.

The local oscillator was built in a totally enclosed rigid box, because these are the days before phase locked synthesis and the oscillator therefore was a free running, but very stable v.f.o. The alignment of the oscillator caused me many sleepless nights because each band covered had two coils, one of which set the operating frequency and the other the frequency span. The adjustments were completely interdependent, and you could spend hours chasing up and down the band getting it right. If you started the adjustment sequence in the wrong order you would eventually run completely out of adjustment range and have to start all over again. Anyone who has an IC-700R with tearstains on the top cover will now know that they were mine, shed during the long night hours of alignment!! But what a little beauty of a receiver, and

- The Gentle Giant

what a fine example of a keen design brain, running ahead of the rest.

The next Inoue design to hit the streets was the IC-2F, which was a crystal controlled 2 metre f.m. transceiver. This appeared in 1968/9, and came into a market which was built on modified surplus Pye a.m. radio telephones and operating techniques which involved the transmitter sitting on a single crystal controlled frequency - any frequency in the band would do, depending on what surplus crystal you happened to have - and calling "CQ, tuning high to low" whilst tuning a (usually unstable) receiver across the entire 2 metre band. The very idea of having crystal control for both receiver and transmitter, and God help us, f.m. transmissions in the a.m. dominated wide open 2 metre band - it was close to heresy, and warranted excommunication from the RSGB if you were caught doing it. However, it was the forerunner of what radio amateurs now see as quite normal, and because of the excellence of the Inoue design the IC-2F became rightly regarded as a fine piece of equipment; totally reliable, easy to use and at an affordable price.

But - and it's a big but, the manufacturer making all the running as we entered the 1970s was undoubtedly Yaesu Musen, and a distributorship for Yaesu was a prize worth having. Despite the unfortunate business practice of always appointing two 'sole' distributors who then fought each other by submitting ever larger orders in the hope of knocking out the other, Yaesu were experts at giving the customers what they wanted at the time, whereas Inoue was always ahead on design but probably too far ahead of the mass market appeal. Everyone, and particularly Lowe, concentrated on marketing Yaesu Musen and I have to say that as I look back on the Lowe advertising for the period from 1970 to 73/4, Inoue was treated pretty shabbily by its UK distributor. But change was coming.

End of the line; all change

In 1974 the major amateur radio dealers in the UK had a surprise visit from representatives of the Trio company. Trio had decided that having their audio distributor handling radio equipment was not satisfactory and were looking for a specialist company to improve their image in the market. I have to say with some pride that the technical facilities which I had built for Lowe were the deciding factor in Trio offering us the UK distributorship, but we were doing so much business with Yaesu that Bill at first refused the offer. However, when we went to Brussels and saw the new range of Trio products we rapidly reconsidered accepting the Trio package. Now the twist in the story of ICOM. An obvious condition of taking on the Trio distributorship was that we would have to relinquish our connection with Yaesu, but when Bill asked "what about Inoue?", the Trio reply was that since Inoue was so very small, they didn't consider him a competitor so Lowe could continue distributing ICOM equipment. In a moment of amazing largesse, we voluntarily gave up the Inoue distributorship as an act of good faith to Trio....Well, everyone makes silly decisions at times, but with the benefit of hindsight this must rank alongside the charge of the Light Brigade or the Gallipoli landings as one of the world's daftest moves.

> "Kent, in the commentaries of Caesar writ,
> Is termed the civillest place of all this isle."
> (King Henry VI. Part 2)

We had been supplying two good chaps in Kent with Inoue v.h.f. products for some little time, and they were operating in the time honoured British fashion 'out of a garage'. Unlike Lowe, Paul Nicholson and Dave Stockley were concentrating on the Inoue range and like me were impressed by the design and quality of the equipment. When the news broke of the Lowe switch to Trio, and the decision to effectively abandon Inoue, they seized the opportunity to make a direct approach to Mr. Inoue, and Paul later told me that Inoue was very upset by the situation and had 'no friends in the UK'. Paul and Dave offered, in a masterly move, to be those 'Friends in the UK', and in August 1974 the *RadCom* magazine carried simultaneous advertisements announcing the Lowe/Trio arrangements and the first appearance of Thanet Electronics as the ICOM distributor for the UK. Now, after 22 years have elapsed, Mr. Inoue still has his 'Friends in the UK' and the partnership has been an outstanding success.

But what of the equipment? In 1974 the top model in the Inoue range was the IC-210 transceiver for 2 metres, and as always the design was well ahead of the times. Other manufacturers had started to use phase locking techniques but only to provide stepped channel frequency coverage

continued on page 20 ▶

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NRD-535	As new incl E.C.S.S.	£1199.95	OPTO- SCOUT	As new	£299.95	PRO-38	Handheld scanner £79.95

BOOK REVIEWS

1

The New Russian Space Programme
by Brian Harvey.
John Wiley & Sons, Praxis Publishing.
ISBN: 0-471-96014-4 Hardback.
Price £25.00

Brian Harvey has written a number of articles about the Russian space programme, an early one of which provided my first insight into the nature of the equipment on board the oceanographic satellites of the COSMOS and OKEAN series. This new book takes the reader from before the start of the space age - if we define that as the launch of Sputnik-1 - and describes in considerable detail early Soviet research into rocketry, and on to ever more sophisticated satellites.

It is divided into three parts, each consisting of three or four chapters. Part one describes the beginnings of the Russian space programme, its golden years and on to the Moon race.

A text of the work involved in building the Baikonour Cosmodrome could be tedious but Brian Harvey conveys the atmosphere of the place, as well as the reasons for its construction. Apparently its predecessor was Kapustin Yar which was considered to be too near the Turkish border and therefore open to electronic eavesdropping. Brian explains that the name Baikonour was an early example of the Russians deliberately misnaming the location; the cosmodrome was 370km away from the real town of that name.

The Kruschev era, the launch of Sputnik-1 (also known as PS 1, or Preliminary Satellite 1) - is described in chapter one. The detail given about apparently well-known events makes one realise just how little was actually released to the public at that time. Spaceship 2 (Vostok B) was a recoverable biological version. Such is the detail - the names of several dogs taken from the Pavlov Institute near Leningrad are given - and a description of their satellite environment. This satellite was successfully launched on 19 August 1960 carrying two dogs - Belka and Strelka - and TV cameras were carried to monitor them. Re-entry was completed successfully on 20 August and the capsule landed in a meadow. The book reveals that there was a message inside requesting that whoever found the capsule should immediately contact the Soviet space centre!

Later chapters continue the theme of providing what seems to be a first-hand account of this early phase of the Russian space programme. The electrifying effect of the successive firsts achieved by the Russians: the first man in space, the first woman in space, the first two-satellite rendez-vous!

Part two explains more of the behind-the-scenes activities and details the fleet of space vehicles, including spaceplanes and shuttles. There is a list of Russia's six basic rockets, and Brian explains how their characteristics helped western experts predict their carrying capability and likely cargoes.

Anti-satellite

A fascinating insight into the military hardware built during the sixties is given. The Satellite Interception System (SIS), also known as hunter-killers, and later developments are described. COSMOS 248 had an apparently normal launch on 19 October 1968, and COSMOS 249 followed it into orbit the next day. After various manoeuvres, 249 intercepted and passed 248 and was then blown up. The Russians had demonstrated anti-satellite weapons!

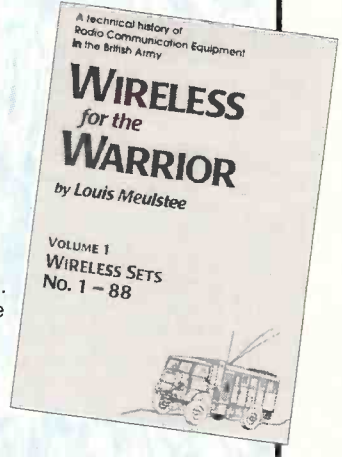
Within the Soviet Union, the effects of the changes which took place during the eighties are described and the author has obviously obtained considerable information to be able to say that some government departments only received a small proportion of the money allocated to them for their space projects.

A comprehensive description of Russian scientific and communications satellite programmes is given, and in a very readable manner. Familiar names such as METEOR and ALMAZ are covered, and the pictures are clear and well-captioned. The final part concentrates on MIR and living in space. The more recent international joint ventures between the Commonwealth of Independent States and other nations are detailed, making this book an invaluable reference work. If you are interested in the CIS space programme, this is £25 well spent.

Lawrence Harris

2

Wireless for the Warrior Volume 1
Wireless Sets No. 1 - 88
by Louis Meulstee.
GC Arnold Partners.
ISBN: 1898805 08 3 Softback
Available from *SWM* Book Store £27.50 plus £1.00 P&P.



This fascinating book - the first in a projected series sub-titled 'A Technical History of Radio Communications Equipment for the British Army' - is the outcome of some 15 years of dedicated research by the author.

The book starts with an introduction to the subject and a chapter explaining the varous Type Nomenclature systems used by the Army for their radio sets. Having got that out of the way, the book gets down to the detail of each wireless set covered.

Each wireless set is described in detail, starting with WS No. 1 of 1933 and going up to WS No. 88, which appeared in 1947. However, if you are particularly interested in WS No. 88, you will have to wait until Volume 2 appears in the first quarter of next year for the main details. A table summarises the technical specification, circuit diagrams are reproduced from the original documentation and photographs are used to enhance the description of the history, development and uses of each set. A series of Appendices - Glossary of Terms, Condensed Data of Equipment, Accessories List, Army Valves Designation and Equivalents and Table of Frequency Coverage - concludes the book.

I found the book to be a fascinating insight into the development of the 'Wireless Set'. For anyone who is interested in Army radio equipment this book will prove to be an invaluable reference work.

Dick Ganderton

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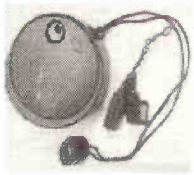

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200 Channel Scanner with 25MHz continuous to 1.3GHz coverage.
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OUR PRICE
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Grundig Yacht Boy 400

- 40 Memory channels
- Signal meter & carrying case
- 1.6 - 30 MHz
- Full s.s.b

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Free S.W. Antenna worth £14.99, FREE Batteries, FREE Short Wave Frequency Book & FREE Headphones.

PRO-2039 Base Scanner

200 channels with Hyperscan system which lets you scan at 25 or 8 channels per second. High speed search facility locates new and unlisted frequencies at a flash. Coverage: 68-88, 108-136.975 (AM), 137-174, 380-512, 806-960MHz. This radio comes fitted with external aerial socket.
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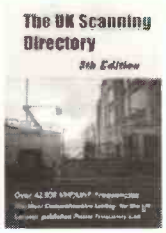

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AOR 2700 Scanner
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Due to a massive commercial order we are able to offer this brilliant new scanner at a fraction of normal cost!

But hurry, supplies are very limited!

uniden

It was the Uniden Bearcat Range that introduced the world to scanners, back in the seventies. They've been making high grade scanners ever since, just take a look at their current product range:

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If all scanners were manufactured to this level of build quality, life in our workshops would be a lot quieter!

- O 400 channels
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ONLY £245.95

BC 9000XLT

Recently supplied to a government department, the new base scanner from Uniden is a professional tool offering serious performance at an affordable price.

- O 500 memories
- O 25-1300MHz (550-760MHz TV video band blocked)
- O Keypad entry
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Noise reduction?

Suffering from power line noise? Got a noisy street lamp or thermostat clicking away? Slip in line the ANC-4 and see it disappear. If not send it back and get a refund! **RRP £195 incl. p&p.**

NOW AVAILABLE FROM STOCK

Welz WS-1000

NEW

This amazing little unit is a full blown scanning receiver capable of covering everything from 500kHz to 1300MHz with no gaps. Not only is it the smallest scanner you've ever seen, it's the lightest too. Closer in size to a box of matches rather than a pack of cigarettes, the new WS-1000 from Welz-Diamond is technology in its extreme. Take a scanner with you where you wouldn't have bothered before.

specification

- ▶ 500kHz-1300MHz
- ▶ AM/NBFM/WBFM
- ▶ 1/5/6.25/9/10/12.5/15/20/25/30/50/100kHz steps
- ▶ 400 memories ▶ Skip search
- ▶ Power voltage from only 2.2-3.5V DC
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- ▶ 16mA power save 1 sec.
- ▶ Weight: 200 grams incl. batteries & antenna

Price: £349.95 incl. VAT & FREE postage
Available on FREE FINANCE:
£49.95 deposit & 12 payments of £25.00

AR-8000 UK

The best scanner on the market. Don't argue. My scanner man Graeme said so. To find out why, give him a call. Even if he does spell his name rather strangely.
RRP: £410.
ML PRICE: £399.
Super low finance available from only £27.50 per month!

The New AOR AR-7030

Probably the best engineered receiver in the world. Including a FREE FIVE YEAR WARRANTY, only available from MARTIN LYNCH.
RRP: £799.
Deposit: £99.
12 payments of £64.28.
Cost of loan: £71.45

FREE 5 year warranty

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USED EXAMPLES AVAILABLE FROM ONLY £399
Call for availability

Retailing at £599, the new receiver from Yaesu takes some beating. At £499, its an even better buy!
RRP: £599.
NEW LOWER ML price CASH/SWITCH £469. Super low cost finance available from only £36.66 p/m!

Opto Electronics Scout

The most innovative product for scanners of 1995? Connect this little frequency counter up to your AR-8000 and see it make the scanner jump onto a frequency that its literally just "sniffed" out of the air! Termed "Reaction Tune", it has many uses both for the hobbiest and commercial user.
RRP: £449. ML Price: £369 Super low cost finance available from only £27.50 p/m!

Drake R-8A

One of our best selling shortwave receivers and one that you do not have to spend hundreds of pounds on additional filters. It has them all fitted!
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The New AOR AR-5000

For those who take the entire radio spectrum very seriously. The AR-5000 covers 10kHz through to a staggering 2600MHz! All mode base receiver, setting new standards in all band performance.

RRP: £1749. **Lynch Price: £1569.**

Deposit £269, 12 payments of £119.39.
Cost of loan: £132.70 or
Deposit £269, 24 payments of £65.13.
Cost of loan: £263.12. (APR 19.9%)

Global AT-2000

A superbly built SWL antenna tuner for improved receive performance. Built in Q selector. **£95.**

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Kenwood R-5000

When someone buys an R-5000, they want a radio to last them a lifetime. Better than this, the R-5000 holds its value like no other Shortwave receiver. Take a look at our new package deal:

RRP: £1059. **Lynch Price: £899.95**

Deposit £99.95, 12 payments of £73.47. Cost of loan £81.64 or
Deposit £99.95, 24 payments of £40.08. Cost of loan £161.92 (APR 19.9%)

Add an SSB narrow filter for only £61.95!

Lowe PR-150

Matching the HF-150, a preselector can greatly enhance reception of weaker signals, that would otherwise be lost in the noise caused by stronger signals. They really do work. Suitable for most other receivers. Ask for details.
NEW LOW PRICE: £199.

Icom ICR-7100HF

The ONLY company who can offer you an ICOM UK approved HF modification, enabling the receiver to cover 500kHz to 2GHz, with no gaps!

RRP: £1549.
Deposit £349, 18 payments of £72.22, ZERO APR.

Timewave & MFJ DSP Filters

DSP 9+
DSP 59 *DSP 599zx *MFJ-784B

NEW LOW PRICES

Digital Signal Processing will enhance any receiver performance by removing one main ingredient - NOISE! If you haven't heard a DSP unit work, then call into the London Showroom for a demo. Alternatively, order by mail order and if it doesn't impress you, return it for a full refund of the purchase price. How's that for confidence?

MFJ-784B All mode Tunable DSP £229
DSP 9+ All mode DSP at only £189
DSP 59+ As above but more features £249
DSP 599zx NEW! Hyper speed processor, alpha display and more £349

Lowe HF-150

We sell as many to commercial users as we do to enthusiasts. The best built, best performing receiver under £500.

RRP: £419. Deposit £59, 12 payments of only £30, ZERO APR.
why not add a keypad for fast frequency access? only £44.95.

NEW...Opto Xplorer

Scan the entire FM spectrum between 30MHz & 2GHz in less than 1 second and hear it, see it decode it, map it and record it! It's bloomin' amazin'! Call our FaxBak service for more information.

AOR AR-3000A

Lots of different versions being offered, but make sure you are buying one sourced through the U.K. distributor. We only sell this model supplied by AOR U.K. Ask before you buy elsewhere! RRP: £949. **Lynch Price: £849**
Deposit £149, twelve payments of only £64.28. Cost of loan: £71.45 (APR 19.9%)
Also available the "PLUS" version. Please add £46.

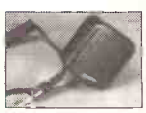
MVT-7200

The alternative to the AR-8000. If you liked the old MVT-7100, this new enhanced version should fit the bill.

RRP: £449. ML PRICE: £399 and FREE FINANCE! deposit £99, 12 payments of only £25, ZERO APR.

Look-alikes

Police look-alike Lapel speaker



Suitable for most scanners on the market.
Only £11.50 incl. delivery.

Police look alike Earpiece

MyDEL P-300

As used by many government establishments throughout the world, the new MyDEL P-300 easy to wear "over the ear" earpiece is available now, including FREE P&P. (State which scanner the P-300 is for when ordering).
ONLY £9.95 p&p FREE!

Garmin GPS-45

Due to an overwhelming demand, we've decided to stock this important device. Locate your latitude/longitude national grid to within an amazing 49ft accuracy! Lots more besides, **only £289.**

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NEW PRODUCTS

Designed and built by Rosetta Labs in Germany, the WinRadio PC card is a complete scanning receiver which actually fits inside your PC!

AS REVIEWED BY MR. BOB TOMALSKI

- Covering 500kHz - 1300MHz
- All-mode including SSB
- Tuning steps 500Hz - 1Mhz (fine tune with b.f.o.)
- Supplied with Windows software, with impressive graphics and on-line help

System Requirements: PC with minimum 386 processor, DOS 3.3 or higher, Windows 3.1, 640k of RAM, (4MB for Windows).

ONLY £399.00 including VAT & Carriage

MARTIN LYNCH WEB SITE
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MyDEL Optima ACARS receiver

Designed exclusively for Martin Lynch, this new receiver releases your expensive scanner from monitoring1 frequency for reception of ACARS. All that is required is 12 volts DC input, and an external antenna. The Optima will then give you audio direct into either ACARS decoding software, or our Universal M-400/M-1200 decoder. It's that simple! **RRP: £129.95**

AEA FAX 111

Why wait for the weather reports?
AEA FAX 111 is a package containing a small demodulator & DOS computer software that lets you receive grey scale HF weather FAX images, (which you can later colour). It also decodes CW, RTTY & NavTex. All you need is an SSB receiver and an IBM compatible PC. **RRP: £119.95.**

Datong Active antennas

AD-370/270 The pair of Active Aerials were originally designed for the Royal Navy several years ago and to date, no other manufacturer has been able to offer such performance from a compact design.

If you are stuck for space and need a good high performance SHORTWAVE ANTENNA then order yours today!
Datong AD-270 (internal) £59.95 **AD-370** (external) **£79.95 p&p £10.**

CASIO QV-10A LCD DIGITAL CAMERA

NEW MODEL

A neat palm size digital storage camera which can store over 90 full colour digital images. Import the picture into your PC with the supplied interface cable & software for either IBM compatible or MAC machines. Ideal for reprinting images on the Internet, SSTV via JVFAX and lots more. Outputs include direct video and serial for PC connection. Supplied with all accessories including Software & Cables.

RRP £799 Lynch Price £479
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Cost of loan: £40.83 (APR 19.9%)

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TRIO

TRIO ELECTRONICS INC.

During recent months our Representatives have visited major Amateur Radio distributors in the U.K. with a view to appointing a Sole Agent to handle our exciting new range of Amateur Equipment.

The major consideration in making the appointment is that the distributor must set the very highest standards of after-sales service which implies workshop facilities capable of maintaining such standards.

We have pleasure in announcing that we have chosen LOWE ELECTRONICS to be our appointed U.K. Sole Agent for Amateur Equipment.

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RADIO COMMUNICATION August 1974

From page 13 ▶

at v.h.f. (remember the FDK Multi-2000). The IC-210 in contrast, phase locked a v.h.f. oscillator to a tunable low frequency v.f.o. so you could properly tune the entire band just like an h.f. receiver. The overall design was extremely attractive, and the general appearance of the IC-210 set the styling pattern for all the later ICOM products; a style which was still evident in the R-70 and R-71 receivers. The competition for the IC-210 was coming from Yaesu with the FT-220 - Aaagh - we sold off the last of our stock at about £80 each on the understanding that we never wanted to see them ever again. In many ways the FT-220 was the equipment equivalent of the Titanic, and without doubt one of the worst horrors I ever encountered. I'll probably have nightmares tonight just remembering it. However, Trio had produced the TS-700 which was by no means as electronically elegant as the IC-210 but was multi-mode thus giving s.s.b., a.m. and f.m. all in one box, and it did cost £325 against the £280 of the f.m.-only IC-210. As a footnote to 1974, that year of change, it was ironic to read again the announcement in December of the appointment by Yaesu Musen, in their accustomed style, of two 'sole' distributors for the UK in the companies of Amateur Electronics UK and Western Electronics UK. In my opinion the resultant battles between these two companies in their attempts to become the only 'sole' distributor eventually destroyed them both, and I have to ask "Where are they now?"

As far as the short wave receiver market was concerned, we had to wait until October 1982 for the announcement of the new ICOM R-70, whereas Trio had for some time made the running with the R-1000. The R-70 came into the market at a price higher than the R-1000 but at half the price of the Drake R-7, with which it was going to be compared. Despite some questioning review results from America relating to close-in intermodulation performance, the R-70 placed Icom back on a successful receiver track, and the later R-71 more than justified the faith which Thanet had placed in Mr. Inoue, even allowing for the slight contretemps which I mentioned last month regarding the passband tuning patents. The big, and I do mean **big** surprise came with the introduction of the ICOM R-9000; a bold move on the part of Inoue, and a leap to the top of the receiver charts for the company. Yes, it's an expensive receiver but the facilities provided by the R-9000 are staggering, particularly the use of a monitor type display which in addition to all the normal receiver functional readout, also gives access to spectrum analysis and even TV reception. The staggering frequency coverage from l.f. right through to 2GHz was quite unprecedented, and all in all the R-9000 showed (and still shows) to the world that Inoue was still out in front when it came to advanced design.

The current range of ICOM receivers includes the R-72 for h.f. general coverage and the R-7100 covering 25MHz to 2GHz. New on the horizon is an R-8500 which will bring some of the R-9000 features and performance down to a price the individual might afford, and which will surely incorporate that continuing commitment to design which has always characterised designs from the ICOM stable. I look forward to it with interest.

Why did I call ICOM UK 'The Gentle Giant'? It's obviously now big enough to be called 'Giant', but gentle because since Paul Nicholson and Dave Stockley decided to be Mr. Inoue's 'Friends in the UK', the company has kept close to its original principles of friendly knowledgeable service, clear and unambiguous policies towards supplier and customer, and a determination to be above all else, totally honest in all its dealings. Unlike other companies which boast about how great they are, ICOM UK has concentrated on steady growth without advertising hyperbole, although in my own view their modest advertising approach to the short wave hobby market has resulted in an undervaluing of the excellent products coming out of Osaka - but the modesty is in the company character. Behind the scenes, ICOM UK have had substantial success in the professional fields of h.f. communications and v.h.f./u.h.f. commercial radio, but this has not deflected them from their attention to all their customers, professional or hobby, and it is manifestly obvious that the basic principles laid down by the original two partners are being closely observed by their staff, led now by Philip Hadler. Just as Mr. Inoue kept pushing forward as new technology developed, so ICOM UK has been swift to take up all aspects of advances in communications, but always to the benefit of their customers. You may well feel that I like the company a lot, and it's absolutely true. Some years ago I had informal discussions with Paul and Dave about the possibility of a joint company involving both Lowe and ICOM. In the event we felt that we would be better keeping our respective allegiances to ICOM and Trio-Kenwood separate, but at the time I really believed that the combination of their principles with my technical

OM

team backing up both ICOM and Trio equipment would have been unbeatable.

Now 'ere's a funny thing

The 'Big Three' Japanese manufacturers are represented in the UK market as Trio-Kenwood UK Ltd., Yaesu UK Ltd., and ICOM UK Ltd., so one might assume that they are all of the same status - not so. In late 1991, the Kenwood Corporation of Japan having moved into the UK and opened a large headquarters near Watford, discontinued its long standing distributorship agreement with Lowe Electronics, thereby reducing Lowe to the status of "Just another dealer" which is what they now are. Kenwood were followed by Yaesu who did the same thing to their distributor South Midlands Communications, now "just another dealer". However, ICOM UK Ltd. is still a genuine UK company in the hands of its original founders, and such has been the relationship between ICOM Japan and the 'Friends in the UK', that this arrangement has survived. However, I can say from personal experience that when the sword falls, it falls without warning and I would refer those interested to the prophetic words of Coleridge:-

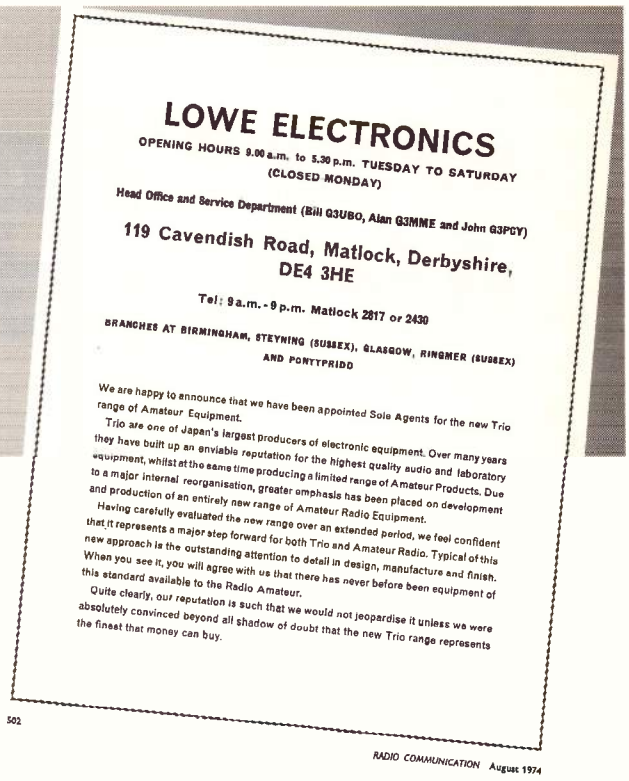
"Like one, that on a lonesome road
Doth walk in fear and dread,
And having once turned round walks on,
And turns no more his head;
Because he knows a frightful fiend
Doth close behind him tread."

And so to other things

When checking references for this article I came across two interesting things; well, you know how it is, you look for an old advert, and find yourself reading an article which you had forgotten about but which has particular relevance today. The first one was a comment by Larry Magne in his review of the ICOM R-71 receiver (but referring to the earlier R-70):-

"A common complaint from European users of the R-70 concerns its apparently low dynamic range, even though standard lab measurements of the R-70's dynamic range have showed it to be quite good. One possibility we considered for this anomaly is that long established laboratory measurement norms - including ours - could be providing misleadingly reassuring figures."

Bearing in mind that this was written in January 1988, it's somewhat surprising that it is only in the last few months that the subject of variable test results on receivers has once again emerged as a discussion topic, and because of the furore generated by the now discredited Radio Netherlands review of the AR7030 receiver, I am involved in a world-wide discussion about alternative methods for testing receiver performance; methods which would hopefully produce repeatable and meaningful performance data which anyone could understand. F.O.U.L. club member JHCW is proving very imaginative in this discussion, and has raised some interesting suggestions as to how to arrive at a generalised 'figure of merit' for any receiver and I'm being dragged further and further into what, after all, was my own field of expertise before I 'retired' to North Devon. I'll keep you posted on any progress made.



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Trio are one of Japan's largest producers of electronic equipment. Over many years they have built up an enviable reputation for the highest quality audio and laboratory equipment, whilst at the same time producing a limited range of Amateur Products. Due to a major internal reorganisation, greater emphasis has been placed on development and production of an entirely new range of Amateur Radio Equipment.

Having carefully evaluated the new range over an extended period, we feel confident that it represents a major step forward for both Trio and Amateur Radio. Typical of this new approach is the outstanding attention to detail in design, manufacture and finish. When you see it, you will agree with us that there has never before been equipment of this standard available to the Radio Amateur.

Quite clearly, our reputation is such that we would not jeopardise it unless we were absolutely convinced beyond all shadow of doubt that the new Trio range represents the finest that money can buy.

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RADIO COMMUNICATION August 1974

Second thing: In an issue of *RadCom* I found an article by Dr. David Tong (D.A.Tong - does it sound familiar?) Yes, it's the same chap. The article discussed the design of helical antennas with helix diameters less than half a wavelength at the operating frequency - in other words the familiar helically wound 'rubber duck' antenna you see on v.h.f./u.h.f. scanners. David took the article further and gave workings for similar helical antennas on lower frequencies, such as the h.f. amateur bands, and by using his figures I calculated that a helix wound for 7MHz with a diameter of 125mm would require about 50 turns to resonate. Why did I do this? Because about three years ago I was presented with a so-called short wave antenna which claimed to have elliptical polarisation (as does a v.h.f. helix as described by Tong), and work across the whole short wave spectrum when it was actually constructed as a wide spaced six or seven turn coil of about 125mm diameter made out of alloy tubing. At the time I voiced my doubts about the claims made for this 'antenna' but my objections were ignored and the thing went on sale, so it was a pleasure to have my doubts confirmed by David Tong's article. Not only would a proper helix require 50 or so turns, the resultant *Q* of the device would be so high as to have a very limited h.f. bandwidth, and not to put too fine a point on it any user of the expensive six turn helical would probably get equal results by using a classic Mark I Cortina bent coat hanger stuffed into a PL-259. This is not the first time that the company producing this antenna have been caught out making fanciful technical claims.

Caveat Emptor my little chickens.

West Pacific Airband Scene

This month we bring you part two of an update to the Pacific Airband Scene feature in SWM March 1994 that concentrated on activity in the East Pacific. The following describes what is happening throughout the aeronautical bands to the west of the area, monitored by Bob Ball from a gas carrier running between Western Australia and Japan.

West Pacific - Honolulu - 'Guam Area'

For what are known as "Guam Area" flights the boundary with Tokyo is along 21°N and flights cross at RISBA, the most Eastern point and working Westwards, ATIGO, TEGOD, OMLET (the busiest by far), MONPI and finally PAKDO. The next point to the West is with Naha (Okinawa) at KEITH (for flights into Okinawa itself) and then SANDE (for flights to Taipei).

Oakland's FIR then continues down 130°E, which is the boundary with Manila, flights crossing at TIDEL, ENDAX (Guam-Manila), ISGOG (Koror-Manila) and MEGOL There are no fixed reporting points along the adjoining FIR in the South-western corner, which is Ujang Pandang and this roughly follows along the meridian 3'30"N. The boundary with Port Moresby is along the equator between 141°E and 160°E, flights crossing at ATPET, PIKOK, GOULD, ADBON and USRAY. The Southern boundary is then shown on the recent Aerad chart as being along 3'30"N and being controlled by Nauru between 160°E and 170°E, whereas fact flights are handled by Honolulu, passing into this area at KAGLI, MANOT, TASAK, KASKU, LEPKA and UPDIX.

Finally the FIR with Nandi continues across to 3°30N 180° but flights emerging from this are directed to South Pacific frequencies. Flights from Australia bound for Honolulu, such as QF25 are passed from Honiara to Honolulu on West Pacific frequencies when they pass the Honiara/Nauru boundary and then when they pass into Nandi's control they are moved to South Pacific frequencies, where they stay when passed back to Honolulu. Airways South of and including B326 are worked on South Pacific frequencies, whereas those North of B326 utilise West Pacific channels.

All flights bound for or overflying Guam are asked to call Guam Centre on 118.7MHz when 250nm out, this usually coincides with a reporting point but the instruction is generally to call 250 out rather than mentioning the point by name, the more common ones to the North are POTSS, PAYEE, OWLSS and NOSES. For flights from Japan to Guam and Saipan this means that the aircraft check in on h.f. at the FIR and then about 30 minutes later they are able to call on v.h.f., so they might only be heard once if they do not request an altitude change. Flights bound for Australia then check in again on h.f. once they pass 250nm to the South of Guam, usually at HOKEY, HUTEL or GARVE.

Due to poor propagation of the higher frequencies the former secondary of 17.904MHz is used as primary from around 2100z, taking over from 11.384MHz, this latter channel can then be employed as the secondary or the former daytime primary of 21.985MHz can be used until around 0300z, when 11.384MHz will take over. During this period the flow of traffic is generally outbound from Guam/Saipan towards Japan and the rest of North Asia. Flights from Australia and New Zealand start reaching the FIR around 0300z.

From around 0600z 11.384MHz comes back into use as the primary, but flights calling in on the 17MHz channel are generally told to stay there until about 0730z, these flights are all generally North of Guam and only stay with Honolulu for half an hour before contacting Tokyo at 21°N. Between 0800 and 1100z things are fairly quiet and aircraft calling on either 6.532 or 11.384MHz are told to use the frequency they call in on as their primary, though there is a drift toward the lower of this pair. The exceptions to this rule seem to be the three Ryan International flights (88, 753 and 892) which invariably use 11.384MHz until as late as 1300z.

From around 1100z, as both the first Honolulu-bound and Southbound flights towards Guam and onwards to Australasia from Japan reach the FIR 6532 becomes the primary for the Guam area, the secondary being 2.998MHz.

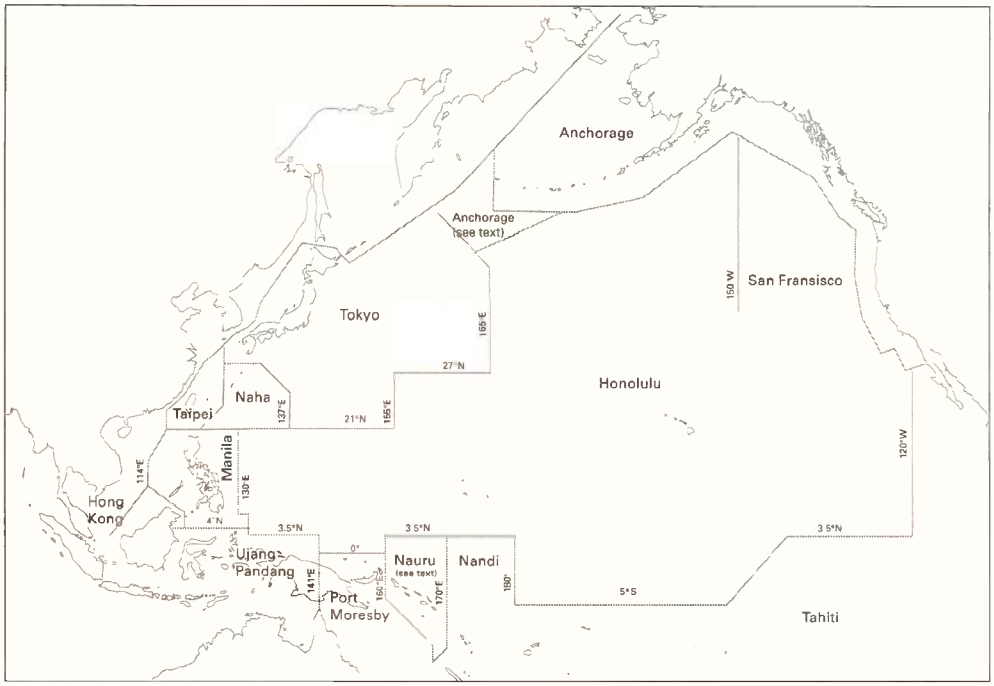
Tokyo - West Pacific

Tokyo is bounded by Honolulu to the East and South, and the approximate boundaries are mentioned under the Honolulu entries. The only other station Tokyo borders on h.f. is Naha, in Okinawa, this boundary extends Due North along 137°E until 26.5°N, where it turns North-westwards until the bottom of Kyushu, before following 30°N. Flights from Tokyo to Okinawa are handled on v.h.f. the entire way, but flights from Tokyo to destinations such as Manila or Singapore cross the Naha/Tokyo FIR at DOVAG and continue on h.f. for 220nm before calling Tokyo Control on 125.9 at BUBDO. Outbound flights from Tokyo check BUBDO on Tokyo Radio's extended v.h.f. channel of 127.3MHz, staying on v.h.f. all the way until the FIR with Naha.

Flights from the South bound for Kansai also call Tokyo Control at BUBDO, but on 133.5MHz. Those in the opposite direction using Tokyo Radio on 127.4MHz until as far out as TAXON, which is the penultimate position report inbound before BUBDO.

Flights from the Guam area crossing the FIR at OMLET are instructed to call Tokyo Control on 125.9MHz at 31°N, whereas those in the opposite direction use the extended range channel of 127.4MHz until UKATA, at 30°N. Other flights arriving from points to the Southwest call on 133.6MHz at 33°N. Outbound they stay on 127.4MHz until NOGAK at 30°N or TONIK at 146°E.

Aircraft inbound from Honolulu are asked to call on 133.6MHz at 146°E when transiting via VEPOX and MASON respectively, coinciding with the non-compulsory reporting points SEALS and MORAY and FERAR, at 145°E when inbound via LOTUS or at 33°N when arriving via PEARL. Most flights leave Japan on two tracks, generally routed via MASON or VEPOX, where they are instructed to make their first



call on h.f. Before carrying on to Honolulu on two tracks separated by two degrees. There are no hard and fast rules regarding which flights exit via which point, flights from Narita can leave via MASON one night and VEPOX the next, these two points can simultaneously carry outbound traffic for Los Angeles as well. As noted above, the outbound traffic to Honolulu follows a very pronounced peak, the first flights, usually CO908C or JL80 reaching MASON or VEPOX around 1030z and the FIR at 165°E at 1200z, the last flight generally reaches these points around 1445z.

Unlike Honolulu, for flights either to the Hawaiian Islands or towards Guam Tokyo employs only one family of frequencies and whereas Honolulu generally makes infrequent largish changes in frequency, such as 6.532 to 11.384MHz without using 8.903, Tokyo tends to make small changes, almost hourly sometimes.

Prior to 2100z Tokyo uses 4.666 as primary and 6.532MHz as secondary until around 2200z, when the latter becomes primary and the secondary is 8.903MHz. Then Tokyo generally moves to 8.903MHz for a couple of hours before becoming established on the daytime primary of 11.384MHz from about 0100z, although as mentioned in the Honolulu notes Tokyo had been using 13.300MHz from around this time during May 1995, but this practice seems to have ceased though 13.300MHz can be used as the secondary for 11.384 instead of 8.903MHz. The agreement between Tokyo and Honolulu is that they try not to use the same channel, so if Honolulu is using 11.384 during the local day for some reason Tokyo will use 8.903 or 13.300MHz. The politeness displayed by both is quite a revelation after listening to the mayhem on 8.942 in the South China Sea or the sheer rabble on 11.300MHz around the Red Sea.

From around 0530z the drop in frequency begins, changes occurring literally by the hour. The first move generally being to 6.532/4.666MHz, possibly stopping for an hour on 8.903 if 11.384 or 13.300MHz had been used. Honolulu tends to inform flights of the changes as they routinely check-in, Tokyo generally selcalls aircraft, even if only to inform them of a change of secondary. Tokyo's FIR is not vast and the frequent changes of frequency do not seem to be really justified.

At 0900z, though it can rarely occur any time from 0745z the local evening primary becomes 4.666MHz and the secondary either 6.532 or 3.455MHz. Prior to the New Year Tokyo used to often use 4.666MHz throughout the evening, but now that Honolulu is using this frequency during this period Tokyo moves to 3.455MHz any time between 1000 and 1100z, i.e. just before the first flights reach the FIR with Honolulu, the secondary invariably being 4.666MHz.

Naha (Okinawa)

Naha's FIR with Honolulu and Tokyo is described above, the Northern limit extends along 30°N to 124°E, where it continues Southwards to 21°N, turning Southwest abeam of Taiwan. Naha's traffic on h.f. is entirely to the East of Okinawa and the major flow is on A590 from Japan towards Manila and thence the Singapore area. Aircraft cross into Naha's care at DOVAG and are worked on h.f. until they approach Minamidaito ('MD') where they transfer to 126.9MHz. The report at AVLAS is also passed on this channel and then at TUNTO the aircraft return to h.f., though you normally do not hear them check-in again. Then they report at GURAG, the FIR boundary with Manila. Flights from the Philippines inbound to Okinawa itself call at BISIG on the FIR on h.f., where they are immediately transferred to 123.9MHz.

Flights from the Guam area to Okinawa (on R584) cross into Naha's FIR at KEITH and continue on h.f. until AVLAS, where they are asked to report to Naha Control on 126.9MHz, whilst aircraft bound for Taipei (on R595) cross at SANDE and are instructed to call on 126.9MHz at TUNTO.

The other flow of traffic on h.f. is from the Guam area towards the Southern parts of Japan and Korea on G339, aircraft cross the boundary with Tokyo at OMGOX and then continue North-westwards and are told to call Naha Control on 132.3MHz at BIXAK. This is also the channel used for flights from Tokyo to Naha and then onwards to Taipei.

During the local daytime, from around 2300z Naha uses 8.903MHz as primary and 13.300MHz secondary, moving from 2.998, 4.666 or 6.532MHz, whichever had been used overnight. Aircraft calling in on 13.300MHz are asked to call on the primary channel, 8.903MHz At about 0930z Naha drops in frequency, usually to 6.532 or 4.666MHz and then more often than not finally becoming established on its night-time pairing of 2.998/8.903MHz around 1030z, although 8.903MHz can be used as late as 1200z on occasions. It is very rare

continued on page 40 ▶

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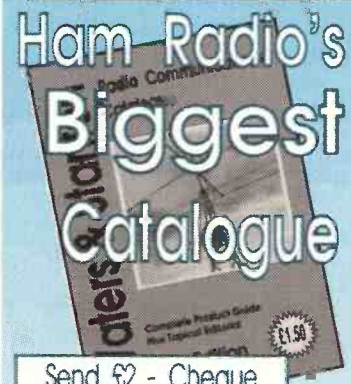

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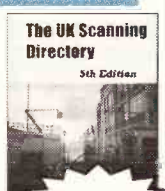

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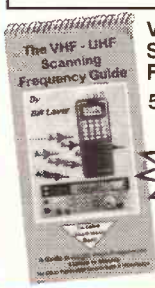

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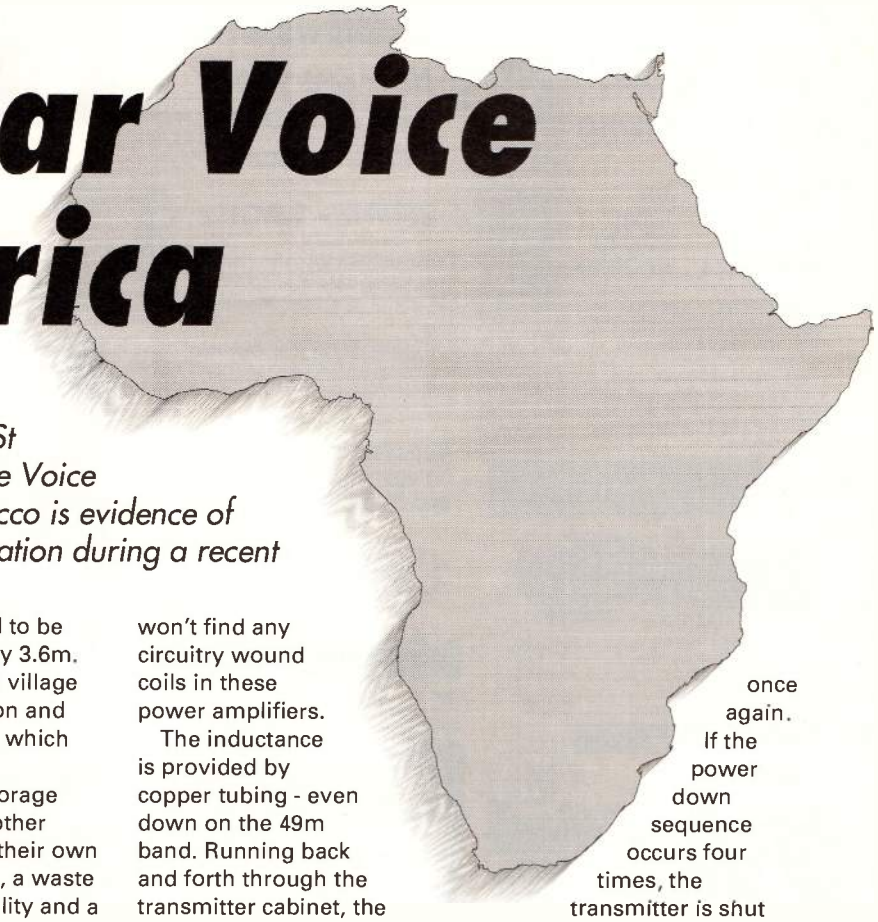


We've come a long way since 1901 when Marconi sent a signal across the Atlantic between Cornwall, England and St John's on the island of Newfoundland. The Voice of America relay station in Tangier, Morocco is evidence of that. Phil Gebhardt VA3ACK visited the station during a recent holiday.

Could Marconi have ever imagined the current state of communication? It's hard to say what would pass through a mind such as his. But in this era of miniaturisation, integrated circuits and low-voltage, low-power devices, I have drifted out of the world of the 6-valve short wave receiver that used valves such as the 6SK7 and 6V6.

Transmitters with strange sounding valves - 807s and 4X250s are a fading memory. I have come to accept that you can send a signal from the moon to the earth using a fraction of a watt.

Wilfred Cooper's world encompasses integrated circuits, computers, satellites and yes, even valves. Wilfred Cooper is Station Manager at the Voice of America's Tangier relay station. Living in Morocco sounds exotic enough, but a visit to the station introduced me to the exotic surroundings in which he works.

The station is new. It went on the air in 1993, replacing the old station that started broadcasting in 1949. Wilfred Cooper arrived in Morocco in 1990 as part of the start up staff for the new station.

The station is located in 465 hectares in a region south of Tangier. The land, originally subject to frequent flooding - it's a stones throw from the Atlantic Ocean - had to be raised approximately 3.6m.

This self-enclosed village has an administration and transmitter building which covers 4159m^2. The maintenance and storage building occupy another 2679m^2. They have their own electrical substation, a waste water treatment facility and a fire fighting system.

The heart, however, is the transmitting capability. The station has ten 500kW short wave transmitters. Each of the Marconi transmitters uses a single Thompson TH-55A valve in the final amplifier stage.

Water-Cooled Valves

The water-cooled valves look more like they belong under the kitchen sink than in a transmitter. Water lines run in and out of the valves.

The valve envelopes are not glass, but metal and ceramic. With 30kV on the anodes, the cooling water needs to have extremely high resistance, so built-in systems automatically test the water resistance as the water circulates and purify it whenever necessary.

Contributing further to the plumbing look of these transmitters are the tuned circuits. Tuning is accomplished by means of vacuum capacitors. Only slightly higher than their approximately 178mm diameter, the capacitors are also water-cooled. And you won't find any circuitry wound coils in these power amplifiers.

The inductance is provided by copper tubing - even down on the 49m band. Running back and forth through the transmitter cabinet, the 75mm diameter copper pipes look more like folded sections of transmission line than inductors.

The heat in the water from the valves and capacitors is dissipated by heat exchangers located outside the transmitter building. Since there are times when all ten transmitters are in operation, the facility has ten heat exchangers plus two additional units for the dummy loads.

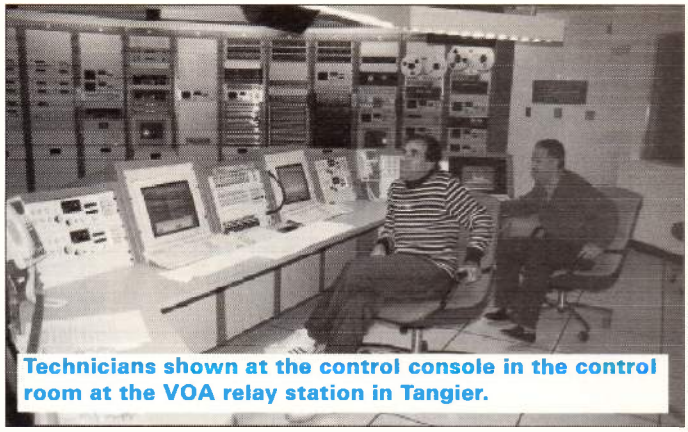
Like amateur radio and CB transceivers, the VOA's Marconi transmitters are designed to work into a 50Ω load. Two-stage pi-networks are used to reduce the power amplifier valve impedance to 50Ω. The first stage reduces the impedance to 110Ω. At this point, sampling circuits ensure that the transmitter is functioning correctly. The second stage further reduces the impedance to the required 50Ω. Should the sampling circuit detect a problem, the transmitter is automatically shut down momentarily. Should the problem continue when power is reapplied, the circuit shuts down the transmitter once again. If the power down sequence occurs four times, the transmitter is shut down entirely and an alarm alerts the technicians.

With several transmitters operating at once, it can be difficult to quickly determine which one has triggered the alarm. Consequently, a warning light system is being designed at the station. Each transmitter will have its own set of lights. When a fault develops, the staff will be able to identify the problem transmitter immediately.

Home-Brewer's Dream

The development of this warning system is typical of the expertise and self-sufficiency of the staff. Equipment faults are traced to the components level and repaired on the site. Shipping equipment out for repair means excessive time lost. However, repairing equipment on site means a complete store of all possible components and materials must be kept on hand. The warehouse is a home-brewer's dream come true.

Not only does the pi-network effect an impedance match and detect faults, it also acts as an r.f. filter to



Technicians shown at the control console in the control room at the VOA relay station in Tangier.

reduce the harmonics from the transmitters by 80dB. While most of us don't think twice before turning off receivers or transmitters, at the transmitter site in Tangier even disconnecting the valve filaments has to be weighed carefully. Because of the cost (in reduced valve life) every time the filaments are turned off and on, the filaments remain energised unless the transmitter is to be cut out of operation for more than six hours.

Each of the ten transmitters is capable of a.m. and sideband operation. The station even broadcast to Europe in stereo during May 1994. It was only the second stereo transmission ever broadcast by VOA. A stereo broadcast had taken place a year earlier at VOA's Bethany facility in the United States. For those transmission, one sideband acted as the left channel, while the other sideband acted as the right channel.

To many short wave listeners, an a.m. transmission simply means that the transmitter generates a carrier signal at a frequency within a short wave band and then an audio signal modulates the carrier. Well, it seems that life in the short wave bands is not quite that simple. VOA transmitters broadcast DAM (dynamic a.m.) signals, the transmitter power is low during periods of no modulation. A 500kW transmitter produces a 100kW carrier with no modulation. The modulating signal not only adds power to the sidebands, it also controls the level of the carrier. As the modulation level increases, the carrier output increases. At 100% modulation, the carrier will reach the full 500kW level. At the Tangier relay station, use of DAM means a 40% saving in power consumption for each transmitter!

For listeners, there is no difference between a standard a.m. signal where the carrier remains at maximum and a DAM signal. During the visit, Wilfred Cooper pointed out that "much of the advancement in broadcast technology is driven by research and development of short wave transmitters". American m.w. stations now also use DAM transmitters.

Gigantic

Like everything else, the antenna feedline is gigantic. The only resemblance to RG-58 is that the VOA's feedline is 50Ω, it's round and the outer jacket is black. Beyond that you could easily confuse the coaxial cable for large heating ducts running along the ceiling. A combination of rigid and semi-rigid coaxial cable is used. Outdoors, close to the antennas, baluns match the 50Ω coaxial cable to 300Ω open wire (actually, it's copper pipe) feedline. In total, there is 17.5km of transmission line at the site.

Each transmitter can feed any of the 21 high frequency curtain antennas. The antennas are located in four groups facing different directions allowing the transmission to Europe, Russia, the former Yugoslavia, the Middle East and Africa. The curtains are strung betweeen towers up to 137m high. The curtains have a gain of 24dB and the beam can be slewed up to 24°. The take-off angle can be adjusted to accommodate the distance to the target area. Before the antennas were installed, the impact of the signal of nearby mountains had to be assessed. Fortunately, the effect turns out to be less than 1dB loss.

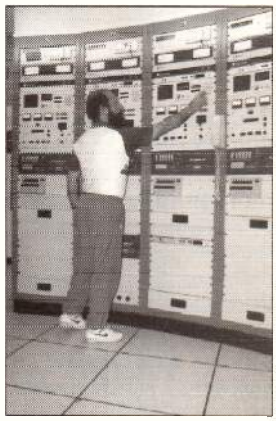
Wilfred Cooper noted that there is a lot of new technology in antennas and towers. The aerospace industry has benefited short wave installations. Materials developed for aerospace technology reduce the weight of towers while maintaining the required strength. Hardware that feels as light as a feather has replaced heavy, bulky nuts and bolts.

Parabolic Dishes

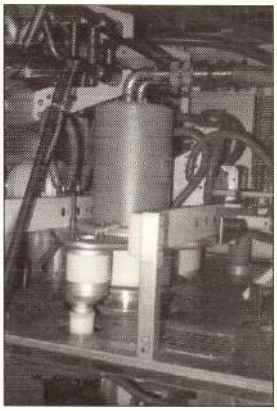
In addition to the curtain antennas, the installation has two parabolic dishes, one for IntelSAT's AOR (Atlantic Ocean Relay) and one for IOR (Indian Ocean Relay). The relay station receives VOA programmes via the satellite with the primary link through the AOR while the IOR functions as a back up. Should the satellite link fail, the station can receive programmes by microwave telephone circuits or directly from other VOA stations using two sloping Vee receiving antennas.

A mobile antenna test van can be driven out to the antenna site and used for both testing and maintenance. While the station can be manually operated - transmitters turned on and off at appropriate times, correct frequency selected, correct antenna connected, antenna slewed and take off angle chosen as necessary and scheduled programme run - the station is set up for computer operation.

The local operations controller (LOC) can automatically control and monitor all aspects of broadcast operations. The LOC consists of a control computer with interconnecting local area networks and remote



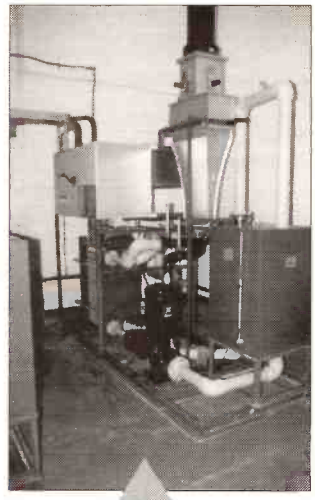
Although the transmitters can be completely controlled by computer, the technicians must be prepared to manually select the on/off time, frequency, appropriate antenna, antenna take-off angle, antenna slew angle and programme. Each of the ten 500kW transmitters has a control rack. Four of the racks are shown here.



At the heart of each 500kW transmitter is a Thompson TH-55A valve. The water-cooled valve has 30kV on the anode so the cooling water must have high resistance. ▶

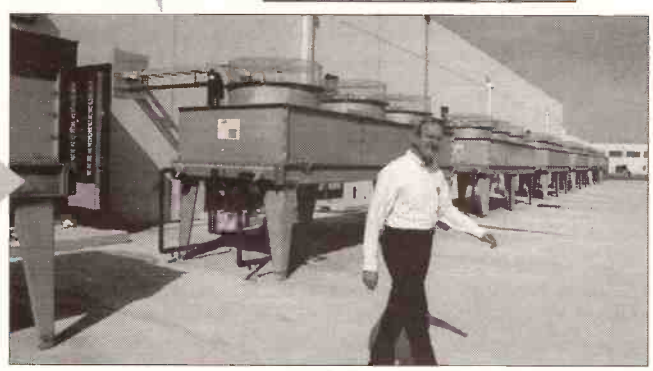
Vacuum capacitors used in the transmitters are water-cooled. There's no shaft to turn the rotor plates here!

Shown here is one section of the anode inductor for the transmitter. Large diameter copper pipe is necessary because of the high power levels involved.



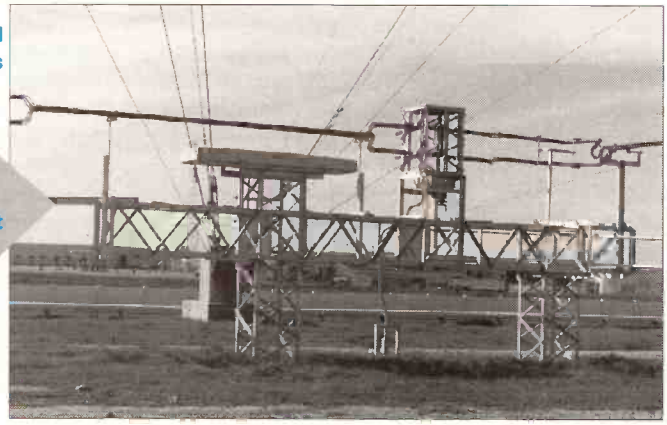
Dummy loads must dissipate considerable power. Shown here is one of the dummy loads. The black coaxial cable can be seen entering the dummy load at the top of the photo. The tapered metallic section below the coaxial feeder is an impedance matching section.

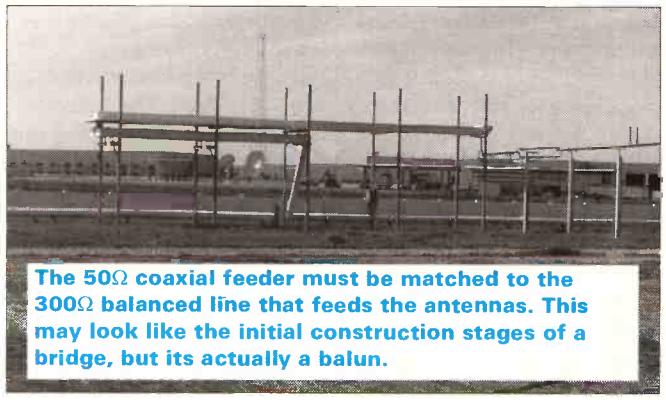
The heat exchangers that dissipate the heat in the water running through the final power amplifiers must be located outside the building. Shown here is VOA Relay Station Manager Wilfred Cooper. Twelve heat exchangers are needed for the ten transmitters and two dummy loads.



Inside the antenna test van is all the equipment needed to run the mobile unit out to the antenna site and do diagnostic work.

The thick horizontal lines running across this photo are transmission lines, connecting the transmitters to the antennas. The rectangular box just below the lines houses the pick-up for the s.w.r. bridge (directional coupler in technical parlance).





The 50Ω coaxial feeder must be matched to the 300Ω balanced line that feeds the antennas. This may look like the initial construction stages of a bridge, but its actually a balun.

terminal units for interfacing to the controlled and monitored equipment. In addition, the system includes a packet switch for communications with the world operations controlled (WOC). Staff at the Tangier relay station schedule the transmitters, antennas and programmes and then forward the information to Washington where the WOC is located.

The WOC is then programmed to control and monitor the Tangier relay station. The WOC is capable of controlling and monitoring and integrating the operations of all VOA relay stations.

As receivers get smaller and more sensitive, short wave signals seem to be getting stronger and easier to hear. The improvement is due to a great extent to the use by broadcasters of relay stations such as VOA's facility in Tangier. But there's another side benefit. While hearing an American station once meant listening to a station located in the US, now you can log VOA relay stations all over the world. Sometimes these relays are in countries that you otherwise could not log. How many of VOAs relay stations can you log? ■

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Short Wave Magazine - John Wilson

"JT has wiped the slate clean on receivers as we know them and has rendered virtually everything else obsolete"
"...the appearance is stunning, the finish on every part is of the highest standard..."
"If you can't get sensible audio out of even a rotten signal with the AR7030 then nothing will do it"
"...there is a very good synchronous a.m. system which has the unique feature of being auto tuned"
"...I was simply amazed when I came to explore the i.f. filtering arrangements..."

Ham Radio Today - Chris Lorek

"...rather stylish and extremely well-made cabinet"
"...I immediately thought how 'clean' the signals sounded"
"Regarding the RF performance of the set, my measured results say it all. If you're not technically minded just read these as superb. The blocking performance was so good that I found it was simply noise limited by the signal source..."

Monitoring Times & Radio Japan - Larry Magne

"All bandwidths have excellent shape factors. Image rejection is superb, as is IF rejection. Blocking and phase noise measurements are both excellent. Dynamic range is excellent at both 5 and 20 kHz separation points, and third order intercept measurements at 5 and 20kHz separation points are superb"
"...arguably the best receiver on the market, regardless of price..."
"...overall audio distortion is good-to-excellent... it becomes excellent-to-superb when the synchronous detector is used, and in the SSB mode is nearly nil"

AWR broadcaster and contributor to the medium wave DX circle and many other DX titles - Gordon Bennett

"Is it an excellent DX machine? Yes!"
"Is it an excellent receiver for SWL's? Yes!"
"Can it be used with an indoor loop? Yes!"
"...the audio is superb"

DSWCI short wave news - Don Phillips

"It is smart, black, well finished and inviting"
"The first thing that impressed me about this receiver is its quietness"
"The AR7030 gives the illusion that it is able to trap any signal that hits the antenna and demodulate it almost at FM quality"
"Synchronous AM? Well it is one of the best I have come across. The receiver locks on and seems to hold even the weakest AM signals"

Independent German reviewer (Funk etc) - Nils Schiffhauer

"Clear advantage to AOR thanks to its perfect synchro detector"
"AOR wins thanks to its fine AGC"
"AOR wins thanks to its considerably calmer background"

Radio Netherlands - Jonathan Marks

"Corners are rounded, there is a minimum of control knobs and the metal cabinet is beautifully engineered"
"Of the synthesizer... this is an extremely low sideband noise design..."
"We think that the phase noise of the AR7030 DDS is excellent, and much better than comparable priced and even much higher priced receivers. ...The measured phase noise values are exactly what is specified".

RSGB RadCom - Peter Hart

"The excellent RF performance of the AR7030 is certainly most apparent in on-air tests. The receiver gives very clean results under all conditions and there is no sign of overload in demanding strong signal situations".
"The intermodulation measurements are at the limit of my measurement capability and the close-in result by far the best I have ever measured on any general coverage receiver".
"I was particularly impressed with the VLF performance".
"The AGC characteristic is ideal and I really cannot fault any of the functions of the radio".
"It is really packed with features and has a superb technical performance".

Short wave column - Gather 'round the radio, boys and girls

No prizes if you can remember that...

Short-wave radio is split into broadcasting seasons. Traditionally, these have been from September to April for the Winter Season and April to September for the Summer Season. All the stations try to get frequency allocations in all the bands so they can move to lower frequencies in Winter in a desperate attempt to be heard in the target country.

Conditions during my time at AOR have been so unreliable as to warrant mid-season changes. Like those for Belper Athletic, they have had limited success. This push for higher powers on the lower frequencies set the design criteria for the AOR 7030. A front-end to take the signal levels and a range of self-aligning filters to keep your signal from the power-house next door. Try for the latest from Croatian Radio on 9.830 at 0700GMT and hear that just because it no longer reckons in your local station's news agenda, the problem has not gone away. The news is repeated at 1400GMT.

A station getting a reputation for reliable reporting is Monitor Radio. Try 13.770 in the very interesting 22 metre band for the Evening Broadcast backed up on 15.665.

41 metres is good to the USA in the mornings, try 7.535 and a raft of evangelical stations 200KHz on either side.

How far can you go?

Test your ECSS skills and the AOR filter menu as you go for Radio Australia on 7.330 in the evenings. Daytime is easier on 15.530.

No real DX'er would log The Voice of America as a find, but now they no longer officially broadcast to Europe, we have to find transmissions that leak from other areas. Late afternoon listening on 10.424, a lower-sideband feeder will test both sensitivity and stability. AOR's are such that you can listen to music on sideband.

More conventional listening can be done on 15.455 in the evenings. This is the African service providing vital news to a continent that the rest of the world really doesn't want to hear from right now.

The drive for efficiency at the BBC means that even World Service is a DX catch in Western Europe. The European Stream will test anyone's sync detector, the best of the bunch being 9.410 and 12.095. The BBC themselves recommend 15.575 for daytime listening. The African Stream is clear in Europe on 21.660 daytime, and 15.400 evenings.

Whoever you end up listening to, let them know. Your favourite station is just dying to hear from you. If you let them know you are out there hanging on their every word, they will put you on the mailing list for programme information and the latest frequency releases. Dying to hear from you?

Yes. If a station can't prove to its government that it has an audience by analysis of its listener correspondence then that station can be threatened. Audience power works; look at Radio Canada's reprieve. Listen for them on 5.995 in the evenings.

And finally...

In a very informal review of all the stations heard during this month's writing session, only about 18% are in English at any one time. Or is that the island mentality striking again...

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The 'Haunted' Radio of Laurel Cottage

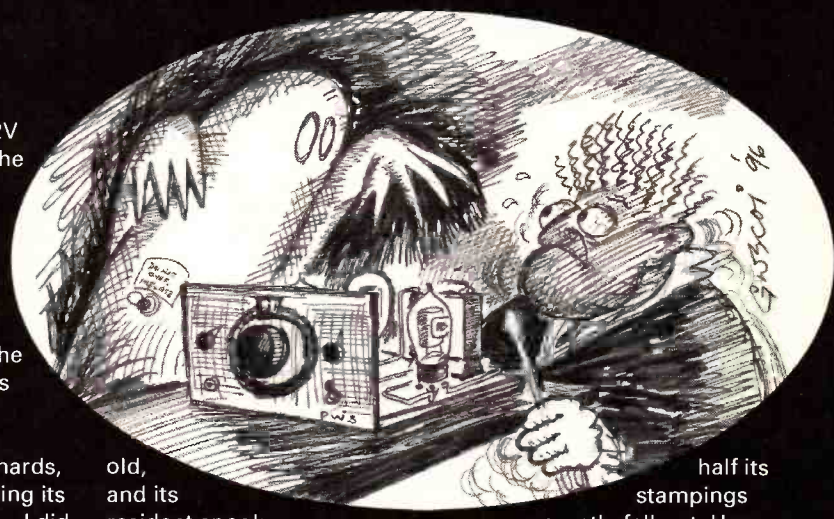
After demob from the Royal Navy at the end of the Second World War, a joyous event akin to being released from a ten-stretch in Wormwood Scrubs, I joined my parents in their latest abode, a mains-less cottage on the water-logged Somerset Levels. My father was at that time moving into a succession of primitive houses, doing them up, selling them at a profit and repeating the process. It made for a very uncomfortable life.

A wireless would brighten matters and as transistors hadn't yet come on the scene, I became possessed of a 3-valve battery set from the late 1920s along with its accompanying cone loudspeaker. Being

impoverished - my gratuity had been dissipated upon a buxom Land Girl - I tried running the set on ex-government surplus batteries: 1.5V for the 2V filaments and 90V for the high tension, which would have been happier with 120V.

The set did work with this arrangement, but not loudly and not for long, as the life of the layer-type batteries was very short indeed.

One evening, when poking around in its innards, in the hope of brightening its under-par performance - I did what all the wireless wiseacres say you shouldn't. I disconnected the loudspeaker while the set was connected to its batteries and still switched on. Don't ask me why - it was nearly half a century ago. But a strange thing happened. Instead of Frank Sinatra being cut off in his prime, he kept on crooning, though a little less loudly and in highly falsetto tones. The loudspeaker was indubitably isolated from the receiver, so whence came the warbling? It flashed through my mind that the cottage was a couple of hundred years old, and its resident spook might be intervening in matters, but an 18th century phantom was hardly likely to be dabbling in this new-fangled wireless!



Scientific Approach

Nevertheless, this loudspeakerless radio was, somehow, producing music. The scientific approach seemed to be demanded rather than the psychic one. So, starting at the detector end, I isolated various individual components to see what would happen.

Mostly it rendered the set totally mute, though it occasionally vouchsafed protesting screeches, not at all ethereal. Eventually, through a process of elimination that would have confounded Sherlock Holmes, my suspicions became focused upon the second audio transformer. Here indeed was the culprit, singing away happily!

Adapting a much-quoted biblical injunction into "If thy transformer offend thee, pluck it out" I removed the offending component, and half its stampings promptly fell out. Here, then, was the answer.

The stampings were so loose (was it a Telsen component?) that they vibrated against one another at the frequency of the audio currents passing through the surrounding windings, and so reproduced Ol' Blue Eyes in Mickey Mouse tones.

Hammer and vice were applied to the stampings, luckily without ruining them and the transformer put back in the set. Switch on: not a sound. Brilliant! Connect the speaker. Again not a sound. Not so brilliant - the temporary connection to the 1.5V dry low-tension battery had come adrift. That put it right, the loudspeaker burst into song and its accustomed baritone voice. All was well, the 'poltergeist' had been laid.

Soon afterwards, my father moved on to his next cottage and I moved on to a more comfortable home. For all I know, the set and loudspeaker are still there, up in the attic. I must call in and ask one day, if ever the floods go down.

Eric Westman ■

The Baby Eddystone

Eddystone receivers have a reputation for quality engineering. Ben Nock G4BXD, takes a close look at the 'cute' S870 high performance receiver.

A rather cute model from one of the best radio set manufacturers in the world, the Eddystone S870 receiver, and its brother the S870A, is quoted in its slim manual as being "... a high performance receiver designed primarily for personal use in situations calling for compactness and wide coverage..."

The later parts of that quote are quite correct. It's small, being only 279mm wide, 203mm deep and 152mm high - smaller than its more famous EC-10 cousin. Its frequency coverage is from 150kHz to 18MHz (150kHz to 24MHz on the S870A), with a small gap in coverage between 380 and 540kHz (380 to 510kHz on the S870A), so it does offer the user a considerable range of l.w., m.w. and short wave stations to choose from.

As for the 'high performance' bit - well! With only five valves - one of which is the rectifier - it doesn't have a separate r.f. amplifier, a straight osc/mixer being used, and only one stage of i.f. amplification, its performance can hardly be called high. Having said all that, considering the simplicity of its design, the sets does work very well when connected to the 41m long end-fed antenna available at this shack.

An important point that should be raised early on in this article is the fact that this set is of the a.c./d.c.variety. Forgetting the modern meaning put upon this phrase, the term a.c./d.c. means that the set can be powered from either the regular a.c. mains supply or a suitable high voltage d.c. supply. This form of d.c. supply was evident in some areas in the early days of electrification, also a d.c. supply was found in areas such as ship supplies and the like.

Basically, one side of the supply voltage is taken directly to the chassis of the set. Although the sets case is not directly connected to the set's chassis, by inserting jumper plugs in the rear this indeed can be the result. At this point it could well be that the mains 'live' would be connected directly to the case of the set. **Caution is therefore advised when playing with any a.c./d.c. set.** The obvious solution is to always use an isolating transformer if working on, or even operating, an a.c./d.c. set.

Circuit Description

The S870 set offers four bands, 150 to 380kHz, 550 to 1500kHz, 1.95 to 6.3MHz and 5.8 to 18MHz. The S870A offers five bands, 150 to 380kHz, 510 to 1400kHz, 1.3 to 3.6MHz, 3.1 to 7.6MHz and 7.3 to 24MHz.

The set utilises a 12BE6 in the role of self-oscillating mixer. Tuned antenna coils, with antenna link windings, feed the grid of the mixer, the stage also acting as an electron coupled oscillator, the tuning capacitors of the oscillator and antenna coils being ganged together. The oscillator section operates on the high side of the antenna frequency.

The output of the first stage, the 465kHz intermediate frequency (i.f.), is double tuned transformer coupled to the single stage of i.f. amplification, using a 12BA6 in this role. A further double tuned transformer feeds the detector stage. A double-diode-triode, a 12AT6, is used as audio detector, a.g.c. detector and audio pre-amplifier. The a.g.c. voltage is applied to both the i.f. stage and the mixer stage. A 19AQ5 is used as the audio output stage, transformer coupled to the internal loudspeaker.

There is no provision for a b.f.o. function, so that c.w. or s.s.b. signals are not resolvable.

The power supply consists of a 35W5 rectifier and a number of resistors to allow for different supply voltages. The valve heaters are connected in series along with the dial lamps, a combination of resistors and thermistors again being used to limit initial surge currents.

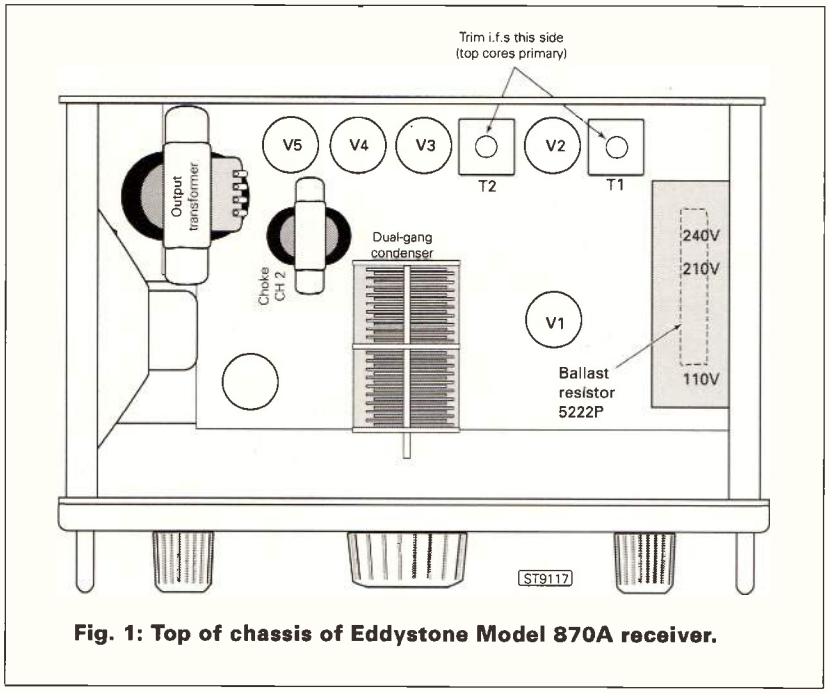


Fig. 1: Top of chassis of Eddystone Model 870A receiver.

art of preventing electric shocks. If the set is operated directly from the mains without an isolating transformer, any leads from the signal generator will require blocking capacitors in both the centre conductor and braid. Use 10nF capacitors rated at least to 400V a.c.

The i.f. alignment is simply a matter of injecting a 465kHz a.m. signal into the grid of V1 via suitable blocking capacitors. The cores of the two i.f. transformers are then tuned for either maximum audio output or, more accurately, for peak volts measured across the loudspeaker. Apply the 465kHz to the antenna terminals and adjust the i.f. rejector circuit, L11, for minimum output.

The alignment of the oscillator and r.f. circuits follow standard procedure, in that the trimmers are adjusted at the high frequency band edge, and the coil cores adjusted at the low frequency band edge.

The frequency points and associated trimmers and coils for the S870A are listed in **Table 1**. The list should be repeated until no further increase is achieved. The signal generator should be connected to the antenna terminals, via blocking

Re-alignment

Bearing in mind the a.c./d.c. problem already mentioned, great care should be taken if attempting to service or align this set. If in any doubt at all it would be best to get assistance from someone well versed in the

S870 Receiver

capacitors, and adjusted in output to maintain a constant output as each circuit is brought to resonance. The dial calibration is first undertaken, using the 'Osc' references to adjust the set as required. Once the dial is reading correct, the r.f. circuits are aligned using the 'Æ' references for best response.

In Use

The controls of the set are very simple, an ON/OFF volume control, a band switch and a tuning knob are all that are provided. The dial, the usual well spaced, finely tuned, horizontal scale so typical of Eddystone, stretches the entire width of the set. The tuning is very smooth, 55 complete turns of the tuning knob being needed to cover the entire travel of the scale.

disadvantage of a dipole is the single band working it imposes. If a long wire is used then one of the antenna terminals marked 'A' is shorted to earth with the fitted link. A dipole is connected directly between the two 'A' terminals.

In operation with the 41m long wire at this QTH, the medium wave signals were extremely loud, even to the point of distorting due to the gain of the set.

On the short wave bands the sensitivity proved good enough to hear many continental and trans-continental stations, the selectivity being a slight problem but, considering that

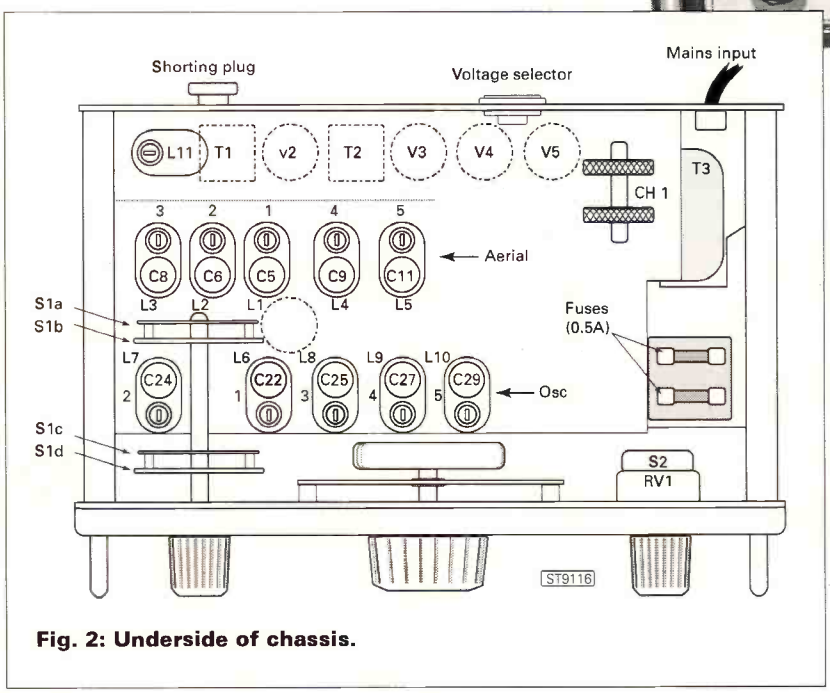


Fig. 2: Underside of chassis.

tuned to the i.f. and positioned close to the set. Fitting such an oscillator inside the set would entail an additional knob and switch, which, if located on the front panel, would spoil the symmetry of the set and reduce its value in the eyes of a collector.

In all, this set is another of the fine examples of Eddystone design and engineering. It is small and, despite the lack of a b.f.o., is a joy to use and tune the bands with. Another quote from the manual goes on to say "the receiver may be used in all areas regardless of climatic conditions and this feature, together with the small size of the unit, makes it particularly suited for cabin use aboard ship".

It is very easy to visualise being one of the 'posh' folk - **P**ort **O**utward, **S**tarboard **H**ome - lounging in one's cabin listening to the beat of the drums on the cabin receiver. ■

The rear panel of the set houses the voltage selector, the set will operate from 100 to 125V or 195 to 250V a.c. or d.c. Also on the rear panel are the two antenna sockets and the earth socket.

In use either a single long wire can be used or a balanced dipole type antenna, the

there are only two i.f. transformers in circuit, was sufficient in most cases.

The lack of a b.f.o. does mean that listening to amateurs is not possible, except for the small band of a.m. users on 80m. This omission, though, could be simply rectified by using an external oscillator

Table 1: Oscillator and Antenna Tracking Adjustment Points for the S870a.

Range	Trim freq	Osc	Æ	Pad freq	Osc	Æ
1	22.0MHz	C22	C5	8.0MHz	L6	L1
2	7.5MHz	C24	C6	3.3MHz	L7	L2
3	3.5MHz	C25	C8	1.35MHz	L8	L3
4	1350kHz	C27	C9	550kHz	L9	L4
5	350kHz	C29	C11	160kHz	L10	L5

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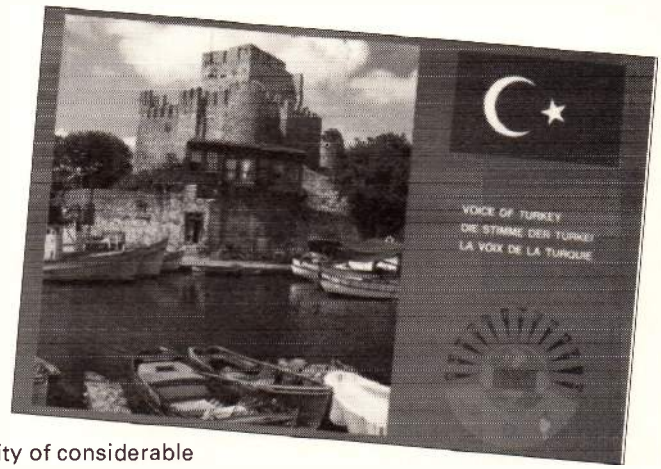
Listening Through Anatolia

Michael Osborn, UK winner of an essay competition, ran by TRT, visits that station's home land. Here he recalls his radio trip through Turkey.



Several months back I casually entered an essay contest organised by Turkish Radio and Television (TRT) and then quite frankly forgot about it. An early morning 'phone call came one late September morning, telling me I was a winner and was indeed on my way to Turkey.

Come mid-October, I'd arrived at Istanbul's Ataturk Airport to be greeted by unfamiliar faces, but the recognisable tones of an English language Voice of Turkey announcer, Kizigul Morali. Whisked away to the hotel, crossing the famous metropolis in doing so, I met the other winners and the group I was about to spend an excellent tour around Turkey with. Like all good short wave listeners, I had, of course, packed my trusty portable receiver.

Bustling Radio Dial

Istanbul, a rich historical city straddling Europe and Asia alike had a bustling radio dial just like its streets. The f.m. band is a testament to the changes affecting radio in Turkey.

In 1993, complete de-regulation was allowed, seemingly without the careful planning as here in the UK. I noted 35 different f.m. stations flicking through the congested dial, playing Western pop music, traditional Turkish songs and the sounds of Islamic prayer alike.

Whilst being a reflection of Turkey's tremendous diversity, the dial in Istanbul is overloaded and difficult to tune. Meanwhile, state-run TRT surrendered its monopoly, but struggles in the new era of competition.

The magnificent sights of Istanbul were punctuated by some fine moments of a.m. reception. Medium wave is a fine ear to nearby Middle East, over 1521-1530kHz I heard the all too familiar jamming sounds from Iraq and with it one of the country's interesting opposition stations. Time to pack the radio away though, it was now time to move on.

Fight For Airspace

Our bus for the whole tour was filled with the exotic strains of Turkish music alongside the gentle babble of chat in the many languages of the contest winners and escorts from the Voice of Turkey. Moving to the beautiful Aegean region and Izmir, visiting the ancient site of Ephesus, saw our party joined by a Turkish Television film crew and the first of many interviews. The weather and food was great, the fleeting minor fame wasn't a problem.

FM in Turkey's third city is just as crowded and diverse. An array of private stations literally fight for airspace. Meanwhile, the blue of the Aegean was exchanged for the blue of the Mediterranean and Turkey's southern seaboard as the tour proceeded.

Antalya is another Turkish city of considerable proportions and is being developed at a breakneck pace as foreign tourists seek the sun and the cheap cost of living. This development lead TRI to construct a special facility at Lara beach in 1990, designed for foreign tourists. The studios there broadcast a mix of music and touristic features in English, German and French, taking news from Ankara.

Also, throughout Turkey, TRT-2 puts out English news bulletins around the clock on f.m. Even this station sometimes faces interference from the myriad of other signals. Fortunately, you don't need to understand Turkish to tune in the radio stations.

Clear And Strong Signals

The guest house at Lara, just metres from the sea, was the best place for radio listening during my trip. On all bands, clear and strong signals were enjoyed. On f.m. I confusingly heard Greek language radio stations during the evening and realised signals from Cyprus were reaching across the Mediterranean.

The Third and Fourth programmes of the Cyprus Broadcasting Corporation identified themselves later on, transmitting from the heights of Mount Olympos, some 240km distant. Down on medium wave, the BBC East Mediterranean Relay was superb over 1323kHz. The Voice of America from Kavala in Greece was crystal clear over 1260kHz, too.

Antalya is an excellent place to tune in to the Middle East. On short wave I had time to hear Iranian station Voice of Mujahed with incredible strength, whilst the presence of jamming on the lower bands indicated other interesting catches. Of course, the BBC World Service, music to one's ears whilst overseas, is bound to be heard on any one if its traditional frequencies. ▶

Voice of Turkey 'Contest 94' winners. (L to R) Iran, Germany, United States, Romania, UK, Bulgaria and Macedonia.

Listening through Anatolia

Broadcasting live over Voice of Turkey with winners from USA and Romania.

Weird Landscapes

Our faithful bus then took us through the weird landscapes of Central Turkey. By now, the party of 20 or so people, some eight nationalities, was in great spirit. My guide for the second half of the trip was another distinguished Voice of Turkey broadcaster, Reshide Morali.

Being something of an expert in Turkish history of every epoch, her no-nonsense approach was great as we tripped from site to site. We soon arrived at the heart of the Anatolian Plateau and modern Turkey, the capital, Ankara.

This final stop of the journey took me to the heart of TRT itself. I stayed at the guest house within the organisation's brand new building in the Oan suburb of Ankara, a substantial taxi ride away from the centre. We met the numerous directors of Turkish Radio with an inevitable round of hospitality.

Live Transmission

I finally visited the offices of the Voice of Turkey's English section and with it the people I'd heard over the airwaves for years before, This included Osman Erkan, section head and genial host of the VOT *Letterbox* show.

The *piece de resistance* for me though, budding broadcaster that I am, was deep in the bowels of TRT headquarters for a live transmission. Alongside the hosts for the evening were also my fellow winners from the United States and Romania. As we shuffled about the studio, the news was presented unflinchingly, but then it was our turn!

Our group talked at length about Turkey, what we'd seen and what we thought and we all had a free hand to put over our opinions. As our broadcast came to an end, my personal moment of glory dawned as I was invited to close the transmission with, "This has been the Voice of Turkey, coming to you from Ankara...."

Rich Slice Of Radio

And so an unexpected ten days in Turkey ended with more good food to see us on our way. For one thing, the country is amazingly diverse in landscape and history. It is very hospitable and friendly too.

What's more, it has a rich slice of radio to offer, whether it be the crowded city f.m. bands or the medium and short waves that offer some excellent reception possibilities due to Turkey's pivotal geographical location.

If you arm yourself with any decent travel portable and a convertible power supply, catches unimaginable here will come with ease. Mind you, it might be an idea to tune to the Voice of Turkey and listen out for the next contest..... ■

Michael Osborn being interviewed for Turkish TV by Voice of Turkey's Kizisül Morali (with American winner Sam Romano).

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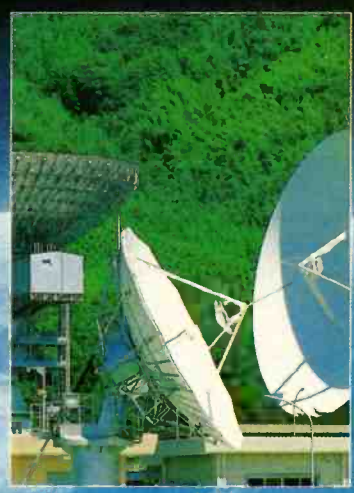

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continued from page 23

▶ to hear Naha on 11.384MHz, even if only to answer a flight calling prior to telling them to shift to 8.903 or 13.300MHz

Manila

Manila's FIR roughly extends from 130°E to 114°E, and between the parallels of 21°N and 4°N. Traffic is handled on v.h.f. whilst overflying the islands and then on h.f. out to the FIR. Thus, Manila uses both the West Pacific and South East Asian frequencies, the logical conclusion would be that the former are used to the East of the islands and the latter to the West, and whilst this generally occurs for the majority of the time it is not rigidly encouraged. For most of the day Manila uses two primary channels, 8.903 and 8.942MHz, the first of these is invariably used by flights from Naha's FIR as they are already on it, whilst flights from Singapore's FIR generally call on 8.942MHz, as they are similarly established there, flights into Ho Chi Minh's airspace use either 11.396 or 8.942MHz. Aircraft calling on one 8MHz channel are normally told to use the other as its secondary, and they are usually left where they call in. Other secondaries like 13.300, 11.396, 6.532, 5.655 and 2.998MHz are mentioned, but the use of these is a little spasmodic and erratic to say the least, both 8MHz channels seem to be used for 24 hours a day. I have heard Manila looking for aircraft on 17.904MHz on a couple of occasions, but this is very rare.

Aircraft cross 21°N from Naha's control and continue on towards the NDB at Jomalig on their way to Manila, transferring to Manila Control on 125.7MHz at SKATE (having crossed at GURAG when coming from Tokyo) or at SARSI (having crossed at BISIG en route from Okinawa). Aircraft from Guam and Saipan cross at ENDAX (130°E) and then also call on 125.7MHz at DILIS on their way to Jomalig. The few flights from Koror on R337 crossing at ISGOG and those from Biak on B462 crossing at BIDOR call on 125.7MHz just prior to Tacloban. Other flights when inbound from Indonesia at 04°N call on 124.9MHz when approaching Davao, Cotabato or Zamboanga. Flights from the West and Southwest call on 118.9MHz at KEVIM, TAMIS or GUTAN, whereas those from the North and Northwest use 119.3MHz at MIPAP, NIPIL, NIKIT or Laoag.

Flights on B596 from Guam and Saipan bound for the Hengchun NDB located on the Southern tip of Taiwan and then onwards to Hong Kong cross the Manila/Naha FIR at MEVIN, but as they would be with Naha for only 45 miles they normally report MEVIN to Manila and then the Naha/Taipei FIR at BONEY to Taipei control on 129.1. In the opposite direction BONEY is reported to Manila and not Naha. A similar situation exists in the very South-western corner of Tokyo's FIR, aircraft on G339 from Australia or the Guam area heading for Korea cross the Honolulu/Tokyo FIR at PAKDO and then 92 miles later (about 9 minutes flying time) the Tokyo/Naha boundary is crossed at OMGOX, with no crossing routes common sense would suggest that reports would only be made to Honolulu and Naha, but this isn't the case.

Taipei

It seems strange that Taipei can be heard on h.f. as its FIR only extends from 21°N to 29°N, and from 124°E to the Chinese mainland, so traffic can be handled entirely on v.h.f. However Taipei can be heard giving Selcall checks to flights on the ground, but I have never heard it passing ATC traffic with an aircraft in flight. Frequencies are generally similar to those used by Naha, i.e. 13.300 during the local daytime and 8.903 or 6.532MHz in the evenings. Tokyo's main daytime channel of 11.384MHz is never used.

Seoul

Again, another station whose FIR boundaries are so small that Taegu Centre handles all ATC traffic on v.h.f. Seoul can be heard giving Selcall checks to aircraft on the ground and handles a lot of traffic from Koreanair flights whilst they are overflying other FIRs. 13.300 or 8.903 are its daytime primaries and 2.998MHz replaces them at night.

Hong Kong

Hong Kong is often heard testing on 13.300 and 8.903MHz around 2300z. Why Hong Kong uses West Pacific frequencies would appear to be unclear as traffic towards the Philippines cross the FIR at DOVAR and AKERO and can be worked all the way on 121.3MHz, the same holds true for aircraft bound for Taiwan crossing at ELATO and KAPLI. Flights for destinations to the Southwest are always worked on the South East Asia frequencies of 13.309, 8.942 or 5.655MHz.

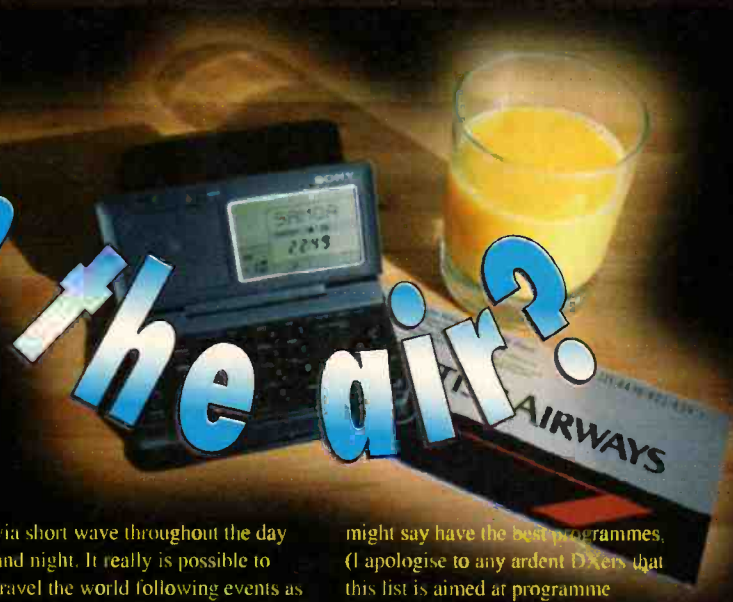
I wrote and asked Hong Kong why they monitor the Central West Pacific frequencies when all their traffic was in the South East Asia area, they replied that Hong Kong was part of the Central West Pacific network and as part of that network it was their duty to continuously monitor and assist other stations in accordance with the network principles. It also mentioned that the frequencies used were 13.300, 8.903 and 6.532MHz - with a power of 5kW p.e.p. using a log periodic antenna, beaming Southwest and East.

Port Moresby

The final station to use West Pacific frequencies is Port Moresby, whose FIR with Honolulu extends along the Equator. I have not heard it frequently enough to establish a hard and fast pattern, so rather than give erroneous information it will be sufficient to say that Port Moresby uses 8.903 as its daytime primary and 2.998MHz replaces it at night. ■

broadcast special

What's on the air?



More than 100 countries have radio stations that broadcast in English to overseas audiences. Peter Shore has been taking a trip round the world without a ticket or his passport - and with all the comforts of his own home!

International radio is big business. Millions of dollars are spent every year running radio stations that send their programmes overseas, and on equipping the studios and transmitting stations that make and beam the programmes world-wide. And then there are all the radio sets sold that have short wave. The Taiwan-based Sangean company alone is reported to make around 750 000 sets every year.

If you have a short wave radio, what can you hear? News-based programmes are the staple fare of many international stations. Britain's BBC World Service reckons that it has about 60% news and current affairs programmes on its 24 hour-a-day English language network and a slightly higher proportion in the 43 other language services it operates out of Bush House in central London.

But in addition to news, listening to international radio stations often provides an insight into a country and its people, customs and geography. You can tune to countries as varied as Albania and Argentina, France and Finland, New Zealand and the Netherlands, the United Arab Emirates and the Ukraine.

If you are planning a holiday in some far-off corner of the world, you could find out what's going on there before your visit, and maybe learn some things about the country not covered in the guide books you bought. And even if you are staying in Europe, you can still find out about events in the mountains of Austria or the weather in the Spanish Costas at the flick of a switch on your short wave radio.

Much of the world's international broadcasting centres on Europe. The continent has the largest concentration of international stations - a legacy of the Cold War and some of the best performing economies in the world. A total of 31 countries run international stations, a majority have English broadcasts every day. Compare that with Africa, where there are only six states with international services, most of them tiny in comparison to their neighbours further north.

Why do international radio stations continue to operate in the age of instant telephone contact and a multiplicity of satellite television channels available just about everywhere? For some countries, international radio is seen as having a voice on the world stage, which provides a degree of prestige. For others, like BBC World Service, the mission is to bring uncensored and accurate information to parts of the world where it is difficult to find out what is going on down the road, let alone in the rest of the planet.

The largest audience figures for international radio stations are in the developing world where the local media is state controlled and independent commercial radio stations that are so popular in Europe and North America are only just starting up. International radio reaches up to 30% of the population in some countries in Africa and Asia. Compare that with the audience for international radio here in Britain: you will find that it is so small as to make it unmeasurable. Try stopping ten people in your High Street and asking them whether they have listened to any foreign radio station in the past week. Almost certainly the answer will be "no" from each of them. Try a similar exercise in the centre of Nairobi, Delhi or Moscow, and the result will almost certainly be different.

Despite their lack of numbers, listeners in Britain, continental Europe and North America have access to the English language broadcasts of more than 100 stations via short wave throughout the day and night. It really is possible to travel the world following events as the sun rises in Australia until it sets over the West Coast of North America. If you want to study a language, international radio can help. Several broadcasters run courses to help you learn anything from Korean (Radio Korea International)) to German (from Deutsche Welle) to Chinese (China Radio International). And if you live abroad and English is not a language you speak, you could study it with the help of Radio Australia, BBC World Service, Radio Canada International and the Voice of America (short wave radio has sometimes been described as the world's biggest classroom).

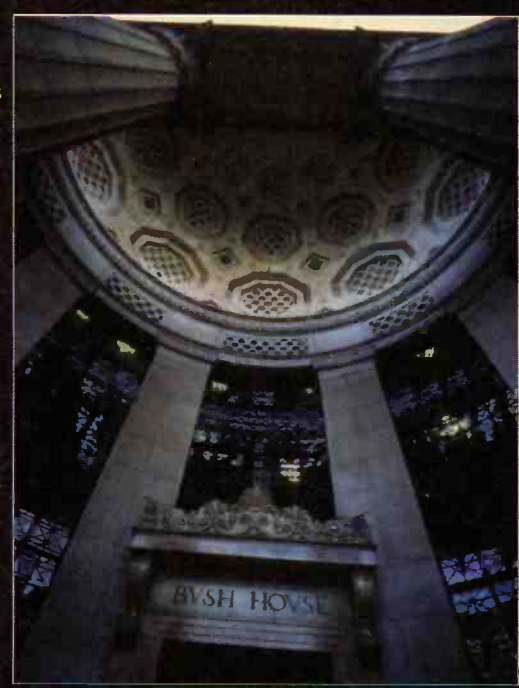
Finding information about what is on the air, at what time and on which frequency can be something of a nightmare. The larger international broadcasters publish programme or frequency guides, which give some information about the sort of programmes you can hear, and tells you how and when to tune in. But you have to write to every station you might want to listen to in order to get comprehensive details.

To help you along, I have compiled the European schedules of eight of the biggest international broadcasters including a number which some people might say have the best programmes. (I apologise to any ardent DXers that this list is aimed at programme listeners rather than people who want to catch the weakest broadcast signals). There is a huge choice, as anyone who has spent time trawling through the short wave broadcast bands knows. If you want more information about times and frequencies of the rest of the world's international radio stations, you can find them in:

World Radio TV Handbook, published in January each year and sold in the *SWM* Book Store for £17.95 plus postage;

Passport to World Band Radio, published each autumn and available through *SWM* for £14.50 plus postage;

Global Radio Guide, published in May and November, available through *SWM* for £3.95 plus postage (see page 79 for full details about all the publications available in the *SWM* Book Store).



Tuning in - times and frequencies of the world's leading international radio stations.

BBC World Service

The 24 hour-a-day English language service is broadcast from Bush House in central London via a network of transmitting stations in the UK (Rampisham in Dorset, Woofferton in Shropshire, Skelton in Cumbria and Orfordness in Suffolk) and overseas. The station describes itself as the "world's most trusted international broadcaster", a fact confirmed by independent market research and an enormous following for programmes not only in English but 43 other languages, too; at least 140 million people tune in at least once a week to BBC World Service.

BBC World Service has divided the world into different regions, and transmits the same programmes, but at different times to take account the multiplicity of time zones world-wide.

There is news on the hour, every hour, along with a comprehensive analysis of current affairs. Last month, the magazine programme *Outlook* celebrated its 30th anniversary. *Outlook* was one of the favourite programmes of Beirut hostages Terry Waite and John McCarthy, and John is now one of the show's regular presenters.

Listeners in Europe can tune in on short and medium wave.

Anyone with Astra satellite receiving kit can listen on transponder 23 - that's UK Gold television - via the audio subcarrier at 7.38MHz.

BBC World Service sports presenters Chris Florence, Gordon Farquar and Andy Farrant.

Channel Africa

Part of the South African Broadcasting Corporation, but funded - for the time-being at least - by the South African Foreign Ministry, the Johannesburg station broadcasts to Africa via powerful short wave transmitters at Meyerton. These 500kW senders are also leased to a number of other broadcasters, including BBC World Service.

Channel Africa's predecessor, Radio RSA, used to broadcast to areas outside Africa, but the station sees it as an African station, broadcasting from Africa to Africa. But its future is uncertain, as the Foreign Ministry has announced it will no longer fund the operation. A committee under the deputy President is considering how South Africa will be represented abroad by international radio, and is due to publish its findings in October.

In the meantime, try listening to the station:

Time	Frequency (MHz)
0300-0500	3.220
	5.955
0500-0600	5.955
	9.590
1500-1800	3.220
	7.155
1600-1700	9.530

And via *World Radio Network* at 1030UTC.

Radio Canada International

A window on Canada and how Canada views the world. That's the description of Radio Canada International given by its head, Terry Hargreaves. The station has been threatened with closure in the past few months, but survived by a whisker. And how else would you be able to find out about what goes on in one of the biggest countries on the planet except by tuning to RCI?

The Montreal-based broadcaster is part of the Canadian Broadcasting Corporation - which itself has had funding cuts imposed by the Federal government - and relays a number of CBC domestic programmes to audiences world-wide. Look out for the CBC comedy *Royal Canadian Air Farce* on Saturday at 2100UTC, and RCI's environment programme *Earth Watch* an hour earlier.

Tune in:

Time	Frequency (MHz)
1330-1400	11.935, 15.325, 17.820 (not Sun), 21.455
1645-1700	9.555, 11.935, 15.325, 17.820 (weekdays)
2000-2100	5.995, 7.235, 11.690, 13.650, 13.670, 15.150, 15.325, 17.820, 17.870
2100-2130	5.995, 7.235, 11.690, 13.650, 13.670, 15.150, 15.325, 17.820

Also via *World Radio Network* at 0830UTC

Two of Channel Africa's staff members, Elize Coetzee (on left) and Charlotte Mathoka opening some of the nealy 70000 letters received annually.

Radio Austria International

With five daily half-hour broadcasts, Radio Austria International reports on the latest political and economic events in the Alpine country, and provides information about the arts and sports.

Listen to Vienna

0730, 0930 (except Sunday), 1330, 1730 on 6.155 & 13.730MHz

2230 on 5.945 & 6.155MHz

World Radio Network carries Radio Austria International on Astra transponder 22 at 0430UTC.

Salzburg - home of Radio Austria International.
Photo courtesy of Austrian National Tourist Office.

broadcast special

Voice of America

Broadcasters Bethany Klein and Meredith Bird prepare to go on the air live for VOA's *Talk to America* show.
Photo courtesy USIA International Broadcasting Bureau.

Broadcasting from studios within sight of the Capitol in Washington, DC, VoA has 47 languages plus English for its world-wide audiences. Among the programmes to look for are *Talk to America*, a global equivalent of your local station's 'phone-in programme. Listeners can question experts on subjects as diverse as politics, medicine, sports, the arts and science via 'phone, fax and the Internet, weekdays at 1706UTC.

Every Saturday at 1730 and 2130 you can hear *Communications World* hosted by Kim Andrew Elliott who examines at developments in broadcasting and other areas of the electronic media. There is world news on the hour, every hour, and *World Report* is a comprehensive hour-long programme of world and US news and reports from VoA journalists and correspondents. Music from the US is also covered in-depth with *Now Music USA* playing rock and soul hits of today and yesterday, *Concert Hall* featuring classical concert recordings and *Music USA-Jazz* - until earlier this year hosted by the late Willis Conover.

Tune in:

Time	Frequency (MHz)
0400-0600	7.170, 11.965, 15.205
0600-0700	6.140, 7.170, 11.805, 11.965, 15.205
1500-1700	9.700, 15.205, 15.255
1700-1800	9.700, 9.760, 15.255
1800-2100	9.760, 9.770
2100-2200	6.160, 9.535, 9.760

Communications World is carried on Sunday at 1500 via *World Radio Network*.

Radio Netherlands

The Dutch international service broadcasts from the media city of Hilversum, half-an-hour by train from Amsterdam. Radio enthusiasts and DXers tune in every Thursday for the well-known award-winning *Media Network* presented by Jonathan Marks, the British-born Director of Programmes, and the station's media analyst, Diana Janssen. But there is also in-depth news and current affairs in the Monday to Saturday *Newsline* with analysis of issues in the international news and correspondents' reports from around the world.

A large number of feature programmes provide a flavour of life in the Netherlands, and look further afield. During August, you can hear *Wake of Half Moon*, a three-part series that traces the history of the 17th century Dutch colony, New Netherland, from its founding in 1609 to its surrender - to the English - in 1664. And every Saturday, *Weekend*, a co-production between BBC World Service, Deutsche Welle, Radio France Internationale and Radio Netherlands, takes to the air with an eclectic mix of information and entertainment.

Listen to Radio Netherlands at:
1030-1225 on 6.045, 9.650MHz
2030-2225 on 1440kHz medium wave (via Luxembourg)
and via *World Radio Network* at 0930, 1630 and 2330UTC.

Radio Netherlands headquarters.

Radio Australia

Concentrates on reaching listeners in the Pacific, but although transmissions are not beamed to Europe, it is possible to hear Radio Australia at different times of the day via short wave. Drawing on the resources of its parent, the Australian Broadcasting Corporation, Radio Australia has a network of correspondents throughout the Pacific region and across Asia as well as in key European and North American cities. Hourly newscasts bring listeners up-to-date with world and regional events every day of the year.

There are special Australian and Pacific news bulletins weekdays at 0110, 0510, 0910, 1110 and 1710UTC and 0710 and 1910 respectively. In addition to news and current affairs, there is extensive coverage of the arts in Australia, and *The Australian Music Show* offers an audio insight into the music, people and issues that make up the contemporary music industry in the country (Sunday 0530 and Monday at 1330 and 1730).

European listeners are advised to tune in on short wave at:

Time	Frequency (MHz)
0700-1100	21.725
1100-1300	15.530
1100-1800	9.615
1430-1800	11.660
1430-1900	6.090
1800-2100	7.330

You can also hear the station via *World Radio Network* on the Astra satellite, transponder 23 at 7.380MHz at 0700 and 1500.

China Radio International

Programmes from Beijing start with ten minutes of world news, followed by news from around China and an analysis of major international events. A variety of feature programmes follow the current affairs slot, including *Focus* each Thursday which looks at some of the issues of concern to Chinese people and *Orient Arena* reporting each Tuesday on sports across the world's most populous nation. If you want to try learning Chinese, *Learn to Speak Chinese* is broadcast on Wednesdays, and weekend features like *The Cooking Show* will give you a flavour of Chinese life, with recipes and tips for Chinese dishes.

Tune in to China Radio International:

Time	Frequency (MHz)
0500-0600	6.950
	9.560
	9.920
2000-2100	6.950
	9.440
	9.920
	11.715
	15.110
2100-2130	11.715
	15.110
2100-2200	6.950
	9.920
2200-2230	3.985 (relayed from Switzerland)
2200-2300	7.170

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2100-2130	5.995, 7.235, 11.690, 13.650, 13.670, 15.150, 15.325, 17.820

Also via *World Radio Network* at 0830UT

The Radio Canada International Newsroom in Montreal.

Listening on the Move

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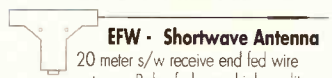

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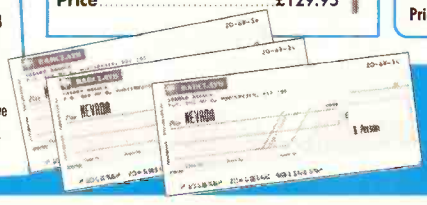

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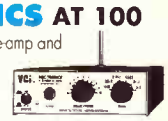

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Plain Language

John Worthington GW3COI talks of learning Morse code and recalls a day when the reading of plain language became imperative!

Most folk who take on the task of learning Morse find it quite hard enough and are rather envious of those old timers who had the benefits of either college or services training where in classes of thirty of forty, spending four hours or more a day, it was, if not quite a doddle, almost inevitable that you steadily advanced your skill at the rate of one word per minute faster each week.

However, it was not quite straightforward, because the larger part of the course was taken up by learning how to send and receive mixed figures, in a word, cipher, and this had to be written down in capital letters for the ultimate benefit of the man whose job was to translate the message into plain language using either a machine or a code book.

Self Taught

It is doubtful if any self taught Morse reader of today can appreciate the extra trouble this used to cause, because for one thing, it is forbidden under the terms of the Ham licence to use any private cipher, so what you have no use for, you obviously don't bother with.

But a short trial with a few mixed letter and figure groups will soon show how difficult it is to obtain complete accuracy between two operators, and this used to lead to numerous requests for repeats when the cipher decoder found his efforts resulting in rubbish!

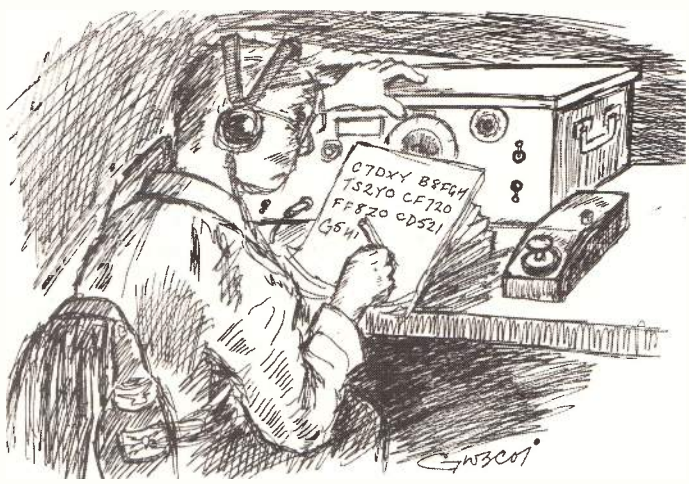
Then there was the business of having to write every character in capitals - some operators would do them very large and it was quite a riveting sight to see a chap hammering away on the message pad with all his might and yet the Morse might only be coming in to him at about 12w.p.m. And yet, everyone seemed to get used to it, eventually, and the style carried over into the way they wrote letters home. I imagine many XYLs/girlfriends, etc. used to wonder why and probably put it down to the dictatorship of the camp censors.

Utmost Concentration

Plain language was taught alongside all this cipher and everybody felt a sense of relief and even pleasure in such periods when the instructor would send passages from his daily paper, etc. I remember one who would send jokes he had heard in his peacetime job as a commercial traveller.

It was a good way of attracting the utmost concentration from his pupils, who gradually became accustomed to 'reading ahead' because they were using the ancient art of intelligent anticipation. Alas, when they were posted to their various stations or aircraft, such skills would be more or less redundant!

I can only recall one case when the reading of plain language became imperative and that was when a civilian aircraft (American Clipper - famous for trips across the Atlantic during the war) was diverted to a RAF base on account of bad weather. The operator was obviously using a bug key at a fair old lick and he burst on to the guard frequency saying he couldn't see the flare path.



The RAF ground operators were electrified and thrown into complete confusion and could only ask for a repeat with shaking fingers on the Type-D key. Back came the swift reply with a few more words added to the effect that a proper operator should be put on. By now, there were at least three RAF chaps bent over their message pads with perspiration interfering with their vision.

Enormous Signal

The Duty Signals Officer had now shown up and it must be said his reading of plain language was also dodgy. Up came the Clipper again and stated he had landed and would they send a launch to guide him in. The SO ordered a message to be sent to the flare path launch over the TR9 (the then current a.m. low power TX/RX as fitted to early Spitfires). But the launch was round the back of a small island and couldn't hear the repeated calls.

There were now five operators round the loudspeaker which had to be plugged into the 1082 receiver, all standing by with clenched hair. The Clipper came on again. He was now an enormous signal and blocked the 1082. Five hands dived for the r.f. gain. Apparently, the Clipper couldn't see any launch and was taking off again to look for him. (It should be added that all this was taking place at night in a full gale with falling snow and the thought of a high flying boat performing with such athleticism boggled the mind!).

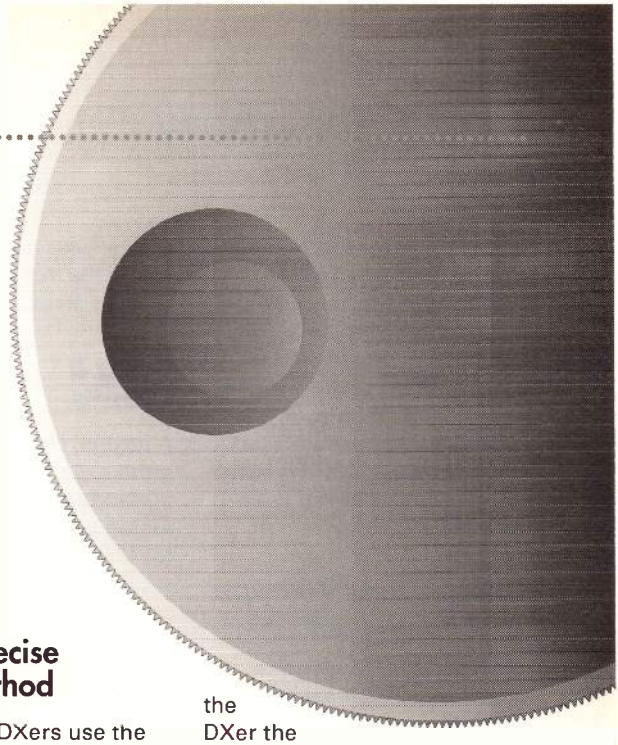
Doing Better

By now, our lads were doing better at writing it all down, having up to this stage been 'filling it in' with guesswork. Incredibly, the Clipper found the launch and actually landed by it. To cut a long story short, and peace and mixed code groups again took over in the RAF cabin.

The following day the operator from the Clipper, an old man of thirty something, visited the cabin and distributed a large pack of Camels in the generous tradition of the Yanks. It was probably a routine visit for him in his hugely varied career, but it was the talk of the operators in blue for many a long watch. ■

broadcast special

Tuning Accurately



Don Phillips considers how the short wave listener or DXer can attempt to record the frequencies of broadcast stations with a useful degree of accuracy.

Tuning Dials To Frequency Display

Any user of a simple portable receiver or a grand old wood-veneered domestic radio will have worked out their own rule of thumb way of knowing where to tune to receive a favourite station. In the early days of our hobby we have all probably turned a tuning knob and seen a wire needle judder its way along a cramped scale. We will have made a mental note that there are always some stations near the 6MHz mark, generally some just below the 12, and in the daytime some past the 15. This is fine for the novice and casual listener who relies upon serendipity to select the station.

The advent of the microchip, with almost countless transistors being created in a single package, has enabled affordable modern receivers to contain what is in effect a digital counter. This means that frequency to which the receiver is tuned can be displayed in numbers to, in most communication receivers, the nearest 10Hz.

What Use Is Accuracy?

Here is a little test. Set your receiver to a.m. mode; if you have a bandwidth control, adjust it to its widest setting, choosing 6kHz if possible. If you are in Europe, tune the receiver to 161kHz. You will hear the powerful station at Allouis in France. Tune the receiver on to 163kHz: you will still hear the same programme which is in fact on 162kHz. Only if you tune in the region of 159 or 165kHz will the audio start to sound a bit thin and you will know that you are going off tune. On unsophisticated equipment it is possible to make a guess at what the central (or carrier) frequency of the signal is by this method: de-tune to one side of the signal, tune 'by ear' until it sounds similarly out of tune on the other side of the signal, and then make a stab at the middle.

Of course, this method serves well for every day listening, in the car, or to the local news at times when you are not interested in knowing the frequency accurately. It is not very helpful when logging an unknown station to have to record the frequency as "somewhere around 162kHz". There may be occasions, especially when listening to stations on the tropical bands, that an accurate knowledge of the station's frequency will greatly assist in identification.

A More Precise Tuning Method

Most serious DXers use the a.m. mode on their receivers very little, choosing to treat each sideband of the broadcasting station signal as a separate signal. The DXer then switches the receiver to either u.s.b. or l.s.b.: sideband mode has several advantages.

Firstly, in l.s.b. or u.s.b. mode the receiver's beat frequency oscillator (b.f.o.) is switched on. If the receiver is tuned so that the b.f.o. appears to coincide with the centre, or carrier, frequency of the incoming station, then the effects of fading are reduced. By this means, the receiver will perform much as if it were operating in synchronous detection mode. This is a specialised facility where a signal's carrier is strengthened by the superimposition of another signal operating exactly in phase with it.

Secondly, sideband mode gives the DXer 'two bites of the cherry'. If one sideband suffers from interference the other may be clear. By careful use of the 'IF Shift' or 'Passband Tuning' control present on some receivers, it is possible to listen to just a part of one sideband to avoid heavy interference.

Thirdly, this method gives the DXer the opportunity to know much more precisely the frequency of the station that is coming through.

In Search Of Zero Beat

Let us return again to the French station on 162kHz. Switch your receiver to either u.s.b. or l.s.b. mode. Tune around this frequency: a loud whistle will be heard. If you have a loved-one in the room, you will be frowned at; the dog may crook his ears. If you follow the whistle to the position where it is lowest the station's carrier frequency will be found. If your receiver is accurately calibrated the digital read-out should show 162.00, or something similar.

Change to the other sideband and repeat the exercise: you should obtain the same answer. If this does not happen then perhaps your b.f.o. needs calibrating or the receiver's master oscillator needs adjustment. The technically proficient may be able to do this, using the frequency of known reliable broadcasting stations as a datum: it is probably wisest to make enquiries from a reputable dealer with workshop facilities to perform a relatively inexpensive calibration for you. If this is not possible it will be necessary to make a note of the receiver's inaccuracy, incorporating this into the calculation of precise frequency loggings.

It is possible to follow the whistle down to 100Hz by ear

quite easily. To tune below this requires good bass response of you receiver and speaker or headphones. By adjusting a tone control for maximum bass, and the use of hi-fi type earphones, it is relatively easy to tune in so that the b.f.o. coincides with the carrier to within a few tens of hertz.

Using A Tape Recorder As A Tuning Indicator

Most serious DXers run a cassette recorder as they comb the wavebands, both as a record of rare 'catches' and an opportunity to examine unclear identifications at leisure. It can be argued that as short wave signals are inevitably low-fi in quality, inexpensive portable cassette recorders are more than adequate for this purpose. My own experience would contradict this: the better a signal can be recorded the better chance there is to discern intelligence from the clutter of interference.

A good hi-fi tape recorder can also assist with tuning in an a.m. station in sideband mode. Connect the recorder to the receiver's audio output (many receivers have specific 'record' outputs), switch the machine on to record, and conduct the same experiment that alienated the loved one and the dog. The bar tuning indicators will indeed record the audio level, but as you tune the receiver to zero-beat, the level will be at a minimum. By carefully detuning by a few cycles should cause the tuning indicators to flicker in sympathy; on moving back to near zero beat again, the indicators quieten down.

Using a Counter

A further, slightly more experimental, method of accurate tuning which I use to calibrate my own receiver is to employ the audio frequency counter on a small multi-meter. The receiver is set to receive the BBC World Service on 9.410 or 15.070MHz. The receiver is then detuned by exactly 1kHz. The counter is connected to the audio output and the receiver's master oscillator is adjusted until the counter reads 1kHz. This method overcomes the problem of asking the counter to read a frequency of 0Hz, which zero beat tuning produces by definition!

Stability

The stability of a receiver depends very much on its basic design, particularly in the areas of oscillators and power supplies. But the user can contribute to stability by keeping the receiver in a room of reasonably constant temperature and not subjecting it to physical bumps and bangs. Some s.w.l.s keep their radios on all the time, and for some models this can bring about a considerable improvement. Of course valves will have a shorter life if used this way. It is also advisable to switch digital displays off or to their dimmest setting.

It is also interesting to note how inaccurate some of the short wave stations are - even some of the international broadcasters vary from the 5kHz channel spacing they should adhere to. Some broadcasters seem to vary from day to day - some channels to look for are given in **Table 1**.

Some stations appear to drift from minute to minute. I have logged some stations that required continuous retuning and these are shown in **Table 2**.

By following some of the ideas discussed, it is possible to keep accurate records and have better view of the stations that move around the broadcast bands. It is surprising that, no matter how modest your own receiver is in terms of stability, there will be a broadcast station that is worse. But don't get over confident. If you find that the WWV Standard Time and Frequency station is drifting, perhaps it's time for a receiver up-grade! ■

Table 1.

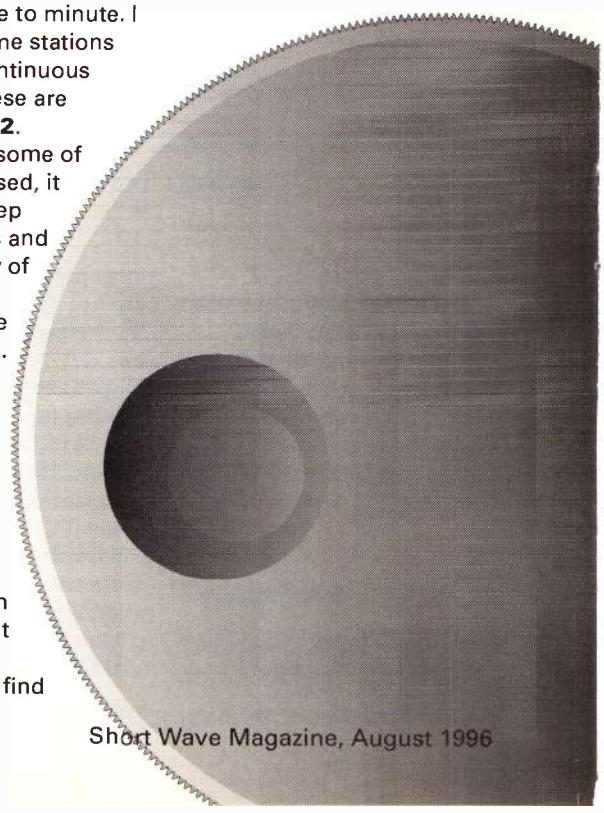
Station	Nominal frequency (MHz)
Radio Argentina	15.345
Radio Algeria	15.160
Radio Pakistan	17.900
Radio Pakistan	11.575
R. Cancao Nova, Brazil	9.675

Table 2.

Station	Nominal frequency (MHz)
Ujung Pandang, Indonesia	4.7536
Nouakchott, Mauritania	4.845
R. San Miguel, Bolivia	4.925
Radio Tacna, Peru	9.505
Radio Baghdad, Iraq	11.805
Radio Pyongyang, N Korea	15.180

Abbreviations

a.m.	amplitude modulation
Hz	hertz
kHz	kilohertz
MHz	Megahertz
DXer	Someone who listens to 'distant' stations
u.s.b.	upper sideband
l.s.b.	lower sideband
i.f.	intermediate frequency



Propagation Extra

I believe that it is still essential that those readers who have an ongoing interest in propagation still have access to the various pieces of information collated by Ron Ham. I have asked Ron to continue to provide his monthly barometric pressure charts in the same format as before. In the meantime I am trying to arrange for a regular supply of sunspot charts and other similar information. If there are any readers who would be prepared to provide such information **on a regular basis**, please get in touch with me at the Editorial Offices, Broadstone.

Ron has provided two barometric pressure charts for this issue, **Fig. 1** covers the month of May 1996, **Fig. 2** covers June 1996.

Fig. 1: Barometric pressure chart for May 1996 taken by Ron Ham at Storrington, E. Sussex.

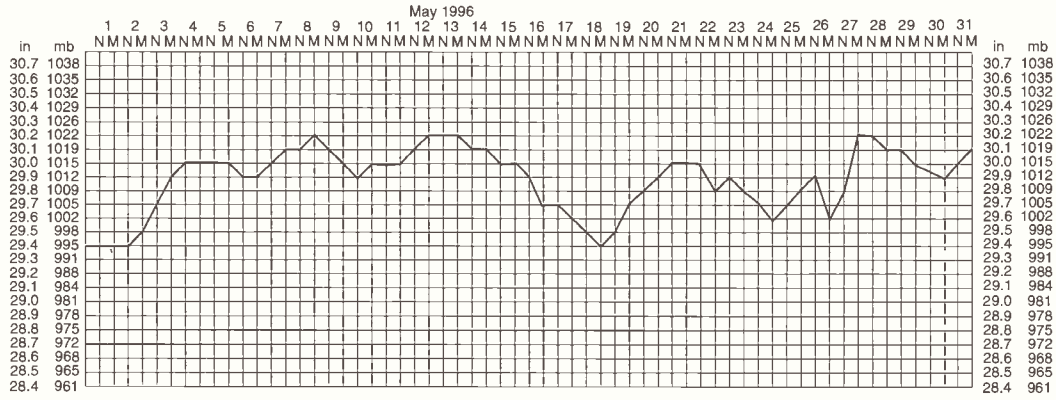
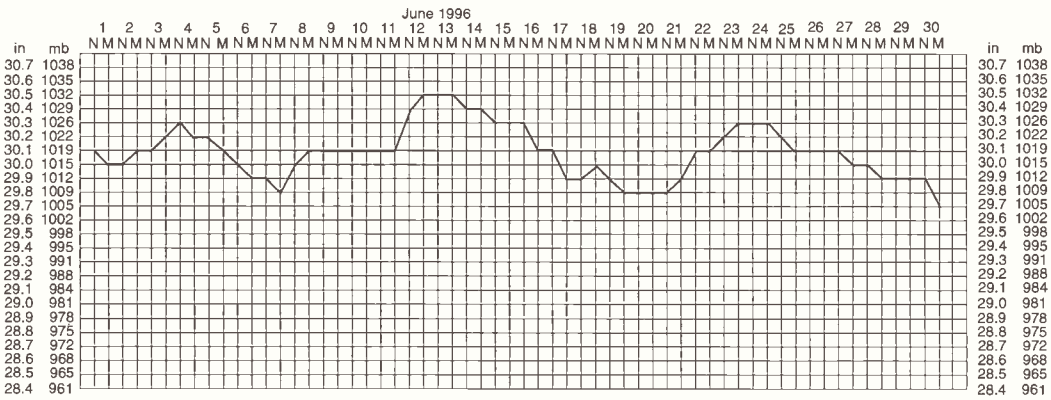


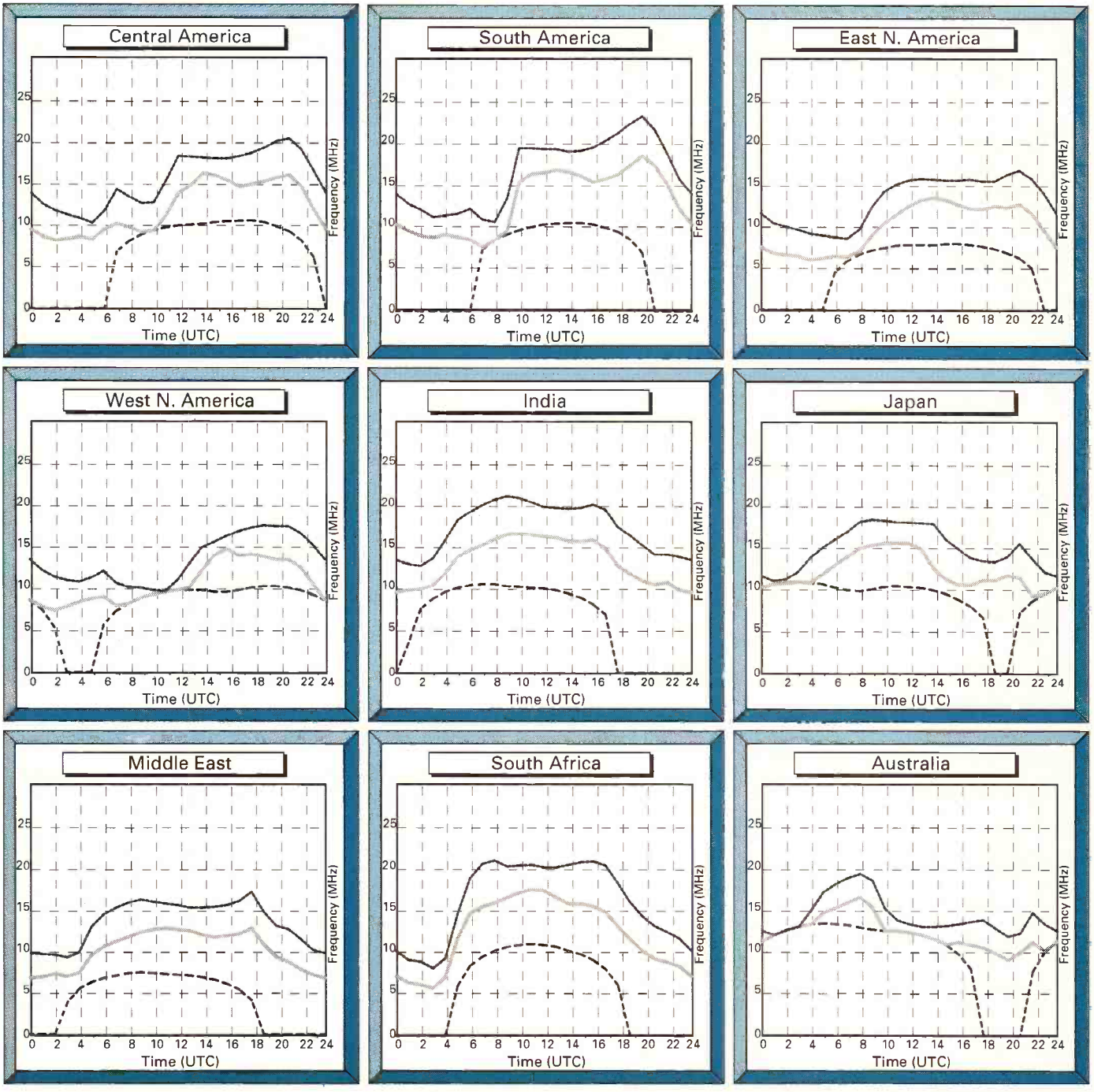
Fig. 2: Barometric pressure chart for June 1996 taken by Ron Ham at Storrington, E. Sussex.



Jacques d'Avignon VE3VIA

World Propagation Forecasts August

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.

Keith Hamer & Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.

DX Television

Sporadic-E activity during May produced some of the best openings ever experienced for several years. The amount of exotic activity has been incredible for the start of a season both in Europe and the United Kingdom. **Roger Bunney** (Romsey) advises that a possible transatlantic opening occurred on the 18th on Channel A2 with a 60Hz video buzz at scanner level. On the 19th there was a five-hour opening to the Middle East with Jordan on Channel E3, Syria on E4, Iran on E2 and even a French-language Lebanese transmission on Channel E2 from the Biet Mery 1kW TL-3 outlet!

Reception Reports

In Derby on the 19th around 1630UTC, Arabic signals were resolved on Channel E4 originating either from Morocco (the Laayoune transmitter) or Tunisia (Remada).

On May 20, an Arabic signal on Channel E2 was noted between 1600 and 1640UTC that is thought to have originated in Iran as the programmes differed from the Dubai schedules. **Andrew Jackson** (Birkenhead) also received a strong Arabic station on May 23 at 1542 on Channel E2 from an unknown source. **Vincent Richardson** (Conwy) sent a sketch of an Arabic-looking logo on Channel E3 that could have been Jordan. Unfortunately, there are no details regarding the date.

John Woodcock (Basingstoke) logged the Swedish PM5534 test card with the new 'SVT 1' identification (see **Fig. 1**) at 1130UTC on the 27th. Co-channel Norwegian signals were present until 1410. A Russian-style test card appeared on Channel R2 around midday; this could have been Estonia before switching to their local colour-bar pattern. We can confirm that a 'YT-1' logo received on Channel R2 at 1340UTC on the 10th was from the Ukraine 1st network.

Richard Wood (Redditch) is now using a rotatable 4-element wideband Band I array mounted outdoors. On the 22nd and 23rd, an Italian private station called 'TVA' was received in colour on Channel IA. The 24th produced DX reception from most European countries including test cards from Hungary (MTV-1 BUDAPEST), Denmark (DR-TV) Russia and Estonia (EESTI TV TALLIN). As Mike says, "The 1996 Sporadic-E season has opened in impressive style but let us hope that it lasts longer than last year's".

Peter Barber (Coventry) logged signals for almost 11 hours on the 24th with reception mainly from central and south-eastern Europe. By 0610UTC, reception was already established with strong signals on Channel R1 from NOVA TV (Czech Republic) with indoor ball games and ORF-1 (Austria) on E2a; the OIRT f.m. band was active too at the time. By 0900, Sweden (UR), Slovenia (SLO-1), Ukraine (YT-1) and Italy (RAI UNO) had all been identified. By 1824, Croatia (HRT), Estonia (ETV), Hungary (MTV-1), Russia (PTV), Finland (YLE) Corsica (Canal Plus) and Spain (TVE-1) had been added to the log.

Lt. Col. Rana Roy (India) reports a disappointing start to the new Sporadic-E season with only relatively minor openings from Dubai and the CIS. Rana comments that twenty years ago there were few transmitters operating in India so Band I antennas with up to 13 elements were installed in many areas for receiving Doordarshan programmes on Channel E4.

Tim Tebbs (New Romney) identified Albania (TVSH) on Channel IC (77.25MHz vision) on the 23rd at 1930 and also the Italian private station TVA on Channel IA at 2030. One of Tim's other highlights included the Icelandic PM5544 test card (RUV ISLAND) on Channel E4 at 1620 on May 27.

Stephen Michie (Bristol) logged the Italian TVA station on the 20th, 23rd and 25th. Using a hand-held indoor loop antenna, complete separation from the co-channel RAI UNO signal was possible. Albania (TVSH) on Channel IC was present on the 23rd at 1800UTC and on the 24th at 1326UTC.

Andrew Jackson (Birkenhead) successfully resolved signals from the 42W RAI UNO relay on Channel E2 on the 24th. This relay is located in the Italian enclave of Campione d'Italia in the Swiss Ticino. Another unusual signal has also been logged - an Italian private station at 47.872MHz (just below Channel E2) with a distinctive white 'VIDEO' logo in the lower right-hand corner of the screen. **Tom Crane** (Essex) has identified this signal on several occasions. It looks like a shopping channel with lots of telephone numbers given. The transmitter is located at Mt. Penice in northern Italy.

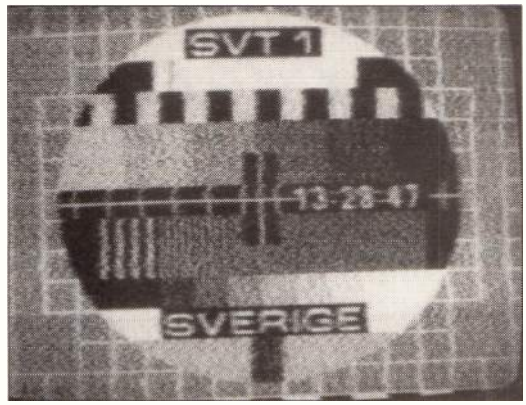


Fig. 1: The Swedish PM5534 test card with new 'SVT 1' identification received in May by Stephen Michie (Bristol).

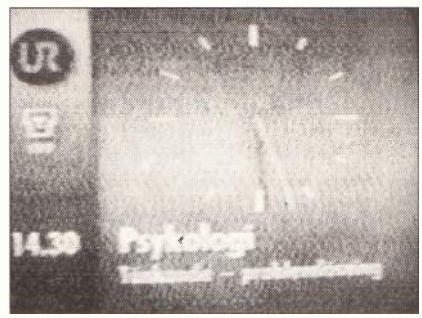


Fig. 2: The 'UR' logo denotes an educational transmission.

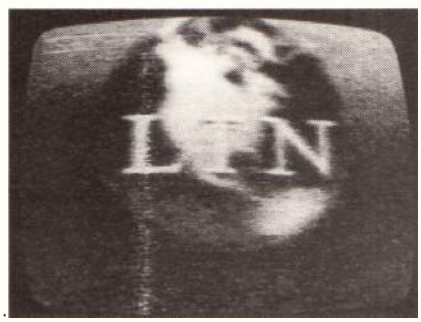


Fig. 3: Lithuania's news globe seen by Stephen Michie on Channel R2.

Carl Bowen (Nottingham) reports what could be a low-power relay of ORF-1 (Austria) seen on Channel E3 with a weather map and altitude/temperature details at 1650UTC on the 23rd. The Italian private station with the white 'VIDEO' logo was present just below Channel E2 at the time.

DXTV New-comers

Shaun Taylor (East Yorkshire) is currently using crossed dipoles in the loft for Band I DX-ing. These feed a small multi-band monochrome portable but an upgrade to a D-100 converter is planned. Spain, Portugal, Italy, Slovenia and Croatia are some of the countries identified so far.

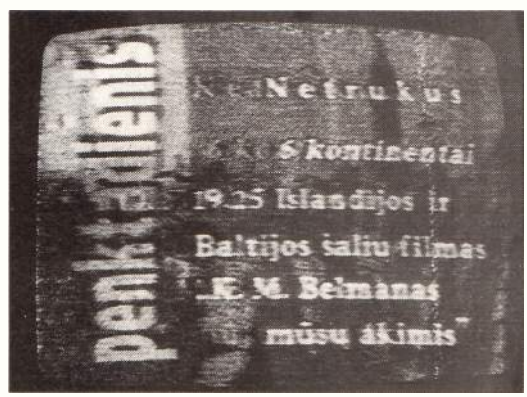


Fig. 4: Programnme schedule from Lithuania.

David Edwardson (Wallsend) is an established s.w.l. but hopes to venture into TV and f.m. DXing. By all accounts he seems to have a good take-off. Using a 4-element loft array, weak stereo signals are present daily from Sandale (Cumbria).

FM Band Activity

Mike Gaskin (Launceston) witnessed an excellent f.m. band opening on May 27 between 1100 and 1500UTC with various Norwegian and Swedish f.m. transmissions swamping local ILR

stations. A sudden skip change occurred mid-afternoon bringing in MDR III and BR 4 from Germany and Radio Nova Alpha on 87.60MHz (no RDS present), possibly from the Czech Republic.

On-screen Logos

Peter Barber (Coventry) has seen a large dark '2' logo with 'YT' in small white letters inside on Channel R2. **Carl Bowen** (Nottingham) and several other DXers have queried this one and it appears to be Ukraine's second TV network. However, just to complicate matters, a simple white 'YT-2' logo has also been seen! **Tim Tebbs** (New Romney) noticed a '1+1' logo on the 24th at 1320UTC during an opening to the east on Channel R2 accompanied by Ukraine TV with its 'YT-1' logo.

Fig. 5: Lithuanian news bulletin.

Service Information

Stephen Michie (Bristol) has supplied details about several changes to various TV services:

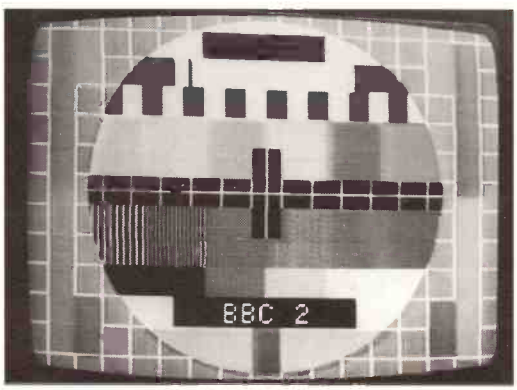


Fig. 6: A PM5544 variation, known as Test Card 'G', as used by BBC-1 and BBC-2 during the Seventies and Eigthies, mainly for regional opt-outs.

Sweden: The identification displayed at the top of the PM5534 test pattern now shows 'SVT 1' for the first network (see **Fig. 1**) and 'SVT 2' for the second, instead of 'Kanal 1'. 'SVERIGE' is still displayed in the lower identification panel. Colour bars without identification are also shown. The on-screen logos (SVT-1 and SVT-2) appear in the top-right of the picture. Note that a 'UR' logo is shown during programmes for schools (see **Fig. 2**). The clock shows 'SVT-1', 'SVT-2' or 'UR' as appropriate.

Portugal: A new logo is now being shown in the top left-hand corner of the screen, consisting of a number '1' with 'R.T.P.' in small letters immediately below. This replaces the old 'C1' logo, although there has been a report of it.

Norway: Regional news opt-outs occur weekdays between 1645 and 1700 (from 1630 on Wednesdays). The logo 'NRK-1' is displayed in the top-left of the screen during programme schedules but in the top-right during programmes. The PM5534 test card is sometimes transmitted with a stylised 'NRK-1' logo at the top but without transmitter identification below.

Estonia: The G-204 (Russian) electronic test card is broadcast with identification '1996' at the top. Also, a blockboard-type test card (PM5537) is shown but with more greyscale steps than before. The identification is 'EESTI TV TALLIN'.

Czech Republic: NOVA-TV news is called 'Televizni Novini'. A very distinctive clock with 'NOVA' in the centre is used.

Hungary: All broadcasts are now in PAL colour.

Moldova: The Russian ORT service is now only aired between 0300 and 0910UTC. For the rest of the day, the YT-1 service from the Ukraine is relayed. Similarly, the airtime of RTR from Russia has been reduced; transmissions now only take place between 1400 and 2100UTC.

Our thanks to Stephen for sending this month's Service Information.

Keep On Writing!

Please send DXTV reception reports, equipment news, off-screen photographs and general information as soon as possible to: **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS, England.**

WIN

Yet another chance to **WIN** an exciting new receiver worth **£349!**

R	S	F	S	S	K	U	Z	G	I	D	W	E	V
R	F	A	R	E	C	Y	C	C	G	J	I	J	M
O	B	J	G	E	S	A	U	E	E	M	D	H	N
M	I	E	T	N	Q	D	N	S	X	I	E	N	V
I	T	C	R	S	S	U	L	N	K	O	B	P	P
N	S	S	D	Q	Q	Q	E	E	E	F	A	A	O
I	P	K	E	T	U	J	L	N	H	R	N	P	A
A	E	R	J	L	E	Z	L	H	C	D	D	D	O
T	C	W	Y	A	L	P	S	I	D	Y	N	M	Q
U	T	J	W	E	C	A	O	P	F	Z	Q	A	I
R	R	U	D	O	H	K	M	U	A	T	A	Q	H
E	U	X	R	P	U	A	U	S	F	G	L	D	V
L	M	S	N	O	T	T	U	B	C	O	F	Y	V
V	D	Q	N	X	B	M	L	S	D	N	R	P	S

Words to find

Scanner
Miniature
Handheld
Smallest
Wideband
Spectrum
Frequency
Squelch
Display
Buttons

Part two of our competition to **WIN** an exciting new miniature scanner worth £349.

Reviewed last month, the Weltz WS1000E is claimed to be the world's smallest scanner. **Waters & Stanton Electronics** have kindly donated one as a prize for one lucky reader to win.

Try your luck at winning this compact scanner by entering our three-part competition.

Last month we asked you to spot the five differences on the cartoon, cut out and save the answer form. This month you will need to find the ten words listed above, cut out and keep the marked-up letter grid in a safe place.

In next month's *SWM*, we will publish the address to which you must send all three parts of the competition.

The closing date for this competition is 26 October 1996. The winner will be announced in the December 1996 issue of *Short Wave Magazine*.

Only fully completed entries can be accepted.

Roger Bunney, 33 Cherville Street, Romsey, Hants SO51 8F8

All pictures this month thanks to John Locker, Wirral

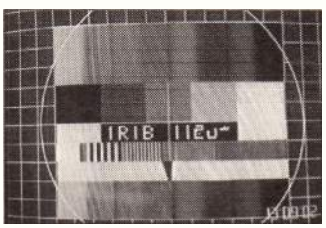
Satellite TV News

Heavenly Sightings.....

Football fans have had a field day with the EURO '96 matches across the UK and filling the satellite transponders with sporting feeds, commentaries and reaction for several weeks. From my own observations there's been football from 37°W across to 16°E and beyond (the summer leaves on the trees have effectively stopped signals for me past 16°E!). I'm not a football fan and I haven't included any loggings in my book!

I've been keeping a close watch on the Orion 37°W output in Telecom band with the BBC evening *Spotlight* live inserts into the regional programming from 1830 hours local. Plymouth 'UKI-231' is an extremely active unit with location action most nights, though June 16 saw them using capacity via the French Telecom 2C bird at 3°E late afternoon with footage relating to the Plymouth-USA yacht race. I've had absolutely no luck in locating our local BBC South (Southampton based) SNG truck, for a week they ran live input from local seaside resorts but despite careful hunting nothing was ever seen! I understand that the BBC SNG trucks can access Intelsat, Eutelsat, Telecom and Orion birds as from June.

On a personal note I've been testing a new Chaparral M60e satellite receiver, it's a menu driven unit though the 'blue screen' can be deleted in favour of menus' against weak signals. Threshold extension, variable bandwidths, looping, dual speed scanning with frequency readout on the receiver and other useful features on this very compact unit. Retailing at just over £200 it looks pretty good value and a fuller evaluation will be penned later on.



The Iran test card via Eutelsat II F4 at 7°E, stabilised with an EBU sound in sync (SIS) decoder.

Bosnian War Crimes trials continue, this via Eutelsat 16°E.

I'm not one for the various radio programme feeds on satellite but **Robert Frost** (Felixstowe) is a close observer and advises that for text viewers page 332 on UK Gold is a 'radio round-up' listing. Despite the many letters received, very few satellite enthusiasts seem to listen to the numerous radio programmes available - I'd like to hear from anyone listening to the international 'short wave' programmes carried in parallel on satellite and their comments in general on these services.

Full marks for sat-zapper **Tim McClellan** (Christchurch) reacting to the recent column query 'BSKYB DORAL' and suggests this was a news feed including Stephen Dorrel, the Health Secretary. Near neighbour and fellow zapper **Julian Redwood** (also Christchurch!) has successfully assembled his 1.8m dish in only one hour with only another hour to achieve accurate Clarke Belt tracking and results are greatly improved now having replaced his noisy 1.2dB noise LNB with a 0.8dB counterpart. The inclined orbit actuator has yet to be fitted. Julian can now track 53°W to 42°E with no obstructions, lucky fellow!

Marcus Tate (Bolton) comments that May 27 Eutelsats' 7°, 10° and 16° East went 'berserk' with the Israeli elections and he counted no less that 17 feeds out of Tel Aviv, mostly UKI-148 and from JCS (Jerusalem Capitol Studios). Customers for these news oferings included MBC, ABC, Fox News, Channel 7 America, NHK Tokyo, ZDF, PRO 7 and Sky News, mainly in PAL but others in SECAM and NTSC. One unusual sighting was 'Vision Works, Dublin' that was fed SIS (sound in syncs). It was in fact Marcus that steered me towards the Chaparral M60e that he was about to buy for his own use.

Over to Greece and **Stathis Panagiotidis** (Thessaloniki) noted a 'significant' drop in signal levels once Intelsat 707 went into operation at 1°W, the Scandinavian spot beams are now much more tightly spotted into the target zone though the Israeli spot signal levels have now risen. Overseas and **Bandula Gunasekera** (Sri Lanka) has recently installed a Telecom Band LNB to permit reception at Ku from PAS-4 @ 68°E. The LNB was purchased in Singapore at £29 and covers 12.25-12.75GHz intended for S.E. Asian birds such as Asia-Sat-2; JcSAT-3, Apstar-1A and KoreaSat-1. Interesting that this price was only available provided the LNB was 'exported' out of Singapore and not used locally.

I heard from **John Locker** (Wirral) that the Israeli AMOS-1 bird went onto station at 4°W early June though as yet (June 20) no signals have been seen by any of our readers. John has also monitored Astra-1F tests with heavy carriers at 20°E between 12.100-12.500GHz. With the suggested two year delay before start-up of BSKYB digital TV the on-stream commencement of programming may be delayed. It's possible that the recently announced 28°E Astra-2 slot may be used for digital downlinks only though mention has been made for other transmission uses.

A very long reception log has been received from **Roy Carman** (Sandown) who has experienced a curious fault on his satellite system. Following high winds he found that received satellites were suffering reduced signal levels or disappearing completely. Checks were made around the dish thinking the system had shifted in the winds but everything was tight. A process of elimination eventually proved that an ADX Plus frequency extender was faulty! One of his interesting sightings recently was the opening ceremony of the new Virgin Megastore in Times Square, New York, carried via Intelsat K at 21°W- in PAL for Europe - though the signal was also transmitted via Telstar 401 and Galaxy K7 for North American consumption. Early morning transmissions have been monitored by Roy on Eutelsat II F3 at 16°E at 11.570GHz vertical, suggesting a Ukranian channel - a small corner logo includes "ic > tv", the '>'being a blue dart through a yellow crescent shape and with Cyrillic lettered captions. PanAmSAt's - PAS-3 at 43°W still remains a quiet bird comments Roy and recommends checking out the Hispasat Spanish sat at 30°W as the cheap leases often reveal numerous UK and other OB feeds. With the upcoming Atlanta, USA Olympics '96 I anticipate that the Atlantic region satellites are expecting lots of business and PAS-3R will I'm sure be very active.

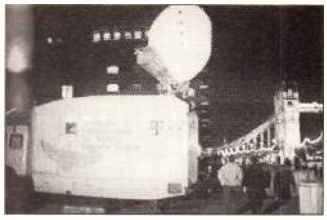
Orbital News

Canal Plus are discussing the opening of a digital satellite service in French speaking Belgium to rival the French Canal-Satellite package that opened April. To encourage cable take-up Canal Plus will share start up costs with cable companies. Canal Plus intends to offer a similar deal into Spain with local cable firms there, hoping for a start-up late 1997. Sony is incidently manufacturing digital decoders for the French Canal Plus package, the decoder units being made at their UK plant at Pencoed in Wales.

Eutelsat carried live the launch and almost simultaneous destruction of the new Ariene 5 rocket from French Guinea on their 13°E II F1 satellite June 4 afternoon. With the explosion so went several cluster satellites and putting on hold further Ariane launches until the problem can be resolved. And Bulgaria has now joined the Eutelsat group as their 45th member.

One reader has already reported the new 'HOME TV' satellite channel that transmits across India with a broadly based entertainment and film format for some 12 hours daily. And more new channels across Asia, Star TV have launched the 24-hour 'Viva Cinema' for the Philipines in the Tagalog language and the noted US company HBO are starting their own 24-hour movie service 'Cinemax' - commercial free - early October based around the libraries of Warner, Paramount, MCA and Columbia Tristar.

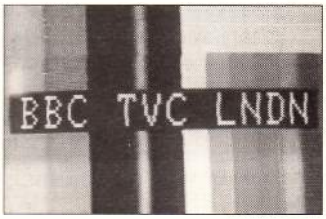
Asian news exchange via 7°E ex C-Band cross strapped, source in Beijing, China.



The Deutches Telekom SNG truck on the Thames embankment seen by its own camera via Kopernikus DFS-2 at 28°E.

Circuit identification including stereo tracks.

Check out Eutelsat II F3 at 16°E for Russian UK feeds.



A SIS circuit ident from BBC TV Centre, London via 7°E.

Gerry L. Dexter, c/o SWM Editorial Offices, Broadstone

Bandscan

America

WHRI is issuing this new QSL to commemorate their 10th anniversary.

Radio Canada International is not the only Canadian short wave station suffering from hard times. CHNX in Halifax, Nova Scotia (6.130MHz) is using a mere 40W of their listed 500W and reportedly isn't likely to take the trouble to make the technical adjustments to get back to full power anytime soon.

CKFX, the longtime low power (10W) station in Vancouver, BC, is no longer on the air. According to Arthur Cushen as late as ten years ago, the short wave target audience was being reached by medium wave and the short wave transmitter had been kept on the air just as a target for DXers.

Dominican Republic: A new station from this country is Cristal Internacional, operating on variable 5.012 - officially 5.010MHz. Actually, this is a return to short wave for this one, which was active on 5.010 variable for a while back in the 1970s. The station carries 'tourist and cultural' programming designed to both promote the Dominican Republic and to 'unite' Dominican's abroad, according to Dario Badia, the station's president. The station is on the air from 2100 to 0300, using a locally-made one kilowatt transmitter. Their associated medium wave station is Radio Pueblo, and it's possible you may hear that ID from time to time as well. Reception reports are welcome and should be sent to the station in care of Apartado Postal 894, Santo Domingo, Dominican Republic.

Another Dominican station, Radio Quisqueya, has recently reappeared. It's on 6.235MHz or a fraction above and is operating until around 0420 close.

Guyana Returns: The expected return to short wave of the Guyana Broadcasting Corporation has taken place. The GBC has resumed operations on its two former frequencies - 3.290 and 5.98MHz. The exact schedule isn't completely certain at this writing, but probably runs from 2100 to 0900 on 3.290 and from 0900 to 2100 and 5.950. The former frequency was first spotted around 0200. The powerful WYFR in Florida is often a problem on 5.950MHz. GBC is using 5kW on short wave, although originally they were expected to be running twice that.

Paraguay/Peru: Adventist World Radio's planned Paraguayan short wave station will not happen, at least not anytime soon, due to difficulties in transferring funds into the country from the person who was financing the project.

However, Adventist World Radio will put a new short wave station on the air from the Adventist College at Juliaca, near the famous Lake Titicaca. It will use a transmitter formerly used by AWR's Costa Rican station. The new station will operate with five kilowatts, beaming largely south-east, carrying religious programming in Spanish and Quechua. It is possible there may be further short wave transmitters in operation later on.

Ecuador: Recent receptions from this country include the following stations:

La Voz del Rio Tarqui	3.285
Radio Centro	3.290
Radio Oriental	4.780
Radio Nacional Espejo	4.880
Radio Quito	4.919
Radio Baha'i	4.950
Escuelas Radiofonicas	5.010
La Voz de Upano	5.040
Radio Gran Poder	5.050
Radio Nacional Progresso	5.060

Some of these frequencies tend to vary slightly - usually by only a few hundred hertz.

Honduras: The owners of Radio Copan International, that ran test broadcasts on 7.460MHz a while ago say they weren't very happy with the results. You might want to monitor their original frequency, 15.675, for a possible return there, using their original transmitter and antenna system. At a later date, the station may try other frequencies in the 41 or 60m band.

United States: WINB in Red Lion, Pennsylvania is reported to have been off the air for about a year and a half now and it looks as though it may never return, due to a lack of money to repair or rebuild a transmitter that is over 30 years old. Short wave is (or was?) only one aspect of the company's broadcasting endeavours, that also include medium wave, f.m. and TV.

Radio Miami International (WRMI) in Indiana is celebrating their tenth year on short wave and issuing a special QSL card to commemorate the anniversary. WHRI is part of LeSea Broadcasting who's founder, Lester Sumerall, on, passed away last April.

The Voice of America's now closed short wave transmitter site at Dixon, California, last operational in 1988, will soon be operational again. But this time it will be under the ownership of Globe Wireless, that will use the facility for high frequency communications with ships, relaying non-voice mode messages. There are no longer any VOA transmitters at this site although some of the antennas are still there and may be put to use. The transmitters which Globe Wireless will install will be 5kW units. The station will ID using c.w. only.

The US Federal Communications Commission has released a tentative list of those station that will be allowed to move to the new, expanded portion of the medium wave band see, **Table 1**.

It is likely there will be some changes in this list before it becomes final. Once it is finalised (perhaps around the time you read this) the stations will be able to apply for permits for transmitters to operate on these frequencies. Thus it's likely to be very late this year, at the earliest, before the changes are actually implemented. This is the second such list the FCC has released. The first was eventually withdrawn from use, but not before at least two stations applied for and received permission to operate in the expanded band. WJDM, Elizabeth, NJ (on 1660kHz) and KXBT, Vallejo, CA (1630kHz - 0riginaly 1640kHz) are both now active.

Uruguay: A new station here is Emisora Ciudad de Montevideo, CXA42, using 9.650, which is so far operating on an erratic schedule between the hours of 1100 and 0300. The station's programming features tropical and Caribbean music, live broadcasts of musical events and soccer coverage. Although the transmitter is listed as 10kW, the station is, initially anyway, running no more than 1.5kW. Eventually a second transmitter of 5kW is scheduled to operate on 15.230, with the call CXA142. The company also has a medium wave outlet on 1370kHz.

Antarctica: The question surrounding the status of AFRN-McMurdo has finally been resolved; it is permanently off the air - the short wave transmitter isn't even there any longer. So, although there's no chance to hear Antarctica via shortwave broadcast, there are reports that the other station there, Radio Nacional Arcangel San Gabriel, operated by Argentina, may become active again. Watch for it on 15.476, running to sign off at around 2330.

Colombia: A new station here is Radio Fortaleza, broadcasting from Sogamoza on 4723, though it tends to drift to 4750 or higher. Broadcasts run from 1000-1200 (weekends to 1300) and 0100-0300. This is likely an unlicensed station and may be hard to spot since there are many low power Latin American stations operating in this area. The address is **Carrera 10 1495, Sogamosa, Dept. de Boyaca.**

Hawaii: KWHR's schedule now runs from 0000-0400 on 17.510; 0400-0800 on 17.780; 0800 to 1600 on 9.930; 1600 to 1800 on 6.120; 1800 to 2000 on 13.625; 2000-2200 on 15.405 and 2200-0000 on 17.510.

That's all for this time. More from the Americas in three months.

Table 1:

Station	Location	Old kHz	New kHz
KAHI	Auburn, CA	950	1700
KALT	Atlanta, TX	900	1610
KAPR	Douglas, AZ	930	1690
KAST	Astoria, OR	1370	1700
KBLU	Yuma, AZ	560	1660
KBNA	El Paso, TX	920	1680
KBRF	Fergus Falls, MN	1250	1680
KBTN	Neosho, MO	1420	1670
KCFI	Cedar Falls, IA	1250	1650
KCJJ	Iowa City, IA	1560	1630
KCOL	Ft Collins, CO	1410	1680
KCRC	Enid, OK	1390	1640
KDDR	Oakes, ND	1220	1700
KECN	Blackfoot, ID	690	1620
KFVR	Cresecent City, CA	1310	1690
KHPY	Moreno Valley, CA	1530	1670
KHRT	Minot, ND	1320	1620
KHTE	Redding, CA	600	1670
KHVN	Ft Worth, TX	970	1630
KIDR	Phoenix, AZ	740	1700
KJCK	Junction City, KS	1420	1620
KKEL	Hobbs, NM	1480	1670
KKLS	Rapid City, SD	920	1650
KLOQ	Merced, CA	1580	1680
KLXX	Bismarck/Mandan, ND	1270	1640
KMLB	Monroe, LA	1440	1680
KNBA	Vallejo, CA	1190	1630
KNRB	Ft Worth, TX	1360	1700
KOJY	Costa Mesa, CA	540	1650
KOQO	Clovis, CA	790	1640
KPHP	Lake Oswego, OR	1290	1640
KQKE	Soledad, CA	700	1620
KQWB	Fargo, ND	1550	1660
KRCX	Roseville, CA	1110	1660
KRGI	Grand Island, NE	1430	1690
KRIZ	Renton, WA	1420	1620
KRKS	Denver, CO	990	1660
KRZI	Waco, TX	1580	1660
KSHY	Fox Farm, WY	1530	1630
KSLM	Salem, OR	1390	1680
KSOS	Brigham City, UT	800	1670
KSTR	Grand Junction, CO	620	1690
KSVE	El Paso, TX	1150	1630
KSVP	Artesia, NM	990	1650
KTKK	Sandy, UT	630	1650
KTMT	Phoenix, OR	880	1650
KURV	Edinburg, TX	710	1640
KWFM	Tucson, AZ	980	1640
KWHN	Ft Smith, AR	1320	1650
KZOK	Seattle, WA	1590	1660
WAMJ	South Bend, IN	1580	1620
WAOK	Atlanta, GA	1380	1650
WBIT	Adel, GA	1470	1690
WCHQ	Camuy, Puerto Rico	1360	1660
WCMQ	Miami Springs, FL	1210	1700
WDDD	Johnston City, IL	810	1690
WEUP	Huntsville, AL	1600	1700
WGIV	Charlotte, NC	1600	1660
WGOD	St Thomas, USVI	1090	1640
WGYJ	Atmore, AL	1590	1620
WHWH	Princeton, NJ	1350	1680
WJDM	Elizabeth, NJ	1530	1660
WJRZ	Toms River, NJ	1550	1620
WKRG	Mobile, AL	710	1660
WKSH	Sussex, WI	1370	1640
WKTP	Jonesborough, TN	1590	1680
WKZQ	Myrtle Beach, SC	1520	1620
WLVW	Salisbury, MD	960	1670
WMIB	Marco Is, FL	1480	1660
WONX	Evanston, IL	1590	1700
WPMH	Portsmouth, VA	1010	1650
WPTX	Lexington Park, MD	920	1690
WQSN	Kalamazoo, MI	1470	1660
WRCC	Warner Robins, GA	1600	1670
WRDW	Agusta, GA	1480	1630
WREN	Topeka, KS	1250	1660
WRRA	Fredrickstead, USVI	1290	1620
WSFN	Muskegon, MI	1600	1680
WSVA	Harrisonburg, VA	550	1700
WSYD	Mount Airy, NC	1300	1640
WTAW	College Stn, TX	1150	1620
WTDY	Madison, WI	1480	1670
WTRY	Troy, NY	980	1640
WVMJ	Biloxi, MS	570	1640
WWHL	Cocoa, FL	1350	1640
WXTO	Winter Garden, FL	1600	1680
WZNN	Rochester, NH	930	1700

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SSB Utility Listening

Airwaves '96

Last month, I said that I would do a brief 'review' of the latest *Airwaves 96* h.f./v.h.f./u.h.f. aviation frequency directory. I got my copy at the end of May, and it has been in regular use since then.

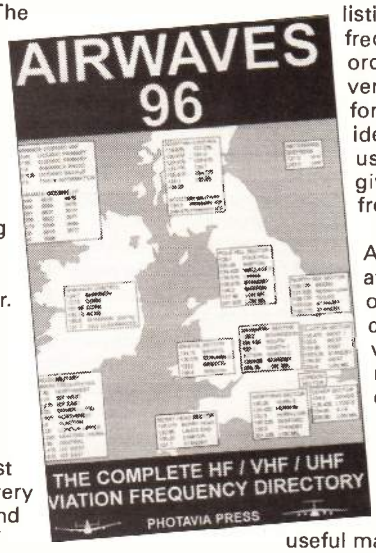
As with previous editions, the book is still A5 sized, but it is now 'comb-bound' with a plastics-coated spiral in the spine, instead of being stapled together. This itself makes the book easier to use, as it will now stay open flat on a desk without fear of it springing closed just when you need it the most.

The subject matter is divided into nine sections, with an introduction at the beginning of the book. The sections follow the same format and layout as previous years, and they are also in the same sequence. The first four sections cover v.h.f. and u.h.f. airband frequencies (and one or two others), and is followed by a section containing all the v.h.f. and u.h.f. frequencies in frequency order.

The section which will be of most interest to readers of this column is the 'h.f. frequency directory'. The first 'h.f.' section is a very comprehensive and accurate listing of frequencies used by aeronautical stations covering the Major World Air Routes; this covers important networks such as the NAT/ AFI/MID and SAM track systems. One set of entries that I did find strange, were those for Basrah and Baghdad in the MID-1 network; these suddenly went very quiet in mid-January 1991 - has anybody heard them since then?

The next section is one of my personal favorites, the listing of the world-wide military h.f. frequencies. *Airwaves 96* lists a large number of frequencies, but there are probably at least as many again which are only used on an occasional basis, and therefore never get reported. I'm sure that NASA would be surprised to see themselves listed with the military, but since they do a lot of communicating with the military, I guess that it makes sense to list them in this section.

The next section lists Airline 'Company Operations', with entries for everything from Aer Lingus to Zambian Airways. Also in this section are Berne Aeradio, ARINC, Portishead Radio and Stockholm Radio who provide long distance communications for just about anybody and everybody. This section also includes a listing of world-wide domestic h.f. frequencies, and also h.f. VOLMET frequencies including the latest RAF changes. The h.f. section finishes with a frequency listing in frequency order, again very handy for trying to identify likely users of any given frequency.



The Appendices at the back of the book contain various maps and diagrams of the airspace around the UK. The most useful map for h.f. listeners is the one that shows all the entry point to the North Atlantic airspace, with all the beacons and lat/longs clearly marked. There is also a listing of the more commonly heard ICAO Location Codes for airports around the world. Although it is not a complete listing, is does prove very useful for identifying the destination of flights.

Although *Airwaves 96* is not quite pocket-sized, it certainly is packed full of information, and is just the thing to keep near to your scanner or h.f. receiver. It costs £8.95 and it is available from the *SWM* Book Store.

STS-79

If all goes according to plan, by the time that you read these words during late July, it will be only a few days before the next launch of the Space Shuttle. Mission STS-79 is due to launch from Florida on Wednesday 31 July at 15.42UTC (16.42 local UK time), on a flight of nearly 9 days. This mission is the third flight to rendezvous with the Russian space station Mir, and it will be orbiting at an inclination of between 51° and 52°N, bringing it over the UK several times a day.

I'm unsure whether or not W3NAN will be re-transmitting the NASA Shuttle audio for this flight. They normally only do this when there are radio amateurs amongst the Shuttle crew, and I have not seen any lists of crew-members yet. However, it is worth carefully checking the usual re-broadcast frequencies for any activity in the few days after the launch. For those of you who do not have the information, or may have misplaced it, here's where to listen:

Station	Freq. (MHz)	Mode
W3NAN	3.860	l.s.b.
	7.185	l.s.b.
	14.295	u.s.b.
	21.395	u.s.b.
	28.650	u.s.b.
W5RRR	3.840	l.s.b.
	14.280	u.s.b.
W6VIO	3.840	l.s.b.
	21.280	u.s.b.

NASA also have a large number of h.f. frequencies which they use to support a Shuttle launch. One of the most commonly reported frequencies is 10.780MHz, which is the primary frequency for the Eastern Test Range. During the preceding 48 hours before a launch, this frequency carries some interesting communications between 'Cape Radio' and the ships and aircraft supporting the launch. During this time, several other frequencies are used to check for their suitability. Listen carefully for 'Cape Radio' asking other stations to QSY to different frequencies - these are the most likely frequencies to be used during and after the launch. As an example, for the STS-78 launch in June '96, they tried frequencies of 5.775 and 7.765MHz (and probably others as well). Supporting the launch are several ships from the US Navy and US Coast Guard, as well as NASA's own ships. Also active for the launch are some 'search & rescue' aircraft, usually using the callsign 'King'.

Miami

A number of readers have reported hearing 'airline LDOC' type signals on 6.637MHz in recent months. I have done some research into this, and even managed to hear some signals myself late one evening.

From what I have heard and read about, there does appear to be a new LDOC (long distance operational control) station operating from Miami in Florida. Almost all the signals relate to flights between airports in Florida and other airports in the Caribbean and South America. Also, most of the airlines are American, such as Southern Air Transport, Evergreen and Rich International.

This frequency is also listed for ARINC Houston, so some care must be taken when logging signals on this frequency. Quite fortunately, one evening a station was having some difficulty contacting 'Miami Radio' (as it calls itself), and the operator gave a list of frequencies that they use: 6.637, 8.095, 10.033 and 21.964 (all MHz u.s.b.). I have never seen any reports for their 21MHz frequency, but all the others appear to be quite active. The 8MHz frequency used to be used, along with 11.470MHz , by cargo flights from Miami, so this last frequency might be worth checking for activity.

Paul Essery GW3KFE, PO Box 4, Newtown, Powys SY16 1ZZ

Amateur Bands Round-up

Listening to the Amateurs

Let's have all your news and comments, sent as usual for the start of the month.

Questions - I Get Questions!

At what age should a listener give up thoughts of obtaining a licence? During last year, the oldest candidate to pass the Morse test was 81; since most people do this test AFTER getting the RAE pass, there is no obvious reason why age should affect one's ability to get a licence. Memory is, perhaps, a mite shakier, I concede, and the process of learning a mite slower. These are dealt with by inventing mnemonics for things that matter, and by extra revision. What you first study today, you must revise tomorrow and again the next day.....softlee, softlee catchee monkey.

I am convinced in my own mind and by my years teaching RAE that in most cases 'age' is given as the reason when they really mean 'I'm afraid to try' or worse 'afraid of failure'.

Rigs

What a pleasure it was recently to operate a KW2000-series rig! Not a superfluous bell or whistle in sight; band-changing by flicking a switch rather than umpteen button-presses, not a 'memory' to be seen, operable to the full by anyone, and no bleeping noises; what wouldn't I give for an updated version with that beautiful clean front panel.

My thoughts were pushed this way by my other interest, REMAP, that involves special projects for disabled people. There are so many people who, for one reason or another find it hard to 'aim' a finger at a tiny button, but could easily manage a rig like a KW2000 either 'as is' or with little more than slight modification to knobs. As for having, as reviews so often say, to sit with the book in one hand and the rig in t' other - yeuch! I have had a certain 144MHz rig for a couple of years past, and I still must take 'the book' with me if I want to use it seriously.

Designers are seduced by the bit of memory left when all the needed facilities are achieved, and they chuck the other stuff in just to use up the remainder. One sees a similar trend in modern cameras, and in computers too. I'm on my fifth word processing program now, each one more complex than the last, and the essential features ever more buried under garbage. To get from the end of this sentence to the point where the computer can be switched off requires more mouse-button pressing than you can shake a stick at!

Thank you to all those who offered congratulations on a bit more space....it will surely disappear again unless all you out there carry on with the welcome increase in the input!

Letters

First I must mention the International Listeners Association; their magazine *Just Listening* comes from **1 Jersey Street, Hafod, Swansea SA21 2HF**, where GW4OXB drives the bus. The current issue features an interesting piece on sunspots, which makes the very valid point that to see them, you must project the image from the telescope on to a white card. To look at the sun direct by telescope or even the naked eye is to take the risk of being blinded.

Next I have another letter from **Ron Pearce** in Bungay; his one-valver found XA1NVX in Mexico, on 7MHz, plus 14MHz signals from 8P9IJ, 5X3A, ZS6BJH, 9H4CM, VO1NP and 3Z0PBY. The last named, dug out from under a pile-up, wasn't offering any details of his QTH. In the absence of any further information, we must question whether this was another manifestation of Slim. On a different note, Ron has a quiet chuckle at the black box reviews praising 'low phase noise.' To be fair, while any p.l.l. system is to an extent limited by phase noise, the assumption that a simple oscillator doesn't have any noise components is a bit optimistic, as five minutes with a sensitive spectrum analyser would show - indeed, I can recall a nasty surprise in that line from a crystal oscillator. The question then, is how low is the noise, and how much does it affect the performance of the receiver. To that extent at least, Ron's one-valver is entitled to its quiet smile - and of course it costs much less to create and put into operation.

Down on the Isle of Sheppey, **Ted Trowell** is still in and out of the bandage works but he still contrives to keep at it. His c.w. filtration coped on 7MHz with ZL2CD, VP2EFF, KP4XX, HK5AJF, VK3MR, YV5AF, KP4AU, ZL1PC, 4X4AU, W9KNI/6, 3V8BB, JW5HE, PJ5AA, TI4CF, 7Z5OO, P49V, HC5AI, VK3BYE and P42V. On 14MHz Ted read the dits and dahs of JY5IN, K0HA, FY5FE, TA2ZY, WA3LCO/MM, 7X2FK, VU2PAI, VU2VKC, VU2BK, VU2RX, PY2EYE, JA7IC, 9K2MU, LU1EWL, K7GE, CN8LR, BV7WB, PT2DMS, HS0/G4DZC, P42V, CX8BBH, 8R3O, JA3ALY, 9V1WW, 4J3M and TM8REG/MM off Sardinia. At 18MHz Ted found R1FJZ/FJL, 4Z5BZ, 5N3/SP5XAR, J28JA, JA0AMN, JR5XPG, 9J2BO, HK5AAG, JA6CNL, JA4EYJ, ZD9BV, PT7WX, 8P9IK, YI9CW and 9L/DJ6SI. On 21MHz, PU2NMA, LU6EDL, LU3DSI, 5Z4BZ, at 24MHz D2EV and N2WCQ/6W1, and on 28MHz N2WCQ/6W1 again, plus 9H3TY and 9H1EL. His final exhortation is 'Keep mowing!'

From **Harry Richards** came a couple of cards, of which the second one asked about the 'A41ITDAP2JTB' in Frank Lennon's list; there should have been a space between the A41ITD and AP2JTB. Probably a slip of the typing fingers - sorry! Turning to the first letter Harry notes that his Barton-on-Humber home is now 'North Lincolnshire' rather than South Humberside. The place was originally Lincolnshire of course. I suppose this sort of nonsense at least keeps politicians out of worse mischief. On to more technical matters, Harry uses the Tandy box mentioned in a recent column backwards, to switch either of his AD270 active antennas to the single receiver. One of the AD270s is arranged inverted-vee style, while the other one is meant to behave more directionally.

Turning now to the letter from **Dennis Miller** in Dawlish, we find Top Band activity accounting for EI7BA, and SV8ZS, while on Eighty we see C94AI, CO3RX, CP6VP, EA9IE, K2RR, ZL3AFT and 3A2MD. Another shift, this time to 7MHz yielding ET3BT, HB0/DL0BLG/P, HJ5YBL, HS1NGR, LU2AMN, T77CD, TI3CF, TJ1RA and ZP9DHA. A big shot at 14MHz produced A71CX, EX8W, HC2OA, HK3LT, HL1KTX, HV3SJ, OH0/SM3GUE, RN3QN, S79MAD, UA9FG, VR2KM, XE1K, YV6PV, YW1A, ZL8RI, 3V8BB, 4F1RGA, 4L5A, 4S7FS, 9K2HN, 9Y4NG before a turn to 18MHz produced C31LD, JA1NVF, R1FJ, ZS6BJV, and 4L7AA. Up on 21MHz Dennis collected RK9AWN, UN0AA, ZS2OM, 4Z5GZ, 5N0RMS, and 9G1BJ. A trip up to 24MHz produced EA9PB, while 28MHz resulted in EG9ITU, HK5AWP and 4Z5UP.

Now we reach **Andrew Bright** from Watford, whose previous letter seems not to have surfaced with me. Andrew finds the static noises on 1.8 and 3.5MHz somewhat hard on the ears, but on the other hand he has found 18MHz open until midnight sometimes. And, of course, when the Sporadic-E season is upon us. Andrew looks straightaway at 50MHz. On a different slant, Andrew noted that although ZL8RI was very audible in UK, few European stations managed to connect. The problem here is that the Ws and JAs not only outnumber us, but of course we are buried under them. As a general principle, if one can hear a station such as this not coming back to Europeans, then he just isn't hearing us. Perhaps the most useful move in such a case is first to consult a propagation program such as Miniprop to see if there are better times-of-day to try; then secondly to look at the alternative path. For example, propagation to VK/ZL in the mornings is by long path when the EUs are going to work and the Ws are mostly still asleep. Always the DX amateur station will try to pick the best time, and of course then try to find where the DX is listening - it does help if you call him where he's listening!

The second question that concerns Andrew is how is a DXCC country defined. This one goes back to the early years after WWII. All the available 'proper' countries where amateur radio was permitted were soon filled into DXers logs. Then people started looking at the possibilities of various other spots. The DX Advisory Committee (DXAC) defined a set of preconditions that had to be met before such a place could be accepted as a valid country, for example many colonies appear in the All-Time list as such became independent and appear now under their new name. One thinks of, for example, the Gold Coast becoming Ghana. Uninhabited spots such as Minerva Reef also had to meet the DXAC requirements. The preconditions have varied slightly over the years, but in essence, if you think you have a 'new one' then you run the details past the DXAC before you speculate money on an expedition. Alas, after all the explanation we don't have room for Andrew's lists!

For **Colin Dean** in Barnsley, 3.5MHz sideband produced CX4CR, KG4AB, PJ7VP, TA2DS, TI4CF, VP2VF, VP8BPZ, ZP5SAN and 9K2MU. 7MHz by contrast sheltered A45ZZ, CE3HJB, CO6RQ, CP4CR, FG5HR, FM5GU, HC1DAZ, OA4IPK, TI2LL, UA0FIB, VE0EE/MM, XQ1IDM

and 4L4MM. Up again to 14MHz where A41JR, A71A, AP2AMR, AP2NJ, C21RK, C94AI, DU1RAA, ET3AA, ET3BN, EY8XX, EZ8CW, HS0/IK4MRH, HZ1TA, VQ9DX, VR2KM, V51BO, XT2DP, XX9AS, YI1GHF, VE3MJQ/YK, ZC6A, 3V8BB, 4K5IV, 4L0B, 5R8EN, 7Q7SB, 9G0ARS, 9K5MR, 9N1KY and 9U5DX. At 18MHz Colin noted Z21CS and 9M2TD, while on 21MHz A71EM, C94AI, PY0TI (Trindade Is) and TU2JL fell into the bag.

Down in Devon, **James Stevens** lives at Abbotskerswell, and previously contributed to the Junior Listener section. During the CQ WW WPX contest, James logged some 119 stations in his 14 hours listening. 14MHz showed W3LN, 9A2CY, W2BS, 4N3AV, EW6DX, YD7P, UM3M, UX7I, AL2CG, 3V8BB, LU1ESE, 4L7AA, AP2TJ, 4X6ZK, HK1A, A41KT, 9H1ER, VU2GK and W1BF, while the 7MHz band produced 9K2A, YA5E, and a station giving a short form of his call as '5ABL'; finally 3.5MHz produced 9A1BC, SV5A and another short form of call as '6AXD.' James is just twelve, and he uses a Sangean ATS-803A plus a Howes CTU8 tuner to match some 30 metres of wire in the loft. One thing that saddens James is the preponderance of S9 reports being dished out, which as he says must be a bit hard on the chaps who are trying to test out a new set-up. Looking at this one practically, so many stations use computerised logging and hence put in 59 as a default setting that it's not surprising to hear such a high proportion; plus of course the fact that very few people test out a new arrangement by playing in a contest. They usually do all setting-up beforehand and then go hell-for-leather in the contest!

Iain Macalister writes from Maybole in Ayrshire and notes that he hasn't sent in a log as he's been on holiday but he does note that in the ARRL contest he managed to find 37 US states and four Canadian provinces. On 28MHz Iain logged 4X4FR, WD4NGB and K5NA on May 28, while in the line of new countries KH0BX, V73W and the VK9CT group, all on 14MHz. As for 3.5MHz, there were A61AN, EY8AM, A92BE, C53HG, and J56DY, but on 7MHz nothing of note popped up. Back on 14MHz, conditions have favoured the Far East with such loggings as 9U/F5FHI, PY0FF, UA9MA/C91, TJ1PD, FR5ZN, TR0B, 6O2R, 9M8QQ, TI9X, 9N1WU, VR2KM, 5A1A, 3V8BB, VQ9LV, HS0/G0HHF, EZ1CJN, 4F1JUX and ZD7HI. Turning to 18MHz JA1JRK, JO1WKO, JG3AVS, JA9BEK and XX9GD. On 21MHz the only station of note was 9Q5TR, plus Europeans on 24MHz. Among the 'specials' noted was a macabre EV10R commemorating ten years since Chernobyl, K26PI for the Olympics in Atlanta Georgia, 3Z0WAW marking 400 years of Warsaw as the Polish capital, and several 8S stations from Sweden. Alas, though, the ZL8RI Kermadec effort 'got away ' with lots of people heard calling him, but the ZL8RI station too low to be copied and the KH4/NH6D Midway effort, where Iain comments he must have been at the wrong place at the right time!

Summer is Antenna Time for Iain, and he's been looking at possibilities of which I would go for the wire beam. A beam aimed westward would have a lot going for it, since it would cover the morning openings to VK/ZL/JA, and later in the day the assorted Yanks. As for the existing random wire, perhaps it would be improved by attention to the earthing arrangements - a counterpoise system would help. Also I would always have a tuner of some sort in use with an end-fed. If your receiver is any good at all, you will hear a 'peak' in signals, or on a dead band the 'sharsh' will peak up slightly even on 28MHz.

A couple of letters came in from **Paul Fineman** in Orpington who has a Sangean ATS-818 and around 10m of wire outside. Loggings included 4X4CU, 3V8BB, W6YO/MM, HI8LPP, 4L7AA, 6W1HM, M0ABT, A61AN, CN8NK, J73NW, VK2IEK, VK3FT, OD5NJ, HL3TUB, 5N4BSI, and from the second letter VO1FA, 9Y4TT, JY5SK, 4U50VIC (a special for 50 years of the UN), OA5GMM, LA1CI on an island called Ringvassoey in the Arctic Circle, OY1F in Faroe Is, UN9LDX, WB2UK, AD4AA, JH1MTQ, TA1FQ, ZP5ALI, 4X6DK, HP9BWQ, a GU0 in Guernsey mobiling, ZP4LH, ET3BT, HV4NOC, KH6DX, JY5DK, and a 4J from Azerbaijan.

QSL Addresses

Ted Trowell has a few for the record:
4J3M goes via UD6DJ; R1FJZ/FJL to DF7RX; 5N3/SP5XAR to SP5CPR; J28JA to F5PWH; P49V to AI6V; N2WCQ/6W1 to PA3BUD; TM8REG/MM to F6GPE; VP8EFF to JH4IFF; and FY5FE to W6SVZ.

Bye

That's the lot for another month. As always, your input - the more the better - to me to arrive by the beginning of the month. Address it to me, please, at PO Box 4, Newtown, Powys SY16 1ZZ.

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

Airband

The immortal Spitfire at Mildenhall Air Fête 1993. *Photograph: Christine Mlynek.*

Propagation, the way in which radio waves travel, is strange and varied. We use radio to send messages over distances, but poor choice of frequency can thwart our aims. This comes as a surprise to uninitiated cellular radio users who lamentably think they are buying a 'car 'phone'! You can't expect the same performance from a radio link as over a land-line.

On the subject of propagation, I hope that **P. Tresiddo** (Cornwall) is reading, as I am replying to your letter on page 5 of the June issue. Why can the ground station of an airways control relay only be received in certain places? As an example, a relatively nearby relay is at Winstone, near Cirencester. This could be over 140km distant with Exmoor getting in the way! Whether or not that signal reaches Cornwall depends on the receiver's exact location. Is it high, looking through a gap in the hills? Or, from a nearby site, is it lower and screened by terrain?

In the Air

On May 19, **Roger Thorneywell** (Garston) saw a low-flying pair of single-rotor helicopters, of black appearance but unmarked, with external stores. At 1425 they passed east-west, returning 2 hours later. What are they and what do they do? Answers to me please.

C. Phillips lives near East Midlands Airport, well known for its cargo operations by the likes of DHL (they have Boeing 727s), Hunting (keeping the last flying Vanguard in service), UPS (DC-8s), etc. The DC-8s are often on trans-Atlantic routes (working, typically, 8.906MHz). Mr. Phillips' question is, after leaving East Midlands, while heading towards Manchester, how do they make initial contact with Shanwick prior to entering oceanic airspace? The answer is an initial call on v.h.f. (123.95, 124.175, 127.65, 127.9 or 135.525MHz). In the case of UPS, their oceanic clearance will most likely be given on 123.95MHz.

How do you interpret Mach numbers? So asks **Jim Wright** (Bedford). In the cruise at great altitude, Mach numbers are more meaningful than indicated airspeed. The Mach number is the aircraft's actual speed as a fraction of the speed of sound. The sound barrier is hence always at Mach 1 but sub-sonic airliners will typically only go as fast as, perhaps, Mach 0.84. There have been notable exceptions: the Trident, exceeding Mach 0.9, would overtake everything in sight. Everything, that is, except Concorde, that manages a respectable supersonic Mach 2.2 or thereabouts. They painted one blue, as an advertisement, thereby losing the white paint's heat dissipation properties - and had to restrict it to about Mach 1.8 as a result! Around Mach 3, aluminium melts; if you want to go this fast, build your aircraft out of stainless steel. Be warned, though: it's too heavy to be an economic proposition.

I'm digressing. The speed of sound (in knots) varies with altitude, reducing in the higher, rarified, air. At sea level it's 661 knots; reducing to 640 knots at FL100, 614 at 200, 589 at 300 and 573 at 400. Remember that FL100, for example, is the correct term for what passengers loosely call 'ten thousand feet'. If you want it in statute miles, or kilometres, per hour (a knot is a nautical mile per hour) then the modern definition of the international nautical mile is 1.852km that works out at about 1.15 statute miles. So, M0.84 at FL400 would be 0.84 x 573 = 481 knots, around 481 x 1.15 = 554 miles per hour. So, you've worked out the apparent aircraft speed - but it will seem different to an observer on the ground because of the effects of wind (head- or cross-winds appear to slow the aircraft down). When a pilot reports Mach number, attempts to plot the aircraft's progress will be inaccurate for this reason.

Jim also asks about readers' experiences with hand-held GPS receivers. Now, you weren't explicit as to exactly what you wanted to know, Jim. To fix your home location, or that of an aerodrome, an Ordnance Survey map works out cheaper than GPS! If you're hoping to plot your course whilst flying as an airline passenger, do ask the Captain's permission first. If your GPS interferes with the aircraft's instruments, the crew need to be able to tell you to turn it off quickly! You might be disappointed that the metal cabin screens the satellite signal and prevents the GPS receiver from working.

Piper Arrow G-BUUM. *Photograph: Christine Mlynek.*

Follow-Ups

If you saw the Schneider Trophy race, then you will be interested in an update from **Mrs. B.** (Isle of Man) - see June page 62. Spencer Flack will indeed be racing his red Baron and he did once keep a Spitfire at Elstree. I remember that it was also red!

Also in June's 'Frequency and Operational News' I guessed that Hawarden (Chester) was to get an i.l.s. This has been confirmed by **Roy Baskett** (Deeside). The equipment, sadly, was relocated from Hatfield - that aerodrome has closed. On a recent visit to the Hatfield area, I saw that an industrial estate has been constructed at the north end of what was the aerodrome.

Have you noticed how Airbus Industrie transports components from one factory to the other? They actually fly whole aircraft wings around Europe in purpose-designed freighters. These aircraft have exceptionally tall fuselages, the top section being wider than the lower part - giving a top-heavy bulbous appearance. At first they operated the Guppy, derived from the airframe and engines of the Boeing Stratocruiser - itself an historic aircraft. Now Airbus have derived their own design based on the A300. Designated the A300-600ST Beluga, these retain the twin-jet configuration but have a bulbous fuselage and an extra vertical fin at each tailplane tip. Now, you linguists, what's a Beluga? There's a Club Belugas on the beach where Chris and I holiday in France.

Information Sources

Flight Routings 1996 (T.T. & S.J. Williams) is available from the *SWM* Book Store (see towards the back of this magazine). For each airline (in alphabetical order by callsign), flights are listed in flight number order, giving point and time of origin as well as destination and scheduled time of arrival (each day of the week being indicated as appropriate). Aircraft type is also stated. As well as flights to/from the UK, overflights passing over Britain are also listed. If you know the flight number, this book yields useful information about the flight itself.

There's also a callsign-to-airline decode table, but not the other way round - which is a nuisance if you want to look up an airline's flights but don't know the callsign. Lastly, certain idiosyncratic British Airways callsigns are decoded to provide the actual flight number. Although the same goes for British Midland, their decode appears as part of their entry in the main body of the book. Highly recommended.

Rescue (Paul Beaver & Paul Berriff), order from bookshops or libraries as ISBN 1-85260-291-0, accompanied the excellent television series. I reviewed it in the July 1990 *SWM* but the Book Store no longer lists it. A report on rescue helicopters from **F. Hermann** (Kingston-upon-Hull) agrees with the information in *Rescue*. Leconfield's Sea Kings have callsigns Rescue 128 and 129. They work the Rescue Co-ordination Centres on 5.680MHz; these are at Plymouth and Kinloss. The Kinloss Centre was recently moved there from Edinburgh.

There is some confusion because Leconfield shares 123.05MHz with Beverley (Linley Hill). On v.h.f., airband signals are amplitude modulated. The amount of speech power is fairly restricted

Godfrey and Roger Preston in G-HEWI.
Photograph: Christine Mlynek.

in comparison with the strength of the radio carrier wave. A distant signal might open a receiver's squelch, causing a burst of noise, even though the speech is too weak to be heard.

Mr Hermann: you ask for a 'list' of some sort, but your letter seems to include all the details already! Could you write to me again, with a more explicit request for the information that you're seeking?

Radio Procedures

Military aerodromes summarise their weather according to a colour code. The decode (requested by **D. R. Gibson** from Stoke-on-Trent) is as follows (colour: visibility in metres/height of lowest significant cloudbase as feet above ground). Blue: 8000/2500. White: 5000/1500. Green: 3700/700. Yellow: 1600/300. Yellow 1: Royal Navy - 2500/500, RAF - 3700/500. Yellow 2: Royal Navy - 1600/300, RAF - 1600/300. Amber: 800/200. Red: <800/<200. Black: aerodrome unserviceable for reason other than weather.

Significant cloud cover is 3/8 (referred to as 'scattered' that includes 4/8) or more of the sky covered. 'Few' clouds means 1/8 or 2/8; 'broken' is between 5/8 and 7/8 with 'overcast' meaning total 8/8 cover. One eighth is called an 'okta,' but the Americans, just to be different, measure their cloud in tenths.

Long-Grounded Pilot (Hemel Hempstead postmark) sent me the obituary of Group Captain James Jeffs CVO, OBE. He enabled the development of British air traffic control from the 1920s onwards, holding many positions including Airport Commandant at Heathrow. He was granted Air Traffic Officer's Licence No.1. In the early days, air-ground communication was on 900 metres (about 290kHz) and many enthusiasts were able to tune their receivers to monitor this channel.

Frequency and Operational News

Aerodrome frequency changes appear in *GASIL* 3 of 1996 from the CAA as follows. Cosford now 118.925 (was 122.1); Cranwell now 119.375 (was 119.0), this frequency also controls the outlying Barkston Heath; and Newton is now on 119.125 (was 122.1), all MHz.

Also from the CAA, *AIC* 47/1996 introduces some new reporting points. If you don't know where they are, how will you know where aircraft are when they report position? Get your radio-navigation chart out now, and mark them on! What, no chart? The various suppliers are listed on my Airband Factsheet. Send a pre-paid addressed envelope to hold one A4 sheet to the Broadstone Editorial Office (**not** to me!) and you'll receive one. Reporting points:

HAWKE: intersection A1 and G27 in the Channel, due south of the Seaford beacon. WAFFU: intersection A47 and G27, near HAWKE. NEDUL: where R41 passes over the Isle of Wight Needles; THRED: one-third of the way from NEDUL to ORTAC on R41 ('needle & thread,' get it?). KIDLI: on B321 close to Kidlington, just south-west of Oxford. GOLES: on B1, 35nm west of Ottringham beacon.

Any thoughts on keeping up with the rapidly-changing airways frequencies? As you know, a NOTAM subscription is beyond my financial means. Surely some reader out there has access to NOTAMs and AIP amendments and could distill the necessary information for the benefit of us all?

No room left for a new 'In the Cockpit' topic. Perhaps another time? I keep promising! The next deadline (for topical information) is August 16. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 2130 local please).

John Griffiths, c/o 22 Ffordd Beibio, Holyhead, Gwynedd, North Wales LL65 2EH.

Scanning

This month, I'd like to open with a brief note on TADS. I've received a tremendous response from people wanting this list - as well as a carefully worded letter warning **against** publishing them! Apparently, whilst the RAF and its masters, the MoD, don't mind sigs picked up and then passed on through the hobby (because policing would be difficult) they take great umbrage at the publication of TADs that are - for those who don't know - Tactical Air Defence frequencies. So, to all TAD hunters out there who asked for a copy....sorry! I think it would be foolish to pass them on and post them out. Of course, many of the frequencies mentioned are freely available in publications (see last month for details or look at people like Javiation for theirs) in print though not written as TADs. So, the answer is - buy one of these excellent publications and try all of the frequencies. Are they TADs or STUDs? I'm afraid that's for you to decide!

I'm indebted to **Dave Edwardson** now, for his notes on antennas that were sent to me. Dave is a listener and DXer and uses various publications as he experiments with wires for better results. If you are interested in experimentation, then this is the way to go - and reasonably cheaply too.

SH of Warwick wrote in with a brilliant log of broadcast auxiliary stations - too many to put in, I'm afraid - and requests information on a station he heard in London in the early 80s. The callsign was Concorde at base and mobile calls changed every two or three days. Frequency was 168.875 n.b.f.m., single frequency. Anyone any ideas on this one? SH uses a SX200N, an AR2001 and an AR1000. Thanks for the log and, as I've said, far too many stations to list but will be kept as a source of reference in case I need it at a future date!

Strange Signals!

Strange signals now! I have run a pretty loose mention of any unusual airband activity that may have been picked up by listeners and the next two letters confirm that odd goings on do happen. **MR** asks if anyone has heard signals on 40.325 f.m. MR says it was an audio tone, that varied in frequency, dropping every minute or so and with audio harmonics present. The signal direction appeared to come from the south of his QTH in Bedford. Anyone any ideas? It has not re-appeared since. He uses an MVT-7100 on its own telescopic whip. MR also asks if UFO activity is present, has anyone noticed variations in radio signals?

From SH, a request for identification on a message heard recently. He asks what is a 'Red Code 2 frequency' - this overheard after a report of an UFO around the Southampton area. Anyone any ideas on this? I would go into further details on this one, but it's a bit delicate!

Airband now, and the first letter from **Mike Powell,** who wrote in with a good log of activity heard on h.f. and v.h.f./u.h.f. Interesting examples of the logs are as follows:

251.635MHz German AF 3883 A-A 'Burners go, wings 45 go'. This ID'd as Tornadoes of 38JBG and followed shortly afterwards on 275.35 with the message 'London, turn right 180' - same aircraft. This proves that monitoring one single frequency is not a good idea as activity shifts about quite a bit! Mike also sends in a sheet of h.f. listings that he normally sends into Graham Tanner. With his set up of an AR3000A and a FRG-7700 (Excellent set, I used to have one ages ago - Mike certainly gets about on the air!).

Another timely warning about TADs from a close correspondent and authority on airband - **PM** of E. Yorks. P tells me that the Internet is being trawled by MoD and the DTI for evidence of TADs on open. So, a few people had to watch their mailboxes after the scare when Photavia Press said they were going to publish TADs in open. Photavia have since backed down....no doubt on advice! So, the issue of TADs is closed, I'm afraid - as far as spreading them around goes, anyway.

Info Swap

An impassioned plea from a **Mr G. Scott** on airband frequencies and asks if I could publish a list of same. Truth is, that would be one enormous list, Mr Scott! However, I did receive some info from another listener in Stoke-on-Trent - **SF** - who is happy to correspond with anyone who wants to swap info. If this is you, send a blank stamped envelope in to me marked 'Stoke F's' and I'll make sure he gets it. His list runs like this:

369.9 is 56(R) ops.
249.675 is London Military.
233.725 Buchan Radar.
381.15 is 41 Sqn ops.
Lyneham Studs as follows:
254.65 ops St.1
381.0 ATIS St.2.
340.175 Gnd St.3.
386.825 Twr. St.4.
359.5 App. St.5.
345.025 Zone St.6.
300.475 Dir. St.7.
375.2 PAR St.8.
284.95 Lyneham A-A.

56(R) squadron is a Tornado F3 squadron based at RAF Conningsby and is also an OCU - Operational Conversion Unit - and comes under No.11 Group Air Defence at HQ RAF Bentley Priory. Other squadrons based at Conningsby are as follows:

5 Sqn (Tornado F3).
29 Sqn (Tornado F3).
Battle of Britain Memorial Flight.

41 Sqn is based at RAF Coltishall, flying Jaguars, and other squadrons on strength are:

6 Sqn (Jaguar).
54 Sqn (Jaguar).
plus Jaguar Maintenance School.

So, whilst this answers Mr Scott's query in some detail, it isn't exactly what he wants! My advice therefore would be to go for some of the excellent airband frequency books on the market - those by Javiation and Photavia are two good starters - and also to keep an eye on Godfrey Manning's column 'Airband'. Graham Tanner's 'SSB Utility Listening' column, too, contains some good points to start on.

However, like many of us, the best way to start is to scan the military airband constantly, noting down traffic as it comes and getting as much detail as you can. I know, from personal experience, that I now only keep 'major' frequencies on the shack wall and then scan the rest and tap into them as they come through. Like many monitors, I tend to catch the majority of my own and use the published ones as reference points. So, my advice to you, Mr Scott, is to catch the military airband and go from there. Callsigns, locators and other gen can be had from the pages of both those publications - and by taking what you can from the column! I hope this helps?

Speaking of **Godfrey Manning**, he recently regaled me with a letter concerned with a trip to the Isle of Wight he made. I'd like to say thanks for that - I have been a few times and enjoy the Solent and it's shipping and also the radio activity that you get there. Godfrey also asks if anyone knows the frequencies used by staff at places like Warwick Castle? He said he had a look at a hand-held but could find no reference to what the TX/RX channels were. Anyone any idea? Either write to Godfrey or drop me a line - either way, let's see what goes on!

To the listener who said that having what amounted to two airband columns in the magazine was rather silly I say this. Godfrey does Civil and technical - having a PPL he is the man in the know. I do military. Occasionally we cross but as the content of our columns are really different, we accept this. Come to that, we also cross with people like Graham Tanner now and again too! It's life, it's rich and varied - and you're getting it free! Where else can you get two differing views on the same subject for the price of one magazine?

Also, the mystery surrounding the RAF Ash site - mentioned a few times in here - is somewhat cleared up. It is home to Radar Early Warning (CRC & Reserve SOC) and an OCU and also the OT&E Evaluation Unit. It comes in under the Air Warfare Centre HQ at HQ Strike Command, RAF High Wycombe. There! I knew I'd get it in the end! Likewise, that RAF Lyneham is home to No. 47 Squadron of the RAF that is used by those gentlemen from Hereford for various missions now and again! Amazing what facts you can glean when you look up stuff!

All Wrapped Up

I think that about wraps it up for this month. Hopefully it will be a balmy August with plenty of dog-days and time off to spend with a radio and a note-pad. I've given up on the RAE in lieu of my course at college for a while - brain overload and all that - and also because I'm looking for some form of decent work to keep me going, pay my way and buy all sorts of goodies to do with the car and the radio! Oh, and not forgetting Julie who I'm afraid comes a poor second to the interests in my life. A public apology - I don't mean it!

Keep writing in with all your news and logs. I'll try and get back where I can to letters but, remember - I need that s.a.e.!

Good listening and be careful - catch you down the log sometime.

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Info In Orbit

Asked whether I prefer monitoring pictures from the polar or geostationary WXSATs, my own preference is usually the latter. Near-continuous imagery always has its attractions. This attraction has recently been increased by the American GOES-8 WXSAT that hovers about three degrees above my western horizon and which, as of May 26, has implemented a new transmission schedule incorporating images from its sister WXSAT GOES-9. More details later in the column.

Current wxsats

NOAA-9 is providing global operational ozone and earth radiation budget data as well as real-time SAR (search and rescue) operations. No a.p.t. is transmitted.

NOAAs 10 and 11 are on standby, with SAR operational. One pass is taken each week to monitor health and safety - again no a.p.t.

NOAAs 12 and 14 have continued routine operations - transmitting continuous a.p.t. (picture) signals on 137.50 and 137.62MHz respectively. METEOR 3-5 continues to transmit while in sunlight, on 137.85MHz. With the sun reaching its highest elevations during the late spring and early summer months, visible-light pictures have their best contrast. Similarly WEFAX visible-light images of the northern hemisphere from METEOSAT-5 (transmitting on 1691.0 and 1694.5MHz) are at their best.

GOES-8 Transmission Schedule Changes

The American geostationary WXSAT GOES-8 implemented a new WEFAX schedule as from May 26. The satellite can be seen from many westerly locations in Britain, hovering a degree or two above the western horizon, because of its location at 76°W over the eastern coast of the USA. From Plymouth I receive a good signal using a Yagi (from TH2 Imaging) and pre-amp (from Timestep) tuned to 1691.0MHz (as for METEOSAT-5), pointing towards my western horizon.

The schedule change was announced in advance and brings GOES-8 image dissemination to a new level, incorporating images from GOES-9, METEOSAT-5 and NOAA-14, together with an assortment of weather FAX type charts. Re-transmitted GOES-9 images include full disc infra-red, and sections. GOES-8 images include visible, infra-red, water vapour and full disc. The NOAA images are a mosaic of separate passes over the poles and other regions, and provide an opportunity for the study of low resolution imagery of otherwise almost inaccessible regions of the globe.

Letters and Pictures

Readers may have noticed the small size reproduction of several pictures published within this column. The difficult choice is to have fewer but larger pictures or smaller but more!

Dr Martin van Duinen lives in Holland from where he monitors both a.p.t. (normal low resolution pictures from the polar satellites) using a Timestep system, and h.r.p.t. (high resolution from the polar satellites) using a Hansen system. Martin sent several pictures from which I selected his October 1995 OKEAN image of the Baltic Sea region. Martin's prints included some obtained by direct screen photography and some from a high quality laser printer. A very clear radar track, together with the 'piano key' telemetry column can be seen in **Fig. 1. D. George James**, of Elgin in Scotland set up a Timestep h.r.p.t. system with a Yaesu Az-El rotator driving a 1m self-constructed parabolic dish. Data is fed to a 486 PC. George sent me a set of h.r.p.t. images some weeks ago, one of which -

Fig. 2 - shows the Netherlands as seen in channel two data stream from NOAA-12, imaged last August. George also monitors a.p.t. and METEOSAT using Timestep equipment and a Dartcom down converter. George commented on the initial difficulties of finding information on a specialist topic such as WXSAT monitoring. Within the UK, the Remote Imaging Group is undoubtedly the best organisation involved with this subject; readers interested in joining should write to the membership secretary **Ray Godden, G4GCE at Wayfield Cottage, The Clump, Chorleywood, Herts WD3 4BG; Tel: (01923) 720714**.

Lester Jones of West Kirby collected a mid-day NOAA-14 pass in mid-April and sent it to me on disk. The improved image quality obtained when the sun is high in the sky can been seen in **Fig. 3**. Lester uses the JVFAX program with the Martelec interface and a Dartcom receiver. Looking closely at the detail in the image, the cities of France as well as the more familiar ones of the UK can be seen.

Steve Rake of Tredegar in Gwent sent several images taken using PROsat for Windows, which I understand from the brochure was issued by Timestep last November. Steve's pictures were mostly obtained during the Easter weekend and his NOAA picture shows a clear UK with cities and other features seen remarkably clearly. Pity I cannot afford to upgrade!

Brian Dudman of Harrow is a regular contributor to this column and sent a set of images from OKEAN and METEOSAT. The picture in **Fig. 4** is a spliced image obtained using a utility program to join together corresponding C02 and C03 images from METEOSAT-5. For those wanting further clarification, METEOSAT scans the whole of the earth's disc (as seen from its geostationary position above Greenwich) every 30 minutes. The resulting 'whole-disc' image is transmitted as a Primary Data image on 1694.5MHz and can be decoded by those having a decryption unit and suitable PDUS (Primary Data User Station) hardware and software. The image is also split into several parts (formats) and re-transmitted from METEOSAT-5 on 1691.0MHz, (with a few transmitted on 1694.5MHz) in scheduled time slots. The C02 and C03 formats are routinely transmitted every half-hour, (C02 at hour +2 and +34 minutes, with C03 at hour + 6 and +38 minutes), both originating from the same half-hour scan. It takes a careful examination of the image to spot the splice line!

Beginners' Spot - Satellite Tracking Software

A number of readers who are recent converts to the world of WXSAT monitoring have written asking about Kepler element files and their use; some asked how the data is input. Perhaps these notes will help to clarify this topic.

At the planning stage, well before any satellite is launched, the project scientists will have decided on the type of orbit needed for the satellite - whether it should be equatorial, polar, geostationary or somewhere in between. Each type of orbit has its own characteristics and the nature of the project to be done by the satellite is usually the deciding factor on which orbit will be used. As an example, we have one group of WXSATs in geostationary orbits (where each can continuously monitor the weather over almost half the hemisphere), and one group in polar orbits (which are carefully adjusted so that the satellites can image the whole planet within approximately 24 hours).

Satellite tracking programs were originally written to calculate the position of specific satellites and could do so fast enough to indicate the satellite's position in real-time - usually to enable a licensed radio amateur to guide a transmitting antenna - in the case of amateur radio satellites. Later, improvements in hardware permitted the use of graphics of increasing complexity, and these days good quality graphics, showing a map of the earth's surface, are very much the norm. Programs can now display several satellites at once and are invaluable for general monitoring. Examples of well-known

shareware/freeware tracking software include PC-Track, STS-Plus, Winorb29 and Tracksat; other titles appear on space-related bulletin boards from time-to-time. Registration of the shareware version invariably entitles one to an enhanced version with many more features. Several commercial products are available as well, perhaps one of the most well-known in the UK being Track II by Timestep.

These programs come with a set of measurements previously taken of the satellite's orbit - these are called Kepler elements and each set consists of measurements for one satellite. The time that the set of measurements were made is called the Epoch; there will inevitably be a certain delay between the taking of these measurements and their application to the program. Almost all satellite tracking programs include an option to read in elements from a disk file; programs are 'updated' when these new elements are 'fed in' or entered. The elements can be supplied in 2-line NASA element form (where the data - Epoch, etc. - is presented in a specific format), or AMSAT form, where each parameter is labelled. The two-line format seems to be used the most widely.

In any form, the data may be entered manually, (typed in) a laborious method, prone to error but often still done. Up to three years ago I received NASA postal mailings weekly, which I then typed in. If you collect elements from a BBS or via a disk (perhaps even one from me) it is normally a simple procedure to read the data directly into the program. There are points to watch out for when doing this; satellites may have slightly different names, depending on the source of the elements. You may therefore need to edit the names before entering the data. A current example which I have to adjust, is OKEAN 1-7, also known as OKEAN-4. One source on the internet provides the elements with one name; another source uses the other name! Take care!

How often do you need to update your elements? This is a mostly a function of the satellite's orbital height. Generally, the higher the orbit, the less it changes over the short term. Geostationary orbits are less affected by the earth's residual atmosphere than the low earth orbiting (LEO) satellites. METEORs orbit at about 1200km; higher than the NOAAs at about 810km.

However, all is not peace and quiet in geostationary orbit! The Moon exerts enough influence to produce a regular drag effect on these satellites, causing the controllers to make periodic adjustments. If you print-out predictions for an LEO satellite and monitor its passes during the course of a few weeks, you will find them gradually getting out of step with the actual satellite. This is very noticeable with the OKEAN/SICH satellites which are only at an altitude of 650km or so.

Consequently, for most purposes a monthly update of the Kepler elements should suffice. This is why I keep a list (well two actually) of people to whom I send a print-out once per month of the current WXSATs, (including MIR and the Shuttle). The print-out is a sheet containing the Kepler parameters that need to be entered. For those wanting to use the automatic updating option available with most software, I also provide the files on disk. Please note that this is run as a little better than break-even service - not as a commercial venture! For more details, see the information near the end of the column.

Software Requests

The level of requests for software is high, but unfortunately essential items are sometimes omitted. Software requests should be accompanied by a disk, as well as a stamped, self-addressed envelope and contribution as listed. Please tape coins securely. A number of requests arrived with only a letter and a hole!

You can estimate the number of disks required from the following program sizes: PC-Track: 657Kb, WinOrbit-29: 281Kb, STS Orbit-Plus; two files, total size about 630Kb, JVFax 7.1: 468Kb. I ask for 50p per program (to a maximum of £1.50) towards covering the costs of regular searches and downloading.

MIR

Dennis Spratt lives near Truro and obtained his amateur license, since when he has obtained confirmation of reception reports from both MIR and the Shuttle (STS-64 mission). Dennis describes his antenna as utilising a quarter-wave, cut on a biscuit tin with home-made ground plane, used for packet radio on 2m. Dennis has heard MIR, *Discovery* and *Dove* on packet, MIR and *Discovery* on voice and the upper part of the 2m amateur band.

There are many listeners to the transmissions from the manned Russian space station MIR. Various types of telemetry can be heard on various frequencies and I receive occasional calls from hams wanting to know of an address for QSLs. **Kevin Duckhouse** of Christchurch kindly sent me the address to which one can write. He advises enclosing an international reply coupon. Write to: **Sergej Samburov, PO Box 73, Kaliningrad -10 City, Moscow Area, 141070, Russia.**

On to Windows-95

I followed the herd and installed Windows-95. Having heard so many adverse comments about it, it seemed an interesting challenge. So far I am quite impressed with the easier way of running a number of programs simultaneously. I find it invaluable to have a tracking program running while doing other things, such as writing 'Info'. PC-Track (written by Thomas C. Johnson of Johnson Scientific International) caters for many satellites and provides footprints for each one (see review in *SWM*, January this year). My only problem so far is difficulty in running a DOS astronomy program that is fussy about the video card.

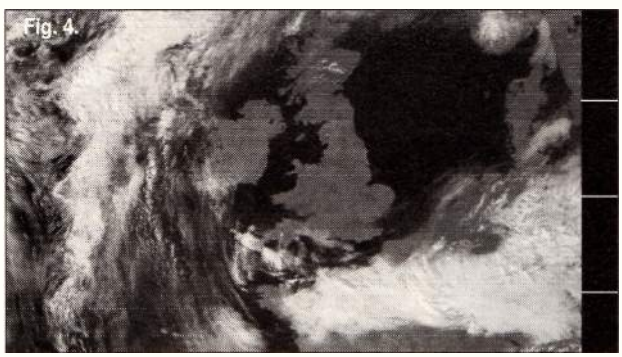


Fig. 4.

Launch Schedule

NOAA-K has been re-scheduled for launch in January 1997. STS-79 is scheduled for launch on July 31 for the next (4th) MIR-linkup. STS-80 is scheduled for a November launch.

Shuttle News

The Shuttle pack is updated from the notices issued by NASA's daily press releases. Copies are individually printed on request. It currently consists of four A4 pages and includes a few colour graphics. Please enclose a secure £1 with a stamped, addressed envelope. As an extra, if you include a disk I shall copy a few MIR and Shuttle images as well. I have collected many such images and wish there was enough room in 'Info' to show them!

Kepler Elements - MIR and Shuttle

Different options are available:

1: For a print-out of the latest WXSAT elements, MIR, and the Shuttle, (when available,) send a self-addressed stamped envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA. During Shuttle operations I send Kepler elements by return-of-post to those requesting them, and can forward the first active set available. In all cases please enclose a secure 20p coin.

2: I also send monthly Kepler print-outs of the WXSATs to many people - there is a beginning and mid-month list. To join, please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions.

3: You can have the data as a computer disk file containing recent elements for the WXSATs, together with a large file holding 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), ideal for automatic updating of your tracking software. Please enclose 50p with your PC-formatted disk and stamped envelope.

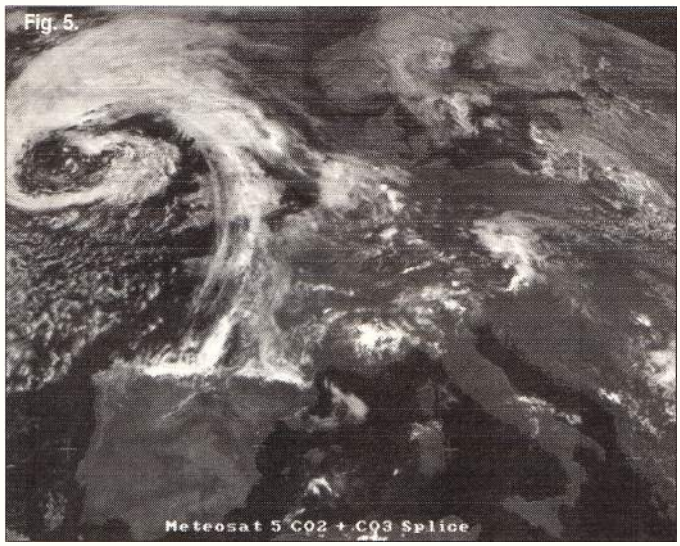


Fig. 5.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz; NOAA-12 transmits a.p.t. on 137.50MHz; NOAAs transmit beacon data on 137.77 or 136.77MHz; METEOR 3-5 (or 2-21) uses 137.85MHz; OKEAN and SICH use 137.40MHz; METEOSAT-5 (geostationary) uses 1691 and 1694.5MHz for WEFAX; GOES-8 (western horizon) uses 1691MHz for WEFAX and Mir uses 145.55 and 143.625MHz.

Any 'hot news' WXSAT topics can be seen on my web page at **http://homepages.enterprise.net/lawrenceh/**

Mike Richards G4WNC, PO Box 1863, Ringwood, Hants BH24 3XD. Internet: mike.richards@dial.pipex.com

Decode

All the Data Modes

Australian QSL

Les Crossan of Wallsend has recently received an excellent QSL from the Australian Bureau of Meteorology. Not only was the QSL accompanied by a very friendly letter, but they also sent schedules and original copies of the received charts. This excellent service meant that Les could check the quality of his received charts with perfect originals. I've included a copy of the significant weather chart that was sent from Melbourne. If you want to try this station, the current frequencies for Melbourne are:
2.628MHz - AXM31
5.100MHz - AXM32
11.03MHz - AXM34
13.92MHz - AXM35
20.469MHz - AXM37
Just to give you a hint as to the best time to listen, Les logged Melbourne at 1934UTC on 5.1MHz. Once you've received some decent charts you will need to put together a pack containing the charts plus a reception report detailing the receiving equipment and the signal quality. You then send this of to: **Bureau of Meteorology, Director of Meteorology, GPO Box 1289K, Melbourne, Victoria 3001, Australia.** My thanks to Les for supplying the charts and QSL card.

Satellite Pics

With the final demise of Offenbach's l.w. transmissions, albeit a year late, I'm sure some of you are suffering satellite withdrawal symptoms! To help moderate the symptoms I've searched through the schedules to dig-out some alternative sources of satellite images on h.f. One reliable source is US Rota (AOK) that operates on the following frequencies: 4.623, 5.8645, 9.3832 and 11.485MHz.

The satellite images available are all infra-red spectrum pics of the Mediterranean Sea. According to the latest schedule, the transmission times are: 0024, 0412, 0427, 0442, 0724, 0739, 1106, 1224, 1612, 1627, 1642, 1924, 1939 and 2306UTC. To get the very latest schedule you need to tune-in at 1300UTC.

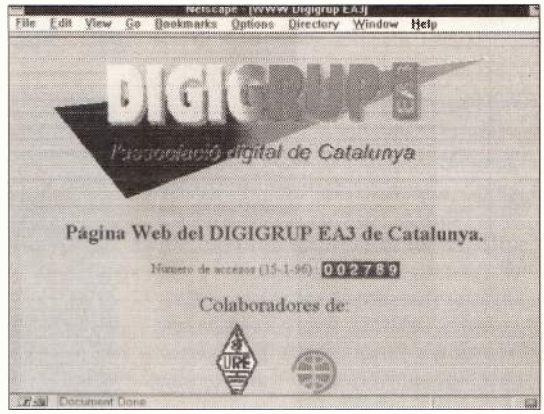
Another good source is RN London on 3.652, 4.307, 6.4525 and 8.3315MHz. Satellite transmission times are: 0440, 1040, 1330 and 1730UTC. To keep up-to-date, the full transmission schedule is sent at 0230 and 1530UTC.

If you know of any better sources of European satellite pictures please drop me a line.

If you want to continue receiving the excellent charts that were on offer from Offenbach your best bet is to monitor Hamburg Met on 3.855, 7.88 and 13.882MHz. The transmission schedule is available at 1050UTC daily.

Mystery Signal

Jonathan Bowes from Praha in Czechoslovakia has sent me an E-mail describing his receiving set-up. At the time of writing he was living in a huge communist-built block of flats with no access to external antenna systems. He has been unable to import his computer and so is restricted to listening on his Sangean ATS-803A. However, even with this limited station, he has encountered an unusual signal that he can't identify. The signal appears at about 2300UTC between 7.06 and 7.07MHz and in Praha is strong enough to wipe-out all traffic within 3kHz! Jonathan thinks it may be a jamming signal as the Czechoslovak Republic has a history of blocking western radio traffic. Do you know what this signal is? If so, please let me know.



Radio Madrid access page.

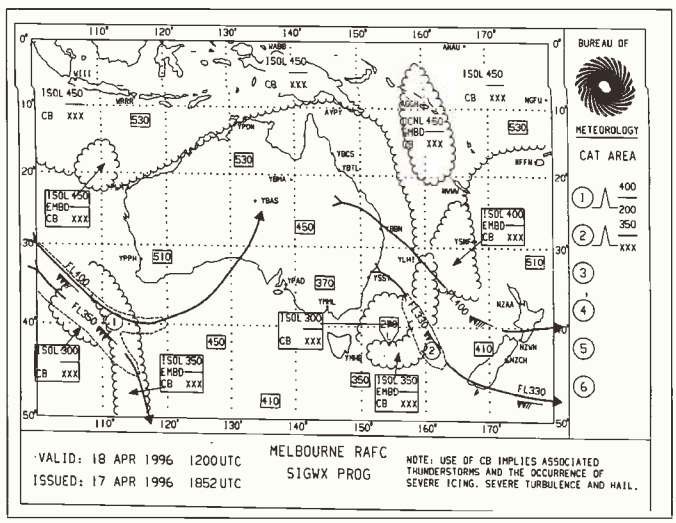
New Web Site

Bob Margolis reports via the WUN mailing list that Radio Madrid in Spain has a new WEB site with links to all manner of interesting data. The location is: **http://www.abaforum.es/is/digigrup**

Details of frequencies and callsigns can be found in the document nautihf.htm, with more specific RTTY linked information in nautihf2.htm. Although much of the information is in Spanish it's quite easy to extract the essential data.

Readers' Special Offers

Disks:
Here's the latest list of readers' special offers. Whilst I do my best to return orders promptly, please allow up to three weeks for delivery.
IBM PC Software(1.44Mb disks):
Disk A (Order Code DKA) - JVFAX 7.0, HAMCOMM 3.0 and WXFAX 3.2
Disk B (Order Code DKB) - DSP Starter plus Texas device selection software.
Disk C (Order Code DKC) - NuMorse 1.3
Disk D (Order Code DKD) - UltraPak 4.0
Disk E (Order Code DKE) - Mscan 1.3 and 2.0



Melbourne original Fax chart.

Klingenfuss Update

It appears 1996 is the year of a complete revamp of the extensive range of utility publications from Joerg Klingenfuss. These books have been a major source of key information for utility listeners for many years and the latest changes should ensure that they continue to be up-to-date and essential reading. Let's start with a summary of the changes. Out goes the *Radioteletype Code Manual* and the *Air and Meteo Code Manual*. These are replaced by the new *Radio Data Codes Manual*. The old *Guide to FAX Radio Stations* has been replaced by the *Guide to Worldwide Weatherfax Services*. There's also a brand new publication, the *Internet Radio Guide* The rationalisation appears well thought out and provides some sensible linking between the old range of books. Let's now look at each of the books in a little more detail.

The new *Radio Data Code Manual* provides a host of detailed technical information on a wide range of transmissions systems. Those of you who are already familiar with the Klingenfuss range may appreciate the following summary of additions in the new *Radio Data Code Manual*. In the Meteo coded data section the following systems are added: AMDAR, Buoy and SYNOP MOBIL whilst the transmission modes are enhanced by: ACARS, MSI/NAVTEX, PACTOR-2 and T-PLEX. The mode enhancements are supplemented by the inclusion of Internet addresses where available.

The first section provides an

interesting insight into the operation of the World Meteorological Organisation showing how the various sources of weather data are centrally compiled. This section covers the world weather watch and the Global Telecommunications system that's used to link all the various weather data sources into the forecasting system. This is followed-up by a full description of a wide range of Meteorological Code forms in common usage. This section is vital if you want to try manually decoding weather RTTY messages using SYNOP or similar coding. There are over one hundred pages dedicated to this section so you can see the subject is covered in depth.

Next comes a full index of the weather observing stations and their respective five digit code. The listing is very comprehensive and covers all international entries. For those with an interest in the Ionosphere and radio propagation, there's a comprehensive section detailing sources of Solar and geophysical data.

For aeronautical fans there's an extensive section covering the radio messaging systems, abbreviations and comprehensive location indicators. That just about completes what was the old *Air and Meteo Code Manual*, so let's move-on to the data transmission modes. This part of the manual provides a mass of, otherwise hard to find, technical data on most of the transmission modes used on the h.f. bands, plus a few v.h.f. modes. Included within this chapter is a fascinating section covering the reception of alternative alphabets such as Arabic and Cyrillic. There's even a look-up table that helps you convert the gibberish that you get when receiving Arabic RTTY on a normal Latin system. Although somewhat cumbersome, this can be great fun to try. The range of modes covered in this section is very comprehensive indeed.

The new *Guide to Worldwide Weatherfax Services* is very similar to its predecessor except all the information has been brought up-to-date. A significant change however, is the addition of Internet source addresses for many of the international service providers. In addition to the schedules and frequency lists, the manual contains a host of sample FAX charts. These are not only useful for identifying stations, but for gauging your receive quality and learning to recognise common faults such as multi-path distortion. Overall this is essential reading for any Radiofax enthusiast.

The final publication in this new line-up, is the *Internet Radio Guide*. This is a very brave thing to attempt in view of the fact that the Internet changes so rapidly. The trick to achieving a successful Internet publication is to get to press quickly and then provide regular updates. Joerg Klingenfuss is very well set-up to achieve this through his experience with his popular *Guide to Utility Stations*. Although most of the information contained in the Guide can be obtained from the Internet, it's very convenient to have it in printed form so that it can be browsed in comfort without running-up the phone bill! The range of topics covered in the Guide was very comprehensive and spanned all forms of radio transmission with interesting links to a host of useful reference sources. Although I have spent several years surfing the Internet, the *Internet Radio Guide* proved to be a useful directory to supplement on-line searching.

For more details on availability and prices please contact the *SWM* Book Store. My thanks to Joerg Klingenfuss for supply of the review copies.

Decoder Interfacing

Many readers write to me with a variety of problems associated with interfacing their new decoding system to their receiver. Whilst this may sound pretty basic stuff, there's often very little guidance in the manuals and with so much mail-order the dealer can only practically be contacted by 'phone. The result can be at best a lot of wasted time and at worst - total failure where the prospective utility listener gives-up. All this can be avoided with a simple logical approach to the problems.

One of the most important points to appreciate about the vital audio connection between the decoder and receiver is that the vast majority of decoder manufacturers design the interface with the expectation that it will be connected to the external speaker socket of the receiver. The simple reason for this is that just about every receiver ever built has one. This provides a high power low impedance drive source for the decoder. The combination of high power and low impedance means there's lot's of drive for the decoder.

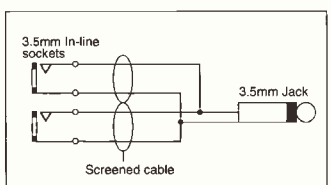


Fig. 1.

Let's take a typical modern receiver with a maximum audio output of 1W into 8Ω. Using Ohms Law, the output voltage available at full power is 2.82V. From this you can see that the decoder manufacturer has to ensure that it will continue to function satisfactorily with such a high drive voltage. So what's the problem? Although the external speaker socket is the most convenient connection point, it suffers a couple of important disadvantages - it disconnects the internal speaker so you can't hear what's going-on (essential for those new to decoding) and second the output level is controlled by the volume setting.

The first problem can be overcome using what's known as a Y-adapter. This comprises a standard 3.5mm jack plug but with two parallel connected sockets mounted on the back. You use it by plugging it into your external speaker socket and plugging and external speaker into one of the piggy-back sockets and your decoder into the other. If you fancy trying some simple home construction you can very easily make your own Y-adapter. You just need two 3.5mm mono in-line sockets and one 3.5mm mono jack. You can then wire them as shown in **Fig. 1**.

Once you've got your Y-connector, all seems fine until you come to do some late-night DXing. When you turn the volume right down you find the decoder stops working because the output level is too low! Don't worry, there's a better way to link your decoder and receiver that, in most cases eliminates these problems. The answer is to use the 'tape', 'line' or 'aux' output from your receiver. This is a low level audio output that's extracted before the volume control so provides a relatively constant output level. However, with most receivers, the output is designed to match-up with the level requirements of tape recorders, not insensitive decoders. As a result the link-up using the 'tape', 'line' or 'aux' output will only usually work successfully if your receiver is specified to be able to deliver 500mV or more from this connection.

If you're stuck with having to use the external speaker socket all is not lost as there are one or two things you can do to overcome the problem. If you are using a Y-connector you could either fit a separate volume control in the speaker lead or buy and external speaker already fitted with a volume control. In this way you can keep the receiver output fairly constant and adjust the listening level using the speaker's volume control. A good source of both external speakers and volume controls is the local car accessory shop - they're sold for car radios.

A situation that often causes confusion is impedance mismatch between the receiver and decoder. With most decoder's being designed for the external speaker socket they often have a low input impedance of maybe as a low as 30Ω. If your receiver has the required output level of say 600mV but is from a high impedance source of say 2kΩ you will find that the decoder shunts away a great chunk of the 600mV and only 9mV actually appears at the decoder. I've illustrated this in **Fig. 2**.

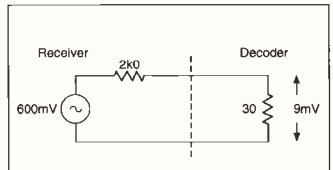


Fig. 2.

The most practical solution to this is to build an Op-Amp or transistor impedance converter or, if you're technically competent, change the value of the 30Ω resistor or other low value resistor that's creating the low input impedance in the decoder. Obviously, unless you really know what you're doing you're taking a great risk with this latter option. You will find designs for simple impedance converters in most of the amateur annuals such as the RSGB or better still the *ARRL Handbook for Radio Amateurs*.

That about concludes this review of interconnection problems, but if you have any other questions for the column please drop me a line.

Printed Literature:

Beginners Utility Frequency List (Order Code BL)
Complex Signals Utility Frequency List (Order Code AL)
Decode Utility Frequency List (Order Code DL)
FactPack 1 Solving Computer Interference Problems (Order Code FP1)
FactPack 2 Decoding Accessories (Order Code FP2)
FactPack 3 Starting Utility Decoding (Order Code FP3).
FactPack 4 JVFAX and HAMCOMM Primer (Order Code FP4).
FactPack 5 On the Air with JVFAX and HAMCOMM (Order Code FP5).
FactPack 6 Internet Starter (Order Code FP6).
For the printed literature just send a self addressed sticky label plus 50p per item (£1.50 for four, £2.50 for 7 and £3.00 for 9). For software send £1.00 per disk (£1.75 for 2, £2.50 for 3, £3.00 for 4 or £3.75 for all 5) and a self addressed sticky label (don't forget I provide the disk!).

Jerry Glenwright, 23 Downland Avenue, Southwick, West Sussex BN42 4RF. Internet: j.glenwright@ndirect.co.uk

ShackWare

Glance at the strapline above this column and you'll notice an addition - yes, I've succumbed to the Internet. The combination of ultra cheap modems, Internet accounts and local 'phone charges, along with the tempting numbers and sites detailed in the 'Info in Orbit' and 'Decode' columns galvanised my resolve and I now have an E-mail address.

I hesitate to bore you all to tears with details of my adventures on-line so suffice it to say that the much-touted Internet does indeed feature a massive amount of information and software for s.w.l.s, and virtually all of it available for the price of an Internet account (currently less than a tenner a month) and a local 'phone call. Those who require more information, please feel free to write to me (with an s.a.e.) and I'll answer your questions if I'm able and offer up the addresses of one or two interesting sites.

Reader Mail

Another mountainous mail-bag for which I thank you all very much. As always, I've given personal replies to everyone who has written. Here's a selection...

Lewis Matthews of Coulsdon, Surrey, chides me for omitting the Acorn computers from the first two 'ShackWare' instalments. I corrected the omission by writing to him with a comprehensive and exceedingly dull account of my contact with the machines over the years - that'll teach him! Lewis needs radio-oriented software to drive his A3010. Write if you can help, I'll pass on all letters.

Lynn Bramley of Hove, East Sussex, writes, "expensive computers are not essential to radio and there's much satisfaction to be gained from extracting maximum performance from the minimum hardware. The biggest failing of the 8-bits was the lack of reliable program storage but this could be overcome for example, in the MSX machines, which possess a cartridge slot. It would be straightforward to reprogram the EPROMs in such cartridges to give plug-in modules. The only problem with this is the lack of info concerning calls to the operating system - does anyone have such information?"

Sounds like a good idea and in fact, it's one that was used by Czech (or Polish, I forget which) programmers of the Atari 8-bit who produced just such non-volatile 'RAM' cartridges a year or two ago. The MSX however, is one of the very few machines of which I have zero experience so if any readers can help, write and I'll pass on the good news.

From the obscure to the pleasantly easy. **Allan Stott** has a 486 PC, an R-2000 and an interest in the data modes. He wonders whether the former can decode the utilities he tunes with the latter, and the answer is an emphatic yes! JVFAX is the foremost shareware FAX and SSTV package available for the price of a disk from a variety of sources including fellow columnist Mike Richards, and Hamcomm is its shareware RTTY, c.w., SITOR, etc., stablemate from the same source (and many others). Happy hours of decoding, Mr Stott. Hopefully, that answers Birmingham-based **Tony Cook's** SSTV enquiry too.

John Morrison thinks the BBS a good idea and asks for a run-down of what's available computer- and software-wise for his proposed "...computer-based shack to decode the data modes". Read on, John, for the first of my quarterly computer cameos...

Software Source

Many of your letters ask for sources of software for the older machines, particularly those running CP/M and while there must once have been gallons of this stuff floating around, it's pretty thin on the ground nowadays. Except that recently, I received a couple of CDROMs for review from Crowborough, Sussex-based PD library PDSL, one of the first libraries to be established in the UK and, if longevity and extent of collection are suitable measures of success, certainly one of the best. PDSL must be among the last remaining UK sources of CP/M software (does WACCI still exist?) and I always recommend the library to correspondents.

One of the CDs is devoted to CP/M and contains more than 19 000 items of software, the complete collections of several prominent CP/M libraries. The other CD is dedicated to Atari machines - including the handy Portfolio, ST and TT, and contains absolutely masses of good quality software in all categories from full-blown applications to the most obscure of utilities.

Problem is, of course, getting the software off the CDROM - elderly machines are unlikely to be equipped with a CD drive! However, they're now so commonplace on PCs and Macs, there's a good chance you can gain access to one at work, university or via a friend - bung in the CD, spool off the software onto floppy, and you've got your own extensive and cheap library of software in one convenient package!

Both CDs are priced at under £20 and can be had from PDSL **Tel: (01892) 663298**. PDSL also stocks a comprehensive collection of directly radio-oriented software for PCs and a copy of the library's catalogue is surely a worthy addition to any s.w.l.s bookshelf.

Bargain Basement

Have you ever been tempted by an elderly computer at a boot sale or club bring-n-buy? It's amazing what turns up and silicon that once cost hundreds can now be carried home for a few pounds, but will it make a useful shack tool or have you simply equipped yourself with little more than an interesting doorstop?

I plan to provide an irregular series (space permitting) of cameos describing bargain-basement machines suitable for s.w.l.s.

Perhaps foremost among computers of the '80s is the ubiquitous Spectrum. Originally available in a rounded black case with the infamous 'dead flesh' rubber keyboard, the machine evolved into a fully-fledged computer with proper keys, built-in cassette or disk drive, 128K, serial port and so on. While the Spectrum didn't necessarily offer the best technical specification, it received by far the greatest amount of all-important software support - due in part to its games heritage. The result was that if it was available, it was available for the Spectrum.

Principal among the many radio-oriented packages devoted to the Spectrum were Technical Software's offerings. The now-defunct company produced a range of hardware add-ons and supporting software for the Spectrum including excellent FAX and APT decoders. I acquired examples of these from correspondent **Geoff Chance** (who also has other Spectrum bits for sale - I'll pass on your letters) and the results are superb. Technical Software adopted the very sensible method of using the Spectrum simply to interpret and redirect the received FAXes and satellite pictures to a printer, rather than attempting to display them on screen.

The result is a high resolution image (grey-scale when appropriate) which, with suitable care to tune the receiver correctly using an on-screen indicator provided by the software, rivals the output of standards such as JVFAX.

Technical Software Has gone I'm afraid, along with the Spectrum itself, but examples of both can found if you search. Spectrums can be had by the dozen at any boot sale, and usually priced at well under a tenner - though try to avoid those which are accompanied by several carrier bags of games, joysticks, light guns and ancient mono tape recorders ('data' recorders!), and a consequently hiked price tag (unless, of course, you like the occasional computer game). Look for the Spectrum +2 with 128K and built-in cassette drive, as an all-round good buy. As for supporting software and add-ons, probably the best idea is to watch the reader classifieds at the back of *SWM* and perhaps place your own 'wanted' ad. That way you're likely to reach the people who have what you want simply gathering dust in a corner of the shack. Rallies are another happy hunting ground and - dare I say it - the Internet.

Why not write and tell me what recent boot sale discoveries you've made - especially if the finds are now active at your station.

Read All About It

Anyone who has followed ShackWare over the last three instalments, might have guessed that I have just the *tiniest* interest in elderly computers! Well, it seems I'm not alone and that there are others who are not only interested, but who know far more than I do and who are about to do something positive with their knowledge. Radio and computing historian **Enrico Tedeschi** of Portslade, East Sussex is currently researching a book that will chart the rise of home and small business computers, and advise would-be collectors where to start and how to develop their collections.

It sounds like the perfect guide to the silicon of yesteryear and I eagerly await its publication. More details as and when, meanwhile if you think you can help, write to me and I'll forward all post.

And Finally...

Do keep writing, your letters are the lifeblood of the column, and watch out for details of my World Wide Web home page featuring links to interesting radio and computer sites (when I get around to constructing it!). The BBS proposed last quarter is still under consideration too, do tell me if you want it. Until next quarter, good listening.

Brian Oddy G3FEX, Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

LM&S

Long, Medium and Short Waves

Some of the incoming short wave reports for this series indicate frequencies which are 5kHz above or below those actually in use by stations. Such errors could arise from several causes but most likely the receiver main tuning control was incorrectly set.

Before noting down the frequency indicated by the receiver digital display make quite sure that the incoming a.m. broadcast transmission is centered in the passband of the receiver intermediate frequency (i.f.) amplifier. This usually can be achieved by listening to the signal while slowly adjusting the receiver main tuning control or the 'up-down' keys.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT).
Unless otherwise stated, all logs were compiled during May.

Particularly good reception of the sky waves from the Radiotelevisione Italiana (RAI) 10kW outlet at Caltanisseta, Italy on 189kHz was noted on May 26 & 27 by **Fred Pallant** in Storrington. During a news bulletin in Italian at 2100UTC on the 26th the signal rated SINPO 23443. It is surprising that other contributors to this column seldom mention this low power station since it is a good pointer to the varying propagation conditions in this band.

Medium Wave Reports

The DXers who were prepared to search the band well into the night during May picked up a few of the broadcasts from m.w. stations in E.Canada and E.USA but the increasing hours of daylight resulted in only a short period when darkness existed along the whole length of the transatlantic path.

On April 30 **Tony Stickells** (Thornton Heath) logged WEEI in Boston, MA on 850 as 23122 at 0012; WTOP in Washington, DC on 1500 as 33222 at 0018; also CJYQ in St.John's, NF on 930 as 23133 at 0308. Up in Shetland **John Slater** (Scalloway) searched the band during the night of May 2. He logged CJYQ as SIO333 at 0340; also VOCM in St.John's, NF on 590 as SIO222 at 0345. On the 15th he heard RFO St.Pierre & Miquelon on 1375, which rated SIO222 at 0325; also CJFX Antigonish, NS on 580, noted as SIO222 at 0330. A change in the conditions on the 17th enabled him to receive a broadcast from Caribbean Christian Radio, Grand Turk on 1020, which was SIO222 at 0330.

Despite frequent checks during May **Harry Richards** (Barton-on-Humber) did not hear any transatlantic DX. However, at 0135 on June 3 he received WNRB in Boston, MA on 1510. Although WNRB is always the strongest transatlantic signal in his locality reception at that time was very poor.

The sky waves from some of the stations in the Middle East and N.Africa also reached the UK after dark - see chart. During a short holiday in France, **Andrew Stokes** (Leicester) used a Sony Walkman and a small Sony portable in Lille to compile some interesting logs - see charts. Particularly good reception was noted from Virgin Radio on 1260 but their transmission on 1215 was weak by day and suffered from phase distortion at night. He was very surprised to hear ILR Isle of Wight Radio on 1242, which rated SIO222 at 1831.

In the late evening **Roy Patrick** (Derby) has been receiving the broadcasts from the new ILR station 'Radio 1521' in Craigavon, N.Ireland on 1521kHz. He informs me that their address for reports is:-

Radio 1521, Carn Business Park, Craigavon, Co.Armagh, N. Ireland BT63 5RH.

Whilst searching for the ground waves from distant local radio stations in Bookham, **Brian Keyte** noticed that ILR 'Boss 603' on 603kHz, previously 'CD603', has now adopted the name 'Cheltenham Radio'.

Test transmissions on 963 and 1377kHz from a new local radio station named 'Asian Sound Radio' have been heard during some mornings by **Ross Lockley** in Galashiels. When fully operational, it will broadcast to the Asian community in and around Manchester/East Lancashire. Ross suspects there will be co-channel interference when the skywaves arrive after dark from Pori, Finland on 963 (600kW).

The new combined service of BBC R.Solent and BBC R.Dorset, which is carried by the Bournemouth transmitter on 1359, is proving to be a disappointment for some listeners in Dorset. **Bernard Curtis** (Stalbridge) says "It is virtually a relay of R.Solent with just a few news items for Dorset added on. Somerset is much better served with about four hours of local programmes from Taunton on 1323".

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listner
153	Bechar	Algeria	1000	H*,L
153	Donebach DLF	Germany	500	A,B,C,D,E,F*,G,H,I*,J,K
162	Allouis	France	2000	A,B,C,D,E*,F,G,H,J,K,L
171	Nador Medi-1	Morocco	2000	D,H*,J
171	B'shakovo etc	Russia	1200	A,B,C,E*,G,H*,J
177	Oranienburg	Germany	750	A,C,D,F*,G,H,I,J
183	Saarlouis	Germany	2000	A,B,C,D,E*,F,G,H,I,J,K*
189	Caltanissetta	Italy	10	H*,J*
198	BBC R-4 via ?	UK	?	C,D,J
198	Droitwich BBC	UK	500	A,E,F,G,I,K*,L
207	Munich DLF	Germany	500	A*,C,D*,E*,F*,G,H*,J,K*,L
207	Azilal	Morocco	800	H*
207	Kiev	Ukraine	500	C*
216	Roumoules RMC	S.France	1400	A,C,D,E*,F*,G,H,J,K*,L
225	Raszyn Resv	Poland	?	A,C,D*,E*,F*,G,H,I,J*,L
234	Beidweiler	Luxembourg	2000	A,C,D,E*,F,G,H,I,J,K,L
234	Ark'gelsk etc	Russia	500	J
243	Kalundborg	Denmark	300	A,B,C,D,E,G,H,J
252	Tipaza	Algeria	1500	E*,G*,J*
252	Atlantic 252	S.Ireland	500	A,B,C,D,E,F,G,H,I,J,K,L*
261	Burg(R.Ropa)	Germany	200	A,B,D,G,H,I,J,K*
261	Taldom Moscow	Russia	2500	E*,F*,J*,L*
270	Topolna	Czech Rep	1500	A,D*,E*,F*,G,H,K*,L*
279	Minsk	Belarus	500	D*,E*,G*,H*,J*,K*

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

Listeners:-
(A) Paul Bowery, Burnham-on-Crouch.
(B) Vera Brindley, Woodhall Spa
(C) Noel Carrington, Sutton in Ashfield.
(D) Ted Harris, Manchester.
(E) Sheila Hughes, Morden.
(F) Eddie McKeown, Newry.
(G) George Millmore, Wootton, IoW
(H) Fred Pallant, Storrington.
(I) Tom Smyth, Co.Fermanagh.
(J) Tony Stickells, Thornton Heath.
(K) Andrew Stokes, while in Lille, France.
(L) Norman Thompson, Oadby

Short Wave Reports

Owing to the sunspot minimum period the **25MHz (11m)** band is unlikely to be used for broadcasting in 1996.

Daily variations in propagation occur in the **21MHz (13m)** band. When the conditions are favourable, R.Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) may be received in the UK. It was rated 35333 at 0830 by **David Sayles** in Doncaster; 33333 at 0910 by **Thomas Williams** in Truro; 35343 at 0931 by **Michael Griffin** in Ross-on-Wye; 35443 at 1022 by **Tim Allison** in Middlesbrough.

A number of other broadcasters also use this band during the day. They include DW via Wertachtal? 21.680 (Eng to S.E.Asia 0900-0950) rated 44444 at 0900 in Scalloway; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to S.E.Asia 0900-1200) 15331 at 0925 by **Eric Shaw** in Chester; UAER, Dubai 21.605 (Ar to Eur 0615-1029) 25332 at 0930 in Chester; DW via Julich? 21.600 (Eng to S/E.Africa 0900-0950) 32332 at 0941 in Ross-on-Wye; UAER, Dubai 21.605 (Eng to Eur 1030-1055) 25433 at 1030 in Middlesbrough; RFI via Allouis? 21.620 (Fr to E.Africa 1030?-1300) 32222 at 1205 by **Robert Connolly** in Kilkeel; RCI via Sines, Portugal 21.455 (Eng to Eur, M.East, Africa 1330-1400) 35433 at 1339 in Middlesbrough; BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 1300-1700) 35553 at 1425 by **John Parry** in Larnaca, Cyprus; R.Portugal via Sines 21.515 (Port, Eng to India, M.East 1400-1500 Mon-Fri) 35223 at 1430 by **Eddie McKeown** in Newry; BBC via Ascension Is 21.660 (Eng to W/E/S.Africa 1100-1700) SIO222 at 1500 by **Tom Smyth** in Co.Fermanagh; BBC via Ascension Is 21.490 (Eng to S.Africa 1500-1630) 34453 at 1517 by **John Eaton** in Woking; REE via Noblejas 21.570 (Sp to S/C.America 1230?-1900) 45544 at 1539 by **Darren Beasley** in Bridgwater; RAI Rome 21.520 (Tt to Africa [Home svce relay] 1410-1700, Sun only) 44454 at 1620 in Woking; UAER, Dubai 21.605 (Eng to Eur 1600-1640) 45333 at 1635 by **Paul Bowery** in Burnham-on-Crouch; WYFR via Okeechobee. USA 21.745 (Eng to Eur 1600-1800) 24222 at 1702 by **Peter Pollard** in Rugby.

Although the propagation conditions in the **17MHz (16m)** band vary from day to day, R.Australia's broadcast via Carnarvon on 17.715 (Eng to Asia, Pacific 0200-0900) can usually be received in the UK. It was rated 25552 at 0453 by **David Edwardson** in Wallsend; 33233 at 0754 in Newry; 45444 at 0850 in Ross-on-Wye. Their transmission from Darwin? on 17.880 (Eng to Asia, Pacific 0200-0730) was rated 44554 at 0515 in Larnaca, Cyprus.

Also received during the morning were the BBC via Masirah Is, Oman 17.790 (Eng to India, W.Asia 0600-0830, 1000-1130), rated 25333 at 0632 in Burnham-on-Crouch; R.Pakistan via Karachi 17.895 (Eng to Eur 0800-0845) 54444 at 0800 by **Tom Winzor** in Plymouth; R.Slovakia via Rimavska Sobota 17.555 (Eng to Australia 0830-0857) 32333 at 0830 in Truro; BBC via Ascension Is 17.830 (Eng to W/C.Africa 0730-2100) 44433 at 0910 by **Stan Evans** in Herstmonceux; R.Austria Int via Moosbrunn 17.870 (Ger, Eng to Australia 0800-1100) SIO222 at 1000 in Co.Fermanagh; BBC via Cyprus 17.705 (Eng to Eur 0900-1200) 23442 at 1020 in Chester; R.Pakistan via Karachi 17.895 (Eng to Eur 1100-1120) 43433 at 1101 in Middlesbrough;

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	F*,N*
531	Ain Beida	Algeria	600	N*
531	Leipzig	Germany	100	A*,F*,I*,J,M*,N*
531	RNE5 via ?	Spain	?	A*,I*,J,N*
531	Beromunster	Switzerland	500	J,N
540	Wavre	Belgium	150/50	A*,B,C,F,I*,J,N,O
540	Solt	Hungary	2000	N*
540	Sidi Bennour	Morocco	600	A*,I*,N*
540	Vitoria(EI)	Spain	10	A*
549	Les Trembles	Algeria	600	A*,C*,J*,N*
549	Thurnau (DLF)	Germany	200	A*,B,C,F*,I*,J*,N
549	St.Petersburg	Russia	1000	B*
558	Espoo	Finland	100	A*,J*
558	RNE5 via ?	Spain	?	A*,J*
567	Tullamore(RTE1)	Ireland (S)	500	A*,B,C,O,F,H,J,M,N
567	RNE5 via ?	Spain	?	A*
576	Muhlacker(SDR)	Germany	500	A*,F*,I*,J*,N*
576	Riga	Latvia	500	J*
576	Barcelona(RNE5)	Spain	50	A*,I*,J*,N*
585	Paris(FIP)	France	8	A*,B,H,J,N
585	Madrid(RNE1)	Spain	200	A*,F*,H,I*,J*,N*
585	Gafsa	Tunisia	350	I*
585	Dumfries(BBCScot)	UK	2	C,F,H,N*
594	Frankfurt(HR)	Germany	1000/400	A*,F*,I*,J*,M,N*
594	Oujda-1	Morocco	100	A*,N*
594	Muge	Portugal	100	A*,I*,N*
603	Lyon	France	300	C,F*
603	Sevilla(RNE5)	Spain	50	A*,I*,N*
603	Newcastle(BBC)	UK	2	D,F,H,M,N*
612	Athlone(RTE2)	Ireland (S)	100	A*,C,D,F,H,J,M,N*
612	Sebaa Aioun	Morocco	300	N*
612	RNE1 via ?	Spain	10	A*,J*,N*
621	Wavre	Belgium	80	A*,B,C,F,I*,J,N,O*
621	RNE1 via ?	Spain	10	N*
621	Barcelona(OCR)	Spain	50	A*,I*
630	Dannenberg(NDR)	Germany	100	F
630	Vigra	Norway	100	A*,I*,J*,N*
630	Tunis-Djedeida	Tunisia	600	A*,F*,G*,J*,N*
639	Praha(Liblice)	Czech	1500	B,I*,J*,M,N
639	RNE1 via ?	Spain	?	A*,F*,I*,J,N*
648	Orfordness(BBC)	UK	500	B,C,F*,J*,M,N,O*
657	Neubrandenburg(NDR)	Germany	250	F*,I*,J*,N*
657	Napoli	Italy	120	B*,J*,N*
657	Madrid(RNE5)	Spain	20	A*,J*,N*
657	Wrexham(BBCWales)	UK	2	B,C,F,I*,M,N
666	MesskirchRohrd(SWF)	Germany	300/180	A*,F*,I*,N*
666	Lisboa	Portugal	135	A*,N*
666	Barcelona(COPE)	Spain	10	A*,I*
675	Marseille	France	600	A*,C,J*,N
675	Lopic(R10 Gold)	Holland	120	A*,B,D,F,G*,I*,J,N,O*,P*
684	Sevilla(RNE1)	Spain	500	A*,F*,I*,J*,N*
684	Avala(Beograd-1)	Yugoslavia	2000	A*,I*,N
693	Tortosa(RNE1)	Spain	2	I*,N*
693	Droitwich(BBC5)	UK	150	B,C,D,F,J*,N,P*
693	Folkestone(BBC5)	UK	1	O*
702	Flensburg(NDR)	Germany	5	A* B,F,I*,N
702	Monte Carlo	Monaco	40	J*,K*
702	Masirah Is(BBC)	Oman	1500	N
702	Slovensko 1 via ?	Slovak Rep.	?	N*
702	Zamora(RNE1)	Spain	10	A*,I*,J*,O*
711	Rennes 1	France	300	A*,B,C,I*,J,N,O*,P*
711	Heidelberg	Germany	5	A*,F*,I*,N*
711	Laayoune	Morocco	600	J*
711	Murcia(COPE)	Spain	5	A*,N
720	Langenberg	Germany	200	A*,B
720	Lisnagarvey(BBC4)	Ireland (N)	10	C
720	Norte	Portugal	100	A*,N*
720	Lots Rd,Ldn(BBC4)	UK	0.5	B,C,F,J,M,N
729	Putbus/Bergen(NDR)	Germany	10	N*
729	Cork(RTE1)	Ireland (S)	10	A*,C,F*,H,I*,J,M*,N*
729	RNE1 via ?	Spain	?	A*,I*,J*,N*
738	Paris	France	4	A*,B,J
738	Poznan	Poland	300	I*,J*,N*
738	Barcelona(RNE1)	Spain	500	A*,I*,J*,N*,P*
747	Flevo(Hilv2)	Holland	400	A*,B,C,F,G*,I*,J,N,O*
747	Cadiz(RNE5)	Spain	10	I*,J*
756	Braunschweig(DLF)	Germany	800/200	A*,B,C,F*,I*,J*,N,P*
756	Bilbao(EI)	Spain	5	A*,I*,N*
756	Redruth(BBC)	UK	2	C,H,J
765	Sottens	Switzerland	500	A*,F*,I*,J*,N,O*
774	Sofia	Bulgaria	50	I*
774	Enniskillen(BBC)	Ireland (N)	1	C,M
774	RNE1 via ?	Spain	?	A*,I*,J*,N*,O*
783	Burg	Germany	1000	A*,F*,I*,J*,N*
783	Miramar(R.Porto)	Portugal	100	N*
792	Limoges	France	300	J,M,N*
792	Lingen(NDR)	Germany	5	A*,F*,I*,J*,N*
792	Sevilla(SER)	Spain	20	A*,I*,N*
801	Munchen-Ismaning	Germany	300	A*,F*,I*,M*,N*
801	RNE1 via ?	Spain	?	A*,I*,J*,N*
810	Madrid(SER)	Spain	20	A*,B*,I*,N*
810	Westerglen(BBCScot)	UK	100	C,D,F*,J*,M,N
819	Sud-Radio, Toulouse	France	20	N*
819	Batra	Egypt	450	J*,N*
819	Toulouse	France	50	I*
819	Trieste	Italy	25	B*,N*
819	Warsaw	Poland	300	A*,I*,N
819	S.Sebastian(EI)	Spain	5	A*
828	Hannover(NDR)	Germany	100/5	I*,N*
828	Rotterdam	Holland	5	A*,B,C,I*,N,O
828	Barcelona(SER)	Spain	50	A*
837	Nancy	France	200	A*,B,C,I*,J,M
837	COPE via ?	Spain	?	A*,J*,N*
846	Rome	Italy	540	A*,B*,F*,J*,N,O*
855	Berlin	Germany	100	J*,N*
855	R.Bucharest	Roumania	750	B*
855	RNE1 via ?	Spain	?	A*,F*,I,J*,N
864	Santah	Egypt	500	A*,N*
864	Paris	France	300	A*,B,F,J,N
864	Socuellamos(RNE1)	Spain	2	A*,J*,N*
873	Frankfurt(AFN)	Germany	150	A*,D,F*,I,J*,N
873	Zaragoza(SER)	Spain	20	A*,I*,N,O*
882	COPE via ?	Spain	?	A*,I*,J*,N
882	Washford(BBCWales)	UK	100	C,B,D,F,J,M,N
891	Algiers	Algeria	600/300	A*,G*,I*,J*,N,O*
891	Huisberg	Netherlands	20	B,I*,J,N
900	Milan	Italy	600	A*,B*,F*,I*,N,O*
900	COPE via ?	Spain	?	I,N*
909	B'mans Pk(BBC5)	UK	140	B,C,F,J,M,N,O*
909	M'side Edge(BBC5)	UK	200	D
918	Plesivec(Sloven'nR)	Slovenia	600/100	A*,I*,J*,N
918	Madrid(R.Int)	Spain	20	A*,I*,J*,M,N*
927	Wolvertem	Belgium	300	A*,B,C,I,J,N,O*
936	Bremen	Germany	100	A*,B,F*,I*,N,O*
936	Venezia	Italy	20	N*
936	RNE5 via ?	Spain	?	A*,N*
945	Toulouse	France	300	A*,C,I*,N*,O*
954	Brno (CRo2)	Czech Rep.	200	N
954	Madrid(CI)	Spain	20	A*,J*,N
963	Pori	Finland	600	A*,F*,I*,L*,Q
963	Tir Chonaill	Ireland (S)	10	C,M
972	Hamburg(NDR)	Germany	300	A*,F*,I*,J*,N
972	RNE1 via ?	Spain	?	A*,J*,N*
981	Alger	Algeria	600/300	A*,G*,I*,N
981	Coimbra	Portugal	10	E*,N*
990	Berlin	Germany	300	A*,F*,I*,J*,N
990	Potenza	Italy	10	B*,N*
990	R.Bilbao(SER)	Spain	10	A*,I*,N*
990	Redmoss(BBC)	UK	1	I*
990	Tywyn(BBC)	UK	1	H,N
999	Schwerin (RIAS)	Germany	20	I*
999	Torino	Italy	20	A*,N
999	Madrid(COPE)	Spain	50	A*,I*,N*
1008	SER via ?	Canaries/Spain	?	A*,I*,N,O*
1008	Flevo(Hilv-5)	Holland	400	A*,B,C,F*,G*,I*,J,N,Q
1017	Rheinsender(SWF)	Germany	600	A*,B,F*,I,J,M*,N,O*
1017	RNE5 via ?	Spain	?	A*,I*,N*
1026	Graz-Dobl	Austria	100	N*
1026	SER via ?	Spain	?	A*,N*
1035	Milan	Italy	50	A*
1035	Lisbon(Prog3)	Portugal	120	I*
1044	Dresden(MDR)	Germany	250	A*,F*,I*,N*
1044	SER via ?	Spain	?	A*,I*,J*,N*
1053	Zaragoza(COPE)	Spain	10	A*
1053	Talk R.UK via ?	UK	?	C,D,F,J,M,N,O*
1062	Kalundborg	Denmark	250	A*,B,D,I*,J*,N*
1062	R.Uno via ?	Italy	?	N*
1062	Norte	Portugal	100	I*
1071	R.France via ?	France	?	A*,B*,I*,J,M,N,O*
1071	Riga	Latvia	50	I*
1071	Bilbao(EI)	Spain	5	A*,N*
1071	Talk Radio UK via ?	UK	?	C,D,F,N
1080	Katowice	Poland	1500	A*,I*,J*,N
1080	SER via ?	Spain	?	A*,I*,N*
1089	Talk Radio UK via ?	UK	?	C,D,F,J,M,N,O*
1098	Nitra(Jarok)	Slovakia	1500	A*,I,J*,N*,O*
1098	RNE5 via ?	Spain	?	A*,N*
1107	AFN via ?	Germany	10	A*,I*,N
1107	RNE5 via ?	Spain	?	A*,I*,N*
1107	Talk R.UK via ?	UK	?	C,F,J,N
1116	Bari	Italy	150	A*,B*
1125	La Louviere	Belgium	20	A*,B,I,J*,N
1125	Deanovec	Croatia	100	N*
1125	RNE5 via ?	Spain	?	A*,J*,N*,O*
1125	Llandrindod Wells	UK	1	H
1134	COPE via ?	Spain	2	A*,I,N*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	A*,I,J*,N*
1143	AFN via ?	Germany	1	A*,I*,N*,O*
1143	R.Due via ?	Italy	?	N*
1143	Bolshakovo(Mayak)	Russia	150	B*
1143	COPE via ?	Spain	2	A*,I*,J*,N*
1152	Cluj	Roumania	950	B*
1152	RNE5 via ?	Spain	10	A*,I*
1161	Strasbourg(Flnt)	France	200	A*,B*,I,J*,N
1161	S.Sebastian(EI)	Spain	50	A*
1179	Bacau	Romania	200	B*
1179	SER via ?	Spain	?	A*,N*
1179	Solvesborg	Sweden	600	A*,D,F,I,J*,L,N
1188	Kuurne	Belgium	5	A*,B,J,N*,O*
1188	Reichenbach(MDR)	Germany	5	F*,I*,N*
1188	Szolnok	Hungary	135	A*,I*
1197	Munich(VOA)	Germany	300	A*,I,N*
1197	Virgin via ?	UK	?	C,D,F,J,N,O*
1206	Bordeaux	France	100	A*,I*
1206	Wroclaw	Poland	200	I*,J*,N
1215	Virgin via ?	UK	?	C,D,F,J,M,N,O*
1224	Vidin	Bulgaria	500	J*,N*,P*
1224	Lelystad	Holland	25	A*,B,C,I*,N,O
1233	Liege	Belgium	5	A*,B*,I,O*
1233	Cape Greco(RMC)	Cyprus	600	N
1233	Virgin via ?	UK	?	C,F,N,O*
1242	Marseille	France	150	A*,B*,I,O*,P*
1242	Virgin via ?	UK	?	C,F,N*,O*
1251	Marcali	Hungary	500	A*,I*,N*,P*
1251	Huisberg	Netherlands	10	A*,B*,F*,I*,N*,O*
1251	R.Renascenca via ?	Portugal	10	N*
1260	SER via ?	Spain	?	A*,C,I*,N*
1260	Guildford (V)	UK	0.5	J,N,O
1269	Neumunster(DLF)	Germany	600	A*,B*,F*,I*,J*,N,O*,P*
1269	COPE via ?	Spain	?	A*,N*
1278	Strasbourg	France	300	A*
1278	Dublin/Cork(RTE2)	Ireland (S)	10	A*,B*,C,F,G*,H,J*,M,N*,O
1287	RFE via ?	Czech Rep.	400	A*,I*,J*,N,O*,P*
1287	Lerida(SER)	Spain	10	A*,N*
1296	Kardzali	Bulgaria	150	A*
1296	Valencia(COPE)	Spain	10	A*,I,N*
1296	Orfordness(BBC)	UK	500	B*,C,M,N,O*,P*
1305	Rzeszow	Poland	100	A*,I*
1305	RNE5 via ?	Spain	?	A*
1314	Kvitsoy	Norway	1200	A*,B,C,F*,G*,I,J*,N,O*
1314	RNE5 via ?	Spain	?	A*
1323	Zyyi(BBC)	Cyprus	200	N*
1323	W'brunn (V.Russia)	Germany	1000/150	A*,F,G*,I
1332	Rome	Italy	300	A*,B*,I*,J*,N*,O*
1341	Lakihegy	Hungary	300	A*,N*
1341	Lisnagarvey(BBC)	Ireland (N)	100	B*,C,F,H,J*,N*
1341	Almeria(OCR)	Spain	2	B*
1341	Tarrasa(SER)	Spain	2	A*,B*,N*
1350	Nancy/Nice	France	100	A*,B*,F*,G*,I*,N
1350	Cesvaine/Kuldiga	Latvia	50	J*
1359	Arganda (RNE-FS)	Spain	600	A*,B*,N*,O*
1368	Foxdale(Manx R)	I.O.M.	20	A*,C,FH*,J*,M,N*,P*,Q
1368	RAI via ?	Italy	?	A*
1377	Lille	France	300	A*,B,C,I*,J,N,O,P*
1377	Ukraine	Ukraine	50	N
1386	Athens	Greece	50	B*
1386	Ahwaz	Iran	400	N*
1386	Bolshakovo	Russia	2500	B*,D,G*,I,J*,N,O*,P*
1395	Lushnje(Tirana)	Albania	1000	A*,F,I
1395	Lopic	Netherlands	120/40	B,F*,G*,J*,K*,N,O
1404	Brest	France	20	A*,G*,I*,J,N*,O*
1413	RNE5 via ?	Spain	?	A*,F*,I*,J*,N*
1422	Alger	Algeria	50/25	J*
1422	Heusweiler(DLF)	Germany	1200/600	A*,B*,C,F,I*,J*,N,O*,P*
1431	Kopani	Ukraine	500	I*
1440	Marnach(RTL)	Luxembourg	1200	A*,B,D,G*,I,J,N*,O*,P*,Q*
1440	Damman	Saudi Arabia	1600	F*
1449	Squinzano	Italy	50	A*,B*,J*,N*
1449	Redmoss(BBC)	UK	2	C,F*,H,M*,N*
1458	Lushnje(Tirana)	Albania	500	A*
1467	Monte Carlo(TWR)	Monaco	1000/400	A*,F*,I*,J*,N*
1485	AFN via ?	Germany	1	B*
1485	SER via ?	Spain	?	A*
1494	Clermont-Ferrand	France	20	A*,N*
1494	St.Petersburg	Russia	1000	G*,I*,N
1503	Stargard	Poland	300	J*
1503	RNE5 via ?	Spain	?	A*,J*,N*
1512	Wolvertem	Belgium	600	A*,B,F,G*,I*,J*,L,N,O*,P*,Q*
1512	Jeddah	Saudi Arabia	1000	B*
1521	Kosice(Cizatice)	Slovakia	600	I*,J*
1521	Duba	Saudi Arabia	2000	A*,F*,M*
1530	Vatican R	Italy	150/450	A*,G*,I*,J*,N*
1539	SER via ?	Spain	?	N*
1539	Valladolid(SER)	Spain	5	A*,J*
1557	Osijek	Croatia	10/20	B*
1557	Nice	France	300	A*
1566	Mjadzel	Belarus	10	B*
1566	Sfax	Tunisia	1200	A*,N*
1575	Genova	Italy	50	A*,B*,I*,N*
1575	SER via ?	Spain	5	A*,J*,N*,P*
1584	SER via ?	Spain	2	A*,N*
1593	Holzkirchen(VOA)	Germany	150	E*,I*,N
1602	SER via ?	Spain	?	A*,N*
1602	Vitoria(EI)	Spain	10	A*,J*
1611	Vatican R	Italy	15	F,N

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

Listeners:-
(A) Darren Beasley, Bridgwater.
(B) Paul Bowery, Burnham-on-Crouch.
(C) Noel Carrington, Sutton-in-Ashfield.
(D) Martin Cowin, Kirkby Stephen.
(E) John Eaton, Woking.
(F) Ted Harris, Manchester.
(G) Sheila Hughes, Morden.
(H) Brian Keyte, Bookham.
(I) Eddie McKeown, Newry.
(J) George Millmore, Wootton IoW.
(K) Roy Patrick, Derby.
(L) Clare Pinder, while in Appleby.
(M) Tom Smyth, Co.Fermanagh.
(N) Tony Stickells, Thornton Heath.
(O) Andrew Stokes, while in Lille, France.
(P) Norman Thompson, Oadby.
(Q) Thomas Williams, Truro.

Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) 44434 at 1124 by **Ron Damp** in E.Worthing.

Later, R.Cairo via Abis 17.595 (Eng to S.Asia 1215-1330) was 32332 at 1230 in Kilkeel; BBC via Antigua, W.Indies 17.840 (Eng to N/C.America 1400-1700) 44233 at 1448 in Woking; VOA via Tangier, Morocco 17.895 (Eng to Africa 1630-1900) 24332 at 1715 in Doncaster; Monitor R.Int via WSHB 17.510 (Eng to Africa 1600?-1930?) 35223 at 1716 by **Vera Brindley** in Woodhall Spa; BBC via Ascension Is 17.880 (Fr, Eng to Africa 1800-1945) 32222 at 1915 by Martin Dale in Stockport; R.Nederlands via Bonaire 17.605 (Eng, Du to S/E/W.Africa 1830-2025) 44344 at 1955 in Rugby; RCI via Sackville 17.820 (Eng to Eur, Africa 2000-2130) 22222 at 2100 in Stalbridge; WYFR via Okeechobee, USA 17.555 (Eng to Eur 1800-2200?) 44333 at 2057 by **Tony Hall** in Freshwater Bay, IoW; VOFC Taiwan via WYFR 17.750 (Sp, Ger, Eng to Eur, [Eng 2200-2300]) 34333 at 2230 in Scalloway.

Unstable conditions have also been evident in the **15MHz (19m)** band. In the morning R.Australia via Carnarvon 15.530 (Eng to Asia, Pacific 0600-0900) SIO343 at 0623 in Woking; R.Japan via Moyabi, Gabon 15.165 (Eng to Eur, M.East, Africa 0700-0800) 43333 at 0700 by **Clare Pinder** in Appleby; BBC via Limassol, Cyprus 15.575 (Eng to E.Eur, M.East, W.Asia 0730-1500) 35343 at 0729 in Middlesbrough; R.Pakistan, Islamabad 15.470 (Eng to Eur 0800-0848) 44544 at 0800 in Galashiels; R.Slovakia Int 15.460 (Eng to Australia 0830-0857) 34343 at

Local Radio Chart

Freq (kHz)	Station	ILR/BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	B,I,L,P
585	R Solway	B	2.00	C,D,E,I
603	Cheltenham R.	I	0.10	C,D,I,L,P
603	InvictaSG,Litt'brne	I	0.10	B,C,D,H*,I,L,P
630	R.Bedfordshire(3CR)	B	0.20	B,C,I,L,P
630	R.Cornwall	B	2.00	D,I,K*,L,O*
657	R.Clwyd	B	2.00	C,D,I,L,O*
657	R.Cornwall	B	0.50	D,I,L
666	Gemini AM, Exeter	I	0.34	D,I,L,P
666	R.York	B	0.80	C,D,E,I,J
729	BBC Essex	B	0.20	B,C,I,L,M,P
738	Hereford/Worcester	B	0.037	C,D,I,P
756	R.Cumbria	B	1.00	D,E,J
756	R.Maldwyn, Powys	I	0.63	C,D,I,L
765	BBC Essex	B	0.50	B,C,D,I,L,P
774	R.Kent	B	0.70	B,I,L,P
774	R.Leeds	B	0.50	C,D,E,I,J
774	3 Counties SG, Glos	I	0.14	C,D,L
792	Chiltern SG,Bedford	I	0.27	B,C,I,L,O,P
801	R.Devon & Dorset	B	2.00	D,I,L,O,P
828	Chiltern SG, Luton	I	0.20	B,I
828	2CR CG, Bournemouth	I	0.27	L
837	R.Cumbria/Furness	B	1.50	D,E
837	R.Leicester	B	0.45	B,C,D,I,L,P
855	R.Devon & Dorset	B	1.00	G,L
855	R.Lancashire	B	1.50	D
855	R.Norfolk	B	1.50	B,C,I,P
855	Sunshine 855,Ludlow	I	0.15	B,I,P
873	R.Norfolk	B	0.30	B,C,I,L,P
936	Brunel CG, W.Wilts	I	0.18	D,I,L,P
945	Derby (Gem AM)	I	0.20	B,C,D,H*,I,P
954	Gemini AM, Torquay	I	0.32	I,L
954	Wyvern, Hereford	I	0.16	C,I
963	Asian Sd,Manchester	I	?	F,J
963	Viva, Southall	I	1.00	B,C,I,L,P
990	R.Devon & Dorset	B	1.00	D,I,L
990	Gt.Yks G, Doncaster	I	0.25	C,I
990	WABC, Wolverhampton	I	0.09	I
999	Gem AM, Nottingham	I	0.25	B,C,I,N
999	Red Rose G, Preston	I	0.80	D
999	R.Solent	B	1.00	B,I,L,P
1017	WABC, Shrewsbury	I	0.70	C,D,I,N
1026	R.Cambridgeshire	B	0.50	B,C,H,I,N,P
1026	Downtown, Belfast	I	1.70	D,O
1026	R.Jersey	B	1.00	D,I,L,Q*
1035	Country 1035,London	I	1.00	B,I,L,P
1035	R.Sheffield	B	1.00	C,N
1035	N.Sound, Aberdeen	I	0.78	J
1035	W.Sound, Ayr	I	0.32	D
1107	Moray Fth,Inverness	I	1.50	J,O
1116	R.Derby	B	1.20	B,C,D,I,N,P
1116	R.Guernsey	B	0.50	D,I,L,P,Q*
1152	Amber, Norwich	I	0.83	B,J*
1152	Clyde 2, Glasgow	I	3.06	J
1152	Lon.Newstalk,London	I	23.50	B,I,L,P
1152	Pic'ly G,Manchester	I	1.50	D,N
1152	Xtra-AM, Birmingham	I	3.00	C,I
1161	R.Bedfordshire(3CR)	B	0.10	B,D,I
1161	Brunel CG, Swindon	I	0.16	D,I,L
1161	Gt.Yks, Hull	I	0.35	C,N
1161	Southern Counties R	B	1.00	B,I,L,P
1161	Tay AM, Dundee	I	1.40	J
1170	Amber SGR, Ipswich	I	0.28	B,J*
1170	GNR, Stockton	I	0.32	D,H,J
1170	SCR, Portsmouth	I	0.12	H,I,L
1170	Signal G,Stoke-on-T	I	0.20	C,N
1170	Swansea Snd,Swansea	I	0.58	D
1170	1170AM,High Wycombe	I	0.25	B,H*,I,P
1242	InvictaSG,Maidstone	I	0.32	B,I,P
1242	IoW Radio, Wootton	I	0.50	I,L,Q
1251	Amber SGR,Bury StEd	I	0.76	B,C,I,J*,P
1260	Brunel CG, Bristol	I	1.60	I*
1260	Marcher G, Wrexham	I	0.64	J,N
1260	SabrasSnd,Leicester	I	0.29	C,I
1260	R.York	B	0.50	C,D
1278	Gt.Yks G, Bradford	I	0.43	C,K*,N
1296	Radio XL,Birmingham	I	5.00	B,C,I,J,L,N,P
1305	Gt.Yks G, Barnsley	I	0.15	C,D,J,N
1305	Premier via ?	I	0.50	B,I,J*,L,P
1305	Touch AM, Newport	I	0.20	L
1323	S.Coast R, Brighton	I	0.50	B,I,L,P
1323	SomersetSnd,Bristol	B	0.63	D,I
1332	Premier, Battersea	I	1.00	B,I,J*,L,P
1332	WGMS CG, Peterboro'	I	0.60	B,C,D,J
1332	Wiltshire Sound	B	0.30	I
1359	BreezeAM,Chelmsford	I	0.28	B,I,P
1359	Mercia CG, Coventry	I	0.27	C,N
1359	R.Solent	B	0.85	I,L
1359	Touch AM, Cardiff	I	0.20	I*
1368	R.Lincolnshire	B	2.00	C,I,N,P
1368	Southern Counties R	B	0.50	B,I,L,P
1368	Wiltshire Sound	B	0.10	L
1377	Asian Sd,Manchester	I	?	F,J,N
1413	Premier via ?	I	0.50	B,I,J,L,P
1431	Breeze AM, Southend	I	0.35	B,I,J*,P
1431	210 CG, Reading	I	0.14	H*,I,L,P
1449	R.Peterboro/Cambs	B	0.15	B,C,I,N
1458	R.Cumbria	B	0.50	D
1458	R.Devon & Dorset	B	2.00	D,L
1458	Fortune, Manchester	I	5.00	J,N
1458	R.Newcastle	B	2.00	J
1458	Sunrise, London	I	50.00	B,I,L,O,P
1458	Radio WM	B	5.00	C,I
1476	CountySnd,Guildford	I	0.50	B,C,H*,I,L,P
1485	R.Humberside (Hull)	B	1.00	A,H*,I*
1485	R.Merseyside	B	1.20	D,I*,N
1485	Southern Counties R	B	1.00	B,I,L,P
1503	R.Stoke-on-Trent	B	1.00	B*,C,D,H*,I,J,L,N,P
1521	R.1521 Craigavon,NI	I	0.50	D,M*
1521	MercuryXtra,Reigate	I	0.64	B,C,I,L,P
1530	R.Essex	B	0.15	B,H*,I,L,P
1530	Gt.Yks G,Huddersf'd	I	0.74	A,C,N
1530	Wyvern, Worcester	I	0.52	D,H*,L,P
1548	R.Bristol	B	5.00	I,L
1548	Capital G, London	I	97.50	B,I,L,P
1548	City G, Liverpool	I	4.40	D,N,O
1548	Gt.Yks G, Sheffield	I	0.74	C
1548	Max AM, Edinburgh	I	2.20	I*,J
1557	R.Lancashire	B	0.25	A,D,I*,J,N
1557	Mellow, Clacton	I	0.0	B,I,J*,P
1557	Northants SG	I	0.76	C,I,J*
1557	Sth Coast R, So'ton	I	0.50	H,I,L
1584	KCBC, Kettering	I	0.04	I
1584	London Turkish R	I	?	B,I,P
1584	R.Nottingham	B	1.00	C,H*,I,N
1584	R.Shropshire	B	0.50	D,I
1584	Tay, Perth	I	0.21	J
1602	R.Kent	B	0.25	B,C,I,L,P

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

Listeners:-

(A) Tim Allison, Middlesbrough.
(B) Paul Bowery, Burnham-on-Crouch.
(C) Noel Carrington, Sutton-in-Ashfield.
(D) Robert Connolly, Kilkeel.
(E) Martin Cowin, Kirkby Stephen.
(F) Ted Harris, Manchester.
(G) Francis Hearne, N.Bristol.
(H) Sheila Hughes, Morden.
(I) Brian Keyte, Bookham.
(J) Ross Lockley, Galashiels.
(K) Eddie McKeown, Newry.
(L) George Millmore, Wootton, IoW.
(M) Roy Patrick, Derby.
(N) Philip Rambaut, Macclesfield.
(O) Tom Smyth, Co.Fermanagh.
(P) Tony Stickells, Thornton Heath.
(Q) Andrew Stokes, while in Lille, France.

0845 in Doncaster; AIR via Aligarh? 15.050 (Eng to N.E.Asia 1000-1100) 24232 at 1000 in Newry; UAER, Dubai 15.395 (Eng to Eur 1030-1055) 44444 at 1030 by **Sheila Hughes** in Morden; R.Austria Int via Moosbrunn 15.450 (Eng to Pacific? 1030-1057) 43343 at 1036 by **Chris Shorten** in Norwich.

During the afternoon BBC via Woofferton & Skelton, UK 15.070 (Eng to Eur, M.East, N/C.Africa 0500-2130) 22221 at 1206 in Stockport; R.Australia via Darwin 15.530 (Eng to Asia, Pacific 1100-1300) 33333 at 1216 in Burnham-on-Crouch; R.Finland via Pori 15.400 (Eng to N.America 1230-1300) SIO444 at 1230 in Co.Fermanagh; RCI via Sines, Portugal 15.325 (Eng, Fr to Eur, M.East, Africa 1330?-1500?) 55335 at 1343 in Plymouth; WWCR Nashville, USA 15.685 (Eng to Eur 1100-0000) 44433 at 1450 in Kilkeel; WYFR via Okeechobee 15.695 (Eng to Eur, Africa 1600-1900?) 33333 at 1630 by **Bill Griffith** in W.London; RAI Rome via BBC Ascension Is 15.320 (It to Africa 1700-1800) SIO333 at 1730 by **Philip Rambaut** in Macclesfield; WEWN Birmingham, USA 15.665 (Eng to Eur? 1245?-1756) 33333 at 1745 in Stalbridge.

Later, R.Cairo, Egypt 15.255 (Eng to C/S.Africa 1630-1830) 35333 at 1809 in Bridgwater; Monitor R.Int via WSHB 15.665 (Eng to Eur 1800-2200) 54344 at 1820 by **Stan Watkins** in NW.London and 44334 at 2050 in Rugby; R.Damascus, Syria 15.095 (Ger, Fr, Eng to Eur 1805-2105) 54434 at 1840 in Chester; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 55555 at 1850 in Storrington; R.Bras, Brazil 15.265 (Eng, Ger to Eur 1800-2050) 54433 at 1910 in Herstmonceux; R.Nederlands via Bonaire 15.315 (Eng to S/E/W.Africa 1830-2025) 43333 at 1920 in Truro; HCJB Quito 15.540 (Eng to Eur 1900-2158) 45444 at 1928 in Woodhall Spa; Voice of Vietnam, Hanoi 15.010 (Fr, Eng, Sp to Eur 1800?-2130) 44545 at 1930 by **Norman Thompson** in Oadby; VOA via Morocco 15.410 (Eng to Africa 1600-2200) 54344 at 1935 in Freshwater Bay; RAE Buenos Aires, Argentina 15.345 (Eng, Fr, Ger, It, Sp to Eur, N.Africa 1900-2300) 44333 at 1945 in E.Worthing; R.Africa 2, Eq.Guinea 15.186 (Eng to Africa ?-2200? Mon-Fri) 44333 at 2015 in Scalloway; VOA via Greenville, USA 15.580 (Eng to Africa 1800-2200) 43332 at 2050 by **Martin Cowin** in Kirkby Stephen; VOFC Taiwan via WYFR? 15.600 (Fr, Ger, Eng to Eur 2000-2300) 35553 at 2216 in Wallsend; DW via Antigua 15.410 (Ger to S.America 2200-0145) 44444 at 2310 by **Tez Burke** in Bradford.

Slightly more stable conditions exist in the **13MHz (22m)** band. During the morning DW via Julich? 13.780 (Ger to ? 0600-0755) was rated 44554 at 0603 in Larnaca, Cyprus; R.Korea via Kimjae 13.670 (Eng to Eur 0800-0900) 32222 at 0800 in Appleby; R.Sweden 13.625 (Sw to Eur, Africa 0800-1000 Sun) 44444 at 0840 in Truro; R.Australia via Darwin 13.605 (Eng to Asia 0900-1030) 35443 at 0916 in Storrington; R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eur 0400-1800) 45444 at 0953 in Ross-on-Wye; R.Nederlands via Irkutsk (Eng to Far East, S.E.Asia 0930-1125) 13332 at 1010 in Burnham-on-Crouch; Finland via Pori 13.645 (Eng to Australia 1030-1100) 44444 at 1030 in Morden; R.Sweden, Stockholm 13.740 (Sw to Asia 1130-1200) 55335 at 1130 in Plymouth.

After mid-day Vatican R, Italy 13.765 (Various [Eng 1345-1405] to Asia) was 33333 in Stalbridge; SRI via Sottens? 13.635 (Eng, Fr, Ger, It to S/C.Asia 1500-1700) 44444 at 1505 in Kilkeel; WHRI South Bend, USA 13.760 (Eng to E.USA, Eur 1500-2157) 35443 at 1513 in Middlesbrough; DW via Sackville, Canada 13.790 (Ger to N.America 1400-1600) 44354 at 1527 in Woking; R.Pakistan, Islamabad 13.590 (Eng to M.East 1600-1630) 33333 at 1600 in Norwich; R.Norway Int 13.805 (Norw [Eng Sun only] to Eur, Africa? 1600-1630) 44444 at 1606 in Storrington; R.Denmark via RNI 13.805 (Da to Eur, Africa? 1630-1655) 44444 at 1635 in Storrington.

Later, R.Nederlands via Flevo 13.700 (Eng to S/E.W.Africa 1830-1925) was 44333 at 1845 in Newry; Croatian R, Zargreb 13.830 (Cr, Eng to Eur 24hrs) 55555 at 1900 in W.London; DW via Sines, Portugal 13.790 (Eng to Africa, S.Asia 1900-1950) 33333 at 1932 in Stockport; R.Denmark via RNI 13.805 (Da [Eng Sun only] to Eur, Africa? 1930-1955) 35333 at 1940 in Bridgwater; RCI via Sackville 13.670 (Eng to Africa 2000-2158) 53232 at 2010 in NW.London; WWCR Nashville, USA 13.845 (Eng to E.USA 1400-0100) 44434 at 2017 in E.Worthing; RCI via Sackville 13.650 (Eng to Eur 2000-2130) 54444 at 2115 in Freshwater Bay; R.Havana, Cuba 13.715 (Eng to Eur 2100-2200) 43333 at 2125 in Rugby; Monitor R.Int via WSHB 13.770 (Eng to Eur 2000-2157) 45444 at 2145 in Woodhall Spa; WJCR via Millerstown, USA 13.595 (Eng 12hrs, Chin 12hrs) 24222 at 2218 in Scalloway; Monitor R.Int via WSHB 13.770 (Eng to S.Eur, W.Africa 2200-0000) 34444 at 2319 in Bradford.

In the **11MHz (25m)** band VOA via Kavala? 11.805 (Eng to Eur, M.East, N.Africa 0600-0700) was 23322 at 0610 in Freshwater Bay; HCJB Quito 11.615 (Eng to Eur 0700-0830) 54444 at 0815 in Norwich; Vatican R, Italy 11.740 (Eng to Eur 1020-1030) 54444 at 1027 in Plymouth; Polish R, Warsaw 11.815 (Eng to Eur 1200-1255) SIO444 at 1200 in Co.Fermanagh; Israel R, Jerusalem 12.077 (Eng to Eur, N.America? 1400-1430) 44444 at 1400 in Truro; WYFR via VOFC Taipei, Taiwan 11.550 Eng to India 1302-1502) 34333 at 1445 in Galashiels; R.Australia via Carnarvon 11.660 (Eng to S.Asia 1430-2057?) 32432 at 1450 in Doncaster.

Later, R.Pakistan, Islamabad 11.570 (Eng to Eur 1700-1755) was 45333 at 1750 in Woodhall Spa; R.Japan via Sri Lanka 11.930 (Eng, Jap to M.East, N.Africa 1700-1900) 22332 at 1741 in E.Worthing; WWCR Nashville, USA 12.160 (Eng to Eur? 1500-2300) 32233 at 1755 in Stalbridge; AIR via Bangalore 11.620 (Hi, Eng to Eur 1745-2230) 43443 at 1830 in Bridgwater; R.Romania Int, Bucharest 11.940 (Eng to Eur 1900-

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2009	C,H,L
2.325	ABC Tennant Creek	Australia	2010	C,H,L
2.485	ABC Katherine	Australia	2000	C,H,L
2.850	KCBS Pyongyang	N.Korea	2005	C
3.200	TWR Manzini	Swaziland	1945	H
3.220	R.HCJB Quito	Ecuador	2310	C
3.220	Channel Africa	S.Africa	0255	K,R
3.220	R.Kara, Lome	logo	2017	H,P,R
3.223	AIR Simla	India	1733	H
3.230	R.Sol de Los Andes	Peru	0208	K
3.230	SABC Meyerton	S.Africa	2000	C,H,K,P,R
3.240	TWR Shona	Swaziland	1907	C,H,P
3.245	AIR Lucknow	India	1710	H,R
3.255	BBC via Maseru	Lesotho	2017	C,E,G,H,K,L,M,P,R
3.270	SWABC 1, Namibia	S.W.Africa	2043	C,D,F,H,I,K,L,P,R
3.290	Namibian BC,Windhoek	S.W.Africa	2015	C,F,H,I,K,P,R
3.300	R.Cultural	Guatemala	0405	B,C,K,R
3.306	ZBC Prog 2	Zimbabwe	1955	C,H,K,L,R
3.315	AIR Bhopal	India	1733	C,H,L,R
3.316	SLBS Goderich	Sierra Leone	2042	B,C,H,L,M,P
3.320	SABC Meyerton	S.Africa	2000	B,C,H,K,L,P
3.325	FRCN Lagos	Nigeria	2040	C,L,P
3.335	CBS Taipei	Taiwan	2004	C,H,L
3.338	R.Maputo	Mozambique	2005	C
3.340	R.Altura	Peru	0020	C
3.340	R.Uganda, Kampala	Uganda	2018	H,K,L
3.345	AIR Jaipur	India	0025	C
3.345	AIR Jammu	India	1731	H
3.345	Channel Africa	S.Africa	1858	H,P
3.356	R.Botswana	Gabarone	2049	H,L,P
3.365	GBC R-2	Ghana	2009	B,C,E,F,I,K,L,M,P
3.365	AIR Delhi	India	1823	H
3.375	R.Nacional S.Gabriel	Brazil	0225	C,K,R
3.377	R.Nacional, Mulenvos	Angola	2007	H,L
3.380	NBC Blantyre	Malawi	2007	C,H,K,L,P,R
3.390	BBC via Meyerton	S.Africa	2052	H
3.395	RRI Tanjung Karang	Indonesia	2315	C
3.395	ZBC Gweru	Zimbabwe	0325	R
3.915	BBC via Kranji	Singapore	2220	C,F,H,K,P
3.945	AIR Gorakhpur	India	1539	H
3.950	Qinghai PBS, Xining	China	2253	F
3.955	BBC via Skelton	England	1830	K,N
3.955	R.Budapest	Hungary	1904	B,K
3.965	RFI Paris	France	2010	B,C,F,J,K
3.975	R.Budapest	Hungary	1900	C,F,J,K,N,O,Q
3.985	China R via SRI	Switzerland	2210	F,K
3.985	SRI Beromunster	Switzerland	2020	C,J
3.995	DW via Julich	Germany	2135	B,C,F,K
4.005	Vatican R.	Italy	2025	A,B,C,E
4.035	Xizang PBS, Lhasa	Tibet	2310	J
4.130	V of the Strait 1	China	2306	F
4.330	Xinjiang BS, Urumqi	China	1635	H
4.500	Xinjiang BS, Urumqi	China	1624	F,H
4.735	Xinjiang, Urumqi	China	2247	C,F,H
4.750	Xizang BS, Lhasa	Tibet	2320	C
4.755	R.Educ CP Grande	Brazil	0320	R
4.760	Yunnan PBS,Kunming	China	2335	C
4.760	AIR Port Blair	India	1708	H
4.760	ELWA Monrovia	Liberia	1924	H,K,L,N,P
4.760	TWR Manzini	Swaziland	0325	R
4.770	Centinela del Sur	Ecuador	0315	R
4.770	FRCN Kaduna	Nigeria	1915	C,K,L,P,R
4.775	AIR Imphal	India	1652	H
4.775	R.Tarma	Peru	0315	R
4.783	RTM Bamako	Mali	2008	C,H,L,P,R
4.785	Cairi Porto Velho	Brazil	0310	R
4.790	Azad Kashmir R.	Pakistan	1714	H
4.795	R.Douala	Cameroon	2016	B
4.800	R.Nac Amazonas	Brazil	0040	K
4.800	CPBS 2 Beijing	China	2256	B
4.800	AIR Hyderabad	India	1706	H
4.800	LNBS Lesotho	Maseru	1921	C,H,K,L,P,R
4.805	R.Nac.Amazonas	Brazil	2307	B,C,R
4.810	SABC Meyerton	S.Africa	2026	L
4.815	R.diff TV Burkina	Ouagadougou	2047	C,H,L,P,R
4.820	La Voz Evangelica	Honduras	0330	K,R
4.820	AIR Calcutta	India	1649	B,C,H,L
4.820	Xizang, Lhasa	Tibet	2318	F
4.825	R.Cancao Nova	Brazil	0305	R
4.828	ZBC R-4	Zimbabwe	2037	H,L,P,R
4.830	R.Botswana, Gaborone	Botswana	2057	K,R
4.830	R.Tachira	Venezuela	0030	B,C,G,K,R
4.832	R.Reloj	Costa Rica	0631	P
4.835	R.Tezulutlan, Coban	Guatemala	0030	C,R
4.835	RTM Bamako	Mali	2020	B,C,F,H,J,K,L,P
4.840	AIR Bombay	India	1711	C,H,L,R
4.845	RTM Kuala Lumpur	Malaysia	1600	H
4.845	ORTM Nouakchott	Mauritania	2016	B,C,J,K,L,P,R
4.850	R.Yaounde	Cameroon	2040	C,K
4.850	AIR Kohima	India	0035	C,H,P
4.860	AIR Kingsway(Feeder)	India	1859	H,L,P
4.865	PBS Lanzhou	China	2203	B
4.885	L.V. del Cinaruco	Colombia	0335	P,R
4.870	R.Cotonou	Benin	1920	H,K,L,P,R
4.875	R.Roraima, Boa Vista	Brazil	0310	C,K,R
4.879	R.Bangladesh	Bangladesh	1553	H
4.880	AIR Lucknow	India	0050	B,C
4.885	R.Clube do Para	Brazil	0040	B,C,K
4.885	KBC East Sce Nairobi	Kenya	1828	C,H,L
4.890	RFI Paris	via Gabon	0358	K
4.890	R.Port Moresby	New Guinea	2002	H,L
4.890	ORTS Dakar	Senegal	2034	B
4.895	Voz del Rio Arauca	Colombia	0045	C
4.895	AIR Kurseong	India	1709	H
4.895	Pakistan BC	Pakistan	1906	H,L
4.900	SLBC Colombo	Sri Lanka	1723	H
4.905	R.Nat N'djamena	Chad	2014	B,C,I,K,L,P,R
4.910	RTG Conakry	Guinea	2009	B
4.910	R.Zambia, Lusaka	Zambia	1910	B,H,L,P,R
4.914	R.Cora del Peru,Lima	Peru	0104	B,K,R
4.915	R.Anhanguera	Brazil	0231	K,R
4.915	Armonias del Caqueta	Colombia	0627	P
4.915	GBC-1, Accra	Ghana	2050	C,G,J,K,L,P,R
4.915	KBC Cent Sce Nairobi	Kenya	1905	L
4.920	R.Quito, Quito	Ecuador	0623	P
4.920	AIR Madras	India	1820	H,L
4.925	R.S.Miguel,Riberalta	Bolivia	2258	F
4.931	R.Internacional	Honduras	0215	C,J,K,R
4.935	KBC Gen Sce Nairobi	Kenya	1928	B,C,H,L,P,R
4.940	AIR Guwahati	India	1645	H
4.940	R.Abidjan	Ivory Coast	2040	C
4.945	R.Difusora	Brazil	0305	R
4.950	R.Nacional, Mulenvos	Angola	1859	H,L
4.950	AIR Jammu	India	1704	H
4.950	R.Madre de Dios	Peru	2302	F
4.955	R.Marajoara, Belem	Brazil	0216	K
4.955	R.Nac. de Colombia	Colombia	0238	C,G,K,R
4.965	Christian Voice	Zambia	1911	H,K,L,P
4.970	PBS Xinjiang	China	1644	H
4.970	RTM Kota Kinabalu	Malaysia	2136	B
4.975	R.Pacifico, Lima	Peru	0310	R
4.975	R.Uganda, Kampala	Uganda	2030	C
4.980	PBS Xinjiang, Urumqi	China	1628	H
4.980	Ecos del Torbes	Venezuela	0035	B,C,F,G,I,K,P,R
4.985	R.Brazil Central	Brazil	2307	F,R
4.990	FRCN Lagos	Nigeria	2030	C,P,R
4.990	R.Ancash, Huaraz	Peru	0340	R
4.995	R.Andina, Huancayo	Peru	0255	R
5.005	R.Nacional, Bata	Eq.Guinea	2024	D,H,L,P
5.005	R.Nepal, Kathmandu	Nepal	0048	B,H
5.010	R.Garoua	Cameroon	1827	B,H,L,R
5.010	AIR Thiru'puram	India	0040	B,C,G,K
5.020	PBS-Jiangxi Nanchang	China	2305	R
5.020	La V du Sahel,Niamey	Niger	2001	B,C,H,J,L,P,R
5.025	R.Parakou	Benin	2038	J,K,L,P,R
5.025	R.Rebelde, Habana	Cuba	0410	B,R
5.025	R.Uganda, Kampala	Uganda	2000	C,H,L,P,R
5.030	AWR Latin America	Costa Rica	0412	B,C,J,R
5.035	R.Bangui	C.Africa	2048	C,H,I,K,L,R
5.040	L.V. de Yopal	Colombia	0245	R
5.045	R.Cultura do Para	Brazil	0240	C,K,R
5.047	R.Togo, Lome	Togo	2045	C,K,L,P,R
5.050	Guangxi PBS, Nanning	China	1640	H
5.050	R.Tanzania	Tanzania	1906	H,I,K,L,P,R
5.055	Faro del Caribe	Costa Rica	0218	K
5.055	RFO Cayenne(Matoury)	French Guiana	0315	C,P,R
5.060	PBS Xinjiang, Urumqi	China	1635	F,H
5.065	R.Candip, Bunia	Zaire	1751	H
5.075	Caracol Bogata	Colombia	2309	B,C,I,J,K,P,R

DXers:-
(A) Tim Allison, Middlesbrough.
(B) Tez Burke, Bradford.
(C) Robert Connolly, Kilkeel.
(D) Martin Dale, Stockport
(E) Ron Damp, Worthing.
(F) John Eaton, Woking.
(G) David Edwardson, Wallsend.
(H) P.Gordon Smith, Kingston, Moray.
(I) Bill Griffith, S.W.London.
(J) Sheila Hughes, Morden.
(K) Eddie McKeown, Newry.
(L) Fred Pallant, Storrington.
(M) Roy Patrick, Derby.
(N) Clare Pinder, while in Appleby.
(O) Peter Pollard, Rugby.
(P) Richard Reynolds, Guildford.
(Q) Chris Shorten, Norwich
(R) John Slater, Scalloway.

1955) 44444 at 1900 in Appleby; R.Bulgaria, Sofia 11.720 (Eng to W.Eur 1900-2000) 44344 at 1915 in NW.London; R.Kuwait via Kabd 11.990 (Eng to Eur, N.America 1800-2057) 53533 at 1925 in Herstmonceux; Egypt R, Cairo 12.050 (Ar [Home Sce Relay] to Eur, N.America 0100-2300) 44434 at 1959 in Bradford; RCI via Sackville 11.690 (Eng 2000-2130, Fr 2130-2200) to Eur, M.East, Africa) 54544 at 2020 in Chester; R.Damascus via Adra 12.085 (Eng to Eur 2005-2105) 44444 at 2025 in Morden; R.Finland via Pori 11.755 (Fin, Sw, Russ, Fr, Eng, Ger to Eur 0700-2130?) 45545 at 2120 in Oadby; BBC via Ascension Is 11.835 (Eng to W.Africa 1930-2315) 35553 at 2130 in Wallsend.

Broadcasts from many areas may also be received in the **9MHz (31m)** band. Among those noted were SRI via Fr.Guiana 9.885 (It, Eng, Fr, Ger, Port to Australia. S.Pacific 0830-1100), rated 23222 at 0900 in Galashiels; R.Nederlands via Bonaire, Ned.Antilles 9.720 (Eng to Pacific 0730-1025) SIO322 at 0911 in Macclesfield; R.Nederlands via Nauen 9.650 (Eng to Eur 1030-1225) 55555 at 1105 in Herstmonceux; R.Romania Int, Bucharest 9.690 (Eng to Eur? 1300-1355) 32223 at 1300 by **Gerald Guest** in Dudley; Channel Africa, Meyerton 9.530 (Eng to Africa 1600-1700) 53333 at 1625 in Norwich; Voice of Turkey, Ankara 9.460 (Tur to Eur, N.America 0800-2200) 55555 at 1635 in Oadby.

Later, the Voice of Turkey, Ankara 9.445 (Eng to Eur 1830-1920) was 43333 at 1830 in Appleby; Israel R, Jerusalem 9.435 (Eng to W.Eur, N.America 1900-1930) 54344 at 1905 in Kirkby Stephen; R.Nederlands via Flevo 9.895 (Eng to S/E/W.Africa 1830-2125) 34543 at 1925 in Wallsend; VOIRI Tehran, Iran 9.022 (Eng to Eur 1930-2027) 44333 at 1942 in Middlesbrough; China R.Int, Beijing 9.920 (Eng to Eur 2000-2157) 54444 at 2008 in E.Worthing; Voice of Armenia, Yerevan 9.965 (Eng to America 2030-2100) 44333 at 2030 in Bradford; R.Finland via Pori 9.855 (Eng to Eur, N.America 2000?-2058) 32222 at 2035 in Truro; R.Bulgaria, Sofia 9.700 (Eng to Eur 2100-2200) SIO444 at 2100 in Co.Fermanagh; R.Record, Sao Paulo, Brazil 9.505 (Port 0900-0000) 22332 at 2200 in Scalloway; CBC Montreal 9.625 (Eng, Fr, Inuk, Cree, Attik to N.Canada 1155-0610) 53544 at 2239 by **Richard Reynolds** in Guildford.

Noted in the **7MHz (41m)** band were R.Japan via Skelton, UK 7.230 (Eng to E.Eur 0700-0800) rated 43333 at 0726 in Plymouth; WJCR Upton, USA 7.490 (Eng to E.USA 24hrs) 22332 at 0730 in Galashiels; TWR Monte Carlo, Monaco 7.115 (Eng to Eur 0640-0820) 54554 at 0820 in Herstmonceux; Channel Africa 7.155 (Eng to S/E.Africa 1500?-1800) 23232 at 1655 in Bridgwater; AIR via Aligarh? 7.412 (Hi, Eng to Eur 1745-2230) 32233 at 1745 in Stalbridge; R.Australia via ? 7.330 (Eng to S.Asia 1800-2100) 44434 at 1811 in Kirkby Stephen; VOA via Selebi-Phikwe, Botswana 7.415 (Eng to Africa 1900-2230) 44433 at 1910 in Chester; R.Nederlands via Talata Volon, Madagascar 7.120 (Eng to S/E/W.Africa 1730-2025) 43433 at 1915 in Doncaster; R.Thailand via Udon Thani 7.210 (Eng to Eur 1900-2000) 54444 at 1923 in Woodhall Spa; Polish R, Warsaw 7.285 (Eng to Eur 1930-2025) 54444 at 1950 in Ross-on-Wye; ERA Thessaloniki, Greece 7.430 (Greek to Eur 1400-2255) 44444 at 2017 in Stockport; RCI via Skelton, UK 7.235 (Eng to Eur, M.East, Africa 2000-2130 Mon-Fri) 53333 at 2025 in NW.London; VOIRI Tehran 7.260 (Eng to Eur, M.East 1930-2028) 33333 at 2028 in E.Worthing; R.Romania Int, Bucharest 7.195 (Eng to Eur 2100-2156) 54444 at 2130 in W.London; R.Bulgaria via Plovdiv? 7.480 (Eng to Eur? 2300-0000) SIO333 at 2338 by **Francis Hearne** in N.Bristol.

Some of the broadcasts to Europe in the **6MHz (49m)** band originate from SRI via Lenk 6.165 (Eng 0715-0730) 54444 at 0715 in NW.London; R.Austria Int via Moosbrunn 6.155 (Fr, Sp, Eng, Ger 0400-2300) SIO333 at 0736 in N.Bristol; R.Vlaanderen Int, Belgium 6.035 (Eng 0900-0925 Mon-Sat) 33333 at 0900 by **Julian Wood** in Elgin; Deutschland R. Berlin 6.005 (Ger 24hrs) 31231 at 1045 in Oadby; R.Yugoslavia 6.100 (Eng 1830-1900) 44343 at 1840 in Bradford; R.Prague, Czech Rep 5.930 (Eng 2000-2027) 44344 at 2000 in Appleby; China R.Int, Beijing 6.950 (Eng to Eur 2000-2157) 45344 at 2004 in Newry; RCI via Skelton, UK 5.995 (Eng 2100-2130) 43444 at 2015 in Rugby; R.Latvia Int, Riga 5.935 (Eng 2030-2035 Mon-Fri) 44444 at 2030 in Morden; REE via Noblejas? 6.125 (Eng 2100-2200) SIO323 at 2100 in Co.Fermanagh; R.Budapest, Hungary 5.935 (Eng 2100-2125) 54444 at 2110 in Norwich; R.Sweden via Karlsborg? 6.065 (Eng 2130-2200) 43444 at 2140 in Truro; BBC via Woofferton, UK 6.195 (Eng 1900-2230) 45444 at 2144 in Woking; R.Austria Int via Moosbrunn 5.945 (Fr, Sp, Eng, Ger 1800-2300) 45444 at 2252 in Middlesbrough.

TRADING POST

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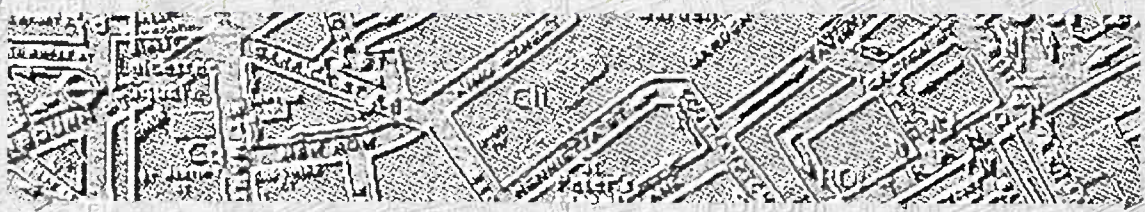

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