shortwave magazine

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Features

- Automatically tunes these receivers with Reaction Tune (Pat.Pend.) CI-V receivers (ICOM's R7000, R7100, and R9000), (Pro 2005/2006 equipped with OS456, Pro 2035 equipped with OS535) or AOR models (AR2700 and AR8000).
- Records and saves 400 unique frequencies
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- CX-12AR Computer Interface for Scout & AOR (optional)
- PC Utility Disk for downloading memory to PC included
- Rapid charge NiCads with 10 hour discharge time
- DB 32 VHF/UHF mini-antenna shown with Scout (optional)
- Distinctive Beeper/Vibrator indicate frequency hits

At right: Scout shown with CLIPMATE™. A handy windshield mount for Scout, for quick access and visibility.

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short wave magazine

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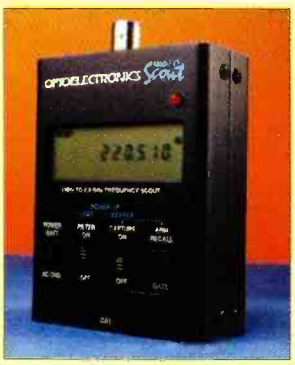
Cover Subject

The latest communications receiver from Lowe Electronics, the HF-250 gets a world's first review in this issue. *Photo: Craig Dyball.*

Features



Because of space constraints, the second part of *Brian Adkinson's* Simple 2-valve SW Radio has had to be held over.

Regular Columns

Good Listening

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

August 26: A computer/rally/games fair is being held at Manchester University, Rectory Hall, Oxford Road, Manchester, next to Manchester museum and junction with Dover Street. Admission is £2 for adults and £1 for children/OAPs. Doors open 10am to 3pm. Free mag/CD and posters and free technical advice. **0161-627 2502**.

August 27: The Coleraine & District Amateur Radio Society are holding their annual rally at the Lodge Hotel, Coleraine. Doors open at 12 noon and admission is £1.50, which includes a draw. There will be a large number of traders in attendance and refreshments will be available. **Brian GI8LTB** on **(01265) 58664**.

August 27: The Galashiels Club are holding their Open Day at the Focus Centre, Livingstone Place, Galashiels. Doors open at 11am till 4.30pm. There will be many traders, a Bring & Buy, club stalls, a raffle and refreshments will be available. **John Campbell GM0AMB**. Tel/FAX: **(01835) 822686**.

August 27: The East Coast Amateur Radio & Computer Rally is to be held at the Clacton Leisure Centre, Vista Road, Clacton-on-Sea, Essex. Doors open at 10.30am to 4pm. There will be major suppliers and manufacturers of radio equipment, computers and computer software, accessories, antennas and second-hand gear. There will also be a Bring & Buy, plus a bar and cafeteria available from 11am. Free car park and talk-in on S22 and SU22 (GB1ECR). Further information can be obtained from **Sharward Promotions** on **(01473) 272002** or **FAX: (01473) 272008**.

August 27: The Torbay Rally is being held at the Clenon Valley Leisure Centre, Paignton, Devon - where there's room to stop and chat! Doors open at 10am. There will be trade stands, a Bring & Buy, special interest displays, the use of leisure facilities, a restaurant and bar. For the family, only a four minute walk away, there is a beach, boating lake, steam railway and a flume water park. Further details can be obtained from **John G3YCH, QTHR. (01803) 842178**.

August 28: The Huntingdonshire Amateur Radio Society are holding their Radio Rally at St. Peter's School, St. Peter's Road, Huntingdon, Cambridgeshire. Doors open at 10am and admission is £1. Refreshments available. There will be two halls and a car boot sale. Talk-in on S22. **David Leech G7DIU. (01480) 431333**.

September 3: The 18th Telford Radio Rally is being held at the usual venue, Telford Exhibition Centre, Telford. Free parking and easy access from M54. Flea market, Bring & Buy, trade stands, Novice feature, special interest groups and RSGB Morse tests. **John (01743) 249943** or **Dave (01952) 588878**.

***September 3:** The Bristol Radio Rally is being held at Brunel Centre, Temple Meads Station, Bristol. Doors open at 10.30am to 4pm (disabled 10.15am). Admission is £1 (accompanied children under 12 free). There is ample under cover parking, refreshments, large Bring & Buy and talk-in on S22. Further information from **Muriel Baker G4YZR, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG** or **(01275) 834282** (24hr answerphone).

September 10: The BARTG Rally is being held at Sandown Exhibition Centre, Sandown Racecourse, Esher, Surrey. Doors open 10.30am to 5pm. Admission fee for adults is £2, OAPs £1.50 and under 14s free, if accompanied by an adult. **Peter Nichol** on **0121-680 5963**.

***September 10:** The 14th Lincoln Hamfest will be held on the Lincolnshire Showground. Entry is £1.50. Morse tests available plus all the usual attractions. **Sue Middleton** (XYL G8VGF, QTHR). **(01522) 525760**.

September 12: The Mid-Warwickshire Amateur Radio Society are holding their Open Day from 6-9pm at the club's rooms in the St. John Ambulance HQ Building, 61 Emscote Road, Warwick. There will be amateur stations on the air together with displays of packet radio, home-brew, kit construction and lots more. All are welcome to come and see the club in action, ask questions and learn about amateur radio. **Don** on **(01926) 424465**.

September 17: Peterborough Radio & Electronics Society East of England Rally is to be held at the Peterborough Showground, easy access from A1, A605, A47. There will be trade stands, radio car boot and other local attractions. Full catering and bar. Acres of free parking. Doors open at 10.30am, 10am for disabled visitors. Admission is £1. Talk-in on S22 via G3DQW. General enquiries to **Ted G0REM** on **(01733) 66471**, QTHR.

September 17: The Central Lancaster Radio Rally is to be held at the Central Lancaster High School, Craig Road, Lancaster (five minutes from Jcn 34 M6). Doors open at 10.30am and the entrance fee is £1. There will be the usual traders, special interest groups, a Bring & Buy and refreshments. **Susan Griffin** on **(01524) 64239/(01384) 896199**.

September 23: A Radio Amateur Table Top Sale is to be held at St Mary's Hall, Reddish, Stockport. More details from **John G4ILA** on **0161-477 6702**.

September 24: The Droitwich Amateur Radio Club are holding their Three Counties Radio Rally at The Three Counties Showground, Malvern. For further details you can contact **Eddie G4PQZ** on **(01905) 773181**.

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 Fighting Cocks Public House, Hengrove. 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. August 29 - Video, September 27 - 'On location' by G3UHK. Dave Bailey G4NKT. 0117-967 2124.

South Bristol ARC: Wednesdays, 7.30pm. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. August 30 - Preparation for Bristol Radio & Computer Rally, September 3 - Bristol Radio/Computer Rally, 6th - 2m challenge - work all Bristol, 13th - Review of Bristol Rally, 20th - Learn to play bridge - committee meeting, 27th - Bring & Buy - car boot sale. For more information ring (01275) 834282 on a Wednesday evening.

BUCKINGHAMSHIRE

Aylesbury Vale RS: Wednesday evenings, 8pm. Hardwick Village Hall, (Hardwick is situated off the A413 between Aylesbury and Buckingham). September 20 - Mini construction evening. Ivan Eamus G3KLT. (01296) 437720.

CLWYD

Conwy Valley ARC: 1st Wednesdays, The Studio, Penrhos Road, Colwyn Bay, Clwyd. September 6 - Microwave techniques by Dr. Miles Capstick GW4RCE. R. W. Evans GW6PMC (01745) 855068.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. August 30 - The International Short Wave League - illustrated stalk by the ISWL Publicity Officer, Chris Carrington G0IYZ, September 4 - Amateur TV group meeting, 6th - Junk sale. Richard Buckby G3VGW, 20 Eden Bank, Ambergate, Belper, Derbyshire DE56 2GG. (01773) 852475.

DEVON

Appledore & DARC: 3rd Mondays, 7.30pm. Appledore Football Clubroom. Dave Brierley G3YGJ. (01237) 476124.

GREATER LONDON

Edgeware & DRS: Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. August 24 - SSB Field Day briefing, September 2/3 - SSB Field Day, 14th - Station on the air, plus c.w. practice, 28th - *Practical Wireless*, a personal history by Rob Mannion G3XFD. Rod Bishop. 0181-204 1868.

Southgate ARC: 2nd & 3rd Thursdays, 7.30pm. The Pavilion, Winchmore Hill Cricket Club, Firs Lane, Winchmore Hill, London N21 3ER. August 24 - DF equipment check out and ROTA, September 14 - Computer simulated c.w. contest by Mr Ron Lindsay G3KTZ, 28th - ROTA. M. E. Viney G0ANN. (01707) 850146.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. August 25 - On air activity. (01737) 351313.

HAMPSHIRE

Horndean & DARC: 1st & 4th Tuesdays, 7.30pm. Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. September 5 - Natter night, 26th - HM Coastguard by Toby Stone. S. Swain (01705) 472846.

Winchester ARC: 3rd Fridays, Red Cross Centre, Durngate House, North Walls, Winchester. 7.30pm. September 15 - Mike Homer G6AIQ - Wildcard! P. Simpkins G3MCL. (01962) 865814.

HEREFORD & WORCESTER

Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. September 12 - Talk, 26th - Night on the air (packet). Barry Taylor. (01527) 542266.

HERTFORDSHIRE

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. September 14 - The Schneider Trophy by Rex G3NQT, 16th - Sausage sizzle and activating TL32, 28th - Natter night. Dave G1CAY on (01992) 460841.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. September 19 - Equipment test evening by Ian Daniels G4VTD. A Messenger G0TLK. 0181-777 0420

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. August 30 - Night on the air/construction QRP/Morse practice, September 6 - *PW* and my former years by Rob Mannion G3XFD, 13th - Night on the air/construction QRP/Morse practice, 20th - Building an 813 linear by Chris G4ILR, 27th - Night on the air/construction QRP/Morse practice. Mike G4EOL. (01603) 789792.

OXFORD

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

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

SOMERSET

Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. August 31 - Committee meeting and club station GX3CMH & GX8YEO on the air. Cedric White, QTHR. (01258) 473845.

SUFFOLK

Bury St. Edmunds ARS: 3rd Tuesdays, 7.30 for 8pm. Culford School. September 19 - Tesla and a.c. power by George Woods G3LPT. Kevin Waterson G1VGI, 20 Cadogan Road, Bury St. Edmunds, Suffolk IP33 3QJ. (01284) 764804.

TAYSIDE

Dundee ARC: Tuesdays, 7pm. Dundee College, Graham Street, Dundee. September 12 - Enrolment eveing, 19th - Construction evening, 26th - AGM. Allan Martin GM7ONJ, 11 Langlee Place, Broughty Ferry, Dundee, Tayside DD5 3RP.

WARWICKSHIRE

Mid Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. Sy Johns HQ, Warwick Div., 61 Emscote Road, Warwick. September 12 - Open day. The event starts at 6pm and runs until 9pm. During the event, there will be on-air demonstrations, packet radio, home-brew and kit construction and much more. Don on (01926) 424465.

WEST MIDLANDS

Sandwell ARC: The Broadway, Warley. RAE class on Monday nights, Morse class on Wednesday nights and RAE Novice class on Thursday nights. Three operating shacks, h.f./v.h.f./u.h.f., Phone, c.w., RTTY, AMTOR, Packet, all bands. Talks, outings, contest and demonstrations. September 7 - Enrolment evening, 7.30pm, light refreshments and introduction to course and club. For further information please ring 0121-552 4619/0121-552 4902.

WEST SUSSEX

Worthing & DARC: Wednesdays, 7.30 for 8pm. The Parish Hall, South Street, Lancing. September 6 - Discussion evening, 20th - 'Stateside' by G3LQI, 27th - Early Sinclair products by Enrico Tedeschi. **Roy G4GPX**. **(01903) 753893**.

WEST YORKSHIRE

Denby Dale ARS: Wednesdays, 8.30pm. Pie Hall, Wakefield Road, Denby Dale, West Yorkshire. Denby Dale ARS also provides RAE, Morse and Novice RAE classes and is a registered City & Guilds examinations centre for both the RAE and Novice RAE exams. September 6 - 'Alarm update' by Malcom G0ISX, 13th - Fox hunt - start Pie Hall, Denby Dale, 20th - 'Sailing - Part 2' by Ken Whortley. Further details from the examinations secretary Brenda G4OTE on (01484) 424776 or secretary Malcom McKenzie G8RWN, 9 Broomhouse Close, Denby Dale, Huddersfield, W. Yorkshire HD8 8UX on (01484) 861782 for club activities.

Keighley ARS: The Ingrow Cricket Club, Ingrow, Keighley. Thursdays, 8pm. August 31 - Treasure hunt, September 7 - Natter night, 14th - Ideas for 1996?, 21st - Natter night, 28th - Quiz v Northern Heights (pie/peas). Kathy G0RLO. (01274) 496222.

Wakefield & DRS: Tuesdays, 8pm. The Ossett Community Centre, Prospect Road, Ossett. September 2/3 - 144MHz Contest, 5th - On the air, 10th - Jodrell bank trip, 12th - Blakey Ridge - the video, 19th - Modifying PMRs by G4IZH, 26th - On the air. Bob 0113-282 5519 or G3WWF@GB7WRG.

WILTSHIRE

Trowbridge & DARC: 1st & 3rd Wednesdays, 8pm. The Southwick Village Hall, Southwick, Trowbridge. September 6 - The why and wherefores of the cubical quad antenna, talk by Dave Buik G0DAB. Ian G0GRI on (01225) 864698.

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

junior listener

Car Boot Sales

Usually when you start off in a hobby you haven't got that much money to spend - at least not until you are sure you like it! This is especially true if you are a 'junior' or 'senior' listener. So what do you do?

There are several ways you can save money when buying a radio, but is it really a bargain? Recently, We've been to a couple of car boot sales and we were fortunate enough to see a later model of our Tandy lap-top computer going for a really good price. As it is battery powered we were able to check it worked and so decided to risk parting with the cash. Since getting it home we've been pleased with it and it seems to work fine, so that was a bargain. I did see several scanners and short wave radios, in fact I think I saw several CB sets and an amateur radio set as well. But how do you know if you are getting a bargain?

I would say that if you don't know what you are looking for, don't risk it. Make sure you can check the scanner or whatever works. If you don't know how to drive one because you are just starting out, try and take someone with you who does know. Ask why they are selling it. The answer will probably be that either they've bought a newer one or that they tried the hobby and have given up.

Finally, remember that if it goes wrong next week that's your problem and it could be expensive getting it repaired. So your bargain may not be a bargain after all!

Second-hand Adverts

Another way to save money is to buy second-hand through adverts in your local free paper or in places like *Short Wave Magazine*. Obviously, prices will be higher than at a car boot sale, but you should get a better chance to try before you buy. Again, if it goes wrong you have to get it fixed at your expense.

Other Shops

Nowadays it seems as though you can buy a scanner or short wave radio in the strangest of places. Camera shops, television shops even discount centres seem to have scanners available, if not short wave radios. Often they have unusual brand names for sale although they are cheap, but it's difficult to find out how good they are until you have got it home and used it for a while. It's worth asking what kind of guarantees go with the purchase, just in case. Usually they will just replace it with another one, but you won't get any other kind of after-sales service.

Radio Dealers

Of course, you can buy from a recognised dealer and buy a well-known make of radio. For your money you will get an after-sales service, they'll help you get the hang of the controls and advise you how to get the best from your radio. If anything should go wrong, then you'll get the technical support needed.

So, 'you pays your money and takes your chance'. Personally, what do I think. Well, my first radio was bought brand new from a main dealer as have been the 'major' purchases ever since. I have bought second-hand and from car boot sales, although these purchases have been the more minor elements to the station. I'm not a great risk taker and prefer to have the back up in case things go wrong, but I am always on the look out for a bargain.

Radio Rallies

I am reminded by a recent fax from Frank Elliot, the organiser of the longstanding Leicester Amateur Radio Show, that rallies are a very good place to buy. Not only do you get lots of radio dealers in one venue, there are often some good 'show special' deals to be had. Most shows also have a bring and buy stall where many a good bargain - and some junk - can be obtained. Don't forget, though, that my warnings about car boot sales and second-hand adverts apply. The Leicester Amateur Radio Show, will be held as usual at the Granby Halls on the 20 and 21 October. Details from Frank G4PDZ, Tel: 0116-287 1086.

On the Air

I've heard that a new radio station has finally gone on the air with some test broadcasts. WVTG (possibly WGTG) is transmitting on 7.355MHz from McCaysville, GA in the USA. They have a power output of 50kW and their antenna is 275m long suspended 27m above the ground. Their test transmissions are aired between 1300-2200 each day. Their address is Box 1131, Copper Hill TN 37517, USA. They will QSL all reports sent to them.

This station has been listed in the *WRTH* this year, but they have only just got onto the air. It could be worth trying to hear them and get their nice new QSL card.

Novel Idea

As everyone else seems to be talking about Internet and 'information super highways', etc., I thought I would stay fashionable and mention something too! This has got to be the strangest way to listen to a 'radio' broadcast. The station WRN now broadcasts live onto the Internet! If you want to see/listen to this for yourself you should check the WRN Homepage at **http://www.wrn.org**

I think this takes first prize and the strangest way to listen - unless you know different.

New Realistic Scanner

Link Electronics have sent me a press release on the PRO-62 scanner. This is a new Realistic scanner that covers 68-88, 118-174, 380-512 and 806-960MHz. It has 200 memories and you can select a.m. or f.m. on any of the programmed frequencies. It costs £199.99 and is available from Link Electronics, 216 Lincoln Road, Peterborough PE1 2NE. Tel: (01733) 345731.

Broadcast Bands Award

Here are a few details for the ISWL Short Wave Broadcast Band DX Award.

This is available to all broadcast band listeners for verified reception of short wave broadcast stations in all six continents. The number of countries that must be verified in each continent when applying for any of the four classes of award are shown in the table.

No. countries in	Europe	Africa	Asia	N.Am	S.Am	Oceania	Total
Class 1	35	40	35	12	10	8	140
Class 2	30	30	27	10	7	6	110
Class 3	25	22	18	7	5	3	80
Class 4	17	15	10	4	3	1	50

The cost of the award to non-members is £2.00 and to obtain a claim form you need to send the return postage to: Herbert Yeldham, Awards & Contests Manager, ISWL, Belle Fleurs, Wade Reach, Walton on the Naze, Essex CO14 8RG.

Pen Pals

I wonder how many newcomers feel that they are the only people in the world struggling to understand this complex hobby of ours. Would you like to correspond with other newcomers? If so drop me a line with your name and address and we'll put together a list of people wanting to write. Tell us a little about your hobby and let's see if we can put people together.

news

For the latest in the World of Listening

Fab Feba

Feba Radio have produced a booklet - *Organising a Feba Event*. This little booklet is packed with creative ideas, recipes, hints, tips and much more. Just what every hard-pressed, looking-for-inspiration, church meetings secretary always wanted.

The booklet has been brought out during Feba's 25th anniversary of broadcasting from their Seychelles station to help people organise an anniversary event. Whether it's making an event at church special or a social event with a missions emphasis, this little booklet has it all.

Although written from the standpoint of Christian radio and offering resources available from Feba, Feba hopes the new booklet will be widely used by those wanting to increase awareness of Christian mission.

Copes of this smashing booklet can be obtained from **Mrs Jennie Ring at Feba, Ivy Arch Road, Worthing, West Sussex BN14 8BX.**

Summer Schedules

The International Short Wave League's *Guide to English Language Short Wave Broadcasts to Europe (Summer Schedules)* has recently arrived on the *SWM* Newsdesk. The information is presented in time order (GMT/UTC) with aligning programme time periods, country and station names, frequencies, programme details, news, features, sport and world service transmission, etc.

The guide costs £1.50 (IRCs or postage stamps to the value of £1.50 are also acceptable) and the guide will be available form ISWL rally stands. For more information, contact **The International Short Wave League, 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA.**

Challenge Time

The idea of the 1995 October s.w.l. challenge is to log as many countries as possible in the 48 hours from 0000 on October 28 to 2359 on October 30 1995. The challenge takes places at the same time as the SSB Leg of the CQ WorldWide DX Contest.

RULES

1. A s.w.l. may listen at any time during the 48 hours.
2. Only one station from each DXCC country may be logged on each of the main amateur bands (28, 21, 14, 7, 3.5 and 1.8MHz).
3. Points will be as follows:
   a) countries in the s.w.l.s own continent score 1 point on each band. Countries outside the s.w.l.s own continent score 5 points on each band.
   b) The final score shall be the total of the countries heard on the six bands multiplied by the total number of points from each of the six bands.
4. Entries must show:
   a) date
   b) time (UTC)
   c) callsign of station heard.
   The callsign of the station being worked in not required
   d) RS of station heard at s.w.l.s QTH. No station may be logged whose RS is less than 4x4.
5. A country multiplier check sheet **must** be provided.
6. Computer generated logs will be welcomed.
7. Logs should be sent to: Bob Treacher BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ.
8. Logs **must** be postmarked no later than 27 November 1995.
9. Certificates will be awarded. Entrants wishing to receive a copy of the results booklet **must** include at least £1, $1 or two IRCs.

Interim Station

The BBC has opened an interim f.m. transmitting station at Crystal Palace to improve reception for some two million people in South London from Crystal Palace in the east to Richmond in the west and in the Epsom and Leatherhead areas. Improved reception is also available for those people travelling into London.

Interim tests of all the BBC national services began on 6 March 1995 and are liable to interruption. The new transmission frequencies are:

Radio 1	98.5MHz
Radio 2	88.8MHz
Radio 3	91.0MHz
Radio 4	93.2MHz

On some radios, the f.m. band may be marked as v.h.f. Please note that as this transmitter broadcasts only with vertical polarisation, any external or loft-mounted aerials must be mounted so that their rods are vertical.

Listeners with self-tuning RDS (Radio Data System) radios need take no action, except to ensure the RDS function on the radio is selected. Such radios will then automatically tune to the appropriate frequencies.

Further information on f.m. reception including advice on fitting an external f.m. antenna is available from: **BBC Engineering Information, Villiers House, The Broadway, Ealing, London W5 2PA. Tel: (0345) 010313** (local call rate).

National Transmitter News

Television Relay Stations

May 15, Catrine, Ayrshire, a new television relay station opened, provided jointly by the BBC and the ITC. The station is located on a mast in the Shawwood area of Catrine, about 18km east of Prestwick. It is designed to bring good television and teletext reception to about 240 people in the Ballochmyle Street, Mill Street, Chapel Brae and St. Cuthbert's Street areas of Catrine.

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

Station Details

Channels:	BBC1 (Scotland)	55
	BBC2 (Scotland)	62
	ITV (Scottish TV)	59
	Channel 4	65
Antenna Group:	C/D	
Polarisation:	Vertical	
Effective Radiated Power:	5W	

Reception advice is available from either:

ITC Engineering
Kings Worthy Court
Kings Worthy
Winchester
Hants SO23 7QA
Tel: (01962) 848647

BBC Engineering Information
Villiers House
The Broadway
Ealing
London W5 2PA
Tel: 0181-231 9191

Response to VHF/UHF Threat

The RSGB has recently published its response to the CEPT *Detailed Spectrum Investigation Phase 2 Report*. In an article in the July edition of *RadioCommunication*, summarising the Society's formal reply to the RadioCommunications Agency (RA), each frequency band is dealt with in turn, detailing the original input by the IARU and the RSGB's reaction to the CEPT recommendations.

The RSGB Licensing Advisory Committee states: "There are very severe and growing pressures on our allocations at present, it is in all our interests to defend them as vigorously as possible at every opportunity. The Society will be opposing these losses vigorously in its input to the RA."

Non-members of the RSGB are urged to read this article and to join the national society in order to strengthen its hand in tackling threats to the current frequency allocations. Copies of the July *RadCom* are available to non-members who send an A4-sized self-addressed envelope with 43p worth of stamps to: **John Davies, July RadCom, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.**

news

Refurbishment & Extension

As part of its continuing programme of transmitter refurbishment, the BBC will be fitting new transmitters to the BBC channels at the Moel-y-Parc, Angus and Stockland Hill television transmitter sites. This new equipment will also bring the additional benefit of Nicam stereo sound to the two BBC television channels at each of these sites.

The Moel-y-Parc transmitter serves viewers in north east Wales and also provides coverage to some viewers in Cheshire, Greater Manchester and Merseyside. The Angus transmitter serves viewers around the Tay estaury and parts of Lothian and Perthshire.

The Stockland Hill transmitter covers east Devon, west Dorset and parts of Somerset. In addition, over fifty low power relay stations will receive the Nicam stereo service when their parent station begins tranmission.

Both the Moel-y-Parc and Angus transmitters are expected to begin Nicam transmission in the winter of 1995/6, with Stockland Hill following in the Spring on 1996.

BBC Television began its Nicam stereo service back in August 1991. With the addition of these three transmitters, the total number of main stations broadcasting the Nicam service will be twenty seven, corresponding to over 90% of the population.

Tropical Bands Survey & Clandestine Stations List

Now available is the 23rd edition of *Tropical Bands Survey*, (28 pages) issued by The Danish Short Wave Clubs International (DSWCI) and compiled by Anker Petersen. The survey lists all active broadcasting stations in the 2.00-5.900kHz range, by frequency, power, location and transmission time.

Again this year, the survey is based upon monitoring information from DXers all over the world. Each station is classified by a code describing its credit audibility. The Tropical Bands Survey is available for 10 IRCs or 50 Danish Crowns, marked airmail delivery or £5.75.

Also available is the *Clandestime Stations List*. This listing contains all the latest available data on all active Clandestine stations broadcasting on short wave, including transmission schedule, political organisation, language, addresses and verification policy.

The stations are listed in frequency order, as well as in time order and country by country. You'll also find much background information on the Clandestine stations, which it is claimed can not be found anywhere else!

The Clandestine List is available for 10 IRCs or 50 Danish Crowns airmail delivery or £5.95. Reduced rates for bulk order can be obtained for both publications. Send your order with payment to: **DSWCI, c/o Bent Nielsen, Egekrogen 14, DK-3500 Vaerloese, Denmark.**

New President

Back on July 8, the Council of the RSGB elected Peter R. Sheppard G4EJP as the Society's President for 1996. He is currently Zonal Member for Zone A, the north of England. Any enquiries regarding the RSGB should be sent to: **The Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE** or alternatively, ring them on **(01707) 659015.**

Old Timers Net

Many s.w.l.s all over the country regularly tune into 3.680MHz between 8 and 9am every morning to listen to the sometimes rather heated debates on this popular 'Old Timers' net. Sometimes referred to as the 'Voice Recognition Net', as the dozen or more taking part all seem to recognise each other's voices and seldom bother to use callsigns (only to comply with the regulations of course!).

Recently, members met in the wireless museum at Bletchley Park during the recent rally, several for the very first time, and tried to put a 'face to the voice'- very difficult!

Database DAVE

Major new computer developments were launched back in July by the BBC World Service, hence making programme makers around the building have faster, better, access to sound in a variety of languages. Computers are being used for the first time to move sound from a central actuality database to programme departments. News stories are now archived electronically and the BBC's only comprehensive anniversaries database goes live during the month.

The new actualty database now means that staff in the 41 language services of BBC World Service, the world's leading international broadcaster, can now access sound material 24 hours a day through a newly developed distribution network. Called DAVE 2000 (Digital Audio Voice Editor), the network consists of computers each connected to its own speaker and tape deck. Users can go to any of the work stations and key in the code of the soundbite they want, preview, edit and dub the material onto tape using the linked tape deck.

Up to 40 hours of material can be held on DAVE ranging from popular sound effects and the current Top Ten chart singles to famous speeches. Material is held on the database for up to a month before being archived onto disc.

Also back in July, World Service launched the BBC's Anniversaries Information Service, a database of over 25 000 anniversaries. General or specialist lists will be made available for use throughout the BBC and searched can be made by name, date, subject or country.

The BBC World Service has a regular global audience of more than 130 million listeners and a world-wide reputation for accurate news. Until now, cross checking for accuracy and consistency has been done manually, but in future will be made easier with the introduction of a new database, which can automatically archive all news and current affairs material. Scripts, talks and correspondents' despatches will all be stored in the database. For instance, a user wanting to call up a previously archived material to check how a story was reported, can now do so by making a simple telephone call. The computer finds the material, which is then electronically delivered to the user requesting it via the newsroom's computer system.

Members of the 3680 Old Timers' Net, (L to R) Gren G3WYU, Les G2FQP, Chris (s.w.l. son of G8CK), Bill G8CK, Douglas G3KPO, Jim G4PZB, Ron G4UAC, Mavis (XYL of G4MJN), Roy G3REZ and Bob G3BAC.

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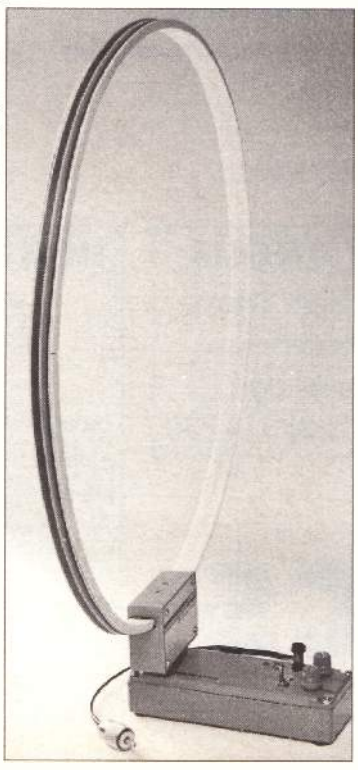
Aarrgh! Not Another M

Bill Wilson sadly died after this article had been accepted and scheduled for publication in this issue. His family have kindly agreed to its publication.

The RAINBOW Loop



Despite the obvious advantages of using a loop antenna for medium wave DXing, - see the 'quarterly list of equipment used' that appears in the 'LM&S' column of this magazine for proof! - many listeners must be put off the idea of using a loop in a domestic environment. This is because of the, usually, grotty appearance of a home-constructed loop and its user hostility - rather like living with an overgrown cactus plant or spider's web waiting to ensnare the nomadic domestic gerbil/moggie or any wandering budgie or grannie...

The Rainbow Loop, like John Tweeker's version in January 1991 *SWM*, is an attempt to civilise the beast, being clean and uncluttered. It is practically indestructible and is highly reproduceable. It is particularly useful when used with any of the modern broadband input receivers, which are hard put to make any sense of medium wave when used near a medium wave transmitter - I can see the rigging on the local medium wave mast (radiating 14kW) from his QTH!

Of course, all these receivers are excellent when preceded by even a single turned circuit to clean up the plethora of signals barging into the front-end and zapping the poor old mixer. How strangely different from the old-fashioned track-tuned receivers with ganged tuning capacitors, which admitted only the signal you wanted to listen to!

There is perhaps one exception among non-professional receivers, the NRD-515, which employs automatic two-stage ganged tuning pre-selection on the medium wave band. Even the Lowe HF-125/225, which has been beautifully designed for excellent r.f. performance under difficult conditions comes to grief when confronted with massive local signals.

Easy to Null

Because the loop assembly in this design is a plug-in unit, experiments with different sizes and configurations of loop or ferrite rods are very easy and quick to try out. In addition, the use of a marine band loop is useful to the s.w.l. to take bearings on transmissions, whether broadcast stations, ships, amateurs or even those mysterious 'numbers' stations. And don't forget the use of a loop for helping to null out r.f. radiation from local digital counters, timebases and unfriendly computers, provided of course, that the noise is not mains-borne.

In my locality, when conditions are good, it is a simple matter to select either Germany or Eire, both on 567kHz, simply by rotating the loop! The Rainbow Loop is not really suitable for receivers that do not have a low impedance antenna input of around 50Ω or so.

Two versions of the 'active' section of the 'Rainbow' are shown, **Fig. 1** is the basic assembly, while **Fig. 2** uses an extra tuned stage, which does make a real difference to the overall r.f. selectivity. In this version, unpluging the loop assembly automatically converts the unit into a two-stage pre-selector (with an optional low-Z input) for your end-fed or random wire antenna.

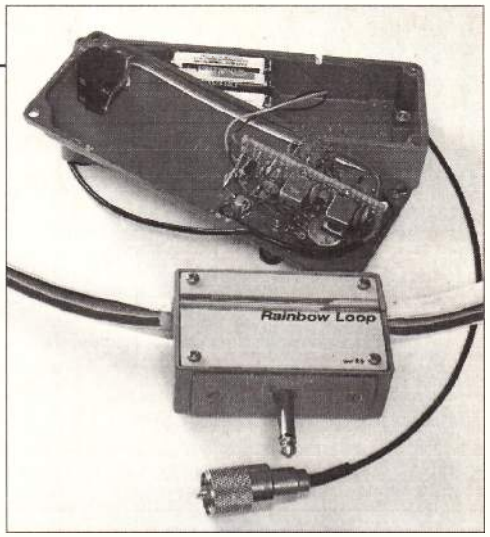
The Circuits

This consists of a simple varicap tuned f.e.t. source-follower to convert the high impedance of the loop to a low impedance suitable for the 50Ω input of the receiver. One could use the f.e.t. as an amplifier, but the last thing that most present-day receivers need is extra gain, they are usually more than adequate in this respect.

A gain control, R4, is included, together with the On/Off switch, which also bypasses the loop and automatically connects the normal antenna straight to the receiver so that instant comparisons may be made. Varicap tuning was chosen for a few reasons, 270° rotation of the tuning control is achieved as opposed to the 180° of a tuning capacitor. The Varicap can be 'trimmed' easily with the tuning voltage to give the required swing and there's simply a lot less physical work to do in the construction stage!

S1 has three functions.

edium Wave Loop!



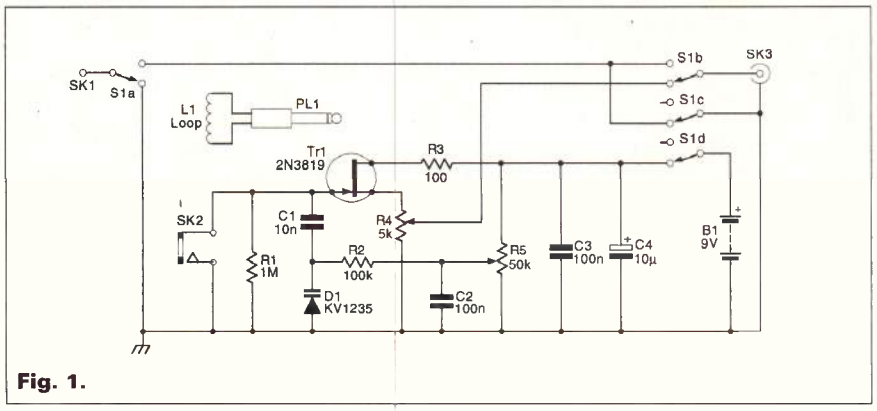


Fig. 1.

When switched 'On', the loop or bandpass filter is enabled (depending on whether or not the loop is plugged in), the wire antenna at SK1 is earthed to avoid spurious pick-up, and power is applied to the circuit. When 'Off', S1a and S1b connected the wire antenna straight through to the receiver and disables the loop/bandpass filter.

A 9V battery supplies both the f.e.t. and the tuning voltage for the varicap, however, I use an optional built-in NiCad battery and charger, the l.e.d. acting as a front panel indicator that the charging process is taking place. This means, varicaps being what they are, that when the battery voltage begins to drop, it will be impossible to tune the loop to the h.f. end of the band. There is the consolation that it's a battery condition indicator for free.

SK4 is the d.c. charging socket, 12V d.c. is needed here to recharge the PP3 NiCad, 15-20V d.c. for a 12V pack. I use a 12V pack of eight AA NiCads to provide a long lasting steady 9V via a zener diode. If you decide to use a PP3 NiCad, the value of Rx is 1kΩ for a 12V pack of 1.5V AA cells, this value becomes 18Ω.

The integral charger saves the trouble of opening the case whenever the battery begins to go flat. I use this method in practically all my battery operated equipment and it does save a great deal of hassle. The one exception is my digital watch (but I'm working on it.....).

Construction

First, visit your local d.i.y. store and get a length of pvc 'U' section extrusion 19 x 7mm, the type used for edging 15mm chipboard. You'll require 1.5m of this channel together with some flat, self-adhesive, sponge draught excluder strip. This latter is not essential, but will provide a tidier job on completion.

The small abs box is first prepared by cutting two openings for the extrusion to fit through. Drill two holes to start each opening and then, using a sharp craft knife, these pilot holes are enlarged to 19 x 7mm to accommodate the 'U' channel. Next, a small block of wood is shaped to enable the ends of the channel to be fixed to the inside of the box using 20mm or so screws and nuts or woodscrews.

The jack plug is next fitted to the bottom of the box. The precise method will depend on the type of plug and the size of the box used. A side-entry type is preferable, but in any event, any internal p.c.b. slots moulded inside this part of the box will need to be removed, very easily done using a sharp woodworking chisel, especially if the box is first warmed slightly to make it less brittle.

If a straight barrel plug is used, the easiest way to arrange for the thickness of the wall to the box to be held between the plug and its cover when they are screwed together, but remember to fit the two leads first. **Fig. 3** shows the method I used.

The sponge strip is now stuck down around the whole length of the channel, this is simply to give some tension to the windings when they are fitted. Finally, a small scrap of stripboard is screwed to the wooden block to enable the connections to the ribbon cable to be made.

The 10-way ribbon cable can now be laid round the channel with the ends going into the box and a wooden wedge inserted into one slot from the inside to firmly secure that end of the ribbon to the case. The cable is now pulled tightly round, compressing the sponge, and the other end secured in the same fashion, this will enable the ribbon to be held firmly in the channel without putting any tension on the soldered connections.

Next, nine pairs of cable ends are trimmed to a suitable length and soldered to the

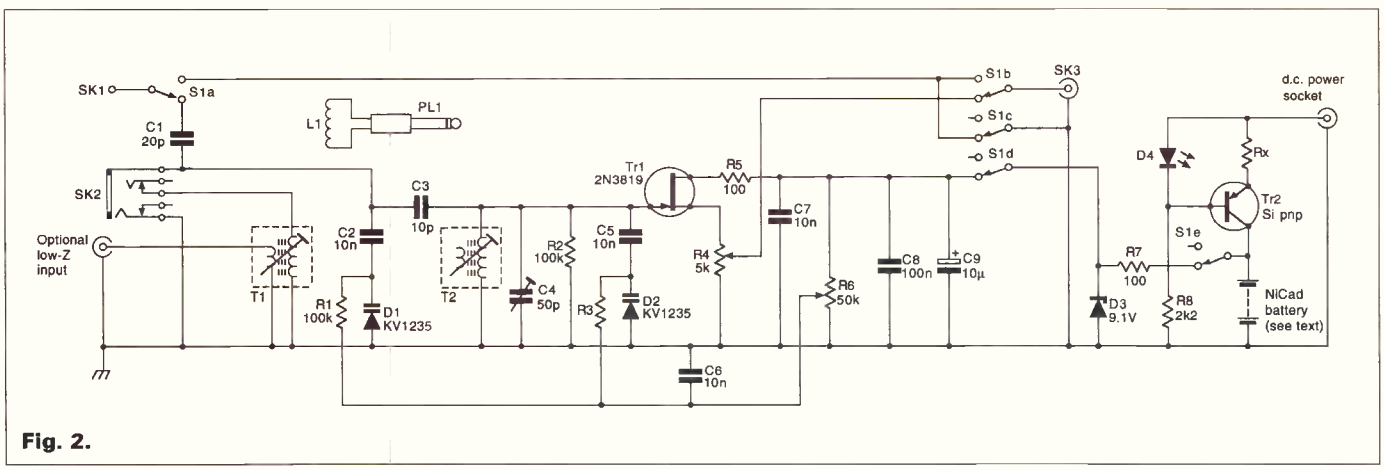


Fig. 2.

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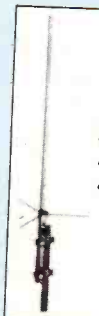

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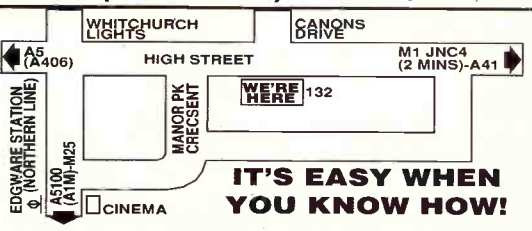

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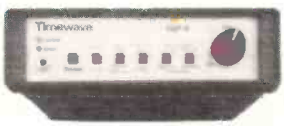

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All modes including S.S.B.
~~£129.00.~~
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108-137MHz ★ Marine band coverage 137-176MHz
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stripboard so that each conductor is in series with the next, the two free ends being then taken to the plug tags. One complete end conductor of the ribbon is left unconnected, this can just be left floating to provide a coupling loop for experimental purposes.

The 'active' part of the unit is next constructed, a weighty diecast metal box is ideal as it provides both screening and mechanical stability. The main components are mounted on a section of stripboard. Apart from ensuring that the lead to the gate of the f.e.t. is reasonably short, there is nothing critical about the construction.

The output of the device should be coupled to the receiver by means of a length of coaxial cable terminated with an appropriate coaxial plug. Don't forget that this low impedance connection will allow the loop to be situated some distance away from the RX - even in another room if this is electrically less noisy. Quite a good place for the 'Rainbow' is screwed to the ceiling of the shack, leaving the operating position clear, if you do inadvertently try to garrott yourself on it, the loop will simply flex itself out of the way. Makes a perch for the budgie as well.....but make sure he hasn't eaten any of the ferrite beads lying about on your bench, this could seriously upset the inductance of the loop!

Alignment

No alignment is required for the basic version, but you can try the effect of disconnecting either one, two or three turns of the loop to give enhanced coverage to marine/160m amateur band frequencies but at the expense of the l.f. end of the medium wave performance.

The advanced version (**Fig. 2.**) is aligned as follows. Attach your random/long wire, plug in the loop and tune the receiver to a weak station, around 550-600kHz. Tune the loop (with the R6) for maximum signal and then adjust the core of T2 for maximum signal. Now find a weak signal around 1500kHz, peak it with R5 again, then adjust C4 for maximum signal. Repeat these steps until tracking between the loop and T2 is optimum. Now remove the loop and with the RX and loop tuned to a weak 550-600kHz signal, peak up the signal with the core of T1. Don't forget that T1 is not in circuit when the loop is in use, being brought into use by the switched jack socket only when the loop is unplugged. The value of C1 should be chosen to suit the particular long/random wire in use, the smaller the value, the better, as this will have minimum damping effect on the receiving set-up.

Now it's ready to go, and you can enjoy the many benefits of the Rainbow Loop. ■

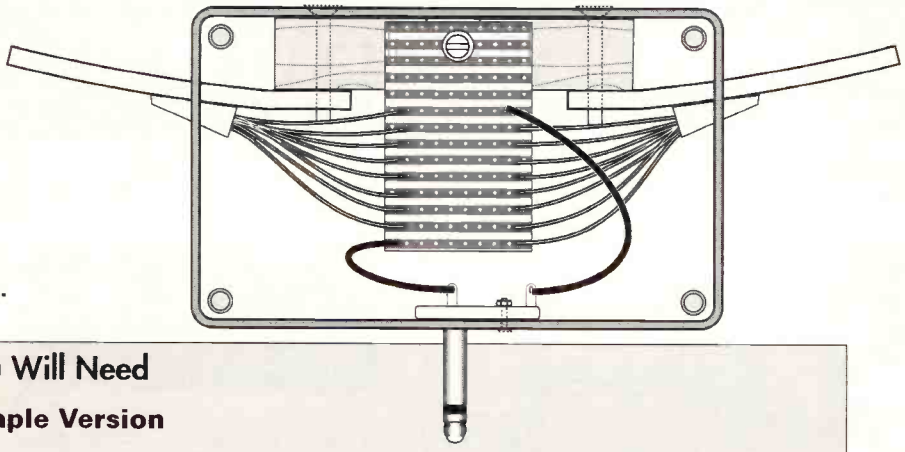

Fig. 2.

You Will Need

Simple Version

Resistors

Carbon Film 0.25W, 5%

100Ω	1	R3
100kΩ	1	R2
1MΩ	1	R1

Potentiometers 0.25in shaft

5kΩ lin.	1	R4
50kΩ lin.	1	R5

Capacitors

Ceramic film

0.01µF 50V	1	C1
0.1µF 50V	2	C2, C3

Electolytic

10µF 10V	1	C4

Semiconductors

Transistors

2N3819	1	Tr1

Diodes

KV1235	1	D1

Miscellaneous

4-pole 2-way switch, S1; 0.25in mono jack socket, SK1; 4mm socket, SK2; Coaxial socket, SK3; 0.25in angled mono jack plug, PL1; PP3 Battery, B1; Battery connector - PP3 type; Veroboard; metal box; 10-way Ribbon cable, 1.5m, for L1; pvc edging strip.

Advanced Version

Resistors

Carbon Film 0.25W, 5%

100kΩ	1	R1, R2, R3
1MΩ	1	R1
100Ω	1	R7
2.2kΩ	1	R8

Potentiometers 0.25in shaft

5kΩ lin.	1	R4
50kΩ lin.	1	R6

Capacitors

Ceramic film

20pF 50V	1	C1
10pF 50V	1	C3
0.01µF 50V	1	C2, C5, C6, C7
0.1µF 50V	2	C8

Variable

50pF air spaced trimmer	1	C4

Electolytic

10µF 10V	1	C9

Semiconductors

Transistors

2N3819	1	Tr1

Diodes

KV1235	1	D1,D2
BZY88C91	1	D3
LED 5mm	1	D4

Inductors

YMRS80046N (Toko)	2	T1, T2

Miscellaneous

4-pole 2-way switch, S1; 0.25in switched stereo jack socket, SK1; 4mm socket, SK2; Coaxial socket, SK3; 0.25in angled stereo jack plug, PL1; Nicad battery (see text), B1; Battery connector; Veroboard; plastics box; metal box; 10-way Ribbon cable, 1.5m, for L1; p.v.c. edging strip.

A Low-noise Vertical Antenna

Tim Wright has been working on the design of a low-noise vertical antenna for general receiving purposes. He has been using one of his designs at his noisy QTH at Pagham with very good results. Dick Ganderton has also been trying one.

The antenna is manufactured by **Communications Aerials Ltd., Unit 1A, Woodland Industrial Estate, Eden Vale Road, Westbury, Wiltshire BA13 3QS. Tel: (01373) 822835.** It is understood that retail sales will be handled by **Garex Electronics, Unit 8 Sandpiper Court, Harrington Lane, Exeter EX4 8NS. Tel: (01392) 466899.**

Large antennas are often used to produce a narrow beam transmission, or to drag in a minute signal from a distant source. The general purpose receiving antenna tends to be overlooked, even though there is a great deal that can be done to optimise medium and high frequency reception.

The strongest possible signal into the receiver does not always yield the best results. Even when the wanted signal is weak, too large an antenna will bring in strong adjacent channel signals so powerfully that they may cause blocking or intermodulation problems. A good receiver gives its best performance when the unwanted background noise below the signal is slightly greater than the unwanted noise generated in the receiver.

Use of too large an antenna will mean greater levels of signal and unwanted noise with the attendent risk of overloading the receiver.

Use of too small an antenna means very weak signals will be hidden by the receiver's internal noise.

The sky is a source of noise that we cannot eliminate without also losing the desired signal. The new design of antenna is sized so as to receive unavoidable sky noise at a level a little above the receiver's noise.

The size of a resonant antenna varies inversely with frequency, while its capture area varies directly with its size. The amount of noise received depends directly on the capture area. A larger antenna receives more sky noise, so we would like to keep the antenna at its ideal size, but use it to receive all frequencies. At lower frequencies the antenna is too small to be resonant, so we have included broad band matching to maintain a reasonable impedance match at the receiver over the frequency range.

The matching circuitry gives some additional advantages.

1. The feeder between the antenna and receiver will have low losses. This enables the antenna to be sited well away from sources of man-made noise such as computers, fluorescent lights, TV sets, etc. The receiver can be sited for the operator's convenience, even if longer feeds are required.

2. The antenna signal path is isolated from the receiver power source. This eliminates earth loops and noise pick-up, prevents galvanic action in marine environments and improves safety in land-based systems - no problems with earth leakage trip circuitry. Modern wiring practice using PME makes such isolation desirable as a fault current in the building can flow to ground via the antenna and create a fire hazard.

3. No active matching components are used, so there is no need for power to the antenna and cross modulation and overload problems are avoided. The system is unlikely to be damaged by intense r.f. fields and static discharges.

An antenna that works superbly at first, but deteriorates with time is highly undesirable. This one is made to the highest marine specifications and has been extensively tested for over two years in land use and for six months at sea, with no electrical or mechanical problems. ■

Tim Wright suggested that I might like to try out the new design of low-noise vertical antenna after he had demonstrated how it dramatically reduced the noise level into his measuring receiver at his Pagham QTH.

I returned home with a 3m long marine grade whip antenna fitted with 10m of Twinax feeder cable and a prototype version of the special balun needed to convert from the Twinax feeder to a conventional 75Ω coaxial feeder. The only other antenna available at short notice at my QTH was a Lowe Electronics Long Wire Magnetic Balun, which has a low-noise performance anyway.

The new whip was mounted at the top of my Tennamast so that it was at a height of around 5m. A suitable earth spike was made from a length of copper tube and knocked into the ground as near to the base of the mast as possible. The earth connection from the balun was connected to this spike and the Twinax and 75Ω coaxial feeder plugged into to the balun.

Unlike Tim, I do not have a measuring receiver, so all I could do was compare the results from the two different antennas by using a changeover switch. I used my trusty Eddystone 940 as well as a Lowe HF-150 Stack and found that the noise level on the new vertical was at least two 'S' points lower than the Magnetic Balun Long Wire.

The whip is a phosphor bronze rod 3m long with an epoxy encapsulated matching unit all designed to withstand exposure to a marine environment.The base is made from marine grade cast aluminium and either 10 or 20m of Twinax feeder cable is factory fitted.

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TR2400	H/Held	£349.00

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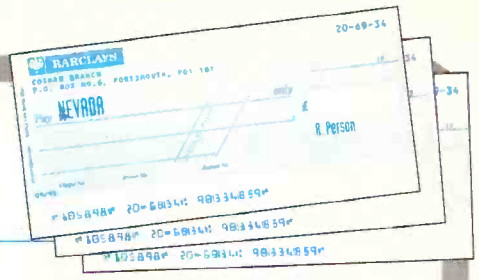

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A Modified Joymatch ATU

The Partridge VFA (Variable Frequency Antenna) together with the Joymatch antenna tuning unit from the same stable has been a useful system for many years. C.M. Lindars obtained his second-hand about 25 years ago and offers some useful modifications to improve the usefulness of the combination.

My Partridge VFA was the De Luxe model consisting of two copper pipes with a loading coil approximately in the centre. Unfortunately, it had been mistreated at some time, fracturing it. It needed to be dismantled and the wooden portion repaired with a strong wood-working adhesive. During this operation, opportunity was taken to inspect the coil and general construction.

In use, it seems to be preferable to mount the VFA vertically, as high up as possible, although it works in almost any position. For best results, the down lead needs to be at least 2.5m long and an a.t.u. is essential.

Several different models of the Joymatch a.t.u. were available. Mine is a simple 'L' match consisting of a tapped coil and a variable capacitor of 365pF. In use, tuning is sharp on most bands and there is no doubt that it raises signals at least three 'S' points. The coverage of the original a.t.u. was 1.2 to 32MHz.

My particular version of the Joymatch, known as a "Triple Purpose 'L' Match", started life as a kit, including full instructions to enable a neat job to be made. The original owner who had assembled it was, unfortunately, over generous with the solder and had managed to short consecutive turns of the coil together in several places.

To cure this problem, the coil was removed from the case and the tapping points gently lifted with a small hook. This has the effect of tightening the turns of the coil and raising the tapping points clear of the other turns. After re-tinning, the various connections were remade and all was well again.

Better Peak

Recently, whilst using the a.t.u. on a 12m long wire and downlead, there seemed to be a tendency for the variable capacitor to always need to be at minimum capacity. It was then discovered that if the capacitor was transferred to the RX end of the coil a better peak could be obtained.

This gave me the idea of installing a simple toggle switch at the back of the case so that the capacitor could be tried in either position 'at the flick of the switch'. I remembered that some years ago, July 1977 to be precise, a Dr. Squance had described a very comprehensive a.t.u. in *Short Wave Magazine*.

Realising that there was insufficient space for all the options included in his design, the decision was made to mount a 3-pole, 4-way rotary switch at the back of the case of

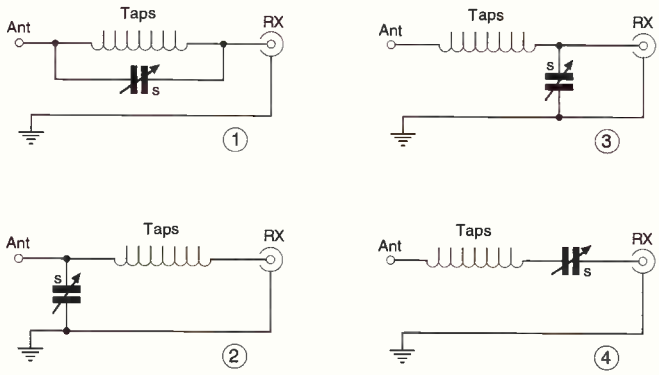

Fig. 1: The four different types of a.t.u. available by moving the tuning capacitor.

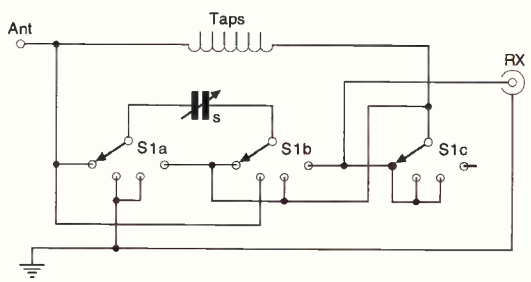

Fig. 2: Circuit diagram of the modifications needed to switch the four types of a.t.u. Note that the switch for the taps has not been shown.

the a.t.u. and wire it so that all four options shown in **Fig. 1** would be available at the twist of a knob. A suitable switch would be Maplin

1. Capacitor C in parallel with the coil.
2. Capacitor C from coil to Earth at the antenna end.
3. Capacitor C from coil to Earth at the RX end.
4. Capacitor C in series with the coil.

This greatly increases the usefulness of the a.t.u. and allows it to be used with a variety of antennas, other than the Partridge VFA.

Circuit

The circuit diagram of the modified a.t.u. is shown in **Fig. 2** and the wiring detail in **Fig. 3**. A 10mm dia. hole needs

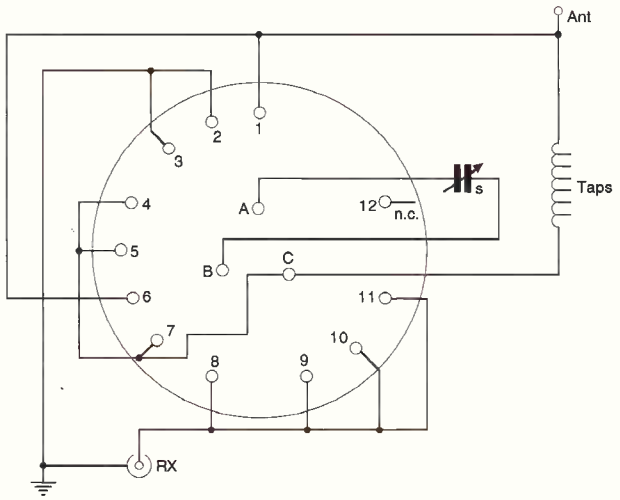

Fig. 3: The wiring of the rotary switch.

to be made in the back of the case to mount the switch, care being taken not to damage either the coil or the original 12-way tapping switch and its wiring. Wire the new switch with all connecting leads before mounting it on the back panel. Then 'dress' the new wires to give short, neat connections.

In use it is helpful to keep a record of the optimum position of the three controls for the various bands and a simple self-adhesive paper label on the back panel assists here. The modified a.t.u. is very satisfactory in use and the absence of a second capacitor, which would allow a Π configuration to be set up, is not noticeable. With the simple addition described, a good piece of gear becomes even better.

■

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second post

Our bumper mailbag this month requires a third page of readers' letters!

To: dick@pwpub.demon.co.uk

Subject: Medium Wave Coverage in August *SWM*

I was very pleased to see such extensive coverage given to m.w. listening (Medium Wave DXing and Kiwa Loop review) and related topics. This is most timely as we are approaching the autumn and the start of the traditional m.w. DXing season. This year, in particular, is significant since we are virtually at the minimum of the 11 year sunspot cycle and this is usually a time of enhanced m.w. propagation.

There are couple of points I'd like to raise in Tom Crosbie's article that need some clarification, lest they raise the expectations of newcomers to m.w. listening. I refer to **Tables 1 & 2** on pages 17 and 20 which clearly give the newcomer/beginner the impression that they will hear the stations listed.

I won't criticise the contents of the lists point by point, but both lists include stations that have been off the air for at least eight months (hint: Austria 1476kHz and CKLM 1570kHz). Both lists also include a significant number of stations that have never been heard in UK and others that are considered by DXers to be top rate catches. Most new listeners attempting to hear these stations will almost certainly be disappointed and may well give up trying. Sadly, **Table 2** omits ALL of the Top Ten North American stations heard in the UK in the last two years, which I have listed below:

590	VOCM St Johns NF	1400	CBG Gander NF
710	CKVO Clarenville NF	1410	WPOP Hartford CT
930	CJYQ St Johns NF	1410	CIGO Port Hawksebury NS
1010	WINS New York NY	1500	WTOP Washington DC
1130	WBBR New York NY	1510	WNRB Boston MA

The above list is based on reports by listeners published regularly in *Medium Wave News* and other UK magazines, but I have omitted stations that recently have become very much harder to hear since Talk Radio UK appeared on air.

Just for interest I have compiled my own version of 'Your First 60 Countries' which I include below. But it is worth stressing that 60 countries is not a beginner's target from the UK. In fact, hearing over 40 countries from the UK is a good achievement. For this reason I've confined the list to 30 countries that most listeners, irrespective of their location in the UK, should be able to hear if they choose their listening time with care. Also note that every frequency is used by more than one country, so you may have to tune in at different times/days to hear a particular country, as described by Tom in his article.

Country	Best Frequencies (kHz)	Country	Best Frequencies (kHz)	Country	Best Frequencies (kHz)
Albania	1395	Italy	846, 900	Sweden	1179
Algeria	891, 981	L'bourg	1440	Switzerland	765
Belgium	927, 1512 etc	Monaco	1467	Tunisia	1566, 630
Canada	930, 590	Morocco	1044, 612	USA	1510, 1010
Croatia	1134, 1125	N'lands	1008, 747	Vatican	1530, 1611
Czech Rep	639, 1287	Norway	1314	Venezuela	1470, 1500
Denmark	1062	Poland	1080		
Finland	963, 558	Russia	1386, 1494		
France 1	350, 1377, 1071	S. Arabia	1521, 1440		
Germany	594, 1422 + many	Serbia	684		
Greece	1386	Slovakia	1098		
Ireland	567, 612	Spain	585, 738 + many		

I wholeheartedly agree with Tom Crosbie's comment "Joining the Medium Wave Circle is also a good idea.."! But, since Tom omits details of how to contact the Circle, could I use your letters column to fill in the facts? The Circle can be contacted by writing to the Secretary at **137A Hampton Road, Southport Lancs PR8 5DY, England**, or you can E-mail the Circle at **steve.whitt@zoo.bt.co.uk** for more information.

I do hope you can find some space in your mailbag to include at least the above two lists if not all of my comments.

Keep up the good work

Steve Whitt

Editor *Medium Wave News*

Thank you for your comments on Tom's article. With regard to the listings of stations being out of date the stations were checked out when Tom first wrote the article - using all the current reference books. As I have pointed out in my Editorial this month, I would never state that any station could not be heard in the UK. It may be improbable, but impossible - no. Further, a lone listener may have heard a station that no one else has heard, but he just hasn't told the rest of the world.

*I am only too pleased to be able to let readers know how to contact the Medium Wave Circle - I hope that you get some new members as a result - **Ed**.*

Antenna Rigging

Essential reading for all mast or tower owners. Some sound advice from Terry Brown G0NSA.

Not so long ago, the only choice for mast guys was wire rope. Not only is this material inflexible and hard to handle, but it requires to be broken up into non-resonant sections to avoid problems on h.f. with the antenna tuning. With the advent of readily available Nylon ropes, the task of providing guys has become much easier.

But to be effective, the guys need to be attached correctly. For instance, Nylon rope is smooth and very few knots will hold for long without slipping.

Knots will also reduce the strength of the rope leading to premature failure of the system. What is needed is to fasten the guys without knots in such a way that your mast will stay in the air.

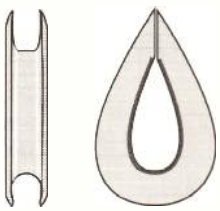
Master The Art

I have tried to master the art of rope splicing, but always end up with a joint so untidy that I would be ashamed to put it aloft! Now I use whipping twine to form all my joints and find it a much easier way to get the job done.

Where the rope is attached to the mast or anchor points, it is essential that the correct hardware is used to protect the rope from wear. 'D' shackles and thimbles of various sizes are obtainable from hardware stores or ships chandlers to suit the size of rope you are using.

At each end of a guy line the rope is passed around the channel in a thimble and the cut end of the rope is laid against the guy rope for several inches, whipping twine is then used to finish off the job. Having formed what is known as a hard eye, the guy can be attached at each end by using a 'D' shackle.

By using the thimble, the rope is protected from wear and strain is avoided by spreading the load through a gentler turn. All ropes will stretch with time and to save having to undo all your hard work to take up the slack, it is a good idea to insert rigging screws when the guys are being assembled.

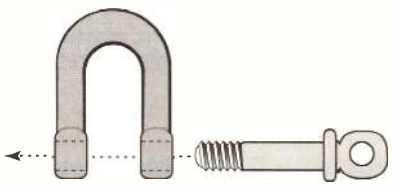


Hard eye.

A rigging screw consists of a solid body with a screw thread in each end arranged so that turning the body causes a threaded rod at each end to tighten or loosen the guy rope, depending on which way the body is turned.

Two Purposes

A point to bear in mind is that with wind vibration, both the 'D' shackle and rigging screw are liable to unscrew themselves. The hole in the bar of the 'D' shackle serves two purposes. One is to allow the screw to be tightened by means of a tapered bar (not pliers). The other use is to pass a wire through the hole and round the body to stop it undoing.



'D' shackle.

The rigging screw should be secured by means of a figure of eight piece of wire passed through the eye at each end. A coating of grease will help to keep the screw threads from seizing up.

All the hardware needed is available in galvanised or stainless steel at prices that are not too prohibitive. It must be remembered that you only get what you pay for and whilst more expensive the stainless steel will last a lot longer.

The use of the correct hardware will not only mean your guys will last longer but they will look better and more professional - besides which, the system will be easier to check and maintain.

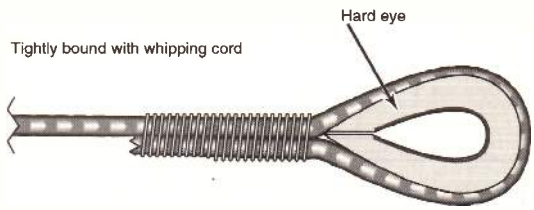
Now that the winter has ended and the warmer weather is upon us, let us not forget those days of ice and wind and the toll it has taken on the metalwork we amateurs put up in the air. From the modest support pole to the largest tower, our aim should be to keep it up in the air at all times.

A little time spent now will keep it in a safe condition and avoid costly accidents. The first consideration should always be your safety and the wellbeing of those around you, a few simple rules just to get us in the mood.

A) Wear good strong shoes with non slip soles.
B) Gloves are also advisable.
C) If your maintenance involves any kind of work above ground, fix the bottom of the ladder to a stout ground post to stop it moving, also tie off the top of the ladder.
D) The use of a harness could save you a nasty fall.
E) Never work on a tower in its wound up state.
F) If you drop a spanner, it could make you very unpopular if it hits anyone or goes through the conservatory roof. A piece of string from the harness to the spanner will avoid this and save you having to climb down to retrieve it.

Safe & Secure

Having made sure you and any helpers are as safe as possible, its time to stand back and take stock of what needs doing. A simple support pole should be checked to ensure that all fastenings are secure and not corroded, any joints should be tight and free from rust. Pulleys benefit from an application of grease and ropes should be checked for cuts or wear.



Fitting the hard eye.

A more robust type of support is the wind-up mast or tower, and although they vary in heights, the workings are basically similar. As they are wound up and down, an arrangement of cables and pulleys hoists the beast into the air, with the sections sliding inside each other.

Over a period of time the cable (usually steel strands) will stretch and may well suffer broken strands. The cable should be inspected and replaced at once if found to have any breaks. A repair is not possible and the cable has reached the end of its useful life.

The liberal application of grease to the cables and pulleys will inhibit rust and keep things moving smoothly.

The winch is the key to movement for any tower and deserves to be treated with respect. If greased and used properly it will give years of service.

A brake of some sort will operate to stop the winch slipping and allowing the whole lot to come crashing down and usually consists of a spring loaded cam that engages a toothed wheel. Only a fool will rely on this arrangement alone to hold things aloft. If a locking mechanism is not provided to stop the winch from moving, then make one or change the winch.

On some winches the brake only works on the upward movement of the tower. Coming down, you are on your own. Letting go of the handle when lowering the tower is not a good idea nor is trying to stop the handle as it spins out of control when you have let it go, serious injury will be caused, as will damage to whatever is on top of the tower.

Top Condition

Nearly all supports will require some sort of guying to stop excessive movement at the top of the structure, how many will depend on how high or heavy your set-up is. As you rely on these guys to hold things steady during the worst our climate throws at us, it makes sense to ensure that they are in top condition.

Pay close attention to all cables and fixings and use the best quality you can afford. Check that however the guys are anchored, it is in good condition. Short cuts here will put the whole structure at risk.

If you have a Boy Scout handy all well and good, if not, buy a good book on how to splice and join ropes.

If a rotator is in use then now is the time for a look to see if the rain has got into the works and to replace grease. Nuts and bolts will also be easier to undo if you remembered to grease them before you did them up, if not, do it now.

The final link in the chain is the stub mast between the mast itself and the antenna. Most of the flexing in the system is done by the stub and it must be in good condition and strong enough to do the job. One good idea I saw recently is to push fit a wooden dowel inside the metal stub.

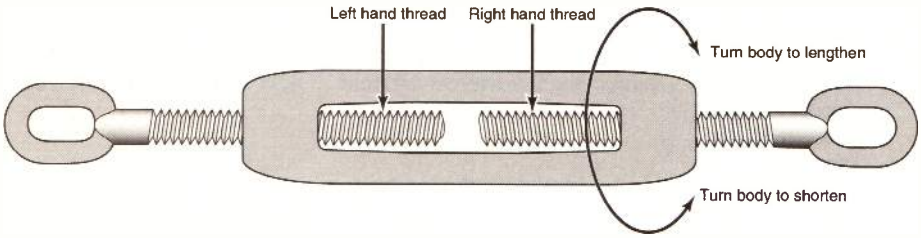
I also ran a Nylon rope up the inside of my stub with the dowel, as moisture caused the dowel to swell and fill the pole, the rope was securely trapped. Now, should the pole fail, the rope will stop the antenna falling too far and doing too much damage.

Final Check

When the antenna itself was assembled and prior to its erection it should have been protected from the elements by the application of grease to all fixings and joints. While you are checking that all is well with the antenna, it will only take a moment to wipe off the old and replace with new grease.

A final check that all cables are sound with no leaks and the whole system should be ready to spend another year on the air. On paper it all sounds like hard work but should only take a few hours - a small price to pay when you think of what would be involved should the whole lot come crashing down.

Should the worst happen, and despite your best efforts it all comes down, then at least when the insurance assessor arrives he will see that you took every care of your equipment. It is all insured, of course? ■



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Morse class, Tuesdays, 7 - 9pm, **starts late September.** Contact **Ken Horne GM3YBQ** on **(01592) 265789 (evenings)** or **T. McGill** at **Balwearie High School** on **(01592) 640335 (mid September)**.

Newbury Technical College.

RAE course, Wednesdays, 7 - 9pm, **starts September 13.** Tutor - G3NDS. Contact **Newbury College** on **(01635) 35353** or **Ray Oliver G3NDS** on **(01672) 870892**.
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Swindon Technical College.

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Wombourne Adult Education Centre, Youth & Community Centre, Church Road, Wombourne, Wolverhampton WV5 9EZ.

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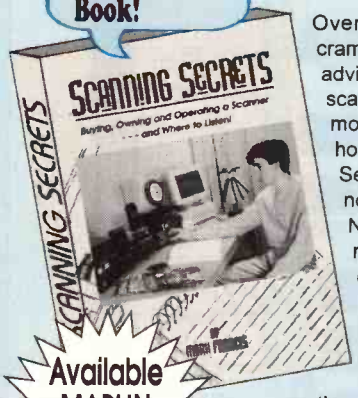

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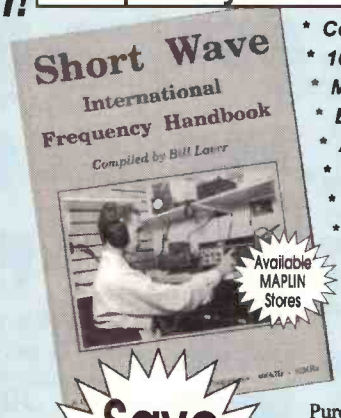

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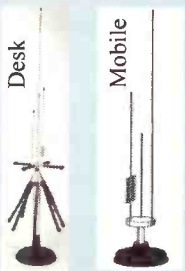

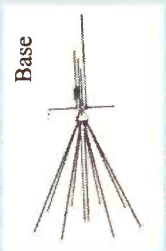

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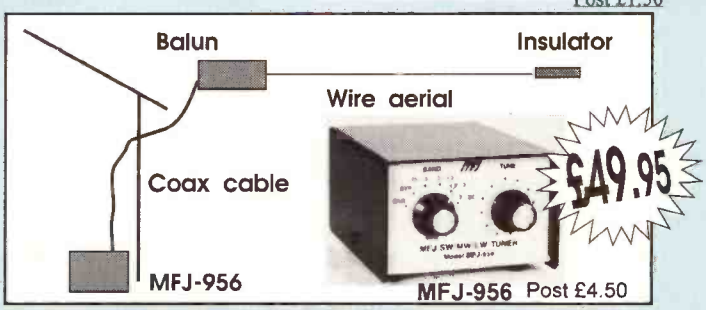

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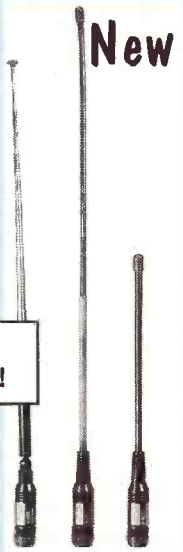

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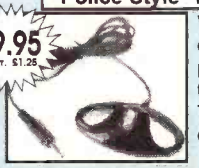

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ATUs, Pre-selectors, Bump In

OK, you have a receiver and you have an antenna; join one to the other and you can hear signals, so why do you need anything else between them? The listeners who may have experience of transmitting equipment will say that matching between a transmitter and an antenna ensures maximum transfer of power, and the same ought to be true in matching an antenna to a receiver, but the two arguments are not complementary in practice since the transmitter case involves matching at a few frequencies only and between relatively constant impedances.

For a receiver which is covering the range from 100kHz to 30MHz, it's unlikely that its input impedance is anything like constant over the range, and for an antenna operating over the same frequency range, its impedance can change dramatically as can its reactive components. It would take a very complex tuning system to match the average short wave receiver to the average antenna over the full l.f./m.f./h.f. range, and I haven't seen such a system on the market yet - at least, not outside full blown professional installations which cost as much as the family car.....

Passive Pre-selector

And yet I hear the cries from afar "I've got an a.t.u. with my receiver and I can peak signals with it". Probably true, O Master of the Universe, but the peak you hear is probably nothing to do with impedance matching and more to do with the additional front-end selectivity given by inserting a tuned circuit between the antenna and the receiver, meaning that the a.t.u. is acting as a passive pre-selector. Although it is true that at some frequencies the wildly swinging impedance of the antenna will approach values which the a.t.u. can accommodate, for most of the time the so-called 'matching' does not and cannot exist.

However, before I get sent the Black Spot by makers of antenna tuning units, let me say that any additional front-end selectivity is a bonus, and an a.t.u. performs a useful function in this respect.

Many a.t.u.s on sale utilise the Π network which has an input (*antenna*) tuning capacitor, an output (*receiver*) tuning capacitor, and a series coil which usually has coil taps selected by a rotary switch. To give some idea of the range of component values required for a Π network, let me quote from published data for a network operating at about 4MHz at an antenna impedance of 1.5kΩ and a receiver input at a nominal 50Ω. The antenna capacitor has to be around 360pF, the receiver capacitor around 1.8nF, and the coil around 6.5μH. If the antenna impedance happens to be nearer 5kΩ, the network values change quite dramatically to 120pF, 760pF and 18μH. For lower antenna impedances the capacitor values would be enormous and the coil remarkably small, and none of the Π network a.t.u.s with which I am familiar have anything like the range of component values to accommodate the impedance changes in a short wave receiving setup.

Dr. Ulrich Rohde has published figures for the impedance of a horizontal wire antenna at h.f. which show that (*in the case of his example*) at 5MHz the antenna exhibits an impedance of some 2kΩ resistive and 3 to 4kΩ inductive reactance, whilst at 6MHz the impedance has swung to 100Ω resistive with 3kΩ capacitive reactance. It takes a mighty matching network to cope with that!

Low-pass Filter

The final thing to remember is that the Π network acts as a low-pass filter; in other words it passes all frequencies lower than the one in use. In transmitting this is an advantage because the network helps reduction of higher harmonic outputs from the transmitter, but in a receiver there is no advantage at all because what you really want is something which passes only the frequency of interest and reduces all others, whether above or below that frequency. This means that if you are using a simple a.t.u. and trying to listen to a weak station on the international distress and safety frequency on 8.291MHz, your receiver will still be suffering from the welter of strong broadcast stations about 1MHz lower which may well be producing unwanted interference to the stations on 8.291MHz.

However, there are certainly some receiver tuners on the market which do not use the Π configuration, and these would be more effective (*See the review of the Howes CTU8 in December 1994 SWM*). Unfortunately, it is sometimes difficult to find out from dealers' catalogues exactly what configuration their tuners employ, so be sure to ask some questions before buying. Manufacturers MFJ offer a wide range of commercially made receiver tuners, and I feel sure that they must have something suitable.

Herd of Buffalo

I said earlier that any selectivity ahead of a receiver is worth having: let's consider why. Imagine that a solitary Apache Indian is standing in the middle of a prairie and coming towards him at full tilt is a herd of buffalo. His job is to isolate the only white buffalo from the herd and take it back to the camp. If he simply stands there and tries to catch this sole buffalo, he is going to be trampled to death! If you now consider that poor chap as your receiver, and the herd of

And Things That Go The Night

buffalo as the entire h.f. spectrum of signals galloping down the antenna, you may gather what your receiver has to cope with - or get trampled to death.

Now imagine that the tribal medicine man has conjured up a very strong fence all the way across the prairie and in that fence is a gate which is wide enough to pass just one buffalo. The buffalo catcher has also been given magic powers to move the gate to any position along the fence so as to catch the white buffalo. Once through the gate the catcher can deal with the solitary buffalo quite easily whilst the rest of the herd is stopped by the fence. That fence is a selective filter, and the moving gate the tuning control. If you have such a filter between your antenna and receiver, you can select the signal you want to hear and substantially reject the unwanted spectrum. That's front-end selectivity, and is probably the main benefit of an a.t.u., not its ability to match impedances.

Pre-selectors

Unlike an a.t.u., a pre-selector makes no attempt to match impedances because its function is to pre-select; that is to select wanted signals from a spectrum and reject all the others. Some pre-selectors do it well, others not so well, but all selectivity is welcome, particularly with today's generation of receivers which tend to have broad band input circuitry. Between the antenna socket and the first mixer of a typical modern receiver lies a bank of band pass filters, often arranged to cover frequency octaves, i.e. 1 to 2MHz, 2 to 4MHz, 4 to 8MHz, 8 to 16MHz, and 16 to 32MHz. The frequency range below 1MHz is covered by a low pass filter which could have a response right down to 100 or 30kHz depending on the particular receiver.

Let's assume that you are trying to listen to weak US Airforce s.s.b. traffic on 8.050MHz but all you can hear is strong broadcast garbage. After a while you realise that out of the garbage you can hear German so you think "I'll bet it's Deutsche Welle", and after much head scratching you realise that what you are hearing is a 3rd order intermodulation product caused by Deutsche Welle on 7.140MHz and Monaco on 6.230MHz both running powers of 500kW (*That's half a million watts, Fred*). There's nothing mysterious about 3rd order products; they are calculated as either (2f1 - f2) or (2f2 - f1), and in this case if you use ((2 x 7140) - 6230) you find, as if by magic, that the 3rd order product is bang on 8.050MHz.

John Wilson G3PCY, offers the fruits of decades of short wave listening.

Because your receiver's bandpass input filter covers 4 to 8MHz, there is no rejection of either 7.140 or 6.230MHz, allowing both those 500kW signals to get into the receiver at the same time as your poor struggling wanted signal on 8.050MHz. Enter the pre-selector, riding over the hill like the 7th Cavalry to rescue you. A half-decent pre-selector peaked on 8.050MHz will reject or at least severely attenuate both of the unwanted signals, allowing you to listen in peace. Note at this point that a Π network type a.t.u. will certainly **not** help because it has a low pass characteristic and would therefore pass both unwanted signals without attenuation....get the picture? Remember though that some a.t.u.s do not use the Π network and they would almost certainly help in this situation.

Pre-selectors With Built-in Pre-amplifiers

Oh Boy! Having taken all that care to minimise high level interfering signals, the last thing you need is a 20dB amplifier in line to restore them to their original level and hammer the living daylights out of your receiver. The only gain you might need in a very selective pre-selector is about 6dB to make up for the losses within the selective networks. In my experience, most short wave receivers have more than enough gain built in already, and you will turn a silk purse into a sow's ear by stuffing 20dB of further gain ahead of it. If you simply cannot live without gain, (*as they said to the Chairman of British Gas*) make sure that it is at least controllable so that you can turn down the wick for most of the time. If you really suffer from high intermodulation levels, a 10dB attenuator will do more for you than extra gain.

It's a strange fact that with the advent of synthesised general coverage receivers for the amateur listener (*the professional has different requirements such as fast frequency hopping*), many problems which had long been of no consequence with older receivers utilising mechanical tuning, re-appeared with a vengeance. If one looks inside a classic general coverage receiver, the most obvious component is a multi-section variable capacitor driven from the main tuning control. One section of this capacitor will tune the receiver local oscillator, but all the other sections will be tracking the tuned circuits at the front end of the receiver to provide a 'magic gateway' of selectivity to select the 'white buffalo' and reject the herd. Receivers of this type did not need pre-selectors; the preselection was inherent in the design.

Even in receivers of the 'Collins' design using fixed down-conversion to a tuneable i.f., the r.f. amplifier and first mixer still had track tuned circuits to provide that all important front end selectivity. In receivers such as the Collins 51J series, the front-end tracking was done mechanically by an elegant gearbox and cam drive system, whilst in other receivers such as the Eddystone EA-12 the front end tuning control was brought to the front panel labelled 'RF Tuning' and you simply turned this control to peak the incoming signal; pre-selection built-in as a normal feature.

To summarise then; for the average listener with a length of wire for an antenna, it is unlikely that any 'Antenna Tuner' will be capable of tuning the wire to resonance except on a few frequencies, but the a.t.u. will, nevertheless, give some front-end selectivity, even though it may not help to reduce intermodulation products from interfering signals lower in frequency than the one being received. A properly designed pre-selector will provide real assistance for most receivers built since the late 1970s, and will definitely improve some recent short wave receivers with no built-in r.f. selectivity at all.....you will have to discover for yourselves which receiver(s) I mean.

▷ 33

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REACTION TUNE ensures that you hear it FIRST!

NEW OPTOELECTRONICS Scout & AOR AR2700 / AR8000 receiver

If portability is of prime concern and "hand carry" is the only possibility then the **Scout** may help you locate those elusive transmissions when visiting airshows, motorsport events etc.

The **Scout** is similar to a conventional frequency counter in that it measures the frequency of any transmission from 10MHz to 1.4GHz which is 10dB to 15dB higher than the ambient RF background level. However, the **Scout** distinguishes itself from a traditional frequency counter by being able to differentiate between random noise and coherent RF transmissions. This exclusive feature developed by OPTOELECTRONICS is called **DIGITAL FILTER** & **AUDIO CAPTURE**. Its this feature which enables the **Scout** to record the frequency of transmissions automatically as an embedded microprocessor evaluates each measurement to determine when and which RF frequency is dominant.

Of particular interest to operators of the AR2700 & AR8000 is the ability to connect the **Scout** directly to the receiver (small modification required) so that active frequencies are automatically fed to the AOR receiver which immediately jumps to the active frequency reported by the **Scout**, this feature is called **REACTION TUNE**. Previously the **Scout** would only connect with the ICOM R7000, R7100, R9000 and Pro-2005/6 ALL OF WHICH ARE BASE STATION UNITS. OPTOELECTRONICS have acknowledged AOR's innovation of computer control in hand held receivers (CURRENTLY ONLY OFFERED BY AOR) and have added support to the **Scout** making it possible to take the system portable so the full potential may be exploited. Another strong plus for the AOR is the AUTOMODE BANDPLAN DATA programmed into the AOR receivers, this ensures that when an active frequency is reported by the **Scout**, the AOR receiver will automatically change to the correct mode - again, not available on other brands.

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

Due to the high popularity of the new Scout, the price has reduced to £399 (Modification to AR2700 / AR8000 £25 plus carriage) Special package of AR8000 + Scout £820

** FREE UK carriage on all main items **

Sorry, no space for "tip of the month" this issue. Remember we carry other models in new stock too by AOR, Yupiteru, Icom, Lowe, Drake, Opto Scout etc. Usually there is a selection of good clean used equipment available too. Please call or send a S.A.E. for full details and prices... "packages" are also available from time to time. We offer free UK carriage on most main items.

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AR3000A PLUS receiver - enhanced version of the AR3000A with WEFAX, narrow AM filter, SDU "ready" etc. **£1039**

AR3030 receiver - all mode short wave receiver. **£665**

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** New aerial booklet available, please phone or send a SAE for details and prices.*

***ICOM** ICR1 £375, ICR7100DC £1375, **YUPITERU** MVT7100 £349, VT225 £239, VT125 £185, **LOWE** HF150 £399, HF225 £479, HF225E £675, PR150 £229, **DRAKE** SW8 £625, R8E £1149, **OPTOELECTRONICS** Scout £399 & more...*

CONTROL SOFTWARE for AOR receivers

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

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

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PACKAGE AOR/02 *The New Concept* **AR8000** UK receiver bundled with the **SC8000** leatherette soft case, **TW500** telescopic whip (in addition to the standard RA8000 helical aerial), **WA1500** wire aerial with BNC plug... FREE CARRIAGE £455 (saving over £32)

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Baluns

'Things that go bump in the night' are usually things dangling from your wire antenna hitting the rain gutter or the bedroom window, and the most popular of the 'bumpers' in recent times has been the so-called long wire balun. Firstly, they are not baluns. 'Balun' is a contraction of 'Balance to Unbalance', and since these devices are intended to go between an unbalanced coaxial cable and an equally unbalanced long wire antenna, they should be called 'Ununs'. Secondly, although hailed as new, the design goes back to the days of steam radio in the late 1920s when receivers were insensitive, long wire antennas were used, and electrical interference was a real problem. Today's 'Ununs' are still not as elegantly conceived as those original 1920/30 designs, (*nor indeed as elegantly named*) but there is no doubt that they transform the performance of a long wire/receiver combination.

Critical

I used the word 'transform' deliberately, because that is what these devices consist of; an r.f. transformer to convert the low impedance of a coaxial feeder to the much higher impedance found at the end of a wire antenna. Before you go dashing off to raid the junk box for a core and some wire, however, the design of these things is not straightforward because you have to get the right turns ratio to cater for most situations and the choice of core material is critical for good performance across the spectrum. You also have to find the right compromise between the number of turns needed for good l.f. characteristics, whilst at the same time ensuring that distributed capacitance is not going to ruin the h.f. end.

The long wire 'Unun' is the easiest way I know of making a long wire work, giving genuine signal level increases because of the better matching, whilst at the same time affording reduction of locally generated electrical interference. Prices currently range from a reasonable £19.95 from Barton Communications, to a startling £45 for imported units, which frankly seems rather high. I note that Waters and Stanton are currently offering a package deal of a Balun and an MFJ passive pre-selector for £67.50, thereby giving the best of all worlds for not much more than the cost of the imported Balun alone.

Some of you may have knowledge of the amateur radio scene, where antenna baluns are often used and widely advertised for sale. Unlike the listener's 'Unun', the amateur radio balun is correctly named because it is normally used at the centre of a **balanced** dipole antenna to give a correct match to low impedance **unbalanced** coaxial cable. Such a balun is virtually useless to the general short wave listener, because it is intended to work between matched impedances and simply do a balanced to unbalanced transformation, usually with an impedance ratio of 1:1, or sometimes 4:1. Used at the centre of a dipole intended for use across the whole h.f. range, where the antenna impedance will be swinging all over the place, this type of balun will just not work, and you are wasting money if you buy one. Don't do it unless you are only interested in listening to a single frequency, i.e. the resonant frequency of the dipole (*or three times the resonant frequency of the dipole*).

Active Antennas

If because of local circumstances you really cannot erect a length of wire for an antenna, then the active antenna may seem to be the only way of solving the problem. An antenna of this type is 'active' because it incorporates a wide band r.f. amplifier with sufficient gain to make up for the limited length of the actual antenna, which may be no more than a metre long whip or a short, very fat dipole.

There are good active antennas; there are bad active antennas, and I can only tell you of my own experiences with some of them. A professional would probably go straight to Rohde & Schwarz and take a look at the HE010. This covers 10kHz to 80MHz so would suit the short wave listener perfectly, if he could take out a small mortgage to buy it - this quality is never cheap. In the realms of the hobby market there are the antennas from Dressler which perform extremely well, or the DX-1 from RF Systems in Holland, but neither of these have been advertised for some time so the current prices are not known. I do recall that they are in the 'hundreds of pounds' category. Best value for money have always been the AD-270 and AD-370 from Datong which offer good performance at modest (*£60 to £80*) prices. Things to definitely avoid are those active antennas which are no more than a whip antenna with a high gain pre-amplifier at the base. They simply don't work, because the preamplifier generates the most dreadful series of intermodulation products from the entire h.f. and v.h.f. spectrum that it is possible to imagine, and all you get in your h.f. receiver is a meter-pinning noise level overlaid by mixtures of Radio 1 FM and the local Fire Brigade.

Good receiver designers sweat blood developing linear front-ends and bomb-proof mixers for receivers in order to get good intermodulation performance. Having achieved it, the unsuspecting user then puts up a cheap active antenna which has such a poor intermod performance that it totally negates all the designer's good work, and the receiver can do nothing about the shambolic mess of signals being generated at the top of the antenna mast inside the active antenna. For an active antenna to be any good at all it ought to have better intermodulation figures than the receiver which it feeds, and this is what costs the money in a good antenna. The simple whip with an f.e.t. buffer at the bottom will just not cope with the situation and will be worse than useless - and I do mean **worse** than useless.

Lightning Protection

The best protection against lightning damage is to live in a cave where there are no storms. But next to that you can unplug your antenna feeder from the equipment during a storm and connect it to a good earth well away from the radio.

There are devices on the market which consist of a spark gap inside a coaxial back-to-back connector, but if there is sufficient voltage on the antenna feeder to jump an air gap, it has probably already finished off your receiver. The situation is rather like that of a safety match; the only way to test it is to strike it, after which you throw it away. As a note of caution, an electrical storm many miles away can generate huge static voltages on a long wire antenna, so it pays to always disconnect the antennas when the radio is not in use.

Another device which is claimed to offer high voltage protection is the 'Transi-Trap', which contains a gas filled glass element with precise breakdown characteristics, or the 'Receiver Guard 2000' from Design Electronics Ohio, which uses high-speed diode switching. Both these are available from Universal Radio in the United States, who are happy to deal directly with you.

Unexpurgated Views

Those are my unexpurgated views on just a few of the accessory units available to the short wave listener, and I hope that they lead you to raise a quizzical eyebrow when you read some of the more fanciful claims made by various people. Of course you are free to disbelieve me as well, but I began in radio communications at the tender age of 12, was pirating with my home built equipment on Top Band at 14, and have been professionally involved ever since, including 30 years as a founder and director of what became the best known hobby radio company in the UK and Europe. Now retired (*sort of*), I am pleased to pass on my honest opinions of equipment, techniques, people and personalities in the business, and I hope you enjoy what I say, or at least pause to consider.....

Correspondence c/o *Short Wave Magazine* is welcomed, and I wish you as many happy years in the hobby as I have enjoyed myself.

■

Boost It!

If you are looking to improve the DX potential of your portable receiver, Andrew Howlett G1HBE may have the answer with his medium wave booster.

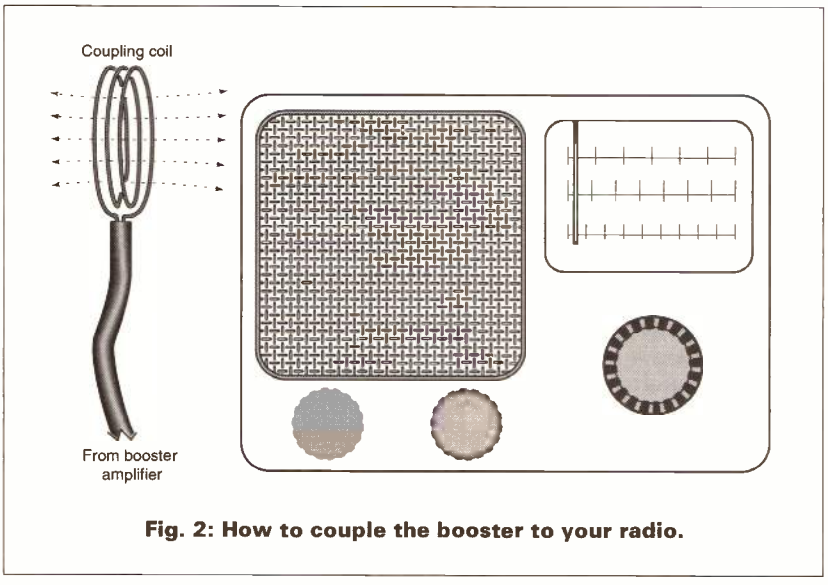

Fig. 2: How to couple the booster to your radio.

The short wave performance of modern mid-priced portables is surprisingly good, but where some of these sets fall down is on medium wave, making DX ing on this band difficult if not impossible. A loop aerial can make a dramatic difference, but because of their size they can be rather awkward to operate. For the last couple of years, I've been using the gadget described here to 'winkle out' those distant stations.

The Circuit

The circuit is shown in **Fig. 1**, and it could hardly be simpler, m.w. signals are picked up by L1 (on the ferrite rod) in the usual way, and tuned by C1. The use of a dual gate f.e.t. as the active element makes the circuit tolerant of strong local signals, and the second gate provides a convenient method of gain control. The amplified signal appears at the drain of Tr1 and exits via the d.c. blocking capacitor C4 to make its way via a length of screened cable to the coupling coil L3. This couples the amplified signal to your radio's ferrite aerial by transformer action; more on this later. The extra 'boost' is provided by components C3 and L2, which introduce positive feedback around the whole circuit, and as the feedback loop includes the main tuned circuit L1/C1, a '*Q*-multiplier' effect takes place, reducing the bandwidth and cutting down the strength of stations on each side of the tuned frequency whilst boosting the wanted signal.

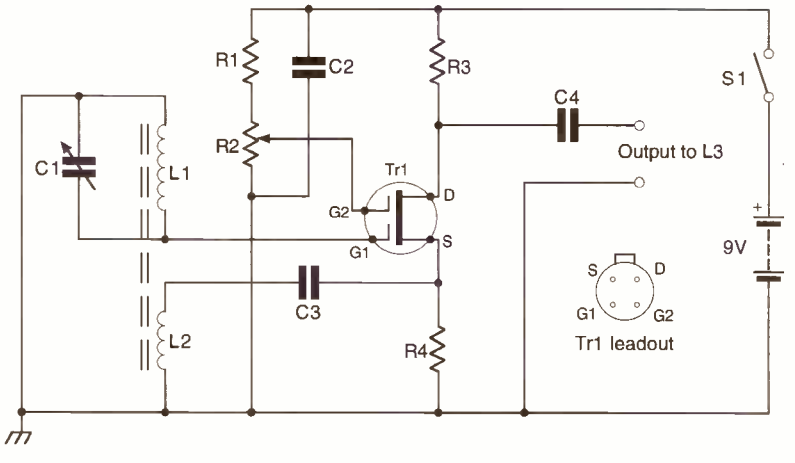

Fig. 1: Circuit diagram of the medium wave booster.

Construction

The bigger the antenna the better, and this is as true of ferrite rods as it is of any other type. I used a 200 x 12mm one from J. Birkett of Lincoln, and it came complete with a medium wave winding of about 40 turns on a sliding former. There was also a secondary winding of about 8 turns on the same former, but as this was not required it was removed, taking care not to damage the 40 turn winding, as I used it for the main tuned circuit. If the rod you have does not have a suitable coil, one can be wound quite easily from enamelled copper wire of about 30s.w.g. Wind the turns neatly with one wire diameter spacing between each turn, onto a former made from plastics tube or rolled paper. **Fig. 4** shows the arrangement including the extra feedback winding L2, which can be made using the same method. The electronics can be built-up very easily on a small piece of Veroboard, and the circuit is so simple that no layout is given; the only critical part of the circuit being the correct orientation of the f.e.t., Tr1. The connections for this are shown in **Fig. 1.** The tuning capacitor can be an air-spaced type taken from an old radio, or

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The **AR3000A** has established itself as a high performance base mobile receiver offering an extremely wide frequency coverage of 100 kHz - 2036 MHz and all mode receive. The introduction of the **AR3000A PLUS** provides even greater performance and capabilities.

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SEARCHLIGHT Windows PC software £99 + £3 P&P
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WA7000 base aerial HF/VHF/UHF £149 UK carriage free

The **SDU5000** is a spectrum display unit designed with the AR3000A in mind. Locating brief transmissions has never been so easy, by using the MAX facility any transmission within ± 5 MHz may be identified and signal strength measured in dBm. A small modification is required to the standard AR3000A to provide compatibility but the **AR3000A PLUS** is ready to go. The SDU5000 will also operate in conjunction with the ICOM receivers R7000, R7100 & R9000 (optional CT-17 required). **SDU5000 £799** UK carriage free

The **AR3030** is The New Classic of short wave receivers. Coverage is from 30 kHz - 30 MHz and all mode receive. The legendary 6 kHz mechanical AM filter is fitted as standard along with a 2.4 kHz Murata filter for SSB and an additional filter for NFM. Stability is excellent due to the standard fitting of a TCXO. **AR3030 £699** UK carriage free

Optional VHF converter (air or marine) £109 + £3 P&P
Optional Collins SSB, CW or 4.0kHz AM filters £89.29 each + £2 P&P
Concerto Windows PC software £49 + £3 P&P

The **AR8000 UK** receiver is without doubt the most full featured wide band hand held receiver on the market today. Frequency coverage is from 500 kHz - 1900 MHz without gaps with all mode reception... twin frequency display, alphanumeric text comments.
AR8000 £449 UK carriage free
SC8000 case £17.95 + £1.50 P&P
CU8232 interface £99 + £3 P&P
PC-MANAGER DOS software £49 + £3 P&P
* Windows software to be released soon...
TW500 telescopic whip £14.95 + £1.50 P&P
DA900 high performance whip 245mm in length £12.95 + £1.50 P&P
EP2000 earphone £1.90 + £1.50 P&P
ABF125 airband filter £28.50 + £1.50 P&P

All prices include VAT. Please request the full list of accessories and prices.

The **AR2700 UK** is the very latest high-tech hand held receiver from AOR. Frequency coverage is 500 kHz - 1300 MHz with receive modes of NFM, WFM & AM. An optional **VOICE RECORD** chip RU2700 permits an **instant 20s digital recording off air** which may be replayed over and over again. Computer control is also possible by using the optional IF-ADP and CU8232 adaptor and interface.

AR2700 £299 UK carriage free
SC2700 case £17.95 + £1.50 P&P
RU2700 record module £44.90 + £2 P&P

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A WEB site is "currently under construction" and the URL is:

http://www.demon.co.uk/aor

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RRP £349	RRP £279	RRP £299	RRP £349.95	RRP £419.95	RRP £299	RRP £449
All mode	500kHz–1300MHz	68–1300MHz	200kHz–1300MHz	All mode	500kHz–1300MHz	All mode
lkHz-999MHz	with a gap	Deposit	Deposit	lkHz-1650MHz	Deposit	500kHz–2036MHz
Deposit £37	Deposit £27	£29	£37.95	Deposit £41.95	£29	Deposit £44
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ICOM ICR7100 DC	NVT 8000	PRO 2035	PRO 2036
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RRP £1449	RRP £469	Deposit	Deposit
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RRP £1059.95	RRP £799	RRP £419	RRP £895	RRP £559
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Fig. 4: General arrangement of windings on the ferrite rod.

a miniature 'Polyvaricon' example (where do they get their names from?) available from Maplin or Cirkit, the only trouble with these is finding a knob to fit them! Keep the wires between L1 and C1 short, likewise the wires from C1 to the Veroboard. The design of the coupling coil L3 may have to be changed according to the layout of your radio, but generally the ferrite rod runs horizontally across the top of the set, end to end. The best way of introducing the amplified signals into the set is by way of a coil attached to one end of the radio, with its axis in line with that of the rod; **Fig. 2** shows how. Probably the most practical design of coil is that shown in **Fig. 3**. The coil consists of about ten turns of enamelled copper wire (30s.w.g. will do again) supported on a 40 x 40mm piece of Veroboard. The screened lead feeding this coil need not be 'proper' coaxial cable, microphone lead being perfectly good enough and more flexible. The coil can be glued to the board, or if you have the facilities it could be potted in epoxy resin to form a neat block. The only non-damaging way of attaching the coil assembly to your radio is Blu-tak, not very elegant but effective.

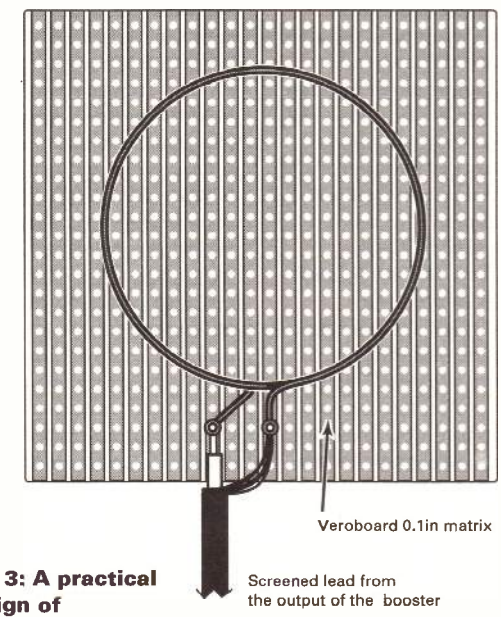

Fig. 3: A practical design of coupling coil.

Setting-Up

Complete the wiring of the electronics, but leave L2 **off** the ferrite rod for now. If the f.e.t. you used came with a static protection wire around the pins, remove it now. After checking for wiring errors and short circuits, attach L3 to the end of your radio as shown in **Fig 2.** Tune into a weak station in the middle of the medium wave-band and connect the battery and switch on. Set the gain control R2 to about two-thirds clockwise rotation and then tune the booster's tuning capacitor C1 until you hear the station peak up. Rotate the booster's ferrite rod for best possible reception, and then turn R2 up and down to check that the strength of the signal can be altered. If R2 does not seem to have the right effect, switch off and re-check your wiring; **Table 1** lists the voltages for a correctly functioning unit. Assuming all is well, carefully push L2 onto the end of the rod, listening to the signal all the time. If you're lucky and you've got the 'sense' of L2 right, there will be a point where the station becomes much stronger, and if you go beyond this point the booster will burst into oscillation. If none of this happens remove L2, turn it around and try again. Position L2 so that oscillation starts at about three-quarters rotation of R2, then tune to the bottom and top ends of the band to make sure the booster has enough gain to work properly at the extremes of it s tuning range. If the circuit will not oscillate at one end of the band, a small adjustment of L2 towards the main winding will put matters right. Once you are satisfied that your booster is working, seal L2 in position as it should require no further movement. The size of the ferrite rod will dictate the size of box into which the booster is built. Needless to say the box must be a plastics one, or no signals will penetrate it!

In Use

There is a knack to using the booster, but once mastered it can make a dramatic difference to weak signal reception. For best effect, the trick is to operate the booster in its 'not quite oscillating' mode. Careful tuning and control of R2 can narrow the bandwidth to such an extent that 'sideband cutting' is possible, much reducing interference from adjacent stations. When used like this the tuning becomes extremely sharp, so be patient. Finally, if the booster has little or no effect, although all the voltages are correct and it can be made to oscillate, the fault is almost certain to be poor coupling of L3 to your radio's antenna Try different positions for L3. Happy twiddling! ■

Table 1

Supply	9V
Tr1 drain	6V
Tr1 source	0.7V
Tr1 gate 1	0V
Tr1 gate 2	0-0.8V
Top R2	0.8V

You Will Need

Resistors

Carbon Film 0.25W, 5%

560Ω	1	R4
2.2kΩ	1	R3
100kΩ	1	R1

Potentiometers 0.25in shaft

10kΩ lin. with switch	1	R2

Capacitors

Ceramic film

0.1µF 50V	3	C2, C3, C3

Semiconductors

Transistors

40673	1	Tr1

Miscellaneous

Ferrite rod; PP3 Battery; Battery connector - PP3 type; Veroboard; 30s.w.g. enamelled wire for L1, L2 & L3; plastics box.

Lowe HF-250 Communications Receiver

Brand new and hot off the production line is the all new Lowe HF-250. Mike Richards is the first reviewer in the world to get his hands on this latest offering from this British receiver manufacturer.

The Lowe HF-250 is the latest in a fine breed of receivers from this famous manufacturer and is bound to cause quite a stir. Over recent years Lowe's have established themselves as a champion of British design and achieved wide success through a range of well built high performance products. The HF-250 represents a change in so much that it is now in direct price competition with many of the Japanese mainstream receivers. One of the most significant changes in this model is the styling. As can be seen from the photographs, the new model boasts very sleek curving lines that should increase its appeal considerably. These improved looks have been achieved without losing the individual style for which Lowe Electronics have become famous. In addition to the obvious aesthetic changes, the HF-250 boasts a wide range of enhanced features that make it a formidable contender in this very competitive market.

Layout

One of the striking features of the new design is the sleek black anodised brushed aluminium front panel and the clarity of the panel markings. The simple use of white on black is very effective both in terms of styling and practicality. When using the HF-250 for late night DXing the clear panel markings are a great boon. The main display illumination was also very well balanced for all lighting conditions. Besides the main display, the front panel was dominated by the main tuning knob. This knob had a wonderfully silky feel and was very free moving. The remaining operational functions were set using press buttons. These all had a very positive feel with a click to confirm operation. In addition to the main display, there was a bank of l.e.d.s used to show the mode and memory status. On the HF-250's top panel was an ingenious cut-away handle that I hope you can see from the photographs. Not only was this a good carrying handle but also provided the vent for the internal speaker. Moving on to the rear panel, there was a good selection of antenna connection options. Antennas catered for are 600Ω wire, 50Ω coaxial feeders and a whip for portable operation. Each option was selected using a three-way slide switch on the rear panel. The WA-250 whip option was particularly useful for portable operation as it includes a built-in antenna pre-amp to provide the correct high impedance match for a whip antenna. In addition to the versatile antenna connections, the HF-250 featured the now standard record and external speaker outputs. These both used 3.5mm jacks and the speaker jack included switching to disable the internal speaker. The output level from the record jack was around 350-400mV from a 5kΩ source impedance so should prove fine for most ancillary equipment such as data decoders and external d.s.p. filters. The speaker output boasted a healthy 1.6W into an 8Ω load but you could also use 4Ω speakers without any problems. Power was supplied via a standard coaxial socket also on the rear panel and the HF-250 needed a nominal 12V at 500mA. This is normally provided by the supplied 240V a.c. external power unit but could of course also be met using any other 12V d.c. source. If you wanted to use the HF-250 as part of a transmitting set-up there was a mute connection adjacent to the antenna sockets. This mute used the normal convention, i.e. ground to mute. The only remaining connection on the rear panel was 9-pin D-type connector for the remote control link to a computer. This serial port featured standard RS-232 levels, so can be connected directly to your computer's serial port without having to buy an expensive level converter.

Remote Control

One of the very new features of the HF-250 is the provision of an optional full function remote control unit. The controller looks just like any other TV/hi-fi remote control, but gives access to virtually all the HF-250's features and adds a couple more. The only irritating omission was the lack of a volume adjustment. The handset included the usual up and down buttons for frequency and mode adjustment and this was supplemented by a MHz button. This increased the frequency in 1MHz steps with a loop around at 30MHz. To help with the quick selection of a band, the MHz button included an auto repeat so you could hold the button depressed and just release when the required frequency is reached. The new features added with the remote control were mute and standby and most importantly, direct frequency entry. The mute did just that and suppressed the audio output with a toggle action. The direct frequency entry was a very welcome addition. Pressing the numbers on the keypad caused the display to build-up the required frequency. For frequencies above 3MHz the receiver switched to the entered frequency as soon as the final digit was entered. When entering lower frequencies you has to press the Enter button to let the receiver know you had finished entry. One point to note with this operation is that you could only enter frequencies in kHz despite the display indicating frequency to 100Hz. Power for the remote control unit was via two AAA cells mounted in the rear of the handset.

Smart Tuning

Lowe have put a lot of development effort into making the manual tuning feel right.

The result is a simple but very effective tuning algorithm that appears to cope very well with all the listening modes. The secret lies in allocating the correct tuning steps for the rotary control combined with well judged rate switching as you move the knob faster. In practice the switching was hardly noticeable, but the end result was the ability to search around the band very quickly but with a minimum 8Hz per step fine tuning to home in on the required signal. The actual frequency steps used also varied with the selected receive mode. The beauty of this implementation was that it felt so right. This great feel was further boosted by the heavy tuning knob. Its action was very smooth and free running and could easily be spun for very rapid frequency changes. Any readers who've used the classic Eddystone dials will know what I mean. A more conventional feature for fast tuning was the provision of Up and Down MHz buttons. As you would expect, these altered the displayed frequency in 1MHz steps and included a fast auto repeat and automatic loop around at 30MHz. An additional extra was the provision of a FAST button next to the main tuning dial. Holding this depressed whilst tuning caused the tuning rate to increase to 1kHz per step. Once you had found the required frequency you could operate the control lock facility to prevent inadvertent operation of the controls. This lock was particularly comprehensive and completely disabled the remote control and front panel functions.

Mode Roundabout

Selection of the required receive mode used a novel carousel technique. Whilst the selected mode was indicated with a group of six l.e.d.s to the left of the main display changing modes was done by first pressing the Mode button and then using the Up and Down buttons to highlight the required mode. This same technique was used for the remote control unit. Once the required mode has been selected, it is activated by a single press of the mode button. This may sound complicated, but I found it quick and easy once past the initial familiarisation. If you have the optional synchronous a.m. option fitted, selection of the appropriate receive sideband is shown by illuminating the AMS l.e.d. plus either u.s.b. or l.s.b.

Versatile Filtering

One of the hall marks of the Lowe receivers has been the inclusion of a wide range of i.f. filters. The HF-250 included four i.f. filters, namely 2.2, 4, 7, and 10kHz. These filters are automatically allocated according to the mode selected as follows: a.m. = 7kHz, a.m.s. = 7kHz, a.m.s. (l.s.b./u.s.b.) = 4kHz, s.s.b./c.w = 2.2kHz. The automatic allocation will suit most occasions but the filter can be changed at any time by pressing the Filter button and cycling through the available choices. This lets you quickly adjust the filtering to give the best results. Those interested in c.w. work will find the HF-250 particularly good as it now has a user selectable 200Hz audio filter. When this mode is selected, pressing the Filter button gives the option of the standard 2.2kHz filter or the additional 200Hz audio filter. When the narrow band f.m. option is fitted the filter buttons is used to switch the squelch on or off. In this case the i.f. filtering is fixed at 12kHz.

Memory

The HF-250 features 255 user-programmable memories in which to store all your favourite frequencies. Although there was no formalised grouping, as found in scanning receivers, there were some good memory review features that can be used to help make sure things are kept in order. Storing frequencies in the memories was very simple - you just tune the required frequency, select a free memory using the Up/Down buttons and simultaneously press the two store buttons. The memories can be reviewed in two ways. You can either select memory mode and have the display just show the stored parameters or you can select channel mode. In this mode the receiver will tune to each stored frequency as soon as the memory is selected. There were no memory move or delete functions so management has to be by re-writing and over-writing the memory channels. As with most modern receivers, the HF250's memories retained the mode and attenuator settings as well as the frequency. The storage medium for the memory information was an electrically erasable programmable read only memory or eeprom. The great advantage of these devices is that they don't require back-up batteries and each memory will be retained for a minimum of ten years. Closely associated with the memory and general tuning options was the provision of a background tuning store. This was similar to having two v.f.o.s and could prove useful particularly when monitoring a duplex signal. Using this system you could pre- set the receiver so that it was tuned to two frequencies and then switch between the two at the touch of a button.

Computer Control

One of the ways to really make receivers like the HF-250 sing is combine their excellent r.f. performance with the sophisticated facilities offered by computerised control. The HF-250 is well set-up for this with a full set of commands. A significant improvement over the HF-150 is full two-way communication. This means that as well as the computer being able to set modes and frequencies, it can also interrogate the receiver to check the current status. This effectively closes the control loop and opens up potential for comprehensive control. One of the important extras was the ability to read the S-meter data. This combined with the accurate setting of frequency means that you could fairly easily use computer control to build-up a display of activity within a defined band. At the time of writing the only computer control program available was Lowe's own Basic package. Whilst this provides very useful on-screen control of the receiver it only scratches the surface of what could be done. I would expect that most of the main stream computer control programs will very quickly be enhanced to cater for the HF-250 command set.

Timer Control

Just to complete the main features, the HF-250 includes a clock and a pair of programmable timers. The clock is fairly conventional and provides a read-out in hours, minutes and seconds. The two timers could be set-up with on and off times along with a pre-set memory number. This was a very versatile feature particularly if you want to record stations that transmit at an unsociable hour! My only criticism of this mode was the lack of panel markings showing the timer functions on the buttons. Mind you, if they had

marked the panel I probably would have complained that the panel was too cluttered!

Operating Manuals

Lowe have addressed the problem of combining help for newcomers with detailed operating instructions by providing two books - an operating manual and a listeners guide. The main operating manual sticks very much to the point and sequentially describes the receiver's functions and how best to operate them. This was supplemented by detailed, but very small circuit diagrams, and a basic circuit description. I was a little disappointed with the overall quality of the manual and would like to have seen better print and binding quality with a few more illustrations to explain some of the operations. The *Lowe Listeners Guide* is very well known and provides a useful introduction to all aspects of listening.

Using The HF-250

For the review I tried the HF-250 in a number of different locations with a wide variety of signal types. For the base stations tests I used the receiver with a random wire antenna fitted with a MLB and coaxial feeder. For portable operation I used active antennas and simple wire systems. The manual tuning ergonomics were really excellent with well chosen and seamless rate changes on all bands and modes. I found that the Fast Tune button next to the tuning knob took some getting used to and was only really suitable for right-handed operators. This was not too serious a problem as the other tuning options covered most requirements. The mode selection system also took a little practice but was soon mastered. Most of these idiosyncrasies were more a feature of the individual design than real operational problems. Perhaps most important of all was the HF-250's on-air performance. This proved to be extremely good. I've found with many Lowe receivers that the disappointment from the apparent lack of buttons and gizmos is very soon overshadowed by pure good performance. The HF-250 is no exception and produced top quality results in all modes. The s.s.b. quality was really very good indeed due to the use of a well designed product detector. Equally the a.m. performance provided very low distortion through the use of a full wave detector. Another example of the way in which Lowe have sought to help the listener through good design is the inclusion of an automatic noise blanker. This operates from the a.m. detector and causes a momentary blanking of the audio signal whenever high level a.m. noise peaks are detected. Whereas some of the flashier receivers would have a switch or two for this, Lowe have sought to simplify the operation by making the feature completely automatic. The r.f. performance was also very good and with no gain before the first mixer, was able to produce a 3rd order intercept point of greater than +4dBm at 10kHz signal separation. This increased to +13dBm with a 50kHz signal separation. I was particularly pleased with the ability to select different i.f. filters. Not only could this be used to minimise interference from adjacent signals, but you could also open-up the filters for better quality audio when working on a clear band. I suppose the clumsiest part of the whole operation was the clock and timer settings as you had to refer to the manual to remember all the functions. With a small internal speaker mounted inside the top panel, users would be well advised to use an external speaker for best quality. I tried the HF-250 through a Bose bookshelf speaker and was impressed with the results. You will note that the HF-250 features something of a rarity with a tone control on the front panel. Even this has been very carefully thought-out and gives a flat response when set at its mid point, with low and high pass characteristics respectively at each and of the control travel. ■

Specification

Frequency range:	30kHz to 30MHz continuous	
Reception Modes:	a.m., s.s.b., c.w., (n.b.f.m + sync a.m. with the DU250 option)	
IF frequencies:	1st - 44.999 to 45MHz, 2nd 455kHz	
Display:	6-digit backlit l.c.d.	
Manual Tuning		
	c.w., s.s.b. & sync a.m.	8Hz steps/1.8kHz per rev.
	a.m.	50Hz steps/11kHz per rev.
	f.m.	125Hz steps/11kHz per rev.
Keypad entry:	1kHz resolution	
Memories:	255 total - 10 years retention	
Functions:	store, recall, preview and channel	
Tunable frequency stores:	two A & B	
IF Filters:		
	s.s.b., a.m. & sync a.m.	2.2, 4, 7 and 10kHz
	c.w.	2.2kHz + switchable 200Hz audio peak centred on 800Hz
	f.m.	12kHz
RF Attenuator:	20dB	
Antenna Inputs:	50Ω via SO-239 socket	
	600Ω wire on sprung terminals	
	High impedance active antenna on SO-239 socket	
Audio Outputs:		
	Record	350mV from 5kΩ
	Speaker	1.6W into 8Ω or 2.0W into 4Ω at 5% t.h.d.
	Headphones	4V from 220Ω
Frequency Response:		
	s.s.b.	2.2kHz filter 370Hz to 2.5kHz (-6dB)
	a.m.	2.2kHz filter 40Hz to 1.1kH
	4kHz filter	40Hz to 3.1kHz
	7kHz filter	40Hz to 4.3kHz
	10kHz filter	40Hz to 5.2kHz
Tone Control:		
	High Pass	330Hz to 4.4kHz (-6dB)
	Flat	40Hz to 4.3kHz (-6dB)
	Low Pass	40Hz to 1.4kHz (-6dB)
Sensitivity:	10dB s:n for a.m. and s.s.b. 12dB SINAD for n.b.f.m.	
	60kHz-2MHz	a.m. 0.7, f.m. 0.6, s.s.b. 0.3µV
	2-30MHz	a.m. 0.5, f.m. 0.6, s.s.b. 0.15µV
Filter Bandwidth		
	2.2kHz	2.3kHz at -6dB, 3.4 at -60dB
	4kHz	5.9kHz at -6dB, 9.8 at -60dB
	7kHz	8.8kHz at -6dB, 12.9 at -60dB
	10kHz	10.5kHz at -6dB, at -60dB
Intermodulation Effects:	2.2kHz filter	
	3rd Order Intercept	>+4dBm at 10kHz separation
		>+13dBm at 50kHz separation
Frequency Stability:	10Hz/hr drift at 20°C (typical)	
Distortion:	a.m.	1% t.h.d.or 0.6% with synchronous detector
	s.s.b.	0.2% t.h.d.

SUMMARY

I certainly liked the HF-250 and found it a refreshing change from many of the receivers in this price range. The HF-250 is eminently suitable for the listener who demands high performance but doesn't want the distraction of an array of switches and knobs for every function. Lowe have also managed to produce a receiver that looks good whilst still keeping that individual design flare that has become a trademark of this manufacturer. Although there were one or two niggles with the HF-250, these were all fairly minor and didn't compromise the overall result. The all important r.f. performance was excellent for all types of listening from utilities through to broadcast.

The Lowe HF-250 costs £799 and is available from Lowe Electronics, Chesterfield Road, Matlock, Derbyshire. Tel: (01629) 580800.

My thanks to Lowe Electronics for the loan of the review model.

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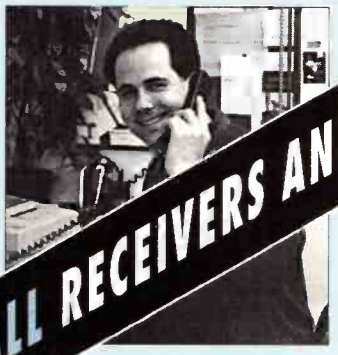

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Scouting Around

If you have ever attended an air display or special event with a scanner you will know that it can be very frustrating to see radio communications taking place all around you whilst being unable to find the frequencies in use.

There are several ways of improving this situation including using the automatic search and store function on your scanner - if it has one. However, this does take some time and you need to make a fairly educated guess at the range of frequencies in use to improve your chances of detecting what may be very brief transmissions. A slightly better method is to use more sophisticated equipment such as a spectrum analyser or frequency counter.

A spectrum analyser allows you to see a large portion of the radio spectrum on a screen and each time a transmission is made a vertical line appears on the display indicating the frequency and received signal strength. This does allow you to detect quite weak and very short duration transmissions but the equipment is very expensive, quite large and you have to keep your eyes glued to the screen. Not very practical if you want to walk around.

The second option is to use a frequency counter. This can work quite well providing you understand the limitations of such a device. A normal frequency counter is designed as a piece of test equipment for the purpose of accurately measuring radio frequencies. If you attach an antenna to it and the counter is sensitive enough, you should be able to measure the frequency of any transmitter within a limited distance from the counter. The problem is that a normal counter will continue to give a random display even if no signals are present. You have to be able to see someone using a transmitter before you can look at the display to see if it is showing a steady value.

I modified a hand-held counter a few years ago so that it would only update the display if a signal was present, the last reading being frozen once the signal ceased. In order to tell when a signal was present I also added a small audio bleeper to alert me when the display was being updated. This worked very well and I was able to find lots of frequencies very quickly just by keeping the counter in my pocket and walking close to people if they were using a transmitter; as I could then leave reading the display until later. The only problem with this arrangement was that the battery would only last for a few hours and that the counter had an l.e.d. display, which I was unable to read in bright sunlight. The next improvement was a counter -with an l.c.d. display and built-in memory. This was a lot more sensitive but I missed the facility of an audio bleep when a signal was present, and although it had a built-in computer interface I still needed to manually programme the displayed frequencies into my scanner.

Had To Try One

So when I heard about the Optoelectronics 'Scout' frequency recorder, which had an l.c.d. display, digital filtering and capture, 400 memories, computer port and radio interface, audio bleeper and 'Vibrate' mode - I knew I must try one!

When the unit first arrived I was surprised at just how small it was - measuring only 65x30x95mm (without the belt clip) it is about the size of a cigarette packet, making it very easy to carry around. The front panel has a 20x50mm l.c.d. display providing a function, frequency and signal strength indication, a red 'gate' l.e.d., three small slide switches for power, filter and capture functions and a square push-button to select the 'gate' time. The top panel has a d.c. power socket, red l.e.d. charge indicator, BNC antenna connector and a 2.5mm audio jack which is used as the computer port. Also supplied was a small mains charger, antenna, PC software disk and instruction book.

The next question was - how can such a small unit having so many functions be operated with only four controls? On switching the unit on I was greeted with a loud Morse greeting spelling out the word 'SCOUT' and the display showing initially all the segments displayed followed by the software version 3.1 and the computer interface selected, in this case AR8000. By playing with various switch combinations I found I could select different options but, I must admit that I had to refer to the manual before I could make much sense of what I had actually achieved.

A Good Command of Things

The commands are easy once you know what you are doing. This depends on the switch positions when the power is initially switched on. In its normal state the unit just acts as a frequency counter. Different gate times can be selected by momentarily pressing the square push-button on the front panel. This toggles the unit through four different gate times of 800µs, 8ms, 80ms and 800ms giving display resolutions of 10kHz, 1kHz, 100Hz and 10Hz respectively.

Operating the filter switch causes a digital filter to be selected which prevents the unit constantly displaying a random count. This is very useful if you wish to use a fast gate time but don't wish to see the last digits of the display constantly flickering.

With the filter selected, operating the capture switch changes the operation from that of a normal frequency counter to what Optoelectronics call a frequency recorder. In this mode the unit will detect and store any signals strong enough to overcome the background level of radio signals. The unit can record up to 400 different frequencies and in addition log up to 255 occurrences of a particular frequency. A clever software filter prevents any signals within 10kHz of previously measured frequencies from being stored. This very effectively overcomes the problem of memories filling with adjacent frequencies when the count is not absolutely stable. Frequency resolution is fixed at 1kHz in the capture mode and it takes under a second to effectively lock onto a signal and perform the necessary digital filtering.

Switching the filter function off with the capture switch still on permits you to toggle through all the frequencies stored in memory by pressing the gate push button. This displays the memory number and measured frequency with the number of 'hits' appearing alternately on the l.c.d. screen.

Clearing all the memory contents is achieved by switching the unit off, unless you press and hold down the gate button for longer than a second. This puts the unit into a 'sleep' mode which dramatically reduces the battery drain and additionally permits you to switch the unit off without erasing the memory contents - although I must admit that I sometimes forgot to do this before flicking the power switch. The internal NiCad batteries gave over six

Alan Gardner, ever interested in anything to make his scanning exploits easier, tests the reaction tuning capabilities of the new Optoelectronics Scout 400.

hours continuous use with the 'sleep' mode automatically operating when the batteries go flat - so you don't lose the memory contents. In addition the built-in charge circuit permits a full recharge within one hour from a suitable 12V supply.

Powering the unit with the filter selected initiates the auto back-light function. In this mode the back-light illuminates and stays lit for ten seconds if a signal is detected. If the capture switch is on when the power is switched on an audio 'bleep' is activated when a signal is detected. One 'bleep' for a known signal, two 'bleeps' for a new one. Flicking the capture switch during power up selects either AOR AR8000 or Icom CI-V signalling protocols via the computer port - but more of this later.

A final mode is selected by pressing the push button during power up enabling the 'Vibrate' function. Instead of the 'bleeper' sounding when a signal is detected a 'Vibrator' rattles the case, so if the unit is being operated in a jacket pocket the user is silently alerted to the fact that a signal has been detected. The only outward sign of anything unusual being the smile on the operators face! I found it most amusing to watch the unit move across a table each time a local paging transmitter operated.

By this stage you are probably wondering how well it works in practice and what sort of measurement distances can be obtained. Connecting a small multi-band scanner antenna to the BNC socket immediately produced a reading with the capture mode selected and during the next few minutes several different transmissions were recorded. I was most impressed by this and connected up a signal generator to check the level of signal required to produce a stable reading on the display. This turned out to be very good over the range 50-500MHz with a level of 1mV producing a reading. Maximum sensitivity was at around 200MHz with the response dropping slightly below 20MHz and above 900MHz, although readings could still be easily obtained outside these limits.

The actual distance from which transmissions can be detected is very dependent on the transmitter power, antenna, location and background signal level. It is actually determined by a very clever algorithim, which looks for the strongest signal which is at least 10-20dB above the general noise floor. However, as a guide with a λ/4 wave antenna connected to the Scout, a 1W v.h.f. hand-held transmitter could be detected at 30m, a 1W u.h.f. hand-held transmitter could be detected at 20m and a 25W v.h.f. base station detected at 0.5Km. With a λ/4 wave v.h.f. airband antenna connected several signals from aircraft on the local airport approach frequency were measured. With a v.h.f. low band antenna connected to the Scout very good ranges were achieved. I believe this was partially due to the fact that signals at lower frequencies generate a higher voltage at the output of a resonant antenna by virtue of the element capture area. In fact Packet Data transmissions from AA patrol vehicles operating at around 72MHz were being recorded almost constantly.

Variety of Conditions

During the review period I was able to try the unit out under a variety of conditions. One of the most interesting tests was to visit a local p.m.r. radio site. The site has eight masts within a radius of 0.5km and has various services operating from it including a Band II f.m. broadcast transmitter, v.h.f. paging services, v.h.f. and u.h.f. links and other general p.m.r. services. I thought that if the Scout could make sense of that lot it would be a miracle - well it almost managed it!

The main problem was the 1kW f.m. broadcast station which operated continuously and produced a much higher signal level than any of the other services on the site. Fortunately I had remembered to take a home-made Band II notch filter with me and inserting this in line with the antenna made a vast difference. I found that I was able to walk around the site with the telescopic antenna collapsed and by watching the l.c.d. signal bargraph display I was able to null out some of the stronger signals which I had already captured and so I was then able to detect some of the less obvious transmissions.

Once I returned home the next test was to try out the computer interface. I used this with the supplied software and a home built level converter to download the contents of the Scout to a PC text file. I was then able to import the data into a database and compare the measurements against previous loggings I had made. This made the identification of unknown transmissions very easy and helped to confirm the source of some of the known ones.

Another interesting aspect is the ability to tune a receiver to the frequency being captured by the Scout. I was able to try this with both an Icom IC-R7000 and an AOR AR8000 hand-held and it worked very well, with the radio usually locking to a signal in less than a second. The Icom does not have the automatic mode selection which is available on the AR8000 so some button pressing is necessary at times to switch between a.m. and f.m. With the AR8000 some manual changes were still required because of the mixture of modes in the lower v.h.f. bands, however most of the time the automatic selection made monitoring a pleasure. Enabling the band scope function whilst in using the Scout to tune the AR8000 was most interesting as you are almost immediately able to determine if the receiver is exactly tuned to the incoming signal.

As a final test I decided to try the Scout/AR8000 combination on a car journey to London as I thought this would provide plenty of opportunities to capture different transmissions. I used an external antenna on the car to feed the Scout and just the antenna supplied with the AR8000 attached to the receiver. I assumed that this would give the strongest signal to the Scout and that the AR8000 would be sensitive enough.to receive signals with the antenna inside the car.

The first thing I noticed during the journey was the large number of times the Scout captured paging transmissions. This became very annoying as the receiver remained tuned to the paging frequency until the next signal was detected. Turning the squelch control up, switching in the attenuator and placing the receiver in the passenger footwell helped to reduce the reception range so that it was comparable to the detection range of the Scout. This made monitoring much more comfortable and I could safely assume that if I could hear a transmission I was reasonably close to its source. The second problem was that for the majority of the time the signals heard were those from mobile stations, this meant that it was often necessary to look up the frequency offsets in order to determine what frequency the base station was likely to be operating on and hence the user. If the use of Scout / receiver combinations proves to be popular perhaps AOR will consider incorporating an automatic duplex tuning option in to the next generation of receivers - or even better have a built-in 'frequency recorder' mode of operation.

Time to Smile

I had a great deal of fun using the Scout - so much so that I have now bought one! Providing you are aware of the limitations of using a frequency counter to try and capture transmissions off-air you should not be disappointed. I can't wait to try mine out at various shows during the summer months. So if you see a spectator suddenly start smiling for no apparent reason - It's probably me with the 'Vibrate' mode selected.

Thanks to **Waters and Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835, Fax: (01702) 204965**, for the loan of the Scout and the modified AR8000. ■

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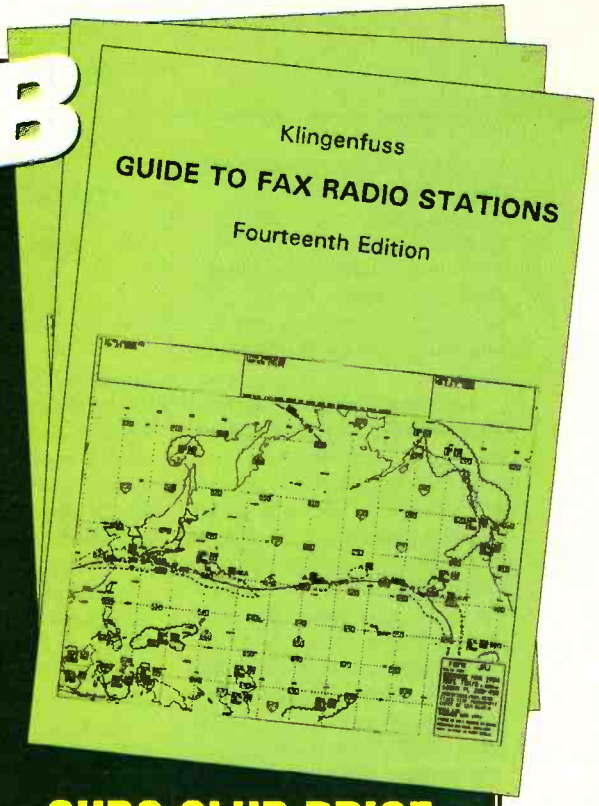

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WATERFALLS AT BALDOCK

The Radiocommunications Agency operates the UK's monitoring input to the International Monitoring System of the ITU at Baldock Radio Station. Dick Ganderton and Kevin Nice recently visited the station and were both taken with the 'waterfall' charts.

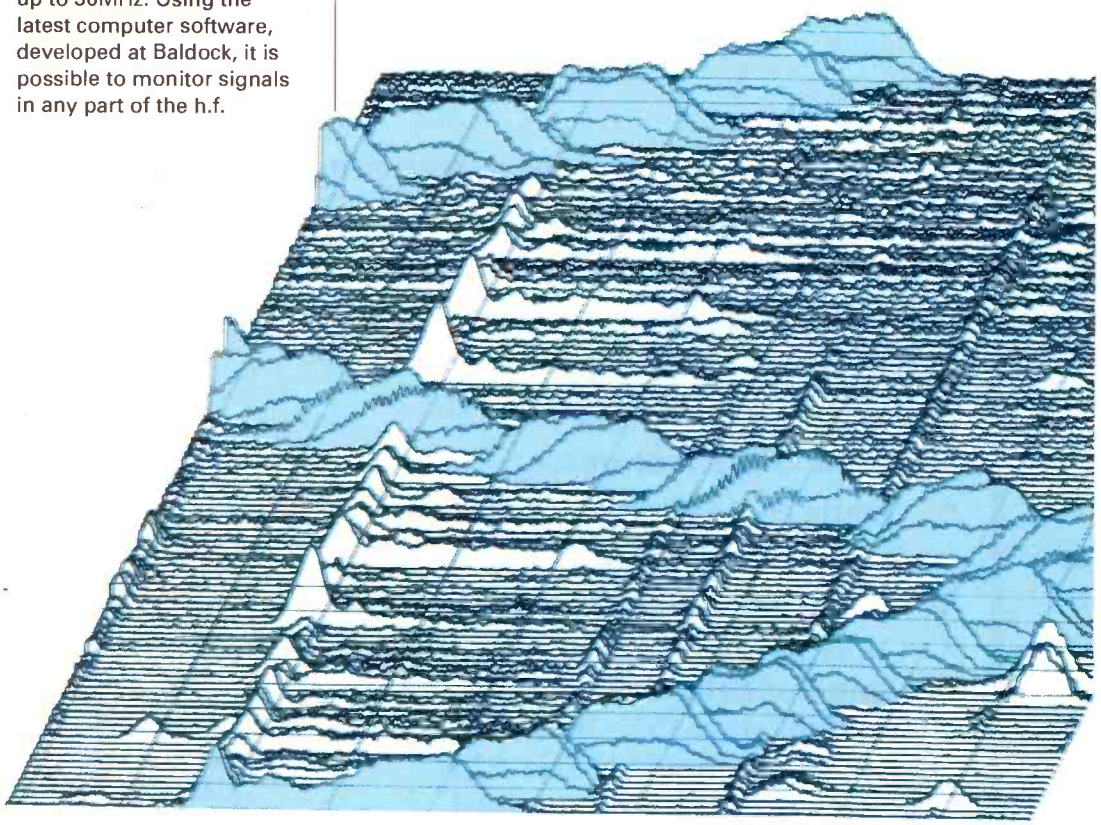
Baldock Radio Station is located in an electrically quiet location around 60km north of London. Operated 24 hours a day throughout the year, the station specialises in offering assistance to those suffering from interference as well as monitoring segments of the radio spectrum. There is also the International Satellite Monitoring Station located adjacent to the Radio Station.

Waterfall Plots

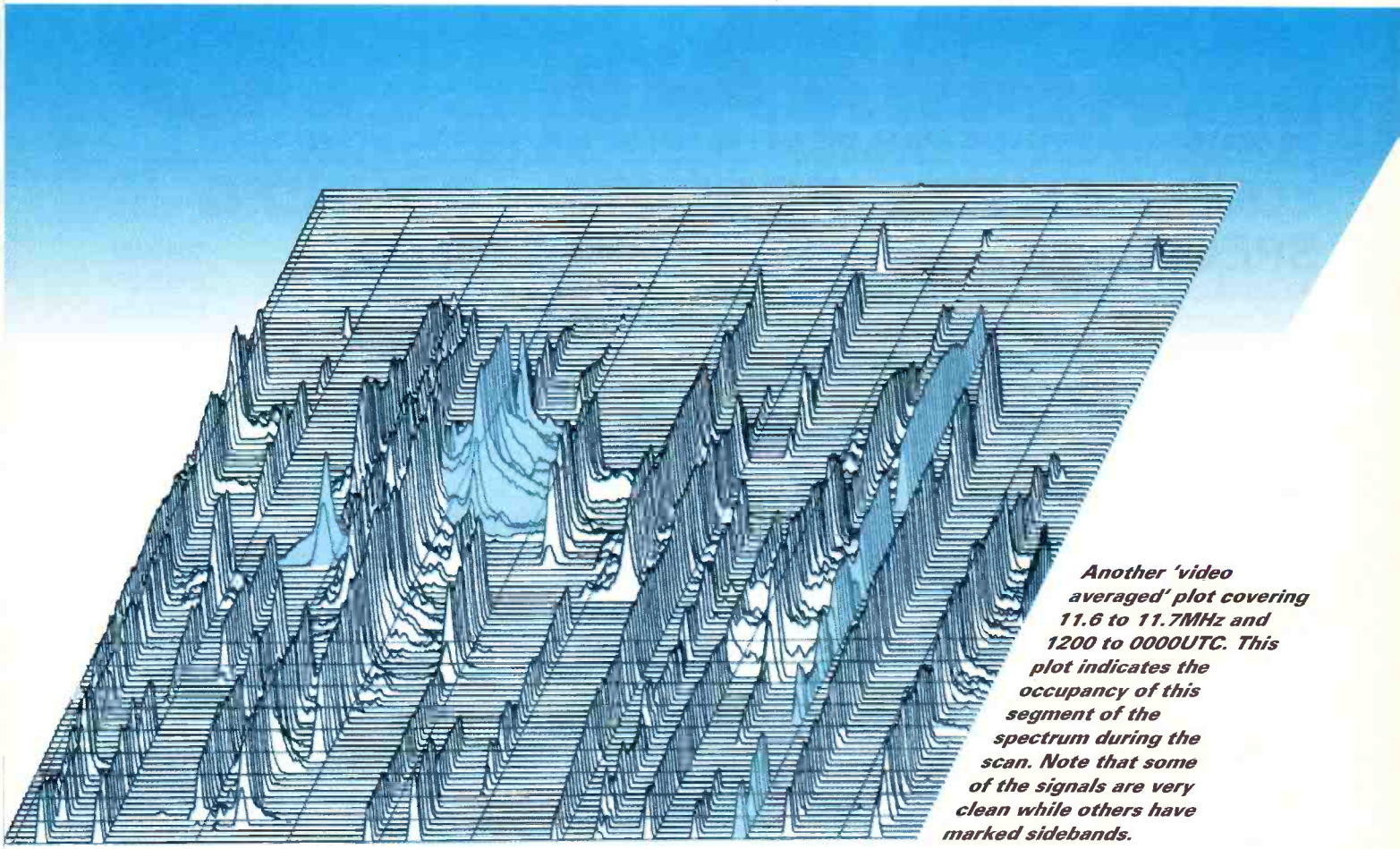
To help seek out interference problems, Baldock can monitor, automatically, any portion of the radio spectrum up to 30MHz. Using the latest computer software, developed at Baldock, it is possible to monitor signals in any part of the h.f. spectrum and to plot these out in a striking format.

Known as 'waterfall' plots the technique involves sweeping the desired segment with a computer controlled spectrum analyser. The resultant plot forms the first line of the 'waterfall'. At pre-determined time intervals the sweep is repeated with the new plot drawn behind the first one, but displaced to the right. This is continued throughout the total period allocated to the survey, producing the striking 'waterfall' charts, samples of which are reproduced here. The computer program works out how to displace the sweeps and hide the appropriate bits behind the previous sweeps to give the 3-D 'waterfall' effect.

The signals can be displayed in two different ways. The 'max hold' mode shows all signals occuring during the scan and this emphasises short-term events. The other mode is 'video averaged' - used to show long-term signals and is particularly useful in showing the carrier on a.m. signals. ■

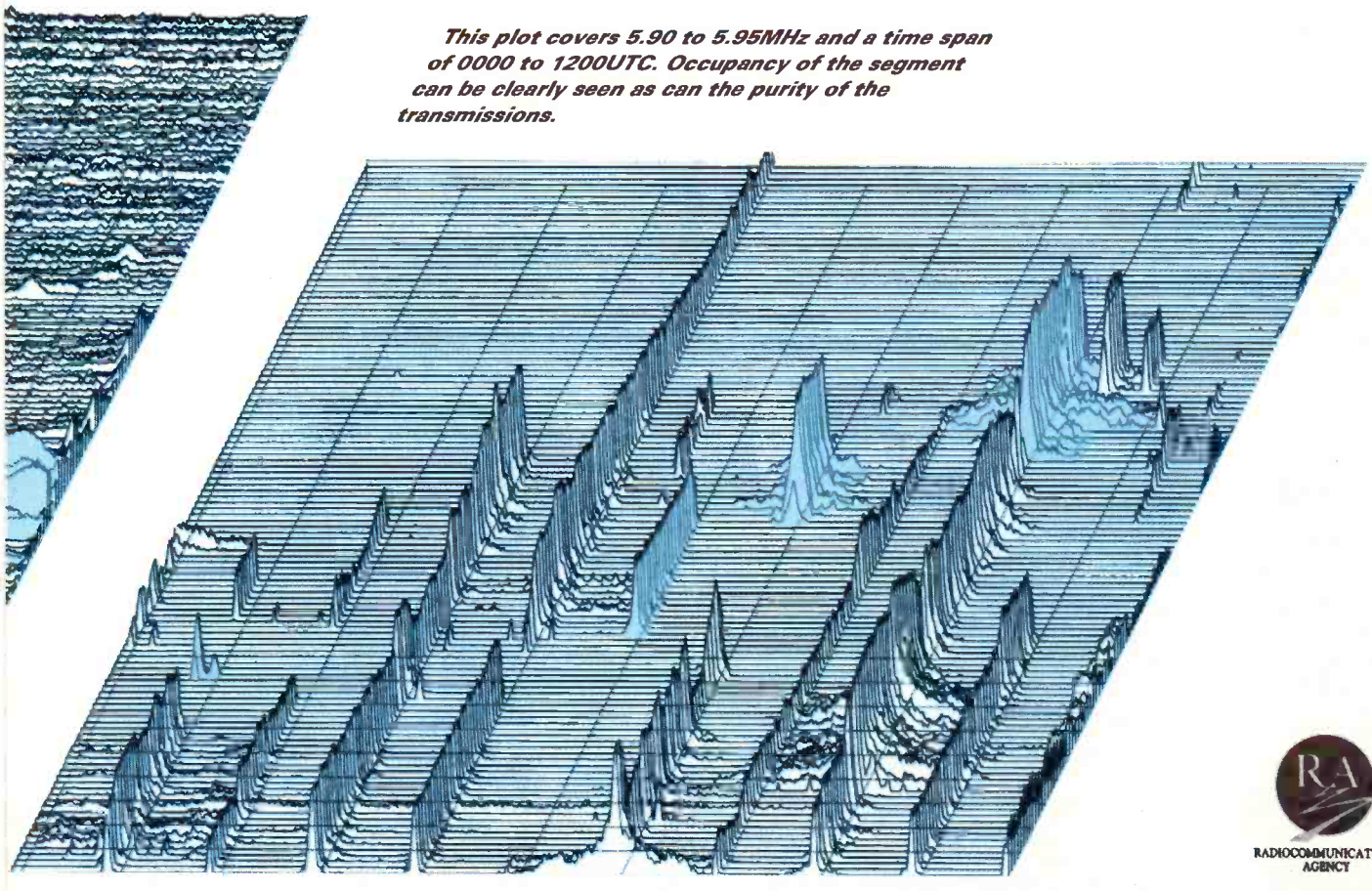


This very striking plot shows a transmitter drifting across the portion of the spectrum being monitored. This information can be used by the Radiocommunications Authority to identify rogue stations and get something done about them. This is a 'video averaged' plot. The drifting signal has been coloured by SWM to make it stand out better. The time scale of the complete plot is six hours, while the frequency span is 2.18 to 2.19MHz.



Another 'video averaged' plot covering 11.6 to 11.7MHz and 1200 to 0000UTC. This plot indicates the occupancy of this segment of the spectrum during the scan. Note that some of the signals are very clean while others have marked sidebands.

This plot covers 5.90 to 5.95MHz and a time span of 0000 to 1200UTC. Occupancy of the segment can be clearly seen as can the purity of the transmissions.



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Reflections

Prior to the advent of the R1155 communications receiver, bombers of the Royal Air Force were fitted with the R1082. Such sets, now about 53 years old, are not often seen. However, thanks to **Robert Willington G7PUM** (Tunbridge Wells) I can show you one and, what's more, it's sitting in its own dedicated transit case, **Fig. 1**.

The 'i082 set uses a pair of plug-in tuning coils for each given range. These are coloured green and red and are inserted, as required, by the wireless operator in the appropriate sockets. Green at top centre **Fig. 1** and red at the bottom. There are 28 coils, 14 of each colour, and those not in use are kept in a specially designed carrying case, **Fig. 2**. Incidently, the bright emitter valve of the 1920s seen in the lid is part of Robert's vintage wireless collection.

The majority of the RAF's wartime sets and accessories were packed in these robust wooden cases. Note the metal reinforcing on the corners, the strong carrying handle and the stencilled contents label on the side, **Fig. 2.** The centre right of **Fig. 1** shows the A 'crown' M (Air Ministry) logo inside the lid of the equipment case. This logo, sometimes called 'Arthur Mitchell' can also be seen on many valves and components along with a 10A/ or 10E/ RAF reference number.

Muirhead Dials

I cannot tell you much about the R1082 because many years have gone by since I have taken one to bits. However, the on/off switch is at the upper left immediately above the 4-pin power input socket, **Fig. 1**, and the main tuning controls are the two Muirhead slow-motion dials on the right-hand side of the panel. Some versions of these dials have an illuminated cursor fitted above the outer scale that holds a festoon type bulb. The front cover, secured by a central screw, has been removed in **Fig. 3** to give you a closer view of its gearing. Muirhead dial mechanisms were also used by the RAF on their RF26 and RF27 tuning units and the R1224A receiver. The one shown in **Fig. 3** is on the front panel of the battery operated R1224A communications receiver built in the mid-1930s.

Observations

As usual my thanks are due to the people mentioned here for placing their observations on record for us all to see.

Solar

During his daily solar observations, **Ron Livesey** (Edinburgh), using a 2.5in refractor telescope with a 4.0in projection screen, located one active area on the sun's disc on May 8-12 and 15 and two on days 13, 14, 18 and 19.

From his observatory in Selsey **Patrick Moore** kindly sent a drawing, **Fig. 4**, of the sunspot group that appeared on his projection screen during his morning solar observation on May 14. Patrick also reported 'no spots' from the 25th to 30th inclusive.

Aurora

Ron Livesey, the auroral co-ordinator for the British Astronomical Association received reports of aurora described as 'glow or patch' for the overnight periods on May 4/5 and 5/6, 'homogeneous arc' on 15/16 and 23/24 and 'ray bundles', 'active pulsating' and 'corona structures' on 2/3, from observers in Fair Isle, Scotland and The Shetland Isles.

Magnetic

The magnetometers used by **Karl Lewis** (Saltash), **Ron Livesey**, **David Pettitt** (Carlisle), **Tom Rackham** (Goostrey) and **Tony Rickwood** (Gillingham), between them, recorded strong disturbances to the earth's magnetic field on May 2, 3, 5, 16, 30 and 31 and lesser events on days 4, 6, 7, 8, 17, 23, 24 and 25.

Sporadic-E

On eight days between May 20 and 31 inclusive, **David Glenday** (Argyll) logged pictures in Band I (48-68MHz) because of disturbances in the E region of the earth's ionosphere. He received pictures from Norway (NRK) on Chs. E2 (48.25MHz) and E4 (62.25MHz) on the 20th, France on Ch. L2 (49.25MHz) and Spain (TVE1) on Chs. E2, E3 (55.25MHz) and E4 on the 21st, Czechoslovakia on Ch. R1 (49.75MHz) and Spain on the 22nd, Norway, Spain and Sweden (SVT1) on the 23rd, Switzerland (DRS) with a lozenge-shaped on-screen logo on Ch. E2 and possibly Italy (RAI-UNO) on Ch. Ia (53.75MHz) on the 27th, France and Spain on the 30th and Spain on the 31st.

In Basingstoke, **John Woodcock** identified pictures in Band I from Croatia and Italy on the 12th, Portugal on the 18th and Spain on days 11, 13, 16 and 17. On each of these days John also saw many pictures in Band I from unidentifiable sources. During the event on the 12th he heard a German amateur in Berlin on his recently constructed 56MHz converter.

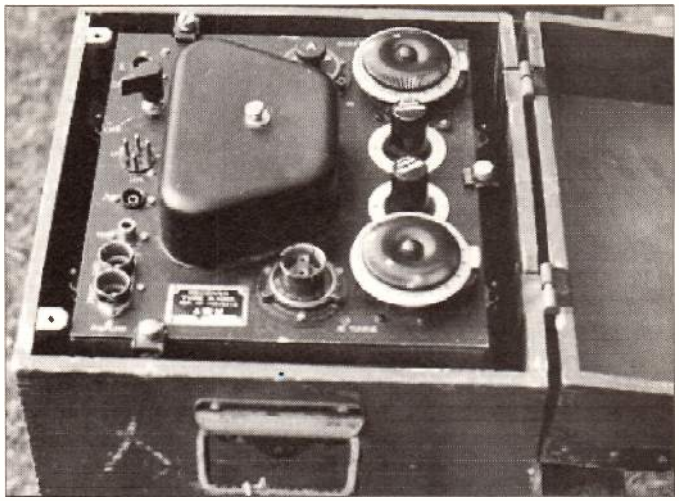

Fig. 1.

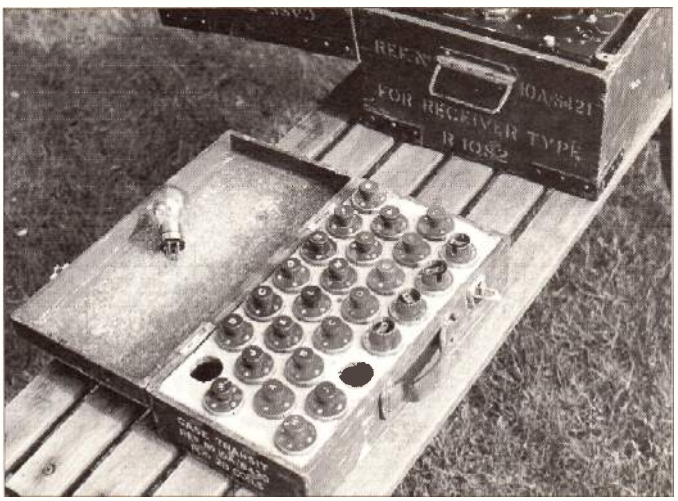

Fig. 2.

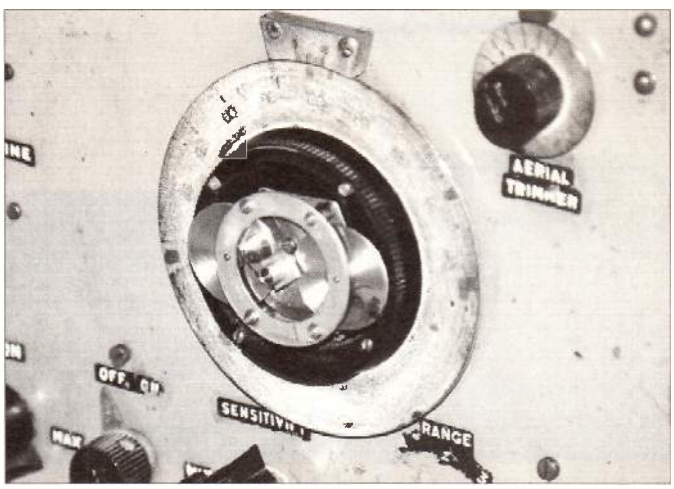

Fig. 3.

Band II

At midday on June 2, **Howard Smith** (Merseyside) was on the Isle of Wight and heard three Arabic stations and a lot of Spanish stations while tuning through Band II (87-107MHz). Later, while returning to Yarmouth and the ferry, he found that "the band was full of Italian stations, such as Radio Milan and many commercials. Then I received a loud signal from Radio Zagreb".

"Lots of DX this month with a couple of large Sporadic-E disturbances," wrote **Arthur Grainger** from Carstairs Junction. As expected all the bigger stations that he normally hears were much stronger and, in addition to logging such stations, in Band II, as Horizon Radio (103.3MHz) from Milton

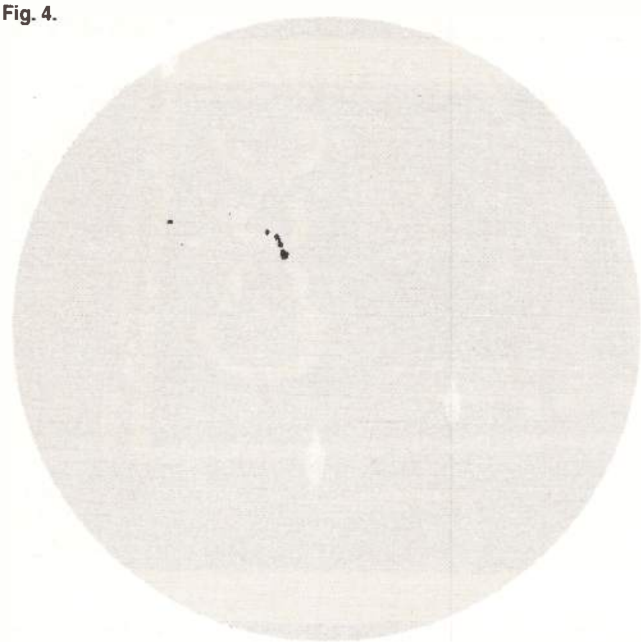

Fig. 4.

Keynes, Radio Leeds (103.9MHz), Radio Humberside (95.9MHz), Radio Northampton (103.6MHz) and Wear FM (103.4) from Sunderland, he received many transmissions from abroad. Among those he identified, by their RDS and Radiotext idents, was Croatia (HRT-HR1 & HRT-HR2 on 96.1 & 105.2MHz respectively), France (Inter & Musique on 97.1 & 105.5MHz respectively) and, like Howard Smith, a good number from Italy. Arthur also heard a relay of N.P.R., from Washington DC, on 107.0MHz but he is not sure where this signal came from. He told me that there were dozens of signals coming through but many were not strong enough for an RDS identity. Typical Sporadic-E Arthur.

The Troposphere

"June has been a peculiar month for the weather. At the beginning it was cold and wet with little sign of summer approaching", wrote Arthur Grainger at the end of the month. He added, "now there is a heatwave and three months. Six inches less than the total for the same three months of 1994.

The daily variations in atmospheric pressure from May 26 to June 25, **Fig. 5**, were taken at noon and midnight from Arthur Grainger's barometer in Scotland (dotted trace) and from my own barograph (solid trace) down here is Sussex.

When **George Garden** (Edinburgh) noted a high pressure area over Europe on May 30, he drove his pick-up-truck, equipped with a multi-standard Grundig TV receiver and a u.h.f. beam antenna, **Fig. 6**, to Cairn O' Mounth for a spot of TVDXing. Around 1903 he received pictures, in colour, from Denmark's TV2 on Ch.35. He returned to the site early in the evening of the 31st and caught a French film from Denmark (TV2) and a games show from Holland (NED. 2), on Chs.30 and 47 respectively. At 1851 George watched an international news bulletin on TV2 and said that the colour was the strongest of all stations reported. "The view out to the North Sea in this direction is

Fig. 5.

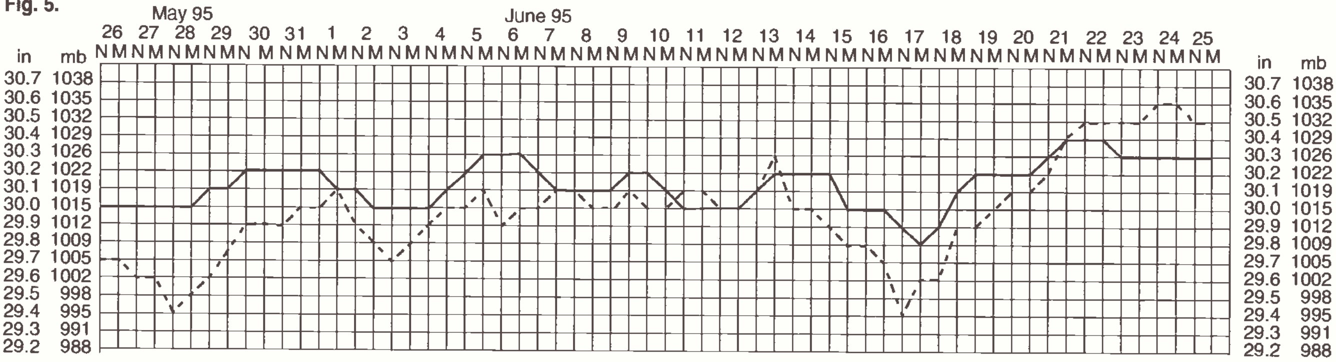

Fig. 6.

from what I see on the weather forecasts, Scotland and the Western half of Britain are getting the best of it". Also at the end of June, **John Scott GM7UIK** (Glasgow) remarked, "as I sit here and tap out this letter, we have glorious weather and my handy fan is cooling the 144MHz band set when I am using it and also me". You have the priority right John, hi!

In June I measured just 0.82in of rain compared to 1.18in for the same period last year. There was some rain on days 3, 4, 11 and 17 but the rest of the month was mainly warm and dry with daytime temperatures above 70°F from the 20th to 25th, well above 80°F from the 26th to 29th and reaching 92°F on the 30th. It's not surprising that the South is very dry with only 2.23in of rain in the past unobstructed and conditions were very hazy", said George.

While in Dorset during the last week of May, Howard Smith logged Europe 1, France Culture, France Info, France Inter, France Musique, Radio France Normandie and RTL2 in Band II, all at a distance of about 130km. To Howard's surprise he heard a very strong signal from Radio Frequence Nord on 94.7MHz, over 480km away, near the Belgian Border.

SSTV

In June, **John Scott** found the h.f. bands busy at times around 14.230MHz with the familiar sound of slow-scan television picture pulses. Between May 28 and June 26, John copied a variety of captions from stations in France, **Fig. 7**, Holland, Hungary, **Fig. 8**, Italy, Russia, Sicily and Spain and exchanged pictures with local GM stations around 144.5MHz. John tells me that GM0NAF, using a Spectrum computer and G1FTU software, had contacts with stations in England and Morocco and that GM0VRP had one of his first slow-scan contacts with KH6AT in Hawaii. For the benefit of those readers unfamiliar with SSTV techniques, the dotted traces across the top of the 'CQ' line and the HA call-sign in **Fig. 8** were caused by some form of electrical interference on top of an otherwise very good signal.

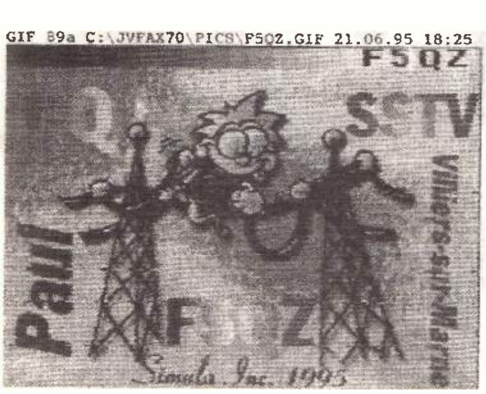

Fig. 7.

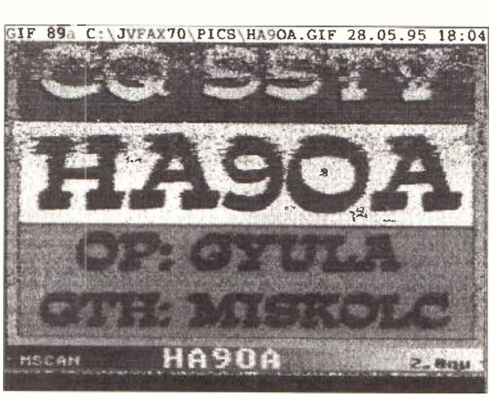

Fig. 8.

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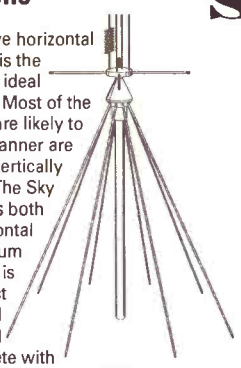

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Tel: 0121-460 1581/0121-457 788

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

Satellite TV News

The Latest from the Clarke Belt

Late June through into July proved rather less active that earlier months - the ongoing fighting in former Yugoslavia continues and with regular news feeds inbound for CBS, NBC, Sky and others. Main satellite carriers seen here usually are in the Telecom band (12.5-12.7GHz) on both Eutelsats' 13 and 16°E, the 34°W Intelsat 603 that traditionally carried the Sarajevo feed hasn't been seen for a considerable time. Sarajevo is certainly still uplinking as the EBU leased transponders often carry an SIS (sound in syncs) distribution feed originating from Sarajevo, I wonder if anyone has seen the main uplink and can advise.....

Roy Carman (Reigate) comments that the Sarajevo 16°E feed continues on 12.546GHz vertical in clear PAL - 'CBS UKI 83 SARAJEVO' and he has also received the 34°W feed via Intelsat 603 using 'STI SUI-4 EBU SARAJEVO' at 10.964GHz vertical in SIS PAL. On a personal note, trees immediately to my south-east and perhaps 21m high have grown even more feet over the last 12 months and Eutelsat II F3 at 16°E is a very weak and sparklie offering now using my 1.5m dish and Chaparral 0.7dB noise LNB - beyond 16°E no signals can be received thus confirming that satellite signals will not travel through deciduous foliage! I am so concerned over the loss of signals beyond Astra - particularly the popular UK news carrier Eutelsat I F4@ 25°E - that I'm considering putting up somewhere a dedicated 1m dish.

Fortunately there are others that are more favourably placed. **Martin Peters** (Reading) is one such enthusiast with a variety of home dishes, for domestic Astra he uses an old BSB 350mm dish and FSS bullet LNB from a car boot sale and provides good Astra signals even using a Global 1D extender module. For general sat-zapping he uses an 800mm dish and tracks the Clarke Belt manually. A former BSB 'Squarial' has been modified to right-hand circular and gives noise free Hispasat (30°W) offerings. Dish down-feeders use normal u.h.f. TV coaxial cable (shudder) and switch selected into the TV via a 50 pence TV/games selector switches (more shudders) - Martin comments 'breaks all the rules but works fine'!

Martin's main reason for his letter relates to several queries over Morse (c.w.) identifications heard on Intelsat birds by readers recently. From the *World Satellite Almanac* by Mark Long, Martin sends details - the FCC require that all uplinks out of the US carry a Morse code identification, this to assist other users by providing an identification in case of interference, queries, etc. The 'Automatic Transmitter Identification System' (ATIS) is usually carried at 25w.p.m. on the 7.10 or 8.30MHz subcarrier and details callsign (usually starting with E), an identity code, telephone number and other information. There are now several Morse decoders on the market that will provide a readout of the c.w. information. Thanks, Martin.

Orion 1 Atlantic enthusiast **Colin Paton** (way up north in Greenock, Scotland) advises that 6 new Scandinavian satellite channels will be on air at 1°W early 1996 and Telenor may be ordering another new satellite to provide up to 30 analogue TV channels. Intelsat 7A when orbital early 1996 will replace the existing Intelsat 702 at 1°W bird and improve Scandinavian capacity from 18 to 24 TV channels. Back to Orion and Colin logs the 37°W bird with down-links observed at 12.585GHz vertical (Starbird); 12.667 and 12.617GHz vertical; 12.645GHz horizontal all with occasional TV news feeds and other programme offerings. Also on the same bird but FSS can be found VH-1 German (clear) 11.469GHz; TV-10 Gold (inverted video) 11.4915GHz and 11.6858GHz carrying Asianet (clear) out of New York. Orion often provides useful backlinks into the UK from UK mainland sites and well worth checking out for OBs (outside broadcasts) during the day not forgetting the early morning breakfast shows. Recently on consecutive days Intelsat K at 21°W were carrying in FSS band (10.9-11.7GHz) live weather forecasts, etc., for GMTV from seaside resorts such as Bournemouth. Again its worth a quick scan before racing off to work.

In another monthly I aired the query of the outside broadcast coverage July 2. What was happening at the 'Questra' prison near Brescia in Italy? During the afternoon and into the late evening coverage was of the buildings, close ups of windows with folk inside and the to-ing and fro-ing of police and other security types. Intelsat 515 at 18°W maintain coverage via the Iveco SNG uplink 'ITA 30' at 11.135GHz vertical. The event was of some importance but perhaps not to the UK as no mention was heard on 'our news'.

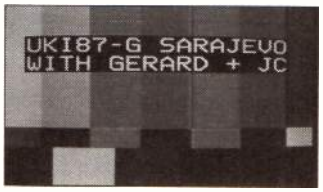
Mid-June several readers reported the arrival on Eutelsat II F3 at 16°E 'ART' - the Arab Radio and Television - on test at 11.095GHz using Y (vertical) polarisation, with audio at 6.65MHz with a Central European spot signal level at 47dBW - so says the scrolling caption. As of mid-July the captions were still 'testing' and no programming had yet been seen. I'm advised by David Thorpe (*Transponder Bulletin*) that ART carry several programmes in C Band via the Arabsat 1D at 20°E.

July 7 and the media circus arrived near to my workplace in Southampton for coverage of an alleged corrupt footballer scandal/Malayasian gambling interests, etc. I noticed an Intelsat K offering early morning live reports into a breakfast TV show and when passing the Civic Centre employment bound perhaps 40 minutes later found two SNG vans, one from ITN with an inverted (flat) offset dish on the van's roof, and another unmarked unit with a conventional prime focus dish emerging from the rear of the van on an hydraulic arm - neither dishes were spotted towards the south-west seemingly more to a 13 or 16°E slot.

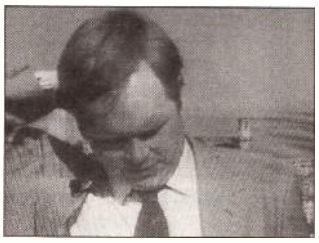
Roy Carman is another of our regular sat-zappers and usually finds something unusual in the Clarke Belt each month. Kopernikus DFS-2 at 28°E is an often overlooked satellite that is rapidly filling with regular programming channels and occasional news feeds. He comments about a 'unique' type of encryption seen on the 'Top TV' Hungarian channel via DFS-2 at 12.589GHz - the screen was split into 4 horizontal sections with the extreme top and bottom sections 'in the clear'. Some of the picture segments are encrypted, others upside down and the 'clear' video information segments in mono. Roy comments it's all quite watchable when music videos are playing!! Another June sighting, following on from the Yugoslavian comments earlier, Roy tells of a Eutelsat 16°E feed showing the UN fire brigade in Sarajevo at a fire scene, the brigade members were all armed and were all American. They came under fire from enemy positions and immediately returned fire, suggesting to Roy that the Americans at that time were more involved in former Yugoslavia than is generally realised.

For followers of BBC TV in Arabic that has been carried into Rome for the Orbit TV International channel package across the Middle East recently (mid-June) were disappointed when the evening signals disappeared. For reasons unknown the BBC moved their Arabic feed onto Intelsat 603 at 34°W using 11.006GHz vertical in clear B-MAC. After a short period the BBC Arabic/Orbit feed resumed on Telecom 1C at 3°E. **John Locker** (Wirral) and **Ian Waller** (Lincoln) were considering the source of the NBC UK feed out of New York seen at about 34°W- though not quite. Eventually the 11.133GHz vertical signals were decided by committee to be via the inclined Intelsat 506 at 32°W. The signal varies during the day caused by its inclined orbit characteristics and more recently signals have been 'peaking' early afternoon and again some 12 hours later. Check out 11.133GHz vertical for this itinerant signal. News from *Transponder Bulletin* ex David Thorpe, Chester.

The ART caption radiated via Eutelsat II F3 at 16°E.



Two SNG (satellite news gathering) uplink vehicle idents seen via Orion 1 (37°W) and Eutelsat II F1 (13°E).

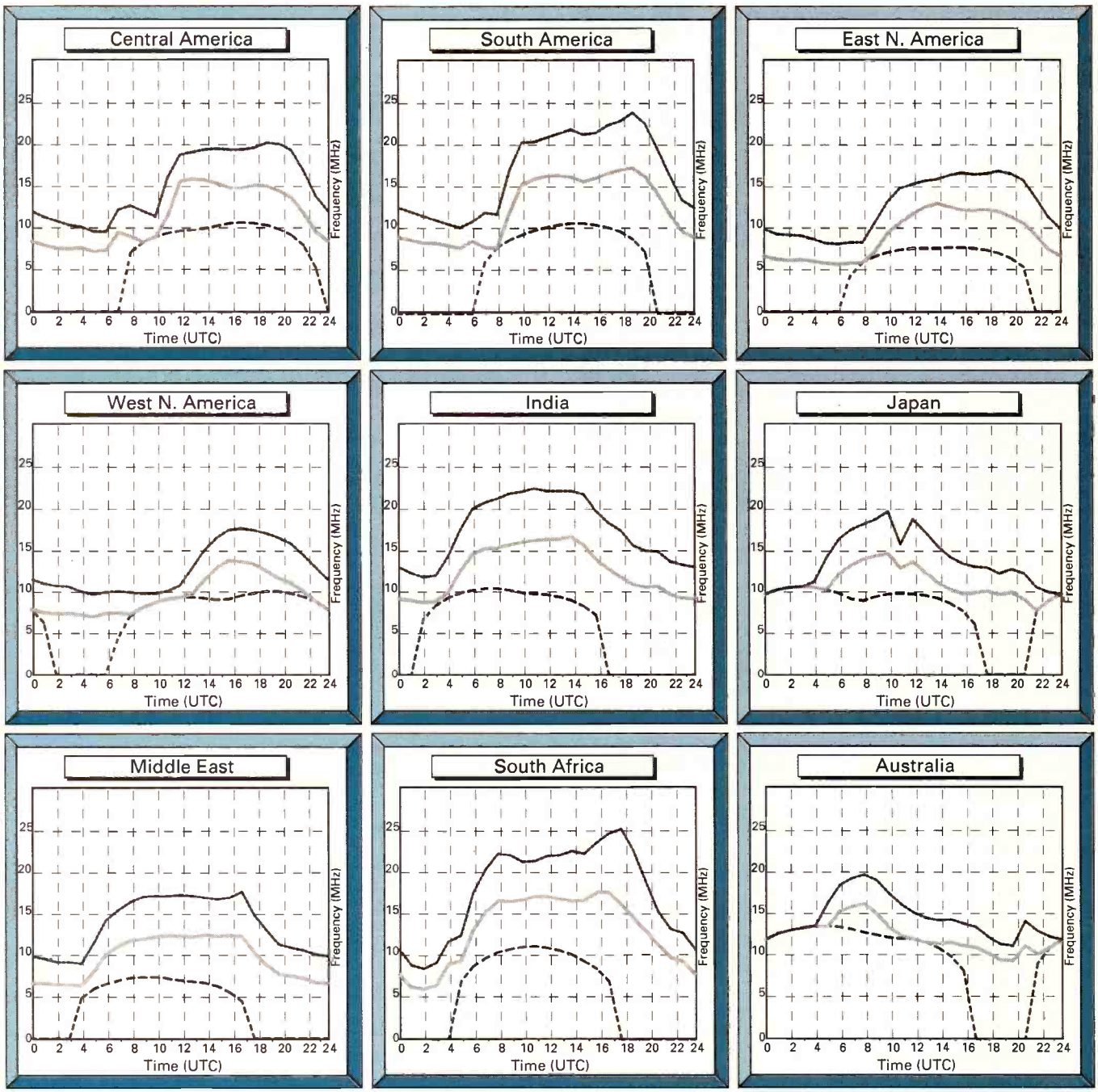


Adam Boulton adjusts his head prior to a Sky News report from the Cannes promenade during the recent political talks - actually Adam is fitting a deaf-aid earpiece for reverse studio sound comms. Eutelsat II F1 (13°E).

Jacques d'Avignon VE3VIA

World Propagation Forecasts September

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.

Graham Tanner, 64 Attlee Road, Hayes, Middlesex UB4 9JE. (Internet: gmt@delphi.com)

SSB Utility Listening

A Wessex HCC4 of 32 (The Royal) Squadron, as sometimes flown by HRH Prince Charles.

SAM

Last month, in the 'Traffic Log', I asked if anyone had heard any 'SAM' callsigns with a particular set of flight numbers; those numbers were 676, 677, 787 and 125. I said that I had a theory about what they were, and now I am 100% certain.

In the early 1970s the US Government decided to buy four Boeing 747 'Jumbo Jets', and to fit them out as emergency command posts, so that they could continue to govern the USA in the event of a war or other disaster. The USAF decided to give them the official designation of E-4. One of the aircraft was always on standby close to The President, so that he could be quickly in control of any situation should the need arise. These four aircraft acquired the nick-name of 'Knee-Cap', which was close to their official title of NEACP - National Emergency Airborne Command Post. The four aircraft are officially based at Offutt Air Force Base in Nebraska, but there is usually one at Washington DC, or following close-by when The President is using 'Air Force 1'.

Following the 'collapse' of the Iron Curtain, there has been little need for a specialised Command Post aircraft, particularly since The President now has his own personal Boeing 747. Therefore, the NEACP aircraft have been used in recent years for normal SAM missions - if a SAM mission can be called 'normal'! The four aircraft concerned have tail-numbers 31676, 31677, 40787 and 50125, and in the usual SAM fashion they use the 'last three' to make-up their full callsign. Each of these aircraft has been heard on SAM flights in the last 18 months.

These aircraft still provide backup for Air Force 1, and are often heard using their normal 'Gordo' callsigns on v.h.f. and u.h.f. In recent times when Mr. Bush and Mr. Clinton have visited Europe or the USSR, one of these aircraft has been on stand-by at RAF Mildenhall in Suffolk.

They are also used extensively in the USA, where they use the callsign NIGHTWATCH. This is a network of stations which are involved in the command and control of the USA's nuclear forces. Not all the Nightwatch callsigns are Boeing E-4 aircraft, but many of them are; I have heard them a few times late at night, but I have not seen any logs from readers reporting these callsigns.

Kittyhawk

A lot of people send in logs containing entries for the various RAF Architect frequencies. One of the more common callsigns heard is that of 'Kitty' or 'Kittyhawk'. I was quite surprised to receive a letter recently from **Colin L** in Essex asking who used this callsign - and I thought that this was one of the most 'known-about' callsigns around; how wrong can you be!

There has also been some major changes to the Kitty/ Kittyhawk callsign users in recent months, so it would appear to be a suitable moment to remind everybody of the new setup.

The callsigns 'Kitty' and 'Kittyhawk' used to be used by 'The Queen's Flight' based at RAF Benson in Oxfordshire. In the past 15 years they have operated a fleet of Wessex helicopters and Andover turbo-prop aircraft; however the Andovers have been replaced by three British Aerospace 146 four-engine jets. The callsigns were always suffixed with a single digit number. The callsign 'Kittyhawk' signifies that the VVIP is on board, and 'Kitty' is used for all other flights (i.e., positioning flights).

I believe that the number used indicated which pilot was flying the aircraft, but I have seen reports which claimed that it represented which VVIP was on board.... even when there was no VVIP on board!

In March 1995, 'The Queen's Flight' ceased to exist, and was combined with 32 Squadron based at RAF Northolt in West London, which is used for transporting VIPs. The new unit was renamed as '32 (The Royal) Squadron', and now comprises the fleet of Wessex helicopters and BAe146 jets from Benson, with the Gazelle helicopter and BAe125 executive jets of the former 32 Squadron. In conjunction with this merger, the callsigns used by VIP and VVIP flights has been changed. When you hear a 'Kitty' or 'Kittyhawk' flight working Architect you cannot easily tell if it is a BAe146 or a BAe125 jet, unless they say so. The number suffix used to be fairly standard, in that '1' to '5' were BAe146 aircraft and '6' and '7' were the Wessex helicopters. Now, they use a 4-digit number between 1000 and 1999, or use the old single-digit system, but you cannot tell what type of aircraft you are hearing! They also use an 'R' suffix when the VVIP is on-board (maybe it stands for Royalty?), so you may hear callsigns such as 'Kittyhawk 1261R' or 'Kitty 7R'. The Wessex and Gazelle helicopters do not have any h.f. comms equipment, so you will not hear them working Architect.

The BAe146s have retained their old Selcalls, and all the BAe125s have Selcalls, so here is a list to help you identify which aircraft you are hearing:

XX507	BAe125	AH-CK
XX508	BAe125	AH-CL
ZD620	BAe125	DJ-FH
ZD621	BAe125	DJ-FK
ZD703	BAe125	DJ-FM
ZD704	BAe125	DJ-FL
ZE395	BAe125	AH-DF
ZE396	BAe125	AH-DJ
ZE700	BAe146	LM-BD
ZE701	BAe146	LM-BE
ZE702	BAe146	EM-BQ

The first column lists the individual aircraft serial number; look out for these on the TV news when they show VVIPs arriving at an airport.

I have also seen logs where people have reported hearing the callsign 'Britannia' on 4.742MHz calling for various 'Kitty' flights. This is actually the Royal Yacht HMY *Britannia*. Other callsigns associated with the Royal Family are 'Rainbow', 'Leopard' and 'Unicorn', but I have not seen these reported since the start of April when the two squadrons combined.

The photograph on this page shows one of the Wessex helicopters of 32 (The Royal) Squadron; it is bright red with a blue horizontal band across the middle. Although the picture was taken a few years ago, they still look exactly the same today.

Bosnia

Dave B. from Merseyside writes to say that he has found another very active frequency being used by the UN forces in the blockade of the former Yugoslavia. The frequency of 7.9025MHz is being used extensively for blockade operations in the Adriatic Sea, with station 'MS' being the Net Control Station. There is a lot of communications between units (presumably ships) with 'tri-graph' callsigns, and frequent mentions of 'Ponies' (helicopters). There are also reports of ships being boarded and searched, with details of their journey being passed back to 'MS'. Dave also mentions a few other frequencies which are connected with Bosnia; he says to try the following: 14.4925 (daytime spare frequency), 5.4315 (main Naval blockade net).

Traffic Log

(all frequencies in MHz, all times UTC)

4.9735	(24/6, 15.50 onwards; 25/6, 09.00 onwards) Z30B calling 'any station on this net', and was answered by 22C; they QSY'ed to frequency **'TJ'**. Z30B and 22C appeared on 5.343MHz where they joined stations Z52 (Net Control Station), 14B, Z24, 89A, 80A and Z74. At one point, several stations QSY'ed to frequency **'YT'** (which was 4.478MHz), and several to 'OB' (which was not found). This was the annual Combined Cadet Force radio competition known as 'Summer Wine'.
4.9735	On the 25th, 80A was Net Control Station, working Z72B and 89A. They QSY'ed to 'HK' in AM mode, and appeared on 5.331MHz. This frequency was unusable so they QSY'ed to 'DT' (which was not found); they later appeared on 5.343 and tried to QSY to 'DT' again (so 5.343 Is not DT).
5.448	(6/7, 09.10) FYY42 and FYY44 passing practice messages to station BT9P, and then requesting weather forecasts for several airfields in northern England. The 'FYY nn' callsigns are used by navigator training aircraft based at RAF Finingley in S.Yorkshire.
8.122	(7/7, 05.00) 'Navigator' calling 'Barry Anne', but getting no reply. This frequency Is used by the Australian Navy, who refer to it as channel 'A4'. I suspect that these are callsIgns for ships, but I have no idea which ones.
8.764	(5/7, 22.33) NMN/Coast Guard Portsmouth with an electronic voice reading lat/long co-ordinates for the Gulf Stream in the Gulf of Mexico. It was followed by an announcement about a new free-phone number for reporting problems with the NMN service.
10.194	(15/6, 20.13) Sentry 03 working Trenton Military for a phone patch. There was no answer, so '03 said they would try again in 10 minutes. Another Canadian Forces discrete frequency?
10.780	(22/6, 22.03) Ascension working USS John Hancock, which was on stand-by for the Shuttle launch on 23/6 (which was cancelled). John Hancock wanted to know the SAR Monitoring frequency for the launch, and was told 5.711MHz.
11.059	(28/6, 07.10) SAM 677 working Andrews VIP on F365, Just establishing contact, with no traffic to pass at the time.
11.175	(28/6, 07.06) SAM 677 (A USAF Boeing E-4, see item on this page) working Croughton on a SAM mission, requesting some discrete frequencies from Andrews VIP. Andrews suggested F365 as primary and F461 as secondary.
11.175	(6/7, 19.40) 'Tailpipe Delta' calling Incirlik 'on 15.502MHz', but getting no response. In the following 5 minutes he also called for Incirlik 'on 8.967', 'on 6.750', and 'on 15.015', but always transmitting on 11.175MHz. Maybe 15.502MHz is a discrete frequency of some sort, but I don't know who 'Tailpipe Delta' is.
11.232	(15/6, 20.11) Sentry 03 working Trenton Military, requesting a phone-patch. Trenton asked them to QSY to 10.194MHz.

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

Amateur Bands Round-up

Listening to the Amateurs

Hello again! My anonymous correspondent - I'm working on him to let me give his name - is in a tizzy about s.w.r. (standing wave ratio) and its implications for the short wave listener.

If we imagine a perfect length of feeder attached to an antenna such as to create a high s.w.r., then all we would have to do is to transform whatever impedance the bottom end of the feeder presented, using an a.t.u. into 50Ω resistive, and our losses would be minimal - un-noticeable.

However, a practical length of feeder isn't perfect, it is lossy. Let's imagine a practical case, of a 28MHz 300Ω antenna, fed with RG174 coaxial feeder. The specification of the feeder is: characteristic impedance 50Ω, velocity factor 66% and attenuation 6.2dB per 100 feet. We'll stay with Imperial units to make it easier, and assume 16 feet of the feeder. Clearly the s.w.r. at the antenna feed-point is 300/50 or 6:1, but we find the s.w.r. seen at the bottom is only 3.6:1. Our feeder loss then, is seen to be about 1dB, if it is perfectly matched, plus another 2dB that results from the mismatch at the antenna end. Thus, even with a perfect a.t.u. we have lost 3dB, whereas with a non-lossy feeder almost all the signal would have reached the tuner and so the receiver.

Most modern antennas use coaxial cable, which is the lossiest. Why? Backalong, most amateurs used open-wire feeders, which are far less lossy but need to be home-made. Anyone on the M1 near Rugby will see it preferred there. An alternative is ribbon feeder that can be low-loss, but which develops high losses and changes of characteristic impedance whenever it rains! Both types need to be carefully kept away from lossy materials like brick walls.

Coaxial feeder, on the other hand, can be run anywhere within reason and the losses are tolerable given the s.w.r. at the antenna end is better than, say, 2:1. The only proviso is that the coaxial cable **must** be proofed against moisture or 'tolerable losses' will quickly turn into 'horrendous losses' particularly if the feed-point s.w.r. is high.

With any cable, the inherent loss in dB per 100 feet rises with increasing frequency; RG174 shows 6.2dB at 30MHz as quoted, but the same piece at Top Band shows under 2dB loss, while at 145MHz it would offer around 15dB loss!

Letters

Now to **D. L. McLean** in Yeovil. Don has been chasing DX for more years than I can remember, and he notes this time the amount of short-skip stuff heard on the 14-28MHz area. In the day there has been little DX about but the best times have been late afternoons into evenings on 14 and 18MHz and a few South Americans on 21MHz at the same times.

An oddity was the strange conditions sometimes on 18MHz around 2300, with signals from Europe, W6, W7, VE7, JA and VK. 14MHz gave A92MM, NU2L/VO2 (IOTA NA 044) KF6XC/KL7 (IOTA NA 197), NL7TB/KL7 (NA 197), VP2E/N4BWS, TI2CC, YO3YX/D2, ZD8ASI and 4U0ITU; on 18MHz the tally was A22BW, FS5PL, FY5FY, HR3/KC5MLL, J3/KB0QNS, J3/N3SIY, N7QXQ/HR6, P49T, PJ0/KB5DZP, S92SS, V31RD, VP2E/N4BWS, VP2MES, VP2MR, YI0EB, 4U/KC0PA, 8R1Z, 7W5J (a disguised 7X) and 9Y4NW. On 24MHz HC1JQ, IS0ZCV, KA1DWX were brought to book.

Now we turn to **Wayne Griffin** of Halesowen; Wayne has an IC-R70 fed from a half-sized G5RV arrangement up in the loft. Wayne wanted to do the Set Listening Period, but a sister-in- law's wedding rather upset the programme. However, in one hour Wayne logged Z31FK, K3DRP, RK9JWD, N2RIZ, UU7JF, YU1BD, WA2AB, W1KSZ, 9A1YA, YO3AFO, W3GOH, W2IY, SV1QN, SP4AWE, UT5UQH, LY2CC, KS4BF, UA2FO, LU7AZ, DA0WCY - a 'special' - RA6HVC, 4X6TT, YU1BD and 4N1KT. Wayne also notes that he listens to the 3.5MHz nattering as well.

Memories!

Nearly thirty years ago, a regular correspondent was **Norman Henbrey** in Northiam, Rye; how nice then to get a letter and an entry from him. Norman still has, operational, the KW77 receiver he used in those days, but he now runs either an NRD-525 or FRG-7700M as the mood demands, driven by a 3.5MHz end-fed half- wave. The NRD-525 was used for the first part of the period, to yield IK4UTT, LY3BKL, IK1LOC, G0ONH, CT1HB, EA3TT, IS0ZCV, UA3BZ, IK2RZQ, EI2GO, JH4HBB, LA7QHA, RW1ZZ/3, RA9FLF, SP7VCK, UU1JA, SP8GMU, SV9/G0NJZ/M, IV3XNF, OE1OOG, IK8VRQ, CN8LR, OH2BGD and UE1QDX in a couple of hours.

Question

A first letter from **Phil Townsend** in London E17, queries whether the period chosen for the Set Listening Period was a good choice. The morning period is probably the best time for DX chasing, simply because so many people in our time zone are not active! Turning to the list on 14.136MHz Phil noted TM5 and PG3GRI nattering with the TM5 claiming to be United Nations. Blatant piracy at both ends. SM5EBP, LA9ED, G0CXJ working G0TNA and HF0POL working G3JKU were also logged.

John Collins in Birmingham heard RN1HC, 7Q7JL with c.w. interference, CQ5B for IOTA EU-040, EU3FT (cards only direct to W3HCW) VP9IH calling CQ Europe, UG7ITU, 6X8BR and JW0C. This one will have closed down by the time you read this, but cards go to Box 9178 Svalbard.

Mark Malone next, from Great Harwood and Mark notes that at his listening times 21MHz is usually dead, though on one morning a quick spin round the band located VQ9LW, YI0EB and 9K2KO. At 18MHz CN8NY, CP8XA, JA4OND, TI5CGG, VP2MR, YV6QD, Z21CS, CU3YY, PJ8AD, TI7DBS, 4X6TT, 5T5BN, 7K2PMJ went in the book. For 14MHz the list was longer: A71A, A92Q, BV7GA, CN8LI, EA9AU, ET3AA, WB2LBF/FS, FY5FJ, HS0VBJ, HZ1AB, JA7AKH, KC0NA (Minnesota), NM3B in Pennsylvania, PP7GAG, XX9AS, ZF1UK, ZP6LA, 3V8BB, IK2BHX/4J0, 5N0QC, 5Z4PL, 7X2DB, 9K2YA, 9L1PG and 9Y4LR. Another sheet notes A61AN, A92MM, AP2AMM, BV7GA, CU3AG, CX7BV, EA9KS, JA1WCR, K6VX, K9DT, KH6AT, LU8ADX, OD5ZZ, PT2AZ, PY2ELV, R1FJZ (Franz Josef Land), S0RASD, S92YL, TU5CE, TZ6VV, VK3QI, ZC4RAF, 5Z4BJ, 7Q7LA, 9G1NS, 9J2AE, 9K2ZM, 9L1PG and 9M8DJ.

Ted Trowell notes that things haven't been too good on the bands this time around, but he did log, on c.w. only, on 7MHz CO2LT, OH0/DL7CF, ZL2AGY, TK/F8EL, TI2KWN, KE6CVH, PJ2AM, VK3RP, 8P6DY, AA6JZ/MM in the Caribbean and bound for Barbados, PZ1DV, W1CW/MM/R2, ZL3ABV and N2NU. At 10MHz 4U0ITU dropped into the bag while on 14MHz we see ZS95RWE, YI9CW, W7GWD, JA0DAI, EA6RA, ZB2FK, JA1NUT, JA9CWJ and OK1EE/OD5. 18MHz produced JA2SGH, 9K2MU, TA2ZW, 9M8FC, JR5XPG, 7N2PTB, EA6/DL1KBQ, PY2OW, WA7URE (Oregon),9Q2L, SV5/SM7DAY (Kalymnos Is), A71AN and ET3YU. At 21MHz we see CE6BCR, 7Q7LA, 9X/ON4WW, PU2MH, J28JA, ZP5XF, XX9MM, ZY2TN, PY2CJ, PY2OU, LU1EWL, YI9CW, 9Q2L and EA8BWP. On 24MHz the haul was YL2GP, YO4PX and SV8/DJ2GM/P, leaving 28MHz for DF5AC, 9A2SY, EA2ANG, LT1A, LV1V, OZ5DX, S51WD, N3RS and EA8AUP.

Mark Borthwick lives in Hawick where he found the bands pretty poor, with his only DX logged being between 0100 and 0700. 3.5MHz was used for GR8VE, GR4VEU, GR4SBL, GR5RR, GR0LAN, GB125BRC, GB0PSG, GB4CWR, GB4PAX, GX4CES, GC4RAF, PI45ZWN, Z22JE, ZS5J, CX2B, W1TRC, W2HTI and W2QN. Turning to 7MHz Mark mentions LU1RAZ, LU1PAW, LU2FYU, LU2ANN, LU2VD, LU5FHM, LU8VCC, LU9MBI, LU9FEC, LU9FIM, ZP1DW, ZP1ES, ZP1HTW, ZP1CM, ZP5UG, ZP5WYV, ZP5MGR, ZP6HW, PP2VB, PY2OCG, PY3JZ, PP5UA, YV4GD, YV5NKV, CX2TL, CX8BR, CE1RQB, CP6DA, 8R1Z, CO2VM, CO2DC, CM2YS, CO3BN, CM5EA, CO6ZG, CM6EL, CO7PF, HH2JO, XE1EPA, YN4CBL, HR2AES, TG8TA, VE2AUU, VE2MCZ, VE2QR and VK3BCY.

Denis Sheppard in Earl Shilton uses a KW-2000 that picked up Top band signals from GM4NQT, LY2ZZ, ON6IZ and SM6EOR; at 3.5MHz the take included CE8EIO, CG7H (a special for the G7 conference, Halifax, Nova Scotia), CO0OTA, HC1OT, HK4DHR, KP2AD, LU2SN, LU5ONX, LU8EEM, PY3CEJ, UA9CDC, VE3YJ, VK3EW, VK6APZ, V31RD, XO5FG, ZL3LB, 4U/KC0PA (Western Sahara), 9K2MU and 9J2GA. At 7MHz there were FS5PL, LU5EUC, PT7ASR, VE2RP, VK2ABN, and on 14MHz BV2FG and A92FZ. At 28MHz plenty of Europeans were noted, mostly by way of v.h.f.-type propagation modes.

SLP

No prizes, alas, for the last one as there weren't enough entries; but we'll set another one. A bit more flexibility; listen for any six consecutive hours over the weekend October 28/29.

That's the lot for another month. Thanks to all who wrote in to *DX News Sheet* under its new Editor, G4BUE, to *The DX Bulletin* and *The DX Magazine*. As ever, please let's have your letters reach me at the latest by the beginning of the month, to allow me time to put things together. Remember, I can **always** use more input!

Greg Baker, PO Box 208, Braidwood NSW 2622, Australia. Internet: greg@pcug.org.au

Bandscan Australia

I welcome any news and comments. In particular I am interested in any s.w.l. information on Australian stations heard by *SWM* readers so I can chase up more details and interesting snippets from this end.

News this time covers a wide range including news of troubles at Australia Television and possible effects on Radio Australia, a new Australian commercial radio and communications magazine and digital television. And although pay television courtesy of operator Galaxy is up and running with a massive print media advertising campaign I think it is about time I gave readers a rest from that saga and looked at other things.

Weather Halts Tower Project

Hobart's notorious Mount Wellington has claimed another victim. The National Transmission Agency (NTA) has been building a new 131m transmission tower atop this Tasmanian mountain to replace the 1960 vintage tower that is giving up its struggle with gales, ice, rain and snow. The new tower will be a 67m high concrete shaft supporting a 64m array of broadcasting antennas shielded by a fibreglass radome.

Although scheduled to be completed in April this year the weather at the construction site has been so bad that construction has been halted until warmer weather in October or November. In one 33 day period, the workforce was only able to manage five full days work and eight part days. To date, about 93m has been built and this will be secured until construction can recommence.

Australia Television

Having failed to attract significant sponsorship and run up cumulative losses of $A8 million (£3.7 million) Australian Television (ATV) has been bailed out with an interim $A2.5 million (£1.1 million) injection of funds from the Australian Broadcasting Corporation (ABC). This money will allow ATV to continue until June 1996, during which time the ABC hopes to make the service viable in one form or another. Annual operating costs of ATV are estimated at $A6 million (£2.8 million) that is twice the original estimates and annual losses are in the range of $A4 - 5 million (£1.8 - 2.3 million).

There have been a number of suggestions for clawing back this shortfall. One has been for ATV to trim its operating costs including persuading the government-owned and -operated NTA to waive its $A1 million (£460,000) annual transmission charge. Others more serious to the s.w.l. community have been to suggest have been to cut into Radio Australia (RA) funding by amalgamating the two overseas services. This proposal has the danger not only of reducing its already tight funding but of commercialisation of RA. Some commentators have suggested that the government could help by directing its own advertising effort - including bodies such as the Australian trade promotion organisation Austrade - towards ATV.

The pressure is on from other quarters too as the Indonesian satellite transmitting the ATV signal - Palapa B - is nearing the end of its working life. The Indonesians are reported to be keen to hear whether ATV will require a transponder on Palapa C.

Australian Television Content

The Australian Broadcasting Authority (ABA) has put forward a proposal to lift the minimum Australian programming content from 50% to 55% in the time period 0600 to midnight and to double first-run children's drama to 32 hours per year. The idea of Australian content is to prevent the swamping of Australian culture with foreign - particularly US - imported material. The aim according to ABA chairman is to confirm Australia's identity, character and cultural diversity. Networks will be allowed eight hours of repeats and be required to produce ten hours of documentaries. There are also rules for lead actors, supporting cast and production facilities and personnel.

Radio and Communications Magazine

Australia's two commercial communications magazines - *Amateur Radio Action* (ARA) and *CB Action* (CBA) - have merged to form the new and larger monthly *Radio and Communications* (*R&C*) magazine. According to the Editor, Len Shaw, there is and has been a strong overlap in the interests of CB and amateur radio *aficionados* and that large numbers of amateurs were introduced to the hobby via CB radio. As examples he cites shared interests in scanners, antennas, DX and communications software. He also points out that a 60% increase in printing paper prices would have meant large increases in cover prices for ARA and CBA that would have made their separate production less viable.

Writing in the first issue of *R&C* Len also makes a strong plea to allow no code amateur licences. He says that we are 'excluding hundreds, probably thousands, of potential amateurs by requiring them to pass a test that has no practical place in today's world'. That should stir a few people up!

The first issue of *R&C* runs to 100 pages and includes a number of feature articles - speech processing, v.s.w.r., number stations, the ultra-secret SPAM B2 in the first issue - and construction projects and a range of equipment reviews.

Regular features include 'Baudwalking' on the Internet and E-mail, 'WEFAX' on satellite communications, 'In Flight' on aviation monitoring, 'Packet Racket' on packet, Online 1995 on computers and radio, 'Hot Frequencies' for scanning enthusiasts, 'Gone Troppo' on amateur v.h.f. and u.h.f., 'DX and Band Report' on amateur activities, 'Shortwave Listening' on SWL, 'Here and There in Amateur Radio' on some amateur radio issues, talking points and trends in amateur radio, '11m DXinternational' on CB DX, 'Propagation IPS charts' and DX Update on Amateur DX. The price is $A3.95 that translates to about £1.80 an issue. I have no subscription information but Len Shaw is at **shawlen@werple.mira.net.au** for those who want to chase it up.

Digital Television

The ABA has released an expert report on the next generation of television broadcast technology in Australia. Digital terrestrial television broadcasting (DTTB) is billed as providing Australian audiences with cinema quality picture and sound and interference free reception.

Because there would need to be a phase in period for DTTB the report notes that frequency space will need to be found for the new services in the u.h.f. spectrum to run in parallel with existing PAL services. The report also examines the possibility that some urban services may be allocated to v.h.f. Band III frequencies. Other issues include the difficulties and expense of using Australia's existing 7MHz channel separations in face of US and European systems designed for 8MHz separations. My feeling is that it would pay Australian authorities to watch for convergence between US and European technologies and go for the winner in the technological tussle. Fortunately, dates for the introduction of DTTB and phasing out of PAL transmissions have yet to be determined.

Other News & Information

Australia's Special Broadcasting Services (SBS) - the network specialising in foreign language programming - has its Internet World Wide Web home page at **http://acslink.net.au/~tomw/sbs.html.** At this stage it is fairly basic but does provide a mission statement, a definition of a multicultural society and details of SBS radio and television and answers the question What is SBS? The SBS home page has links to the home page for Michael Lee, the Minister for Communications and the Arts and into other Australian government services. Lee's Internet address is **minister@dca.gov.au.**

Another Internet home page is Australia's Ionospheric Prediction Service (IPS) with home page at **http://www.ips.gov.au/**. Through this page web surfers can access the current IPS solar terrestrial report, other reports and summaries and a series of images. Some parts of the site are under construction but the report from the IPS Sydney Regional Warning Centre brings a range of data including the Australian region ionospheric summary and forecast, Australian foF2 ionospheric values, a geomagnetic summary and forecast, Learmonth magnetometer data, Learmonth K-indices, solar summary and forecast and a current Learmonth solar image.

I can't claim to understand all of the numbers but it is certainly comprehensive. The IPS page leads into a myriad of other relevant Australian and overseas services. Interested users can also subscribe to mailing lists to receive up to date solar and geophysical data. Comments and suggestions to **www@ips.gov.au.**

The ABC is working through overseas news gathering arrangements with the BBC and the Canadian Broadcasting Corporation. The aim according to the ABC managing director is to improve services by sharing facilities. Unions are justifiably concerned that it will lead to staff losses in the long run and are concerned that the move may have some connection with the diversion of large slabs of ABC funds to prop up ATV.

My address is PO Box 208, Braidwood, NSW 2622, Australia. For personal replies please send 2 IRCs. Those with an Internet connection can now get me at the address at the head of the page.

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

Airband

Grob 109B.
Christine Mlynek.

Did any of you take up the *SWM* reader's offer of piloting the flight simulator (see last month)? If so, you could write in and share the experience! Geoffrey Swaffield (Wallington) tried it, finding it a bit different to the light aircraft with which he is more familiar. But, it was good fun!

Mayday

When an emergency arises that is serious enough to threaten life, a Mayday call should be transmitted to the air traffic unit that is currently being worked. However, many aircraft are outside regulated airspace and might not be in touch with a suitable unit. In this case, a call on the international distress frequency 121.5MHz is advised (aircraft crossing the North Atlantic also monitor this frequency so it's still worth a call in this area).

Nerd NC. 858S.
Christine Mlynek.

So, asks **Brian Taylor** (Woking), just how is your position pin-pointed on 121.5? Various relay stations around the country pick up the signal and send it by land-line to either the Scottish or London Area and Terminal Control Centres. The Distress and Diversion cell (D&D, affectionately known as 'Death & Destruction') at each centre receives the message. Whereas it helps to know the nearest centre, in practice it's acceptable to put out your call and see which one answers. Coverage below 3000ft altitude is unreliable.

If more than one relay station receives the call, auto-triangulation comes into effect. The receiver is equipped with a direction finder and so a line can be drawn on a map to show which way the aircraft is lying in relation to the relay station. A second station can draw another line that will intersect the first, giving a position estimate. Further bearings from other stations are sometimes available to increase accuracy. This all happens automatically on a wall-chart display, although I should mention that some of the elevated terrain in the more northerly areas is not well served by this system.

If all else fails, D&D controllers can ask the pilot for details of the surrounding area and then work out the position from the topographical maps. Sometimes, a little local knowledge helps too!

These days, many light aircraft are equipped with secondary surveillance radar transponders (I'll tell you more later in the column) and dialling up a code of 7700 will get the alarm bells ringing at D&D. In this case, position fixing is immediate as the controller simply looks on the radar screen. The advantage is that some places with poor radio communications cover can still be seen on radar.

Information and Equipment Sources

Peter Goodchild (Basingstoke) notes that *Pilot Magazine* (available at newsagents) sometimes carries articles that describe the application of aeronautical radio. This publication will appeal to readers who are more deeply involved with actual flight.

A quantity of headphones and spares is for sale by **Robert Wright** (247 Sandy Lane, Hindley, Wigan, Lancashire WN2 4ER, Tel: (01942) 255948). Included are ANB-H-1, CQF-49456, PDR-8, R-14 and R-30-E. Some of these have historical value but might still be good for listening (especially on c.w. in some cases).

Follow-Ups

In the July issue (page 68, 'You Write'), Robert Hall (South Africa) asked about a possible emergency involving a United B.767. Robert found more details in an American newspaper. When one engine failed, cabin pressure could no longer be maintained and it was necessary to descend. This further compounded the problem since communications became difficult from low altitude over the distance involved. The flight arrived safely at Bermuda, unable to apply reverse thrust as the asymmetric power would have pushed the aircraft off the side of the runway.

There must be some interesting lessons that extended-range twin-engine operators could learn here. I know that a single engine failure doesn't mean that the aircraft drops out of the sky, but another justification for extra power plants is the services that they provide. Part of the compressed air flowing through the engine is diverted into the cabin so as to maintain pressure. This represents a power loss, as thrust is sacrificed. Other services such as anti-icing have the same effect. The remaining engine is now struggling to cope with all these demands on its own. The necessary height loss seems to have made things worse in this case.

Frequency and Operational News

As previously explained here, 612 Volunteer Gliding School is moving its Grob 109s from Halton to Abingdon (although other Grobs will remain). According to *GASIL* 3 of 1995 (from the CAA) Abingdon Radio will be on 129.975MHz which, looking at my information, was not one of the original frequencies when the airfield was last active. Also from the CAA, in *AIC* 56/1995, the TACAN at Wick (WIZ, 113.6MHz) has been withdrawn.

Following up from last month, 118.25MHz at Cranfield still has direction-finding (VDF) facilities but is not monitored as an initial contact frequency. Initial calls (with VDF available too) should be on 122.85MHz.

In the Cockpit

Last month I introduced Secondary Surveillance Radar (SSR). An airborne transmitter sends a signal to the ground-based radar, enabling a strong, clear image to paint on the controller's screen. Alongside the target symbol (representing the aircraft) there appears a 'squawk' code as transmitted by the aircraft. The four-digit code is dialled up by the pilot, in accordance with the controller's instructions. Last month's photo showed an SSR transponder control panel with the code 7000 set on it.

Now I'll explain what the codes mean. 7000 is the conspicuity code as set by aircraft that aren't under radar control. They might be flying within the coverage of a controller's radar and yet remain outside controlled airspace. Code 7000 says to any controller who sees it: 'I'm here, I'm not coming into your airspace, and you can see me clearly so as to confirm my movements'. The code is not in any way highlighted on the radar screen despite being called 'conspicuity'. With the vast number of light aircraft displaying this code, it is often the most frequently seen squawk. Even some balloons carry a transponder.

Another non-radar code is 2000. This is where the aircraft is not expected to be within radar cover, but is under control. In this case, the technique is known as procedural control with the aircraft reporting its position to the controller over the radio. This often happens in Greece, for instance. However, there might be some nearby radars in use (e.g. in adjacent countries, or for military purposes). Pilots squawking 2000 while under Greek procedural control will tell you that their transponders are occasionally interrogated by radar. Each time the transponder replies, a light flashes on the control panel. In last month's photo you could see the light. Under each number-window is a black knob. The (green) light is between the knobs.

Never forget the emergency

codes! I explained 7700 above (see 'Mayday'); 7600 means that the communications radio has failed and 7500 signifies 'unlawful interference' i.e. hijack. There's another way to warn of radio failure. An aircraft seen on radar to fly clockwise in a triangle is indicating transmitter failure, the opposite direction means total radio failure.

Some special-purpose codes. If dropping parachutists, 0033 is set; for free-falls commencing above FL100 this is mandatory. Observation flights operating under the 'open skies' treaty squawk 7007. In the London area, 0020 is squawked by the G-HEMS medevac helicopter.

In general, each air traffic service unit in a given area has its own block of codes that it will allocate in turn to each aircraft that comes under its control. Trying to keep track of loads of 4-digit codes all over the radar screen isn't easy. The radar equipment incorporates a computer that is loaded with a look-up table. When the squawk is known, the aircraft's flight number, callsign or registration can be looked up. It is this information that is displayed on the screen. Remember that the aircraft only sends a 4-digit code; it's the ground-based computer that translates the code into a flight number and this process is called 'code-callsign conversion'. It's also possible to tag the flight number with the aircraft's destination, usually as the last two letters of the ICAO aerodrome locator. For example, LL will show up if the flight is going to Heathrow (as the ICAO designator is EGLL).

As well as the basic squawk code, the transponder is also able to transmit flight level. This is the altitude reading that would be obtained with the altimeter's sub-scale set to 1013mb. If the actual setting is different, the transmitted level and the altimeter indication won't be the same. If it appears that the transponder is mis-reading then the controller will ask the pilot to squawk 0000, indicating that the radar image is now unreliable.

Some history. SSR first began in the second world war as IFF (Identification Friend or Foe). The allies had the advantage of more highly-developed radar, and introduced a method of signalling to ground stations that the received image was of a friendly aircraft. This was later developed into the SSR system we know today. Some continental pilots still call it IFF! It was vital that the enemy was never able to fool our radar by sending out the 'friend' signal; so it was hoped that no IFF units would fall into enemy hands. In case an aircraft carrying IFF equipment crashed behind enemy lines, all IFF sets were fitted with self-destruct explosives. If you are ever offered such a piece of equipment, make sure it's safe before handling it! Next time, I'll develop this subject further by explaining the three main transmission modes of modern airborne SSR.

The next three deadlines (for topical information) are September 15, October 13 and November 10. 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).

Yakovlev YAK-52.
Christine Mlynek.

Abbreviations

AIC	Aeronautical Information Circular
B.	Boeing
CAA	Civil Aviation Authority
c.w.	continuous wave (Morse code)
FL	flight level
ft	feet
GASIL	General Aviation Safety Information Leaflet
ICAO	International Civil Aviation Organisation
mb	millibars
MHz	megahertz
TACAN	TACtical Air Navigation

John Griffiths, c/o 22 Ffordd Beibio, Holyhead, Gwynedd, North Wales

Scanning

First, an apology. If you've written to me recently and have not seen your name in print, don't despair! In between ending college, finding temporary accommodation between terms in June - September, and starting work during the vacation plus running the car to various shows, I've mislaid some of the letters I tend to use to fill the column with. I'll get them....once I've organised my filing system again! Once September comes and I'm back to square one - and better organised, of course - we should be back on track. Meanwhile, keep the letters coming!

There's some interesting mail this month, covering the usual wide variety of topics associated with scanning. One interesting postcard came to me via Quiberon and **Godfrey Manning** who writes the 'Airband' column in the magazine. Godfrey had just come from a bridge visit aboard the ferry *Acadie* and reports some facts about the equipment carried. The vessel's callsign is FV 7722, that she would use in communications with other vessels and shore stations on h.f. (m.f.). For example, if calling coast radio stations. For v.h.f. comms she would use her name. Built in 1971, she maintains a watch on the international distress frequency of 2.182MHz and v.h.f. Channel 16. Her port ops are carried out on Channel 9 and the company ship-to-ship channel is 15. She trades between Quiberon and Belle-Ile, in Brittany, with a sister ship. My thank's to Godfrey for that and no, it wasn't me at Wendover Canal Festival with my Clubman! I was at Coombe Abbey, however, at the Mini Owners Club first National!

A letter from **W. B. Atkinson** of Denton, in Manchester, included a press clipping concerned with the story of how a rogue EPIRB sparked off a full-scale air sea rescue search. The EPIRB in question - one of many false alarms that go on at the rate of 96% according to the Radiocommunication Agency - was just one of many incidents discussed at a conference in Manchester in May of this year. It was found in a bag at the airport after being pinpointed by investigators. Other discussions told of High Frequency industrial drying ovens and illegally modified CBs causing interference to Greater Manchester's Fire Services and also the sad case of a watchkeeper on a berthed ship at Barrow who left the handset switched on - blocking out Channel 16 and imperilling the lives of many users by this action. This time, I'm glad to report that no scanner users were mentioned - showing that the RA also hassle service users - but illustrating quite clearly that even qualified users can make mistakes. Mr. Atkinson questions the ease of purchase of equipment such as this - perhaps second hand or even stolen - and wonders if it is not time such equipment carried a warning regarding its capabilities? EPIRBS do not ' sound off ', and you have no indication from the set that it is working - until a rescue helio appears. overhead! However, many people would not know what it looks like and therefore would not have a clue about the capabilities of the set. It brings to mind the true story of an offshore worker - from one of the rigs - who pinched a beacon,'for fun' whilst offshore and, on arrival home, threw it on top of his wardrobe....

....to be woken, during the early hours of the next morning, by a Coastguard helicopter hovering above the house! Yes, a prosecution followed - and rightly so. Word of advice, be careful when buying at boot sales if you're unsure of the equipment being offered.

R. Dalton of Ashford, in Kent, writes in asking where he can hear the UNPROFOR Bosnia ops. Not on v.h.f., I'm afraid! This operation is mostly h.f. work, and you'd need a high frequency receiver to be able to monitor any Bosnian ops. There are many frequencies available but I would point you in the direction of Graham Tanner who edits the 'SSB Utility Listening' column in the magazine. This is where any s.s.b. utility workings would be. Scanning ranges are mainly UK based! Again, Interproducts carry a title concerned solely with this sort of listening and I'd advise you to search out their ad on page 75 and get a copy of their list.

John Hepburn writes, again, with some interesting aircraft frequencies gleaned from a sortie at Newcastle airport. Using a PRO-50, John allied this to his existing PRO-30, and set out to monitor as much as possible. I've reproduced them here, with the additional gen that most are ground services.

John goes on to say that you don't need an a.m. radio to stay busy at airports and I agree with him! Monitoring is not just about flights - and extra activity only adds to the sense of knowing what's going on. Many thanks for those, John.

A letter from **Paul Dexter** of Shipston-on-Stour asks if anyone is interested in monitoring Fire Brigade transmissions? Paul wonders if whether anyone would like to correspond with him on this aspect of utility monitoring and, if so, to contact him at: 6 Gerrards Road, Shipston-on-Stour, Warwickshire CV36 4HH.

Paul also mentions the letter from a reader experiencing interference by a data signal - possibly from a mobile data unit - to airband comms. He suggests that the signal could well be from this source. His answer? When the interference starts, look for a fire engine! If one leaves the station shortly after the data burst, then this is the problem. If not, then it isn't. So simple as to be obvious, really!

Again, Paul mentions that I'm reluctant to publish Police frequencies, but have no qualms about doing the same for other users. I agree that this is a bit of a grey area but the publication of Police frequencies seems to me to be courting trouble. Ambulance frequencies are put in as a 'maybe' - you may find them there or you may not. However, by using the word 'police', I feel I'm opening myself to prosecution simply as I'm suggesting they are there. Does that make sense? I believe that the day I publish one frequency and tie in it with a particular force is the day I'll have a visit or receive a summons. In my position I have to be very careful about this and while I'm not backing down, I don't believe in courting trouble either! Best left as it is, I think!

Whilst in this area, it's time I very briefly outlined MASC - Marconi Advanced SCrambler - which is slowly but surely coming in on 'sensitive' frequencies. In its most simplistic form MASC is a circuit board that can be fitted to radio sets to block off reception by unauthorised users. It uses analogue methods - known as spectral rotation - that changes the audio frequency of voice. It mixes, if you like, the frequencies in the human voice with a higher audio frequency and results in the 'Donald Duck' copy you may hear on the air. You may be able to ID the odd word here and there but otherwise it's unintelligable - and therefore secure.

Key numbers are programmed into the circuit board - there are about 100 000 000 000 different combinations available! This allows keys to be changed should the set fall into the wrong hands, thus making it useless at a stroke to the 'new owner'. MASC transmissions are recognised by small data bursts at the start and end of every transmission. These bursts give the ID to a control room operator of the officer calling in, and are useful in making a 'silent ID' if there is trouble - if attacked, for example, the officer does not need to do anymore than press the p.t.t. switch.

MASC is recognised by the Home Office and ACPO - Association of Chief Police Officers - as being a system that will ensure 100% secure transmissions in the future although many police forces and special units already have MASC capability. Some examples are the Philips PRP74 u.h.f. hand held, the Icom IC-H10SR v.h.f. hand-held and the Racal Cougar PRM 4515 - known in the military as PRC 394 series. PRC 394 = personal. 395 = base. 396 = vehicle. 397 = manpack. These secure sets mean that interception of frequencies is impossible for the average scanner owner and should a descrambler become available for systems like MASC, then I would envisage severe retaliation by the Home Office, the RA and Police

NEWCASTLE AIRPORT GROUND SERVICES

119.700	Tower. a.m.	456.975	Brittania Airways.
124.375	Approach. a.m.	458.375	Internal Paging.
455.650	Grass Cutting.	459.125	Brittania Airways Cleaners.
455.750	Tower.	459.325	Passenger Control.
455.812	Baggage Handling.	459.400	British Airways.
456.137	Stores.	460.112	Passenger Info.
456.450	Airport Security.	460.925	Airport Mobiles.
456.450	Engine Fitters.	461.100	Tower. f.m. - and following.
456.612	Tower.	461.112	Luggage Control.
456.662	Stands Services.	461.162	Baggage Loading.
456.900	Refuelling.		

Authorities. The future of interception of such transmissions grows less and less as many military trained communications system experts freelance for work outside of the dwindling defence market. Even if some of those experts build a descrambler, the marketing of it would be instantly banned. Rightly so, given the sensitive nature of police work.

Paul Wey, who edits and produces *The Scanning Report* has sent me a list update and, whilst looking through it, I've noticed many frequencies marked as 'Unid' - radio shorthand for unidentified. Can any readers place positive IDs on the following frequencies? All are in the Birmingham / West Midlands area.

441.925 / 453.925
443.025 / 456.525
453.050 / 453.125
453.700 / 441.150
456.800 / 453.175
461.3375 / 164.975
461.3375.

My own listings show these to be in various areas - but I hesitate to use them as I feel certain they're wrong. I'd be grateful if any readers could possibly ID them. If they are 'sensitive', then I'll communicate with Paul direct. Please send in all lists to the column.

Plug now for a club I'm a member of. Numbers monitors will know about ENIGMA - the European Numbers Information Gathering and Monitoring Association - and I have written a piece which will shortly appear in the magazine entitled 'Counting by Numbers'. Very briefly, if you are caught up in wondering what numbers stations are about, what single letter beacons do and who on earth 'The Lincolnshire Poacher' is, why not write for further information to:

BRC Enigma Newsletter, 17-21 Chapel Street, Bradford, West Yorkshire BD1 5DT. ENIGMA can be E-mailed on the following: **mikec @ praxis. co. uk**

That's All

To round off this month, I'm enclosing a list of airband frequencies heard here at my temporary location in Steeple Claydon, Bucks. It should illustrate how lucky I am being 'dah'n sarf' - and on top of lots of action! The following were heard on the VT-225 and AoR AR-2000, on whips. I've yet to get my antennas up for h.f. and v.h.f./u.h.f.

In the meantime, good listening - and keep on writing!

STEEPLE MONITOR VHF/UHF AIRBAND

Morning period (10am - noon.)

Frequency	ID	Comments
119.000	Juliet Romeo	Brize Radar.
123.200	UNID	UNID - ID Req.
123.300	Benson.	
126.550	Wycombe Air Park	ID needed.
128.600	VOLMET	LONDON South.
129.550	'X-Ray 2'	Luton.
315.750	Uniform 71	Possibly Bulldog of UAS TXing to Lyneham / Abingdon SRE or Benson. Note - was heard asking for 'VMC on SRE'

Lawrence Harris, 5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB

Info In Orbit

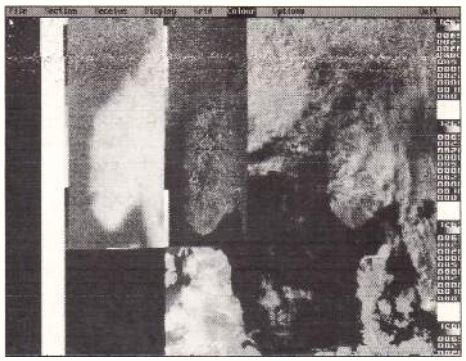


Fig. 1: OKEAN-4 image. 1 July 1995.

Those who received the Kepler elements printout at the beginning of July may have been surprised by my written addition that METEOR 3-5 was going to be switched off from 6th!

The mailing list for Kepler elements is now split into two groups - those receiving printouts at the beginning of the month and those receiving them around the middle. Where information on future METEOR/NOAA operations becomes available, it can be included.

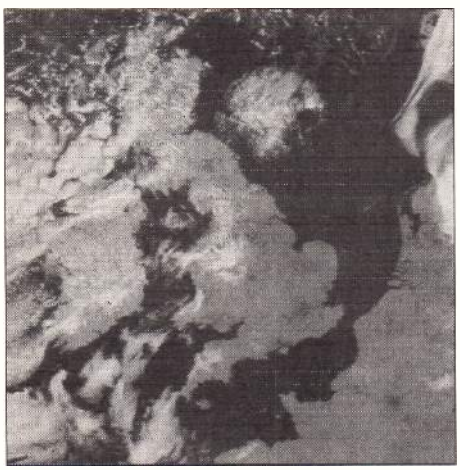


Fig. 2: NOAA picture of Britain. June 1994 from Cedric Roberts.

Current WXSATs

As intimated above, METEOR 3-5 ended its long run of sunlight operations late on July 5. This WXSAT was approaching the terminator where illumination is poor, so was a candidate for a rest period. This was the first time that I have been able to find out in advance, what was planned. METEOR 2-21 continued to transmit telemetry in sunlight only, and continues to suffer from an antenna problem, resulting in poor signal strength during parts of most passes.

The WXSAT NOAA-9 came back on earlier than one might have anticipated, following its period of pass co-incidence with NOAA-14. While NOAA-14 is travelling north-bound during early afternoons, NOAA-9 is simultaneously travelling south-bound. Periodically they overlap, and during this period, the resulting mutual interference causes noisy pictures.

NOAAs 10 and 11 are no longer fully operational, but both WXSATs are activated by NOAA (The National Oceanic and Atmospheric Administration) controllers once per day to monitor the onboard systems.

OKEAN, the CIS oceanographic satellite, continues to amaze with its multi-spectral pictures - on some occasions nearly all the way down Britain - finally switching off around Bristol! For several days we experienced the south-bound satellite transmitting radar, visible and microwave images during passes that were almost overhead in some instances. **Steven Rake, Jim** and **Hilda Richardson** and I recorded a selection of passes, and no doubt others did as well. Steve, Jim and Hilda sent pictures on disk - identical to mine. My favourite of the sequence is this one - down across the UK.

OKEAN transmissions do not normally contain just one spectral image. For comparison, METEOR WXSAT transmissions contain either visible-light images or infra-red, and for a long time, they have only transmitted during the sunlight portion of their orbits. NOAA telemetry almost invariably includes both infra-red and visible images, and during the night-time part of their orbits, this changes to two infra-red channels in slightly different sections of the spectrum, of which one is described as water-vapour infra-red.

Contrastingly, OKEAN carries a microwave sounder and a radar imager, as well as a visible-light scanner. You can see all three images in **Fig. 1**. the first is the sounder, the second is the radar image, and the larger section contains the visible-light image. As can be seen from this transmission, the radar section is short - presumably due to power constraints.

The number sequence shown on the right edge of the image, represents the status of the on-board hardware. One number can be seen to increment each minute - this is the elapsed time since Moscow mid-night.

Letters

It is gratifying to see the interest shown in WXSAT monitoring, and many letters, pictures and disks have been received. There is a feature on readers' pictures in a future Special Edition later this year.

Meanwhile, amongst a colourful batch of prints from **Cedric Roberts** of Halesowen, came **Fig. 2**, a NOAA picture of Britain from June last year. Cedric uses a Dartcom system and colour printer.

Roger Ray of Telford now uses a laptop computer running JVFAX version 7, fed by the Martelec interface unit. Roger monitors a number of WXSATs and sent a variety of NOAA and METEOSAT pictures, from which I have selected the NOAA-14 north-bound pass taken on April 2. This shows Spain, Europe, Italy and the UK almost devoid of cloud - a weather situation that has typified spring/summer 1995.

Roger comments that his laptop computer generates less r.f. noise than his desktop machine, producing better overall coverage.

Remember That SAE

I occasionally receive letters requesting considerable amounts of information. One asked for circuit diagrams, lists of addresses of people who might do construction kits, advice on receivers, decoders, image processing, and what else was needed as well as a computer! The correspondent failed to even enclose an s.a.e. As many readers know, I do respond to every letter when a stamped, addressed envelope is included. If you write from 'abroad', please enclose an IRC - international reply coupon.

Geostationary wxsat News

The ending of METEOSAT-3 WEFAX telemetry means that westerly counties of the UK can now receive almost uninterrupted, direct 1691.0MHz WEFAX from GOES-8, currently positioned over the eastern coast of America. From Plymouth, this WXSAT is about 3° above the western horizon.

An improvement in the quality of GOES-8 WEFAX pictures can now be seen. Until July 10 at 1500UTC, the WEFAX images, and other products, were generated using pixels having 4-bits width, that is 0000 - 1111. This corresponds to 16 grey shades. From that time on July 10, the sensor pixel width was increased to 8-bits, that is 00000000 to 11111111, resulting in an increase to 256 grey shades, and a marked improvement in contrast.

Another significant change in GOES-8 operations started the same day with the dropping of the tropical east and tropical west sectors. The areas covered by these sectors were already included in the NE, NW, SE and SW sectors, so there is no loss of coverage of the USA. I have asked the operations staff whether we might have some whole-disc GOES images.....!

GOES-8 provides a superb collection of images, including some obtained by NOAA-14 during its passages over the poles. During future editions of 'Info' I hope to slot in the occasional image, by way of illustration.

GOES-9 remains in testing mode for some weeks, and is scheduled to finally replace GOES-7, which then becomes a stand-by WXSAT.

GOMS (ELEKTRO) - Scoop?

I have been making enquiries through a very helpful scientist who has contacts within the Russian Air Force section that deals with the GOMS (ELEKTRO) satellite. He called the Mission Control Center, who replied "No, it is in very bad state". Soon after, RSA released information that ELEKTRO was quite good, apparently contradicting his comments. My friend wrote to me saying "in fact, it is simple - there are real facts and there are official releases. But, since I have no deal with GOMS, I do not want to explain something that concerns ELEKTRO. Between us, this satellite was ten years in dock and was launched as fast as an A-bomb missile should be launched!"

Australian Amateur Rocketry

A slight deviation from our normal coverage of space matters but I am sure many readers may be interested in hearing about the latest exploits of the Australian amateur rocket group. Australia has its own space programme, funded by the Australian Space Office (ASO), with a budget, so I understand, of A$9M in this financial year.

The amateur rocket group receive some funding from the ASO, as part of its educational programme, as well as support from other industry and government organisations (mainly in equipment and supplies) and from annual membership subscription fees.

Ausroc II-2 is an amateur rocket built by the Australian Space Research Institute (ASRI). It was launched on 26 May 1995 from the Woomera Instrumented Range and reached an altitude of just over 2km and a range of about 6km.

Fig. 3: NOAA-14 picture April 2 from Roger Ray.

The rocket had 13 sensors on it, including those for monitoring static and dynamic pressure. The apogee searching program used static pressure and a timer to determine when to deploy the parachute. However, the program did not start since it did not detect that the rocket had launched. The engine chamber pressure was used as one of the criteria for detecting launch, but the threshold was set at 2MPa, the normal operating pressure of the engine. The actual maximum pressure reached was 1.3 MPa. The cause of the under-performance is still under investigation but is concentrating on the LOX tank not maintaining its expected pressure. The LOX valve has been ruled out as the cause of the failure. Ausroc II was designed by Mark Blair, while he was an undergraduate. My thanks to Steven Pietrobon of the Satellite Communications Research Centre, University of South Australia.

Beginners - Getting a Good Quality WXSAT Signal

Last month I mentioned that receiving a signal from a WXSAT is not difficult; between two and four operational polar orbiting WXSATs pass over the UK several times each day, so a general purpose scanner, fitted with a length of wire - even indoors - can pick up a signal. The average power transmitted by the WXSATs varies between 3 and 5W; ample for most antennas.

So, if your interest in monitoring WXSATs is limited to getting some sort of signal into your scanner, you need use no more than any conventional antenna; discones, v.h.f. antenna, dipole, Yagi, Lindenblad, or random-length wire.

Of these antennas, the discone is likely to be the least sensitive, having an extremely wide frequency band for general reception. Most discone users fit a wide-band pre-amp at the discone end, and can expect to receive signals over an extremely wide range of frequencies. Using such a discone and pre-amp, feeding my wide-band scanner, I have easily picked up the 400MHz transmissions from navigation and military satellites of the COSMOS series.

Many of the letters that I receive from beginners comment that they can already hear the WXSATs on their general purpose scanners, and want to know what extra equipment is required 'to decode the signal'. Unfortunately, the answer is far from straight forward, because of two separate problems that are not obvious to the beginner.

Make Your Own?

To tune to the 137MHz carrier coming from the WXSAT, we have to use an antenna that is both tuned and properly designed. Several types are possible; the most common being the dipole. It is not difficult to make your own dipole at little cost:
First estimate the length:

wavelength = speed/ frequency
i.e. approx 300 million miles per second/137 500 000Hz

The result: wavelength = 2.18m.

This is the true wavelength - but a rather unwieldy length. It is easier to cut a dipole to a fraction of this dimension: half-wavelength = 1.09m quarter wavelength = 0.55m

We must allow for the change of velocity of the wave within the dipole - it is about 5% slower than in free space:

actual total length across half-wave dipole = 1.145m.

This is a convenient length, corresponding to half a complete wavelength, therefore called a half-wave dipole. There is no mystery about using a 'half-wave' instead of a 'full-wave' dipole. The generation of 'resonant' signals in a length of wire is a complex subject, but for a specific wavelength, multiples and sub-multiples (we call them harmonics) of this wavelength are all generated by the passing WXSAT (or pager!). We can therefore use shorter lengths of wire than seem suitable at first sight, using these calculations.

Signal Polarisation

A properly cut dipole can receive the 137MHz (a.p.t.) signals, but the received strength will only be about one-half of that available. WXSATs of the present generation scan the earth by rotation about their own axis. This rotation affects the nature of the f.m. signal, that contains the picture data in the telemetry transmitted by the satellite. Its spin imparts a circular polarisation to this downlink 137MHz band signal, that means that any antenna to be used for receiving this signal, must be circularly polarised. A number of types of antenna can fulfil this requirement, so the potential user does have a choice, although the frequency band limits this choice somewhat!

Most WXSAT monitors use the conventional crossed-dipole, phased for right-circularly polarised signals. Phasing is normally done by fitting a phasing-harness; this is an accurately cut length of 75Ω cable, connecting each of the dipole pairs together, so that their signals add constructively to produce the final signal. If the cable length is wrong, or if it is fitted wrongly (connections reversed), the resultant signal will vary wildly, producing unsatisfactory results. Testing a new antenna should be done at ground level before final installation!

Next time we shall look at what the receiver has to do to get a good quality signal out of the 137MHz carrier received from the antenna.

Bulletin Boards

If you have a modem fitted to your computer, you can contact a few BBS that may provide information on WXSAT matters to a varying extent. The following are the main ones - in alphabetical order - that carry relevant information.

Dartcom on (01822) 88249 (protocol 8 bit, 0 parity, 1 stop bit).
This board is mainly for Dartcom customers but can be accessed by anyone, and includes some useful files. Caution should be exercised before downloading large Kepler files that may contain ancient data.

RIG (Remote Imaging Group) on (01945) 440666 (protocol as above)
A very useful board, mainly for members, that provides current Kepler element files and an assortment of useful utility software.

Starbase1 0171-703-3593 and 0171-701-6914 (protocol as above)
This is mainly an astronomy BBS but includes recent Kepler elements and thousands of files and pictures for free downloading. Free messaging facility. Highly recommended.

Timestep (01440) 820002 (protocol as above)
Mainly for their customers but general access is permitted. Maintains recent Kepler elements and a status report.

Future Launches

Shuttle flight STS-73 is scheduled for September 21; the next MIR/Shuttle linkup) is with STS-74 on October 26.

Shuttle Pack

My compiled *Shuttle Listing* has been in demand, with many requests for additional information. I have therefore put together a *Shuttle Pack*, that includes the list of Shuttle flights for the next several years (that may change as months go by), and other associated information, including transmission and re-transmission frequencies.

This pack consists of several A4 sheets and is available by sending 50p with an s.a.e. The data is always the latest available from NASA, and is usually updated several times per week. The basic manifest remains available if you send 20p with s.a.e. As previously mentioned, this is being done as an essentially non-profit making service for *SWM* readers.

Kepler Elements

Different options are available:
1: For a print-out of the latest WXSAT elements and MIR, send an s.a.e. and 20p coin (or separate stamp). Transmission frequencies are given when operating. This data originates from NASA.
2: I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (plus four self-addressed, stamped envelopes) for four editions.
3: You can have a computer disk file containing recent elements for the WXSATs, and a large ASCII file holding current 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 computer searches. Please enclose £2 with your PC-formatted disk and s.a.e.

Frequencies

NOAAs 9, 14 a.p.t. on 137.62MHz; NOAA 12 on 137.50MHz; NOAA beacons on 136.77 and 137.77MHz; METEORs use 137.30 and 137.85MHz.; OKEAN-4 uses 137.40MHz for short periods and METEOSAT-5/GOES-8 use 1691.0MHz for WEFAX.

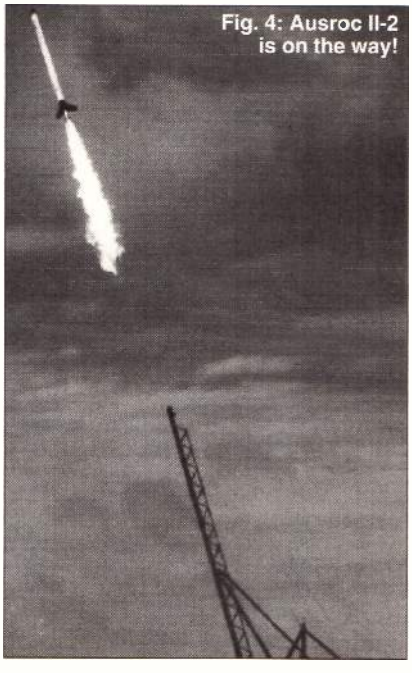


Fig. 4: Ausroc II-2 is on the way!

Mike Richards G4WNC, PO Box 1863, Ringwood, Hants BH24 3XD. Compuserve: 100411,3444: Internet: mike.richards@bbcnc.org.uk

Decode

All the Data Modes

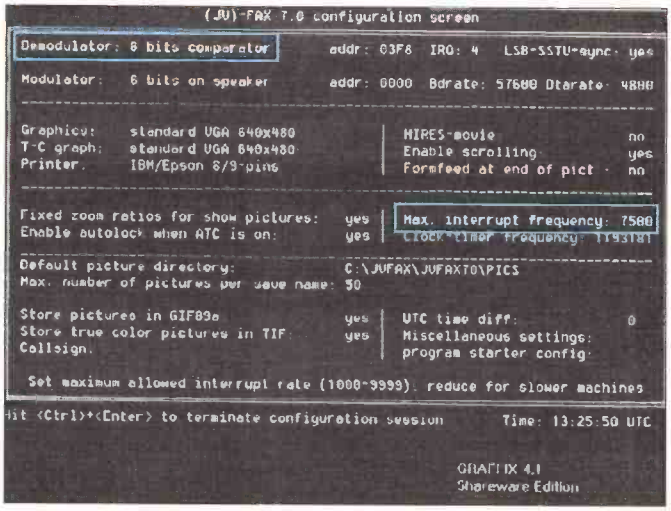
One of the problems experienced by many readers is the difficulty in getting JVFAX to work with slower PCs. Having asked for your experiences in a recent Decode I now have enough information to put a few ideas down on paper. Judging by the replies I received, the most common problem is trying to run JVFAX with a 286 based computer whilst using the simple comparator interface. The basic problem here is that the 286 processor is not fast enough to carry out all the tasks set-up by JVFAX. By far the most demanding is the simple comparator interface. Although this is by far the cheapest and most popular type of interface the penalty comes in increased demands on the processor. With this interface, the audio signal is simply amplified to RS-232 levels and applied directly to the computer. The JVFAX software then examines the signal by noting every time the signal crosses 0V and then measuring the time between each crossing. This simple, but effective, technique enables the software to work out the frequency of the incoming signal. This information can then be used to decide whether to print a white, black or grey dot on the screen. Whilst all this is going on the computer also has to look after the screen display, look out for keyboard commands and show the spectrum analyser tuning display. So you can see the processor is kept very busy indeed.

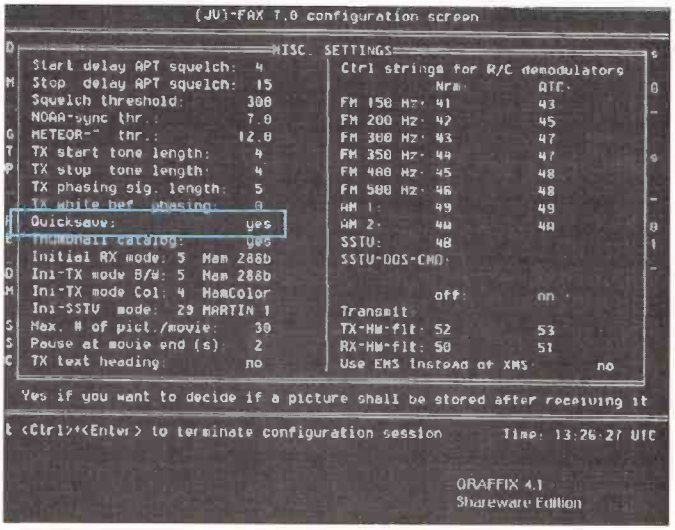
One of the most effective ways to improve FAX reception on a slow PC is to invest in one of the specialist JVFAX interfaces that include on-board processing to take the strain of the computer's processor. One of the most popular examples of this is the one produced by Martelec. For more information see the review in the December 1994 *Short Wave Magazine* or contact Martelec Communications Systems, The Acorns, Wyck Lane, East Worldham, Alton, Hants GU34 3AW. Tel: (01420) 82752.

If you want to stick with the simple interface there are a few things you can do to improve the performance.

The first is to alter the maximum interrupt frequency on the main configuration screen. I've shown a sample screen dump to help you find the right field. The standard setting for this field is 7.5kHz but you will probably find a figure of around 3.62kHz will give more consistent results with a 286 based machine. If you're still having problems you can drop the interrupt frequency further if you wish. The next trick is to alter the bits setting shown against the comparator interface in the configuration screen. The normal setting is 8 but this can be changed to 6 or even 4 to improve results. To help make sure you alter the correct field I've highlighted it on the screen. Another very important consideration for users of the comparator interface relates to the use of Microsoft's EMM386 memory manager. On some machines this can adversely effect JVFAX timing resulting in garbage on the screen. The answer is to try disabling the memory manager. One of the best ways to do this and also eliminate any other programs that may cause problems is to create a basic boot disk. You can do this by using the DOS Format command with /S suffix. This formats a new disk and copies over the basic system files. To use the boot disk you need to reset your computer with the boot disk in drive A.

Another problem often facing 286 users is a small hard disk drive. If space is of a premium you can change a couple parameters to minimise JVFAX's usage of disk space. The first is to limit the number of grey levels of your FAX charts. Whilst the maximum is 255 levels you can reduce this in stages to minimise the disk space usage. The minimum is 2 levels which can in itself be useful for FAX charts as the incoming signal is forced to pure black or white. Another tip is to turn off the quick save option from the miscellaneous settings sub menu, via the configuration screen.





Finally it's well worth getting an up-to-date version of MSDOS as the modern versions come with memory management routines that can be used to free-up memory and so improve the general operation of JVFAX. One of the cheapest ways to do this is to avoid buying the very latest version but go for the previous version. You will usually find that this is available at a much discounted price from the larger dealers or at computer shows and rallies. As the latest DOS is version 6.2 it's probably worth looking out for version 6.0 *[you will find version 5.0 a little less bug filled though - Ed]*.

That's about it so far but if you have any other handy tips please drop me a line

MCL-1100 Update

Bob Taylor from Momentum Ltd. has just sent me details of a new enhancement available to all MCL-1100 and the earlier DM-1000 data decoders. The enhancement comes in the form of an expansion board that fits inside the decoder. The intention is to use this board to support a whole range of additional features. However, the initial release contains software for synoptic decoding. With this facility you can tune-in to one of the many synoptic RTTY stations such as Bracknell Met on 4.489MHz and automatically decode the five digit groups into plain text weather reports. This opens-up a fascinating new world of weather information that can be invaluable to those with a general interest in weather.

The Momentum implementation supports all the main synoptic modes including: TEMP, TEMP DROP, TEMP MOBIL, TEMP SHIP, SHIP, SYNOP, AIREP, PILOT, PILOT MOBIL and PILOT SHIP. If you've previously used a decoder with

Decode Special Offers

Here's a summary of the special offers currently available to Decode readers.

IBM PC Software:

JVFAX 7: A full featured FAX and SSTV transceive program with fully automated reception of weather pictures.

HAMCOMM 3: Provides RTTY, ASCII and AMTOR transceive facilities with a built-in translator for decoding SYNOP and SHIP weather reports.

DSP Starter Disk: A selection of digital signal processing programs as described in this month's Decode.

Literature:

Day Watson Beginners List: A chronological listing of reliable signals - essential reading for those new to decoding.

Decode List: Straightforward listing of frequencies logged by Decode readers over recent months.

Complex Modes List: A comprehensive listing by signal type of the more complex transmission types.

FactPack 1 - Interference: Provides step-by-step guidance for clearing-up common interference problems.

FactPack 2 - Decoding Accessories: Guidance on how to choose those vital accessories from a.t.u.s to speakers.

FactPack 3 - Starting-Out: Advice for those contemplating utility decoding.

FactPack 4 - HAMCOMM/JVFAX Primer: Step-by-step instruction to receive your first RTTY and FAX signals.

FactPack 6 - Internet Starter: A selection of tips and explanations to help you cut through the hype.

To receive any of these offers just send a self addressed sticky label plus 50p per item or £1.50 for 4, £2.50 for 6 or £3.00 for 8 items, £4.00 for 9 or more items. If you're ordering JVFAX or HAMCOMM you will also need to send a blank formatted 720Kb disk for each program or just one 1.4Mb disk. For the new DSP starter you will need to send one 1.4Mb formatted disk.

SYNOP facilities you will have discovered that, with so many stations using 75 baud RTTY the decoded text can flash up on the screen too quickly. Momentum have handled this problem with a display buffer and a user selectable scroll speed. This means you can adjust the display speed to render the text readable. This was a great advantage though you will occasionally run into problems with busy stations as the buffer will eventually fill-up and you will start to lose data. However, I think the advantages easily outweigh this occasional problem.

I've yet to see an example of the expansion board, but from the manual it looks very easy to use.

Like many expansion systems, this one has to be factory fitted and the total cost is £129 inclusive of VAT and next day return delivery.

Cheap Internet!

Those of you who've tried the Internet will have discovered that the major disadvantage is 'phone charges. For many this has been because you have to dial a long distance call to make the initial connection to your Internet supplier.

There is help at hand thanks to modern digital switching techniques. Using this technology many Internet suppliers are now able to offer their customers access via virtual Points of Presence or v-PoPs. Using this system, the customer just dials a special local number and the telephone switching system automatically routes the call to a free modem at a distant site. From the customer's point of view you just have to pay for a local call, while the Internet supplier is able to reduce the number of sites he has to maintain so saving on accommodation and maintenance costs. You will find that many suppliers are now offering this service and from my own experience I can recommend the BBC Networking Club that operates through the Pipex network. If you want more information two of the most popular suppliers are: BBC Networking Club, Sulgrave House, Woodger Road, London W12 8QT or Demon Internet Limited, 42 Hendon lane, London N3 1TT. Tel: 0181-349 0063.

New Interface

Interfaces for JVFAX and HAMCOMM always attract readers . The latest to come my way is the RSD 116 from CommSlab Ltd. Like many other HAMCOMM/JVFAX interfaces they have managed to fit all the electronics inside a standard 25-way D-type connector. However, in addition to providing the usual receive facilities, the RSD116 includes transmit/receive switching and a filter to tidy-up the transmit tones. The RSD116 is supplied with three unterminated leads for connection to your transmitter or receiver. These were colour coded to facilitate easy identification.

For those with an interest in transmission there was a miniature potentiometer accessible via a small hole in the D-type connector that could be used to adjust the modulation level.

With all the necessary connections made, the RSD116 performed very well giving good definition on received FAX charts. A look inside the D-type connector showed that the traditional 741 op-amp had been replaced by a more modern LF071 amplifier. One of the features that separates this interface from all the others is the level of help provided. The review model was supplied with a draft copy of a manual designed to guide the new user through all the common difficulties with HAMCOMM, JVFAX and PKTMON. This manual included a selection of annotated screen dumps showing very clearly the parameters that have to be adjusted. There is even a frequency listing showing a selection of easy to find stations. As if all this wasn't enough, CommSlab also provide a telephone help-line so you can discuss any problems with someone in the know. For more information contact CommSlab at PO Box 19, Erith, Kent DA8 1LH. Tel: (01322) 330830. My thanks to CommSlab for the loan of the review model.

DSP Update

My DSP coverage to date has generated lots of feedback from readers that is very gratifying. Many have asked if the programs on my DSP disk are available direct from the Internet. You'll be glad to hear that they are and the key files and sites to watch are:

ftp.tapr.org and **directory /tapr/SIG/hfsig/upload**

files to retrieve = PSATOR23, DSPSND5, FFTSCOP

ftp.ucsd.edu and **directory /hamradio/dsp**

file to retrieve = dskmodem

Probably the best site to watch for the latest info is **ftp.tapr.org /tapr/SIG/hfsig/upload**. This is where Johan Ferrer uploads all his new programs. As far as I'm aware the next to look out for is a Windows based decoding system that uses a PSA sound card.

The next hot DSP news comes from **Mike Kerry G4BMK** from Grosvenor Software. Mike has written explaining that he can supply code to adapt the Texas DSK for use with the Grosvenor software transceive programs. As this range of programs are very popular with amateurs, the DSP software should prove very useful. Mike also reports that support software supplied with the DSK is rather crude and can be open to errors. In an attempt to overcome some of the problems. Mike has written his own assembler for use with the TMS320C26 DSK. The really good news is that Mike has made the cross assembler available as shareware. Mike has also very kindly let me include his software in my DSP starter disk. As a result all future orders for this disk will automatically include this new range of software.

Klingenfuss Guide to Facsimile Stations

Joerg Klingenfuss has recently sent me the latest, fifteenth edition of his essential guide for the FAX enthusiast. One of the most obvious changes with the new edition is the inclusion of the year on the front cover. In this case the latest issue is shown as 1995/1996. This may seem a minor point, but if have bought several over the years you have to put them all together to work out which is the latest! This latest version is 48 pages longer than last year's and contains lots of updated information.

The first few sections contain a wealth of reference and equipment information. This is followed by a substantial section covering meteorological satellites. As well as providing basic details of each satellite there were separate sections dealing with APT Predict and FANAS orbital data systems.

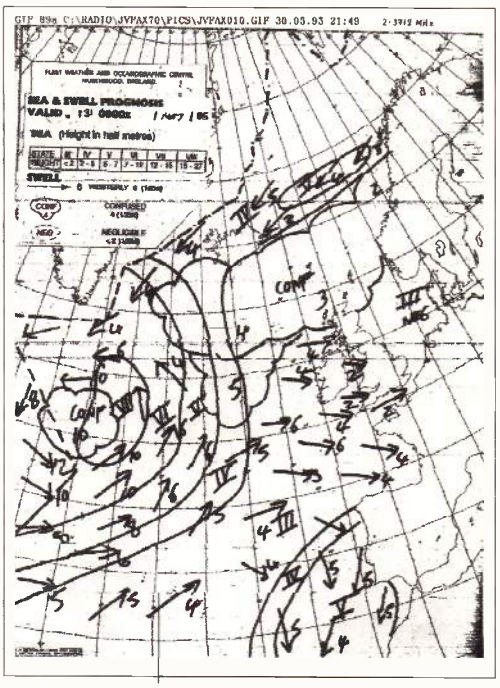
For many the main section of this guide is the h.f. frequency list and schedules. The schedules are particularly valuable with full details of all the transmissions including time and the range of frequencies used. There was also a similar range of detail available for satellite based systems.

The final 300 page section gave examples of the types of charts that can be received. This can be useful not only to decide the type of chart you want to receive, but also to let you see the results you can expect from good quality amateur gear.

The Klingenfuss Guide to Facsimile Stations 15th Edition is an invaluable, if not essential, guide to anyone seriously interested in FAX reception. The guide is available from the *SWM* Book Store price £20.00 plus P&P My thanks to Joerg Klingenfuss for supplying the review copy.

New Complex List

Thanks to some great work by Day Watson, my complex list has been completely revised. As one of the most experienced listeners Day has got the list off to great start by supplying a complete listing of all his complex loggings. The range of modes spans just about everything that can be decoded using equipment that's available on the amateur market. The new list should be ready for despatch by the time this column gets to print.



Fax from Northwood received using JVFAX on an IBM PS/2 286 PC.

Frequency List

(all in MHz)

6.838	ALIS	228.7	-	_	2210	Coded Messages
7.520	Piccolo 12	40	_	_	1030	Coded
7.716	MFSK	100	-	-	2100	NATO Military
7.801	RTTY	50	400	9BC22	1655	Tehran press
7.959	RTTY	50	400	9BC23	1640	Tehran press
10.7199	FAX	120	576	LRB72	-	Buenos Aires met
10.980	FAX	90	576	RDD79	1645	Moscow Met
11.125	RTTY	100	800	HZN	1550	Jeddah Met
11.133	RTTY	50	400	BZG41	1653	XNA Beijing
12.212	RTTY	50	400	YZ1234	1707	TANJUG Belgrade
12.806	FAX	120	576	NKW	1452	USN Diego Garcia
13.3656	RTTY	50	170	5YD	-	Nairobi Met
14.367	RTTY	75	400	BZP54	-	Xinhua Beijing
14.502	SITOR A	100	170	-	1727	Cairo Egypt
14.597	Piccolo 12	40	-	-	0815	Coded
14.982	FAX	60	576	RBV76	1625	Tashkent Met
19.011	Twinplex	100	-	-	1245	MFA The Hague
20.734	PACTOR2	100	170	_	1215	UNID

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

LM&S

Long, Medium and Short Waves

A number of new commercial stations are now operating in the medium wave band and several more are in the pipeline. They hope to attract a regular listening audience but most people prefer to listen to the stations they know and like, so they may well run into difficulty.

To enable them to judge if their efforts are really worthwhile these stations will need feedback from listeners, so be sure to tell them what you think about their programmes when sending a reception report to them.

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 the four week period ending June 30.

Over in Canada **Alan Roberts** (Quebec) has been searching the band at night in the hope of hearing some of the l.w. broadcasters on this side of the Atlantic. Although June seems an unlikely time of year for this type of activity, Alan observed during last summer, also the one before, that a few night-time mid-summer openings occur. He was able to confirm this again on June 18, because just before 0300UTC he picked up a religious broadcast from Radio Monte Carlo via Roumoules (1400kW) on 216kHz. It was followed by a station ident, the Monaco anthem, a time check and the news in French.

Medium Wave Reports

There were no reports of m.w. transatlantic signals reaching the UK in June. This was not unexpected, because the long hours of daylight and the five hour time difference resulted in only a short period when darkness existed along the whole length of the path between E.Canada, or E.USA and the UK.

In contrast, the broadcasts from some stations in N.Africa and the Middle East were received here at night. An extensive log was compiled by **George Millmore** in Wootton, IoW. On June 20 the conditions proved to be well above average and he received the sky waves from the SER 10kW outlet at Las Palmas, Gran Canaria on 1008, which rated SIO323 at 2150. He was surprised by the strength of the signal from Duba, Saudi Arabia on 1521, which was peaking SIO434 at 2255. Over in Co.Down **Eddie McKeown** (Newry) picked up the sky waves from the BSKSA 1000kW outlet at Jeddah on 1512, which rated SINPO 25322 at 0155.

Premier Radio, the new London Christian station, uses five transmitters on three frequencies to cover Greater London and beyond, namely 1305 (N.London, Stevenage, S.London & Crawley); 1332 (Central London); 1413 (W.London & Reading, E.London & Maidstone). Perfect reception (SINPO 55555) on all frequencies was noted at 1800 by **Sheila Hughes** in Morden. Commenting on their programmes, **John Wells** (E.Grinstead) says they "make a change from the usual rubbish".

Reports from other areas indicate that their broadcasts are being received over a much wider area than planned! All three channels were logged during daylight by **Martin Price** in Shrewsbury. Over in Wootton, IoW the ground waves from their outlet on 1413 rated SIO333 at 1415. During the late evening their transmission on 1413 has been received by **Roy Patrick** in Derby. Reporting from Lanarkshire, **Arthur Grainger** (Carstairs Junction) says "Premier Radio is a real surprise. At night it can boom in on 1413 at SIO444 and what a lovely wee service this is. I wonder if any other Northern DXers have found the same. I did surprise one presenter by entering into a 'phone-in competition one evening".

Also attracting attention is another new station, namely Viva 963, which is aimed at female listeners. Although their programmes cover such topics as women's views on the daily news, the environment, men, sex and shopping, it is hoped they will attract a number of males too! Their transmission for London and the South East on 963 was rated 44444 at 0647 by **Rhoderick Illman** in Oxted. Reports on reception in other areas would be very welcome here.

Short Wave Reports

The propagation conditions in the **25MHz (11m)** band are so unpredictable that all international broadcasters have ceased using it.

Variations in propagation occur daily in the **21MHz (13m)** band but it is still in use. Sometimes R.Australia's broadcast to Asia via Darwin on 21.725 (Eng 0630-1100) has reached the UK. During favourable conditions it was rated 45544 at 1015 by **Ross Lockley** in Broxbourne and 43444 at 1030 by **Norman Thompson** in Oadby. It was also received in Gibraltar by **Charles Beanland**, who logged it as 33223 at 0855.

Also received during the morning were DW via Julich? 21.680 (Eng to S.E.Asia 0900-0950), logged as 24422 at 0930 by **Darren Beasley** in Bridgwater; R.Portugal Int 21.720 (Port to Africa 0900-1100) SIO333 at 0930 by **Philip Rambaut** in Macclesfield; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to S.E.Asia 0900-1200) 35344 at 1009 by **Paul Bowery** in Burnham-on-Crouch; UAER, Dubai 21.605 (Eng to Europe 1030-1055) 22222 at 1047 by **Vera Brindley** in Woodhall Spa; BBC via Ascension Is.21.660 (Eng to W/E/S.Africa 1100-1700) SIO222 at 1100 by **Phil Townsend** in E.London.

After mid-day, R.Ukraine Int 21.800 (Uk WS 0900-1700?) was noted as SIO352 at 1305 by **John Eaton** in Woking; RCI via Sines, Portugal 21.455 (Eng to Europe, M.East, Africa 1330-1400) SIO444 at 1330 by **Kenneth Buck** in Edinburgh; R.Portugal Int via Sines 21.515 (Port to M.East, India? 1230-1400) 44243 at 1348 in Newry; WYFR via Okeechobee, USA 21.500 (Eng, Ger to Europe, Africa 1700-2000) SIO333 at 1745 by **John Slater** in Scalloway; HCJB Quito, Ecuador 21.455 (Eng, u.s.b. + p.c.) 35343 at 2040 by **Michael Griffin** in Ross-on-Wye; WYFR via Okeechobee. USA 21.745 (Eng to Europe 1600-2100?) 22111 at 2042 by **Thomas Williams** in Truro; HCJB Quito 21.455 (Ger [u.s.b. + p.c.]) 22222 at 2315 by **Robert Connolly** in Kilkeel.

The propagation conditions in the **17MHz (16m)** band have also varied daily. At best, R.Australia's broadcast to Asia via Carnarvon 17.715 (Eng 0100-0900) was SIO343 at 0535 in Woking and 24432 at 0657 by **David Edwardson** in Wallsend. Also noted during the morning were R.Romania Int. 17.720 (Eng to Pacific areas 0645-0745) 24443 at 0652 in Oxted; R.Pakistan, Islamabad 17.900 (Eng to Europe 0800-0845) SIO544 at 0830 in Scalloway; Israel R, Jerusalem 17.575 (Eng to Europe, Asia, Pacific 1000-1030) 45544 at 1004 in Bridgwater; AIR Delhi 17.387 (Eng to Pacific areas 1000-1100) 24222 at 1057 in Newry; R.Pakistan, Islamabad 17.900 (Eng to Europe 1100-1120) SIO222 at 1100 by **Tom Smyth** in Co.Fermanagh; SRI via Schwarzenburg? 17.515 (Eng, Fr, Ger, It to Far East, S.E.Asia) SIO444 at 1128 in Macclesfield; BBC via Mayhe, Seychelles 17.885 (Eng to E.Africa 0500-1400) 22332 at 1140 in Kilkeel.

After mid-day RCI via Sackville, Canada 17.820 (Eng, Fr to Europe, M.East, Africa 1330-1500?) was SIO344 at 1315 in Edinburgh; Africa No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) SIO233 at 1345 in E.London; RTM Tanger, Morocco 17.595 (Fr, Eng to M.East, N.Africa 1400-1700) 44434 at 1610 by **George Tebbitts** in Penmaenmawr; DW via Meyerton? 17.800 (Eng to C.Africa 1600-1700) SIO544 at 1620 by **David Green** in Doncaster; Monitor R.Int via WSHB 17.510 (Eng to Africa 1600-2000) 35333 at 1720 in Burnham-on-Crouch; R.Nederlands via Bonaire 17.605 (Eng to S/E/W.Africa 1830-2025) 32222 at 1940 in Truro; WYFR via Okeechobee, USA 17.845 (Eng to Africa 2000-2300?) 45444 at 2025 in Ross-on-Wye; RCI via Sackville, Canada 17.820 (Fr, Eng to Europe, M.East, Africa 1930-2130) 44444 at 2055 in Gibraltar; VOFC via

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Donebach	Germany	500	A,B,C*,D,E*,F,G,H,J,K,M
162	Allouis	Fance	2000	A,B,C*,D,E*,F,G,H,J,K,L*,M
171	Nador Medi-1	Morocco	2000	K*
171	Kaliningrad	Russia	1000	A,B,F*,H,L
177	Oranienburg	Germany	750	A,B,F,G,H,K*,L*
183	Saarlouis	Germany	2000	A,B,D,E*,F,G,H,J,K,L,M
198	Droitwich BBC	UK	50	A,B,D,E*,F,H,J,K,L*,M
207	Munich	Germany	500	A,B,E*,F,G,H,K*,L*,M
216	Roumoules RMC	S.France	1400	A,B,D,E*,F,G,H,I*,J,K*
225	Raszyn Resv	Poland	?	A,D*,F*,H,J,K*,M
234	Beidweiler	Luxembourg	2000	A,B,D,F,G,H,J,K,M
243	Kalundborg	Denmark	300	A,B,D,F,G,H,K,L*,M
252	Tipaza	Algeria	1500	B*,D*,F*,K*
252	Atlantic 252	S.Ireland	500	A,B,D*,E*,F,G,H,J,K,L,M
261	Burg(R.Ropa)	Germany	200	K*
261	Taldom Moscow	Russia	2000	D*,F*
270	Topolna	Czech Rep	1500	D*,F*,K*,M
279	Minsk	Belarus	500	K*,L*

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) Martin Dale, Stockport.
(C) John Eaton, Woking.
(D) Sheila Hughes, Morden.
(E) Stephen Jones, Oswestry.
(F) George Millmore, Wootton, IoW.
(G) Fred Pallant, Storrington.
(H) Martin Price, Shrewsbury.
(I) Alan Roberts, Quebec, Canada.
(J) Tom Smyth, Co.Fermanagh.
(K) Andrew Stokes, Leicester.
(L) Norman Thompson, Oadby.
(M) Phil Townsend, E.London.

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	J*
531	Ain Beida	Algeria	600	J*,M*
531	Leipzig	Germany	100	B,E,G*,H,J*,M
531	RNE5 via ?	Spain	?	G*,H,J*,M*
531	Beromunster	Switzerland	500	J*,L
540	Wavre	Belgium	150/50	A,B*,G*,H,J*,L, M*,N*,O
540	Sidi Bennour	Morocco	600	H*,J*
540	Vitoria(EI)	Spain	10	F*
549	Les Trembles	Algeria	600	H*,J*,M*
549	Thumau (DLF)	Germany	200	A,B*,E,G*, H*,J*,M*,O
558	Espoo	Finland	100	J*,M*
558	Rostock(NDR)	Germany	20	G*
558	RNE5 via ?	Spain	?	B*,G*,H,J*,M*,N*
567	Berlin	Germany	100	G*,J*
567	Tullamore(RTE1)	Ireland (S)	500	A,B,E,F*,H, J*,L,M*,O
567	RNE5 via ?	Spain	?	H*
576	Muhlacker(SDR)	Germany	500	A*,B*,E,G* ,H*,J*,M*
576	Barcelona(RNE5)	Spain	50	G*,H*,J*,M*
585	Paris(FIP)	France	8	A,H,O
585	Madrid(RNE1)	Spain	200	B*,G*,H*,J*,M*
585	Dumfries(BBCScot)	UK	2	J*,L
594	Frankfurt(HR)	Germany	1000/400	A,B*,E,G*, H*,J*,M*
594	Oujda-1	Morocco	100	H*
594	Muge	Portugal	100	G*,H*
603	Sevilla(RNE5)	Spain	50	G*,H*,J*,M*,N*
612	Athlone(RTE2)	Ireland (S)	100	A*,B,H*,J*,L,M*,O
612	RNE1 via ?	Spain	10	G*,H*,J*,M*
621	Wavre	Belgium	80	A,B*,G*,H, J*,M,N*,O
621	RNE1 via ?	Spain	10	M*
621	Barcelona(OCR)	Spain	50	G*,H*,J*
630	Vigra	Norway	100	G*,H*,J*
630	Tunis-Djedeida	Tunisia	600	B*,G*,H*
639	Praha(Liblice)	Czech	1500	A*,B*,G*,H*,J*,N*
639	RNE1 via ?	Spain	?	B*,G*,H*,J*,M*
648	RNE1 via ?	Spain	10	G*,H*,J*
648	Orfordness(BBC)	UK	500	A,B*,H,J*,M*,O
657	Neubrandenburg(NDR)	Germany	250	G*,H*
657	Napoli	Italy	120	H*
657	Madrid(RNE5)	Spain	20	H*,J*,M*,N*
657	Wrexham(BBCWales)	UK	2	A,E,G*,J*,M,N*
666	MesskirchRohrd(SWF)	Germany	300/180	A*,G*,M*
666	R.Vilnius	Lithuania	500	G*,J*
666	Lisboa	Portugal	135	A*,G*,H*,J*
666	Barcelona(COPE)	Spain	10	M*
675	Marseille	France	600	G*,H*,J*,N*
675	Lopic(R10 Gold)	Holland	120	A,B*,D,G*,H, J*,K,L,M,O
684	Sevilla(RNE1)	Spain	500	G*,H*,J*,M*
684	Avala(Beograd-1)	Yugoslavia	2000	A*,B*,G*,H*,J*,M*
693	Viseu(RDP1)	Portugal	10	J*
693	Droitwich(BBC5)	UK	150	A,B,F*,H,M,O
693	Enniskillen(BBC5)	UK	1	L
702	Yerevan	Armenia	100	H*
702	Flensburg(NDR)	Germany	5	A,G*,H*,J*,M*
702	Monte Carlo	Monaco	40	A*,H*
702	Sebaa-Aioun	Morocco	740	M*
702	Zamora(RNE1)	Spain	10	M*
711	Rennes 1	France	300	A,D,G*H,J*,O
711	Heidelberg	Germany	5	A*,G*
711	Laayoune	Morocco	600	H*,M*
720	Lisnagarvey(BBC4)	Ireland (N)	10	H*,J*
720	Norte	Portugal	100	A*,G*,H*,J*
720	Lots Rd,Ldn(BBC4)	UK	0.5	A,B,H,L,M*,O
729	Cork(RTE1)	Ireland (S)	10	H*,J*,L,M*
729	RNE1 via ?	Spain	?	B*,G*,H*,J*,M*
738	Paris	France	4	A,H
738	Poznan	Poland	300	A*,H*,J*
738	Barcelona(RNE1)	Spain	500	B*,G*,H*, J*,L*,M*,N*
747	Flevo(Hilv2)	Holland	400	A,B*,D,E,G*, H,J*,M,N*,O
747	Cadiz(RNE5)	Spain	10	J*
756	Braunschweig(DLF)	Germany	800/200	A,B*,E,G*,H*,M*
756	Bilbao(EI)	Spain	5	F*,G*,H*
756	Redruth(BBC)	UK	2	H
765	Sottens	Switzerland	500	B*,G*,H*, J*,M*,N*
774	Sofia	Bulgaria	50	H*
774	Enniskillen(BBC)	Ireland (N)	1	J*
774	RNE1 via ?	Spain	?	B*,G*,H*,J*,M*
783	Burg	Germany	1000	G*,H*,J*,M*
783	Miramar(R.Porto)	Portugal	100	H*,J*
783	Dammam	Saudi Arabia	100	H*,M*
792	Limoges	France	300	H
792	Lingen(NDR)	Germany	5	G*,H*,J*
792	Sevilla(SER)	Spain	20	B*,G*,H*,J*,M*
801	Munchen-Ismaning	Germany	300	B*,G*,J*
801	RNE1 via ?	Spain	?	B*,F*,G*, H*,J*,L,M*
810	Madrid(SER)	Spain	20	H*,J*
810	Westerglen(BBCScot)	UK	100	B,F*,H*,J*,L,M*
819	Toulouse	France	50	G*,J*,M*
819	Warsaw	Poland	300	A*,H*,M*
819	S.Sebastian(EI)	Spain	5	E,M*
828	Freiburg(SWF)	Germany	40	A*
828	Hannover(NDR)	Germany	100/5	G*,M*
828	Oujda-2	Morocco	100	H*
828	Barcelona(SER)	Spain	50	B*,G*
837	Nancy	France	200	A,B*,E,H,L*,N*
837	COPE via ?	Spain	?	B*,G*,H*,J*
846	Rome	Italy	540	A*,B*,D*,G*, H*,J*,M*
855	Berlin	Germany	100	A*,B*,G*
855	RNE1 via ?	Spain	?	B*,G*,H*, J*,M*,N*
864	Santah	Egypt	500	A*,H*,J*
864	Paris	France	300	A,D,G*,H,O
864	Socuellamos(RNE1)	Spain	2	M*
873	Frankfurt(AFN)	Germany	150	A*,B*,G*,H*, J*,K,M*
873	Zaragoza(SER)	Spain	20	G*,H*,M*
873	Enniskillen(R.UI)	UK	1	J*
882	COPE via ?	Spain	?	G*,J*
882	Washford(BBCWales)	UK	100	A,B,O,F*,H, J*,L,M,O
891	Algiers	Algeria	600/300	A*,B*,G*,H*,J*,M*
891	Huisberg	Netherlands	20	A,G*,L*,M*
900	Brno(CRo2)	Czech Rep	25	H*
900	Milan	Italy	600	A*,B*,D*,H*,J*,M*
900	COPE via ?	Spain	?	G*,J*,M*
900	Qurayyat	Saudi Arabia	1000	H*
909	B'mans Pk(BBC5)	UK	140	A,F*,H,M,O
909	M'side Edge(BBC5)	UK	200	J*,L
918	Plesivec(Sloven'nR)	Slovenia	600/100	A*,B*,H*,J*
918	Madrid(R.Int)	Spain	20	H*,J*,M*
927	Wolvertem	Belgium	300	A,G*,H,M,N*,D
936	Bremen	Germany	100	G*,H*,J*,M*
936	Venezia	Italy	20	H*
936	RNE5 via ?	Spain	?	H*,J*,M*
936	Lvov	Ukraine	500	A*
945	Toulouse	France	300	A*,B*,G*,H*
954	Brno (CRo2)	Czech Rep.	200	A*,H*
954	Madrid(CI)	Spain	20	B*,G*,H*,J*,M*
963	Pori	Finland	600	B*,G*,H*,J*,M*
963	Paris	France	8	A
963	Tir Chonaill	Ireland (S)	10	L*,M*
963	Tunis-Djedeida	Tunisia	200	G*
972	Hamburg(NDR)	Germany	300	B*,G*,H*,J*,M*
972	RNE1 via ?	Spain	?	H*,J*
981	Alger	Algeria	600/300	B*,F*,G*,H*, J*,M*,N*
990	Berlin	Germany	300	G*,H*,J*,M*
990	R.Bilbao(SER)	Spain	10	H*,J*
999	Schwerin (RIAS)	Germany	20	M*
999	Madrid(CDPE)	Spain	50	J*,N*
1008	Las Palmas(SER)	Gran Canaria	10	H*,M*
1008	Flevo(Hilv-5)	Holland	400	A,B,D,G*,H,M,N*,O
1017	Rheinsender(SWF)	Germany	600	A*,B*,G*,H*,M*
1026	SER via ?	Spain	?	G*,H*,M*
1035	Lisbon(Prog3)	Portugal	120	G*,M
1044	Dresden	Germany	250	G*,H*,J*
1044	Sebaa-Aioun	Morocco	300	H*,M*
1044	SER via ?	Spain	?	G*,J*,M*
1053	Zarogoza(COPE)	Spain	10	G*
1053	Talk Radio UK via ?	UK	?	A,B,H,J*,K,L,M,O
1062	Kalundborg	Denmark	250	A,G*,H*,J*
1062	Norte	Portugal	100	G*,H*
1071	Brest	France	20	H
1071	France-Inter via ?	France	?	B*,M*
1071	Lille	France	40	A,G*,O
1071	Riga	Latvia	50	H*
1071	Bilbao(EI)	Spain	5	H*,J*,M*
1071	Talk Radio UK via ?	UK	?	J*,M
1080	Katowice	Poland	1500	H*,J*
1080	SER via ?	Spain	?	G*,H*,J*,M*
1089	Krasnodar	Russia	300	G*
1089	Talk Radio UK via ?	UK	?	A,B,H,J*,K,L,M,O
1098	Nitra(Jarok)	Slovakia	1500	A*,B*,G*,H*,J*,M*
1098	RNE5 via ?	Spain	?	G*,J*
1107	AFN via ?	Germany	10	A*,G*,J*,M*
1107	RNE5 via ?	Spain	?	G*,M*
1107	Talk R.UK via ?	UK	?	A,B,E,F*,H,J*
1116	Pontevedra(SER)	Spain	5	G*
1125	La Louviere	Belgium	20	A,G*,H*,J*
1125	Deanovec	Croatia	100	J*
1125	RNE5 via ?	Spain	?	G*,H*,J*,M*
1134	COPE via ?	Spain	2	G*,H*,M*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	B*,G*,H*,J*,M*
1143	AFN via ?	Germany	10	A*,G*,H*,J*,M*
1143	COPE via ?	Spain	2	G*,H*,M*
1152	RNE5 via ?	Spain	10	H*
1161	Stara Zagora	Bulgaria	500	J*
1161	Strasbourg(Flnt)	France	200	B*,G*,H*,J*,M*
1161	S.Sebastian(EI)	Spain	50	M*
1179	SER via ?	Spain	?	M*
1179	Solvesborg	Sweden	600	B,G*,H*, J*,K*,M*,P*
1188	Kuurne	Belgium	5	A,E,G*,H*,J*,O
1188	Reichenbach(MDR)	Germany	5	G*,J*,M*
1188	Szolnok	Hungary	135	H*
1197	Munich(VOA)	Germany	300	B,G*,M*
1197	Virgin via ?	UK	?	A,B,H,J*,M,O
1206	Bordeaux	France	100	G*,J*
1206	Wroclaw	Poland	200	A*,H*
1215	Virgin via ?	UK	?	A,B,H,J*,K,L,M,O
1224	Virgin via ?	UK	?	H*,L*
1233	Liege	Belgium	5	J*
1233	Nitra	Slovakia	40	G*
1233	Virgin via ?	UK	?	A,B,H,J*,M,O
1242	Marseille	France	150	A*,G*,M*
1242	Virgin via ?	UK	?	B,J*,M
1251	Marcali	Hungary	500	G*
1251	Huisberg	Netherlands	10	G*,H*,M*
1260	SER via ?	Spain	?	G*,H*
1260	Guildford (V)	UK	?	A,H,M*
1269	Neumunster(DLF)	Germany	600	B,G*,H*,J*,L,M*
1278	Strasbourg	France	300	H*,M*
1278	Dublin/Cork(RTE2)	Ireland (S)	10	A*,B*,H*,J*,L*,M*
1287	RFE via ?	Czech Rep.	400	G*,H*,M*
1287	Lerida(SER)	Spain	10	J*,M*
1296	Valencia(COPE)	Spain	10	H*,J*,M*
1296	Orfordness(BBC)	UK	500	A,H*,M,O
1305	Rzeszow	Poland	100	A*,G*,H*,M*
1305	RNE5 via ?	Spain	?	G*,M*
1314	Kvitsoy	Norway	1200	A,B,G*,H*, J*,K,L,M*,P*
1323	Wachenbrunn(RMWS)	Germany	1000/150	G*,J*,M*
1332	Rome	Italy	300	G*,H*,J*,M*
1341	Lakihegy	Hungary	300	G*
1341	Lisnagarvey(BBC)	Ireland (N)	100	B,H*,J*,M*
1341	Tarrasa(SER)	Spain	2	H*
1350	Nancy/Nice	France	100	A*,G*,H*,J*,M*
1359	Arganda (RNE-FS)	Spain	600	G*,H*,J*,L*,M*
1368	Foxdale(Manx R)	IoM	20	B,H*,I,J*,L*,M*
1377	Lille	France	300	A,D,G*,H,J*,M*,O
1386	Bolshakovo	Russia	2500	G*,H*,J*,M*
1395	Lushnje(Tirana)	Albania	1000	G*,H*
1404	Brest	France	20	A*,C,G*,H,J*,M*
1413	Masirah Is(BBC)	Oman	1500	G*
1413	RNE5 via ?	Spain	?	H*,M*
1422	Heusweiler(DLF)	Germany	1200/600	B*,H*,J*,K,M*
1431	Nikolayev	Ukraine	400	M*
1440	Marnach(RTL)	Luxembourg	1200	A,B,G*,H,J*,K
1440	Damman	Saudi Arabia	1600	C*,G*,J*,K*,M*
1449	Berlin	Germany	5	G*
1449	Squinzano	Italy	50	C*,D*,H*
1449	Redmoss(BBC)	UK	2	J*
1458	Lushnje(Tirana)	Albania	500	L*
1467	Monte Carlo(TWR)	Monaco	1000/400	B*,G*,H*,J*,M*
1476	Wien-Bisamberg	Austria	600	M*
1485	SER via ?	Spain	?	M*
1494	St.Petersburg	Russia	1000	G*
1503	Stargard	Poland	300	J*
1503	RNE5 via ?	Spain	?	G*,M*
1512	Wolvertem	Belgium	600	A,B*,D*,G*,H*, J*,M*,O
1512	Jeddah	Saudi Arabia	1000	C,G*
1521	Kosice(Cizatice)	Slovakia	600	G*
1521	Duba	Saudi Arabia	2000	C*,H*,J*
1530	Vatican R	Italy	150/450	D*,G*,H*,J*,M*
1539	Mainflingen(DLF)	Germany	700	M*
1539	SER via ?	Spain	?	H*,M*
1566	Sfax	Tunisia	1200	C*,H*,M*
1575	Genova	Italy	50	H*,M*
1575	SER via ?	Spain	5	H*,J*,M*
1584	SER via ?	Spain	2	H*,M*
1593	Holzkirchen(RFE)	Germany	150	G*,H*,J*,L*
1593	Dnipropetrovsk	Ukraine	5	M*
1602	SER via ?	Spain	?	H*,M*
1602	Vitoria(EI)	Spain	10	G*,H*,J*,L*,M*
1611	Vatican R	Italy	15	G*,J*

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) Martin Dale, Stockport.
(C) John Eaton, Woking.
(D) Sheila Hughes, Morden.
(E) Rhoderick Illman, Oxted.
(F) Stephen Jones, Oswestry.
(G) Eddie McKeown, Newry.
(H) George Millmore, Wootton, IoW.
(I) Clare Pinder, while in Appleby.
(J) Martin Price, Shrewsbury.
(K) Harry Richards, Barton-on-Humber.
(L) Tom Smyth, Co.Fermanagh
(M) Andrew Stokes, Leicester.
(N) Norman Thompson, Oadby.
(O) Phil Townsend, E.London.
(P) Thomas Williams, Truro.

Okeechobee, USA 17.750 (Eng to Europe, Africa 2200-2300) 32222 at 2200 by **Clare Pinder** in Appleby.

Despite varying conditions in the **15MHz (19m)** band there is always plenty to interest the listener! Amongst the many entries in the reports were VOA via Kavala 15.205 (Eng to Europe, M.East 0500-0700) rated SIO444 at 0515 by **Francis Hearne** in N.Bristol; AWR via Slovakia 15.620 (Eng to Africa 0900-1000) 44444 at 0900 in Newry; DW via Meyerton? 15.410 (Eng to W.Africa 1100-1150) SIO222 at 1100 in Co.Fermanagh; ISBS Reykjavik, Iceland 15.775 (Ic [u.s.b. + p.c.] to Europe 1215-1300) SIO444 at 1240 in Scalloway; R.Japan via Moyabi, Gabon 15.355 (Eng to S.Africa 1500-1600) 32232 at 1500 in Oadby; Voice of Vietnam, Hanoi 15.009 (Eng to Africa 1600-1630) SIO344 at 1600 in E.London; UAER, Dubai 15.395 (Eng to Europe 1600-1640) SIO533 at 1611 in Doncaster; WVHA via Scotts Corner, USA 15.665 (Eng to Europe, USA 1500-1658) 32332 at 1615 in Kilkeel; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 54444 at 1720 in Burnham-on-Crouch; HCJB Quito 15.490 (Eng to Europe 1700-2000) SIO222 at 1728 in Macclesfield.

Later, the Voice of Vietnam, Hanoi 15.009 (Eng, Fr, Sp to Europe 1800-2130) was 35543 at 1801 in Wallsend; RNB Brazil 15.265 (Eng, Ger to Europe 1800-2020) 33442 at 1910 in Woking; Monitor R.Int via WSHB 15.665 (Eng to Europe 1800-2200) SIO455 at 1930 in

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R	I	0.80	A,B,C,K,M,O,P,Q,R
585	R.Solway	B	2.00	E,M
603	Cheltenham(CD603)	I	0.10	A,C,K,M,O,P,R
603	Invicta SG (Coast)	I	0.10	B,K,Q,R
630	R.Bedfordshire(3CR)	B	0.70	A,B,C,F,K,M,O,P,Q,R
630	R.Cornwall	B	2.00	A,K,R
657	R.Clwyd	B	2.00	A,E,I*,K,M,N*,Q,R
657	R.Cornwall	B	0.50	K
666	Gemini AM	I	0.34	A,G,K,M,R
666	R.York	B	0.80	C,G,M,O,Q,R
729	BBC Essex	B	0.20	B,K,M,O,P,Q,R
738	Hereford/Worcester	B	0.037	A,C,F,G,M,O,P,Q,R
756	R.Cumbria	B	1.00	E
756	R.Maldwyn	I	0.63	C,I*,K,M,O,R
765	BBC Essex	B	0.50	A,B,C,E*,K,M,O,R
774	Gloucester(3CSG)	I	0.14	A,M,O
774	R.Kent	B	0.70	B,K,P,Q,R
792	Chiltern(S.Gold)	I	0.27	A,B,H,K,M,O,P,Q,R
792	R.Foyle	B	1.00	E,N*
801	R.Devon & Dorset	B	2.00	A,G,H,I*,K,M,Q,R
828	Chiltern(S.Gold)	I	0.20	A,B,O,Q,R
828	R.Aire(Magic828)	I	0.12	C
828	R.WM	B	0.20	M
828	2CR(Cl.Gold)	I	0.27	A,B,K,R
837	R.Cumbria/Furness	B	1.50	J*
837	R.Leicester	B	0.45	A,B,C,G,H,K,M,O,P,Q,R
855	R.Devon & Dorset	B	1.00	A,G,K
855	R.Lancashire	B	1.50	C
855	R.Norfolk	B	1.50	B,G,P,R
855	Sunshine R	I	0.15	M,O,P,R
873	R.Norfolk	B	0.30	B,C,D,G,K,M,O,R
936	Brunel R(Cl Gold)	I	0.18	A,E*,H,K,R
945	R.Trent(Gem AM)	I	0.20	A,B,C,E*,H,K*,O,P,Q,R
954	Gemini AM	I	0.32	A,K,R
954	R.Wyvern(WYVN)	I	0.16	A,B*,M,O,P,R
963	Viva 963	I	?	E*,H,L,M,R
990	WABC(Nice & Easy)	I	0.09	C,M,O,P,R
990	R.Devon & Dorset	B	1.00	A,K,R
990	Hallam R(Gt.Yks)	I	0.25	C,R
999	R.Solent	B	1.00	A,H,K,Q,R
999	R.Trent(Gem AM)	I	0.25	C,O,P,R
999	Red Rose(Gold)	I	0.80	C,E,J*,M
1017	Beacon R(WABC)	I	0.70	A,C,E*,I*,M,O,P,R
1026	Downtown R	I	1.70	E,N
1026	R.Cambridgeshire	B	0.50	A,B,C,G,O,P,Q,R
1026	R.Jersey	B	1.00	A,R
1035	Country 1035	I	?	A,B,C*,E*,K,L*,M,N*,Q,R
1035	R.Sheffield	B	1.00	C,O
1035	West Sound AM	I	0.32	E
1107	Moray Firth R	I	1.50	E
1116	R.Derby	B	1.20	A,C,G,J*,M,N*,O,P,R
1116	R.Guernsey	B	0.50	A,G,H,K,R
1152	BRMB(Xtra-AM)	I	3.00	A,O,P
1152	LBC(LondonNewstalk)	I	23.50	A,B,K,P,Q,R
1152	Piccadilly R(Gold)	I	1.50	C,M
1152	R.Broadland	I	0.83	B,C*,J*,R
1152	R.Clyde(Clyde 2)	I	3.06	E
1161	Brunel R(Cl.Gold)	I	0.16	A,K,O,R
1161	R.Bedfordshire(3CR)	B	0.10	B,O,Q,R
1161	Southern Counties R	B	1.00	A,B,K,N*,R
1161	Tay AM	I	1.40	E
1161	Humberside(Gt.Yks)	I	0.35	C,M
1170	GNR Teeside	I	0.32	E
1170	Hi Wycombe 1170AM	I	?	B,G,Q,R
1170	Portsmouth(SCR)	I	0.12	K,R
1170	R.Orwell(SGR)	I	0.28	B,R
1170	Signal R(S.Gold)	I	0.20	C,E*,M,O
1170	Swansea Sound	I	0.58	A,G*
1242	Invicta Snd(Coast)	I	0.32	B,Q,R
1242	Isle of Wight R	I	0.50	A,K,R
1251	Saxon R(SGR)	I	0.76	B,E*,M,P,Q,R
1260	Brunel R(Cl.Gold)	I	1.60	A,E*,K,N
1260	Marcher Snd(Gold)	I	0.64	C,E*,M,P
1260	Sunrise R, Midlands	I	0.29	E*,O,Q
1278	Bradford(Gt.Yks)	I	0.43	J*,N
1296	Birmingham(R.XL)	I	?	E,J*,M,R
1305	Barnsley(Gt.Yks)	I	0.15	C
1305	Premier R	I	?	G,M
1305	Touch R	I	0.20	A,E*,J*,R
1323	R.Bristol(Som.Snd)	B	0.63	A,E*,M,R
1323	Brighton(SCR)	I	0.50	B,E*,K,Q,R
1332	Hereward R(WGMS)	I	0.60	B,C,E*,K,O,P,Q
1332	Premier R	I	?	G,M,R
1332	Wiltshire Sound	B	0.30	A,K,R
1359	Essex R(BreezeAM)	I	0.28	B,C,Q,R
1359	Mercia Snd(Xtra-AM)	I	0.27	E*,M,O,P
1359	Red Dragon(Touch R)	I	0.20	A,M
1359	R.Solent	B	0.85	A,K,R
1368	R.Lincolnshire	B	2.00	G,O,P,R
1368	Southern Counties R	B	0.50	A,B,G,K,Q,R
1368	Wiltshire Sound	B	0.10	A,K
1413	Premier R	I	?	B,D,E*,G,J*,K,L*,M,R
1431	Essex R(BreezeAM)	I	0.35	B,E*,M,Q,R
1431	R.210(Cl.Gold)	I	0.14	A,C*,E*,K,R
1449	R.Peterboro/Cambs	B	0.15	B,G,E*,M,O,P,R
1458	Fortune	I	5.00	C,E*,J*,M,N
1458	R.Cumbria	B	0.50	E,J*
1458	R.Devon & Dorset	B	2.00	A,K,R
1458	Radio WM	B	5.00	M,O
1458	Sunrise R	I	50.00	A,B,C*,E,K,Q,R
1476	Guildford(M.Xtra)	I	0.50	A,C,E*,J*,K,M,Q,R
1485	R.Humberside (Hull)	B	1.00	E,P
1485	R.Merseyside	B	1.20	C,E,J*,M,N
1485	Southern Counties R	B	1.00	A,B,K,O,Q,R
1503	R.Stoke-on-Trent	B	1.00	A,C,E,G,J*,K*,M,O
1521	Reigate(M.Xtra)	I	0.64	A,B,C,J*,K,M,Q,R
1530	Huddersfld(Gt.Yks)	I	0.74	C,E*,M
1530	R.Essex	B	0.15	B,K,Q,R
1530	R.Wyvern(WYVN)	I	0.52	E*,J*,K,M,O,R
1548	Capital R(Cap G)	I	97.50	A,B,E*,K,P,Q,R
1548	R.Bristol	B	5.00	A
1548	Liverpool(City G)	I	4.40	C,J*,M,N
1548	R.Forth(Max AM)	I	2.20	E
1548	Sheffield(Gt.Yks)	I	0.74	M,O
1557	Northants R(S.Gold)	I	0.76	E*,P
1557	Southampton(SCR)	I	0.50	A,E*,K,R
1557	R.Lancashire	B	0.25	C
1557	Tendring(Mellow)	I	0.125	B,M,R
1584	Kettering(KCBC)	I	0.04	C,E*,G*,H,O,Q,R
1584	R.Nottingham	B	1.00	C,E*,G*,J*,N,O,P,R
1584	R.Shropshire	B	0.50	A,C*,M
1584	R.Tay	I	0.21	G*,J*
1602	R.Kent	B	0.25	A,B,E*,J*,K,Q,R

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) Martin Dale, Stockport.
(D) John Eaton, Woking.
(E) Arthur Grainger, Carstairs Junction.
(F) Francis Hearne, N.Bristol.
(G) Sheila Hughes, Morden.
(H) Rhoderick Illman, Oxted.
(I) Stephen Jones, Oswestry.
(J) Eddie McKeown, Newry.
(K) George Millmore, Wootton, IoW.
(L) Roy Patrick, Derby.
(M) Martin Price, Shrewsbury.
(N) Tom Smyth, Co.Fermanagh.
(O) Andrew Stokes, Leicester.
(P) Norman Thompson, Oadby.
(Q) Phil Townsend, E.London.
(R) John Wells, East Grinstead.

Edinburgh; RCI via Sackville 15.150 (Fr, Eng to Africa? 1900-2130) 23332 at 1951 in Oxted; R.Damascus, Syria 15.095 (Eng to Europe 2005-2105) 45433 at 2040 in Bridgwater; R.Nederlands via Bonaire 15.315 (Eng to S/E/W.Africa 1830-2025) 33222 at 1948 in Truro; WWCR Nashville, USA 15.685 (Eng to Europe 1100-2100) 33323 at 2057 by **Wallace Moodie** in Port Seton; WRNO New Orleans, USA 15.420 (Eng to E.USA, Europe 1500-2300) 22222 at 2124 in Woodhall Spa; BCC via Pali, Taiwan 15.125 (Chin 2100-1700) 22332 at 2219 in Gibraltar; HCJB Quito 15.540 (Eng [u.s.b.+ p.c.] to N.America 0030-0700) 44433 at 0030 in Morden.

In the **13MHz (22m)** band R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Europe 0400-1800) was SIO444 at 0730 in N.Bristol; SRI via Sottens? 13.685 (It, Eng, Fr, Ger, Port to Australia, S.Pacific 0830-1100) 33333 at 0900 in Truro; R.Norway Int, Oslo 13.800 (Norw [Eng Sun] to Asia 1200-1230) 45433 at 1210 in Bridgwater; R.Vlaanderen Int, Belgium 13.670 (Eng to N.America 1300-1325) 33233 at 1300 in Appleby; SRI via Sottens? 13.635 (Eng, Fr, It, Ger to S.E/S.Asia 1300-1500) SIO322 at 1300 in Co.Fermanagh; R.Nederlands via Flevo 13.700 (Eng to S.Asia, M.East 1330-1425) 44444 at 1330 in Newry; UAER, Dubai 13.675 (Eng to Europe 1600-1640) SIO533 at 1610 in Doncaster; VOA via Selebi-Phikwe, Botswana 13.710 (Eng to Africa 1630-1900) 44333 at 1705 by **Harry Richards** in Barton-on-Humber; R.Pyongyang, Korea 13.785 (Eng to Europe, M.East, Africa 1700-1750) 44334 at 1722 in Burnham-on-Crouch; AWR via Slovakia 13.595 (Eng to Africa? 1700-1758) SIO212 at 1735 in Macclesfield.

Later, RCI via Sackville 13.650 (Fr, Eng to Europe, M.East, Africa 1900-2130) was 35232 at 1951 in Oxted; WHRI South Bend, USA 13.760 (Eng to E.USA, Europe 1500-2200) 32222 at 2017 by **Martin Dale** in Stockport; Monitor R.Int via WSHB 13.770 (Eng to Europe 2100-2157) SIO444 at 2150 in Edinburgh; RCI via Sackville 13.670 (Eng to Caribbean, S.America 2200-0000) 44444 at 2201 in Woodhall Spa; UAER, Abu Dhabi 13.605 (Eng to USA 2200-0000) 33333 at 2205 in Penmaenmawr; WWCR Nashville, USA 13.845 (Eng to E.USA 1400-0100) 34343 at 2236 in Woking; WJCR via Millerstown, USA 13.595 (Eng 12hrs, Chin 12hrs) 23322 at 2330 in Kilkeel; AWR Costa Rica 13.750 (Eng to America 2300-0100) SIO433 at 0045 in Scalloway.

Broadcasts from many areas have been received in the **11MHz (25m)** band. Some came from R.Japan via Kranji, Singapore 11.740 (Eng, Jap to S.E.Asia 0500-1000), rated 13321 at 0712 in Oxted; HCJB Quito 11.615 (Eng to Europe 0700-0830) 55444 at 0730 in Ross-on-Wye; Slovak R.Int, via Velke Kostolany 11.990 (Eng to Australia 0830-0857) 33333 at 0835 in Truro; R.Romania Int, Bucharest 11.940 (Eng to Europe 1300-1400) 44444 at 1345 in Morden; Voice of the Mediterranean via Cyclops, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) SIO444 at 1400 in E.London; WYFR via VOFC Taipei, Taiwan 11.550 Eng to India 1302-1502) 32243 at 1500 in Woking; BBC via Kranji, Singapore 11.750 (Eng to Far East 1100-1800) 33333 at 1503 in Burnham-on-Crouch; R.Pakistan, Islamabad 11.570 (Eng to M.East 1600-1630) SIO333 at 1607 in Doncaster; R.Australia via Shepparton 11.695 (Eng to Pacific areas 1430-1700) 43434 at 1545 in Penmaenmawr; R.Australia via Carnarvon 11.660 (Eng to S.Asia 1430-2100) SIO444 at 1645 in Edinburgh.

Later, R.Bulgaria, Sofia 11.720 (Eng to W.Europe 1900-2000) was 53533 at 1900 in Broxbourne; AIR via Bangalore 11.620 (Eng, Hi to Europe 1745-2230) 33233 at 1930 in Port Seton; R.Moldova Int via Galbeni, Romania 11.580 (Eng to Europe 1930-2000) SIO333 at 1955 in Scalloway; SRI via ? 11.640 (Eng, Fr, It, Ger to Africa 2000-2200) 54544 at 2012 in Bridgwater; R.Kuwait via Kabd 11.990 (Eng to Europe, N.America 1800-2100) 33344 at 2033 in Stockport; R.Romania Int, Bucharest 11.940 (Eng to Europe 2100-2155) 44444 at 2100 in Appleby; R.Havana Cuba 11.705 (Eng to Europe 2100-2200) 33233 at 2121 in Newry; R.Japan via Moyabi, Gabon 11.865 (Eng to Europe 2100-2200) 33333 at 2151 in Woodhall Spa; RS Makedonias, Thessaloniki 11.595 (Gr to Europe 0600-2255) 22233 at 2229 in Gibraltar; BBC via Kranji, Singapore 11.955 (Eng to Oceania 1800-0000) 43333 at 2305 in Kilkeel.

Many broadcasters are taking advantage of the conditions in the **9MHz (31m)** band. Among those noted were R.Australia via Shepparton 9.860 (Eng to Pacific, Asia 0630-?) 33343 at 0648 in Woking; R.Nederlands via Bonaire, Ned.Antilles 9.700 (Eng to Pacific areas [u.s.b. + p.c.] 0730-0825) SIO222 at 0730 in N.Bristol; SRI via Lenk? 9.535 (Eng to Europe 1000-1030) 54554 at 1015 in Bridgwater; R.Prague, Czech Rep. 9.505 (Eng to Europe 1030-1057) 44444 at 1030 in Morden; R.Nederlands via Nauen 9.650 (Eng to Europe 1130-1325) 44434 at 1318 in Penmaenmawr; VOA via Tinang, Philippines 9.760 (Eng to S.Asia 1400-1700) 32423 at 1430 in Oadby; R.Tirana,

Tropical Bands Chart

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1938	E
2.325	ABC Tennant Creek	Australia	1939	E
2.475	Zhejiang 1,Hangzhou	China	2217	C
2.485	ABC Katherine	Australia	1935	E
3.200	TWR Manzini	Swaziland	1951	D,E,G,N
3.210	Em.Nacional,Maputo	Moz'bique	2140	C,E,L,N
3.220	Channel Africa	S.Africa	2017	D,E,G,H,N
3.220	R.Kara, Lome	Togo	2145	B,L
3.230	R.Sol de Los Andes	Peru	0330	H
3.230	SABC Meyerton	S.Africa	1905	B,E,L
3.240	TWR Shona	Swaziland	1912	E,N
3.245	AIR Lucknow	India	0105	B
3.255	BBC via Maseru	Lesotho	2053	C,D,E,G,H,J,L,N
3.270	SWABC 1, Namibia	S.W.Africa	2027	B,C,E,H,L,N,O
3.290	SWABC 2, Namibia	S.W.Africa	2019	B,C,D,E,G,H,N
3.300	R.Cultural	Guatemala	0055	B,D
3.306	ZBC Prog 2	Zimbabwe	2053	D,E,H,J,L,N
3.315	AIR Bhopal	India	1728	E
3.320	R.France Int. via ?	France?	2118	H,N,O
3.320	Pyongyang	N.Korea	2153	L
3.320	SABC Meyerton	S.Africa	2054	B,D,E,F,G,J,K
3.325	FRCN Lagos	Nigeria	2145	C
3.335	CBS Taipei	Taiwan	1946	E
3.345	AIR Jaipur	India	0040	B
3.345	AIR Jammu	India	1732	E
3.356	R.Botswana	Gabarone	2054	E,G,H,J,L,N
3.365	GBC R-2	Ghana	2056	B,C,F,H,I,J,K,M, N,O
3.365	AIR Delhi	India	1825	E
3.370	R.Beira	Mozambique	2011	E
3.375	R. Natcional S. Gabriel	Brazil	0100	B
3.377	R.Nacional,Mulenvos	Angola	1910	E
3.380	R.Chortis	Guatemala	0050	B
3.380	NBC Blantyre	Malawi	2059	E,H,J,N
3.395	ZBC Gweru	Zimbabwe	0303	D
3.915	BBC via Kranji	Singapore	2058	B,E,H,K,L,O
3.925	NSB (R.Tampa)	Japan	2310	B
3.955	BBC via Skelton	England	0305	C,H,P
3.955	R.Budapest	Hungary	1910	B,F,G,H,P
3.965	RFI Paris	France	2225	A,B,C,F,G,H,M, O,P
3.980	VOA via Munich	Germany	1920	A,B,G,H,O,P
3.985	China R via SRI	Switzerland	2101	H,I
3.985	SRI Beromunster	Switzerland	2015	B,G,P
3.995	DW via Julich	Germany	2252	B,C,G,H,N,P,Q
4.735	Xinjiang, Urumqi	China	2310	B
4.750	R.Bertoura	Cameroon	2103	H
4.750	Xizang BS, Lhasa	Tibet	0025	B
4.760	ELWA Monrovia	Liberia	2051	E,H,J,L,N
4.765	R.Integracao	Brazil	0216	H
4.770	FRCN Kaduna	Nigeria	2050	B,O,F,H,J, L,M,N,O
4.775	AIR Guwahati	India	1636	E
4.777	R.Gabon, Libreville	Gabon	1907	B,E,F,L,N,O
4.783	RTM Bamako	Mali	2033	A,B,C,H,J,L,N
4.785	R.Tanzania	Tanzania	2017	L,O
4.786	Ecos del Combeima	Colombia	0400	N
4.790	Azad Kashmir R.	Pakistan	1651	E
4.790	R.Atlantida	Peru	0217	H
4.800	R.Nac Amazonas	Brazil	0005	B
4.800	AIR Hyderabad	India	1716	E
4.800	LNBS Lesotho	Maseru	2020	E,H,L,N
4.805	R.Nac.Amazonas	Brazil	0040	N
4.810	SABC Meyerton	S.Africa	2022	L
4.815	R.diff TV Burkina	Ouagadougou	2107	B,H,L
4.820	E.Prov.Huila	Angola	2027	L
4.820	La Voz Evangelica	Honduras	0050	B,N
4.820	AIR Calcutta	India	1721	E
4.825	R.Cancao Nova	Brazil	2301	O
4.828	ZBC R-4	Zimbabwe	2050	E,J,L,N
4.830	R.Botswana,Gaborone	Botswana	2108	H
4.830	R.Tachira	Venezuela	2250	B,M,N,O
4.832	R.Reloj	Costa Rica	0410	N
4.835	R.Tezulutlan, Coban	Guatemala	2300	N,O
4.835	RTM Bamako	Mali	1954	B,D,H,J,L,M,N
4.840	AIR Bombay	India	0045	B,E,M,N
4.845	RTM Kuala Lumpur	Malaysia	1644	E
4.845	ORTM Nouakchott	Mauritania	2250	B,F,H,L,M,N,O
4.850	R.Yaounde	Cameroon	2110	C,H
4.850	AIR Kohima	India	0030	B,C,M,O
4.860	AIR Kingsway (Feeder)	India	1900	E,J,N,O
4.865	PBS Lanzhou	China	2205	C
4.865	L.V. del Cinaruco	Colombia	2315	B,N,O
4.870	R.Cotonou	Benin	1952	C,E,H,J,L,N,O
4.875	R.Roraima,Boa Vista	Brazil	0135	N
4.879	R.Bangladesh	Bangladesh	0015	B
4.885	R.Clube do Para	Brazil	2330	B,H
4.885	R.Difusora Acreana	Brazil	0040	B
4.885	Ondas del Meta	Colombia	2317	O
4.885	KBC East Sce Nairobi	Kenya	1843	E,L
4.890	RFI Paris	via Gabon	0402	H
4.890	R.Port Moresby	New Guinea	2005	E
4.895	Voz del Rio Arauca	Colombia	2340	B,O
4.895	Pakistan BC	Pakistan	1634	E
4.900	SLBC Colombo	Sri Lanka	1702	E
4.905	R.Nat.N'djamena	Chad	2050	J
4.910	R.Zambia, Lusaka	Zambia	2045	E,J,N
4.915	GBC-1, Accra	Ghana	2016	B,C,F,H,J,K,L, M,N,O
4.915	KBC Cent Sce Niarobi	Kenya	1900	J
4.915	R.Cora, Lima	Peru	0150	D,N
4.920	AIR Madras	India	1613	E
4.925	R.Difusora, Taubate	Brazil	0040	B
4.925	R.Nacional, Bata	Eq.Guinea	2250	M
4.927	RRI Jambi	Indonesia	2250	M
4.935	KBC Gen Sce Nairobi	Kenya	1906	E,J,L,N
4.945	R.Progresso	Brazil	2325	B
4.950	R.Nacional, Mulenvos	Angola	1906	E,J,L,N
4.950	AIR Jammu	India	1707	E
4.955	R.Nac. de Colombia	Colombia	0520	N
4.965	R.Alvorada	Brazil	2330	B
4.965	R.Zambia, Lusaka	Zambia	2005	E,J,N,O
4.970	R.Rumbos, Caracas	Venezuela	2325	B
4.975	R.Uganda, Kampala	Uganda	2050	G,J,L,N
4.980	Ecos del Torbes	Venezuela	2300	B,D,H,K,M,O
4.990	AIR Ext.Service	India	0045	B
4.990	FRCN Lagos	Nigeria	2130	N
5.005	R.Nacional, Bata	Eq.Guinea	2053	E,H,J,L,N
5.005	R.Nepal, Kathmandu	Nepal	1650	E
5.009	R.Madagasikara	Madagascar	1856	E
5.010	AIR Thiru'puram	India	0040	B
5.020	PBS-Jiangxi Nanchang	China	2355	B
5.020	Voz del Upano, Macas	Ecuador	0345	N
5.020	La V du Sahel,Niamey	Niger	1941	E,G,J,L,N
5.020	SLBC Tamil Home Sce.	Sri-Lanka	1719	E
5.025	R.Parakou	Benin	2039	J,L,N
5.025	R.Rebelde, Habana	Cuba	0045	B,N
5.025	R.Uganda, Kampala	Uganda	2046	J,N
5.030	AWR Latin America	Costa Rica	0500	N
5.035	R.Aparecida	Brazil	0230	N
5.035	R.Bangui	C.Africa	1941	B,C,H,J,L,M,N,O
5.040	Voz del Upano,Macas	Ecuador	0045	B,N
5.047	R.Togo, Lome	Togo	2110	A,B,H,J,L,M,N,O
5.050	Voz de Yopal, Yopal	Colombia	0030	N
5.050	R.Tanzania	Tanzania	1943	G,H,J,N,P
5.055	RFO Cayenne (Matoury)	French Guiana	2150	B,N
5.060	PBS Xinjiang, Urumqi	China	2340	B,N
5.060	Sist d'Em Progreso	Ecuador	0040	N
5.065	R.Candip, Bunia	Zaire	1823	E
5.075	Caracol Bogata	Colombia	2345	A,B,D,F,H,K,L,N,O

DXers:-

(A) Paul Bowery, Burnham-on-Crouch.
(B) Robert Connolly, Kilkeel.
(C) John Eaton, Woking.
(D) David Edwardson, Wallsend.
(E) P.Gordon Smith, Kingston, Moray.
(F) Sheila Hughes, Morden.
(G) Rhoderick Illman, Oxted.
(H) Eddie McKeown, Newry.
(I) Wallace Moodie, Port Seton.
(J) Fred Pallant, Storrington.
(K) Roy Patrick, Derby.
(L) Richard Reynolds, Guildford.
(M) Harry Richards, Barton-on-Humber,
(N) John Slater, Scalloway.
(O) Andrew Stokes, Leicester.
(P) Phil Townsend, E.London.
(Q) Thomas Williams, Truro.

Albania 9.760 (Eng to Europe 1600-1612) 54544 at 1600 in Broxbourne; R.Australia via Darwin 9.615 (Eng to Asia 1100-1755) 54444 at 1639 in Burnham-on-Crouch; R.Mediterranee Int via Nardor, Morocco 9.575 (Fr, Ar to N.Africa, S.Europe 0500-0100) SIO433 at 1700 in E.London; SRI via Lenk? 9.905 (Ger, It, Fr to N.Europe 1700-1845) 55444 at 1709 in Woodhall Spa.

Later, DW via Sines, Portugal 9.615 (Eng to Europe 2000-2050) was 44434 at 2020 in Truro; R.Nederlands via Flevo 9.860 (Eng to C/W.Africa 1830-2125) 23333 at 2006 in Oxted and 44444 at 2023 in Gibraltar; R.Thailand, Bangkok 9.555 (Eng to Europe? 2030-2045) 42343 at 2030 in Newry; R.Budapest, Hungary 9.835 (Eng to Europe 2100-2130) 52432 at 2100 in Ross-on-Wye; Voice of Turkey, Ankara 9.445 (Eng to USA 2200-2250) 43333 at 2200 in Appleby; AIR via Delhi? 9.950 (Eng to W.Europe 2045-2230) SIO433 at 2220 in Doncaster; R.Nac del Paraguay 9.735 (Sp 0800-0400) 34553 at 2235 in Wallsend; RFPI Costa Rica 9.400 (Eng [u.s.b.+ p.c.] to N.America 2330-0000) 22442 at 2335 in Kilkeel.

In the **7MHz (41m)** band Monitor R.Int via WSHB 7.535 (Eng [Various Sat/Sun] to Europe 0400-0955) was 44444 at 0641 in Oxted; TWR via Monte Carlo, Monaco 7.110 (Eng to Europe 0640?-0820) 54444 at 0748 in Burnham-on-Crouch; IRRS Milan 7.125 (Eng, Fr, Sp, Russ, Ger [u.s.b + p.c.] to Europe, N.Africa, M.East) 24222 at 0908 in Woodhall Spa; R.Tirana, Albania 7.155 (Eng to Europe 1600-1615) SIO434 at 1605 in Doncaster; AIR via Aligarh? 7.412 (Hi, Eng to Europe 1745-2230) 34453 at 1805 in Woking; R.Bangladesh, Dhaka 7.190 (Eng to Europe 1815-1900) SIO333 at 1830 in Scalloway; R.Nederlands via Talata Volon, Madagascar 7.120 (Eng to S/E/W.Africa 1730-2025) 43233 at 1848 in Newry; R.Thailand, Bangkok 7.200 (Eng to ? 1900-2000) 42542 at 1941 in Bridgwater; DW via ? 7.115 (Eng to W.Africa 2100-2150) SIO333 at 2100 in Co.Fermanagh; R.Budapest, Hungary 7.250 (Eng to Europe 2100-2130) 54444 at 2100 in Ross-on-Wye; Croatian R. via Deanovec 7.370 (Eng 2200-2210) 22222 at 2203 in Truro; WRNO New Orleans, USA 7.355 (Eng to E.USA 2300-0300) 35222 at 2303 in Barton-upon-Humber; WJCR Upton, USA 7.490 (Eng to E.USA 24hrs) 33333 at 2340 in Kilkeel; R.Prague, Czech Rep 7.345 (Eng to N.America 0000-0027) 44444 at 0000 in Morden.

Many of the **6MHz (49m)** broadcasts are intended for listeners in Europe. Among those noted were R.Japan via Skelton, UK 5.975 (Jap, Eng 0500-0800) SIO322 at 0730 in N.Bristol; R.Vlaanderen Int, Belgium 6.035 (Du, Eng, Fr, Ger 0800?-1200) 44444 at 0924 in Penmaenmawr; R.Austria Int, via Moosbrunn 6.155 (Ger, Eng, Fr, Sp 0400-2300) 44444 at 0929 in Oxted; RFI via Allouis 6.175 (Eng 1600-1700) SIO544 at 1614 in Doncaster; R.Sweden via Horby? 6.065 (Eng 1615-1645) 55434 at 1630 in Ross-on-Wye; R.Prague, Czech Rep 5.930 (Eng 1700-1727) SIO323 at 1700 in Co.Fermanagh; Polish R, Warsaw 6.095 (Eng 1700-1755) 22222 at 1714 in Woodhall Spa; R.Latvia Int, Riga 5.935 (Eng 1900-1930 Sat/Sun only) 53533 at 1900 in Broxbourne; BBC via Limassol, Cyprus 6.180 (Eng 1700-2200) 32343 at 1906 in Woking; China R.Int, Beijing 6.950 (Eng 2000-2157) SIO444 at 2000 in E.London; R.Sweden via Karlsborg? 6.065 (Eng 2030-2100, also to M.East, Africa) 54555 at 2030 in Burnham-on-Crouch and 44444 at 2054 in Gibraltar; AWR via Slovakia 6.055 (Eng 2100-2158) 53443 at 2103 in Newry; REE via Noblejas? 6.125 (Eng 2100-2200) 54444 at 2100 in Appleby; R.Korea via Skelton, UK 5.965 (Ger, Fr, Eng 2000-2230) 55555 at 2215 in Bridgwater; R.Japan via Skelton, UK 5.965 (Eng 2300-0000) 22222 at 2315 in Truro.

Also noted in this band were WWCR Nashville, USA 5.935 (Eng to USA 0100-1400) 35343 at 0600 in Burnham-on-Crouch; R.Australia via Carnarvon? 6.090 (Eng to S.Asia 1430-1900) 35543 at 1837 in Wallsend; Iraqi BC & TV 6.560 (Kur to M.East 0300-2300) 32333 at 1919 in Port Seton; R.Nacional de Amazonia, Brazil 6.180 (Sp 0900-0200) heard at 2258 by **Richard Reynolds** in Guildford; R.Nederlands via Flevo 6.020 (Eng to N.America 2330-0125) 43333 at 2330 in Morden; BBC via Antigua, W.Indies 5.975 (Eng to C/S.America 2100-0600) 33333 at 0005 in Kilkeel; DW via Antigua, W.Indies 6.040 (Eng to N.America 0100-0150) 45444 at 0103 in Woking; R.Satelite, Santa Cruz, Peru 6.745 (Sp 2300-0330) SIO232 at 0245 in Scalloway; Voice of Lebanon 6.550 (Ar to M.East 24hr) SIO222 at 0255 in Quebec.

Station Addresses

Radio XL, KMS House, Bradford Street, Birmingham B12 0JD.

Radio Thailand, 236 Vibhavadi Rangsit Highway, Huaykhwang, Bangkok 10400, Thailand.

Radio Tampa, Nihon Short Wave Broadc.Co.Ltd, 9-15 Aksaaka 1-chrome, Minato-ku, Tokyo 107, Japan.

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

LW Maritime Beacons

Owing to the increasing hours of daylight during April, May and June many listeners were unable to search for the sky waves from the more distant maritime radiobeacons which arrive here after dark. Instead, they concentrated on receiving during daylight the ground waves from beacons located around the coastline of the UK and a number of other countries.

As the ground waves travel away from the transmitting antenna (often a Marconi 'T') they follow closely the surface of the earth, which causes them to lose energy, or become attenuated. Such losses are minimal over sea paths but they can be quite high over certain types of soil or rock, notably granite and old sandstone. Nevertheless, as the chart clearly shows, the ground waves from some beacons were received over considerable distances!

The listeners who were prepared to explore the band after dark picked up the sky waves from beacons in more distant places. Their logs included some along the coast of Greenland, Iceland, the Faeroes, Scandinavia, the Baltic, the Mediterranean, N.Africa and even the Canaries Is! Some were logged for the first time by dedicated DXers, which just goes to show that the conditions at night are unpredictable.

A very impressive visual display has been made by **Peter Westwood** in Farnham. After mounting a 5 000 000:1 scale map covering Lat.35°N to 60°N and Long.20°W to 10°E on a base he then placed a small self-adhesive gold roundel at the exact location of each of the 63 beacons he has so far received.

It was nice to hear from two newcomers this time. **Ross Workman** (Shoreham-by-Sea) started beacon Dxing in May. He uses a Lowe HF-225 receiver with a BBC computer plus the Technical Software TX8 program to decode the signals. **John Hobson** (Ely) first searched the band in early June during daylight and it soon became apparent the selectivity of his receiver was inadequate. He says "Things got better when I fitted a 500Hz filter and better still when I received Robert Connolly's indispensable booklet."

Robert Connolly's popular guide, *Non - directional Beacons of Europe*, is still available - if you would like an information sheet about it please write to him, via me, enclosing an s.a.e.

Long Wave Maritime Radiobeacon Chart

Freq (kHz)	C/S	Station Name	Location	DXer
284.5	LZ	Lizard Lt	S.Cornwall	A,B,C*,D,E,F,H,I,J,L,O,P,Q
284.5	MA	Cabo Machichaco	N.Spain	D*,E,F,K,L
284.5	PR	Porkkala	Finland	F*,L*
285.0	NO	Cabo de la Nao Lt	S.Spain	D*
285.0	NP	Nieupoort W.Pier	Belgium	D*,L
286.0	TR	Tuskar Rock Lt	S.Ireland	A,B,C*,D,E,F,H,I,J,L,O
286.5	AL	Almagrundet Lt	Sweden	D*,L*
286.5	BY	#Baily Lt	S.Ireland	D,I
286.5	FE	Cap Frehel Lt	France	F
286.5	FI	Cala Figuera	Majorca	C*,D*,F*,L*
286.5	FT	Cap Ferret Lt	W.France	C,D,E*,F,I,J,K,L,N*
286.5	NK	Inchkeith Lt	F of Forth	B
287.3	BT	Bjargtangar Lt	Iceland	D*
287.3	IB	I.Berlenga	Portugal	D*,L*
287.3	JA	Jaroslawiec	Poland	D*
287.3	LE	Leba Rear	Poland	L*
287.3	MD	Cabo Mondego	Spain	D
287.3	OD	Swinoujscie	Poland	L*
287.3	RO	Rozewie	Poland	D*
287.5	DO	Rosedo Lt	France	D*
287.5	FR	Faerder Lt	Norway	D*,F
288.0	HH	Hoek van Holland	Holland	D,L*
288.0	KL	Sklinna Lt	Norway	B,D*,F*,L*
288.0	OH	Old Hd of Kinsale	S.Ireland	A,C*,F,I
288.5	FI	Cabo Finisterre Lt	N.W.Spain	A*,C*,D,F,K,L*,P*
288.5	UD	Cabo Salou	S.Spain	L*
288.5	YM	Ijmuiden Front Lt	Holland	D,E,F*,L,O
289.0	BY	Baily Lt	S.Ireland	A,B,C*,D,F,I,L,M
289.5	KY	Oksoy Lt	Norway	D*
289.5	LO	Landsort S Lt	Sweden	D*,F
289.5	MN	Hammerodde	Denmark	D*,F*
289.5	SN	Ile de Sein NW Lt	France	D*,L*
290.0	FD	Fidra Lt	F of Forth	B,D*
290.5	OY	Duncansby Hd Lt	NE.Scotland	D,M
290.5	LL	Hallo Lt	Sweden	D*,F*,L*
290.5	SB	S.Bishop Lt	Pembroke	A,B,C*,D,E,F,H,I,L,O,P
290.5	VI	Cabo Villano Lt	N.Spain	A*,C*,D,E*,F,K,L,M*,Q*
290.5	VY	Visby	Sweden	L*
291.0	CF	Capo Ferro	Sardinia	L*
291.0	SN	Cabo San Sebastian	S.Spain	F*
291.0	TG	Torsvag Lt, Koja	Norway	L*
291.0	OR	Orskar Lt	Sweden	D*
291.5	SU	South Rock LV	Co.Down	A,B,C*,D,E,F,G,J,K,L,M,O,P
291.9	AV	Aveiro	Portugal	D*
291.9	LC	Leca	Portugal	Q
291.9	LT	La Isleta	Canaries	D*,F*
291.9	MR	Montedor Lt	Portugal	D*
291.9	NA	Punta Lantailla	Canaries	D*,F*
292.0	MH	Mahon, Minorca	Balearic Is	D*
292.0	SJ	Souter Lt	Sunderland	B,C*,D,F,G,I,K,L,O
292.5	SM	Pt St.Mathieu Lt	France	A,C*,D,E*,F,G,H,I,L*,O,P*,Q
293.0	CP	St.Catherine's Lt	I.o.W.	A,C*,E,F,H,K,L,O,P,Q
293.0	RN	Rhinns of Islay Lt	Is of Islay	B,D,F*,I,M
293.0	SY	Svinoy Lt	Norway	B,D*
293.5	RO	Cabo Silleiro Lt	N.Spain	D*,F*
294.0	KU	Kullen High Lt	Sweden	D*,F,L*
294.0	PH	Cap d'Alprech	France	A,C*,D,E,F,H,I,J,K,L*,O,P,Q*
294.5	MH	Mohni Lt	Estonia	D*
294.5	NG	Pikasaare Ots	Estonia	D*
294.5	PA	Pakrineem Lt	Estonia	D*
294.5	PS	#Pt.Lynas Lt	Anglesey	D,F,I
294.5	PT	#Souter Lt	Durham	B
294.5	SN	Sletnes Lt	Norway	D*
294.5	UK	Sunk Lt V	Off Essex	C*,E,G,L,O
295.5	CB	La Corbiere Lt	Jersey C.I.	A,C*,D*,E,F,L*,O,P*,Q
295.5	CR	Cap Couronne	France	D*,L*
295.5	RE	La Rochelle	France	D*
296.0	BH	Blavandshuk Lt	Denmark	A*,B,D*,F,I,L*
296.0	GR	Goeree Lt	Holland	F,L,O
296.0	KN	Skrova Lt	Norway	D*,F*
297.0	FG	Pt de Barfleur Lt	France	A*,C*,D*,E,F,G,H,I,J,K,L,O,P*,Q
297.5	MA	Mantyluoto	Finland	D*,F*
297.5	PS	Cabo Penas Lt	N.Spain	O*,E,F
298.0	GX	Ille de Groix	France	C,O*,E,F,I,O,P*,Q
298.0	TA	Cabo Gata	S.Spain	D*,F*,L*
298.5	RR	Round Is Lt	Is Scilly	A,B,C*,D,E,F,G,H,I,J,K,L*,O,P,Q
298.5	SW	Skagen	Denmark	D
298.8	DV	Djupivogur	Iceland	D*
299.0	AD	Ameland Lt	Holland	B,D,F,L
299.0	BN	Les Baleines	W.France	D*,F,L*
299.0	O	Tarifa	S.Spain	O*
299.0	UN	Understen Lt	Sweden	D*
299.5	NP	Nash Pt Lt	S.Wales	A,C,D,E,F,G,H,I,J,L,O,P,Q
299.5	SK	Skomvaer Lt, Rost	Norway	D*,F*
299.5	VR	Utvaer Lt	Norway	B,O*,F*,L*
299.5	VS	Vieste Lt	Italy	L*
300.0	MZ	Mizen Head	S.Ireland	A,D,F,I,L
300.0	TI	Cap d'Antifer Lt	N.France	C,E,H,J,L,P*,Q
300.5	DU	Dungeness Lt	Kent	A*,C,E,F,G,H,J,K,L,O,P,Q*
300.5	LA	Lista	Norway	B,O*,F,I,L*,P*
301.0	CA	Pt de Creach	France	D,F*,H
301.0	ER	Eierland Lt	Holland	D*,F,L*
301.1	GV	Livorno	Italy	L*
301.1	RG	Raufarhoefn	Iceland	D*,L*
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305.0	FP	Fife Ness Lt	SE.Scotland	B,D,F,I,O
305.0	GL	Ile de Giraglia Lt	Corsica	D*,M
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305.7	DA	Dalatangi Lt	Iceland	F*,H*
306.0	EC	Elizabeth Castle	Jersey	H
306.0	FN	Walney Is Lt	Off Lancs	B,C,D,F,I,K,L,O,P
306.0	TN	Thyboron	Denmark	B
306.5	GJ	Le Grand Jardin Lt	France	Q
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306.5	OR	O.Osmussaar	Estonia	D*
306.5	RS	Ristna	Estonia	D*,L*
306.5	SY	Sorve	Estonia	D*
306.5	UT	Utsira	Norway	A*,B,C*,D*,E*,F,G,I,K,L*,N
307.0	GL	Eagle Is Lt	Ireland	B,D,F,I,L,M
308.0	RC	Cabo Roca	Portugal	D
308.0	RD	Roches Douvres Lt	France	A,C,D*,E,F,G,H,J,K,L,O,Q
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309.5	MA	Marstein Lt	Norway	B,D*,F*,L*
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310.0	:ER	Pt de Ver Lt	N.France	A,C,D*,E*,F,H,J,M,O,P,Q
310.3	GV	Goltur	Iceland	L*
310.5	BO	Bokfjord Lt	Norway	D*
310.5	SG	Sjaellands N Lt	Denmark	B,D*
311.0	GD	Girdle Ness Lt	NE.Scotland	B,D,M
311.0	NF	N.Foreland Lt	Kent	A,C,E*,F,G,H,I,K,L,O,P,Q
311.5	LP	Loop Hd Lt	S.Ireland	A,D,F,H,I
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313.5	PQ	Porquerolles	S.France	D,L*
314.0	HK	Hekkingen Lt	Norway	D*
314.0	VG	Ile Vierge Lt	France	A,C,D,E*,F,H,I,K,L,M*,O,P,Q
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314.5	TL	Punta D.Penna	Italy	D*,F*,J
316.0	IN	Ingolfshofdhi Lt	Iceland	D*,F,L*
319.0	LEC	Stavanger	Norway	A,B,C,D,E*,G,H,I,K,L,M,O,Q
328.0	HB	Holsteinborg	Greenland	L*
331.0	FH	Frederikshab	Greenland	L*
367.0	JV	Jakobshavn	Greenland	D*
372.0	OZN	Prins Chris's Sund	Greenland	D*,E*,F,L*
381.0	AB	Akraberg	Faeroe Is	A*,B,D*,E*,F*,L*
404.0	NL	Noslo	Faeroe Is	B,F*,L*

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

DXers:-

(A) Darren Beasley, Bridgwater.
(B) Kenneth Buck, Edinburgh.
(C) Steve Cann, Southampton.
(D) Robert Connolly, Kilkeel.
(E) John Eaton, Woking.
(F) Jim Edwards, Bryn.
(G) John Hobson, Ely.
(H) George Millmore, Wootton, IoW.
(I) Albert Moore, Douglas, IoM.
(J) Fred Pallant, Storrington.
(K) Peter Pollard, Rugby.
(L) Peter Rycraft, Wickham Market.
(M) Tom Smyth, Co.Fermanagh.
(N) John Stevens, Largs.
(O) Philip Townsend, E.London.
(P) Peter Westwood, Farnham.
(Q) Ross Workman, Shoreham-by-Sea.

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Anita Louise McCormick KA8KGI
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EMC

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Dick Biddulph G8PDS
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Mike Mansfield G6AWD
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