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- ▲ High Scan Speed

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Telescopic Antenna, NiCad Batteries, Car Connector, UK Charger, Carrying Strap, Earphone, English Manual

Price £449



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Cover: The latest communications receiver from the Yaesu stable, the FRG-100, has been put through its paces by two of SWM's regular contributors - Peter Shore and Mike Richards. You can read all about it on page 33.

In the middle of this issue you will find your free, pull-out *Guide to Short Wave Listening* magazine.

DISCLAIMER. Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. *Short Wave Magazine* advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The Publishers of *Short Wave Magazine* wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.



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Free Pull-out Magazine

Guide to Short Wave Listening



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good listening

editorial

SWM SERVICES

Subscriptions

Subscriptions are available at £21 per annum to UK addresses, £23 in Europe and £25 overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £36(UK) £39 (Europe) and £41 (rest of world).

Components for SWM Projects

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

The printed circuit boards for SWM projects are available from the SWM PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 021-353 9326.

Back Numbers and Binders

Limited stocks of most issues of SWM for the past five years are available at £1.80 each including P&P to addresses at home and overseas (by surface mail).

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

Orders for p.c.b.s, back numbers, binders and items from our Book Service should be sent to:

**PW Publishing Ltd., FREEPOST,
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Court, Station Approach, Broadstone
Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole (0202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (0202) 659950.

We have now been at our new Broadstone offices for two months and are still unpacking and sorting things out. Unlike a company making nuts and bolts we couldn't produce extra quantities before the move to allow us to shut down. In fact the March issue of SWM was being produced while the removal men took the furniture out from around us! To cap it all, no sooner had we moved *Short Wave Magazine* and *Practical Wireless* than our new title, *Practical Motorist*, had to be moved from its Verwood offices. Even as I write this, 14 boxes have been delivered containing new chairs, all of which have to be assembled by - guess who?

SWM PCB Service

Anyway, back to more interesting things. The reason behind the preamble is to let you know that the SWM and PW PCB Services have been 'sub-contracted out'. We have had increasing difficulties in providing the level of service we would like to give you, so we have arranged for **Badger Boards** to take over the service. I am confident that John Badger will be able to provide both the quality and level of service expected and I know that he is looking to expand the service to include components where possible. You can find further details on page 41.

Cover Price

You will, no doubt, have noticed that, with this issue, the cover price of your favourite magazine has increased. We have managed, by dint of heavy investment into 'new technology', to keep the price steady for two years. However, inflation has now caught up with us and we have, reluctantly, had to increase the cover price. There is one way that you can beat the increase - for a limited period a subscription to SWM will be pegged at the old price!

Dick Ganderton G8V FH

letters

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

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

No Morse Licence

Dear Sir

I see that the B licensees are still whinging. The imagined excuse this time, would appear to be the most excellent modification to the Morse test.

I have long come to the conclusion that if you handed some B licensees an A licence on a silver platter, he, she or it would look for a silver spoon. Do they ever stop to think of the unfair advantage that English speaking amateurs have over their foreign counterparts? I wonder how

many English speaking amateurs we would have, if we all had to pass our exams and Morse tests in, say, Chinese.

B licensees do not have an automatic right to an A licence, they have to work for it, the same as all A licensees had to. Nobody bent over backwards to accommodate myself, I had to do a good year of hard practice on the Morse, in order to get my A licence. Why do B licensees of the present time think they should have preferential treatment?

There is no possibility of the Morse requirement being

removed in the foreseeable future, so I suggest they stop whinging and get down to some hard studying as we all had to do. Anything worth having, is worth working for.

In conclusion, I would point out to B licensees and would be amateurs, that the rules and regulations for an amateur licence have stood us in good stead for a great number of years, we all passed our exams, surely you are not going to admit that we are smarter than you are?

**W. Mitchell
Co. Wicklow**

Holiday Help

Dear Sir

I have recently bought an AOR AR-2000 that gives lots of good listening.

What I would like to know is the law on scanners. Can I take my AOR on holiday to Majorca? Also is there any law to say I cannot take the scanner onto the aeroplane? I listen to the airband most of all and I don't want to have my scanner confiscated at the airport.

Terry Broadhead, Rotherham

Ed: I'd like to hear of any experiences readers have had taking their radios on holiday for our Holiday Radio feature later on this year.



Interference Problems

Dear Sir

The problems of interference to radio receivers from the various electrical and electronic devices situated in or around domestic premises is like inflation and equally frustrating.

Your correspondent in January '93 *SWM*, complaining of interference from a house alarm system, may find some consolation from reading that I have mainly overcome wideband h.f. radiation from a neighbour's satellite dish/down converter.

First, identify the trade mark of the offending equipment and obtain their address from the 'business directory' usually run as a department of the larger city libraries, e.g. Birmingham where they are very helpful and efficient. Write to the manufacturers with full details of your complaint. State that the pleasure you had from your hobby beforehand and that it is considered their responsibility to ensure that their equipment does not degrade other systems that were in existence prior to the commissioning of their leaking equipment.

That will take time to take effect. In the meantime purchase an SEM QRM Eliminator.

Position your receiver where it is ergonomically practicable within the area where directly received interference is at a minimum. After connecting the QRM Eliminator to the receiver by coaxial link you will need two antenna. A main antenna erected as far away from the source of interference as possible and a wire antenna erected to pick up more of the unwanted signals than your main antenna.

Tune your receiver to a quiet channel, apart from the interference; within the band you wish to monitor. Cancellation of r.f. interference is achieved by careful adjustment of the Eliminator's knobs.

Obviously, I, *SWM* or SEM cannot be held responsible if 100% success is not achieved because some non-linear types of interference may not be recognised by the Eliminator. That being the case you will have no alternative other than 'putting the boot in', one way or another!

Jim Hunt
Stourport-on-Severn

Letters

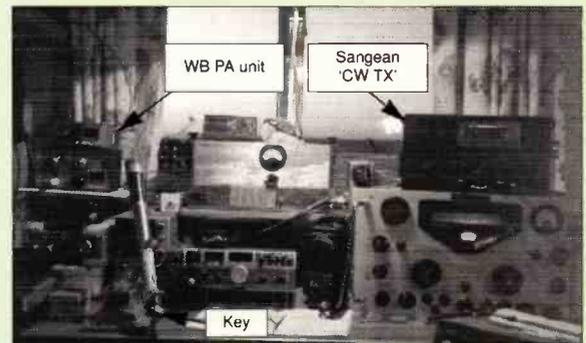
Sangean Mods

Dear Sir

You asked what modifications readers had done to this receiver? I have turned one into an all-band QRP c.w. transmitter!

Only one electrical connection to the receiver is needed and the receiver itself is left untouched. The additional circuit board is contained within the battery compartment. Keyed output at about 20mW is amplified by a small wide-band p.a. The receiver display reads the transmit frequency and the stores, etc., may be used if required. Two transmit controls are provided, fine tuning by VXO (for zero beating) and drive level.

Transceive operation is possible but I use an external RA17L for reception. **D A Bunday, Bath**



Passed the Morse Test

Dear Sir

Congratulations, seeing that you have only made four errors in your Morse alphabet on page 17 of the January issue, you have passed the new Morse test. This, according to your 'Junior

Listener' is going to allow six uncorrected errors. Do you think it is a good idea to have such a test that allows so many mistakes to go uncorrected? Or is this just another typical example of the attitude now in this country, anything will do if we can get through? Quality is a thing of the past.

C Durant, Solihull

Long Range Maritime CW Services Update

Dear Sir

I was today passed a copy of the February *SWM*, which included a special feature on 'Long Range Maritime CW Services', which I read with interest. Unfortunately, there are a number of inaccuracies in this article. These errors are listed here:

1: There is no Maritime Service in the 24MHz band. 22MHz and 25MHz (with paired frequencies in the 26MHz band) are the highest ones used in this service.

2: There are some errors in the table listing coast station c.w. frequencies:

- i: GKB (4.23790) should be 4.274MHz
- ii: GKA (17.09850) should be 17.0984MHz
- iii: GKB (22.44860) should be 22.4487MHz
- iv: GKA (22.46690) should be 22.4670MHz

I cannot comment on the non-Portishead frequencies.

3: Portishead only remotely controls the **Radiotelex** stations on medium-frequency. The southern ring stations are, in fact, coordinated at Lands End radio (GLD) for c.w. and R/T working. For the Northern Ring, Stonehaven radio (GND) is the controlling station, although other stations (in both rings) are manned regularly (but not constantly) on a local basis.

4: The Portishead Radio transmitter sites at Leafield and **Ongar** (nor **Dungar**!) were closed in the mid-1980s. All Portishead Radio transmissions now come from a site at Rugby.

5: The maximum power of Portishead is 10kW, not 15kW as stated.

6: The allocation of ship callsigns is handled by the DTI (Radiocommunications Agency). High-traffic vessels having Short Wave Magazine, April 1993

'GB—' callsigns is not strictly true, as two of our high-traffic passenger ships of the 1980s (*Cunard Countess* and *Cunard Princess*) had callsigns of GUNP and GUPP respectively - certainly not at the start of our lists! Both vessels have since re-registered under the Bahamas flag.

7: Our c.w. traffic lists are generated by computer (our machines were made redundant about 4 years ago) and are transmitted at 20w.p.m.

8: The GKD transmitters are no longer used for working purposes and no callsigns are generated. Vessels are now given a turn on GKB, with GKC only being used at times of high traffic. The GKF transmitter is no longer used.

By the way, we do not encourage listeners to monitor us, as we are relaying messages of a private nature - listening to us is akin to monitoring somebody's telephone line!

Finally, the 'unknown' stations in Table 1 are:

- HWN - French Naval Radio, Paris
- UJY - Kaliningrad Radio, CIS
- FUX - French Naval Radio, Le Port, Reunion Is
- CTP - NATO Radio, Lisbon
- FUV - French Naval Radio, Djibouti
- VXO - No trace my files
- CFH - Halifax Radio, Canada
- 6WW - French Naval Radio, Dakar, Senegal
- VHP - No trace on my files
- HAR - Hungarian Naval Radio, Budapest
- FUF - French Naval Radio, Fort-de-France, Martinique
- DHS - Rugen Radio, Germany

Larry Bennett G4HLN
Customer Services Officer, Portishead Radio

grassroots

rallies

April 18 Marske-by-the-Sea Radio Rally will be held in the Marske Leisure Centre, High Street, Marske-by-the-Sea near Saltburn. Doors open at 11am. There will be the usual traders, a Bring & Buy and refreshments. Talk-in will be on S22. **Mic G7ION.** Tel: (0287) 610030.

April 18: The Lough Erne ARC 12th Annual Mobile Rally will be held at the Killyhevlin Hotel, Enniskillen. Talk-in is on S22. **Alwyn G10BFD.** Tel: (0365) 323802.

May 3: The Dartmoor Radio Club Rally will be held at a new and larger venue, the Yelverton War Memorial Village Hall, Meavy Lane, Yelverton, Devon. Doors open 10.30am with Talk-in on S22. **Ron G7LLG.** Tel: (0822) 852586.

May 9: The MARS/Drayton mobile rally will be held at Drayton Manor Park, Tamworth, Staffs. Doors open at 10.30am. All the usual traders, flea market, Bring & Buy, club stands. The family rally. **Peter G6DRN.** Tel: 021-443 1189. Trade stands ring **Norman G8BHE.** Tel: 021-422 9787 evenings.

May 30: Plymouth Radio Club Rally will be held at Plymstock School, Plymstock. Doors open from 10.30am to 4pm. There will be car parking, traders, Bring & Buy, Talk-in, Raffle and refreshments. **Derek Foster G7ESZ.** Tel: (0752) 787181.

June 6: The Spalding & DARS are holding their Jubilee Mobile Rally at Springfield Gardens, Spalding. **T Kettlewell.** Tel: (0775) 722940.

June 27: The 36th Longleat Amateur Radio Rally, Longleat House, near Warminster, Wiltshire. **Shaun.** Tel: (0225) 873098.

July 4: The York Radio Rally will be held in the Tattersall Building, York Racecourse, Knavesmire, York. Doors open at 11am, entrance fee £1. Ample free parking, amateur radio, electronics and computers, arts and crafts, Morse tests, licensed bar and cafe. Talk-in on S22. **Andy Suter.** Tel: (0904) 708164.

July 11: The Horncastle Amateur Radio, Electronics & Computing Fair will take place at the Queen Elizabeth's Grammar School Sports Hall. **Tony Nightingale G6CZV.** Tel: (0507) 522482.

***August 8:** Flight Refuelling ARS Hamfest will take place at the Flight Refuelling Sports ground, Merley, Wimborne. The event will run from 10am to 5pm and will include the usual mix of traders, Bring & Buy, craft exhibitors, car boot sale and field events. Overnight camping facilities available for the 7th. Talk-in on S22. **Richard Hogan G4VCD.** Tel: (0202) 691021.

September 5: The Telford Rally will be held at the Telford Exhibition Centre, Telford. **Bob G7BWQ.** Tel: (0952) 770922.

***September 5:** The Bristol Radio Rally will be held in The Great Train Shed, Temple Meads Railway Station, Bristol. **Muriel Baker G4YZR.** Tel: (0275) 834282.

September 5: The Vange ARS Annual Rally will be held at The Laindon Community Centre, Laindon High Road/Aston Road, Laindon, Basildon. Doors open from 10.30am. Admission 75p. There will be trade stands, a Bring & Buy, raffle, refreshments, good car parking, talk-in on S22. **Mike Musgrove G4NVT.** Tel: (0268) 543025.

If you're travelling long distances to rallies, it could be worth phoning the contact number before setting off to check all is well.

Avon

RSGB City of Bristol Group: last Mondays, 7pm. The Small Lecture Theatre, Queens Building, University of Bristol, University Walk, Bristol. April 26 - Home Wine Making - with free samples! **Dave Bailey G4NKT.** (0272) 672124.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. April 7 - Voice Your Opinions, 14th - 144MHz Activity Evening, 21st - Stress Management by Maralin Nash, 28th - Simple Computer Programming. **Len Baker.** (0275) 832222.

Bedfordshire

Shefford & DARS: Thursday, 7.45pm. Church Hall, Amptill Road, Shefford, Beds. April 8 - Bring Your Vintage Amateur Radio Kit with Books & Other Bygones, 15th - Ariane, The Rocket & The Launch Site by John Goldfinch. **P. Bradfield.** (0462) 700618.

Berkshire

Maidenhead & DARC: 1st Thursday & 3rd Tuesday, 7.45pm. The Red Cross Hall, The Crescent, Maidenhead. April 1 - FM Systems by G3VCT, 20th - The PC Computer Part 2 by G0CWI. **Neil G0SVN.** (0628) 25952.

Cornwall

Cornish RAC: 7.30pm. The Village Hall, Perranwell Station, Perranwell, Nr Truro, Cornwall. April 1 - AGM, 6th - Activities Night, 11th - Computer Section. **Geoff.** (0209) 820836.

Derbyshire

Derby & DARS: Wednesdays, 7.30pm. 119 Green Lane, Derby. April 7 - Junk Sale. **Richard Buckby.** Ambergate 852475.

Devon

Plymouth RC: Tuesdays, from 6pm. Royal Fleet Club, Devonport. RAE 6-7.30, Morse 7.30-8, Club evening 8pm onwards. Radio shack available.

East Sussex

Hastings E&RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey Close, Hastings. April 21 - Junk Sale. **Reg Kemp.** 7 Forewood Rise, Crowhurst.

Southdown ARS: Mondays, 7.30pm Chasely Home for Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne. April 12 - Latest developments in Computers by Computing Devices Ltd. **Jan G4XNL.** (0323) 412699.

Essex

Loughton & DARS: 1st & 3rd Fridays, 7.45pm. Room 12, Loughton Hall, Deben Community Centre, Loughton Hall, Redden Lane, Loughton. April 2 - AGM, 16th - Video Night. **Ray Pedley.** 081-500 2811.

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.

Fife

Dundee ARC: Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. April 6 & 13 - No Meeting, 20th - QRP History, Equipment & Tactics by GM0LNQ, 27th - Construction Night. **George Millar.** 30 Albert Crescent, Newport on Tay, Fife.

Grampian

Stirling & DARS: Thursdays, 7.30pm. Throsk, Nr Stirling. March 25 - Electronics in Medicine by GM4UYE. **Brian Mulleady.** (0324) 36235.

Greater London

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, Chiswick, W4. April 20 - Practical Problems in e.m.c. by G3IGM. **Colm Mulvany G0JRY.** 081-749 9972.

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. April 8 - Grand Surplus Equipment Sale, 22nd - London AR&C Debrief. **Brian Shelton G0MEE.** 081-360 2453.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. April 9 - No Meeting, 30th - I Followed Rommel by Joan Nicholls. **Chris Frost.** 081-397 0427.

Hampshire

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. April 1 - F-layer Propagation by G3NAQ. **S.W. Swain.** (0705) 472846.

Hereford & Worcester

Bromsgrove & DARC: Fridays. Avoncroft Arts Centre, South Bromsgrove, Worcester. April 9 - Constructor's Competition. **Joe Poole.** (0562) 710010.

Hertfordshire

Dacorum AR & TS: 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Hempstead. April 20 - Being an RLO for the RSGB by G4UNL. **Dennis Boast.** (0442) 259620.

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. April 1 - Hints & Tips with G3JNJ, 15th - The Post Office Tower by George Morley, 29th - Social Night. **Roy G4UNL.** 081-804 5643.

Verulam ARC: 2nd & 4th Tuesdays, 7.30pm. RAF Association Headquarters, New Kent Road, St Albans. April 27 - Antenna Modelling Software by G3SEK. **Walter Craine.** (0923) 262180.

Humberside

Goole R & ES: Most Fridays, 7.30pm. West Park Pavilion, off Airmyn Road, Goole. Last Fridays. The Black Swan Inn, Asselby. April 2 - GOOLE On The Air, 9th - Repeater Group Report, 16th - Video, 23rd

- ATV Demonstration, 30th - Social Evening. **Steve Price.** (0405) 769130.

Kent

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. April 20 - WAB Award Scheme by Alan Messenger. **Geoffrey Milne.** 081-462 2689.

Lancashire

Rochdale & DARS: Mondays, 8pm. Cemetry Hotel, 470 Bury Road, Rochdale. April 12 - Five Million Volts. **G0PUD.** (0706) 32502.

Norfolk

Dereham ARC: 8pm. St John's Ambulance Hall, Yaxham Road, Dereham. April 8 - SWL by G4LPW Mark Taylor **G0LGJ.** (0362) 691099.

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. April 7 - AGM, 14th - Pre-Historic Elephant of West Runton by Dr Tony Stewart, 21st - Real Radio Evening, 28th - First HF NFD Briefing. **Sheila Snelling G0KPW.** (0603) 618810.

Nottinghamshire

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. April 1 - Junk Sale. **Mary G0NZA.** (0623) 755288.

South Notts ARC: Fridays, 7pm. Highbank Community Centre or Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. April 2 & 30 - Construction at Fairham College 6.30pm, 9th - On Air h.f. & v.h.f., 16th - Open Forum (Members Only), 23rd - SNARC Sponsored Trip to Friedrichshafen by G0LXX. **Ray G7ENK.** (0602) 841940.

Strathclyde

West of Scotland ARS: Fridays, 8pm. Garnethill Multi-Cultural Centre, Rose Street (Off Suchiehall St), Glasgow. April 9 - Making the Best Use of Test Equipment by G3AXX & G4COX, 23rd - Developments in ATV. **Jack Hood G4M4COX.** (0698) 350926.

Suffolk

Sudbury & DARC: 1st Tuesdays, 8pm. The Five Bells Inn, Great Cornard, Sudbury. April 6 - Packet & AMTOR Comparisons by G4GGC. **Colin Muddimer.** (0787) 77004.

Warwickshire

Stratford upon Avon & DARS: 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford-upon-Avon. April 12 - No Meeting, 26th - AGM. **A. Beasley G0CXJ.** 060-882 495.

Wiltshire

Trowbridge & DARC: 3rd Wednesday. The Southwick Village Hall, Southwick, Trowbridge. April 7 - CW Operating Practice & Procedures by G3BPE, 21st - Natter Nite. **Ian G0GRI.** (0225) 864698.

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

junior listener

Young Amateur of the Year

The Radiocommunications Agency, along with the RSGB, have just started their Young Amateur of the Year Award for 1993. This is open to anyone under 18 who has an interest in radio. They are looking for outstanding achievement in an aspect of radio, such as: DIY radio construction. Operation of radio community service - helping in emergency communications or helping the disabled. Encouraging others - perhaps through the novice licence scheme. International communications. School projects.

The prize for the most outstanding achievement between 1 August 1992 and 31

July 1993 will be awarded at the RSGB's HF Convention in September. The winner will receive £250 cash and gets a visit to the Radio-communications Agency radio Monitoring Station at Baldock, Herts.

The runner-up also gets the trip to Baldock. All entrants will receive a copy of the RSGB's amateur radio log book.

The all important information - closing date and applications address. the closing date is July 31 and the address to send your application (yes, you can nominate yourself) is:

Young Amateur of the Year Award 1993, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Good Luck!

Improve Your German

The 3rd series of Deutsche Welle's German-by-radio language course begins at the end of September for listeners in Asia, Africa and North America. I know that the previous courses have been heard well in the UK, so it's still worth taking part.

Listeners wishing to take

part in the course as from September shouldn't waste any time in sending for the book that goes with the series. Just write, requesting a copy of the blue booklet *German Why Not?* series three, with full English text - this is free of charge by the way.

Deutsche Welle, Listeners Mail Dept., PO Box 10044, D-5000 Cologne, Germany.

Did You Know

It costs just £15 to obtain a CB licence. Not having one, or using illegal equipment can cost up to two years' imprisonment and an unlimited fine. Food for thought?



The April 1993 picture from the Deutsche Welle calendar.

Tony King (Mailbox), Moira Tuilaepa and Myra Oh (Pacific Breakfast Show) admire the first run of Radio New Zealand stickers released late last year.



Radio New Zealand sticker.



Russian Translations

I have heard about a young Russian who is willing to translate reception reports or letters into Russian, so you can send them off to Russian stations. The fee for this task is 3IRCs. Dmitri has had a couple of letters published in *Short Wave Magazine* and has a good command of English.

If you're interested in using his services, write to: **Dmitri Souslov, PO Box 96, Kazan 80, Russia - 420080.** Actually, if you want to be absolutely correct for the Russian postal system, you should start the address with the country and finish with the person's name.

Digital Communications

Now the subject of digital communications may be daunting, but I've heard of a four-part series you can listen to on the subject. HCJB are

starting the feature on April 7 and it continues on the 14th, 21st and 28th. *The Ham Radio Today* programme by John Beck has called the feature 'Getting started in Digital Communications'. This could be well worth listening for.

Unusual Information

I received a few bits of information from Tony King at Radio New Zealand International recently, and learnt something in the bargain! The emblem that you see on lots of all Radio New Zealand paperwork has a meaning.

"At the centre is 'Te Ika a Maui' the fish-hook with which Maui hauled the North Island of New Zealand from the ocean. Its shape echoes the 'koru' - the frond of the native punga fern, supported by fern leaves. Above it is the representation of a mountain, such as Taranaki (Mt. Egmont) or Aoraki (Mt Cook). The triangles come from compass plates used in sailing ships, and now incorporated in many Polynesian tattoos. They point towards the dots of Micronesia's atolls, protected by reefed lagoons.

The wavy line at the base is like those painted on the body for Melanesian dances and 'sing-song's, representing Vanua - the land. The overall shell shape is reminiscent of fans plaited from pandanus and coconut fibre by people all over the Pacific.

The emblem was designed by Michael Tuffrey, a New Zealander of Samoan descent. There, if any of you are doing a project on New Zealand, there's a bit of extra info that you can use. In fact, if you have to do a project on any part of the world, why not listen in to that country's international radio station, QSL and see what they send back for you to include in your project.

How Old are Your Mum & Dad?

This isn't such a daft question! Deutsche Welle are celebrating their 40th Anniversary on May 3 this year and are holding some special events to commemorate the occasion. If you know some-one who was born on 3 May 1953, then they can

take part in a prize draw. Trips to Germany are included in the list of prizes. You do, of course, need to send a copy of the appropriate birth certificate to qualify!

Even if you don't know anyone with the necessary birthday, there will still be plenty of competitions for you to enter, just keep listening to Deutsche Welle.

news

Radio & DXTV News

Problems continue with the Gibraltar TV studio. The only locally made programmes are now the area news and the occasional offering of local interest made by 'Straitvision', which is inserted between the GBC news and BBC WSTV input. Straitvision was formed by redundant members of the GBC staff. The local government will not raise the subsidy for GBC - which has remained at the present level for 9 years - and there is every chance that GBC could close.

In Belgium the Canal + programme is aired on Chs. E11, E63 on a 24 hour basis from the Leglise transmitter. Canal Plus has changed to Syster scrambling over the terrestrial network, a system developed between the Kudelski and Canal + groups.

Swedish TV is to expand broadcast hours during the forthcoming months with SVT-2 transmitting a breakfast TV show from March 1 last to combat the TV-4 equivalent that has taken large audiences and sold all advertising space. The SVT-2 programme will run 0630-0915 local and originate alternately between 11 regional

studios including Stockholm. In next door Finland, MTV (oy Mainostelevisio Ab) is to take over the 3rd channel leaving the YLE to fill the gaps in the schedule previously filled on the 1st and 2nd networks.

There have been 86 applications for private TV licences in Greece, 78 for local coverage and the others for national networking though a few are already on air! Network applications include Mega Channel, Sky TV, Hellas 62, Antenna TV, New Channel, Kanali 29, Channel 7 X and Nea Teleorasis. With such competition ERT is revamping her image, ERT-1 will go for a general entertainment format, ERT-2 for the young and ERT-3 culture and education.

Reader **Brian Williams** in South Africa noticed that his terrestrial M-NET TV service - that has 'clear periods' 1700-1900 local - was carrying another scrambled programme during the clear period. With several adjustments of the front panel M-NET decoder BBC World Service TV appeared. Now BBC WSTV is being carried over M-NET during the 0200-1100 period daily, a local paper has highlighted the method for gaining free access to the BBC service by decoder



Kellogg's Tour

Kenwood will be supplying radio equipment to Britain's top professional cycle races of 1993, the Kellogg's Professional Tour of Britain and the Leeds World Cup Classic. Radio officials, TV crews and police will be using Kenwood TK240 hand-held radios and TK705 mobiles, base stations and repeater units. The Kellogg's Tour of Britain takes place from August 9 to 13 and the Leeds World Cup Classic on August 15. You can see the route for the Kellogg's tour on the map.

adjustment which has attracted large audiences.

FM-TV Busybody is the name of an English language f.m., TVDX and satellite bulletin published in Finland. The folded A4 format booklet runs to 12 pages full of interesting loggings and news. The 1993 subscription costs 110 FIM from Timo Leponiemi, Nox 7, 05901, Hyvinkaa, Finland. Postal Giro account is Helsinki 1388 116, add another 25 FIM if using giro.

Tim Anderson has introduced a computer program for Amiga and IBM PC called DX Watch. This is a data base of World-wide Band 1 TV TX offsets with a small Band 3 and u.h.f. offsets in addition. Additional

files can be added, e.g. each country, continent, channel, etc. A 2nd programme on this disk includes key words such as PTT NED, NOS, Noxema, Nieuws, Pauze, etc so that unknown words can be identified and hopefully the country id. Users can build up their own file (s) to give a large TVDXing data base. The disk costs £8.00 including UK post from **Tim Anderson, 2 Burry Road, St. Leonards on Sea, E. Sussex TN37 6QX**

Dave Shirley G4NVQ wrote the program. Another disk called Amiscan version 2.0 is available for scanner enthusiasts at £8.50 - write with s.a.e. for information.

Sixteen More Stores

Waters and Stanton have announced that from March 1, a selection of their scanners including Yupiteru and AOR, will now be available through all twenty-three branches of the Maplin electronics shops.

This follows the successful completion of the pilot scheme started last year when seven of the top Maplin shops were stocked out with a selection of scanning receiver. The after sale service work will continue to be carried out by Waters and Stanton who will also be able to offer telephone technical advice to customers before and after purchase. The address of the nearest Maplin Electronics store can be obtained by either telephoning **(0702) 206835** or purchasing the Maplin catalogue from any branch of W.H. Smiths.

CB Prosecutions

Ninety-five people were convicted for CB offences in the UK last year. The Radiocommunications Agency won every case it brought, and the largest penalty imposed by the courts was £668 plus costs. In the majority of cases, the courts also confiscated equipment.

Most offences were for unlicensed use or the use of illegal equipment such as linear amplifiers or a.m. and s.s.b. sets. These are outlawed under CB regulations.

Venue Mix-up

The organisers of the All Formats Computer Fairs would like to point out that the venue for the London Fair on Saturday April 24 is **not** Sandown Park, but the Novotel in Hammersmith. for further details, contact: **(0608) 662212**.

Catalogues

Two new catalogues have landed on the desk this month. The first is from Marco, it's a 166-page catalogue with products alphabetically arranged, e.g. Aerials and Accessories, Audio-Stereo Mixers, Books, etc.

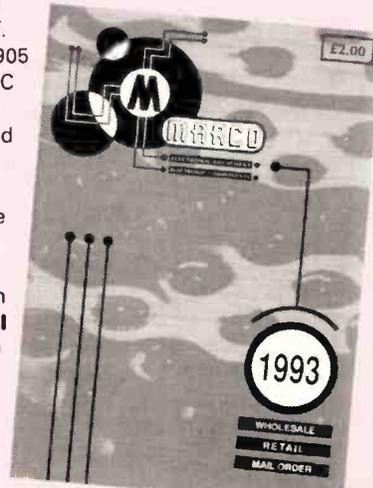
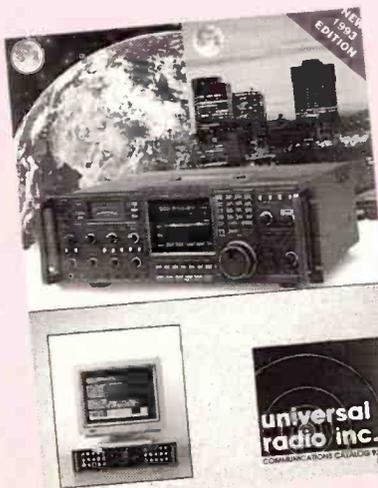
The catalogue costs £2.00 from **Marco, The Maltings, High Street, Wem, Shrewsbury SY4 5EN. Tel: (0939) 232763.**

The second catalogue is from the USA. Universal Radio has a new, expanded, edition of its *Communications Catalog* (yes, as it's American they have a different spelling!). *Catalog 93-01* is 100-pages and covers equipment for the amateur, short wave and scanner enthusiast.

Several new items are in this catalogue. the Yaesu FRG-100 receiver, World Access 8A

Receiver, Standard CCR708A v.h.f./u.h.f. receiver, Philips AE-3905 Receiver, Sony & JRC GPS Receivers and many new books and publications.

Catalog 93-01 is available free inside the USA by fourth class mail, or for 4IRCs outside North America. **Universal Radio, Inc., 6830 Americana Parkway, Reynoldsburg, Ohio 43068, USA.**



A Prize Giving

A Ukrainian who won a two-week trip to Britain in a BBC World Service competition is finally visiting the country - after 28 years!

Alexei Antonovich Brazhnik, who is now 61, was refused permission to make the trip in 1965 by local Communist Party bosses. But three years ago he was able to claim his prize when he contacted the BBC during its first-ever exhibition on the former Soviet Union. The BBC ran the competition on its Russian Service, as a time in the sixties when east/west relations were relatively relaxed. Jamming of the BBC had temporarily ceased and only resumed when Soviet troops invaded Czechoslovakia in 1968. It stopped finally in 1987.

Competition entrants were asked to write a short essay about what they would like to do if they had a chance to visit Britain, together with questions on how they saw life here. Since his arrival from Ukraine, Mr Brazhnik has quickly grown fond of his local pubs and happily exchanged his own home-made vodka for the best bitter!

Diamond Jubilee of Drake

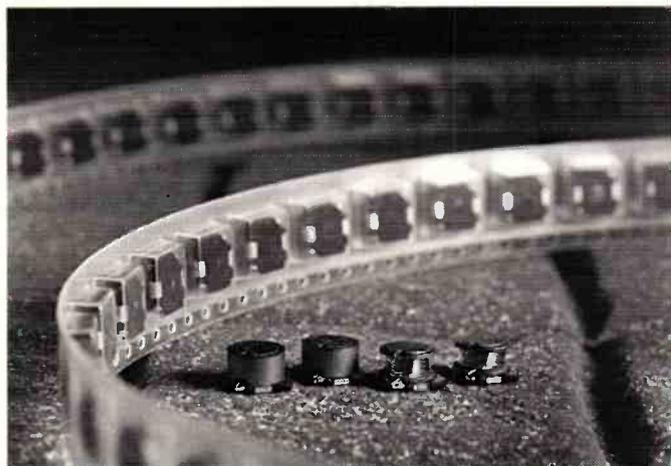
The R.L. Drake company celebrates its 50th anniversary as a manufacturer of electronic communications equipment. Originally the company manufactured radio equipment for the US Military during the second World War, but now have expanded its role in communications equipment by moving into the

amateur field as well.

In the early 1980s, the Drake company expanded into satellite communications and became the foremost American manufacturer of satellite television systems - a distinction it still holds.

For details on any Drake equipment, contact: **R.L. Drake Company, PO Box 3006, Miamisburg, Ohio 45343, USA. Tel: (513) 866-2421.**

Surface Mount



Following on from the success of Toko's p.c.b. mounting high power inductors, Cirkit are now stocking the new D7 series of low profile surface mount types. Measuring only 3.2 x 4.8mm, the D7 style is designed to accommodate a wide variety of wire diameters. Inductances from 1 μ H to 470 μ H are available, with current ratings from 0.195 to 3.12A making these coils ideal for noise filters and decoupling power supply rails. A magnetically shielded version is also produced, using an external ferrite ring, for use in more critical locations. **Cirkit Distribution Ltd., Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (0992) 441306.**

ICS Electronics have expanded their range of data products with the inclusion of the PK-900. Many readers will have heard of the PK-232, this is its successor.

This unit decodes Packet, ASCII, Baudot, Morse, AMTOR, NAVTEX, t.d.m. and Siam. For further details you can either read Decode on page 53 or contact **ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Arundel, West Sussex BN18 0BD. Tel: (0903) 731101.**

news

Scanner Power Supplies

The SSE PSU 101MKIV is built for powering/charging most scanners found on the UK market, including the MVT-7100. The PSU has two d.c.l sockets at the rear, one for using with scanners and the other may be used with accessories such as the JIM pre-amps, etc. It also has a bracket with a BNC fitted to the rear of the support. The SSE PSU 101MKIV is supplied with 12V d.c.output as standard. Other versions are available for other pocket scanners with 9V and 6V d.c. outputs. **Solid State Electronics (UK), 6 The Orchard, Bassett Green Village, Southampton SO2 3NA. Tel: (0703) 768598.**



Cross-Channel Radio

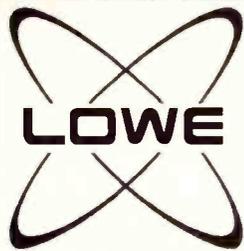
The Radio Authority has decided, in principle, to advertise a restricted service licence, to run for a period of eight years, to provide a travel information radio service along the M20 motorway between Folkestone and Maidstone. If a suitable frequency can be identified and it can be secured on an appropriate time-scale, the authority hopes to advertise the licence as soon as possible. The Authority believes that travel information for users of the M20 heading towards the Channel ports and beyond (to France and Belgium) will become increasingly important once the choice of cross-Channel operator is extended by the opening of the Channel tunnel.

New Antenna Tuning System

Logic Aerials have put in some work on the Delta Loop antenna by adding a 'Delta tune System'. According to their research, users of the system have noted improved results. The delta loop antenna system has a wide band coverage and low s.w.r. It is constructed of light-weight aluminium and is easily assembled and made ready for use. A 50-75 Ω coaxial cable connection is all that is needed. Logic Aerials have applied for patent cover and are interested in hearing from both the trade and retail customers. The antenna costs, £90, more details from **Logic Aerials. Tel: (0493) 781215.**

The PK-900 Data Controller





LOWE ELECTRONICS

Bringing the world
to your home

WORLD BEATING SHORTWAVE RECEIVERS

LOWE HF225

Everybody loves a winner! It probably came as no surprise to owners of the HF225 when our receiver won yet another award. After all, they are already appreciating the excellent sensitivity, superb IF filtering and the remarkable ease of operation. Add a keypad for direct frequency entry, an active whip antenna, synchronous detection and FM unit and you have one of the most versatile receivers on the market today - significantly less expensive than some of its far eastern competitors!



HF225.....£479.00
HF225 EUROPA£699.00

(A very special limited edition - telephone for details)

LOWE HF150

Small, but perfectly formed, the HF150 is really establishing itself as a premier receiver for serious listening. It's complete with selectable sideband synchronous detection, three AM bandwidths and SSB filtering optimised for DXing utility stations. But we don't just stop there. We've just made it a lot more useful by launching a quick release mobile mounting bracket, and now we've added computer control for complete versatility. Call at any of our branches for full details.



HF150.....£359

THE BEST OF THE REST...

KENWOOD R5000

Despite its age, still proving a tough, reliable HF receiver. IF Shift and Notch controls allow you to process the incoming signal and narrower CW and SSB filters are available for those who need them. Now the only shortwave set with provision for installing a VHF converter. (And our unique two year warranty!)



From.....£949

ICOM R72E

An ideal choice for those who need lots of memory channels and scanning facilities. FM can be added as an option as can narrower CW filters. DDS technology ensures smooth tuning. Direct frequency entry from the keypad, clocks and timers enhance the operation.



R72E.....£759.00

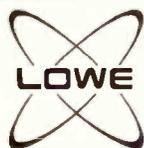
JRC NRD535

Probably the finest receiver available today. Designed to give you total control of the incoming signal, its many features include pass band tuning, notch filters, noise blankers, dedicated data modes including FAX and built in RS232 interface for computer control via our Multiscan software.

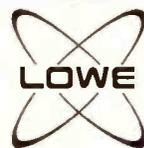


From.....£1395

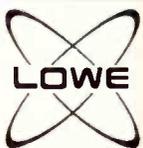
Colin G3XAS at
BOURNEMOUTH
27 Gillam Road,
Northbourne,
Bournemouth
BH10 6BW
Tel: 0202 577760



Dave G4KFN at
NEWCASTLE
Newcastle Airport,
Woolsington,
Newcastle Upon Tyne
NE20 9DF
Tel: 0661 860418

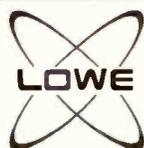


Tony G4CYE at
BRISTOL
79/81 Gloucester Rd,
Patchway,
Bristol
BS12 5JQ
Tel: 0272 771770

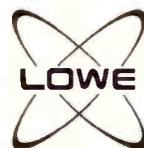


NEW

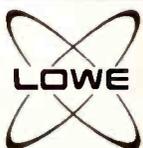
Fred G4RJS at
LONDON
223/225 Field End Road,
Eastcote,
Middlesex
HA5 1QZ
Tel: 081 429 3256



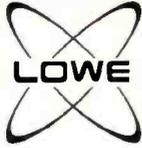
Tony G4NBS at
CAMBRIDGE
162 High Street,
Chesterton,
Cambridge
CB4 1NL
Tel: 0223 311230



Sim GM3SAN at
CUMBERNAULD
Cumbernauld Airport,
Cumbernauld,
Scotland
G68 0HH
Tel: 0236 721004



Head Office
Main Showroom
and Mail Order



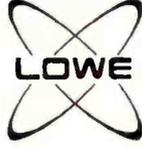
DERBYSHIRE

Here to help you are:

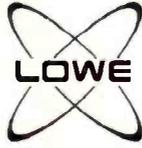
Rob G8MPT, Bill G8LXN
Beryl G7LME, Julie
Tom G6PZZ, Richard G3OQT
John G3PCY

Chesterfield Road, Matlock,
Derbyshire DE4 5LE
Tel: 0629 580800
Fax: 0629 580020

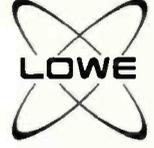
Steve G6URJ
KENT
Chatham Road,
Sandling,
Maidstone
Kent ME14 3AY
Tel: 0622 692773



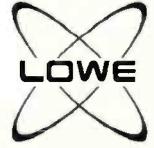
Steve G1WSY at
HEATHROW
6 Cherwell Close,
Langley,
Slough, Berks
SL3 8XB
Tel: 0753 545255



Tom G4LAR at
LEEDS
34 New Briggate,
Leeds,
LS1 6NU
Tel: 0532 452657



NEXT?



**NEW!
YAESU
FRG100**



A new receiver from Yaesu has been a long time coming and the FRG100 sets a new standard from this manufacturer. Broadcast listeners may like the 6 and 4kHz bandwidths and the fifty memory channels will store both frequency and mode.
Seems good value at.....£559

LOWE NEWS!

Plymouth is the site of our latest branch, bringing Lowe sales and service to the south west for the first time. Over the years we have served a large number of satisfied customers in the Devon and Cornwall area by virtue of our excellent mail order system, so we are particularly pleased to offer customers old and new, somewhere they can visit and actually see our products and to try them out before buying.

Derek Foster, G7ESZ, and Peter Thornhill, G6ZKQ are your contacts here. Both contribute widely to amateur radio activities in the area, and keep themselves up to date on the short-wave scene also. In addition, both have many years professional experience to draw on and you still have the back up of the biggest and best service department dedicated to hobby radio. You'll find us at:

**The Basement
Royal Fleet Club
Devonport
Plymouth
Devon
PL1 4PQ**

Tel 0752 607284
Fax 0752 607285

MULTISCAN

Computer control of receivers is a growing interest with many SWL's and as a result, Lowe Electronics have commissioned the Multiscan program for IBM PCs and compatibles. This is quite a sophisticated and versatile program offering a high level of control of functions depending on the receiver in use. It supports the current range of receivers from Kenwood, Yaesu, AOR, JRC and Icom's R7000 and R7100.

Multiscan features 2000 memory channels with dual VFOs and space for a fifty character "comment". Manual tuning can be accomplished with keyboard entry, up/down controls or by mouse control, together with mode change, filter selection, BFO control, passband tuning, noise blankers etc., depending on your receiver.

A spectrum analyser display is also incorporated, together with a comprehensive logbook and precompiled database of over 1000 entries. The database is fully editable, allowing you to create a number of files. A datasheet is available but a demonstration at one of our branches allow you to see the full potential of these excellent software.

MULTISCAN.....£75.00

RF SYSTEMS

This small company from the Netherlands has really turned on the world of shortwave listeners. Their products are highly innovative, extremely well made and offer great value for money – and what's more they work!

Comprehensive datasheets are available on all their products and we'll be happy to supply these on request.

- Magnetic Longwire Balun.....£39.95**
- MLB Antenna Kit 1 (12.5m long).....£66.95**
- MLB Antenna Kit 2 (20m long) £76.95**
- MLB Marine (special MLB for maritime use).....£54.95**
- DXONE the ultimate active antenna.....£289.00**
- DX7 Active antenna.....£179.00**
- T2FD Low noise antenna.....£169.95**
- DXListener.....£249.00**

**NEW! FROM
RF SYSTEMS
THE MAGNETIC
TRANSFER ANTENNA**

Developed primarily for marine applications, the MTA is a passive antenna. Comprising of a 2m long, UV resistant, plastic pipe with stainless steel fittings, the MTA can be mounted in a variety of locations. It has a specially wound helical element designed for omnidirectional reception and is elliptically polarised to make the most out of transmissions vertically or horizontally polarised. Two versions are available: one covering 100kHz – 25MHz and the other 500kHz – 30MHz. We expect the price to be around £159.00. Full details on request.



WEATHER MONITORING BY RADIO

Open up a fascinating new world of short wave listening by monitoring weather broadcasts from around the world

SONY ICF-SW 55 and ICF-SW 77 SSB Radio Receivers



These are ideal for use with any of our HF weather broadcast decoding systems. The name of each station can be stored together with all relevant frequencies. Station selection is at the touch of a button. The ICF-SW 77 even selects the strongest frequency for that station automatically. 100 Hz tuning resolution for the 55, 50 Hz for the 77, which has a greater memory capacity.

For ease of use and value for money, the new SONY compact receivers cannot be beaten. They give communications receivers at twice the price a run for their money!

ICF-SW 55: £279.99
ICF-SW 77: £399.99

Weather Facsimile, RTTY, Navtex, CW and FEC for the IBM-PC



All you need to produce superb reproduction of weather maps and amateur transmissions on the VGA screen of an IBM-PC. Extremely easy to use. Even the hardware to interface between your PC and an SSB receiver and a 9 to 25 pin interface adaptor are included.

Covers weather facsimile, Navtex, RTTY, CW and FEC.

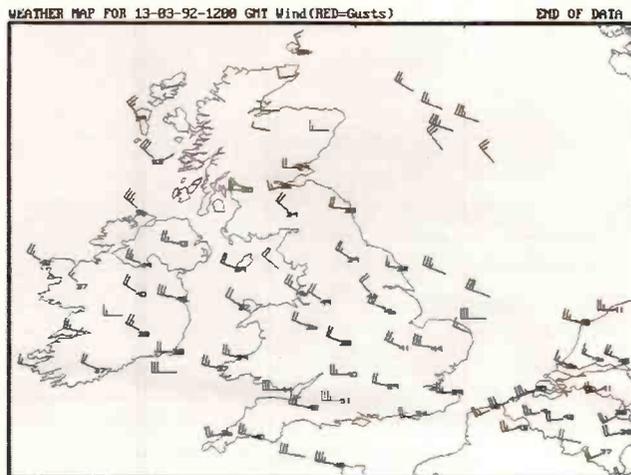
ICS-FAX III: £139.95

Please contact us for free catalogue and price list.

Our products are available direct and from dealers throughout Europe. Callers by appointment.



NEW! Synop on your IBM-PC



ICS-SYNOP II permits SYNOP data sent in RTTY format on HF by meteorological organisations around the world to be directly plotted on the screen of your IBM-PC. Plotted weather information fully selectable.

Just stand back and watch weather observations appear on a map on the screen of your PC as you watch. Updates every 3 hours. The software and hardware interface are both included in our remarkably low price.

This is a total breakthrough in weather monitoring by radio. Send for more details now.

ICS-SYNOP II: £149.95

Direct Reception of Meteosat and NOAA Weather Satellites on your IBM-PC



Complete systems, ready to plug in and go. Built to the highest professional standards.

All systems come complete with software, documentation, computer interface, cable, receiver, pre-amplifier and antenna. Very easy to use, giving superb high quality images. False colours and animation available. Supports VGA, SVGA displays on 286 processors and above. Includes features hitherto seen only on professional systems costing many times more. Colour brochure available on request.

Met-2a (Meteosat): £975.19
NOAA-2a: (NOAA option): £587.44

Prices include VAT at 17.5%.

Add £6.00 post and packing.

Data on any product available on request.

ICS Electronics Ltd. Unit V, Rudford Industrial Estate, Arundel, West Sussex BN18 0BD
Tel: (0903) 731101 Fax: (0903) 731105



Economising the 328R Receiver

When he ordered a 328R 'Spy' receiver from Anchor Surplus, Bill Wilson had little idea of the quality of equipment he was to get, or where it would lead.



The 328R receiver and its new battery pack.

The 328R spy receiver turned out to be an ex-WD receiver, measuring a mere 175 x 90 x 50mm and covering the range 2.5 to 30MHz in five bands. It has a tuned r.f. stage, and an excellent 460kHz filter in the i.f. stage allowing very easy c.w./s.s.b. reception.

Calibration of the long steel strip tuning scale can be checked with the internal 1MHz and 250kHz crystal calibrator. Only a few milliwatts of audio is provided for the high impedance headset - or to a tape recorder for which a lead is supplied with the radio. The 328R is very lively indeed, even on its own whip antenna.

Silicon transistors are used throughout and the power consumption is around 30mA, this being supplied by a pair of 'special' 6.75V mercury batteries - or by an external 12V d.c. supply. Three sets of these batteries are issued with the equipment and more could be obtained from Anchor Surplus for around 50p each. Why do I mention this? Read on...

Euphoria

Initial euphoria came to a full stop when I happened to see the current price of these batteries - almost £10 each, so that worked out at £20 for around 30 hours listening! My blood curdled at the mere thought and the mind was bent to devise an alternative means of powering the receiver to permit portable use.

My first reaction was to use a 1.5V NiCad and a small inverter to give the necessary 12V. It was found possible to fit the NiCad and inverter into the battery compartment, but the efficiency was pretty abysmal. The eventual solution was to make up a NiCad pack in a suitable case to physically match the receiver and the opportunity was also taken to incorporate a small audio amplifier and

loudspeaker to obviate the constant need to rely on headphones.

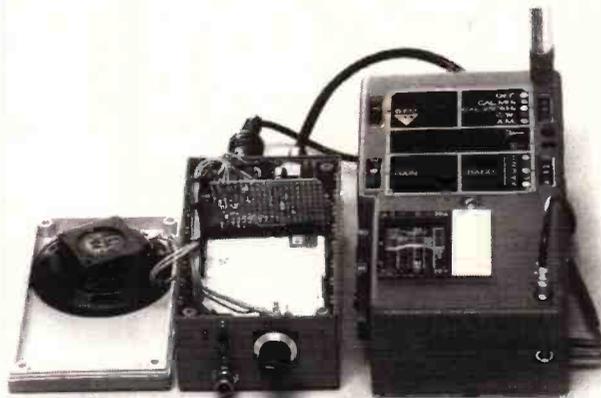
A 'Retex' ABS plastics box 125 x 70 x 49mm was chosen. This will accommodate a small speaker as well as the ten NiCads, AA size is ideal, holders being available to take ten of these, or in my case, a 'surplus' NiCad pack was used. This consisted of ten 0.5A cells. There is a preset variable resistor in the circuit

to set the appropriate charging current for the type of NiCad chosen. The box size given is purely a suggestion, a larger battery supply or speaker may be preferred, in which case a larger box would be required. Sockets are provided for the 15-30V needed for charging the NiCads, for the 12V output to the receiver and audio input from the 328R. The latter is a 5-pin DIN to suit the tape output lead of the receiver, but it is wise to build in a spare socket (Phono or whatever one habitually uses) for general use as an audio amplifier.

A volume control is built into the front of the case, thus one can use the r.f. gain control on the receiver purely for this purpose while the new volume control is simply that, making c.w./s.s.b. reception very much easier. To simplify use of the unit, the sockets are located on the rear of the unit to leave room at the front for the volume control, ON/OFF switch and the 'power-on' i.e.d. The DIN socket, of course, accepts the 'tape' lead of the radio, either the earphone or tape socket of the 328R may be used, as both are controlled by the receiver's gain control. A small piece of stripboard holds all the other components, the layout not being critical in any way.

Setting-up

The only setting-up required is the adjustment of the charging current for the particular type of NiCads used. Before



How the batteries fit into the project box, you can clearly see the loudspeaker in the lid.

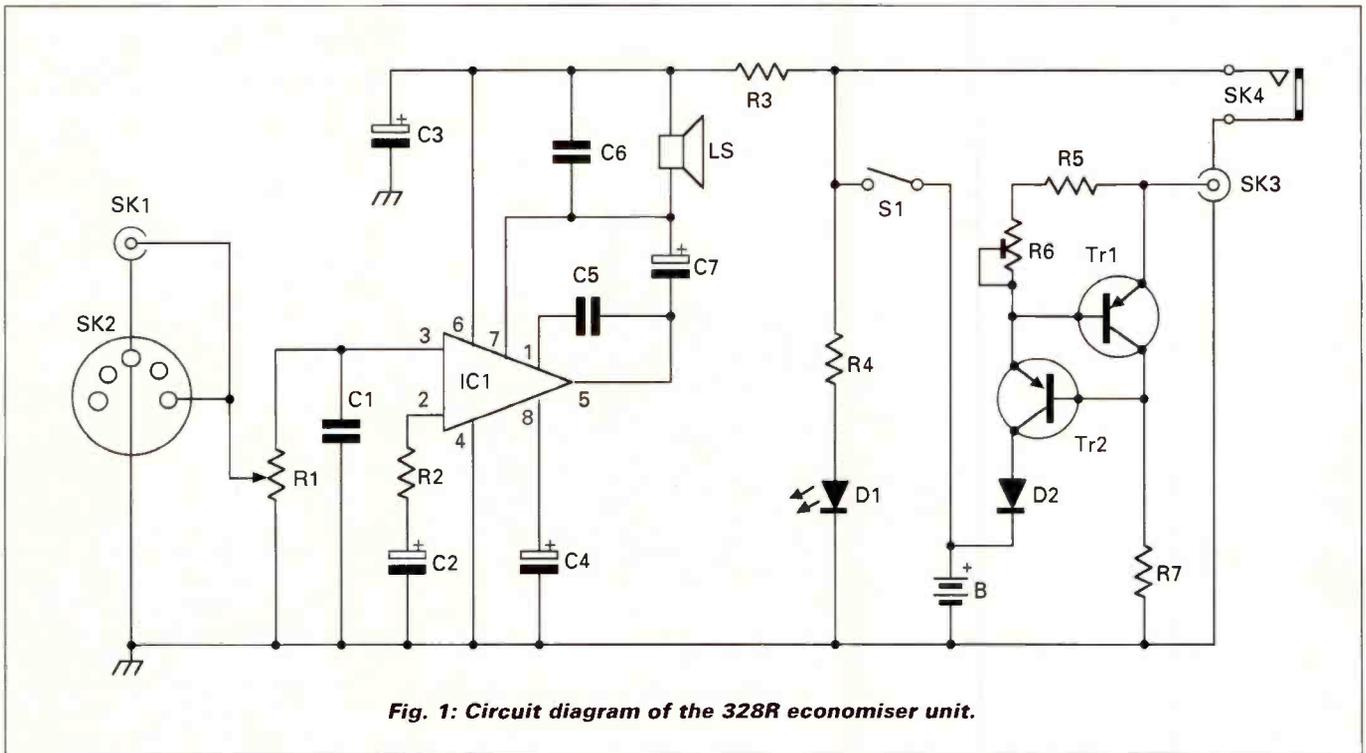


Fig. 1: Circuit diagram of the 328R economiser unit.

connecting the batteries, insert a milliammeter between D2 and the minus line, set R6 to maximum resistance, provide a source of 15 to 30V d.c. at SK3, (+ to centre) then adjust R6 until the correct charging current for the particular type of NiCad is indicated, the meter is now replaced by the NiCads and the unit is complete.

The unit is easy to build,

cheap - especially if 'surplus' NiCads are used - and will soon pay for itself. The idea could be applied, of course, to any other battery equipment for which NiCads are not available.

There is one small modification that can benefit the receiver - the b.f.o. pitch control has perhaps too big a swing, however it is a simple matter to add a resistor

(a 100kΩ will provide a starting value for experiment) between two tags on the b.f.o. control. Locate the pin on the printed circuit board below the b.f.o. control that has a white wire going to the control. Solder one end of the new resistor to this pin and then solder its free end to the centre pin of the control (green wire). All that remains to be done is to carefully tune

the pot core directly behind the b.f.o. control so that the l.s.b. and u.s.b. settings are at the extreme limits of the control, once this is done, there is then no need to 'search' for the correct l.s.b. and u.s.b. settings each time the b.f.o. is used.

Finally, has anybody got a circuit or handbook for the 328R?

Shopping List

Resistors

10Ω	1	R5
33Ω	1	R3
120Ω	1	R2
680Ω	1	R4
1kΩ	1	R7
Potentiometers		
Preset		
100Ω	1	R6
Variable		
10kΩ	1	R1

Capacitors

200pF	1	C5
10nF	1	C1
100nF	1	C6

Electrolytic

47μF	2	C2, 4
100μF	2	C3, 7

Semiconductors

Diodes		
1N4001	1	D2
I.e.d.	1	D1
Transistors		
BC212	2	Tr1, 2
Integrated Circuit		
TBA820M	1	IC1

Miscellaneous

Switch s.p.s.t. (S1); 5-pin DIN socket (SK2); phono socket (SK1); d.c. input socket (SK3); 3.5mm socket (SK4); 8Ω loudspeaker; ten AA NiCads (see text for alternatives); Case to suit.

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AR1500e	Compact <u>all mode</u> hand-held receiver. Receive coverage 500 kHz ~ 1300 MHz... AM/NFM/WFM & SSB using BFO. Enhanced model.	Was 299.00	250.00	49.00
AR1500EX	Compact <u>all mode</u> hand-held receiver. Receive coverage 500 kHz ~ 1300 MHz... AM/NFM/WFM & SSB using BFO. Latest model.	349.00	299.00	50.00
AR2800	Competitively priced full featured base - mobile scanning receiver. <u>All mode</u> operation AM/NFM/WFM & SSB using a BFO. Coverage is 500 kHz ~ 600 MHz & 800 ~ 1300 MHz. Includes internal NiCad.	449.00	375.00	74.00
AR2500	Base - mobile receiver 5 - 550 MHz & 800 - 1300 MHz fitted with BFO. Has an RS232 computer port.	Was 419.00	325.00	94.00
AR2000	Hand-held receiver 500 kHz - 1300 MHz without gaps. AM/NFM/WFM	309.00	250.00	59.00

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Time Signals from Broadcast & Other Sources

There is little excuse today for DXers not to have at least one clock in the house giving near-perfect time, maintains Philip C Mitchell.

World-wide, a total of 30 radio transmitters spend their entire life maintaining highly accurate time signal sources 24 hours a day, which apart from keeping out time pieces accurate are an essential source of time standards for industry, commerce, astronauts, aircraft navigation, defence forces and science.

These stations are in addition to the hundreds of broadcast stations, such as the BBC, that at fixed times through their programme schedules, send out accurate time signals for the benefit of their listeners.

UTC

All these time signals are given in Universal Co-ordinated Time (UTC), which has replaced Greenwich Mean Time (GMT) in the last decade.

Some of the specialised radio stations that maintain time standards have dual purpose functions. The main carrier frequency, for example, is sustained at highly accurate levels for use as a reference by manufacturers of communications receivers and transmitters, along with the other instruments needing precise calibration. The accuracy of transmitted frequencies from some of these stations, e.g. WWV and WWVH is of the order of about 1 part in 1000 million (1×10^{-11}) and the daily deviation less than 1 part in 10^{12} . The same transmitted emissions maintain time standards and accuracy, constantly improved over the years to what is now in the order of 0.01ms as derived from cesium atomic time scale clocks.

As with an extra day being inserted in our calendars for a leap year every four years, likewise an extra leap second has to be inserted into the time scale approximately every two

years to compensate for variations in speed of rotation of the earth and the fact that there is a deviation in the position of North and South Poles about 10m every 14 months. This latter deviation will alter the relative position of longitude from which time zones are related.

Who Can Be Heard

The constant UTC time will then be corrected to equal astronomical time UT1. This 'event' usually takes place on December 31 or June 30 and means, in effect, just one minute in time on either of these dates will be 61 seconds long!

Some of the time signal stations that can be received in the UK are listed in Table 1. These are just a few out of the many global radio sources. Many share the same 2.5, 5, 10 and 20MHz frequencies, so will also be received on the back of stronger signals. Separation will, therefore, be a

possibility if a directional antenna system is used, hence a co-ordinate of position should be known.

A more comprehensive list of time signal stations is published in the *World Radio TV Handbook*. Here it is noted that most of these will issue QSL cards against verified reception reports.

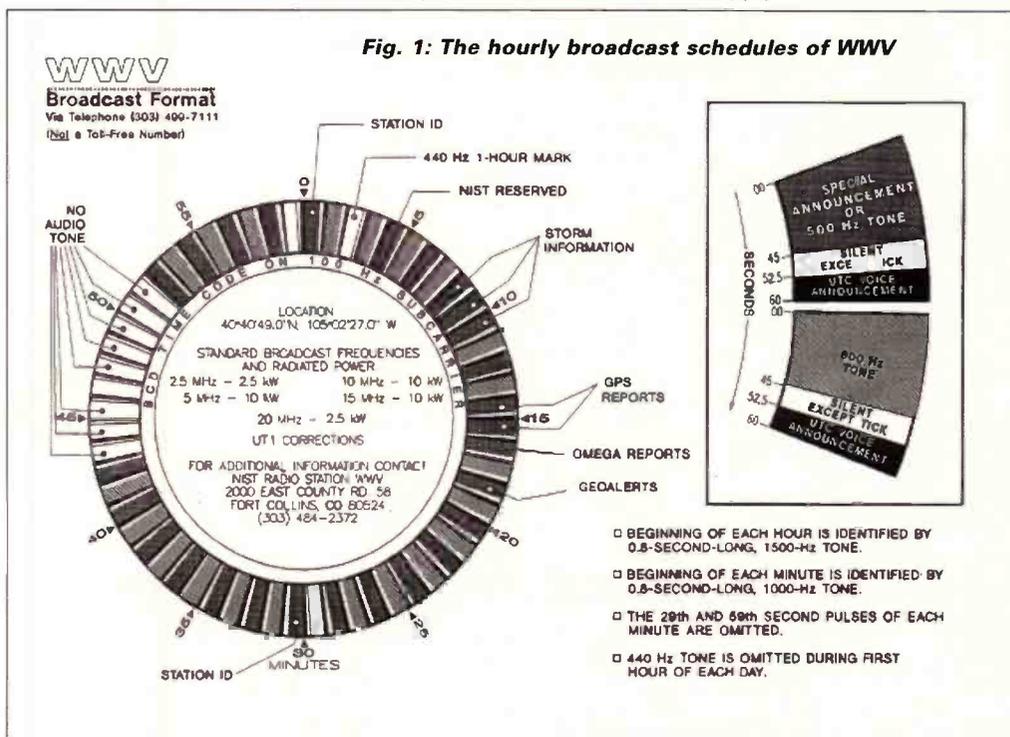
Amongst the more interesting and informative stations transmitting time signals are American-based WWV and WWVH, operated by the US National Institute of Standards and Technology. Both are synchronised to give the same information at slightly different times in the minute cycle. From the schedule in Fig. 1, it will be noticed that within each minute, considerable information is broadcast apart from basic time standard indicators. The voice announcements of time are first given by a female voice (from WWVH) at 45 seconds in the segment and followed by

male voice (from WWV) at 53 seconds to differentiate the two stations.

In the UK the principal time and frequency standard source is from station MSF Rugby, operated by the National Physical Laboratory, Teddington. In addition to the audio time signals, two binary codes are transmitted, one of 10ms (fast code) and the other sequence at 1 bits/second (slow code) and it is these transmitted codes that have, in recent years, spawned a new breed of commercially available highly accurate timepieces that are able to receive these signals. The time coded transmissions were dealt with in some detail in *Wireless World* (ref 1) back in July 1978.

Kits

Junghans manufacture these clocks and watches, but a two-part kit is available from Maplin (ref 2), and Cirkit can supply both a receiver and



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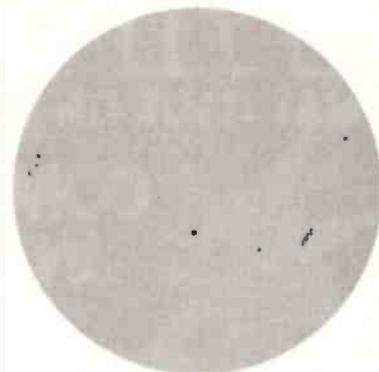
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The Real Cause of Sunspots

If you were wondering about what causes the sunspot cycle, two American economists claim to have discovered the answer. Greg Baker reports.



Economic research is the unlikely source of information on what causes the sunspot cycle. Writing in the US economic journal *Southern Economic Journal*, Volume 48, Number 3, January 1982, Richard G. Sheehan and Robin Grieves give us what must be the most startling finding this decade.

That famous economist William Stanley Jevons (1835 - 1882) put them onto it - modern mathematical economics helped them prove it.

Jevons believed that fluctuations in US economic

activity was caused by variations in the sunspot number.

Using data from 1899 to 1978 these two university economists attempted to vindicate the often scorned Jevons. They found that indeed there was a causal link between sunspots and the business cycle. Unfortunately for Jevons, however, the causation was the other way around: US business cycles cause variations in the sunspot number.

What they don't say is what market condition cause an increase or a decrease in the

sunspot number. But then, we know that, don't we? The 1987 stock-market crash must have caused Sunspot Cycle 22.

So that's it, the upturn in the sunspot number heralding the beginning of Cycle 22 was caused by the stock-market crash and the down-turn in economic activity. And the faltering world economic recovery is gradually killing Cycle 22.

According to research, we should be keeping an eye on the financial markets to judge the number of sunspots!

The implication for short wave listeners is obvious. Abandon keeping track of propagation reports. Watch the business section of your newspaper instead. The FT Index will tell you all you need to know! ■

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The **Supa-Tuta Plus** is easy to use and everything is controlled from the front-mounted keypad. The unit has an external Morse key socket for sending practice, plus variable speed (two to 99 words per minute), variable sidetone via an internal speaker and headphone socket. There are also 90 different training sequences with answers for checking, plus 10 random sequences, and also 10 different messages of 500 characters with answers. You'll also find a library of random words and abbreviations - (no answers here!). The **Supa-Tuta Plus** has an 'echo' mode enabling the student to send Morse back to the unit for comparison, a Morse character check, and a Morse element check. After you've learned Morse with the **Supa-Tuta Plus**, you can use it as an electronic keyer, by connecting it to your transceiver. As an electronic keyer the **Supa-Tuta Plus** features: Relay switching, dot and dash memory, iambic paddle memory, single paddle operation, variable speed operation between two and 99 w.p.m. and variable weighting. It's also fully portable, measuring 130 x 145 x 40mm (sloping to 20mm), and operates from an external power supply of between 9-14V d.c.

The Supa-Keya



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The **Supa-Keya** uses microprocessor technology to provide: sidetone pitch between 500 and 1250Hz, sidetone volume control, speed between two and 400 w.p.m., single key speed trim, set weight control, single key weight trim, automatic insertion of serial number (four digits), automatic increment/decrement of serial numbers, eight stored messages (non-volatile), and you can edit/append or clear stored messages. The **Supa-Keya** accepts iambic paddle operation, has switchable dot and dash memories, employs a relay output for transceivers, has a Morse check and transmitter tune facility. An innovative design feature enables the keyer to check the accuracy of the input characters. If you send an incorrect character, the **Supa-Keya** will reject it and sound an error signal (switchable in normal use). And, to complete a very useful package, the **Supa-Keya** is also fully portable, measuring 130 x 145 x 40mm (sloping to 20mm), and is powered from an external 9-14V d.c. supply.

Supa Special Offers

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This month SWM has got some 'Supa' special offers for you, direct from the famous Dewsbury Electronics stables. They come in the shape of the **Supa-Tuta Plus** at £55 including p&p (normal price £75 plus p&p), the **Supa-Keya** at £75 including p&p (normal price £99 plus p&p), and the **Supa-Tuna** for £50 including p&p (normal price £67.50 plus p&p).

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To: Short Wave Magazine (Special Offer April), FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

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- ★ 66-88, 118-174, 406-512, 806-956MHz

★ UK charger/nicad pack supplied **£249.95**



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One of the new additions to the Sony range, the SW77 covers 150kHz to 30MHz plus 76-108MHz. With a rotary tuning dial, 125 scan memories, reception of AM, FM, USB, LSB, CW, tape record facility, this is a superb all rounder **£349**

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- ★ 125 multi-function memories
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Roberts R808 Portable Receiver	£99.00
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Scanners 2 by Peter Rouse, Both books full of good info

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HP-2000

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AOR

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Hand-held. Covers 500kHz to
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AR-3000A

Multimode scanner –
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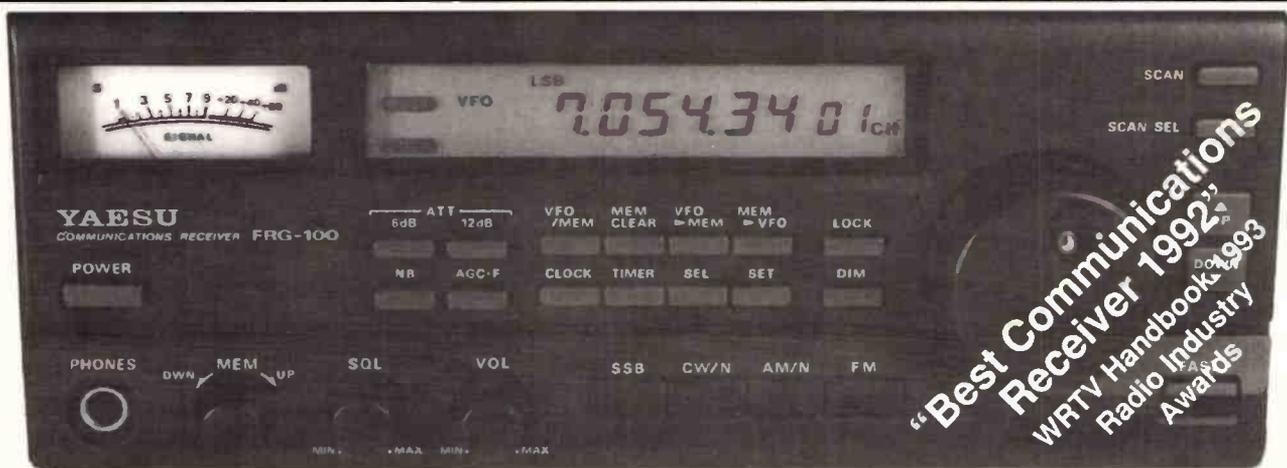
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nearest rivals and will continue to do so until it dominates the market.

The Sun - The Source

Part 6

Kevin Fox concludes his series on how the sun affects the propagation of radio waves.

The SIDC (Sunspot Index Data Centre) number is more of an index to solar activity rather than a count of visible spots. However, there are more accurate methods of discovering this information - especially in the short term: the Solar Flux and the 'K' and 'A' indices.

Solar Flux

The amount of radio frequency energy generated between 2.600 to 2.800GHz by solar activity is measured on earth and is called the Solar Flux. In times of low solar activity such as sunspot minimum, the Solar Flux will be low. Conversely when the sun is very active then the

Solar Flux will rise accordingly. Direct measurement of the Solar Flux tells us what the sun is actually doing now rather than what we think it should be doing. Further, the Flux changes slowly so that it may be used for propagation predictions over a matter of weeks. There is a close link between the SIDC sunspot count and the measured Solar Flux, usually expressed in the formula:

$SF = 73.4 + (0.62 \times DSC)$
where SF=Solar Flux and DSC the Daily Sunspot Count.

For example, an SF rating of 180 equals a DSC of 137 (which is good propagation, by the way). Just to recap, the higher the Solar Flux as

measured on earth then the 'better' will be the radio wave propagation.

The 'K' and 'A' Indices

The solar wind blasting past the earth also contains a strong magnetic element in its make-up - the same effects which can disrupt magnetic devices and induce electricity in lines and pipes on this planet. Yet again we have another two weapons in our arsenal to ultimately discover the best possible frequency to use, which is after all exactly what we're trying to achieve in the first place. At various solar observatories around the world the magnetic element of the solar wind is measured

(detected) every three hours and the results plotted. This is known as the A Index.

Whereas the Solar Flux told us how much r.f. energy the sun was producing at 2.8GHz, the A Index tells us how much magnetic energy is contained in the solar wind, and how much is reaching earth's atmosphere. Loosely, an A Index of less than 10 indicates fairly quiet ionospheric conditions, whilst an A index of 30 may mean possible ionospheric storm conditions and a good likelihood of aurorae. The A Index directly measures the magnetic content of the solar wind, and how much of it is hitting earth's atmosphere. However the K Index actually measures the effects of the magnetic disturbance on earth. Instead of sampling the solar wind on its way past the planet, the K Index monitors changes in the earth's magnetosphere, pinpointing local variations and disturbances. Again there is a link between the 'K' and 'A' Indices.

So, we now have all the elements needed to ascertain the m.u.f., so it's time we put them all together and find out how it is worked-out. Put simply and stripping away all the technicalities, The Maximum Usable Frequency (m.u.f.) is exactly that: the highest frequency we can use to ensure that our radio signal is returned back to earth via reflection from the ionosphere.

Critical Frequency

Solar data discussed so far is an indication of what the sun should be doing. To work-out the m.u.f. we have to know what the sun is doing. The first step in this process is to measure the Critical Frequency. Simply, a wide band of r.f. energy is fired vertically up into the

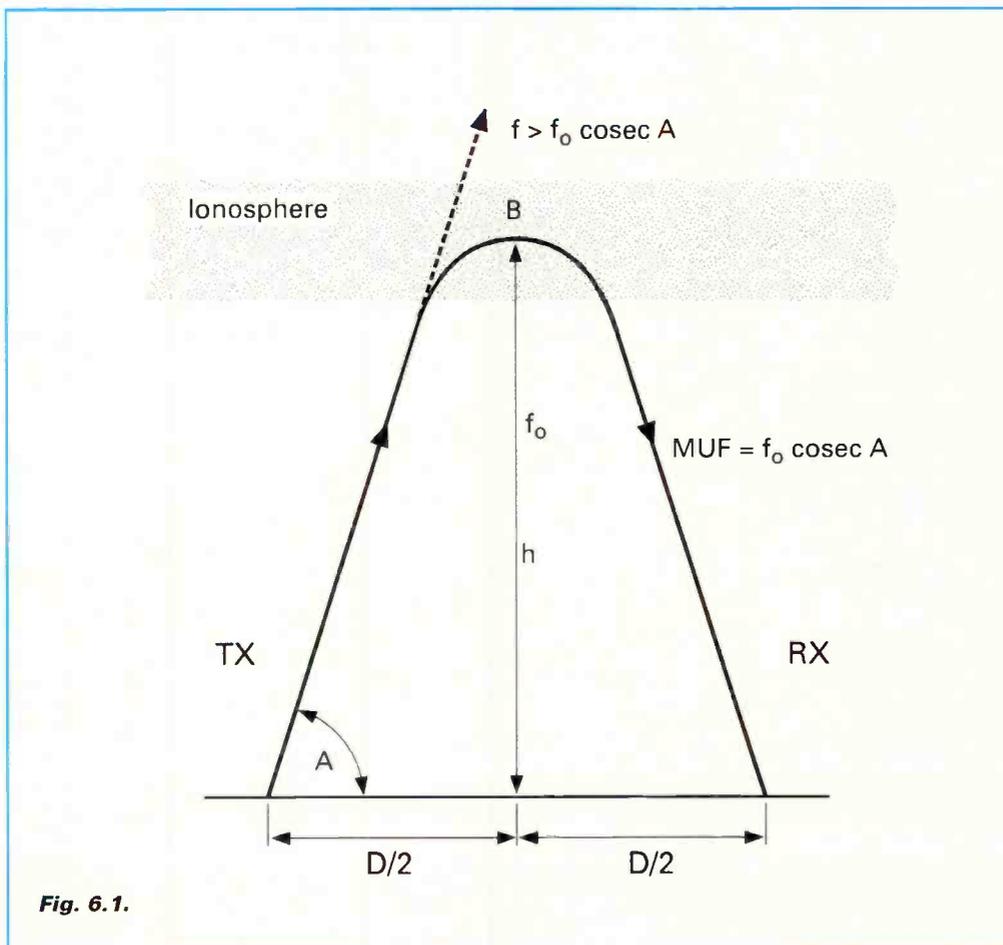


Fig. 6.1.

ionosphere, and the highest frequency which is successfully returned to earth is nominated the Critical Frequency (c.f.). Above the c.f. and the signal is lost into space (see Part 3, *SWM* Dec 92). Intrinsically, the Critical Frequency is of no use to the radio amateur as it only records the highest (vertical) signal returned to earth, and there are not many amateurs who want their r.f. to land less than 2m away from their transmitters! However, both the E and F1 layers also have their own Critical Frequencies, so beware of my simplification of a complex subject.

Maximum Usable Frequency

The m.u.f. is a three cornered calculation (see later) giving short wave listeners and radio amateurs the frequency that will propagate a radio signal over a given path with the minimum amount of attenuation and absorption. It is usually expressed as a frequency, such as m.u.f. = 12MHz. You should aim to work as close to or slightly below the m.u.f. for best results as exceeding the m.u.f. means that the signal will be lost in space, whilst working well below the m.u.f. increases attenuation and runs into difficulties like E Layer reflections, which will stop your signal from reaching the F Layers.

Calculating the m.u.f.

The m.u.f. can be calculated from a formula that uses the Critical Frequency (c.f.), height of the F2 Layer and the distance to the target country, and is usually given as:

$$MUF = f_0 \operatorname{cosec} A$$

Where 'f₀' is the Critical Frequency and A is the take off angle from the transmitter. (The height of the F2 Layer and the distance to the target country is taken into account by cosec A.) The drawing, **Fig. 6.1**, makes this seemingly complicated formula a lot

easier, and is taken from an original drawing courtesy of CQ Publishing Inc. USA.

There are some important things you have to keep in mind when considering any m.u.f. calculations.

1. As the m.u.f. is directly related to Critical Frequency it will vary as previously discussed - seasonally, day/night etc.

2. Transmitter power plays **no part** in m.u.f. calculations: the ionosphere either reflects a signal or it doesn't.

3. m.u.f. calculations are only valid for a single hop. That's not to say that your signal will then simply stop dead; after the first reflection off the ionosphere other factors take over, such as angle of antenna radiation, and multiple skips from the surface of the earth.

4. m.u.f. further varies according to the distance to the target country. As previously said, the higher the m.u.f. the better the overall propagation. Using the higher frequencies, such as 28MHz (10 metres) - m.u.f. permitting - allows a good quality signal to travel a very long way with a minimum of transmitter power.

Home-brew Predictions

Starting at v.h.f./u.h.f. frequencies, keeping a close eye on the TV weather reports, especially the satellite pictures, which show you trends. What to look for has already been discussed earlier. Beacon watching is perhaps the best method at these frequencies because this method can also show you different propagation modes such as 'Tropo', aurorae and sporadic E. Having a list of continental beacons will be of great assistance to v.h.f./u.h.f. operators and listeners. The British Astronomical Association (BAA) have details of how to construct a very sensitive magnetometer that measures any changes in the earth's magnetic field (see 'K' Index), and will pass them on to you on receipt of an s.s.a.e.

This device will give you advanced warning of possible auroral conditions.

For members of the Radio Society of Great Britain - which should be every UK licensed amateur - they will have access to the excellent propagation news and predictions in the RSGB's house magazine *Radio Communication*. Again, as a service for **all amateurs** whether members or not, the RSGB broadcast solar data on their Sunday morning news bulletins.

Other sources of solar information are the Standard Frequency Station WWV in Boulder, Colorado, USA, which transmits geomagnetic and solar activity information at 18 minutes past each hour, on 5, 10MHz, etc. using s.s.b. If you don't have an h.f. receiver try telephoning them directly on 303-499-8129! Radio Australia broadcasts daily sunspot counts, the Solar Flux and geomagnetic data on frequency 9655kHz, but note that this information is always a day behind. The Marconi Radio Propagation Services provide solar and geomagnetic data, but at a price, of course. Write to them at Baddow Research Lab, Great Baddow, Essex CM2 8HN.

Computers

For those amateurs and listeners who own a personal computer and are already familiar with a programming language such as BASIC, the formulae already given in this short series can easily form the kernel of a powerful computerised propagation predicting program.

MINIPROP

For h.f. operators with either an IBM PC compatible or an Amstrad PCW series computer, there is a superb h.f. propagation prediction program called MINIPROP. This is what's known as a Shareware program: if you like it and use it a lot then you're

supposed to send a donation to its creator and register yourself as a user. Registration automatically qualifies you for any further upgrades of the basic program, and the full instruction manual. However, that said, as the program comes to you from a Shareware or Public Domain software source for just the price of the media. There's already an 102Kb ASCII documentation file which firstly gives you a good grounding in the basics of h.f. propagation before explaining how to use the program. But be warned, the document prints to forty pages!

When up and running, you set up the parameters, such as your own location (latitude and longitude in decimal), the angle of radiation of your antenna, and the bands you're interested in. Once you initiate the program, MINIPROP asks for the date in American format (MMDDYY), then Terminal A (that's you) and the target country (enter a valid prefix such as 'ZL' for New Zealand. MINIPROP then asks for either the Solar Flux or the sunspot count. Then you sit back as the program crunches the numbers. Once the numbers are crunched MINIPROP shows the great circle bearings of both terminals, the path of the Greyline, local sunrise/sunset for both terminals, and the distance between them. After further number crunching, the program then gives a band-by-band detail of time and the received signal strength above a pre-set threshold (set by program default or by you).

This may seem an unusual way of giving the results of calculating the m.u.f., but it works very well in practise as it shows you how many skips will be required to your target country, and how loud your signal will be on arrival at the DX station. Of course MINIPROP does much more than this but I think I've given you enough basic detail to whet your appetite for what is a first class piece of software. ■

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Now you can call at your local store and enjoy the full Waters & Stanton after sales warranty. Contact your nearest store today for the Maplin convenience and the Waters & Stanton technical back-up and warranty.

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VT-150 £189



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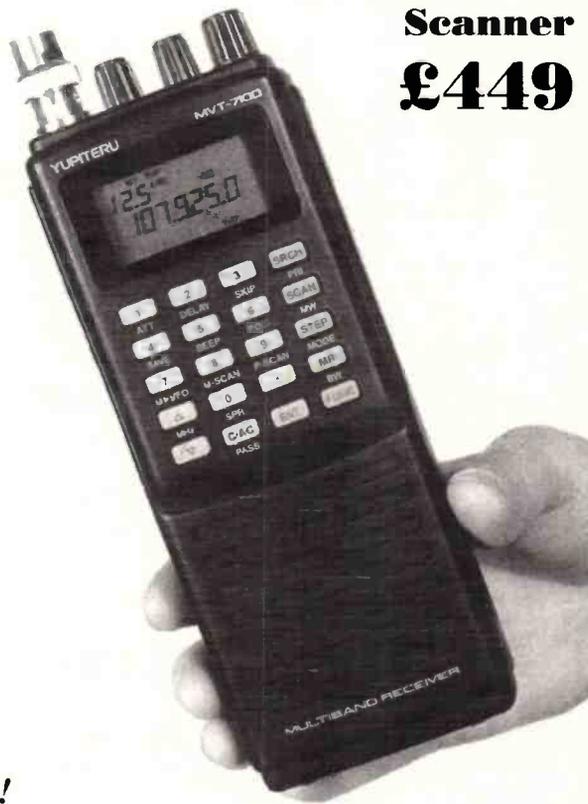
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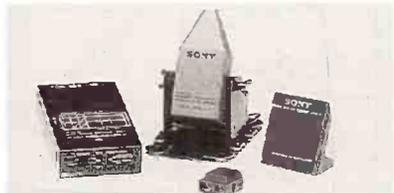
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OUTPUT: 1200mW (10%THD) WEIGHT: 1.7kg (3.75lbs) without batteries. Wide/narrow filter switch.

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SKY SCAN

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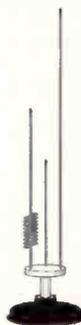
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MVT 8000 MOBILE/BASE

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THIS RADIO IS ESPECIALLY SENSITIVE AT UHF FREQS. Set is supplied with mains power unit.

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- ★ Priority channel function



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VT-125 UK CIVIL AIRBAND RECEIVER

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AOR SCANNERS

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A Lightweight UHF Antenna - Further Info

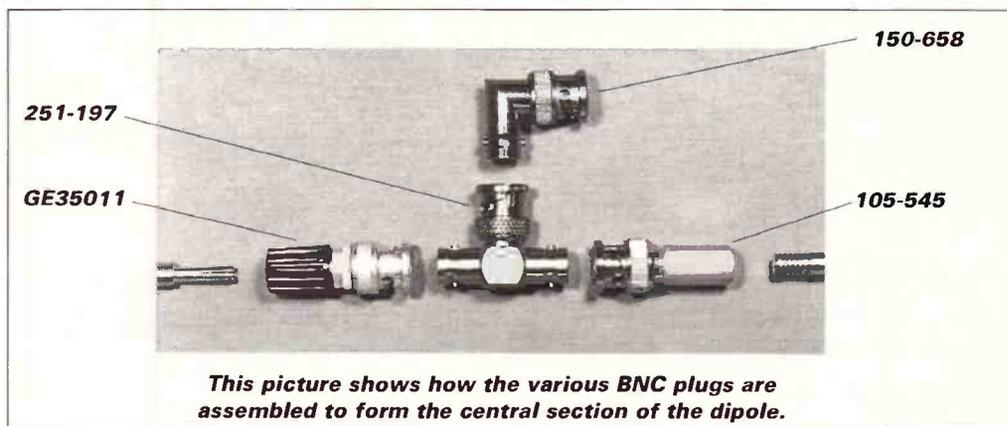
The Lightweight UHF Antenna, described in the March 93 issue of SWM was an interesting concept in using a selection of BNC connectors to assemble the centre section of the dipole. However, several readers have enquired as to where they can obtain some of the more unusual connectors. This short additional article provides details of from where and for how much you can obtain all the connectors needed.

Farnell Electronic Components, Canal Roads, Leeds, West Yorkshire LS12 2TU, Tel: (0532) 636311 can supply all of the BNC connectors used in the project. They are normally a trade only source but will accept orders with either a personal cheque, VISA or ACCESS card number for payment with your order.

To make it easier to identify the various connectors and their Farnell order codes, the picture showing the connectors before assembly has been reproduced here, with the part numbers added. To help even further, a complete parts list with Farnell order codes and prices - as at March 93 - is also given.

Description	Farnell Order Code	Price
T Adaptor 50Ω	251-197	£2.96
BNC to 4mm 50Ω	GE35011	£1.98
Right-angle 50Ω	150-658	£5.98
BNC Straight Plug 50Ω	105-545	£1.92

One off of each item in the table is required to complete the project. All the prices given above are exclusive of post and VAT, so ordering by telephone using a credit card is much easier.



First Aid

SWM contributor would be very pleased to hear from anyone who wants to dispose of any 'DS' electrical fittings. These are a round-pin plug and socket system in which one of the three pins is a replaceable fuse. Old catalogue information would be handy too. **Andy Emmerson, 71 Falcutt Way, Northampton NN2 8PH. Tel: (0604) 844130.**

Help! Help! Help! Could any reader please help a fellow s.w.l. My friend has had his Trio 9R59D now for several months. Unfortunately, working instructions did not come with it. Is there anybody out there that can help. All costs will be met. **A. Doman, 12 Pool Bank Street, Nuneaton, Warks CV11 5DB.**

Has anyone got a spare 'tuning film' for an R210 h.f. receiver, or know where I can get one. Also any information on fitting the film. **Gavin Jones, 74 Joseph Luckman Road, Bedworth, Warwickshire CV12 8BQ. Tel: (0203) 315080.**

Could anyone give me details on how to fully control my Yaesu FRG-9600 using my IBM compatible PC. I am running the CAT FIF 232C interface and am sending frequencies, mode, etc., to the radio without any problems. What I haven't managed to do is get the radio to send a 'Busy' signal back to the PC. I am running a BASIC (V4.0) program but do not know how to write the software to enable effective hand-shaking to occur. Do I also need to carry out some additional wiring in the CAT? Any help would be appreciated. **Paul Davies. Tel: (0279) 451977 7-10pm.**

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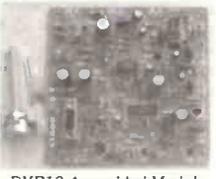


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73 from Dave G4KQH, Technical Manager.

FRG-100

Communications Receiver

Compact, easy to use and yet sophisticated, complete coverage...it sounds like the description of a radio listener's dream receiver. But perhaps that dream set has come a little closer to reality with the introduction of the new Yaesu FRG-100 communications receiver. Short Wave Magazine decided to send the receiver out to two different, specialist, reviewers to get the best possible picture of this radio. Peter Shore tuned around the broadcast bands and Mike Richards tried it on the utility bands before looking into the technical aspects

I was not terribly thrilled when the Editor of *Short Wave Magazine* telephoned and said, "drop everything - we've got a new receiver for you to test", especially since the resulting article had to be written up within four days. And so it came to pass that a cold miserable weekend in February I unpacked the new Yaesu FRG-100 receiver, plugged in a long wire antenna and switched on...

It is compact, measuring just 238mm x 243mm x 93mm high and weighing in at a little over 3kg. The controls are neatly laid out on the front panel, with a large signal meter and liquid crystal display and a reasonable size tuning knob over to the right. The total of 28 buttons and knobs is far less than some of the larger portable receivers marketed currently by Sony, which suggests that getting to know how this set works should be reasonably straightforward.

That proved to be the case, for with only a limited amount of time to get to know the FRG-100, I gave the instruction book a miss and went straight in to knob twiddling. When the set is switched on it tunes to the frequency last used. Tuning manually is easy: turn the knob and the set tunes in 100Hz steps if a.m. reception mode is selected, or by depressing the button to the bottom right of the tuning knob, marked FAST, the increments increase to 1kHz. It took me a little while to get to master control of the tuning knob as it seems to have a

very light feel. This means that in FAST mode, it is very easy to scan across the bands too quickly.

The greatest drawback as far as I was concerned was the lack of direct frequency input. It seems rather short sighted in this day and age not to include a keypad to allow easy frequency call up. But Yaesu have at least incorporated a feature which allows easy access to the broadcast bands. The user simply has to press and hold the SET button together with the UP key. The set emits a 'beep' (about which more later) showing that the band selection mode has been accepted. The user presses the FAST key, and then either UP or DOWN to step through each of the broadcast bands from long wave to the 11 metre band and the lowest frequency of the band is tuned in.

The Instruction Book

This is the point where the instruction book has to be consulted. Running to 40 pages, it is comprehensive and thankfully written in clear and easy to understand English. This is also where you start to realise that things you had assumed in using the receiver without the benefit of reading the instructions are not what they first seemed. For example, you discover that the FAST tuning increments can be altered for each mode (a.m., s.s.b. or c.w.) to between 100Hz and 100kHz. This is particularly useful for broadcast listening as it is

possible to select 5kHz steps for manual scanning across the broadcast bands.

Selectivity can be altered: the factory settings on a.m. are 6.0kHz and 4.0kHz in a.m. narrow. The narrow filter can be set as low as 2.4kHz, although listening is not terribly pleasant with selectivity so narrow. The standard s.s.b. and c.w. selectivity setting is 2.4kHz and when fitted, an optional unit allows c.w. to be narrowed to just 500Hz.

Memories

The FRG-100 boasts a total of 52 memory channels which store, in addition to frequency data the mode (a.m., a.m. narrow, s.s.b. and c.w.). It took me a little while to master the workings of the memory system, but I must say that it is extremely flexible. To store frequencies takes but a few moments. The VFO/MEM key is depressed, and MEM appears in the digital display. The rotary MEM knob at the bottom left of the front panel should now be turned until a vacant memory channel is found and once a channel has been selected, the frequency can be stored by holding the VFO-MEM key for a second until the machine beeps twice. Recall of the stored channels is as straightforward, achieved simply by turning the MEM knob until the memory to be recalled is found, and then pressing the VFO/MEM key to switch from v.f.o. to memory.

A further, and as far as I know unique, feature is the ability to sort the memory channels into ascending frequency order. To make this a set suitable for all applications, Yaesu have built in a sophisticated clock and timer device. Two clocks can be operated independently in either 12 or 24 hour modes. Unfortunately, the display cannot show both time and frequency, so to check time, the clock function has to be selected and the clock remains displayed until the CLOCK button is depressed again. Even if you start to tune the set, the clock remains on display if selected and switching back to frequency has to be carried out by hand.

A novel feature is the hourly time signal which can be switched on or off. When in operation, the time annunciator, as the handbook describes it, gives a series of three beeps (two short and one long) in the three seconds before the hour, whether the set is on or off. It was quite





peculiar to be listening to the time signal on World Service and to have the FRG-100 imitate the Greenwich Time Signal! The 'beep' is interesting in that the frequency of the sound it emits can be altered continuously between 270Hz to 3520Hz, although the factory sets the frequency at 880Hz. The receiver can be programmed to switch on and off, either as an alarm function or to allow unattended recording of a programme. A further sleep facility allows the set to switch off after a user-programmed delay, infinitely variable between one minute and two hours.

That concludes Peter's part of the review, now Mike Richards takes over with his look at the performance on the Utility Bands along with the technical information for the rig.

When I received the FRG-100 from Peter Shore I was initially impressed by its fine styling, clean lines and compact layout. The FRG-100 is also very light and easily transported thanks to the side mounted carrying handle. Powering-up proved to be straightforward as it only required a standard 12V d.c. supply capable of delivering 1.2A. The review model was supplied with an a.c. adaptor that was fitted with a two pin mains connector. I have a personal dislike of this type of connector, but it's a simple matter to remove it and fit a standard 13A plug.

Ergonomics

A good test of the ergonomics of any receiver is to see just how far you can get without reading the manual. The FRG-100 came through this very well and I was able to move around the bands and store and retrieve frequencies from the memories with no problems. I was particularly impressed with the main

liquid crystal display which proved extremely clear in all lighting conditions. The digit size was also just about right. With all the fuss associated with the launch of a new receiver, I, like Peter was surprised to find no direct entry tuning or pass band tuning. However, as you will see later, the FRG-100 has a range of impressive features that more than compensate.

Tuning Modes

Although Peter has outlined the main tuning modes, I thought I'd add a few comments on the programmable tuning steps. The main advantage of this mode is that you can programme different tuning steps for each mode. This unusual feature proved to be very useful in a number of circumstances. An example of this is when tuning through the channelised marine s.s.b. bands. Here the channel spacing is 3kHz so by setting the steps to match you can quickly step from channel to channel. One of the main benefits of this system is that you avoid all the inter channel mush and can make better use of the FRG-100's squelch.

However, this system really comes into its own when used with the Search facility that I'll cover later.

The only problem I found with this systems was the increased sensitivity of the tuning knob. This could be reduced somewhat by halving the tuning rate using the set-up options. Those that need a high degree of frequency accuracy will be impressed with the frequency calibration option. This is a feature that's been absent from receivers for quite a few years. When I was a lad it was standard practice to have a mechanical calibration of the tuning dial. However, with the high stability of modern receivers it has been deemed unnecessary. The provision of a programmable v.f.o. offset on the FRG-100 is therefore something of a revelation. The adjustment range provided is really quite wide, covering $\pm 3\text{kHz}$ in 10Hz steps. Although it's not likely to be used very often it's good to have the facility available.

Memory Tuning

The FRG-100's memory management system included a memory tune facility. This

meant that the operator could use the manual tuning controls to move on from a memorised frequency. This increased the flexibility of the system so that memories could be used just to select the desired band. As a simple example, you could set a series of memories to the l.f. band edge of the amateur bands. These could then be used rather like the broadcast band selection mode to move quickly between these bands. With the comprehensive memory facilities of the FRG-100, it's not surprising to find a number of built-in scanning modes. The four main modes were memory, band, priority and group scanning. The memory scan was the most basic system that scanned through the memories avoiding only those that had been locked out by the operator.

I found the band scan to be particularly effective when monitoring channelised marine or aeronautical services. By setting the FAST tuning steps to match the channelisation you could very effectively monitor a band for activity. The matching of the tuning steps with the channelisation overcomes the problems often associated with using squelch controlled scanning on the h.f. bands. The group scan mode let the operator choose to scan a limited range of memories. The memory groupings were organised in a rather ingenious way so that you could either have ten groups of five or five groups of ten memories. To make best use of the system you would gather together common stations into one of the memory groups.

Advanced Features

Yaesu have really put some lateral thought into the r.f. features of the FRG-100. One of the problems often faced by utility listeners is poor compatibility between the recovered audio spectrum of s.s.b. signals and the requirements of the decoder. This is particularly true of systems that use the American high tones for RTTY. The FRG-100 combats this problem with an adjustable carrier frequency offset. This gave an adjustment range from -1.5kHz to +4.5kHz at the 455kHz second i.f.

I found I could considerably improve data reception by adjusting the offset to cut out the l.f. noise that can often confuse decoding systems.

Specification

Frequency Range:	50kHz - 30MHz
Reception Modes:	u.s.b., l.s.b., c.w., a.m. (f.m. optional) Frequency
Stability:	$\pm 10\text{p.p.m.}$ from -10 to +50°C $\pm 2\text{p.p.m.}$ from 0 to +50°C (TCXO-4 option)
Standard Tuning Steps:	10Hz/100Hz (c.w./s.s.b.) 100Hz/1kHz (a.m./f.m.)
Sensitivity:	$< 0.25\mu\text{V}$ 1.8-30MHz s.s.b./c.w. (2.4kHz) $< 1\mu\text{V}$ 1.8-30MHz a.m. (6kHz) $< 0.5\mu\text{V}$ 1.8-30MHz f.m. (15kHz)
Selectivity:	c.w. (narrow option) 500Hz -6dB, 1.8kHz -60dB s.s.b. 2.4kHz -6dB, 4.5kHz -60dB a.m. narrow 4kHz -6dB, 15kHz -50dB a.m. 6kHz -6dB, 18kHz -50dB f.m. (optional) 15kHz -6dB, 30kHz -60dB 47.21MHz, 455kHz
Intermediate Freq:	47.21MHz, 455kHz
Squelch Sensitivity:	$< 2\mu\text{V}$ 1.8-30MHz (c.w./s.s.b./a.m.) $< 0.32\mu\text{V}$ 28-30MHz (f.m.)
IF Rejection:	70dB or better (1.8-30MHz)
Image Rejection:	60dB or better (1.8-30MHz)
Audio Power:	1.5W in 4 Ω with $< 10\%$ t.h.d.
Antenna Impedance:	Lo-Z 50 Ω , Hi-Z 450 Ω
Supply Voltage:	11-14V d.c., negative ground
Power Consumption:	1.2A max.
Dimensions:	238mm (wide) x 93mm (high) x 243mm (deep)
Weight:	3kg (approx.)
Accessories:	Mains adaptor supplied

For c.w. enthusiasts there were two interesting options. The first enables the beat note to be adjusted to either 400, 500, 600 or 700Hz. The only odd point about this is that the most common preference of 800Hz is missing!

More interesting is the inclusion of selectable c.w. sidebands. When enable you can effectively choose to receive c.w. using either upper or lower sideband. The main advantage is in the reduction of interference from adjacent stations. The selection of i.f. filters is an important decision for all utility listeners. The FRG-100 eases this decision by giving the operator the facility to assign any filter to any mode. You can even assign different filters to u.s.b. and l.s.b. By combining the filter selection with the carrier offset the FRG-100 becomes a very powerful receiving system.

Computer Control

At the beginning of this section I mentioned my surprise at the FRG-100 not having a direct entry tuning mode. Well, it's in the area of computer control that the FRG-100 takes a step forward. Those that are familiar with Yaesu's amateur transceivers will no doubt be familiar with their Computer Aided Transceiver (CAT) system. This system provides for simple computer control of all the key receiver functions.

The beauty of the system is that any computer system fitted with a serial port can be used to control the receiver. Connection to the computer is made with a simple three wire lead carrying just send, receive and common. The data rate is fixed at 4800 baud with one start bit, eight data bits and two stop bits. The instruction manual contained full details of the remote commands so it was perfectly feasible to write your own control program. If you don't have programming experience, your Yaesu dealer should be able to supply a range of software to give sophisticated control.

Some of the more advanced packages include a built-in frequency list that's linked directly to the receiver. Using this type of control is a delight as you just select the desired station from the list and the receiver is instantly set to the correct mode and frequency. You can even build-up very sophisticated scanning routines for advanced monitoring. So, as you can see the provision of

CAT certainly compensates for the lack of direct frequency entry.

Under The Bonnet

With its fascinating range of features I was looking forward to putting the FRG-100 through its paces in the lab. A look at the block diagram showed the receiver to be fairly conventional with a high (47.21MHz) first i.f. followed by the main gain and filtering at 455kHz. Frequency generation was by a combination of crystal and voltage controlled oscillators. The overall frequency accuracy was determined by a 10.48576MHz reference oscillator. Incidentally, this could be replaced by an optional temperature controlled oscillator for the ultimate in stability.

Sensitivity measurements were the first to be made and the review model exceeded its specification throughout the

frequency range. Audio distortion levels were also checked out and the FRG-100 achieved a best a.m. result of 1.55% with a modulating frequency of 400Hz. Working through the rest of the specification showed that the performance was well within the manufacturers limits. The only exception to this fine performance was the 4 and 6kHz filters. Whilst these were quoted as having 6dB bandwidths of 4 and 6kHz

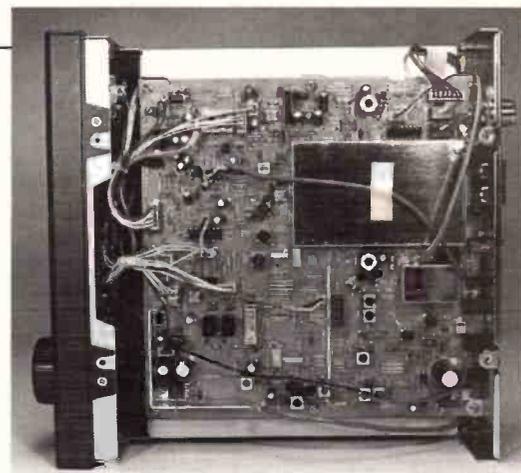
respectively, measurements of the review model showed these to be very much wider. The 4kHz variant measured 7.8kHz whilst the 6kHz unit appeared to give 8.2kHz bandwidth. A check of the -50dB point gave 13 and 14.2kHz respectively. I suspect this was a fault associated with the review model, as the correct response should have given a narrower 6dB point but wider at -50dB.

The review model also had a problem with its lower frequency limit. The specification indicated coverage down to 50kHz but the software prevented selection of frequencies below 130kHz. I've mentioned both problems to SMC and I'm sure they will be quickly resolved.

The acid test with any receiver is its on-air performance and the FRG-100 fared very well indeed. For the broadcast listener, the recovered audio was very clear, even when using the small internal speaker. The versatile filtering options gave the operator maximum flexibility in dealing with adjacent channel interference.

A common problem on the broadcast bands is overload from very strong signals. One of the most effective ways to combat this is with good r.f. filtering and adjustable attenuation. The FRG-100 had both of these and the attenuation was adjustable in 6dB steps from 6 to 18dB. The adjustment was made using two buttons on the front panel marked 6dB and 12dB. When both buttons were pressed the attenuation increased to 18dB.

When I used the FRG-100 for utility reception I was very impressed with the excellent frequency stability. This is absolutely vital when receiving unattended FAX images. As I mentioned earlier, the carrier offset and c.w. sideband selection facilities were extremely useful and set the FRG-100 apart from many other receivers.



We asked SMC to comment on Mike's findings on a.m. selectivity and the inability to go below 130kHz. Their comments are as follows:

There would appear to be no fault with the set tested. We measured another one and obtained results similar to those noted.

	a.m.(n.)	a.m.
-40dB	10.6kHz	12.4kHz
-6dB	6.9kHz	8.2kHz
-60dB	14.5kHz	15.6kHz

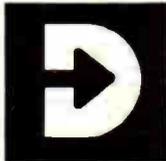
The set will go down to 50kHz. However, this requires a button pushing procedure to modify the software. Start with the set switched off. Hold in both the FM and SSB buttons while switching the set on. All of the first batch into the UK were originally set up to not go below 130kHz, as Mike found.

Conclusions

I found the FRG-100 a relatively easy and pleasant set to use, although some of the functions took some time to become familiar with. It performed well, even with a relatively short and simple outdoor wire antenna, with Radio Australia's broadcasts being easily received. The greatest drawback as far as I was concerned was the lack of a keypad for direct frequency entry, something taken for granted on most cheaper digital receivers, let alone communications sets. Overall, I think that this would be a worthy addition to any short wave listener's receiver collection, with the proviso that it is better to listen with headphones than relying on the small speaker mounted in the set's roof. **Peter**

The FRG-100 can be very deceptive in that its wealth of unusual features are not obvious from a simple scan of the front panel. I was certainly fooled at first sight by the apparent simplicity of the front panel. However, the more I used the receiver the more I grew to like it. I can see that the FRG-100 will take its place alongside the other market leaders in the competitive amateur communications market place, being suitable for all types of listening from broadcast through the complex data modes. **Mike**

The FRG-100 is available from all Yaesu dealers and the current price is in the region of £550 (but that's at the current rate of exchange). Our thanks to **SMC Ltd., SMC HQ, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hants SO5 3BY. Tel: (0703) 255111** for the loan of the review model.



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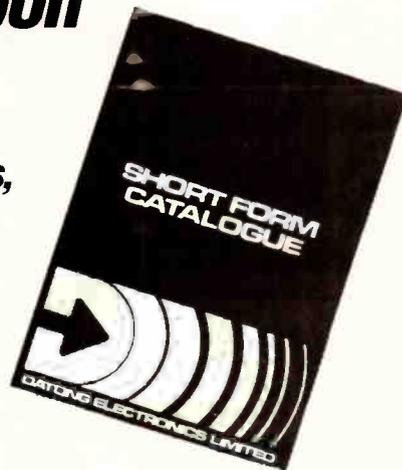
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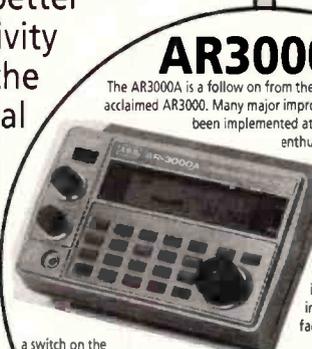
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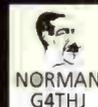
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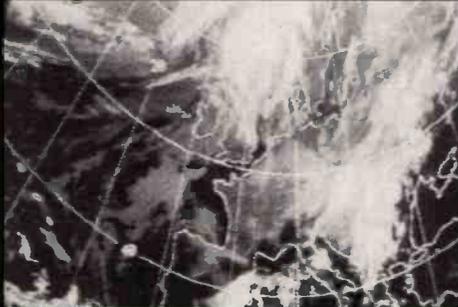
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Satellite TV News

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

The past few weeks has been relatively still across the satellite belt, all is quiet in the Gulf - though undoubtedly the Starbird SNG unit is on standby lest the sabres rattle again.

After a long silence Eutelsat I F2 now at 3°E fired up for several days from January 22, with colour bars and a caption at 10.97GHz horizontal indicating that the Austrian Aflenz Earth station was uplinking onto the bird. The caption was present for at least 2 days, then to colour bars and then transmission ceased. It will be worth watching the satellite for future transmissions. In the Gulf War, 3°E had been used for the Jerusalem Capitol Studios for their backlinking into Europe for numerous broadcasters. The satellite seems to be in an inclined orbit as the signal over several hours fell in strength and then rose. A mystery signal, again colour bars with a caption 'UKI 88' had been present on the new Eutelsat II F4 7°E bird at 11.13GHz vertical. The mystery relates to use of inverted video and a superimposed sine wave, not unlike a version of SAVE encryption (as used until recently on BBC WSTV and the Red Hot Dutch porn channel). There's no sound and the picture has been there for weeks.

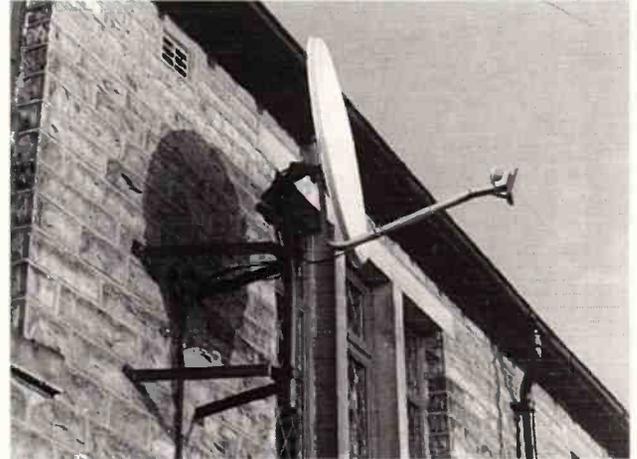
Andrew Sykes again with an excellent catch during January of the 'EBU MOGADISHU' caption downlinking into Europe in Ku band with various news feeds. Normally the ground station(s) representing the various news networks based in Somalia uplinks to Intelsat 505 66°E in Ku band, cross strapping on the bird to give a C Band Global beam coverage. However, on this one day the satellite was downlinking in Ku band and Andrew came across the signal. A rare catch.

A letter and long printout has just arrived from Ian Waller (Lincoln Satellite). Ian, a veteran satellite activist both by hobby and profession, has been monitoring C Band (4GHz) and logged the first ever news feeds on the TDRS 41°W satellite on January

20 carrying the US Presidential inauguration. If you wondered how Sky got their Indian cricket coverage back to the UK then Intelsat 507 57°E in inclined orbit on the Global beam trdr 38 at 4.17GHz with main audio at 6.4MHz is the answer! And also in the east of our parish, Gorizont 53°E has fired up her Lucht transponder where has been seen colour bars with the 'EBU Moscow' ident across the centre.

A new test pattern with 'TGRT' appeared on Eutelsat II F3 16°E at 11.09GHz vertical on February 11, which was later identified as yet another Turkish TV channel uplinking out of the BTI London Teleport. It rejoices in the name of 'Turkiye Gazetesi Radyo Televizyonu' and will be running up to 17 hours daily later in the year. Another shortly to arrive (at the time of writing though operational when these pearls are read) is Radio Television Marocaine again over 16°E at 10.97GHz vertical carrying their Arabic TV service. With Egypt and Tunisia already on this bird our Middle East exiles will be happy, it's interesting to see how Arabic TV operates with the Koran both opening and closing the programme day.

The end of BSKyB transmissions over Marco Polo 1 and 2 at 31°W brought bargain priced D2MAC receivers and dishes onto the UK surplus market, many of these are being modified by enthusiasts for both D and D2MAC service on other satellites (BATC has carried information) and the Trac company have commercially been modifying the equipment and with new software. Marco Polo 1 closed early January but Marco Polo 2, which was sold to Norwegian Telekom in Autumn 1992 has been moved and now operates from 0.8°W - re-christened as 'THOR'. Eventually 5 TV services including a sports and children's channel will downlink spotting into Norway and covering most of Scandinavia. Towards the end of January both CNNI (11.78GHz) and a specially orchestrated Filmnet service



Andrew Syke's wall mounted dish that has been producing noise when the dish moves, any suggestions to reduce the problem.

(12.01GHz) both in right hand circular polarisation opened transmissions. CNNI is in DMAC and Filmnet D2MAC, the latter into Eurocrypt S encryption. CNNI is rumoured to be going Eurocrypt S later this year.

If you've capability of Telecom band operation then check out Olympus at 18°W. An unusual bird, it carried occasional education and corporate video material during the daytime, even the BBC use her for outside broadcast circuits - usually BBC Scotland. Weekday evenings from around 2100UTC the French CBC (Canada) news is carried, going into their weather forecast for various cold outposts around the north and then into programmes, including commercials. The transmissions cease around 2215 onwards. Check out 12.57GHz for the educational feeds and 12.52GHz for the CBC offerings. Who the CBC transmissions are intended for is not known though learned opinion suggests Canadian forces in Europe. Can anyone comment?

Finally, I noticed in early February that the MIR space station has been downlinking data via the ZSSRD-2 satellite 16°W at 11.37GHz circular. Look for intense flashing on the screen. A close look was also kept at 10.835GHz since this is used intermittently for video feeds ex MIR via ZSS to Earth, the crew usually appearing in shot and talking to the folks back home in Russia, though nothing has been yet seen. The national press indicated that attempts were to be made on MIR to deploy a large reflector to deflect solar rays (or radiation) back to Earth! The video frequency is slightly below Ku band as on 'normal' satellite receivers, the SR-50 manual receiver (and indeed other manual and non-synthesised units) can usually be simply modified to extend coverage down to the MIR video downlink - signals though are weakish on a 1.5m dish.

Satellite News

Two changes to widebeam footprint coverage on Eutelsat II F3 16°E with the Egyptian Channel dropping

Superbeam and changing to 11.178GHz trdr 27 vertical, and the Hungarian Duna 7 downlink changing the footprint but remaining on trdr 33 11.596GHz horizontal. Mid January saw the move of all EBU leased feeds of the news and programme exchange circuits from Eutelsat I F5 21°E to the more efficient II F4 at 7°E and increasing leases to 4 trdr. with an anticipated 2 additional trdr leases within 18 months. Coverage from the new bird ranges from Northern Scandinavia to the Sahara, East to the Urals and West to the Canaries. Eutelsat II F6 should be up and operational during 1994 and already bookings are being taken for trdr. capacity - II F6 will co-slot with II F1 at 13°E and offer dedicated TV prime-time downlinking (1700-0100CET), dishes of 800mm will be required across most of Europe/UK with 1m diameters needed in the fringes such as Moscow.

In January, the merger of Eurosport and Screensport took place and it's likely that the reformed channel - 'Eurosport - The European Sports Network' will operate out of Paris, the UK staff of 120 having been made redundant. The new channel will carry audio in English, German and Dutch over the existing Eurosport Astra trdr, a French version 'TV Sport' will air over Telecom 2 later late Spring.

The Lifestyle (and Satellite Jukebox) Channel has also closed and RTL-2 are hot runners for an Astra trdr. shortly. Nickelodeon, an American kids channel is to be launched by Sky over Astra in October '93 (0700-1900) when Astra 1C is on stream.

Sky will offer the channel production facilities at their West London site and the upsurge in children's programming has led to rumours that Ted Turner (alias CNNI) launch his own kids channel later this year - called 'The Cartoon Channel'.

And finally Euronews is now transmitting her 20 hour per day programming into Europe from Eutelsat II F1 13°E at 11.575GHz vertical trdr 37. Based in Lyons, France, the audio sub-carriers include English, French, Italian and German.



Identification logo for the Egyptian Space Channel over Eutelsat II F3 at 16°E.

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Bandscan

EUROPE
By Peter Shore

The last remnants of the Cold War in terms of international broadcasting are clearly the Munich based broadcasters, Radio Liberty and Radio Free Europe. They started operations back in the 1950s, originally run by the CIA, beaming news and information, and, many would argue, extensive propaganda, to the Soviet Union and its satellites. But President Clinton's tight budget plans means that the stations will close by 1995 with the loss of around 1600 jobs. Initially, RFE and Liberty will be merged with the US Information Agency, the parent of the Voice of America, and savings over the next five years will amount to US\$644 million. RFE has been very successful in moving in to the newly liberalised eastern European states such as Czechoslovakia where it broadcasts nationally on f.m. with no short wave transmissions at all.

Many listeners will remember the extensive jamming that was directed against RFE and Liberty during the height of the Cold War. It was reputed that the Soviet Union spent more on jamming than it did maintaining its total broadcasting effort to the West. And in so doing, the bands were made 'at times' almost unlistenable. The cessation of broadcasts from Munich



A QSL from Vatican Radio.

may mean more room for other broadcasters on the shortwave bands, as tens of frequencies are used by the stations at different times of the day and night.

The future of European radio could lie in the co-operation of stations from across the continent; and to prove the point, four international broadcasters are working together to form a new pan-European channel. It will be known as European Digital Radio and will make use of the new Digital Audio Broadcasting - DAB - system that is due to be introduced in many countries across Europe in early 1995.

Radio France International, BBC World Service, Radio Netherlands and Deutsche Welle are formulating plans for a station that will broadcast news and current affairs in three language streams - English, German and French - during the day and in the evening the station will combine to transmit music in CD quality stereo.

All this is technically possible with DAB, as the system is flexible enough to allow each CD quality channel to be subdivided into several mono f.m. quality channels by the use of multiplexing. Intelligent receivers would be able to combine and split the channels, and the listener could select whichever channel or language he or she wanted. There are inevitably problems ahead for the European Digital Radio channel. Finance will be needed as well as access to the terrestrial DAB frequencies which will be in short supply. But the project is novel and already attracting much interest in professional circles. It could well become a reality in the early days of DAB.

World Radio Network

Last year, I told you about an organisation called World Radio Network that had hired an audio sub-carrier on the Astra satellite to transmit the programmes of a variety of international broadcasters to European listeners in high quality. The

tests last summer proved worthwhile with lots of reaction from Astra-equipped listeners in the UK and on mainland Europe, and now World Radio Network is back.

This time the station is using Eutelsat, and has moved in a slightly different direction. It is marketing itself primarily as a means for international stations to reach rebroadcasters on the ground, in other words local f.m. or medium wave stations who want to fill their air-time with programmes produced by other broadcasters.

Vatican Radio has already signed up with WRN, and the programmes can be heard by anyone equipped with a dish capable of receiving Eutelsat II F1 at 13°E. Tune to transponder 32H at 11.554GHz (used by Middle East Broadcasting Centre) and the audio sub-carrier at 7.74MHz.

Satellite News

More satellite news: a station broadcasting in an East European language has been heard on the Astra satellite on transponder 15 using the audio sub-carriers at 7.74 and 7.92MHz. Calling itself Radio Musica Facti, it seems to be in Polish, and is on the air each evening. Keep a close eye on the audio sub-carriers on the UK Gold transponder on Astra. BBC domestic and international programmes will be much in evidence from the beginning of April. World Service and three national networks (likely to include Radio Four) will be on the satellite.

But using satellite for radio does not guarantee success, as was proved by the demise of Radio Luxembourg's English service at the end of December. The station's owner, CLT, decided to pull the plug after advertising revenues plummeted after the switch from the familiar old medium wave channel of 208 metres. At a minute or two before midnight on December 30, Mike Hollis closed the faders for the last time, marking the end of almost sixty years of constant broadcasting in English from the Grand Duchy.

European Broadcast News

On to some general frequency news about European broadcasters: Radio Vlaanderen International is beaming programmes in French and Dutch to Belgian forces serving in Somalia. There is a weekly hour long broadcast on Sundays at 1700UTC on 15.54MHz.

With the split of Czechoslovakia in to two separate states at the beginning of the year, external services are now emanating from Prague, capital of the Czech Republic, and Bratislava, capital of Slovakia. English services from Prague can be heard in Europe at 0700 on 11.99, 9.505, 7.345 and 6.055MHz and at 1800 on 9.605, 7.345, 6.055 and 5.96MHz, at 1930 on 7.345 and 6.055MHz and at both 2100 and 2200 on 9.605, 7.345, 6.055 and 5.96MHz. Slovakian overseas broadcasting will, from the beginning of April, include French, English and German. The advance schedule I have received suggests the following times and frequencies:

1130-1200 in English on 11.99, 9.505 & 7.345MHz

2030-2100 in English on 7.345MHz
0200-0230 in English on 9.58 & 5.93MHz

Radio Vilnius's English service is reduced to just on short wave channel as it is unable to afford the cost of hiring time on transmitters in other parts of the former Soviet Union. The transmissions at 2000 and 2230 are carried on 9.71MHz, and on medium wave on 1557 and 666kHz, and at 0000UTC on 7.15MHz.

Radioline

Finally, if you tune around the bands on a regular basis, you might like to know that the very latest news and tips are carried on *Short Wave Magazine's* weekly Radioline. As well as frequency news, there is the chance to win prizes each week, and if you read this column each month, you could find that many of the answers to the competition questions are easy to complete.

SHORT WAVE MAGAZINE PCB SERVICE

Printed circuit boards for SWM constructional projects are now available from the SWM PCB Service. The boards are made in 1.5mm glass-fibre and are fully tinned and drilled. All prices quoted in the table include Post and Packing and VAT for UK orders.

Orders and remittances should be sent to: **Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B78 4JF. Tel: 021-353 9326**, marking your envelope **SWM PCB Service**. Cheques should be crossed and made payable to **Badger Boards**. When ordering please state the Article Title as well as the Board Number. Please print your name and address clearly in block capitals and do not enclose any other correspondence with your order.

Please allow 28 days for delivery. Only the p.c.b.s listed here are available.

Board	Title of Article	Issue	Price £
SR008	Experimental VHF Receiver	Jun 91	5.81
SR007	VLF Receiver	Dec 90	5.24
SR006	Medium Wave AM Radio	Nov 90	3.34
SR005	R210 Converter	July/August 90	6.87
SR004	PRO-2004 Modifications	Oct 89	6.63
SR003	HF to VHF Converter	Aug 89	5.22
SR002	Weather Satellite Reception	Jun 88	3.88

DXTV Round-up

Ron Ham, Faraday, Greyfriars, Storrington,
West Sussex RH20 4HE

As I write this column in early February, the television bands are and have been generally quiet from the DXer's point of view. However, by the time you read it, toward the end of March, conditions may be totally different. We will then be looking forward to the start of the 1993 sporadic-E season and the super DX in Band I and the spring and summer tropospheric openings that usually accompany the warmer weather.

Where To Look

Last September, **George Garden** (Edinburgh) took his JVC 610 receiver with him on holiday and **Fig. 1** shows him on a trip up the Austrian Alps in Southern Bavaria. Regular readers of this column will know that whenever conditions suggest a hint of DX George takes this set to the nearest high spot, frequently Cairn O' Mounth, to see what is about. Like most sets made for the continental market, this JVC has three European wave-bands, two v.h.f., Bands I (45-68MHz) and III (175-230MHz) and one u.h.f. covering Bands IV (471-608MHz) and V (615-856MHz). As with most of these small sets the Channel numbers are scribed on the JVC's dial, 2-4, 5-12 and 21-69 respectively.

For example, in addition to their u.h.f. channels, television signals can be found from Czechoslovakia on Chs. R1 (49.75MHz) and R2 (59.25MHz) in Band I and Chs. R6 (175.25MHz), 7 (183.25MHz), 8 (191.25MHz), 9 (199.25MHz) and 10 (207.25MHz) in Band III, Denmark on Chs. E3 (55.25MHz) and 4 (62.25MHz) and E5, 6, 7, 8 and 10, Germany on most 'E' channels already mentioned, Hungary, Poland, Romania, and the Commonwealth of Independent States (CIS - Russia) on most of the aforesaid 'R' channels, Ireland on their Chs. 'A' (45.75MHz), 'B' (53.75MHz) and 'C' (61.75MHz) in Band I and 'D', 'E', 'F', 'G', 'H', 'I' and 'J' spread between 175.25MHz and 229.75MHz in Band III, Italy on their channels 'A' (53.75MHz) and 'B' (62.25MHz) in Band I and 'D', 'E', 'F', 'G', 'H' and 'H1' in Band III, Norway on all the 'E' spots in both bands and almost the same for Portugal, Spain, Sweden and Switzerland. This should explain why so many signals mix together on the same channel when an extensive Sporadic-E opens up Band I or a widespread tropo upsets Band III.

Some stations in countries using the 'R' channels also have allocations in Band II. For instance the vision frequencies for Chs. R3, 4 and 5 are 77.25MHz, 85.25MHz and 93.25MHz, respectively. The sound signals for R4 and R5 can sometimes be heard, when sporadic-E is present, on a domestic f.m. receiver on 91.75MHz and 99.75MHz respectively.

From Cheshire, **Tim Bucknall**

writes, "I can't give a frequency because the dial on my Vega is unprecise." Quite right Tim, channel numbers suffice for the majority of television viewers, it is mainly set designers, engineers and DXers, using instruments, communications receivers and scanners, that require more detailed information. However, this can all be found in the television section of the *World Radio TV Handbook*, published annually by Billboard and the latest edition is available from the SWM Book Service at £15.95 plus £1 P&P.

Band I

The normal range of signals from stations operating in Band I can be greatly increased by such natural disturbances as aurora, meteor trail reflection, Sporadic-E and disturbances in the upper 'F2' regions of the ionosphere. Although pictures received via 'F2' are usually smeary, unlockable and often overlapping each other, the signal does sometimes steady itself and lock.

This was proved by **Lt. Col. Rana Roy** (Meerut, India) between 1553 and 1631 last October 21, **Figs 2, 3 and 4**, when he received such signals from Thailand on Ch. E2 (48.25MHz). He thinks it likely that Thailand appeared again, **Fig. 5**, at 1527 on the 31st. Under similar conditions on Ch. E2 he identified Bangkok and Dubai TV on the 14th and 15th and Thailand on the 17th and 23rd. Among the items he saw from known and unknown sources were adverts, childrens' TV, football, songs in Arabic and Thai and Teletext. Also on Ch. E2, from 1530 to 1645 on December 16, Rana found smeary and fluttery pictures accompanied by "sound like a diesel engine running."

Picture Archives

Announcers, logos and on-screen text can be most useful when trying to identify the source of a signal, but please keep in mind that such pictures may only be clear for a few seconds so you must be ready with the camera if you want a photograph. **Bob Brooks** (Great Sutton) has been a DXTV enthusiast for decades and from his archives he sent three photographs of transmissions, with presenters, that he received from stations in Czechoslovakia (CST), **Fig. 6**, Sweden (SVT), **Fig. 7** and Switzerland (DRS), **Fig. 8** during the last 8 years.

Satellite TV

While using his satellite receiver at 1830 on November 20, Rana Roy saw a Russian TV news programme, on band 'C', **Fig. 9**, from an unknown origin. "Sound and pics very clear," said Rana. **John Scott** (Glasgow) uses an Amstrad/Fidelity SRX 200 decoder and an 800mm

'dish' antenna to receive signals from Eutelsat and, when required for records, he prints out the pictures via his video recorder. Among his catches in January were Germany, **Fig. 10**, Holland, **Fig. 11** and Russia. Also from Eutelsat, **Peter de Jong** (Leiden, Holland) received a test card from Tunis (RTT), **Fig. 12**, on December 23 and a caption on the Egyptian Satellite Channel (ESC), **Fig. 13**, on the 29th.

Weather

"The winter this year did start rather early and we had some cold weather between November 20 and December 10," wrote **Rana Roy** on January 4, adding, "It warmed up after that and we are having temperatures between 28°C during day and 11°C at night. Normally at this time of year it should be between 0 to 5°C at night and 15 to 20°C during the day".

"Overall, the weather for January has varied from wet, windy and cold to dry, sunny and cold," wrote **David Ashley** from Norwich. David recorded a massive low of 938mb during the month. Wet and windy was the same story here David, I recorded 5.60in of rain during the month compared with a mere 0.94in in January last year. The daily variations in atmospheric pressure, seen in **Fig. 14**, were taken at noon and midnight from the recording chart on the Short & Mason barograph installed at my home in Sussex.

During the great January snowfall, **David Glenday** (Arbroath) measured an average depth of 400mm in his back garden. "Usually we get very little snow here, being on the coast," said David and continued, "After that came rain and the snow thawed, causing dreadful flooding, especially in Perthshire. Also strong winds".

"We had huge depths of snow lying in Aberdeen bringing all roads out impassable," wrote **George Garden**, adding that at one time high gales blocked the Aberdeen/Dundee road and on another occasion storm force 10 winds knocked out the power at Fordoun and flooding and fallen trees blocked more roads.

Tropospheric

In Basingstoke, **John Woodcock** found French pictures in Band III and Dutch sound on Ch. E36 around 2015 on December 27, French sound on Ch. E39 at 1415 on the 31st, French sound and vision in Band III on January 2. During that opening on the 2nd, **Simon Hamer** (New Radnor) received pictures from stations in Denmark (DR), Norway (NRK & Bergen TV2) Germany (ARD1) and Sweden (SVT1) in Band III and Belgium, Denmark (TV2), Eire (RTE), France, Germany (ARD1, HESSEN3, MDR3, N3, RTL+, SAT1, SWF3, WEST3 & ZDF), Holland (NED3) and Sweden (SVT2) in the UHF bands. He watched *The Flying*

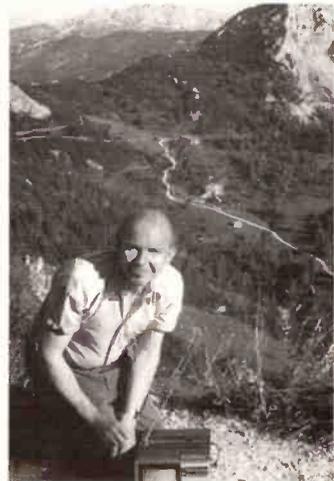


Fig. 1: George Garden.



Fig. 2: Thailand.



Fig. 3: Thailand.



Fig. 4: Thailand.



Fig. 5: SE Asia.



Fig. 6: Czechoslovakia.

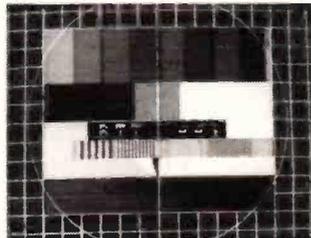


Fig. 12: Tunisia.



Fig. 13: Egypt.



Fig. 15: SSTV.



Fig. 7: Sweden.



Fig. 8: Switzerland.



Fig. 9: Russian News.



Fig. 10: Deutsche Welle TV.



Fig. 11: The Netherlands.

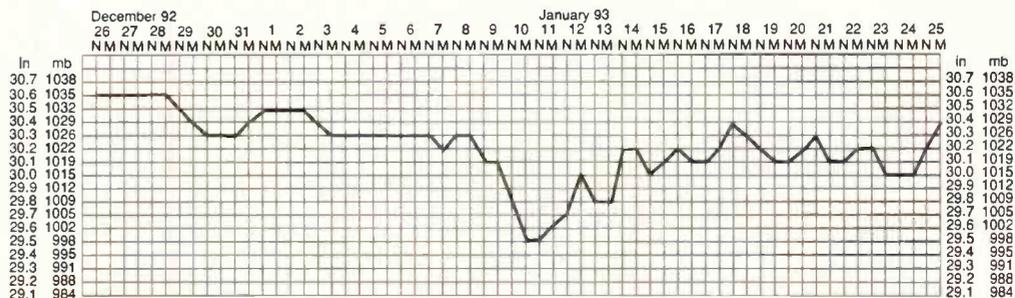


Fig. 14.



Fig. 16: SSTV.



Fig. 17: SSTV.

Doctors from Holland's NED3 with Dutch sub-titles and in December he received a phone call from Wellington so that he could be interviewed for Radio New Zealand's Christmas 'DX' programme, *Mailbox*.

The 2nd was also the best day for David Ashley when he logged good quality u.h.f. pictures from Denmark (TV2), Holland (NED1,2&3) and Germany (ZDF) and from the UK he received Central, HTV West, LWT, Meridian, Tyne Tees and Yorkshire. Because the signal from LWT was overloading he tried his portable and resolved the picture with its own loop antenna. David also found weak pictures from Holland during the daylight hours of the 19th and 31st and

the evenings of the 16th and 29th.

David Glenday found a brief tropospheric opening during the high atmospheric pressure (30.75in/1040mb) on February 1. Between 1100 and 2230 he received pictures from Denmark (DR) and Germany (ARD1) in Band III and Denmark (TV2), Germany (ARD1, NDR3, RTL+, SAT1 & ZDF) and Holland (NED1,2&3) in the u.h.f. bands.

"At 1620 on January 14, I tuned to Ch. 28 and nulled out the combined signals from CH4, Leek & Macclesfield and saw a weak BBC1," said Tim Bucknall and continued, "I monitored it for several hours and, by watching local news, I learnt that it was BBC1, Midlands." He also had a fair result from CH4, Lancaster, on Ch. 21. Around

1440 on the 24th, Tim monitored Ch. 40 and found a news programme with a logo down the side which looked like an 'M' on top and a 'W' underneath. "Then came what looked like the flag of St. Andrew," said Tim, but it did not stay on screen long enough to be certain.

During the tropospheric openings on November 6 and 7 and December 8, Rana Roy received pictures in Band III from stations in Amritsa on Ch. E7, Jalandhar (E9), Kasauli (E6), Lahore (E5) and Marhi (E8) and from Pakistan, Sialkot (E10) and 'STN' (Shalimar Television Network). It's worth looking at an atlas with good coverage of India and Pakistan to see how Rana's DX is received

SSTV

Despite damage to his antenna by the January gales, John Scott kept an eye around 14.230MHz for slow scan television signals and copied a 'CQ' card from DK2AN in Germany, Fig. 15 and a new year greeting, Fig. 16 and a 'CQ' caption, Fig. 17, from SM5EEP in Sweden. The line across the head and chin in Fig. 17 are caused by interference.

Books

Books to interest the TV DXer are available from the SWM Book Service. Possible titles include. *Guide to World-wide Television Test Cards* by Keith Hamer and Garry Smith. It's a very handy and useful reference book for the DXTV enthusiast. There's over 200 photographs of test cards, logos, etc. It's 60 pages and costs £4.95.

For the amateur television enthusiast, *The ATV Compendium* by Mike Wooding G6IQM, is available. Fields such as 3cm TV are covered in depth, particularly the home construction aspect. This has 104 pages, and costs £3.00.

There are also a wide range of books on satellite TV to interest those involved with that aspect of the hobby

SSB Utility Listening

Peter Rouse GU1DKD, Barcroft, Rohais de Bas, St Andrews, Guernsey, C.I.

A brief word this month about antenna tuning units because I have had several letters over the last few months on the subject. First, it would appear that experience has shown that some combinations of antenna and receiver when used with Lowe's magnetic long wire balun do not benefit from an a.t.u.

The simple rule of thumb appears to be that with a good quality communications receiver you can probably get away without one. However, unless experience shows otherwise, I would strongly recommend using an a.t.u. with portable types of receiver such as those from Tandy, Sangean, Philips, Sony and National Panasonic. Such receivers have very simple front-ends and simply cannot cope with strong out of band signals. The usual result is that they overload and desensitize.

The next question I get asked is what sort of a.t.u. should be used? I cannot answer for every installation but would suggest that the usual Pi-match arrangement is probably best. They are available ready built or in kit form or you can even build your own if you can get hold of suitable tuning capacitors (designs are shown in the *PW* books such as *Wires and Waves*).

Your Number is Up

As promised, a look at what is happening with numbers stations. It would seem that despite the warming of relationships between east and west the numbers stations are still active but there have been quite a number of changes. **Simon Mason** is quite an authority on the European scene and his book *Secret Signals* is published by Tiare Publications in the USA, where it would appear these stations have quite a following. Simon reports that the well known Papa November and DFC37 and DFD21 stations have now gone. He also thinks the Romanian Skylark and Czechoslovakian Drums and Trumpet stations may have closed as they have not been heard for some time. He has also established that the Lincolnshire Poacher on 7.887, 8.464 and 9.251MHz transmits from Cyprus and is for agents in Iraq and transmissions are often jammed by a warbler. One new station to listen-out for appears around 4.660 and 5.650MHz on Thursday and Friday with numbers being read out in a strong

Russian accent. **David Featherstone** adds that an American voice can be heard reading numbers on 7.588MHz.

The Laughing Cavalier has also been in contact to say he is alive and well but I must ask him to write in again with his proper name and address (for my eyes only) so that I can pass him the information he wanted.

Oops

I gave out some duff information recently with the Raymond callsigns. Raymond 1 is Langley AFB in Virginia but Raymond 9 was probably Dyess AFB in Texas and Raymond 7 Cannon AFB in New Mexico. My thanks to **Ken H.** and **Paul Hilton** for the information. Paul has also submitted two interesting loggings. Stations 2YH, 3MU and 2MX have been heard on 5.310MHz and they sound like UN stations possibly in Yugoslavia (see the entry from Adrian Rees as well). Paul also heard the Canadian Coastguard Ice Advisory Service on 4.408MHz with an iceberg warning. Paul has also got his hands on the callsigns for the new presidential team: Eagle is President Bill Clinton, Sawhorse is vice-president Al Gore and Evergreen is Mrs Clinton.

USAF Callsigns

Still with callsigns **Len Spindler** offers a tip on the USAF Reach callsigns and says that two numbers usually indicates a tanker and five numbers an airlift mission. **Stuart Viney** queries what sounded like an AWACs on 6.735MHz using the callsign Blue Tattoo and giving track vectors. Both British and American accents were heard and Stuart wonders if this may be connected with renewed activity over Southern Iraq. **Simon Lucas** uses

a Lowe HF-225 with 25m long wire and has logged UN activity in Yugoslavia on 6.996 and 5.310MHz. The latter appears to be UN units monitoring shipping activity off the coast.

Adrian Rees has heard the signals mentioned by **Dominique Kemp** between 2 and 3.4MHz. He believes that it may be a military encryption system with the short digital transmission used to match the equipment for the analogue transmission that follows. Adrian asks for a copy of the current frequency list for RTTY, FAX and so forth. Sorry Adrian but you have written to the wrong chap and, without implying any criticism, can I take this opportunity to explain to all readers that like most of *SWM's* correspondents I work from home and have no regular contact with the other writers. Any mail addressed to me should solely concern this column or I end up having to post your material to the writers concerned.

Bizarre Propagation

Geoff Crowley writes from Iceland where some fairly bizarre propagation takes place at times particularly when he can see the Northern Lights. Geoff uses a FRG-7700 with modified Datong AD370 active antenna system. He heard Virgin 008 requesting medical assistance for a passenger on 8.960MHz, Paramaribo ATC (Surinam) on 8.850MHz and what sounded like a drunken Chinaman singing for an hour on 8.943MHz. Considering that is an air band allocation it seems very odd. Geoff also heard what may have been British military operations on 8.972MHz with the call signs C6W, DPM, 4PJ, P6Y and Bluestar. Geoff queries Iqaluit which appears on several North Atlantic Track frequencies. This is one of the Canadian NAT-D stations and operates

from Frobisher Bay on Baffin Island. Geoff tried to monitor the recent Lufthansa hijacking but without success and asks if a special frequency is used. Not as far as I am aware although there is a special squawk (transponder) code of 7500.

Barry Stoyles monitored Shuttle rebroadcasts on 21.395 on 5 consecutive days and heard a refuelling tankers convention on 8.906MHz on the January 7 with Mobils 14, 18, 20 and 31 all working on track Orange. Barry queries a Shanwick-Gander link on 8.831MHz. So that is where they have moved to. There used to be a Shanwick-Gander-Iceland link purely for contact between controllers on 10.878MHz. It looks as if Barry has found their new frequency. He, like a number of readers, also queries some of the frequencies being used on the NAT and CAR tracks. It looks as if there is a reshuffle going on. I will not publish lists yet but wait until they have settled down. A reader signing 'Casey-01' heard a curious exchange on 5.604MHz between United 934 (A 747 bound from Los Angeles to Heathrow) talking to his despatcher about a near miss with a UFO which the pilot described as like an Aurora spy plane with no wings or tail.

And Finally

Several readers have asked about the USAF *Flight Information Handbook*. The USAF no longer sell direct to the public but according to Peter Finn you should be able to get it through Diagraphics Books and Information Ltd. Telephone: 071-978-4257 and ask for Miss Patrick who will supply prices. And yes, Peter I will take up your offer of the old maps.

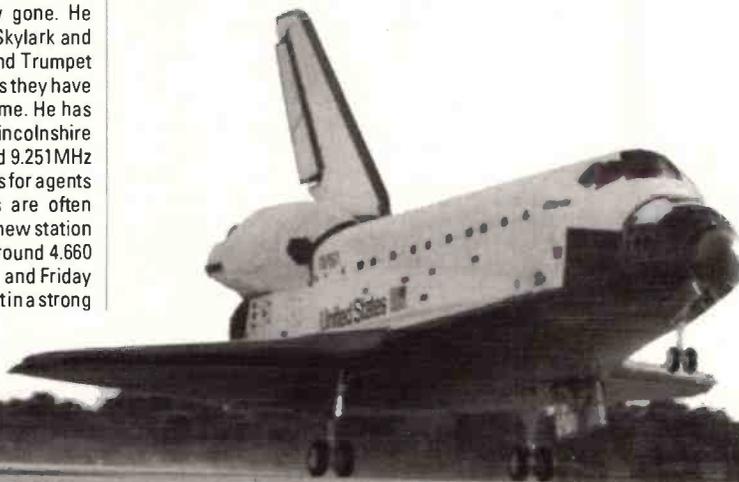
Books

Copies of Peter's Book *Short Wave Communications* are still available from the *SWM* Book Service, along with *Scanners 3rd edition* and *Scanners 2*.

Short Wave Communications covers a wide area and provides an introduction to the hobby of radio communications. International frequency listings for aviation, marine, military, space launches, search and rescue, etc. The book costs £8.95.

Scanners is a guide for users of scanning receivers, covering hardware, antennas, accessories, frequency allocations and procedures. The book costs £8.95.

Scanners 2 is the companion to *Scanners* and provides even more information on the use of the v.h.f. and u.h.f. communications band and gives constructional details for accessories.



The Shuttle is regularly heard by utility listeners.

Amateur Bands Round-up

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

Perhaps the event of the month is the P5RS7 (Yes, that's right!) operation. It started I am told on December 18, and closed on instructions from Pyongyang at 1800Z on January 6, with some 36 000 contacts in the log. It is understood that logs for 6/80/160 are with JA1HGY, and the rest are following. Romeo Stepanenko 3W3RR, plus UB5JDM, UW0MF, UT3UY, and SWL Oleg Pavlenko operated from near the Russian Border. Of course, we must now await the DXAC approval to see if North Korea is added to the list of possibles.

Another 'biggie' was the AH1A - Howland - effort, but surprisingly few people logged this - or did you all think he was just another East Coast W, one wonders?

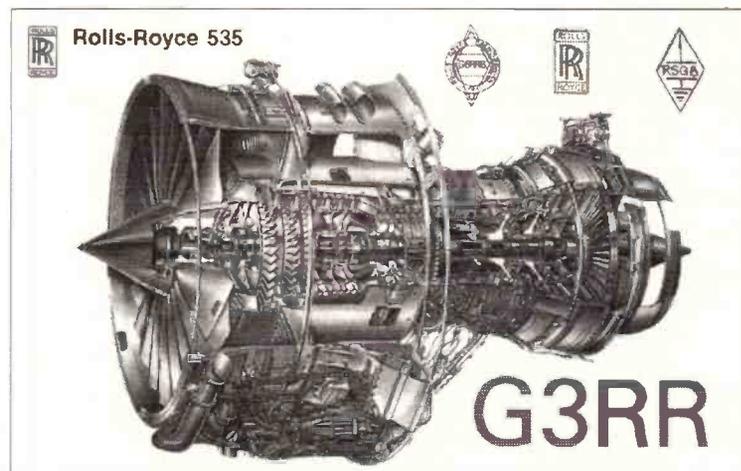
In late March (if all goes well) we may possibly see an outburst of activity from Ghana; this will be the PA3AWW group. Bhutan is also coming into the 'possible' class, thanks to the good work of Jim Smith VK9NS. There are hopes of ET activity too, where DK7PE was at the time of writing going to meet the newly re-formed EARS taking a transceiver donated by INDEXA.

Letters

Geoff Crowley leads off from Hafnarfjörður in Iceland. Geoff is rather restricted as to what he can put up but uses a Datong AD370 with a larger-than-normal antenna. Since the last report, Geoff has added computer-based decoding for FAX, RTTY/AMTOR/SITOR but not - yet - SSTV. The AMTOR stuff is proving to be hard to crack, although Jeff has managed to decode SM30MO and IK5AAX. 24 and 28MHz didn't yield much, but on 21MHz Geoff heard VKs for the first time, plus of course some more on 14MHz plus also ZL4DD - nice to hear one's home country from the other side of the world. Naturally enough in Iceland, auroral echo has been in strong evidence, and 3.5 and 7MHz have done well. We like Geoff's turn of phrase about the aurora - like a science-fiction program!

A voice from the past now; **Luciano Marcquardt** writes from Hereford after a break of many years since he used to report regularly to Justin Cooper. 28MHz gave AC4ZB and KC4EHY plus Europeans, while on 21MHz I note EC9LW (NW Africa), 4N5PK, VE3GLX, W7HSP, K6CCY, W0QEV, 9K2ZZ, 8P6QM, VY2MP, N2NVH and 7X2WAK; more local but still of interest were IS0AYZ and TF3SV. At 14MHz EA8AKN, VK3UM, WP4EPA, LY1BYN, VO1NP, N2OK, ZA1CWN, ZL3JU, PY7ZZ and a gaggle of Europeans. On 80 I see KC7TC/AM (aeronautical mobile), AF3R, K2OV, TI4MF and more Europeans including OY1HJ.

Ted Trowell managed to listen to the c.w. from 5B4AEV and HP1AC on 7MHz while on 10MHz K6DC (at 1500Z!),



Rolls Royce Amateur Radio Club QSL card.

OD5/SP7LSE were booked in. OM3KFE was worked on sideband, as this is now a new country - Slovakia. At 21MHz XE2MX and YN/SM00IG. Finally 28MHz for HK3RQ and PZ1DY.

Stuart Crow is at Birks Hall, Exeter during term-time, with about 10m of wire strung round the room. The site tends to blot out the Europeans - a boon! - so on 7MHz Stuart managed ZL1AXQ, ZL2APW, ZL2BCG, ZL3RV, ZL4AU, ZL4DJ, ZL4IG, VK2BZA, VK2UH, VK3QX, VK4TM, ZF8AA, KP4AWI, CX5BW, HK6NNE, PT7WA, PY1NEW, PY7AW, YV1GOT, YV5FCI, VE1JEP, VE2HQ, VE2OTT, VE2ZT, 5T5SN, 4X6SK, UH8EA, EA9LZ, 9H1AL, 9H1FC plus Europeans; On Top Band, a gaggle of UK stations were noted, and on Eighty Stuart located VO1MZ, CQ9FF and EA9TL; on 18MHz he tripped over FK8CP for a new one, ZL2AAG, ZL2APW, VK2BFE, VK2CLB, VK7GK, JA000, JR1MAF, JA2VPO, JJ3LLT, JH4RLY, JA7MVX, TA1AL, 7X2BK, 7X2DG, 7X2WAK IC8SDA and Europeans. 24MHz saw off K1ZFA, and on 14MHz D44BC, VK2AMD, VK5AAG, VK5BVJ, VK5QG, and VK6AKB were logged.

Around The Bands

Another newcomer yet is **Nigel Dunhill** who writes from Barwick-in-Elmet, and runs a Sony ICF-20010 fed by the Sony active antenna. On 3.5MHz this netted CM6LE, CN8HR (QSL to CN8NS), JT1/RB5LUK, KP2BH, KP4CKY, KW2P/KP5 (Desecheo), P43LJP, TZ6VV, VP2EY, VY2SK, ZB2CF (Box 292, Gibraltar), 3A2LU, 4N4BH, 4U1UN, 7X4AN, 7X2BK and 9K2MU. Turning to 7MHz CE8ABF, UH8ED, ZA1E, 4U1ITU, and finally 14MHz where 7X2VKE and 9H4M were noted - not so many as usual.

Gerald Bramwell in his new abode in Swinton drew a blank on 28MHz, and found just RT5UN and LZ1KUZ on 24MHz. 18MHz gave four Ws, 7X2BK and EA8ZO, Europeans, plus c.w. from HA8TIB and HA5AW. On 14MHz RTTY dealt with HA6PX, 68VF, HI8BG and

IK3ASM; on sideband, AC4PX, VQ9AC and YV5ANF, UR8J and a gaggle of EUs, 7MHz yielded r.t.t.y. from UB4HQ, UH8EA, SV1BDO, IK5RUN, and IK8GYS; on c.w. Gerald heard W3IMD, N2UN, W1JR, W3GAG, WQ1F, an assortment of Europeans, EA7CEZ, 5B4ADA; and a turn over to sideband for 9H1AL, 9H1ED, ZB2CF, CN8HR, FM5CD, 9K2US, LU6AMW, PY5EG, HI8CJQ, EA8AMT, VP2EY, EA9LZ, KP2BH, WP4AZT, KP4AAQ, OA8K, YV5IXF, KP4TR, TI4CF, LU11V, 9K2MU, HS1HSJ, KP4ERJ, YV4WM, HK1HHX, FK5BF, JA1VKV, NP4A/M, TA5C, KP4YD, and YV1GOT. 3.5MHz saw and enormous crop of sideband Ws, and d.x. from all over, including OA4/LA7JO, OD5/SP1MHV, RTTY from lots of Europeans, and a daffy of c.w. stations came in from Europe. Finally, on Top Band, no real DX but lots of Phone and c.w. from Europeans and various parts of the UK.

More Letters

Vince Cutajar in Malta tried 24MHz for WA4DAN/KP5, J28BG, C9RTC, and on 18MHz were added OM3TZW, 3X0HLU, OK1AJN, 5Z4BI and AH1A on Howland for a bit of real DX not reported by others.

Simon Griggs in Chelmsford listened on 3.5MHz in the wee sma' hours and accounted for WA4TH, W4PZV; K3II (c.w.), HK3JJH, PT7NK, PT7BSH, On 7MHz c.w. from W1AW, VE2AUG, SV2BFM, CM7EH, NE2Q, WA2HZO, FM5FZ, K4GXQ, K5XX, A62EH, K2TQC, N9RD, K2SIG, WA2EIN, WA4WRL, K4EJQ, W4XJ, CN8CV, RD6DAB, KP2J, PT7WA, VP9/LA9IAA, SV2B0H, PP7CW, AA7KE, SV1BKN, RM8T, W7ZQ, ZA1J, plus sideband from UH8EA, TI4CF, RV6HF, YV4ARB, HJ4TTF, YV5IXF and ZS6P. Top Band is represented by LX1UN. On 14MHz we get the loggings as 5B4ES, ZB2EO, 7X2WEK, all s.s.b. plus c.w. from UV9CJ. Up again, to 21MHz for c.w. from JA6BDB, JE2ARR, PP5AUX, PY7SA, PP7IK, plus s.s.b. from TK5CW, EA9RA, OY2VO, and JA6HKC. Finally

28MHz for OD5/SP1MHV and 4Z4HB.

Simon goes on to ask about some of the 'special' stations on the bands; he himself has noted that W1AW is the HQ station of ARRL; the bulletins and Morse practice appear on 1.818, 3.581, 7.047, 14.075, 18.097, 21.067 and 28.067. The bulletins are keyed at 1200, 1500, 1800 and (Mon-Fri) 0500UTC; the slow Morse Monday, Wednesday, Friday at 0400 and 1400GMT, with 1100 and 1700 on the other days. Fast Morse is 1100 and 1700UTC Monday, Wednesdays and Fridays, Tuesdays and Thursdays at 0400, Tuesdays, Thursdays, Saturdays and Sundays at 1400UTC. The slow stuff is given at 5, 7, 10, 13, 15 w.p.m.; the fast at 35, 30, 25, 20, 15, 13, and 10 w.p.m.

As for GB2RS, this is the News Service of RSGB. It is read on various frequencies on Sundays; the 3.5, 7, 50, 144MHz bands in particular. Details are in the current RSGB *Call Book*, obtainable from the *SWM Book Service*. The GB2RS bulletin includes both national and local news.

Getting A Licence

I never cease to be surprised at the number of listeners who never seem to take the logical next step of getting a licence. One who did is **John Hemming** who now sports 2E0ACN from Northfield. At the novice power level, John has quickly discovered the profit in using c.w. so he was up to some 46 countries worked by mid-January with only S America to complete a WAC. Equipment available include the Sommerkamp FR100b/FL200b combo, home-brew 'Sudden' and an 'OXO' to cover the bands of interest. John has a simple way of ensuring he can never 'over-do it' with the Sommerkamp setup - he uses a crystal mix, which promptly distorts if he goes over the limit! On the antenna side, John sticks to an end-fed wire; at 15m (50 ft) high there is some 37m (120ft) of end-fed wire, no doubt fed through an antenna coupler of some sort.

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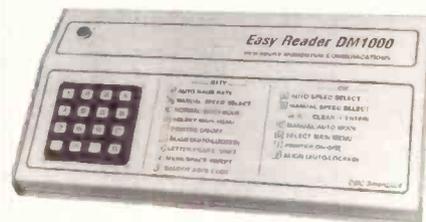
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Airband

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

Who won the Christmas Quiz? Fourteen of the 15 entrants correctly recognised the Breguet Atlantic. Unfortunately, Peter Cardwell (Sheffield) was disqualified for not submitting his entry on a postcard, so making it stand an unfair chance in the random selection process. The remaining entries all went onto random selection since no-one gave the correctie-break answer. Suggestions as to the location were Biggin Hill, Boscombe Down, Fairford, Farnborough, Le Bourget, Mildenhall and St. Mawgan. This aeroplane obviously gets around! A clearer view of the aircraft, as snapped by Christine Mlynek at RAF Brize Norton, appears this month. The prize of a v.h.f. radio controller goes to **C. Smith** (Oldham).

Jack Chapman (Luton) mistook the Atlantic for a Vickers Viscount, another turboprop. He was thinking of Viscount 806 G-APIM, now being restored at Brooklands since its accident early in 1988. While parked, it was struck by a taxiing SD3-30. The hydraulic pressure accumulator was faulty on the Shorts and this caused the brakes to fail. Jack's father was a pattern maker at Vickers' Weybridge plant (right next to Brooklands) before the War. Jack is forgiven for misidentifying the aircraft since the engines of the two types look so similar.

Receiver Hardware

My first ever contact with a novice radio amateur is a letter from **Edward Turnbull 2E1ANZ** (Tyneside). His receiver covers h.f. and v.h.f. Although performance is good at h.f. via a long wire and a t.u., very little comes in at v.h.f. This is because the a.t.u. is doing its job of filtering out signals that are beyond its operating range. Connecting the long wire direct to the receiver will get round this problem but then, I suspect, the signals will be too strong and hence overload the receiver. A good all-round vertically-polarised v.h.f. antenna is the discone, although I appreciate that commercial versions of these are rather expensive for most novices.

Edward sends postcards of scenes at Newcastle Airport. He also muses about the relationship between British Airways and the independents, now that Dan-Air has been taken over.

Eric Bennett (Kidderminster) has noticed differing performances by different antennas. Now, the type of antenna and its location and height are important and have a strong affect on received signal strength, but Eric also mentions that the antennas are connected by different lengths of coaxial cable. Every metre of cable attenuates the signal, and you can tell by how much this happens by reference to the manufacturer's data. This will be quoted in the catalogues of the major electronics suppliers. You



A clearer view of the Christmas Quiz aircraft. *Christine Mlynek.*

want to choose cable with the minimum amount of dB loss per metre at 100MHz. Also, I hope the ejector seat owned by Eric's son, Neil, isn't still armed with its rocket charges!

Information Sources

UK government aerodromes summarise their actual weather state by a colour code and Eric would like to know what these mean. The order of colours, starting with the clearest weather, is blue, white, green, yellow, amber and (airfield closed) red. Visibility is respectively 8000, 5000, 3700, 1800, 900 and less than 900m. Significant cloud base is respectively 2500, 1500, 700, 300, 200 and less than 200ft. Yellow is a critical state and may be subdivided, yellow 1 being slightly better than yellow 2. At USAF Europe aerodromes, slightly different figures are represented by the same colours. If black is given before the main colour, it means that the airfield is closed for a reason other than poor weather.

Julie Stafford (The Aviation Hobby Centre, 1st Floor, Main Terminal, Birmingham International Airport B26 3QJ) kindly sent a copy of *The Pocket UK Airband Frequency Guide* by Ron Swinburne. Although I don't often recommend 'private' frequency lists, this one has some useful features. Its size makes it the only list I know of that really will fit into a pocket. Both v.h.f. and u.h.f. allocations appear in the one list and there is also a table of company operations frequencies. Most novel is a reverse look-up table that enables the aerodrome (or other location) to be found when the frequency is known and this alone makes it worth the price of £3.74 (inclusive of UK postage, an extra £1.59 should get it airmailed anywhere in the world). Perhaps the D&D Cell at LATCC should buy one - I am given to understand that they don't keep a reverse look-up table!

Although I don't know of The Shackleton Preservation Society, I can put **Peter Hamblett G8AAL** (Bewdley) and any other ex-Shackleton people in touch with The Shackleton Association. Contact the Secretary at

Meadow View, Perks Lane, Prestwood, Great Missenden, Buckinghamshire HP16 0JH.

Air Experiences

Vincent Dagostino has started flying lessons from his local airfield in Edinburgh. Hardly surprising, as his aeronautical interest dates back to age 8 (I am told that I first took interest in aircraft at age 1 - beat that!). Vincent's first experience of making airband transmissions involved obtaining clearance from Edinburgh Ground (121.75MHz) in order to start and taxi his Cessna 152. The transponder was set to 7000 during flight, this conspicuity code enabling the aircraft to be seen on radar even though not under radar control. It tells a controller: "I am here, and you can clearly see that I am keeping out of the way of your radar-controlled traffic". A peculiarity is that the Student Pilot's Licence allows radio transmissions to be made so that experience can be gained. A Private Pilot's Licence does not allow radio transmissions! A separate radio licence is also needed but I am sure that Vincent will be taking this as part of his training course.

Tim Binder (East Grinstead) was lucky enough to visit air traffic control at Gatwick. The radar controllers (125.875 and 118.6MHz) are located in a building separate from the control tower itself and the calm atmosphere contrasts with the bustle in the visual observation room. Tim found that one of the outer markers has been withdrawn and that LATCC vector some traffic to Heathrow and Stansted on 119.775MHz.

Follow-Ups

Back in February, I mentioned the Bristol Type T188 at the RAF Museum, Cosford. **Fred Pallant G3RNM** (Storrington) found the aircraft described in Sir Archibald Russell's autobiography, *A Span of Wings*. Sir Archibald joined Bristol in 1925 and retired 45 years later from his post of Chief Designer/Chief Executive. In

those days, experience and loyalty to a company counted for something and employers helped to retain their staff. The aircraft, of 1961 vintage, is described as being two large engines on the minimum of airframe (!) and has a high tailplane mounted on a large fin.

Fred experienced the Harvard (illustrated in February) when in the Rhodesian Air Training Group. A characteristic of this aircraft was a tendency to ground loop, pirouetting in a tight circle around one main wheel when the other wheel lost its grip. The narrow track between the main wheels, which were mounted forward of the centre of gravity, caused this but the long undercarriage legs were a redeeming feature since they prevented the wing-tip from scraping the ground when this happened. At least the rearward centre of gravity will have made it harder for the aircraft to nose over. You can still hear the unmistakable propeller noise when the type is displayed at air-shows.

Frequency and Operational News

The last ever RAF Halton airshow is expected to take place on June 19. Although Halton has been saved from total closure, all technical training there will cease and the airfield will close. Presumably this means the end of club flying there. Future Halton shows will not include any flying. I believe that Halton is presently the country's largest grass aerodrome.

A new a.t.i.s. is expected at Bristol (Lulsgate) on 121.75MHz according to **Alan Jarvis** (Cardiff). Although this is the same frequency as Edinburgh Ground (see above) the geographical separation allows safe reuse of the channel.

Looking now at GASIL of 1/93 from the CAA, Gloucestershire's Radar has been changed from 125.65 to 120.975, Newcastle's Approach from 125.65 to 124.375 and Northolt's Tower/Approach from 134.15 to 126.45MHz. Swansea might eventually have d.m.e. paired with 109.2MHz (channel 29X, ground reply on 990MHz). Both ATZ and MATZ have been withdrawn at Sculthorpe; Truro has a new ATZ.

AIC 2/1993, also from the CAA, introduces changes to upper airspace due to the move of Shannon north Atlantic landfall to 12°W. A number of airways, with UN designations, are affected along with UR116 and the Aerad charts that will be most helpful in showing these are H201/2 and NAT1/2. Send a stamped, self-addressed envelope to the editorial office at Broadstone for your free copy of the single A4 sheet Airband Factsheet, which lists the addresses of chart suppliers.

CONTINUED ON PAGE 49

Scanning

Alan Gardener
PO Box 1000, Eastleigh, Hants SO5 5HB.

I guess that advertisements for the new hand-held scanner from Yupiteru will have appeared by the time this column is published - and from a first glance at the specifications it looks very promising. The new model is called the MVT-7100 and is styled in the same manner as the current MVT-7000, but just take a look at all the improvements Yupiteru have made. The frequency coverage starts at 530kHz and ends at 1.65GHz with tuning steps ranging in size from 50Hz to 100kHz.

Scan/search speed of up to 30 channels per second are possible and the available modes include for the first time selectable upper or lower sideband reception, as well as c.w. Frequencies can be stored in 1000 memory channels and there are 500 pass channels available, plus the scanner is supplied with a large selection of accessories including NiCad batteries and mains charger.

I can easily imagine this model becoming the most popular hand-held during 1993, if the performance turns out to be as good as anticipated. You can see a full review of this scanner in the free booklet *Guide to Short Wave Listening* inside this issue.

Databases

Several months ago I mentioned the subject of using computer databases to keep track of frequency lists. I had a lot of correspondence on this subject with lots of people suggesting their own favourite packages or offering to write specialist software. Judging from the number of different databases in use I don't think that it is a worthwhile proposition for commercial software companies to produce a specialist package, but several enthusiasts have written their own.

One of these is 'AMISCAN' written by Dave Shirley and Tim Anderson. The program allows you to store, sort and retrieve information easily with separate columns for frequency, channel, mode, service and location. It also includes a simple ASCII file conversion utility which allows you to import and export information to and from other databases. This is very handy if you want to swap frequencies or up/download via a modem. I found the IBM PC version very easy to use and fairly fast in operation. The authors intend to develop the program as users suggest additional features and the next version may include an improved global search function which will allow you to set up several separate files of frequencies which can be included in a single search operation.

Tim Anderson is, of course, no stranger to the pages of *SWM* and he has included several thousand frequencies of particular interest to TV and Radio DXers in the Database. This feature alone must make it worth

obtaining a copy, which I think is very reasonably priced at £7.50 inc P&P. You can obtain either an IBM PC or AMIGA version of the program from Tim Anderson, 2, Burry Road, St. Leonards On Sea, East Sussex.

European Scanning

With the recent bad press that scanning has received it is interesting to note that one of our European neighbours has just changed the law relating to the use and sale of scanning receivers. This change of legislation may ripple through to other EEC countries.

Germany used to be one of the most restrictive countries as far as the use of scanning receivers was concerned, but this has suddenly changed. Many former 'underground' scanning groups are now meeting openly and it has even been reported that a few radio magazines are beginning to include features on scanning and are publishing frequency lists. The reason for this change in policy is not entirely clear, but it may be connected with the harmonisation of EEC radio regulations which member countries are now trying to work towards.

This could help improve the situation in Britain, where the calls for a ban on the sale of scanning receivers seem to have subsided for the time being. Another factor could be the introduction of digital communication systems which are very difficult to monitor, making new legislation unnecessary.

It would seem that it isn't just scanner owners who will be prevented from listening. The trade press has been reporting rumours that have been circulating about the new GSM digital cellular telephone system which is due to come into service soon. It would seem that several Government departments are concerned that the digitally coded transmissions are too secure making the off-air monitoring of calls by the security services difficult. As a result of this the coding structure may be changed slightly before the system comes into full operation.

Digital Short Range Radio

While we are on the subject of digital radio an entirely new type of service may be launched during the next few years. Digital Short Range Radio or DSRR is likely to take over part of the existing u.h.f. CB allocation at 934MHz. A similar service had been proposed during the mid 1980s but as far as I am aware it was only ever introduced in Japan, as a form of CB.

The new digital service is likely to appeal to small businesses who don't want the expense of operating their own p.m.r. radio system with a remote

UK TESTING AND DEVELOPMENT LICENCE FREQUENCIES (MHz)

BASE/MOBILE

5.750 (a.m., n.b.f.m. & s.s.b.)
7.556 (a.m., n.b.f.m. & s.s.b.)
9.071 (a.m., n.b.f.m. & s.s.b.)
10.438 (a.m., n.b.f.m. & s.s.b.)
11.117 (a.m., n.b.f.m. & s.s.b.)
16.014 (a.m., n.b.f.m. & s.s.b.)
18.990 (a.m., n.b.f.m. & s.s.b.)
20.990 (a.m., n.b.f.m. & s.s.b.)
24.135 (a.m., n.b.f.m. & s.s.b.)
26.218 (a.m., n.b.f.m. & s.s.b.)
27.045 (a.m., n.b.f.m. & s.s.b.)
27.74125
27.89125
49.82 to 49.98
173.325
458.650
888.500
153.200
454.375
27.120
49.4875
140.96875

BASE

85.875
167.20
456.925
941.5/942.0
1466.875
1467.125

MOBILE

72.375
172.00
462.425
896.5/897.0
1529.375
1529.625

USE

h.f. Fixed and Mobile
Citizens Band
Citizens Band
General purpose
Low power Telemetry (no speech)
Low power Telemetry (no speech)
Low power Telemetry (no speech)
Wide Area Paging (Tone only)
Wide Area Paging
On-Site Paging (Tone only)
On-Site Paging (Tone only)
p.m.r. 'Mid' (also short term hire)

p.m.r. 'Low' (also short term hire)
p.m.r. 'Hi' (also short term hire)
p.m.r. u.h.f. (also short term hire)
Cellular
Fixed Links
Fixed Links

base station, but need a more reliable service than CB can offer. Typical users are likely to include farmers, construction sites and local area delivery companies. The proposed system will have 76 voice channels and two control channels, with digital selective calling using a transmission format similar to that proposed for GSM. The transceivers will automatically find a clear channel, signal the details to each other on the control channel and alter the operating frequency without the user being aware of any change.

The system is particularly clever in that it will allow the use of both simplex and duplex operation in the same band. So repeater stations can be used if the licensing authority will permit it. The base stations are likely to transmit in the band 933-935MHz with a 25kHz channel spacing paired with the band 888-890MHz for repeater inputs if they are used. It is estimated that this should allow up to 2000 users within the same geographical area.

These proposals are still being developed and it is unlikely that anything will actually become available for at least a couple of years, in the meantime conventional methods of analogue transmission are likely to remain with us for some time to come.

Road Construction Communications

Until DSRR becomes established, most large scale construction projects will rely on simple radio communication systems to co-ordinate work on site. The DTI Radiocommunications Agency has been looking into the problem of allocating radio frequencies for these purposes. Many companies were having to make use of the limited number of short term hire frequencies.

These were not suitable for use in many areas because of the large number of licensees per channel. Having a clear radio channel is particularly important when safety is involved, for example between the banksman and tower crane operator on building sites or for traffic co-ordination during road works.

The DTI has now allocated the frequencies (see table at the top of page 49) specifically for road construction projects in the UK along with detailed regulations for their use. In order to maximise the re-use of frequencies limits will be placed on the base station radiated power and CTCSS tone squelch frequencies.

These may prove interesting if you are stuck in roadworks or live near a major road building project.

UK ROAD CONSTRUCTION FREQUENCIES (MHz)

BASE	MOBILE	USE
82.5250	69.02500	Vehicle recovery / Traffic management
163.0875	158.5875	Resident Engineer
163.3000	158.8000	Contractor
163.3750	158.8750	Contractor
163.5125	159.0125	Contractor
163.6125	159.1125	Resident Engineer
165.0750	169.8750	Resident Engineer (Not within M25)

Testing, Testing

With all these new radio systems becoming available you may wonder how equipment manufacturers manage to try out new designs once they have got beyond the stage of laboratory development.

Well, one way is to obtain a Testing

and Development Licence from the DTI. This allows the user to radiate signals on defined frequencies purely for the purposes of testing, development, modification, servicing or repairing equipment as well as scientific research, experimentation and the training of radio theory or practice - which covers a very large range of

users. Interestingly quite a few of the frequencies lie within the h.f. bands so the list on the previous page should appeal to short wave listeners as well as scanner owners.

Burger Communications

I know that many readers of this column also subscribe to various American publications devoted to communications monitoring in one form or another. If you are one of them, you will know that one of the topics that features fairly regularly is the frequencies used by companies such as McDonalds and Burger King for their drive-in restaurants.

So here it is - the first UK letter on the subject from reader **Ian Macdermott** of Essex. The staff at his local drive-in seem to use radio

headsets to pass orders taken from customers to the staff inside the restaurant who prepare the meals. Ian has done extensive research on the subject, which has frequently involved placing large orders! - and says that they don't seem to operate in the 27, 30, 49 or 168-175MHz bands.

I know that the US versions operate in some form of duplex or twin frequency mode and because of this require quite a large transmit/receive frequency spacing. One possibility may be the 459/161MHz bands which are paired for low power on-site communications, but do any Car driving, Burger eating, SWM readers have any other ideas?

Until next month - Good Listening.

Airband

CONTINUED FROM PAGE 47

Air traffic control doesn't operate on split frequencies, so I'm not sure what changes **Jeff Palfrey** (Salisbury) believes to have occurred on 132.8MHz. This is part of the Cardiff sector. Also, I'm not aware of the power output of relays being changed according to time of day, as queried by **Michael Elland** (Cork). Michael is looking for a reporting point: could it be MORKA to the south of Dean Cross on UA1?

The next three deadlines (for topical information) are April 8, May 7 and June 4. Replies always appear in this column and it is regretted that no direct correspondence is possible. All letters to 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS. Genuinely urgent information/enquiries: 081-958 5113.



A Phantom jet, 'posing' rather impressively, at a recent air show.

Abbreviations

AIC	Aeronautical Information Circular
a.t.i.s.	automatic terminal information service
a.t.u.	antenna tuning unit
ATZ	Aerodrome Traffic Zone
CAA	Civil Aviation Authority
D&D	Distress and Diversion
dB	decibels
d.m.e.	distance measuring equipment
ft	feet
GASIL	General Aviation Safety Information Leaflet
h.f.	high frequency
LATCC	London Air Traffic Control Centre
m	metres
MATZ	Military Aerodrome Traffic Zone
MHz	megahertz
RAF	Royal Air Force
u.h.f.	ultra high frequency
USAF	United States Air Force
v.h.f.	very high frequency
W	west

Radio Navigation

v.o.r. - Supersedes the n.d.b. The v.h.f. omni-directional radio range behaves as if it has a radial spoke sticking out for every degree on the compass. These spokes are entirely imaginary but the cockpit indication tells you which radial is being crossed (or flown along). Can also drive the needle on a radio magnetic indicator so that the pilot knows which way to steer to the beacon.

TACAN - TACTical Air Navigation. A combination of a d.m.e. and a military version of the v.o.r.

i.l.s. - The instrument landing system guides the aircraft to the runway during final approach. Two radio beams are required: the localiser (v.h.f.) for direction and the glideslope (u.h.f.) for height. Some aircraft can land themselves automatically by following the i.l.s. Most only fly to 200ft above the threshold, then the pilot takes over. Microwave landing system will eventually supersede i.l.s. Although its functions are similar, it is also capable of providing enhanced facilities.

Marker - A 75MHz beacon that triggers a light and audible warning in the cockpit if the aircraft flies directly overhead. Sometimes found on airways, but most commonly as outer and middle markers to indicate the progress along an i.l.s.

s.s.r. transponder - Airborne device (u.h.f.) that puts out a signal which shows up on the screen of secondary surveillance radar. As well as showing the aircraft's position, it also identifies which aircraft is involved and is capable of transmitting altitude information.

Info in Orbit

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

What super pictures we have been getting from the CIS (Russian) WXSAT METEOR 3-4! During February it has been coming over the north pole (therefore travelling southwards), and switching to visible light transmissions as the sunlight illuminates the ground below.

On February 7, I watched the passes at both 1230 and 1430 UTC as it came over Greenland, revealing massive ice sheets, then across Newfoundland, the Gulf of Saint Lawrence, and disappeared over the western Atlantic. The picture revealed coastline all the way along the river, almost to Montreal, showing the whole of the Gulf to be frozen over. At least that is how it appeared to me.

The skies over Canada were clear and the land views were quite breathtaking. Some fog obscured the river near Quebec but there seemed to be large icebergs and more general ice sheets. The land appeared frozen

some 'banding' that seems to be associated with the aperture changes.

For those not too familiar with METEOR pictures, the visible images include sets of bars and columns, the latter represent digital numbers, changing every few seconds. These give an indication of the level of open aperture, and changes often coincide with bands running across the image, perhaps indicating temporary under or over - exposure.

The infra-red images from 3-3 have remained very good, allowing us to see clear views of Iceland and Greenland, which the NOAA's also transmit, but at lower resolution.

These METEOR WXSATs orbit about 1200 km up, so we see them when they are further away than the American NOAA's, which are about 800 km high. This means that we get a greater coverage from the METEORs, and Fig. 3 is a METEOR 3-4 visible image showing the whole of Lapland



Fig. 2: NOAA 12 visible image from Mark Pepper

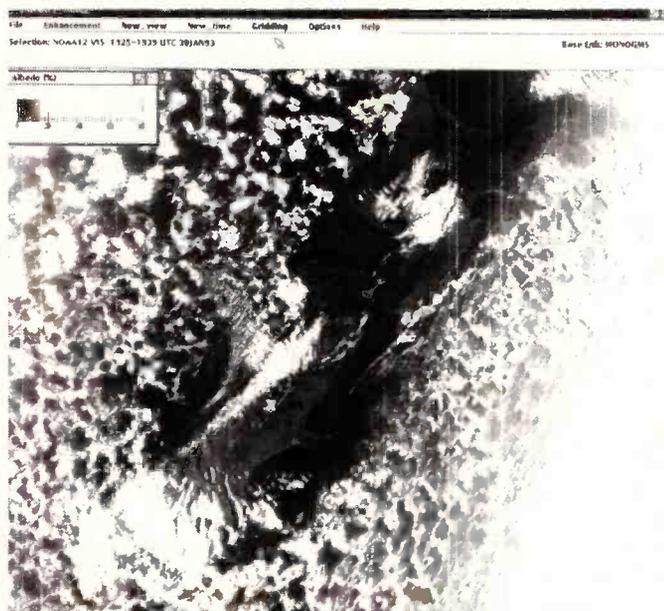


Fig. 1: NOAA 12 high resolution visible image of New Zealand from Steve Rawdon.

over as well. I have kept the image, so if anyone else using Timestep Weather Systems' PROsatII or PCSATIII would like a copy, send me a pre-paid package with disk and I will oblige without cost.

Current WXSATS

January saw the continued operation of both METEORS 3-3 (on 137.85 MHz) and 3-4 (on 137.30 MHz). Both have remained transmitting continuously, but only METEOR 3-3 was actually transmitting infra-red images during its nighttime pass. As described above, the visible light images from METEOR 3-4 have been very good, as have those from METEOR 3-3. Ok, yes there is

and North Cape, at the top of Sweden and Norway. It was collected by Peter de Jong of Leiden during spring last year.

METEOSAT-3 Moves West

On 27 January 1993, METEOSAT-3, the geostationary weather satellite began its move to its new location at longitude 75°W, over the South American state of Colombia. From there it will be able to provide meteorological coverage of virtually the whole of the American continent.

This change of operation began in 1991, following agreement between ESA and EUMETSAT. METEOSAT-3 was made available to the US

meteorological service NOAA because of the launch delays for the agency's new second-generation satellite service. METEOSAT-3 became a television star as it monitored the course of the devastating Hurricane Andrew that hit Florida in August 1992.

This co-operation between EUMETSAT and NOAA goes back several years. Between 1985 and 1988, NOAA made capacity available on its GOES-4 satellite to Europe to collect meteorological data. METEOSAT-3 is to become an integral part of NOAA's forecasting service, and for the first time, Europe has constructed a satellite ground station on US territory, at Wallops Island, Virginia.

METEOSAT weather images have been a feature of peak time European television for over 15 years. They provide fast, reliable meteorological data for Europe, warnings of storms, rain, ice, drought, sun and snow. Meteorologists combine this satellite data with ground measurements to make weather predictions, based on complex computer models.

Two METEOSATs, operating in a geostationary orbit 36 000 km above the equator, provide a daily stream of weather data to users all over Europe, Africa and the United States. METEOSAT-5 is currently operated in stand-by mode as an in-orbit 'spare', while software modifications are prepared for its future use.

Transmitting The Data

A couple of editions back I published a diagram of the data flow from METEOSAT to the eventual users (which includes us). Basically, an on-board communications system transmits raw images from the satellite to the Wallops ground station in America; these images are relayed by a telecommunications satellite to the METEOSAT ground facilities in ESA's European Space Operations Centre (ESOC), at Darmstadt.

From here, the spacecraft and its payload are controlled. Images are processed and meteorological products derived and distributed to national meteorological services and nearly 2000 end users. The meteorological products and image data for the United States are relayed to the Wallops station by a telecommunications satellite, for distribution via METEOSAT's communications payload and ground telecommunications links.

Not only METEOSAT-3 but also the Wallops station, is completely remote-controlled from ESOC in Darmstadt, including any station changes (equipment reconfiguration) and software-updating. Trans-Atlantic telephone trunk lines and ESA-installed back-up facilities ensure redundancy (i.e., spares) of the whole communications system.

The success of the pre-operational satellites paved the way for the operational METEOSAT programme (MOP-1, etc), which covers the construction of three more satellites, support ground facilities, and the operation of these facilities until the end of 1995. After then, there is a second generation.

My thanks to NOAA and EUMETSAT for the information provided in the Press Kit (number 01/93) from which some of this information originates.

METEOSAT-3 Schedule

A new WEFAX schedule came into operation on January 22 during the transfer of METEOSAT-3 to its new location. I am not certain whether a few of the more westerly of us might be able to continue to receive the transmissions but here is a summary for those who may find reception possible.

The first sequence of images starts at 10 minutes past each hour, and, for 0010, 0210, 0310, 0510, 0610, 0810, 0910,

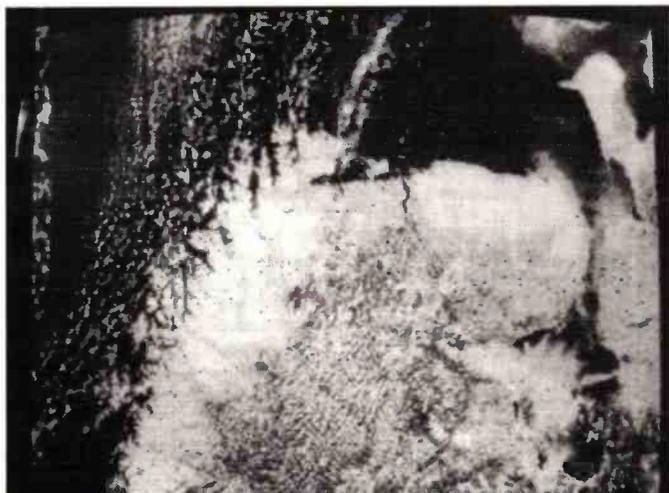


Fig. 3: METEOR 3-4 image of Lapland from Peter de Jong

1110, 1210, 1410, 1510, 1710, 1810, 2010, 2110 and 2310UTC is M1D (i.e., the equivalent of the former L1D). At 01, 04, 07, and 10 hours the M2D image is used. At 1310, 1610, 1910 and 2210UTC the M1C (visible) image is transmitted. Each is normally followed by the next in the sequence.

The second sequence starts at 42 minutes past hours 00 through 10, imaging M1E (water vapour) or M1D. These are followed by three further images. From 1150 to 2350UTC (on the 50 minutes) there is the visible M1C image, followed by M5C or M5D. Administrative WEFAX is transmitted at 0246 and 0846UTC daily. If you want a copy of the schedule just send me an s.a.e. with one extra stamp to cover copying costs.

Letters

It's particularly interesting to receive foreign correspondence, so when a letter arrived from New Zealand containing high resolution images, I was delighted. Four pictures were sent

by Steve Rawdon of the Meteorological Office at Wellington Airport, Fig. 1 is a NOAA 12 visible image of New Zealand. Both the North and South Islands are clearly seen, and the original picture shows much more detail than my atlas. The image was received at 1930UTC on January 30, and setting up this time and date with my satellite tracking program shows that NOAA 12 was over the islands at this time.

Mark Pepper of Camberley recently provided me with some excellent pictures from his WXSAT equipment from which Fig. 2 is a further example. Mark used a laser printer to print this NOAA 12 picture after some image processing. You can clearly see the two black lines which form the minute markers on the right hand side. These markers are also heard in the a.p.t. signal, so if you can't decode the pictures, you can still 'hear' what is going on just by listening to your scanner.

The left side of the frame shows the grey levels which, in the infra-red section, represent precise

temperature calibrations. Richard Atkin of North Devon has been using a Realistic PRO-2006 scanner feeding his GOES/WEFAX software to obtain WXSAT pictures. Richard points out that although ideally one would use a dedicated WXSAT receiver to obtain good quality pictures (because of receiver bandwidth considerations) he feels that beginners might find it worth trying a conventional receiver (assuming that they already have one).

Trevor Lane of Bideford has set up some receivers and various antenna for general radio use, and, having heard the polar orbiting satellites, is now proposing to extend his decoding facilities further. Trevor has treated himself to a 486SX 25MHz computer and has bought the TRACKII satellite tracking program from Timestep. I have submitted a review of this software for publication, and a feature on computers is also underway.

Dave Rogers of Highworth has modified his METEOSAT dish to reduce its weight. Basically this involved removing large areas of aluminium and fitting 12mm chicken wire mesh. This was mounted on a home-made polar mount and lets him move between the two METEOSATS. I wonder whether Dave can still receive M-3 from its new position?

Dave has been trying out a new program written by Viv Williams that connects between his WXSAT scanner and computer, running Timestep's PROsatII program (that I reviewed some months back). Viv's program automatically collects a.p.t. images from the NOAA and METEORS whenever his receiver detects a signal. Pictures are automatically stored, and the system then switches back to METEOSAT!

Alan Jarvis of Cardiff noticed that on his InstantTrack program last December 9/10 the total eclipse of the moon was indicated by the positions of both sun and moon being exactly

opposite in the sky. Programs do sometimes indicate eclipses though generally accuracy is fairly limited.

Books on Space

Simon Allen of Kidlington is one of several SWM readers who have been trying to locate specialist books on space matters. May I refer everyone firstly to the SWM Book Service (details in this edition), and secondly to Geoffrey Falworth whose office is at 15 Whitefield Road, Penwortham, Preston, PR1 0XJ. This is a postal address only (no visitors please). I send a detailed logging of satellite operations to Geoffrey for his specialist space publications.

BARAS News

The British Amateur Radio Astronomy Society had a narrow escape from a premature demise recently. Its former secretary Stewart Newberry has had to step down from his post, leaving the need for a new committee. I have agreed to take the post of Editor of its magazine GAMMA, and I am pleased to be able to introduce potential and former members to the new officers.

Chairman Colin Clements; Secretary Joe Pritchard, 27 Walkley Crescent Road, Walkley, Sheffield S6 5BA; Treasurer P Willis, 36 Chadswell Heights, Lichfield, Staffs WS13 6BH; editorial matters to me at the usual address.

I will pass on any urgent details via this column until the Society is re-established.

Kepler Elements

I will send a print-out of the latest elements upon receiving an s.a.e. and separate stamp. All known weather satellites are included, together with their transmission frequencies if operating. This data is supplied courtesy of NASA.

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Performance, features and ease of use make this still a best seller. Needs TIF1 interface. BBC, CBM64 tape £25, disk £27. VIC20 tape £25. SPECTRUM tape £40, + 3 disk £42 inc adaptor board (needs TIF1 also) or software-only version £25. TIF1 INTERFACE has 4-pole filtering and computer noise isolation for excellent HF and VHF performance. Kit £30, ready-made, boxed with all connections £40. Available only with software.

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Further publications available are *Air and Meteo Code Manual*, *Guide to Facsimile Stations* and *Radioteletype Code Manual* (12th editions). We have published our international radio books for 23 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent book reviews see Mike Richards G4WNC in *Shortwave Magazine* 2/92, 7/92 and 10/92. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

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Lan McDermid has been a keen listener since the 1930s and has devised his own methods of learning Morse code. One of the techniques was simply to listen to station callsigns until he could successfully decode them. If you would like to try this just look around for stations sending a sequence of Vs followed by the callsign. The Vs are particularly useful as they help you to adjust to the sending speed of the station. The advantage of this learning method is that you start by learning the rhythm of the code rather than just dots and dashes. Once you have mastered callsigns, you can move on to five letter groups.

broadcast listening. John keeps an interest in the higher frequencies through his AOR AR-2500 and Realistic 2004 scanners.

As with all successful listeners, John has a good antenna system. The main h.f. antenna is a full size G5RV, which is a popular choice for listeners with a strong interest in the amateur bands. The main feature of this antenna is its ability to load-up successfully on all the h.f. amateur bands. For the v.h.f. bands he uses an Anron 99 CB antenna and a WX290 vertical tri-bander. John's current ambition is to pass the RAE and he's working hard to achieve this.



John Jones - Radio Sunshine.

Two letters from C.R.J Healey of Plymouth and J. Booth of Portsmouth ask about the interference suffered by the Offenbach FAX broadcast of 134.2kHz. Although this subject has been raised before, it's worth another mention. The source of the interference is an l.f. radiolocation system that operates on an adjacent frequency. The strength of the interfering signal varies across the country, but few listeners have completely clear reception. From the experiments I've made and letters from readers, there are a few things that can be done to help. If your receiver has passband filtering you can generally use this to minimise the interference. An alternative is to use a good quality audio filter system such as the FL-3 from Datong.

Radio Sunshine

Featured station for this month is John Jones of Coventry. John appears to have a very bright outlook on life hence the station name - radio sunshine. You can't blame him for trying! John is a keen amateur and utility enthusiast and has built-up a useful station. The h.f. bands are covered using the excellent Lowe HF-150 coupled to the popular ERA Microreader decoder. He also uses a Grundig 500 for general

Bletchley Park

Those of you with long memories will no doubt remember the significance of Bletchley Park during the Second World War. For those with shorter memories, Bletchley was the home of the Government Code and Cypher School. They played a key intelligence role during the war and were responsible for breaking the coded transmissions from the famous German Enigma machine. This was absolutely critical as the Germans believed the code to be unbreakable.

Another famous development was the world's first computer - the Colossus. This became one of Britain's best kept secrets. So why am I writing? Quite simply because a trust has been formed to preserve and develop the Bletchley site. The trust is hoping to re-create the activities around the park and open a series of museum centres. These would be dedicated to the intelligence services, computing, radar and air traffic control. Before this can come to fruition, the trust desperately needs donations.

As many of the signals that interest Decode readers have a direct connection with the work at Bletchley, I thought you might like the opportunity to contribute. If you'd like to join in, your cheque should be made payable

to BLETCHLEY PARK TRUST A/c 60173762, Barclays Bank PLC, Milton Keynes. The address for contributions is: The Hon Treasurer, Suite 8 Denbigh House, Denbigh Road, Bletchley, Milton Keynes MK1 1YP. Tel: (0908) 640404. My thanks to Tony Leavesley of York for supplying this information.

PK-900 Released

This month, ICS Electronics of Arundel have released news of a brand new data controller from AEA. Whilst AEA are most well known for their PK232 data terminal, they have been producing a range of data processing equipment for many years. The latest release is the PK-900, which is billed as the successor to the now famous PK-232.

As you can see from the photograph, the front panel design has changed considerably and now features a large liquid crystal display. This display replaces the l.e.d. based status and mode indications of the 232 and looks to be a great improvement. The old l.e.d. bargraph tuning display has also been built in to the main display. The only controls on the front panel are the threshold and power on/off. So what else does the PK-900 do I hear you asking. For a start, it features dual radio ports. This has particular importance to Packet operators who need access to h.f. and v.h.f. bands. All you have to do is connect the audio in and out from each transceiver to one of the two ports. Switching between the two is then done using the driver software, so negating any hardware switching.

In addition to the standard Packet features the PK-900 includes AMTOR, RTTY, ASCII, NAVTEX, Morse, FAX and TDM. The data modes are also supported by AEAs SIAM signal analysis utility that eases signal identification. Perhaps one of the most important enhancements for the utility listener is the FAX system. Whereas the PK-232 system could only support the reproduction of black and white charts, the PK-900 features grey scale FAX. This opens up a whole new world of FAX photographs and satellite images. Although these were receivable with the PK-232, the grey shades were dithered to black or white and so lost a lot of definition. The provision of a grey scale really brings these images to life.

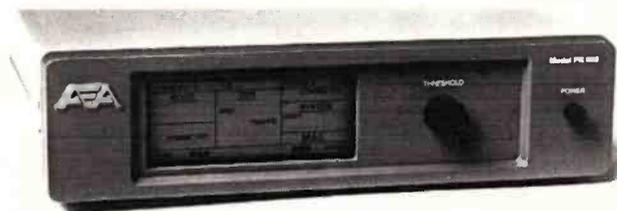
As well as the useful range of standard modes, the PK-900 can be easily upgraded. Two options currently available are PACTOR firmware and 9600 baud G3RUH/K9NG hardware. Both of these are available as low cost plug-in options. If you're controlling the PK-900 using a PC compatible there's a new PC-Pakratt for Windows program available. ICS will be importing a limited number of units that are to be available on a first come first served basis. Incidentally the anticipated UK price is £499.95 but for more details I suggest you contact ICS Electronics Ltd, Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 0BD. Tel: (0903) 731101.

Utility QSLs

This is a subject that I've mentioned before, but is worth another word for the sake of the newcomers. I was prompted to write following a letter from Michael Cox of Wigan. He saw my recent mention of Ocean Gate Radio and, having received this signal, sent them a QSL. You can imagine his delight when, some time later, he received a weighty package of goodies. Included in this pack was a postcard from WOO listing all their current operating frequencies. This included full details of their voice frequencies. There was also a plasticised mat detailing the addresses and frequencies of the AT&T stations WOO, WOM and KMI. Just to complete the picture there were a couple of booklets detailing the AT&T radiotelephone system. So, as you can see, Michael was very pleased with the response from WOO.

I obviously can't guarantee a response as good as this, but I can give you a few tips that will help ensure your QSL is welcome. The first point to understand is the purpose of a QSL. For the service provider, a QSL gives vital information on the coverage of his transmitters. By correlating reports from a number of sources an accurate coverage map can be compiled. One of the key points about any QSL is that it must include some form of evidence that the station in question has actually been received.

For the utility enthusiast this is best achieved with a printout of the decoded signal. Not only does this prove reception, but it gives a good indication of the quality of reception at your location. It's also a good idea to include



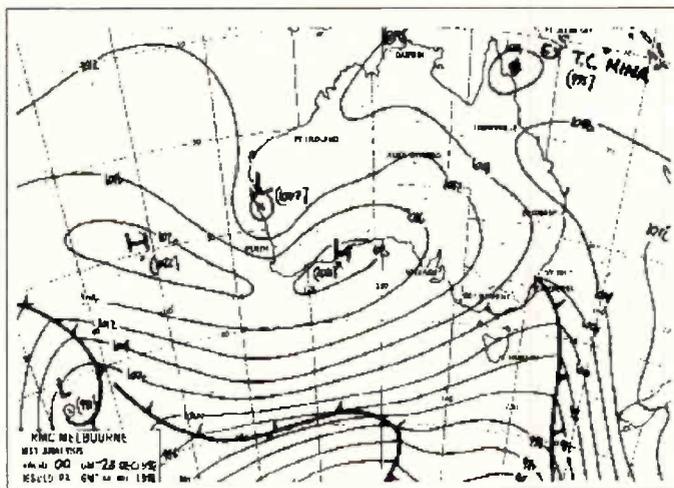
The new PK-900 data controller.

comprehensive details of your receiving equipment and antennas. If you logged the station over a period of time or perhaps at different times of day, then include that as well. In short, the more information you give the more useful your report becomes. You must always remember that the receiving station has no obligation to reply, so don't expect a reply for every QSL and be prepared for a long wait for those that do reply. If you provide a comprehensive report you will find that most stations will respond with an interesting reply. If you know of any stations that provide particularly good QSLs let me know so I can pass the message on.

EX-USSR FAX

A recent letter from **Jan Nieuwenhuis** of The Netherlands gives details of FAX stations that are in operation following the break-up of the USSR. As the political boundaries have, at least temporarily, stabilised I thought it might be useful to reproduce Jan's list here. One point to remember with these stations is they tend to use a variety of drum speeds instead of sticking with 60 r.p.m. Common variants are 90 and 120 r.p.m. with IOCs of 576 or 288. As you can see, the list is in alphabetical order with callsigns added where available.

- Alma Ata Meteo 1, 7.91MHz (RCV79)
- Alma Ata Meteo 2, 9.9275MHz (RXA76)
- Alma Ata Meteo 3, 13.707MHz (RXA77)
- Amderma Meteo 4, 27MHz 6.38MHz & 8.463MHz
- Arkhangelsk Meteo 1, 3.657 (RVZ74), 5.347MHz (RSW71)
- Arkhangelsk Meteo 2, 7.762MHz (RGH77)
- Irkutsk Meteo, 5.28MHz (RKR76), 7.702MHz (RTP72), 10.207MHz (RTP78)
- Khabarovsk Meteo 1, 4.5167MHz (RXB72), 7.475MHz (RXB75), 9.23MHz (RXO70), 14.737MHz (RXO72), 19.275MHz (RXO74)
- Khabarovsk Meteo 2, 3.25MHz (RXB70), 4.58MHz (RYP27), 5.11MHz (RYP29), 7.53MHz (RQM76), 10.22MHz (RDW76), 14.61MHz (RCR79)
- Kiev Meteo 1, 3.36MHz (RPN71), 6.95MHz (RJK78)
- Kiev Meteo 2, 4.525MHz (RPN75)
- Kiev Radio, 12.8287MHz (UJQ)
- Krasnoyarsk Meteo, 2.845MHz (RTO70)
- Magadan Meteo, 5.755MHz (RZX5), 9.355MHz (RNR4), 12.17MHz (RNR4), 13.405MHz (RNR4)
- Minsk Meteo, 3.235MHz (RSR71), 3.81MHz (RST75), 7.575MHz (RSR79), 7.64MHz (RST76)
- Moscow Meteo, 2.815MHz (RVO76), 3.875MHz (RCI72), 5.355MHz (RND77), 7.75MHz (RAW78), 10.71MHz (RKA73), 10.98MHz (RDD79), 15.95MHz (RBI77), 18.71MHz (RIZ59)



Melbourne Met chart.

- Moscow Meteo 2, 53.6kHz (RTO), 5.15MHz (RVO73), 6.88MHz (RAN77), 7.67MHz (RCC76), 10.23MHz (RKA78), 11.525MHz (RWZ77), 13.47MHz (RKU71), 144.5kHz (RCG)
- Moscow Meteo 3, 4.205MHz (RAT21), 12.165MHz (RKB78)
- Moscow Meteo 4, 4.55MHz (RWW79)
- Moscow Meteo 5, 5.325MHz (RND79)
- Murmansk Meteo 1, 10.13MHz (RBW48)
- Murmansk Meteo 2, 6.446MHz
- Murmansk Meteo 3, 10.52MHz
- Novosibirsk Meteo 1, 5.765MHz (RYO79), 9.22MHz (RTB26), 12.320MHz (RYO76)
- Novosibirsk Meteo 2, 3.635MHz (RCK77), 4.475MHz, 5.335MHz (ROF77), 9.06MHz (RCU73), 12.23MHz (RCU79)
- Rostov-na-Donu Meteo, 3.61MHz (ROO70), 7.63MHz (RNR78), 9.1MHz
- Samara (Kuybishev) Meteo 1, 3.71MHz (RGJ61), 4.53MHz (RGJ62)
- Samara Meteo 2, 2.72MHz (RDE73), 5.102MHz (RDE72)
- Samara Meteo 3, 5.42MHz
- St Petersburg Radio, 7.48MHz, 13.78MHz
- Tashkent Meteo 1, 3.69MHz (RBV70), 4.365MHz (RPJ78), 5.89MHz (RBV78), 7.57MHz (RBX72), 9.34MHz (RCH72), 14.9825MHz (RBV76)
- Tashkent Meteo 2, 3.28MHz (RBX70), 5.285MHz (RBX71), 8.083MHz (RIJ75), 9.15MHz (RCH73), 13.947MHz (ROM5)
- Tbilisi Meteo 3, 7.45MHz (RIS70), 7.495MHz (RDK23)
- Yakutsk Meteo, 10.665MHz (RCQ73), 13.45MHz (RCO75)
- Yuzhno-Sakhalinsk Meteo, 4.63MHz (RIQ23)

Computer Compatibility

Roger Nice of Felixstowe writes with what is becoming a common problem. Roger is just starting out in utility listening and wants to put together a system based on a personal computer (PC). The problem he has come across

is just what computer to buy. Anyone who looks through the multitude of computer magazines will know that there are a vast range of computers available, all of which claim to be IBM compatible. So how do you know which is the best machine?

I must admit I find this a difficult question to answer as the market seems to be constantly changing. One point that's particularly important for the utility operator is the hardware compatibility of the computer. This is because many decoding packages work directly with the computer hardware instead of using standard software routines.

The best I can advise is to keep to the more well-known computer manufacturers. If you have a particular decoding package in mind it may well be worth having a word with the suppliers. Many keep a record of the computers systems that successfully run their software packages. If you have any tips to help with the compatibility problem I'd be very pleased to hear from you.

VHF Utilities

A recent letter from **Michael McRoberts** asks if there are any utilities in the v.h.f./u.h.f. bands. Michael has a Realistic PRO-2006 that he would like to use with his Dragon 64 computer for utilities. If you're interested in amateur communications you will occasionally find some RTTY activity in the 145 and 432MHz bands. Far more common on the higher frequencies is amateur packet radio. As far as other utilities are concerned they're a bit thin on the ground.

There are the weather satellites at around 137MHz and 1690MHz. For more information take a look at 'Info in Orbit' column by Lawrence Harris. Most of the remaining utilities comprise point-to-point data links. These links often use fairly simple data protocols such as simple ASCII or a Packet variant. Unfortunately, the information carried

by these links is usually basic computer data and so is not easily interpreted. However, if you know different, please write and I will pass the information on via the column.

Frequency List

Now for this month's list compiled from listeners reports. Thanks are due to the following readers for writing with logs: **C. Healey, Les Griffiths, Robert Hall** and **Day Watson**. The format is the usual: frequency, mode, speed, shift, callsign time and notes. If you would like a copy of the Day Watson Beginners list or my Decode list just send three first class stamps to the address at the head of the column. It would also be a great help if you could mark your envelope BEGINNERS or DECODE and enclose a return address label.

- 117.4kHz, FAX, 120, 576, DCF37, 1030
- Offenbach Meteo
- 2.6185MHz, FAX, 120, 576, GFE25, 1015, Bracknell Meteo
- 4.7855MHz, FAX, 120, 576, DHJ51, 1400, Gregel Meteo
- 5.24MHz, RTTY, 50, 400, 40C2, 2124, TANJUG Belgrad
- 5.3977MHz, ARQ-342, 200, 350, -, 24hr, RFFP Paris
- 5.887MHz, RTTY, 50, 400, IRF50, 1527, ANSA Rome
- 6.872MHz, RTTY, 50, 400, YOG59, 1759, Rompres - Bucharest
- 7.4517MHz, ARQ-342, 200, 350, -, 24hr, RFFP Paris
- 7.88MHz, FAX, 120, 576, DDK3, 1856, Hamburg Met
- 9.0505MHz, FAX, 120, 576, NSY, 2356, USN Catania
- 9.133MHz, RTTY, 50, 400, ZAA6, 0910, Tirana pressreports
- 10.4MHz, ARTRAC, 125, 170, -, 0669, MFA Budapest
- 10.9607MHz, ARQ-342, 200, 350, -, 24hr, RFFP Paris
- 11.03MHz, FAX, 120, 576, AXM34, 1604, Melbourne Met
- 11.4167MHz, ARQ-342, 200, 350, -, 24hr, RFFP Paris
- 11.43MHz, RTTY, 50, 400, HMF49, 1842, Pyongyang
- 11.453MHz, RTTY, 50, -, IMB3, 1006, Rome Meteo geoalert
- 12.186MHz, RTTY, 50, 400, -, 1755, JANA Tripoli
- 14.642MHz, SITOR, 100, 170, -, 1058, UN
- 14.785MHz, RTTY, 50, 400, ATP65, 1517, Delhi/ATP
- 14.9315MHz, RTTY, 50, 850, -, 0743, APS El Djazair
- 16.1652MHz, ARQ-342, 200, 350, -, 24hr, RFFP Paris
- 18.225MHz, RTTY, 50, 400, CNM76X9, 1613, MAP Rabat press
- 19.0966MHz, RTTY, 50, 415, -, 1150, MFA Jakarta
- 19.7476MHz, RTTY, 50, 717, 6VU79, 1158, Dakar Meteo
- 20.0224MHz, FEC A, 96, 400, DGU20H3, 1352, PIAB Bonn

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Medium Wave Chart

Freq kHz	Station	Country	Power kW	Listener
520	Hof-Saale	Germany	0.2	R*
531	Ain Beida	Algeria	600	M*
531	Torshavn	Faroe Is.	5	G*, J*
531	Leipzig	Germany	100	F*, K*, R, 1*
531	Oviedo	Spain	10	R*, W*
540	Wavre	Belgium	150/50	H*, J, K*, R*, 1*
540	Solt	Hungary	2000	G*, R*
540	Vitoria	Spain	5	J*
549	Les Trembles	Algeria	600	J, R*
549	Bayreuth (DLF)	Germany	200	F*, J, R*
549	Minsk	CIS	1000	R*
558	Rostock	Germany	20	R*
558	Valencia	Spain	10	J*, R*
567	Berlin	Germany	100	R*
567	Tullamore (RTE1)	Ireland (S)	500	G*, H*, J, K, L, N, W, Y, Z, 1*, 2*
567	Marbella (RNE5)	Spain	10	D*
576	Stuttgart	Germany	500	F*, G*, J, K, R*
576	Barcelona (RNE5)	Spain	20	J, R*
585	Orl Wien	Austria	600	J, K
585	Paris (FIP)	France	8	K, R*
585	Madrid (RNE1)	Spain	200	G*, H*, J, K, R*, 1*
594	Frankfurt	Germany	1000/400	K*, R*, 1*
594	Oujda-1	Morocco	100	J
594	Muge	Portugal	100	J, R*
594	Zagreb	Yugoslavia	20	W*
603	Nicosia	Cyprus	20	P*
603	Lyon	France	300	J
603	Newcastle	Spain	20	J*
603	Newcastle (BBC4)	UK	2	J, Q, R*
612	Athlone (RTE2)	Ireland (S)	100	G*, H*, J, K, L, W, Z, 1*
621	Wavre	Belgium	80	J, K*, N, R*, W*, Z, 1*
621	Barcelona	Spain	10	R*, S*
630	Dannenberg	Germany	100	J*
630	Vigra	Norway	100	G*, R*
630	Tunis-Djedida	Tunisia	800	J*, M*, R*
639	Praha (Libice)	Czech	1500	K*, R*, Z*
639	Almeria (RNE1)	Spain	20	G*
639	La Coruna	Spain	100	D*, J*, K, R*, W*, 1*
648	Palma de Mallorca	Spain	10	R*, S*
648	Orfordness (BBC)	UK	500	H*, J, K, L, M*, R*
657	Burg	Germany	250	K*, R*
657	Madrid (RCE2)	Spain	20	J*, R*, R*
657	Wrexham (BBC)	UK	2	G*, J, R*
666	Bodenseesender	Germany	300/180	J*, K, M, R*
675	Marseille	France	600	O, R*
675	Logic (HitV3)	Holland	120	F*, J, K, N, R*
675	Bodo	Norway	10	G*
684	Sevilla (RNE1)	Spain	250	J*, R*
684	Beograd	Yugoslavia	2000	R*
693	Berlin	Germany	250	G*, R*
693	Burghead (BBC5)	UK	50	G*
693	Droitwich (BBC5)	UK	150	H*, J*, K, Z
702	Aachen/Flensburg	Germany	5	R*
702	Monte Carlo	Monaco	300	R*
702	Zamora	Spain	300	J*
711	Rennes 1	France	300	R*
711	Heidelberg	Germany	5	R*
711	Laayoune	Morocco	600	G*
720	Langenberg	Germany	200	J
720	Lisnagarvey (BBC4)	Ireland (N)	10	G*, Z
720	Norte	Portugal	100	R*
720	Lots Rd London	UK	0.5	H*, J*, K
729	Cork (RTE1)	Ireland (S)	10	J*, R*
729	Oviedo	Spain	50	G*, J, K*, R*, Z, 1*
738	Paris	France	4	R*
738	Barcelona (RNE1)	Spain	250	G*, J, R*, W*, 1*
747	Flevo (HitV2)	Holland	400	F, G*, H*, J*, K, R*, 1*
756	Brunswick	Germany	800/200	G*, H*, J*, K, M, R*, 1*
765	Sottens	Switzerland	500	H*, J*, R*, W*
774	Enniskillen (BBC4)	Ireland (N)	1	R
774	San Sebastian	Spain	60	K*, R*, W*
783	Burg	Germany	1000	J*, R*, Z, 1*
783	Miramar (R Porto)	Portugal	100	J*
783	Tartus	Syria	600	S*
792	Limoges	France	300	J*, R*
792	Sevilla	Spain	20	J*, R*
801	Munich-Ismaning	Germany	300	R*, 1*
801	St Petersburg	Russia	1,000	S
801	Burgos	Spain	10	M
810	Madrid (SER)	Spain	20	R*
810	Burghead (BBC)	UK	100	G*
810	Westergien (BBC)	UK	100	H*, J, K, L, R, 1*, 2
819	Toulouse	France	50	J*, R*
828	Hanover	Germany	100/5	J
837	Nancy	France	200	J, K, Z*
837	Sevilla (R.Popular)	Spain	10	J, K, R*
846	Rome	Italy	540	G*, Z*, 1*
855	Berlin	Germany	100	R*
855	Murcia	Spain	125	D*, G*, J, R*
864	Santah	Egypt	500	S*
864	Paris	France	300	J*, K, R*, 1*
873	Frankfurt (AFN)	Germany	150	F*, G*, H*, J, K, L, M, R*, W*
873	Zaragoza	Spain	20	M*, W*
873	Enniskillen	UK	1	R, Y
882	Malaga (COPE)	Spain	5	D, Y
882	Washford (BBC)	UK	100	G*, H*, J, K, M, R, 1*
891	Algiers	Algeria	600/300	H*, J, M*, R*, Z, 1*
891	Huisberg	Netherlands	20	R*
891	Uzghorod	Ukraine	150	S*
900	Pilsen	Czech	40	J*, R*
900	Milian	Italy	600	J*
900	Bilbao (COPE)	Spain	10	J, W*
900	Qurayyat	Saudi Arabia	1000	S*
909	Brookmans Pk	UK	140	H*, U, Y*, Z*
909	Clevedon (BBC5)	UK	50	J*
909	Westergien (BBC)	UK	50	G*
918	Madrid (R. Intercont)	Spain	20	J*, R*
927	Wolvertem	Belgium	300	G*, J*, K, R, U, 1*
927	Izmir	Turkey	200	B*
936	Bremen	Germany	100	J*, K, R*, W

Freq kHz	Station	Country	Power kW	Listener
936	Lerida (SER)	Spain	2	J*
945	Toulouse	France	300	K*, R*
954	Madrid (RCE)	Spain	20	K, R*
963	Sofia	Bulgaria	150	R*
963	Pori	Finland	600	G, J*, K, R*, W*, Y*, 1*, 2*
963	Paris	France	8	K*
972	Hamburg	Germany	300	J*, K, R*, W*, 1*
972	Cordoba (RNE1)	Spain	5	G*
972	Nikolayev	Ukraine	500	F*
981	Alger	Algeria	600/300	J*, K, M*, R*, 1*
981	Megara	Greece	200	B*
990	Berlin	Germany	300	K*, M, R*, S*
990	Potenza	Italy	10	S*
990	R. Bilbao (SER)	Spain	10	1*
990	Redmoss (BBC)	UK	1	G*, Z
999	Madrid (R.Popular)	Spain	20	J*, K, R*, 1*
1008	Flevo (HitV-5)	Holland	400	E*, G*, J*, K, M, R*, U*, 1*, 2*
1008	Malaga	Spain	7	I*, R*
1017	Rheinsender	Germany	600	E*, G*, J*, K, M, R*, U*, 1*
1017	Burgos (RNE5)	Spain	5	E*, R*
1026	Graz-Obi	Austria	100	E*, R*
1026	Alicante (SER)	Spain	3	I*
1026	Reus (SER)	Spain	10	J*
1035	Lisbon (Prog3)	Portugal	120	E*, J*, R*
1035	Tallinn	Estonia	500	I, J*, K*
1044	Dresden	Germany	250	E*, J, M, R*
1044	Sebaa-Aiou	Morocco	300	G*, J*, K*, S*
1044	San Sebastian	Spain	10	I*, S*
1053	Zaragoza (COPE)	Spain	10	R*
1053	Burghead (BBC1)	UK	20	G
1053	Droitwich (BBC1)	UK	150	G, H*, J*, J*, U, 1*
1062	Kalundborg	Denmark	250	E*, G*, J*, K, M*, R*, 1*
1062	Norte	Portugal	100	E*
1071	Brest	France	20	E*, J*, L, M, R*
1080	Katowice	Poland	1500	E*, G*, M*, R*
1080	Granada (SER)	Spain	5	I*, M
1089	Brookmans Pk	UK	150	H, U
1089	Moorside Edge	UK	150	I*
1089	Westergien (BBC1)	UK	50	G
1098	Nitra (Jarok)	Czech	1500	E*, G*, R*
1098	Almeria (RNE 5)	Spain	10	G*
1098	Lugo (RNE5)	Spain	10	E*, M, R*
1107	Munich (AFN)	Germany	40	E*, L*, M*
1107	Barcelona (RNE5)	Spain	20	D*, E*, G*, J, K, M*, R*
1116	Barci	Italy	150	E*, R*
1116	Pontevedra (SER)	Spain	20	J, K, R*
1125	La Louviere	Belgium	2	E*, G*, R*
1125	Tovarnik	Croatia	300/100	S*
1125	Vitoria (RNE5)	Spain	10	E*, G*, K, S*
1125	Llandrindod Wells	UK	1	J*
1134	Zadar	Yugoslavia	1200	E*, G*, K, R*, 1*
1143	Stuttgart (AFN)	Germany	10	E*, M*, R*, U*
1143	Messina	Italy	6	M*, R*
1143	Kaliningrad	Russia	150	Z*
1143	Reus (COPE)	Spain	2	J*
1152	Lerida (RNE5)	Spain	10	E*, R*
1161	Strasbourg (Fr. Int)	France	200	E*, J, K*, R*
1170	Krasnodar	CIS	500	R*
1179	Santiago	Spain	10	R*
1179	Solvesborg	Sweden	600	E*, G*, J, K, L, R*, U*, Y*
1188	Kuume	Belgium	5	E*, J*, R*
1197	Munich (VDA)	Germany	300	E*, J*, K, O, R*, U*
1197	Vitoria	Spain	5	J
1197	Minsk	CIS	50	S*
1206	Bordeaux	France	100	E*, J, K, R*, Z*
1206	Wroclaw	Poland	200	E*, G*, J*, K, R*, 1*
1215	Lushnje	Albania	500	S*
1215	Kaliningrad	Russia	500	E*, G*, K*, R*
1215	COPE	Spain	2	J, K, R*, S*
1224	Vidin	Bulgaria	500	E*, K, R*, U*
1224	Madrid (COPE)	Spain	20	J
1233	Liege	Belgium	5	J, R*
1233	Nitra	Czech	400	R*
1233	Tanger	Morocco	200	D
1242	Marseille	France	150	E*, G*, R*
1251	Marcal	Hungary	500	E*
1251	Huisberg	Netherlands	10	E*, G*, J, R*
1260	Valencia	Spain	20	D*, E*, G*, J, K, R*, 1*
1269	Neuminstur	Germany	600	E*, G*, H*, J*, K, R*, Z*, 1*
1278	Strasbourg	France	300	E*, K, R*
1278	Dublin/Cork (RTE2)	Ireland (S)	10	E*, G, H*, J, K, U, W*, 1*
1287	Litomysl (RFE)	Czech	300/200	R*
1287	Melnik (RFE)	Czech	400	G*
1296	Valencia (COPE)	Spain	5	S*
1296	San Sebastian	Spain	5	E*, K, R*
1296	Orfordness (BBC)	UK	500	J*, K, R*
1305	Rzeszow	Poland	100	R*
1305	Drense (RNE5)	Spain	5	E*, J, R*, 1*
1314	Kivitsio	Norway	1200	E*, G*, H*, J*, K, R*, U*, 1*
1323	Zyyi (BBC)	Cyprus	200	A*
1323	Leipzig (R. Moscow)	Germany	150	E*, H, K, R, U, 1*
1323	Wachenbrunn	Germany	1000/150	J*
1332	Brno (Domamist)	Czech	50/25	A*
1332	Rome	Italy	300	E*, G*, J, K, R*
1341	Lakihegy	Hungary	300	E*
1341	Lisnagarvey	Ireland (N)	100	E*, J*, G, H*, J, K, M, T, U, 1*
1341	Tarrasa (SER)	Spain	2	J
1350	Nancy/Nice	France	100	E*, H*, J*, K, R*, T, U, 1*
1359	Berlin	Germany	250/100	E*, K*, R*, S*, Z*
1359	Melilla	Morocco	5	S*
1368	Foxdale (Manx R)	IOI	20	E*, G*, J, K*, L, Q*
1377	Lille	France	300	E*, F, J, K, R*, T, U, 1*
1386	Kaliningrad	Russia	500	E*, J, K, R*, T, U, 1*
1395	Lushnje (R. Tirana)	Albania	1000	E*, G*, K*, R*, S*, 1*
1395	Ufa	CIS	7	S*
1404	Brest	France	20	E*, G*, J, K, R*, T, 1*
1413	Masirah Is (BBC)	Oman	150	A
1413	Zaragoza (RCE)	Spain	20	E*, J, R*, T*
1413	Prisina	Yugoslavia	1000	E*
1422	Heusweiler	Germany	1200/600	E*, F, G*, J*, K, R*, T, U*, 1*
1431	Dresden	Germany	250	R*

Freq kHz	Station	Country	Power kW	Listener
1440	Marnach (RTL)	Luxembourg	1200	E*, F, G*, J*, K, O, R*, T*, U*
1440	Damman	Saudi Arabia	1600	V*, W*, X*, Z*
1449	Berlin	Germany	5	E*, J, R*
1449	Redmoss (BBC4)	UK	2	C
1458	Lushnje (R. Tirana)	Albania	500	G*, S*
1458	Brookmans Pk	UK	50	S*
1467	Monte Carlo	Monaco	1000/400	E*, G*, J, M*, R*, T*, U*, W*, Z*
1476	Wien-Bisamberg	Austria	600	E*, J, S*, T*, U*, W*
1476	Bilbao	Spain	20	E*, J, S*, T*, W*
1485	Augsburg (AFN)	Germany	1	J, S*
1485	Santander (SER)	Spain	2	Z
1485	Boumemouth	UK	2	J
1485	Carlisle (BBC4)	UK	1	S*
1494	Clermont-Ferrand	France	20	E*, G*, J, K, R*, T*
1494	St Petersburg	Russia	1000	R*
1503	Stargard	Poland	300	E*, G*, K*, M*, R*, T*, Y*
1512	Wolvertem	Belgium	600	E*, G*, J, K, M*, R*, T*, U, Y*
1512	Jeddah	Saudi Arabia	1000	B*, S*
1521	Kosice (Cizacte)	Czech	600	E*, K*, R*, W*
1521	Duba	Saudi Arabia	2000	S*
1521	Oviedo	Spain	5	E*, J, T*
1530	Vatican R	Italy	150/450	E*, F*, K, M*, R, U*
1539	Mainflingen	Germany	700	E*, H, J, K*, R*, T*, U*, W*, Z*
1539	Valladolid	Spain	5	J, T*
1557	Nice	France	300	E*, G*, J, R*, Z*
1566	Sarmen	Switzerland	300	E*, J, K*, R*, T*
1566	Sfax	Tunisia	1200	E*
1575	Burg	Germany	250	E*, J, K*, R*, T*, W*
1575	Genova	Italy	50	E*
1575	Cordoba	Spain	5	J, T*
1584	Drense SER	Spain	5	J, K, T*
1593	Langenberg	Germany	400/800	E*, F*, H, J, K, R*, T*, U*, W*
1602	Zielona Gora	Poland	2	G*
1602	Vitoria	Spain	10	E*, J, K, T*, Z*
1611	Vaticana R	Italy	5	B*

- Listeners:**
 (A) Jana Arunachalam, Thumrait, Oman.
 (B) Ted Bady, N London
 (C) Leo Barr, Sunderland.
 (D) Charles Beantland, Gibraltar.
 (E) Darren Beasley, Bridgwater.
 (F) Vera Brindley, Woodhall Spa.
 (G) Geoff Crowley, Iceland.
 (H) John Eaton, Woking.
 (I) Chris Haigh, Huddersfield.
 (J) Gerry Haynes, while in Talgarth, Powys.
 (K) Gerry Haynes, Bushy Heath.
 (L) Simon Hockenhill, E.Bristol.
 (M) Sheila Hughes, Morden.
 (N) Rhoderick Illman, Oxted.
 (O) Mark Jones, Peterborough.
 (P) Zacharias Liangas, Thessaloniki.
 (Q) Ross Lockley, Stirling.
 (R) Eddie McKeown, Newry.
 (S) Roy Merrill, Dunstable.
 (T) George Millmore, Wootton 1.0.W.
 (U) Sid Morris, Rowley Regis.
 (V) Roy Patrick, Derby.<

In his search for a good location, **Sid Morris** (Rowley Regis) spent the early hours of January 3 on the top of the Mendip Hills, 330m a.s.l. Using a Nevada MS-1000 connected to the car radio antenna he logged CKOC Hamilton 1150 at 0100; CJYQ at 0210; CJC Sydney 1270 at 0215; CKPC Brantford 1380 at 0230; also CBY Corner Brook 990 at 0240.

The absence of electrical interference at a location in Wales enabled **Steve Ferminger** (Oxford) to receive his first ever transatlantic signal, it was CJYQ at 2330. Encouraged by this he continued to listen, but it was not until 0110 that WINS became audible on 1010. Before switching off he heard CKCM Grand Falls on 620 at 0125.

A weak signal from CJYQ was heard at 2325 by **Darren Beasley** in Bridgwater. By 2340 it was peaking 2322, so he searched the band! During the next half hour he logged VOXM as 22212, VOAR as 23332 and CBG Gander on 1400 as 21211. In Worthing, **Ron Damp** logged CJYQ as 22222 at 0040, but he was unable to detect any other transatlantic signals.

Favourable conditions were observed on January 27 by **Ted Barty** in N.London. He logged CJYQ as 11231 at 0153; WNEW, NY 1130 as 21331 at 0203; VOXM as 12331 at 0211; WTOP Washington 1500 as 31132 at 0229; also WOGL as 21232 at 0247.

Sky wave signals from some m.w. stations in the Middle East and N.Africa have also reached the UK, see chart. There was a good deal of Local Radio OX about too! In E.Grinstead, **John Wells** found reception from the north to be exceptionally good. He logged ILR Moray Firth R via Greenside 1107 at 1345! On January 8 **Ross Lockley** (Stirling) picked up BBC R.Guernsey on 1116 for about five minutes before co-channel BBC R.Derby faded up again! He uses the broadcasts from Isle Of Wight R on 1242 as a pointer to propagation conditions.

If you enjoy listening to records from the 50s, 60s & 70s, then try RTL's German Service on 1440 - it proclaims itself to be Germany's No.1. 'Oldies' station. Good reception of their ground wave has been noted during daylight by **Harry Richards** in Barton-on-Humber. After dark, very little fading has been observed on their sky wave by **Roy Patrick** in Derby. Switch off is at 2205UTC.

Short Wave Reports

Considerable h.f. propagation variations were evident during January. Reception from some areas was often poor or non-existent. A notable evening feature was the very early closure of the 13, 16 & 19m bands. In contrast, favourable conditions for Tropical band DXing often existed at night.

At times 25MHz (11m) band conditions were so unfavourable that the broadcasts were either inaudible or buried in the noise, but more often good reception was noted. A marked improvement in the reception of R.Australia via Darwin on 25.750 (Eng 0800-0855) has been noted in the UK since they changed their beam heading to cover N.Africa. During a test on January 17, **Gerry Haynes** logged their signal in Bushey Heath as 35334 at 0808, 45333 at 0823 and 55444 at 0848.

Also active in this band are UAE Radio in Abu Dhabi on 25.690 (Ar to ? 0900-1300) 25443 at 0915 by **Eric Shaw** in Chester; R.Norway Int, Oslo 25.730 (Norw to Asia, Aust 0800-0830 & 0900-0930, Norw* to W.Africa 1300-1330. *Eng Sat/Sun) 44333 at 1325 in Hafnarfjordur, Iceland; R.Denmark via RNI 25.730 (Da to W.Africa 1330-1355) 45544 at 1330 in Stirling; DW via Julich 25.740 (Ger to M. East, E.Asia 1100-1355) SIO253 at 1100 by **Kenneth Buck** in Edinburgh; RFI via Issoudun 25.820 (Fr to E.Africa 0700-1550) SIO333 at 1524 by **Ted Walden-Vincent** in Gt.Yarmouth; R.Nederlands via Flevo 25.970 (Du to W.Africa 1030-1115, Sun only) 45344 at 1030 by **Eddie McKeown** in Newry.

Some of R.Australia's 21MHz (13m) signals have been heard in the UK in the morning. Early risers tuned to 21.525 from Darwin (Eng to SE.Asia 0100-0800) 32332 at 0740 by **Robert Connolly** in Kilkeel, or to 21.590 from Carnarvon (Eng to Pacific areas 0100-0900), which **Chris Shorten** noted as 55545 at 0815 in Norwich! Later, 21.725 from Darwin (Eng to SE.Asia 0800-1300) has often been clearly heard. A typical rating of 35444 at 1040 was noted in Brenchley by **Darran Taplin**. Whilst visiting Litohoro, Greece **Zacharias Liangas** (Thessaloniki) logged it as 44333 at 1100. Up in Hafnarfjordur it was 42223 at 1225.

Also heard in the morning were R.Japan via Moyabi 21.575 (Eng, Jap to Eu 0700-0900) 35433 at 0740 by **Chris Haigh** in Huddersfield; BBC via Limassol 21.470 (Eng to M. East, E.Africa 0430-1615) SIO344 at 1015 in Edinburgh and SIO444 at 1100 by **Jana Arunachalam** in Thumrait, Oman; R.Denmark via R.Norway

Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener	Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R.	I	7.50	F,I*,K,N,O,U	1161	R.Tay	I	1.40	A*,C*,L*,M*
585	R.Solway	B	2.00	M	1161	Viking R(Gt.Yks)	I	0.35	B
603	Invicta Snd(Coast)	I	0.10	F,J,J,K,N,R,S*,U	1170	GNR Teeside	I	0.32	L*
630	R.Bedfordshire	B	0.20	D,E,F,H,I,J,N,O,S*,U	1170	Ocean Sd.(SCR)	I	0.12	N,U
630	R.Cornwall	B	2.00	N	1170	R.Orwell (ISGR)	I	0.28	F,K,U
657	R.Clywd	B	2.00	F*,M,N,O,R,U	1170	Signal R.	I	0.20	L*,O
657	R.Cornwall	B	0.50	N	1170	Swansea Sound	I	0.58	E,L*,M
666	DevonAir R.	I	0.34	E,F,I,N,U	1242	Invicta Snd(Coast)	I	0.32	F,I,M*,S*,U
666	R.York	B	0.80	F,J	1242	Isle of Wight R.	I	0.50	D,E,F,H,L*,N,Q,U
729	BBC Essex	B	0.20	D,I,K,N,U	1251	Saxon R. (ISGR-FM)	I	0.76	A*,E,M*
738	Hereford/Worcester	B	0.037	D,E,H,N,O	1260	GWR (Brunel R.)	I	1.60	E,I,M,N,U
756	R.Cumbria	B	1.00	E,F*,M,R	1260	Sunrise R.	I	0.29	F,I,K,L*,O,P,U
765	BBC Essex	B	0.50	D,E,F,I,N,Q,U	1260	Marcher Sound	I	0.64	F
774	R.Kent	B	0.70	F,K,N,Q,S*,U	1278	Pennine R(Gt.Yks)	I	0.43	F
774	R.LeeDS	B	0.50	R	1305	R.Hallam (Gt.Yks)	I	0.15	B,F
774	Severn Sound (3CR)	I	0.14	E,D	1305	Red Dragon (Touch)	I	0.20	E,N,U
792	Chiltem R.	I	0.27	D,E,F,K,M*,P,U	1323	R.Bristol (Som.Snd)	B	0.63	E,F*,M
801	R.Devon	B	2.00	E,F,H,I,J,N,U	1323	S'them Sound(SCR)	I	0.50	F,N,U
828	Chiltem Radio	I	0.20	D*,E,F,G,K,Q,S*,U	1332	Hereward R.(WGMS)	I	0.60	A*,B,F,K,O,U
928	R.Airel(Magic 828)	I	0.12	A,B	1332	Wiltshire Sound	B	0.30	E,F,M*,N,U
928	2CR	I	0.27	G,N,U	1359	Essex R.(Breeze)	I	0.28	F,Q,S*,U
937	R.Furness	B	1.00	M	1359	Mercia Snd(Xtra-AM)	I	0.27	E,O,U
937	R.Leicester	B	0.45	B,D,E,F*,I,J,K,N,Q,U	1359	Red Dragon (Touch)	I	0.20	E,M
955	R.Devon	B	1.00	F,N,U	1359	R.Solent	B	0.85	N
955	R.Lancashire	B	1.50	L*,M	1388	R.Lincolnshire	B	2.00	A,U
955	R.Norfolk	B	1.50	A,B,C*,F,K,U	1388	R.Sussex	B	0.50	D,F,I,N,U
955	Sunshine R.	I	0.15	E,F,H,I,O,U	1388	Wiltshire Sound	B	0.10	E,F,M*,N
973	R.Norfolk	B	0.30	D,E,F,I,K,N,R,U	1413	Sunrise R.	I	0.125	D,F,I,N,U
936	GWR (Brunel R.)	I	0.18	D,E,F,I,M,N,O,R,U	1431	Essex R.(Breeze)	I	0.35	A*,F,L*,N,S*,U
945	R.Trent (GEM-AM)	I	0.70	F,E,K,N,Q	1431	R.210(Gt. Gold)	I	0.14	D,E,F,I,N,U
954	DevonAir R.	I	0.32	I,N,U	1449	R.Peterboro/Cambus	B	0.15	B,E,F,I,K,N,U
954	R.Wyvern	I	0.16	F,G,L*,M*,O,U	1458	GLR	B	50.00	C*,D,E,F,I*,L,N,U
990	WABC (Nice & Easy)	I	0.09	E,F,O,U	1458	R.Cumbria	B	0.50	L,M
990	R.Aberdeen	B	1.00	M	1458	R.Devon	B	2.00	N,U
990	R.Devon	B	1.00	F,I,N,U	1458	R.Newcastle	B	2.00	A,L,M,T
990	Hallam R.(Gt.Yks)	I	0.25	B*,F,K,U	1476	County Sound	I	0.50	A,D,E,F*,M*,N,P,U
999	R.Solent	B	1.00	D,E,F,N,U	1485	R.Humberside	B	1.00	B*,K,M
999	R.Trent (GEM-AM)	I	0.25	B,F,K,R	1485	R.Merseyside	B	1.20	C*,E,L*,M,O,R
999	Red Rose R.	I	0.80	A,M	1485	R.Sussex	B	1.00	D,F,I,N,U
1017	WABC Shrewsbury	I	0.70	E,F*,O,U	1503	R.Stoke-on-Trent	B	1.00	E,F,I,M*,O,P
1026	Downtown R.	I	1.70	E,L,R	1521	County Sound	I	0.64	D,E,F,I*,M,N,R,U
1026	R.Cambridgeshire	B	0.50	E,F*,I,K,P,S*,U	1530	Pennine R(Gt.Yks)	I	0.74	B,E,F,I*,M,N,R,U
1026	R.Jersey	B	1.00	I,N,U	1530	R.Essex	B	0.15	F*,I,N,U
1035	Northsound R.	I	0.78	F,L*	1530	R.Wyvern	I	0.52	E,M,N,Q,R
1035	R.Kent	B	0.50	F,N,S*,U	1548	Capital R. (Gold)	I	97.50	D,E,F,I*,K*,N,P,U
1035	West Sound	I	0.32	E,L*,M	1548	R.Bristol	B	5.00	E,M,N
1107	Moray Firth R.	I	1.50	C,E,L,M,R,U	1548	R.Forth (Max AM)	I	2.20	L*,M
1107	R.Northampton	B	0.50	F,N	1548	R.Hallam (Gt.Yks)	I	0.74	B
1116	R.Derby	B	1.20	A*,B,E,F*,K,L,M,O,U	1557	Chiltem R.(Gold)	I	0.76	A*,D,E,M*,Q,P
1116	R.Guernsey	B	0.50	E,F,L,N,R,U	1557	Ocean Sound (SCR)	I	0.50	M*,N,U
1152	BRMB (Xtra-AM)	I	3.00	E,O	1557	R.Lancashire	B	0.25	M
1152	LBC (L.Talkback R)	I	23.50	D,F*,N,Q,U	1557	Tenoring (Mellow)	?	U	
1152	R.Broadland	I	0.83	B,K,M*,U	1584	R.Nottingham	B	1.00	F,K,M*,N,U
1152	R.Clyde (2)	I	3.06	L	1584	R.Shropshire	B	0.50	E,O,U
1161	GWR (Brunel R.)	I	0.16	D,E,F,N,U	1584	R.Tay	I	0.21	L,M,U
1161	R.Bedfordshire	B	0.10	F,U	1602	R.Kent	B	0.25	D,F,I,M*,N,U
1161	R.Sussex	B	1.00	F,I,N,U					

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

Listeners:

- (A) Leo Barr, Sunderland.
- (B) Vera Brindley, Woodhall Spa.
- (C) Geoff Crowley, Hafnarfjordur, Iceland.
- (D) John Eaton, Woking.
- (E) Gerry Haynes, white in Talgarth, Powys.
- (F) Gerry Haynes, Bushey Heath.
- (G) Francis Heame, N.Bristol.
- (H) Simon Hockenhill, E.Bristol.
- (I) Sheila Hughes, Morden.
- (J) Rhoderick Illman, Oxted.
- (K) Mark Jones, Peterborough.
- (L) Ross Lockley, Stirling.
- (M) Eddie McKeown, Newry.
- (N) George Millmore, Wootton, IOW.
- (O) Sid Morris, Rowley Regis.
- (P) Peter Pollard, Rugby.
- (Q) John Sadler, Bishops Cleeve, Shropshire.
- (R) Tom Smyth, Co.Fermanagh.
- (S) Phil Townsend, E.London.
- (T) Edward Turnbull, Gosforth.
- (U) John Wells, East Grinstead.

Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000 T	
153	Donebach	Germany	500 A*BGHJ*LM*N,O*P,R*ST*U*	
153	Brasov	Romania	1200 B*,L*	
162	Allouis	France	2000 A*BD,EF,H,I*,J*,L,M,N,O*PR*U*	
171	Kaliningrad	Russia	1000 B*,E*,H*,J*,L,M,O*,R*,T*	
171	Medi 1-Nador	Morocco	2000 F*,K,T,U*	
171	Moscow	Russia	500 U*	
177	Oranienburg	Germany	750 A*,B,H,J*,L,M*,O*,R*,T*	
180	Polati	Turkey	1200 C*	
183	Saarouis	Germany	2000 A,B,F*,G,H*,J*,L,M,N,O*,P,R*,T*	
189	Caltanissetta	Italy	10 K	
189	Tbilisi	CIS	500 K*	
198	BBC Droitwich	UK	500 A,E*,F*,H*,J*,L,M,O*,P,R*,T*	
198	BBC Westerglen	UK	50 B*,F*	
207	Munich	Germany	500 A,B,G,H*,J*,L,N*,O*,R*,T,U*	
207	Azilah	Morocco	800 G*,K*,T	
207	Kiev	Ukraine	500 K*,T*	
216	RMC Roumoules	S.France	1400 A*,B*,E*,H*,J*,L,M,O*,P,R*,T*	
216	Oslo	Norway	200 B,H*,J*,R*,T*	
225	Raszyn Resz TX	Poland	7 B*,E*,H*,J*,L,M*,O*,P,Q,R*,T*	
234	Beidweiller	Luxembourg	2000 A*,B,D,E*,F*,J*,L,M,O*,R*,T*	
234	St.Petersburg	Russia	1000 B*,J*,O*,T,U*	
243	Kalundborg	Denmark	300 A*B*,E*,F*,H*,J*,L,M,O*,P,R*,T*	
252	Tipaza	Algeria	1500 H*,J*,O*,T,U*	
252	Atlantic 252	Ireland	500 A*B,D,E*,F*,G,H*,J*,L,M,O*,P,R*,T*	
261	Burg	Germany	200 B*,F*,G,H*,K,L,O,R*,T*	
261	Moscow	Russia	2000 B*,J*,K,M,O*	
270	Topolna	Czechoslovakia	1500 B*,E*,F,G,H*,J*,K*,L,M,O*,P,R*,T*	
279	Ashkhabad	CIS	150 K*	
279	Minsk	CIS	500 B*,J*,L*,M*,O*,R*,T*	
279	Tashkent	CIS	500 K*	

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

Listeners:-

- (A) Vera Brindley, Woodhall Spa.
- (B) Kenneth Buck, Edinburgh.
- (C) Tim Bucknall, Congleton.
- (D) Geoff Crowley, Hafnarfjordur, Iceland.
- (E) John Eaton, Woking.
- (F) Chris Haigh, Huddersfield.
- (G) Simon Hockenhill, E.Bristol.
- (H) Sheila Hughes, Morden.
- (I) Mark Jones, Peterborough.
- (J) Eddie McKeown, Newry.
- (K) Roy Merril, Dunstable.
- (L) George Millmore, Wootton, I.O.W.
- (M) Sid Morris, Rowley Regis.
- (N) Peter Pollard, Rugby.
- (O) Harry Richards, Barton-on-Humber.
- (P) Tom Smyth, Co.Fermanagh.
- (Q) John Stevens, Largs.
- (R) Phil Townsend, E.London.
- (S) Edward Turnbull, Gosforth.
- (T) John Wells, East Grinstead.
- (U) Michael Williams, Redhill.

Long Medium & Short

Int 21.705 (Da to Africa 1030-1100) 33232 at 1030 by **Rhoderick Illman** in Oxted; R.Pakistan, Islamabad 21.520 (Eng to Eu 1100-1120) SIO222 at 1100 by **Tom Smyth** in Co.Fermanagh; R.Moscow via Kinghisepp? 21.515 (Eng to M. East, E.Africa 0930?-1300) 54544 at 1131 in Bushey Heath.

After mid-day R.Norway Int, Oslo 21.705 (Eng to Asia, Aust Sat/Sun only) was SIO443 at 1215 by **Bill Clark** in Rotherham; UAE R.Dubai 21.605 (Ar, Eng to Eu 0615-1645) 53554 at 1300 in Bridgwater; SRI via Sottens? 21.820 (Eng, Fr to SE.Asia 1300-1400) 42343 at 1335 in Newry; R.Vlaanderen Int via Wavre 21.810 (Eng to Asia 1400-1430) 14431 at 1405 by **Ronald Kilgore** in Co.Londonderry; HCJB, Ecuador 21.455 (world-wide u.s.b. + p.c.) 45334 at 1427 by **John Eaton** in Woking & 21.480 (Eng 1900-2000) 35343 at 1900 by **Tim Allison** in Middlesbrough; R.Kuwait 21.675 (Ar to Eu, USA 1300?-1800) 45444 at 1430 in Chester; BBC via Ascension Is 21.660 (Eng to Africa 0730-1745) 43333 at 1540 in Worthing; R.Portugal Int via S.Gabriel 21.515 (Eng to M. East 1530-1600) 34433 at 1548 by **Peter Polson** in St.Andrews; WCSN, MN 21.640 (Eng to N/E.Africa 1600-1955) 45554 at 1615 by **John Parry** in Northwich; WYFR, FL 21.615 (Eng to Eu 1600-1700) 43444 at 1622 by **Ken Milne** in Basingstoke & 21.525 (Eng to W.Africa 1600-1700) SIO333 at 1630 in Gt.Yarmouth & 21.500 (Eng to Eu, Africa 1700-1900) SIO444 at 1732 by **John Coulter** in Winchester; R.Nederlands via Bonaire 21.590 (Eng to Africa 1730-2025) 44344 at 1933 by **Peter Pollard** in Rugby.

There is plenty to interest the listener in the 17MHz (16m) band. In the morning the Voice of Greece, Athens 17.525 (Gr, Eng to Aust 0800-0850) was SIO444 at 0815 by **Cyril Kellam** in Shefffield; R.Pakistan, Islamabad 17.900 (Eng to Eu 0800-0845) SIO333 at 0815 by **Francis Hearne** in N.Bristol & (Eng to Eu 1100-1120) 45433 at 1118 in Middlesbrough; DW via ? 17.780 (Eng to Asia, Pacific 0900-0950) 43444 at 0903 by **P.Gordon Smith** in Kingston, Moray; Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) 44444 at 0930 in Kilkeel; BBC via Ascension Is 17.790 (Eng to E/C.Africa 0730-1500) 23432 at 1007 in Lithoro; SRI via Schwarzenburg 17.670 (Eng, Fr, Ger, It to Far East 1100-1300) 43433 at 1100 in St.Andrews; Voice of Israel, Jerusalem 17.545 (Eng to USA, W.Europe 1100-1130) 44444 at 1102 in Brenchley.

Later, R.Sofia, Bulgaria 17.825 (Eng to N/W Africa? 1200-1300) 32222 at 1232 in Oxted; R.Cairo, Egypt 17.595 (Eng to S.Asia 1215-1330) 22222 at 1236 in Co.Londonderry; R.Yugoslavia, Belgrade 17.740 (Eng to USA 1230-1300) 55555 at 1245 in Northwich; R.Romania Int, Bucharest 17.850 (Eng to Eu 1300-1355) 52343 at 1312 in Bushey Heath; RFI via Issoudun 17.650 (Eng to M. East, India 1400-1500) SIO444 at 1400 in Thumrait and 24332 at 1430 in Worthing; WCSN, MN 17.510 (Eng to Eu 1400-1555) 33443 at 1405 in Chester; R.Nederlands via Flevo 17.610 (Eng to S.Asia 1330-1625) 53454 at 1411 in

Tropical Bands

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1934	J,K,L,M,P,T,V,X,1
2.325	ABC Tennant Creek	Australia	1934	J,K,L,M,N,P,V,X,1
2.445	Jiangxi 1, Nanchang	China	0200	F
2.465	ABC Katherine	Australia	1926	P,V,X,1
2.850	KCBS Pyongyang	N.Korea	2001	J,V
3.200	TWR	Swaziland	1933	M,1
3.205	AIR Lucknow	India	1710	K,M,P,W,1
3.220	CPBS 1, Beijing	China	2200	V
3.220	KCBS Wonsan	N.Korea	2211	V
3.220	R.Togo Lome	Togo	1908	P,1
3.240	TWR	Swaziland	1918	K,M,P,1
3.255	BBC via Maseru	Lesotho	1940	K,M,P,W,X,1
3.255	RTV Brazzaville	Congo	2155	F
3.270	SWABC 1, Namibia	S.W.Africa	2144	F,K,M,P,X,1,8
3.275	AIR Srinagar	India	1645	F,M,P,1
3.278	RRI Jakarta	Indonesia	1910	P
3.279	La Voz del Napo	Ecuador	0357	K
3.280	R.Beira	Mozambique	1910	V,1
3.300	R.Cultural	Guatemala	0235	F,K,8
3.315	AIR Bhopal	India	1649	K,M,P,1
3.316	SLBS Goderich	Sierra Leone	2200	J,M,P,T,U,V,X,1,5
3.320	R.Oron	S.Africa	2201	F,K,W
3.325	FRCN Lagos	Nigeria	1945	J,M,P,X,1
3.330	R.Kigali	Rwanda	0536	U
3.345	AIR Jammu	India	0005	K
3.345	ZBS Lusaka	Zambia	2132	P
3.355	Noumea	N.Caledonia	2030	F
3.355	R.Botswana	Gaborone	1943	F,K,M,P,W,X,1
3.355	AIR Kurseong	India	1610	J,L,M,P
3.365	R.Rebelle, La Julia	Cuba	2356	F,L,P
3.365	AIR New Delhi	India	1604	M,P
3.365	GBC Radio 2	Ghana	1948	F,H,J,K,L,M,P,T,U,V,W,X,1,2,4,8
3.370	R.Tezulutlan	Guatemala	0424	K
3.370	R.Beira	Mozambique	1915	V
3.375	AIR Gauhati	India	1650	M,P,1
3.380	R.Chortis	Guatemala	0225	F
3.380	R.Malawi	Malawi	2145	K,U
3.385	R.Educacao Rural, Tefe	Brazil	2000	4
3.385	RFO Cayenne	Guiana	0055	F
3.390	R.Candij Bunia	Zaire	1706	K
3.395	ZBC Gweru	Zimbabwe	2008	X
3.905	AIR Delhi	India	1621	M,P,1
3.915	BBC Kranji	Singapore	1710	K,M,P,W,1
3.945	AIR Gorakhpur	India	1545	V
3.950	Qinghai PBS, Xining	China	1825	P
3.955	BBC Skelton	England	2100	B,C,F,G,I,K,P,Q,T,U,W,1,4
3.955	Novosibirsk rly A Ata	CIS	1645	1
3.960	Xinjiang PBS, Urumqi	China	0100	F
3.960	RFE/RL Munich	Germany	2000	F,G,K,P,U,4
3.965	RFI Paris	France	2000	B,C,F,G,I,K,P,Q,U,W,2,4
3.970	R.Buea	Cameroon	0445	F
3.970	RFE Munich	Germany	2000	F,K,P,U,W,4
3.975	BBC Skelton	England	2100	F,G,I,K,P,Q,4
3.980	VOA Munich	Germany	2000	B,K,O,P,R,S,U,W,2,4,7
3.985	China R via SRI Berne	Switzerland	2100	B,C,F,G,P,U,W,3,4
3.985	SRI Beromunster	Switzerland	1905	F,G,I,K,P,Q,U,W,7
3.990	Xinjiang BS, Urumqi	China	2349	I,S
3.990	RFE Munich	Germany	1913	K
3.995	DW via Julich	Germany	2000	B,C,F,G,I,K,P,S,U,W,4
4.000	Bofoussam	Cameroon	2200	5
4.020	China R, Beijing	China	2200	V
4.035	Xizang PBS, Lhasa	Tibet	0017	K,M,1
4.081	Ulan Bator 1	Mongolia	2315	K,P,1,8
4.130	V of the Strait 1	China	1812	P,V
4.190	CPBS Minority Sce	China	1828	P
4.200	China R, Beijing	China	1757	V
4.220	Xinjiang PBS, Urumqi	China	2300	K,P,Q,S,8
4.330	Xinjiang BS, Urumqi	China	0016	K,V
4.500	Xinjiang BS, Urumqi	China	2300	J,J,K,P,Q,S,U,W,1,4
4.600	R.Pelta del Acre	Bolivia	2359	F
4.600	R.Baghdad	Iraq	2139	J,K,P,T,U,1
4.735	Xinjiang	China	2320	F,J,K,P,S,U,W,1,4
4.740	R.Afghanistan, Kabul	Afghanistan	1935	X,4
4.750	Nei Menggu PBS	China	0017	K
4.755	R.Educ CP Grande	Brazil	0147	K
4.760	Yunnan PBS, Kunming	China	2316	K,M,P
4.760	AIR Port Blair	India	1612	P
4.765	Brazzaville	PR Congo	2250	F,G,K,L,M,P,T,U,W,X,Z,1,8
4.770	FRCN Kaduna	Nigeria	2020	BFGKLMPPQRS,T,U,W,1,4,8
4.775	R.Amarela	Brazil	0047	K
4.775	AIR Gauhati	India	0040	F
4.780	RTD	Ojibouti	1900	K,V,X
4.783	RTM Bamako	Mali	2140	L,M,P,T,U,X,1
4.785	R.Baku	Azerbaijan	1717	F,M,P,1
4.785	R.Tanzania	Tanzania	1900	K,P,Q
4.790	AIR Shillong	India	0115	B,K
4.790	Azad Kashmir R.	Pakistan	1700	P,W,1
4.790	TWR Manzini	Swaziland	1745	M,W
4.795	R.Nueva America	Bolivia	0300	K
4.795	R.Douala	Cameroon	2145	P,W
4.800	PBS Xinjiang	China	0031	1
4.800	R.Popular Cuenca	Ecuador	0257	K
4.800	R.Buenas Nuevas	Guatemala	1200	5
4.800	AIR Hyderabad	India	0146	P,V
4.800	LNBS Lesotho	Maseru	1848	X
4.805	R.Nac Amazonas	Brazil	2331	K,L,U,1
4.810	Voz de Galapagos	Ecuador	0045	F
4.810	R.Suid-Afrika	So.Africa	2258	E,M,1,4,8
4.815	China R, Beijing	China	2341	K,M,P,V,1
4.815	R.diff TV Burkina	Ouagadougou	2251	B,K,P,U,W,X,1
4.820	La Voz Evangelica	Honduras	0425	F,L,U
4.830	Gaborone	Botswana	2005	M,P,Q,W,X,1,8
4.830	R.Tachira	Venezuela	0050	B,F,K,L,T,1
4.832	R.Rejoj	Costa Rica	0800	G,J,L,Y,8
4.835	R.Tezulutlan, Coban	Guatemala	0055	F,1
4.835	RTM Bamako	Mali	2251	B,F,G,K,M,P,Q,S,T,U,W,X,1,4
4.840	R.Valera, Trujillo	Venezuela	0352	K
4.845	R.Fides, La Paz	Bolivia	0200	1
4.845	ORTM Nouakchott	Mauritania	2252	B,F,G,K,M,P,T,U,W,X,Z,1,4

Freq MHz	Station	Country	UTC	DXer
4.850	R.Yaounde	Cameroon	2050	K,U,W,4
4.850	AIR Kohima	India	2145	P,W,X
4.860	AIR New Delhi	India	1917	K,P,Q,S
4.865	R.Sociedade.F.Santana	Brazil	0925	G
4.865	PBS Lanzhou	China	2310	W
4.865	V. of Cinaruco	Colombia	0425	B,F,K,L,P,Q,1,8
4.865	R.Mozambique	Mozambique	0725	F
4.870	R.Cotonou	Benin	2253	F,K,M,P,U,W,X,4
4.880	R.Bangladesh	Dacca	0100	F,T
4.885	Em Reg Zaire	Angola	1928	V
4.885	R.Clube do Para	Brazil	0156	K,P,1
4.885	China R, Beijing	China	2323	M,P,1
4.885	Voice of Kenya	Kenya	2035	X
4.890	RFI Paris	via Gabon	0420	F,K,U
4.895	R.Bare, Manaus	Brazil	0927	G
4.895	Voz del Rio Arauca	Colombia	0100	B,F,J,K,U,Z,1,8
4.900	V. of the Strait 2	Brazil	2252	B,M,P,X,1
4.900	RTG Conakry	Guinea	1623	K,P
4.900	SLBC Colombo	Sri Lanka	0100	D
4.905	R.Nat.N'djamena	Chad	2145	F,J,K,M,P,S,T,U,W,X,1,4
4.910	V of People	Cambodia	2320	P,T
4.910	AIR Delhi	India	1553	J,V
4.910	R.Zambia, Lusaka	Zambia	2015	X,W
4.915	R.Anhangaura	Brazil	2350	K,T
4.915	R.Nac Manaus	Brazil	0931	G
4.915	SBC T. Accra	Ghana	2252	E,F,K,M,P,S,T,U,W,X,4,6
4.915	Voice of Kenya	Kenya	1910	X
4.920	ABC Brisbane	Australia	1910	P,V,X,8
4.920	AIR Madras	India	1714	1
4.925	R.Nacional, Bata	Eg Guinea	1640	P
4.925	R.Mozambique	Mozambique	2155	X
4.935	R.Capixaba	Brazil	0244	K
4.935	Voice of Kenya	Kenya	1838	F,M,P,U,W,X
4.935	R.Tropical, Tarapoto	Peru	0105	F
4.940	R.Abidjan	Ivory Coast	1550	V
4.955	R.Marajoara, Belem	Brazil	0100	B,F,K,P
4.958	Baku	Azerbaijan	2059	B,P
4.960	R.Federacion, Sucua	Ecuador	0631	K
4.960	AIR New Delhi	India	0125	F,1
4.970	PBS Xinjiang	China	1643	P,V,1
4.970	R.Humbos, Caracas	Venezuela	0255	F,K,U,V,W
4.975	PBS Fuzhou	China	2324	1
4.975	R.Uganda, Kampala	Uganda	1955	K,M,P,U,V,X
4.980	PBS Xinjiang	China	2355	P,S
4.980	R.Olimpica Int.	Dominican Rep	0940	G
4.980	Ecoss del Torbes	Venezuela	2212	B,F,J,K,M,P,T,U,W,X,Z,1,8
4.985	R.Brazil Central	Brazil	2315	K,P,T,1
4.990	Hunan 1, Changsa	China	2330	1
4.990	AIR via Madras	India	0000	J,P,S,Z,1
4.990	FRCN Lagos	Nigeria	2210	J,P,T,U,W,X
5.005	R.Nacional, Bata	Eg Guinea	0600	K,U
5.005	R.Nepal, Kathmandu	Nepal	0050	M,1
5.010	R.Garoua	Cameroon	2255	G,K,M,N,P,Q,U,W,X,1
5.010	R.Madagascar	Madagascar	1849	V
5.015	R.Brazil Tropical	Brazil	0450	K
5.020	PBS-Jiangxi Nanchang	China	0051	1
5.020	ORTN Niamey	Niger	2045	K,N,V,X
5.020	SLBC Tamil Home Sce.	Sri-Lanka	0100	A
5.025	R.Parakou	Benin	1920	M,N,P,T,W,X
5.025	R.Rebelle, Habana	Cuba	0441	K
5.025	R.Uganda, Kampala	Uganda	1905	M
5.030	R.Catolica, Quito	Ecuador	0009	P
5.030	R.Continente Caracas	Venezuela	0220	K,1
5.035	R.Aporecida	Brazil	0439	K
5.035	R.Bangui	C.Africa	1935	K,M,N,P,W,X
5.040	EP de Benguela	Angola	2044	V
5.045	R.Cultura do Para	Brazil	0215	K,8
5.047	R.Togo, Lome	Togo	2145	G,K,M,N,P,T,U,X,Z,1,4
5.050	Em Jesus Gran Poder	Ecuador	0048	J,K
5.050	AIR Aizawal	India	2030	N,P
5.050	SBC Singapore	Singapore	2148	J,T,X
5.050	R.Tanzania	Tanzania	1906	A,M,P,X,1
5.052	SBC R-1	Singapore	2212	A,M,P
5.055	Faro del Caribe	Costa Rica	2340	B,K,P,T
5.055	HFO Cayenne(Matoury)	Fr. Guiana	2030	N,U
5.060	PBS Xinjiang	China	2332	B,M,P,S,U,1
5.075	Caracol Bogota	Colombia	2208	P,U,W,Z,4,8
5.090	Taiwan 2 Sce, Beijing	China	2209	P
5.163	CPBS 2, Beijing	China	2209	P
5.240	Vos 1, Fuzhou	China	0035	M
5.275	WYFR Oakland, CA	via Taiwan	1623	K
5.320	CPBS 1, Beijing	China	2225	P
5.420	PBS Minority Sce	China	2230	K,P
5.440	Xinjiang PBS, Urumqi	China	0010	M,S
5.800	Xinjiang BS, Urumqi	China	1845	P

DXers:

- (A) Jana Arunachalam, Thumrait, Oman.
- (B) Charles Beanland, Gibraltar.
- (C) Vera Brindley, Woodhall Spa.
- (D) Tim Bucknall, Congleton.
- (E) Bill Clark, Rotherham.
- (F) Robert Connolly, Kilkeel.
- (G) Geoff Crowley, Iceland.
- (H) Ron Damp, Worthing.
- (I) John Eaton, Woking.
- (J) David Edwardson, Wallsend.
- (K) Steve Ferminger, Oxford.
- (L) Ron Galliers, N.London.
- (M) P. Gordon Smith, Kingston, Moray.
- (N) Chris Haigh, Huddersfield.
- (O) Robin Harvey, Boume.
- (P) Gerry Haynes, Bushey Heath.
- (Q) Sheila Hughes, Morden.
- (R) Rhoderick Illman, Oxted.
- (S) Zacharias Liangas, Thessaloniki, Greece.
- (T) Ross Lockley, Stirling.
- (U) Eddie Mckeown, Newry.
- (V) Roy Merrall, Dunstable.
- (W) Sid Morris, Rowley Regis.
- (X) Fred Pallant, Storrington.
- (Y) John Parry, Northwich.
- (Z) Roy Patrick, Derby.
- (1) Peter Perkins, Hemel Hempstead.
- (2) Peter Pollard, Rugby.
- (3) Peter Polson, St.Andrews.
- (4) Harry Richards, Barton-on-Humber.
- (5) Alan Roberts, Quebec, Canada.
- (6) Eric Shaw, Chester.
- (7) Edward Turnbull, Gosforth.
- (8) Jim Willett, Grimsby.

Newry; R. Moscow, Russia 17.860 (Eng to ? 1300-1500) 44444 at 1430 in Basingstoke; RTM via Tanger 17.595 (Fr, Eng to N. Africa, M. East 1400-1700) SIO444 at 1607 in Rotherham; RCI via Sackville 17.820 (Eng, Fr to Africa 1800-2000) 55544 at 1810 in Bridgwater; HCJB, Ecuador 17.790 (Eng to Eu 1900-2000) 45544 at 1905 in Stirling; R. Netherlands via Bonaire 17.605 (Eng to W. Africa 1930-2030) 34333 at 1945 in Rugby; HCJB, Ecuador 17.490 (Eng, u.s.b.+p.c.) SIO244 at 1950 in Edinburgh and 45555 at 2039 in Hafnarfjordur.

R. New Zealand's **15MHz (19m)** broadcasts to Pacific areas from Rangataiki on 15.120 (Eng 1850-2138) seldom reached the UK in January, but during a special sports broadcast, which ended at 0630, their signal peaked 44444 at 0540 in Kilkeel! Generally poor reception from R. Australia was also noted. The Darwin broadcast to Asia 15.170 (Eng, Chin 0900-1400) was 32322 at 1100 in Bushey Heath.

Some of the signals in the morning stem from R. Sofia, Bulgaria 15.160 (Eng to Eu 0400-0530) 35434 at 0430 by **Simon Hockenhill** in E. Bristol; BSKSA, Saudi Arabia 15.435 (Ar to E. Eu 0500-1100) 44444 at 1022 in Lithoro; SRI via Sottens? 15.505 (Eng to Aust, Far East 1100-1130) SIO333 at 1115 in N. Bristol; R. Korea, Seoul 15.575 (Eng to Africa 1100-1200) 44444 at 1120 in Norwich; R. Austria Int via Moosbrunn 15.450 (Ger, Eng to Far East 1100-1400) 34543 at 1138 by **David Edwardson** in Wallsend.

During the afternoon the BBC via Limassol 15.575 (Eng to M. East, N. Africa 0600-1500) SIO444 at 1300 in Thumrait; R. Austria Int via Moosbrunn 15.450 (Ger, Eng to Asia 1100-1400) 54444 at 1346 in Middlesbrough; R. Finland via Pori 15.400 (Eng to USA 1400-1500) 44333 at 1430 in Oxted; DW via Wertachtal? 15.145 (Eng to C/ S. Africa, M. East 1500-1550) 33333 at 1500 in Rugby; WWCW 15.685 (Eng to Eu, E. USA 1000-0000) 35333 at 1500 in Derby; LJB Sabrata, Libya 15.415 (Ar [Home Service] 1315-1745) SIO333 at 1530 in Gt. Yarmouth; VOA via Woofferton 15.205 (Eng to M. East 1500-1700) 43333 at 1545 by **Sheila Hughes** in Morden; Channel Africa, Johannesburg 15.430 (Eng to Africa 1600-1800) SIO544 at 1605 by **Philip Rambaut** in Macclesfield; R. Netherlands via Talata Volon 15.150 (Eng to S. Asia 1530-1625) 42433 at 1610 by **Richard Radford-Reynolds** in Guildford; R. Norway Int, Oslo 15.230 (Norw* to Africa 1600-1630; *Eng Sat/ Sun only) 33332 at 1616 in Co. Londonderry; R. Denmark via RNI 15.230 (Da to Africa 1630-1700) SIO434 at 1645 in Sheffield; KTBN Salt Lake City 15.590 (Eng to E. USA 1600-0200) 33333 at 1645 in Worthing.

Later, RCI via Sackville 15.325 (Eng to Eu 1700-1730) 45444 at 1709 in Woking; VOA via Selebi-Phikwe 15.445 (Eng to Africa 1600-1800) SIO444 at 1712 in Rotherham; R. Free Europe via Gloria 15.115 (Bul to E. Eu 1300-1900) 55555 at 1725 in Huddersfield; VO A via Greenville 15.580 (Eng to Africa 1600-2200) 34343 at 1809 in St. Andrews and 44334 at 1831 by **Charles Beanland** in Gibraltar; WSHB Cypress Creek 15.665 (Eng to Eu 1800-1955) 34433 at 1947 in Hafnarfjordur and SIO455 at 1950 in Edinburgh; WINB Red Lion 15.295 (Eng

to Eu, N. Africa 1900-2100) 44223 at 2030 in Bridgwater; RNB Brasilia, Brazil 15.265 (Eng, Ger to Eu 1800-2100) SIO323 at 2037 by **Leslie Biss** in Knaresborough; BBC via Ascension Is 15.400 (Eng to W/C. Africa 1500-2315), received 'quite well' at 2050 by **John Stevens** in Largs; RCI via Sackville 15.150 (Eng to Africa 2130-2159) 34444 at 2145 in Chester.

Two of R. Australia's **13MHz (22m)** broadcasts via Carnarvon have been clearly heard in the UK most days: 13.605 to N/SE. Asia (Eng, Chin 0900-1400) SIO444 at 1110 in Winchester; 13.755 to Asia (Eng 1300-1800) was a potent 54444 at 1632 in Brenchley. Good reception of 13.755 was also noted in Thessaloniki (43434 at 1430); Hafnarfjordur (53444 at 1442) and Thumrait (SIO444 at 1630).

During the daytime DW via Julia 13.780 (Ger to Aust 0600-0955) was 33333 at 0838 by **Ron Galliers** in Islington; UAE R. Dubai 13.675 (Eng to Eu 1030-1100) SIO433 at 1030 in Sheffield; SRI via Sottens 13.635 (Eng, Fr, Ger, It to Aust, Far East 1100-1300) SIO444 at 1130 in Knaresborough; R. Austria Int, via Moosbrunn 13.730 (Ger, Eng, Sp, Fr to Eu 0400?-1730?) 45554 at 1138 in Wallsend; R. Sofia, Bulgaria 13.670 (Eng to Eu 1130-1300) 22231 at 1235 in Oxted; Croatian R, Zagreb 13.830 (Various - News in Eng 1301) 44444 at 1255 in Kilkeel; AWR (KSOA), Guam 17.720 (Bur, Ta, Hi to S. Asia - Eng ident 1500) 14322 at 1455 in Bridgwater; UAE R. Dubai 13.675 (Eng to Eu 1600-1640) SIO545 at 1640 in Rowley Regis.

After dark, RCI via Sackville 13.670 (Eng to Eu 1800-1830) was 33333 at 1825 in Rugby; VOA via Selebi-Phikwe 13.710 (Eng to Africa 1600-2200) SIO455 at 1910 in Edinburgh; WSHB Cypress Creek 13.770 (Eng to Eu 2000-2200) 45544 at 2000 in Stirling; R. Kuwait 13.620 (Eng to Eu, USA 1800-2100) 44444 at 2018 in Gibraltar; RCI via Sackville 13.650 (Eng to USA 2200-2229) 34444 at 2200 in E. Bristol; WHRI South Bend 13.760 (Eng to Eu, Canada 1700-0000) SIO444 at 2255 in Rotherham.

Some of the **11MHz (25m)** broadcasts to areas outside Europe

were logged by UK DXers: R. Netherlands via Bonaire 11.895 (Eng to Pacific 0730-1025) SIO333 at 0955 in Rotherham; R. Australia via Brandon 11.855 (Eng to Asia 1300-?) 33333 at 1400 in St. Andrews; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N. Africa 1400-1600) 43343 at 1425 in Kingston, Moray; RTV via Sfax 11.550 (Ar 0430-2300) SIO444 at 1610 in Winchester and 43333 at 1757 in Gibraltar; R. Pakistan, Islamabad 11.570 (Eng to M. East 1600-1630) 34333 at 1615 in Co. Londonderry; AWR (KSDA) Agat 11.980 (Eng to Asia 1600-1700) 45343 at 1615 in Middlesbrough; KHBI Saipan 11.580 (Eng to NE./SE. Asia, India 1600-1755) 43233 at 1752 in Worthing; BBC via Maseru 11.940 (Eng to E/ C. Africa 1745-1830) SIO322 at 1756 in Macclesfield; R. Nac da Amazonia, Brazil 11.780 (Port 0800-2200) 34333 at 2033 in Bridgwater; R. Anhanguera, Brazil 11.830 (Port 0800-0300) 25532 at 2215 in Stirling; BBC via Hong Kong 11.945 (Eng to E. Asia 2300-0030) 32332 at 2335 in Kilkeel; UAE R, Abu Dhabi 11.815 (Eng 2300-0000) 23222 at 2354 by **Robin Harvey** in Bourne.

Those intended for European listeners include: R. Finland via Pori 11.755 (Fin 1100-1430, also to M. East, Africa) 55555 at 1200 by **Edward Turnbull** in Gosforth; R. Sofia, Bulgaria 11.630 (Eng 1200-1300) 22222 at 1230 in Oxted; R. Romania, Bucharest 11.940 (Eng 1300-1355) SIO333 at 1300 in N. Bristol and 44444 at 1315 in Thessaloniki; Polish R, Warsaw 11.815 (Eng 1300-1355) 44444 at 1310 in Brenchley; RCI via Sackville 11.945 (Eng 2000-2100) SIO444 at 2000 in Edinburgh; R. Damascus, Syria 12.085 (Eng 2005-2105) 34333 at 2030 in Chester; AIR via Aligarh 11.620 (Eng 2045-2230) 44333 at 2114 by **Vera Brindley** in Woodhall Spa; R. Japan via Gabon 11.925 (Eng 2100-2200) 23212 at 2139 by **Leo Barr** in Sunderland; R. Budapest, Hungary 11.910 (Eng 2200-2255) 55555 at 2215 in Norwich; VOFC via WYFR 11.915 (Eng 2200-2300) 33322 at 2225 in Morden.

In the **9MHz (31m)** band R. New Zealand Int via Rangataiki 9.700 (Eng to Pacific areas 0700-1100) SIO222 at 0915 in Edinburgh; R. Vlaanderen Int

via Wavre 9.905 (Eng to Eu 1000-1025) SIO333 at 1000 in Co. Fermanagh; KTWR, Guam 9.785 (Chin to China 0845-1200) SIO222 at 1105 in Macclesfield; VOA via Tinang 9.760 (Eng to S. Asia 1100-1700) 22332 at 1655 by **Martin Dale** in Stockport; R. New Zealand Int 9.675 (Eng to Pacific areas? 1700-1800) 33233 at 1700 in Woodhall Spa; Polish R, Warsaw 9.525 (Eng, Ger to Eu 1600-1800) 33333 at 1730 in Islington; R. Netherlands via Talata Volon 9.605 (Eng to E/W. Africa 1730-1930) 33333 at 1738 in Gibraltar and SIO333 at 1830 in N. Bristol; R. Australia via Carnarvon 9.645 (Eng to Asia? 2100-0000?) 34553 at 2105 in Wallsend; Voice of Turkey, Ankara 9.445 (Eng to Eu 2100-2150) SIO434 at 2115 in Sheffield; R. Cairo, Egypt 9.900 (Eng to Eu 2115-2245) 45444 at 2140 in Woking; VOFC via WYFR 9.850 (Eng to Eu 2200-2300) 44444 at 2215 in Morden; UAE R, Abu Dhabi 9.605 (Eng to USA 2200-0000) SIO333 at 2235 by **Julian Wood** in Elgin; R. Austria Int via Moosbrunn 9.870 (Ger, Sp to S. Am 2200-0400) 33444 at 2352 in Bourne.

The **7MHz (41m)** logs included the BBC via Rampisham 7.150 (Eng to C. Am 0600-0815) 33233 at 0809 in Bourne; WJCR, Kentucky 7.490 (Eng to E. USA 0640-1200) SIO434 at 0815 in Sheffield; R. Prague Int, Czech 7.345 (Eng to Eu 1130-1157) 44333 at 1130 in Morden; United Nations R via IRRS Milan, Italy 7.125 (Eng 1400-1600 Sat only, u.s.b.+ p.c.) 43344 at 1403 in Kingston, Moray; AIR via Aligarh 7.410 (Eng, Hito Eu 1730-2230) 33333 at 1743 in Basingstoke; RTV Sfax, Tunisia (Ar 1800-2300) SIO444 at 1910 in Knaresborough; R. Australia via Carnarvon 7.260 (Eng to Asia 1800-2100) SIO433 at 2049 by **Michael Williams** in Redhill; Voice of Israel, Jerusalem 7.465 (Eng to Eu 2230-2300) SIO333 at 2241 in Elgin; R. Vilnius, Lithuania 7.150 (Eng to Eu 0000-0028) 55545 at 0000 in Gosforth; R. Ukraine Int, CIS 7.240 (Eng to Eu 0100-0155?) 54555 in E. Bristol.

R. Australia's **6MHz (49m)** broadcasts to Pacific areas via Shepparton 5.996 (Eng 0800-2130) rated 55445 at 1915 in Gosforth. R. Japan via Skelton 6.050 (Eng to Eu 2300-0000) was SIO333 in Elgin.

QUARTERLY LIST OF EQUIPMENT USED - +February, #March, *April '93.

- +* Tim Allison, Middlesbrough: Lowe HF-225 + 8m wire.
- +* Jana Arunachalam, Thumrait, Oman: Panasonic RF-845 or Sony ICF-7600DS + 6m wire.
- +* Ted Barty, N. London: Drake RB or RA1217 + half size 5R or 18m V Beam.
- +* Leo Barr, Sunderland: Roberts RC-918 + r.w. in loft.
- +* Charles Beanland, Gibraltar: Sangean ATS-803 + a.t.u. + 6m wire or AA2.
- +* Darren Beasley, Bridgwater: Philips D-2935 + Hex loop or a.t.u. + 15m wire.
- +* Leslie Biss, Knaresborough: Trio R600 + trap dipole in loft.
- +* Vera Brindley, Woodhall Spa: Sangean ATS-803A + whip or r.w.
- +* Kenneth Buck, Edinburgh: Lowe HF-225 + l.w. or s.w. loop.
- +* Tim Bucknall, Congleton: Sony ICF-200ID + a.t.u.
- +* Bill Clark, Rotherham: Sony ICF-200ID + built-in whip or r.w.
- +* Robert Connolly, Kilkeel: Sangean ATS-803A + 30m wire in loft or AN-1.
- +* John Coulter, Winchester: Yaesu FRG-7 + r.w.
- +* Geoff Crowley, Iceland: Yaesu FRG-7700 + dipoles or Datong AD370.
- +* Gary Currah, Peterborough: AOR AR-2000 + 1/4 wave elements for 9 bands.
- +* Bernard Curtis, Stalbridge: Lowe SRX-30 + r.w.
- +* Martin Dale, Stockport: Codar CR-70A + 23m wire.
- +* Ron Damp, Worthing: Racal RA17 + Hex Loop or 2 band Windom.
- +* Antonio De Abreu-Telxera, Evosham: Sony ICF-2001D + Mag Balun + 15m wire.
- +* Steve Ferminger, Oxford: Lowe HF-225 + 25m wire.
- +* Steve Ferminger, Wales: Lowe HF-225 + a.t.u.
- +* Ron Galliers, London: Philips D2935 + a.t.u. + 30m wire.
- +* P. Gordon Smith, Kingston, Moray: Icom RT2 + a.t.u. + 25m V dipole.
- +* P. R. Guruprasad, Swarttruggens, S. Africa: Sony ICF-7600DA + built-in whip.
- +* Chris Haigh, Huddersfield: Drake R8E + a.t.u. + 20m wire.
- +* Robin Harvey, Bourne: Matsui MR-4099 + telescopic whip.
- +* Gerry Haynes, Bushey Heath: #Yaesu FRG-7700 + T2FD antenna.
- +* Gerry Haynes, Bushey Heath: Kenwood R5000 + a.t.u. + 30m wire.
- +* Francis Hearne, N. Bristol: Sharp WQ1370 + r.w.
- +* Simon Hockenhill, E. Bristol: Philips D2935 + built-in whip.
- +* Sheila Hughes, Morden: Sony ICF-7600DS + loop, Panasonic DR48 + 15m wire.
- +* Rhoderick Ilman, Oxted: Kenwood R-5000 + Mag Balun + 19m wire.
- +* Mark Jones, Peterborough: Salsho 5000 + 20m wire.
- +* Cyril Kellam, Sheffield: Sony ICF-7600DS + AN-1 or 25m wire.
- +* Ronald Kilgore, Co. Londonderry: Sony ICF-2001 + built-in whip.
- +* Zacharias Llangas, Thessaloniki, Greece: Philips D2935 or Sony ICF-7600D + r.w.
- +* Ross Lockley, Stirling: Realistic DX-300 + 20m wire.
- +* Eddie McKeown, Co. Down: Tatung TMR-7602.
- +* Roy Merrall, Dunstable: Kenwood R5000 + 40m wire.
- +* George Milmore, Wootton, IOW: Sangean ATS-803A or Racal RA17L + loop.
- +* Ken Milne, Basingstoke: Matsui MR-4099 + whip or 6m wire in loft.
- +* Sid Morris, Rowley Regis: Kenwood R-5000 + 11m wire.
- +* Sid Morris, while on the Memap Hills: Nevada MS-1000 + whip on car.
- +* Fred Pallant, Storrington: Trio R2000 + r.w. in loft.
- +* John Parry, Northwich: Realistic DX-400 + 33m wire.
- +* Roy Patrick, Derby: Lowe HF-125 + 22m wire.
- +* Peter Perkins, Hemel Hempstead: Kenwood R5000 + 20m wire.
- +* Peter Pollard, Rugby: Sony ICF-2001D + built-in whip.
- +* Peter Polson, St. Andrews: Lowe HF-225 + loop or indoor Joystick.
- +* Richard Radford-Reynolds, Guildford: Sangean ATS-803A + 10m wire.
- +* Philip Rambaut, Macclesfield: Int. Marine Radio R.700M + r.w.
- +* Harry Richards, Barton-on-Umber: Grundig Satellit 700 + 20m wire.
- +* Alan Roberts while in St. Bernard de Lacolle, Quebec: Lowe HF-225 + 292m Beverage antenna.
- +* Alan Roberts, Quebec, Canada: Lowe HF-225 + 41m or 11m dipole.
- +* John Sadler, Bishops Cleeve: Omega 4020 + built-in whip.
- +* Eric Shaw, Chester: Lowe HF-225 + 7m wire.
- +* Chris Shorten, Norwich: Matsui MR 4099 + 10m wire.
- +* Tony Singh, Hitchin: Zenith 7000 or Grundig Satellit 3400 + built-in whip.
- +* Stephen Smith, Cwmbran: Realistic DX-302 + a.t.u. + r.w.
- +* Tom Smyth, Co. Fermanagh: Sangean ATS-803A or Morphy Richards R191.
- +* John Stevens, Largs: Hammarlund HQ 180 or Icom R-70 + a.t.u. + r.w.
- +* Darran Taplin, Brenchley: Yaesu FRG-7700 + FR7-7700 + 35m wire.
- +* D. Tomic, Birmingham: Texit HH-1607.
- +* Phil Townsend, London: Lowe HF-225 + loop or r.w.
- +* Edward Turnbull, Gosforth: Cascade RC 320 + a.t.u. + 15m wire.
- +* Ted Walden-Wincent, Gt. Yarmouth: Grundig Satellit 3400 + r.w.
- +* John Wells, E. Grinstead: RCA AR880 + loop, l.w. converter.
- +* Jim Wilett, Glimps, RCA AR77 + loop, Trio 9R-59DS + a.t.u. + X dipole.
- +* Michael Williams, Redhill: Lowe HF-225 + 10m wire or l.w. loop.
- +* Julian Wood, Elgin: Kenwood R2000 + Yaesu FR7-7700 + a.t.u. + 5m wire.

Off The Record

Andy Cadier,
28 Romney Avenue, Folkstone, Kent CT20 3QJ.

While the controversy over the forthcoming use of the BBC's 198kHz long wave transmitters for a 'rolling' news service continue, here are brief details of a somewhat less well-known industrial communications service provided on this frequency.

There are three transmitters operating on 198kHz in the UK, Droitwich in England with 500kW, also Westerglen and Burghhead in Scotland radiating 50kW each. Coverage includes the entire UK, much of Western Europe, and sea areas from south-east Iceland to Finisterre and Biscay. This makes these low frequency transmissions ideal for a digitally encoded nationwide message service in addition to the broadcasting of radio programmes. Both services remain quite separate as the programme sound amplitude modulates the radio carrier wave while a data signal, representing encoded messages, phase modulates the carrier.

A data '1' is signified by 20ms of phase advance followed by 20ms of phase retard. A data '0' is simply this signal in reverse. The maximum phase deviation of the carrier is about 22.5°. The data is gathered into 50-bit blocks, which take just two seconds to transmit, so during one minute, 30 self-contained and individually decodable blocks can be sent.

One of the many customers of this transmitted data service is the Electricity Industry, who for many years have had to cope with maintaining the accuracy of time switch equipment located in consumers premises. The introduction of Radio Teleswitching enables electricity companies to replace the time switches with data receivers giving them remote control over customers metering. The most common type of Teleswitch has a 24 hour clock and a memory that stores the programme messages for 24 hours. The device then controls customers

tariff or load according to the received and stored 24 hour programme.

In the event of a transmission failure, the Teleswitch follows the previously received programme, following a power-cut a temporary fallback programme takes over until the next relevant signal is received. The effects of any random noise obliterating the signals are overcome by routine rebroadcasts of the data messages. Some electricity meters include a built-in teleswitch these are known as Radio Telemeters, which feature an optical communications port for programming and interrogation purposes. Further information is obtainable from BBC Engineering and the Electricity Association. The equipment pictured is manufactured by GEC Meters, Stonefield Works, Stone ST15 0RS.

Incoming Messages

Radiofax had a meeting with the 'Men from the Ministry' late last year. Early optimism was dashed by the revival of the now stale argument over frequency availability. Radiofax were informed that even if a frequency were eventually made available it could not be guaranteed for more than three months at a time, and a six figure licence fee would be payable.....ouch!

Virgin Radio is to commence regular broadcasts on April 30 on some former Radio 3 medium wave frequencies (See 'LM&S' pages for details) The less talk and more music format featuring classic rock from the last 25 years, was successfully used by Radio Caroline during the 1980s.

At the time of going to press, the Radio Caroline ship *Ross Revenge* is still detained in the Western Docks at Dover. Transport officials will not give the ship clearance to leave, their obvious fear is that it may put to sea again and recommence broadcasting. It had been intended to tow the vessel

to the Historic Dockyard at Chatham for repairs and use as a floating tourist attraction. It is still possible to visit the radio ship at weekends, but you need to arrange it with the Ross Revenge Support Group. Their address is, 121 Monkton Street, Monkton, Nr. Ramsgate, Kent CT12 4JQ. The tour of the ship costs just £5, which helps towards the vessel's running costs, restoration and harbour fees.

On a similar subject **Chris Rolph**, tells me that the supporters club Caroline Movement is to close following the next issue of *Bulletin*, the organisation's quarterly magazine. Promotions Manager John Burch is writing a book about offshore radio,

SHORT WAVE IRREGULAR BROADCASTS CHART

Freq MHz	Programme Content	Day	UTC	Monitors
3.910	American Evangelical	Sun	1641	A,F,G,I
3.925	Century 21 CD Show	Mon	1535	A
6.200	Several Dutch stations	Sun	0903	A,D,F
6.205	American Evangelical	Sun	1602	A,D,G,I
6.209	Irish country music	Sun	0952	A,C,G
6.210	Rock music	W/E	0903	A,D,F,I
6.227	Relay of Irish FM station	Dly	1125	A,B,C,D,F
6.238	Caernarfon, Wales (relay)	Sun	0956	C,D
6.250	1st of the month DX Show	Sun	1000	A,C,D,G
6.257	Possibly relay station?	Sun	1050	A,F
6.262	5 Stations (relay service)	Sun	0930	A,B,D,F
6.273	Irish relay service	Sun	0831	A,H
6.275	Dutch or German station	Sun	1023	C
6.280	Ad. for DX loop antenna	Sun	1226	C,D
6.295	Rock music, improved audio	W/E	1307	A,B,D,E,F
6.302	W. Midlands address given!	W/E	1230	C
6.400	Several stations	W/E	1159	A,B,D,G
6.855	From the Emerald Isle	Fri	1045	A,F,H
6.911	2 stns relayed from Dublin	Dly	1515	A,B,D,F,H
7.410	Bill Lewis Show	Sun	1116	B
7.473	Parallel to 11.400	Sun	0833	A,D
7.480	Music from Benelux	Sun	0909	A
11.400	French accent	Sun	0944	C,F,I

Dly = Monitored daily.

W/E = Heard on Saturday and Sundays.

- A: Free Radio Monitoring, Halesowen, W. Midlands.
- B: Bob Marsh, Bexleyheath, Kent.
- C: Ron Galliers, Islington, London.
- D: Darran Smith, Hailsham, E. Sussex.
- E: David Williams, Southampton, Hants.
- F: Chris Harris, Kidderminster, Worcs.
- G: Roger Lewis, Ashford, Kent.
- H: Paul Alce, Paddington, London.
- I: Tim Bucknall, Congleton, W. Midlands.

which will be sent free to all of their members with valid subscriptions.

Mystery Stations

Richard Gosnell in Swindon is trying to obtain information on a number of Italian commercial radio stations he received during last summers Sporadic-E conditions. His letter covers the usual DXing problems including harmonics and ghost images, but so far has been unable to establish why he received pop music on 54 - 56.4MHz. Each of the stations appeared to be Italian, and broadcast in wide band f.m.

Has anyone else heard Radio Diffusione FM, Radio Toscana, or Radio Conciada? No trace of them has been found on the regular f.m. band. Another unidentified station has reached **Alan Roberts** in Quebec, Canada. He reports receiving 'Radio Neige' in narrow band f.m. on 25.710; 25.900; and 26.070MHz with French pop records, mainly oldies, between 1300 and 1600UTC. He says these three frequencies carry the same station but programmes are not in parallel, and suggests these may come from France rather than Canada.

Chris Midgley writes from Liversedge saying he is interested in starting a quarterly bulletin consisting of logs, information, and of course speculation on the activities of numbers stations. This would be free to all participants, and he says items of interest would be sent to me for inclusion in this column. That can't be bad, so if you want to contact Chris write to him c/o my address at the top of this page, and I will forward your letter on to him. A sample of Chris's report includes an English female voice heard on 6.270MHz 6.842; 9.131; 7.887; 8.464; and 9.251 between 1900 and 2200UTC.

Tim Allison says he is not a dedicated spy station hunter, but managed to find several whilst travelling around the band. His report includes 3.370MHz at 2103 UTC; 6.290 at 2032; and 7.375 at 2039. Tim also says he has had some success with one or two of the Dutch m.w. pirates and received some QSL cards.

Your letters and reception logs are always welcome at my address at the head of this page, the deadline for material to be included in the July article is the 1st May.



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Alinco DJ-X1 scanner 4 months old with guarantee plus rechargeable battery pack and charger, discone external antenna, books, etc., £150. Or exchange for Sony style ICF receiver. Tel: (0633) 264342 after 5pm Newport, Gwent.

ADR AR-2000 scanner, boxed, complete, as supplied by dealer, charger, NiCads, mobile cable, carrying case, etc., 12 months old, very little use, £189 o.v.n.o. Tel: (0925) 818107 evenings Warrington, Cheshire.

ADORAR-2002 scanner, 25-550, 800-1300MHz, p.s.u., antenna, boxed, £295. ADR AR-900 hand-held scanner, 108-174, 220-380, 406-470, 830-950MHz, NiCads and p.s.u., £140. Both little used in perfect working order. B. Massey. Tel: (0745) 730671 N. Wales, can travel if required.

ADORAR-3000 scanner, mint condition 100kHz to 2036MHz, boxed, manuals, frequency lists, the best at half r.r.p., £450 o.n.o. Tel: (0675) 470842 Coleshill, North Warwickshire.

ADR AR-3000, Jim M75, pre-amp and Skyscan discone antenna, one year old. All perfect condition with leads, coax, manual, etc., £500, cash only, buyer collect please. Tel: 021-453 4634 after 5pm please, South Birmingham.

ADR AR-3000A, little used, boxed, £450. Tel: (0904) 83226 evenings only.

ADR AR1500 boxed, as new, with all accessories, £230. Tel: (0227) 770449 evenings, Kent.

ADR AR2002 scanner, complete in original box, 5 years old, very good condition, £175. Would exchange for hand-held RX or RX/TX (2m). Tel: (0872) 222678 Cornwall.

ADR AR3000 one year old with discone antenna (boxed), £470 o.n.o. Or exchange for top of range metal detector. Anthony. Tel: (0239) 621610 after 5.30pm.

BBC-B issue 7 Microvitec Cub ADFS, sideways RAM, many ROMS, twin Cumana 40/80, RTTY and other software, desk, etc. Full kit, £175 o.n.o. Andy. Tel: (0248) 364667 North Wales.

Codar CR70A MkII receiver. Any reasonable offer accepted, initial contact by letter please. James F Mair. 15 Mair Street, Portknockie, Buckie AB56 2NL.

Dartcom weather satellite receiver complete - dish, v.h.f. antenna, microprocessor controlled receiver, latest software and full handbooks. Needs 286PC or better. Can be seen working. Price around £1750 (r.r.p. £2773). Tel: (0276) 856866 anytime, Woking, Surrey.

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Eddystone EB36A mains 150kHz-22MHz, similar to EC10, with manual, £50 o.n.o. Or exchange for EC10 or similar. Pete. Tel: (0727) 839908 St. Albans.

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ICS FAX-1 weather map decoder c/w all cables, details page 45 October 1992 *SWM*, £250 post paid. Telequipment D31R dual-trace oscilloscope, £50, buyer collects. G3RDG. Tel: 081-455 8831 anytime, NW London.

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Kenwood R2000 receiver with v.h.f. and manual, £280. Tel: (0452) 415056 after 5pm, Gloucester.

Kenwood R5000, only a few weeks old, £800. Army a.t.u. matches whip and long wire antennas to 75Ω impedance 2 to 27MHz, £26. Also have some units for RX234 and TXD11. Eric. Tel: (0226) 242073 South Yorkshire.

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Lowe HF-125 receiver, like new, D125 a.m. detector, K125 Genie Pad, S125 Wharfedale speaker, H56 headphones, Mk2 multi-tuner, 5RV antenna and bureau, £250. Owen Hughes. Tel: (0942) 833296.

Lowe HF-125 receiver, power supply, manual, £150. Mr Ball. Tel: (0743) 361614 Shrewsbury.

Lowe HF-150 receiver, plus Sony AN1 antenna, both less than 20 hours use and unmarked, £295 o.n.o. Trio R2000 receiver, perfect condition with original packaging and manual, £300 o.n.o. Paul. Tel: (0782) 412997 Stoke.

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Lowe HF-225 complete with case and synchronous detection; little used and in mint condition, £799. Sangean ATS-803A, £79. Sony ICF-6700W, £89. Tel: (0824) 5324 after 6pm North East Wales.

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Passport to World Band Radio 1992, £7.50. *World Radio TV Handbook 1991*, £5. Both good condition. £12 the two. Cheque or postal order to: Mr A.C. Stapleton. 130 Sherwell Valley Road, Torquay, Devon TQ2 6EX.

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Realistic PRD2006 scanner and antenna £200, as new. Realistic DX300, £65. Tel: (0203) 370048.

Regency MX-7000 scanner, 25, 550, 800, 1.3GHz, instruction book, boxed, £175. Tel: (0228) 36958 Carlisle.

RX8 and APT-1 multi-mode decode system, mint condition, £150. Tel: (0253) 21308 Blackpool.

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DIAL SEARCH 1992/94

George Wilcox
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FLIGHT ROUTINGS 1992

Compiled by T.T. & S.J. Williams
This guide was produced with the sole aim of assisting airband listeners to quickly find details of a flight, once they have identified an aircraft's callsign. Identifies the flights of airlines, schedule, charter, cargo and mail, to and from the UK and Eire and overflights between Europe and America. 122 pages. D/P

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HF ANTENNA COLLECTION (RSGB)

Edited by Erwin David G4LQI
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INTRODUCTION TO ANTENNA THEORY (AN) BP198

H. C. Wright
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Written in non-technical language, this book provides information covering important aspects of v.h.f. radio and tells you where you can find additional data. If you have a scanner, you'll find a lot of interesting signals in the huge span of frequencies covered, 100-300MHz & 50, 420, 902 & 1250MHz bands. 163 pages. £9.50

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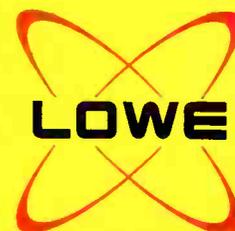
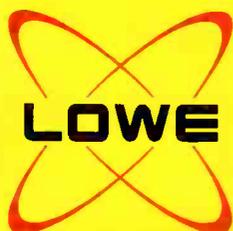
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Guide to **SWL**

Short Wave Listening

Hints & tips to get more from this fascinating hobby



**Yupiteru MVT-7100
Hand-Held Scanner
Reviewed**

**Gadgets &
Accessories For The
Short Wave Listener**

**Short Wave Tour
Of Central America
& The Caribbean**

**Organise Your DX
Time**

Presented free with Short Wave Magazine, April 1993

Welcome to your **FREE 24-page** magazine covering the hobby of short wave listening.

Short wave listening, in all its various guises, is one of the most enthralling hobbies available. This 24-page, pull-out magazine, presented free with the April 1993 issue of *Short Wave Magazine*, has been put together to help you get the most out of your hobby.

Inside you will find articles on how to organise your DX time more effectively, a short wave tour of Central America and the Caribbean, gadgets and

accessories, listening tips and satellite broadcasting - the radio of the future? There is also a review of the new Yupiteru MVT-7100, the latest hand-held offering from this famous stable.

The background cover picture was kindly supplied by Deutsche Welle, celebrating its 40th anniversary this year. The antennas are part of their Wertachtal, Bayern transmitter.

An Introduction to EDXC

by Simon Spanswick



Whatever the hobby, there's a club where interested people can get information and tips, as well as getting in touch with fellow hobbyists. Short wave radio listening - or DXing - is no exception, but the problem is finding out about clubs that exist. That tends to be the case, because DXing is a rather solitary hobby. You can spend hours concentrating on all the weak signals that whizz through the ether on their way from country to country.

One organisation that may be able to help is based in Britain, but has worldwide connections. The European DX Council is an association of short wave listeners' clubs and DX organisations around Europe. Founded in Denmark in 1967 with the aim of increasing co-operation between listeners across the continent, the Council has expanded in recent years and today does much work in promoting short wave listening around Europe.

Many DX and short wave listener clubs belong to the EDXC, and the Council acts as a sort of clearing house of information between clubs and their members. An annual guide to clubs around the world is published by EDXC that gives comprehensive details on clubs in Britain and mainland Europe as well as North America, Asia and the Pacific. Information on each club includes the number of members, any particular areas of specialisation (such as scanning, medium wave DXing, TVDX and so on), publications and, quite importantly, membership fees. The *EDXC Club List* (£1.50) is available direct from the EDXC Publications Office.

Also published is the *EDXC Radio Landlist* (£2.00). This is a useful reference guide to all the world's

radio countries that can be used to keep track of all the different countries you have heard, and can help in competitions organised by DX clubs. Or you could use it to record which countries you have received QSL cards from.

Reception Reports

If you do want to send reception reports to stations, the *EDXC Reporting Guide* (£1.50) is a must. This explains how to write reports that are useful for the station, and tells you what sort of information is needed.

All these items can be obtained from EDXC at PO Box 990, London SE3 9XL. That is also the address for subscribing to the monthly news letter produced by the Council, *Euro DX*. Subscriptions cost £6.50 a year.

Each year, the European DX Council holds a Conference for listeners, broadcasters and station engineers in a different part of Europe. In recent years, it has taken place in Tampere, the second city of Finland, Paris and Barcelona. This year it will be in Spain once again, but further south in the Canary

Islands.

The annual EDXC Conference is a unique opportunity to meet fellow listeners from throughout Europe, and from North America, Asia and the Pacific. Many broadcasters attend: George Wood of Radio Sweden is a regular attendee and stations that regularly send delegates include the Voice of Turkey, Radio Korea, the Voice of Free China, Radio Moscow and the Voice of America. In 1992, several delegates from eastern Europe joined the event for the first time.

Informal

The Conference includes lectures on all aspects of radio listening, demonstrations of the latest equipment, computer workshops and listening rooms. The atmosphere is informal with broadcasters and listeners mingling and exchanges views and opinions. The 1993 European DX Council Conference will take place during the last weekend of May. For full information, write to Conference 93, EDXC, PO Box 990, London SE3 9XL.

The European DX Council can help you get the very best out of the radio listening hobby - from conferences to clubs! Do get in touch with us today.



The Yupiteru MVT-7100 wide-band receiver

Over the past few years there has been a distinct move towards smaller scanners, with more memories, wider coverage and easier controls. Now, Yupiteru have announced their new MVT-7100 model that is just about the best in all the above categories. Short Wave Magazine were fortunate enough to borrow the first one into the country and sent it to Graham Tanner for review.

It is very difficult to cover every available function on this receiver, as there is so much there to cover! Instead, I have opted to discuss the good and bad points and give some personal observations on using the receiver. Although I personally listen a lot to v.h.f. and u.h.f. airband, I was looking forward to trying out the h.f. s.s.b. capabilities of this amazing new receiver.

Description

The Yupiteru MVT-7100 is a hand-held receiver (or 'scanner'). It has a liquid crystal display at the top of the front panel, while beneath the display is a 5 x 4 grid of push buttons (most with a dual function). The bottom third of the front panel is taken up by the speaker grill. The top panel contains a standard BNC antenna connector, a squelch control, a combined on/off/volume control, and a multi-function rotary switch that can be used to change the settings of the receiver (i.e. frequency, mode, step-size, memory, etc.). The left hand side-panel contains two push buttons, small slide-switch, and a recessed **RESET** button. The right hand side-panel has an earphone socket, a socket for a 12V d.c. supply and a small metal clip to attach the wrist-strap. At the bottom of the rear panel is a removable panel that covers the batteries; the rear panel also has a couple of small holes to which the belt-clip can be attached.

The instruction manual is written in English and is very readable and easy to follow. The chapters are grouped to cover related subjects (i.e. searching, or using memories), and explain how to operate the radio

in a nice easy fashion. I only found two errors in the manual: in the section dealing with program-scan the example text talks about adding a frequency into the program-scan sequence, but the example display shows a different frequency. In the section explaining bank-scan the example text lists bank 1 as memory channels 0 - 11 when it should read 0 - 99.

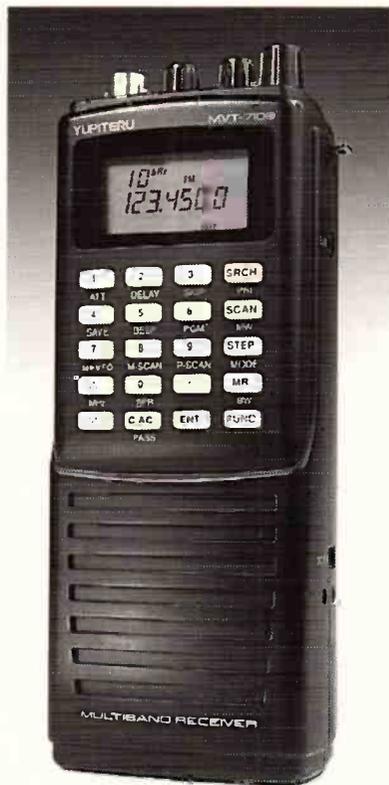
The power supply that comes in the box with the receiver is a standard UK 3-pin mains adapter, which is fitted with a plug suitable for the power socket on the side panel. The grid of push-buttons contains the usual '0' to '9' buttons as well as **ENTER** and **UP** and **DOWN**. Sixteen of the buttons have a dual function and their action can be altered by first pressing the **FUNC** key which changes the operating of the button to the small legend beneath the key.

For example, pressing the '5' button causes a '5' to appear in the liquid crystal display, but pressing **FUNC**, then '5', will cause the push button BEEP to mute (or switch it on, if it was off).

First Impressions

I have owned various models of receivers and scanners over the past decade, and I must admit that I am impressed with the new MVT-7100. It boasts the greatest frequency coverage in a hand-held, and almost certainly the highest number of frequency step sizes.

The MVT-7100 has several nice



features which impressed me initially. There is a small button on the side panel labelled **LAMP**, which (when pressed) provides a backlight to the liquid crystal display and also all the keys on the front panel. The previous model from Yupiteru (the MVT-7000) only has a light for the liquid crystal display, so seeing the keys light-up was particularly impressive. The light stays on for as long as the button is pressed, so that there is only minimal power drawn from the batteries.

Also on the side panel is a small recessed hole marked **RESET**. According to the manual, pressing this with a ballpoint pen (or other suitable implement) will reset the micro-processor - this will completely erase all the memories. At first I wondered why this facility had been provided, but the manual explains that it is possible for the liquid crystal display to display 'garbage' messages, or you may wish to do this just before you use the receiver for the first time.

One surprising facility was the battery-save function. This is quite novel in a receiver, and I don't know of any others which provide this. This only operates during manual mode (i.e. listening to one set frequency) - it doesn't work when

The Yupiteru MVT-7100 wide-band receiver

scanning or searching. There are three alternative 'active/inactive' settings that vary the amount of time that the receiver is 'listening' for a signal and is 'switched-off' conserving precious battery power. The battery-save function only comes into effect when no signal has been detected for five seconds; if during the 'on' period a signal is detected, the battery-save period is suspended until the signal disappears, and then when another five seconds have elapsed, the battery-save cycle starts again. I thought that this was an excellent idea as it can make battery power last much longer.

The receiver has an attenuator that can be used to weaken a very strong (or local) signal. Many other receivers have an attenuator, but they tend to use a push button that is either always on or always off, whatever the receiver is doing. Where the MVT-7100 scores over others is that the attenuator setting can be stored in a memory channel along with the operating frequency and mode. When scanning through memory channels, if a memory channel has the attenuator set on, the display shows ATT above the frequency and strong signals do not overload the front-end circuit.

Memories and Scanning

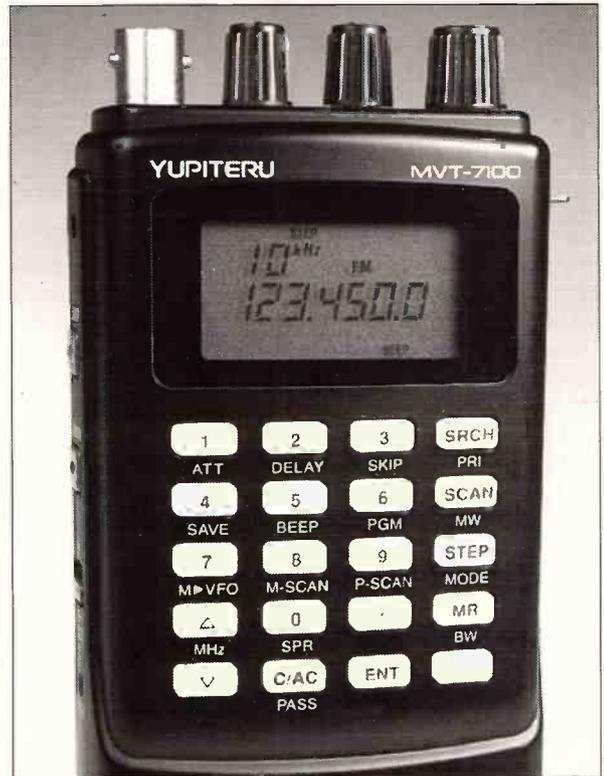
The MVT-7100 has 1000 memory channels, arranged in 10 banks of 100. When scanning (through the memory channels), only those that contain a frequency are scanned. Each memory channel stores the frequency, mode, and whether the channel is 'in use' or 'passed' (i.e., locked-out). Storing frequencies into a memory channel is very easy: enter the frequency and mode, then the desired memory channel number, then press **FUNC** and **MW** (Memory Write), and all the details are stored, over-writing any previous value stored in the memory channel.

It is important to point out that when storing frequencies into memories, that the mode and step-size will default to whatever they are set at prior to storing in the memories. It is entirely possible to store a large number of frequencies,

only to find that you have stored them with the wrong mode. I did this twice, first storing about 20 v.h.f. airband frequencies (that are all a.m.) with the mode set to f.m., and then storing a number of f.m. frequencies with the receiver set to a.m.

As with any receiver with so many memory channels, it's all too easy to forget which frequency is where, which ones have been entered, which ones are 'locked-out' and which have still to be entered. My interest is mainly in airband, so I decided to put frequencies for my local airfield (Heathrow) into one bank, other local airfields into another bank, airways frequencies in a third bank, and any *ad-hoc* frequencies in the last bank. With all these frequencies to enter, it only took two or three tries before I knew the programming sequence without having to refer to the manual each time.

One thing that did confuse me with scanning through memories, concerns the way that you start scanning any particular bank of memories. Imagine that you had filled bank 4 with a number of your favourite frequencies; it would be natural to assume that you would want to scan bank 4. When scanning, the bank numbers to use are one more than the bank number! To scan bank 4, you need to press **5** and **SCAN**. Once you have realised what is happening (or read the manual), you soon press the right key sequences, but initially it is quite confusing. To be fair, if this is your first scanner, you would not know



any different, but if you have ever used another model of scanner, it does tend to catch you out at first.

When you have all your frequencies in memory channels, and are happily scanning, at some point you will realise that you want to skip over certain channels for various reasons (e.g., blank carriers). This can be done by pressing the **PASS** key when the receiver stops on a busy frequency. The memory channel that is **PASS**ed will no longer be scanned next time round. When you decide that you want to include the **PASS**ed channel again, another press of the **PASS** key will reinstate it in the scan.

I was particularly impressed with the ability to scan through different memory banks in whatever order you wish. Just as in **SEARCHING**, where you can search complete ranges in different sequences, you can do the same with the memory banks. With Heathrow frequencies in bank 2, airways frequencies in bank 6, u.h.f. airband ones in bank 8 and my local airfield in bank 5, it is possible to search through these memory banks in any sequence (for example bank 6, then 2, then 5 and finally bank 8).

One rather interesting memory

The Yupiteru MVT-7100 wide-band receiver



memory channels. The first step is to mark each of your chosen memory channels as being part of the program scan; this is done by recalling the memory channel and pressing just two keys. To start the program scan, press another two keys; the receiver will rapidly scan through all the defined channels until a signal is detected. Once the signal has gone, scanning continues through the rest

of the memory channels in the program scan sequence.

Searching

The receiver comes with all ten search banks ready filled with upper and lower frequency limits. These are listed inside the rear of the manual should you ever need to reset them to their original values. The initial search ranges appear to be set for the American market, however, they are very easy to change to whatever you desire.

When setting a new search range, the first step is to set the mode (a.m., f.m. or whatever) and then the step-size (see later for details of the step-sizes available). Once this is done, you then enter the upper and lower frequencies, and the band-number, and that's it. The new details then over-write the old details. To start searching through the frequency range just entered, all you have to do is to press the band-number, and then the **SRCH** button, and the receiver will start searching between the preset limits in the mode that you specified, in the step-size that you told it.

During searching, if the receiver stops on a frequency with a blank carrier, or you wish to continue searching after stopping on an active frequency, all you need to do is to press the small Δ button, and searching continues upwards (or you can press **V** and search downwards). It is also possible to search through multiple frequency bands. By

entering the different search bands into different band-numbers, you can get the receiver to search through the first bank, then the second, and then the third, and so on.

This sounds confusing, so here's an example: In bank 1, we have 144.0 - 146.0MHz, in bank 3 we have 432.0 - 440.0MHz, and in bank 8 we have 70.0 - 70.5MHz. To search through all these separate bands, all you have to do is press **1, 3, 8** and **SRCH**. The receiver will search all the way through the 144MHz band, then the 430MHz band, and then the 50MHz band. It will repeat this cycle ad-infinitum. If you wish to spend more time searching through the 70MHz band, you can press **8, 1, 8, 3** and **SRCH**, and the receiver will search through the bands in that order.

When searching through a frequency range, it is likely that you will come across one or more frequencies that are blocked by blank carriers or data channels. These can be locked out of the search by pressing the **PASS** key. Searching will continue, but the next time round, the **PASS**ed frequency will be skipped over. You can specify a maximum of 500 frequencies to be skipped over, and the display will show **FULL** if you try to **PASS** more than 500 frequencies. Only those frequencies that are **PASS**ed during searching will be passed over in the search mode.

The manual says that the receiver will search through 30 steps each second, which is fast enough for most people. I spent many hours playing with the 'search' options, and I was impressed.

HF SSB Operation

As I mentioned previously, I wanted to spend some time using the s.s.b. capabilities of the MVT-7100. I would never expect to use h.f. s.s.b. reception whilst operating with the receiver as a hand-held, but I liked the idea of having an alternative to my trusty ICF-2001D. The supplied telescopic whip antenna is not really suitable for h.f. listening, so I connected the receiver to my G5RV via my antenna-tuner.

The MVT-7100 does not have a b.f.o., but has separate u.s.b. and

scanning function is the ability to scan only those memory channels that contain the same mode (i.e., a.m., f.m., etc.) as the mode at the start of the scan. This came in handy when I wanted to scan only the f.m. frequencies at my local airport; it means that you don't have to go through all the memories **PASS**ing all the frequencies that are not in the mode that you want to scan in.

As you would expect with a receiver with so many memory channels, there is the ability to define a priority channel. The priority channel is channel 1000, just like entering a frequency into any other memory channel. Any frequency (in any mode) that is stored in memory channel 1000 automatically becomes the priority channel. To start using the priority channel, you need to press the **FUNC** key followed by the **SRCH** (by first pressing the **FUNC** key, you will change the next key press to use the keys secondary function - in this case the secondary function is **PRI**). Once set, this channel will be monitored every 5 seconds, whatever the MVT-7100 is doing; this brief check of the priority channel can be seen working, as the frequency display will momentarily change to the frequency stored in memory channel 1000. To stop priority channel scanning, you have to repeat the above key presses.

One final memory scanning method is known as PROGRAM SCAN. This allows you to select any memories from the whole 1000, and to scan them in memory number order. This allows you to select frequencies from any of the memory banks, and to scan through them; this is almost an eleventh bank of

The Yupiteru MVT-7100 wide-band receiver

MVT-7100 Technical Specification.

Frequency range:	530kHz - 1650MHz
Receive Modes:	n.f.m./w.f.m./a.m./l.s.b./u.s.b.
Frequency Steps:	50Hz/100Hz (both only in s.s.b. modes) 1/5/6.25/9/10/12.5/20/25/ 50/100kHz
Sensitivity:	n.f.m: less than 0.5 μ V (SINAD 12dB) w.f.m: less than 0.75 μ V (SINAD 12dB) a.m: 0.5 μ V (SINAD 10dB) s.s.b: less than 0.5 μ V (SINAD 10dB)
Memories Channels:	1000
Search Pass:	500 frequencies
Search Bands:	10
Priority Channels:	1
Scan/Search speed:	30 channels/frequencies per second
Antenna impedance:	50 Ω
Power supply	12V d.c. or 4 x AA size batteries
Power Consumption:	(at max. output): 140mA
Stand-by:	100mA
Battery save:	10mA
Operating Temp range:	0 - 50°C
Dimensions:	84.4 x 155 x 38.2mm (h x w x d)
Weight:	320g approx, without antenna
Supplied Accessories:	7-section telescopic antenna, car power-supply cable, Ni-CD batteries (4 x AA size), hand-strap, belt-clip (with screws), earphone, operating manual.

l.s.b. modes, and very fine and precise step-size tuning. Tuning an s.s.b. signal takes some getting used to and because you have to tune in exact step sizes, sometimes you cannot get a good readable signal. The first thing to do to receive a s.s.b. transmission is to set the mode to s.s.b. This can be done by simply pressing two buttons, and turning the rotary control on the top panel until USB (or LSB) shows in the display; pressing **ENTER** will set the mode. Once the mode has been set, you can select the step-size; the smallest step-sizes (100Hz and 50Hz) can only be selected when the mode is set to either of the s.s.b. modes.

Frequencies are entered just as in any other mode. My usual test for s.s.b. signals is either of the RAF Volmet stations (4.722MHz and 11.200MHz), which operate 24 hours per day. By tuning to the former frequency, I was able to test the accuracy and stability of the s.s.b. circuit. To get a readable signal, I had to tune about 1kHz above their published frequency (i.e. 4.723kHz). I also tried listening to Gander Metro on 10.051MHz, but found that the signal was best on 10.052MHz (a full 1.2kHz above the published frequency). After 1 hour of listening, the frequency had not drifted at all, and was still higher than expected.

Part of the challenge of listening to h.f. s.s.b. signals is searching

around a known frequency to see if it has drifted. Although the MVT-7100 (or rather, the review model) appeared to be slightly off-frequency, it was still quite easy to search above and below a known frequency. I was not too put off by the difference, as I was able to find the required signals easily and quickly. It might be a different case if you were searching for an unknown frequency, but I would not recommend using any hand-held for this task. The only other hand-held receiver that is capable of resolving an s.s.b. signal is the AOR AR-1500 - it does have a proper b.f.o., but the smallest step size is 5kHz and tuning in either a l.s.b. or u.s.b. signal depends upon the precise setting of the b.f.o. The b.f.o. on the AR-1500 is extremely sensitive, and it is quite easy to knock it 'out of tune'. The small step-size and independent settings for u.s.b. and l.s.b. on the MVT-1500 get round this problem superbly. Because the MVT-7100 can store a mode and exact frequency in a memory channel, it does away with the need for a sensitive b.f.o.

Bad Points

The radio does not have many things that I could find to complain about. However, there are a few things that I would have preferred to be different. Primarily, I would like to have seen the earphone socket on the top of the receiver; currently it is on the side panel, so when any external speaker device is attached, it prevents you from putting the receiver into your pocket. This is only minor 'moan', but as I like to put a receiver in a top pocket to leave both hands free, I either need larger pockets or make-do without any earphones.

One other item that I am not keen on, is the wrist-strap supplied with the receiver. This is attached to a small metal loop, also on the side panel. I would like to have seen something more substantial, maybe a shoulder-strap attached to both side-panels of the receiver.

Finally the power-supply, there are no markings on the casing, or on the power-cord, to indicate the polarity of the power-supply socket; neither is there anything in the manual to explain this. For those who wish to use an existing mains adapter (or fit a suitable plug to a power supply), they will have no way of knowing which connection is positive and which negative.

Conclusion

The Yupiteru MVT-7100 is a superb receiver. It's very sensitive, has extremely wide-band coverage, and is just the right size for a hand-held receiver. The few items that I was not happy about are mainly mechanical and physical problems, rather than operating or programming problems. I was impressed by the numerous methods of scanning memory channels and I like the idea of being able to register the attenuator setting in a memory channel. The back-lit l.c.d. is clear and very easy to read and I liked the way that the back-lit display also lit the push buttons.

The price for the receiver is £449. My thanks go to Nevada Communications, (189 London Road, North End, Portsmouth PO2 9AE. Tel: (0705) 662145) for the loan of the review unit. I was very sorry to have to return it to them at the end of the review period...please can I have it back someday?

Listening for Tips

One of the more frustrating aspects of short wave broadcast listening is that most stations on the bands make regular alterations to their transmission schedules. Roy Spencer looks at how the listener can plan ahead and follow the changes on the bands.

The very nature of the short wave bands is such that many international broadcasters are forced to make frequency changes, sometimes at short notice. One of the reasons for this is to keep ahead of expected variations in atmospheric conditions, which may affect the reception of their signals.

Of course, stations do publicise any schedule changes, so regular listeners and those who are on the mailing lists need never miss their favourite programmes. Unfortunately, not all DXers are able to listen to a particular station every day, or even every week. Many also do not have the time to ask to be put on a mailing list. This means that, rather than listening being made easier, it may be more difficult. It can be rather annoying to carefully tune to the frequency of a well-loved station, only to discover that it is broadcasting in an unfamiliar language, or worse still - it is not there at all.

Luckily, help is available. Although not their primary audience, many international stations produce programmes specifically to help DXers and s.w. listeners to get the most out of their hobby. By occasionally tuning to a few of these programmes, it is possible to keep reasonably abreast of schedule changes, as well as gathering much more useful information.

Unlike most commercial organisations, s.w. broadcasters do not mind promoting their competitors, even though some stations' schedules may coincide with their own. The contents of the various specialist programmes does vary, so the best programmes to listen to will depend on the information you need.

Among the items included may be brief snippets of DX news and tips, propagation information and predictions of sunspot activity,

magazine-style features and interviews, along with the news of the latest developments in radio-related computer software and aspects of satellite broadcasting.

Some programmes also include news about pirate stations. If you are interested in this aspect of s.w. listening, you will find that some of the Sunday morning hobby pirates broadcast more free radio details than most DXers can cope with. For more information on hobby pirates, see 'Off the Record' in the July 1991 issue of *SWM*.

For the technically minded, the Radio Society of Great Britain has a regular Sunday morning news bulletin. This provides details of the current state of the bands, together with sunspot and propagation data.

Table 1 provides a quick glance to listening times which might be useful. However, it should be noted that the list is not exhaustive and you might have to experiment a little as to which broadcast can be received best at your location. Details are, of course, subject to change!

Hints & Tips

As most programmes offer a great deal of information, the following tips may be helpful: Unless you can write very quickly, tape record the programmes. Times, frequencies and addresses often benefit from a second listen. If your main interest is DX news, get this



from the European stations. A programme originating in the Americas or the Pacific is unlikely to contain much useful information for a listener in the UK. Organise the wealth of information that you will collect. This maybe done in a notebook or perhaps a system of index cards arranged by time or frequency.

To give you some idea of what to expect from DX programmes:

Austria: Radio Austria International produces *Austrian Short Wave Panorama*, a magazine style programme of features and broadcast news. Also included is a report from Glenn Hauser.

Bulgaria: Radio Sofia's DX programme gives news and tips, along with occasional interviews. The last programme of each month includes propagation predictions for the following few weeks. The show is broadcast several times during the week, but the first play is on Friday.

Ecuador: *DX Partyline* from HCJB celebrated its thirtieth anniversary in 1991. The programme offers very comprehensive coverage of all aspects of s.w. listening and DXing, including a section on DX clubs and newsletters. *Bandscan* details the stations which can be heard on a particular band in HCJB's part of the world. A list of DX clubs is available for one IRC from HCJB, Casilla 691, Quito, Ecuador.

Listening for Tips

Table 1

Day	Time (UTC)	Station	Programme
Sunday	0030, 0230 & 0500	HCJB, Ecuador	DX Party Line
	0815 (0915 summer)	Adventist World Radio	World DX News
	0900, 0930, 1000 & 1030	RSGB	GB2RS News
	1230, 1330, 1630 & 2330	Radio Austria Int	Austrian SW Panorama
	0018, 0218 & 0418	Swiss Radio International	Swiss Short Wave Merry-Go-Round
	0405	WWCR	Glenn Hauser's World of Radio
	1800	RSGB	GB2RS News
Monday	0835, 1035, 1135, 1250, 1435, 1635, 1835 & 2105	Radio Korea	Short Wave Feedback
	1930	Radio Sofia, Bulgaria	Austrian SW Panorama
	0330	Radio Austria Int	Glenn Hauser's World of Radio
	0000 & 1330	WWCR	
	0035 & 0635	Radio Korea	
Tuesday	0930, 1130, 1530, 1730 & 1930	Radio Australia	Communicator
	1335, 1605, 1830 & 1935	Polish Radio	
1st & 3rd Tuesday	1340, 1610, 2140 & 2340	Radio Sweden International	Media Scan
	0730	WWCR	Glenn Hauser's World of Radio
Thursday	0150, 0750, 0950, 1150, 1350, 1550, 1750 & 1950	Radio Netherlands	Media Network
	0030, 0415	Radio Sofia	
Friday	2215	WWCR	Glenn Hauser's World of Radio
	0050, 0250, 0350	Radio Netherlands	Media Network
	2115 & 2330	Radio Sofia	
Saturday	0730, 1000 & 1900	HCJB	DX Partyline
	0415	Radio Sofia	
	0618, 0918, 1118, 1318, 1518, 1718, 2018 & 2218	Swiss Radio International	Short Wave Merry-go-Round
	1930 & 2130	Spanish National Radio	
	2110	Voice of America	Communications World

Korea: Letters from listeners are answered in Radio Korea's *Short Wave Feedback*, but the programme includes a section called 'William Matthew's Technical Corner', which deals with DX news. They have a monthly prize quiz and acknowledge reception reports during the programme.

The Netherlands: Radio Netherlands International's *Media Network* lasts for about thirty minutes and is presented by Jonathan Marks. Many aspects of DXing are covered, with features and reviews of new equipment. The station has a range of excellent DX-related publications available free of charge. For details, write to Radio Nederland Wereldomroep, PO Box 222, 1200 JG Hilversum, The Netherlands. Ask for a copy of the current *Listener Services Catalogue*.

Italy: *World DX News* from Adventist World Radio begins each week with a look at broadcasting in a featured country. This offers a brief yet informative insight to the history of radio in the country concerned. Following this is a short programme of DX news and tips, with occasional receiver reviews, which is compiled and presented by the Danish Short Wave Clubs International. They

specialise in the tropical bands and medium wave DXing and welcome DX tips from listeners. Write to them at DSCWI, Tavleager 31, DK 2670 Greve Strand, Denmark.

Sweden: The longest running specialist DX programme is Radio Sweden International's *Media Scan* formerly *Sweden Calling DXers*, which has enjoyed over 1200 editions. The programme used to go out every week but nowadays it is broadcast only on 1st and 3rd Tuesdays, with a repeat on Wednesday. A few years ago, one programme could provide enough news to keep most DXers happy and the station would mail weekly bulletins to contributors. Sadly, those days are gone. *Media Scan* is now presented as a lively programme of DX features and radio related interviews and appears to favour news concerning recent developments such as satellite and packet radio.

Switzerland: *Short Wave Merry-go-Round* is Swiss Radio International's DX programme. It is presented by the Two Bobs - Zanotti

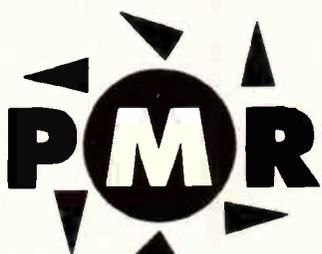
and Thomann - who specialise in answering listeners' technical questions. Sunspot reports and predictions are provided by the Royal Belgian Observatory. Address questions to the Two Bobs, Swiss Radio International, 3000 Berne 15, Switzerland.

USA: Several stations carry *Glenn Hauser's World of Radio*, but it can be heard well via World Wide Christian Radio. The programme includes very detailed information with plenty of DX news and tips. Equipment reviews and radio magazines are also featured.

In addition to these, Radio Australia's *Communicator* and the Voice of America's *Communications World* both offer magazine style news, interviews and features. Polish Radio, Poland and Spanish National Radio provide some DX news and tips and radio related features during their weekly programmes.

So, next time you are frustrated because you have 'lost' a station, or you need inspiration for a frequency to try, give one of these programmes a listen. Hopefully, it will add to your enjoyment of s.w. as well as helping to keep you up to date with the bands.





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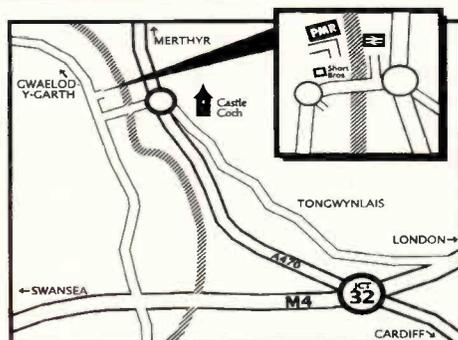
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Radio of the Fut

Since the start of radio broadcasting, short wave has been the only cost effective way of transmitting radio programmes across continents. Now, satellite technology has advanced to such a stage that it may be possible within a matter of years to supplement, and perhaps eventually replace, short wave radio with direct satellite broadcasting. Peter Shore gazes into the not too distant future...

A couple of years ago, the Soviet Union existed, student uprisings in China were being brutally put down and short wave radio was the most effective tool available to international broadcasters for the transmission of programmes. But then, within a matter of weeks of each other, two companies based in the United States put forward proposals which, they suggested, might revolutionise the way international radio programmes would be delivered to listeners.

Radiosat and WorldSpace proposed to launch satellites that would beam international radio services direct to small,

portable receivers in high quality audio without the reception problems that affect short wave signals. The two companies suggested slightly different systems. Radiosat wanted to use frequencies around 1.5GHz, whilst WorldSpace suggested that a higher band, around 2.5GHz, would be its preferred choice.

At first glance, the lower frequency proposal seemed to be most sound, especially, said Radiosat's Richard Marsten (a former member of RCA Astro Electronics Division and of NASA) as this band offers best reception characteristics using the least expensive satellite transmission and reception techniques. Losses at 1.5GHz are just about equal to v.h.f.-f.m.

But much depended on the outcome of the deliberations of the World Administrative Radio Conference, WARC-92, held in February last year, which was to discuss the possible allocation of frequencies to the proposed Broadcasting Satellite Services-Sound (BSS-Sound) envisaged by WorldSpace and Radiosat. The principal problem for member countries (known as Administrations) of the International Telecommunication Union (ITU), the organiser of WARC-92, was that frequencies around 1.5GHz are extensively used for communications by the military who clearly did not wish to relinquish access.

There was considerable debate, often acrimonious, as administrations fought to preserve their internal frequency allocations against international pressure. Eventually, compromise was reached, but resulting in a split allocation of three separate frequency ranges in varying areas of the world. Much of the world opted for the allocation of 1.452-1.492GHz, but others decided

on 2.535-2.655 and a third smaller group chose 2.310-2.360GHz. The map, in **Fig. 1**, shows the world-wide picture of the 1.5GHz allocation.

Proposals

Let us return to the pre-WARC proposals of Radiosat. The satellite envisaged by the company would have had enormous antennas, with apertures of between 28 and 50 metres, much bigger than anything in orbit at present. Such a large aperture means that the coverage area becomes very small, but this can be overcome by having 50 beams on each channel, with each beam covering an earth area of around 285 square kilometres.

The signals from the satellite would have to cope with natural and man-made objects on earth, but initial calculations by Radiosat's engineers suggested that the margins from the 3dB points are 12dB through foliage and 15dB through buildings. An incidental loss allowance of 2.5dB has been built in to those calculations.

Signal processing would be based on the European Eureka 147 standard for Digital Audio Broadcasting (DAB), which is likely to start being introduced experimentally on terrestrial transmissions in early 1995. Eureka 147 offers CD quality stereo sound, but Radiosat's intention was not to broadcast quite such high quality as the system allows. "International radio is mainly voice-based programming," says Marsten, "and so CD quality is not needed. But we will offer much better quality than current short wave audio".

As for the receivers, Radiosat claimed back in 1991 to have started exploratory talks with manufacturers, and said it would be possible to market L-band satellite receivers at



ure?

around US\$50 (£38). Each set would have a telescoping Yagi-type antenna with 13-15dB gain which, even when fully extended, would be relatively small. Digital tuning would be standard as ease of operation is one of the goals for BSS-Sound. In addition, car radios are a prime candidate for BSS-Sound, using a flat plate antenna built into the car roof.

Even if a satellite could be constructed and receivers sold in the consumer market place, there are still hurdles to be overcome. The allocation of space orbits is governed by treaties and any launch by a commercial company has to be regulated through a member administration of the ITU. Each administration may apply for orbit slots and indeed, the



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'parking places'. As one satellite is insufficient to cover the whole world, a minimum of three satellites in geostationary orbit would be required. Engineers are now thinking of using different orbits, perhaps highly elliptical, or even low earth, orbits for BBS-Sound. That increases the numbers of satellites required to

perhaps nine for global coverage. At a cost of between US\$100 million and \$150 million for each satellite, a great deal of investment is required.

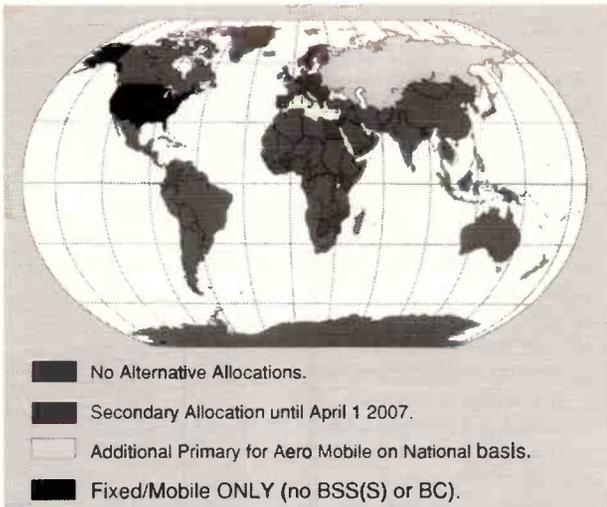
It is clear the BSS-Sound is not going to be the exclusive playground of the international broadcasting community.

The best way forward would be to encourage domestic broadcasters to make use of this new delivery

system. For countries such as Zaire, which has a similar area as continental Europe, yet a population of only 34 million, satellite radio would be a highly effective and inexpensive way of reaching the entire population without the need to invest in costly networks of medium wave or f.m. stations, whilst greatly improving reception over that currently offered by short wave. It is reported that intergovernmental organisations such as the World Health Organisation have expressed interest in the possibilities that satellite radio can offer in terms of education for the developing world. Perhaps, if domestic and international broadcasters can work together and other partners can be persuaded to join, satellite radio has a future.

The End?

Of course, if you are a 'died in the wool' DXer, the prospect of end of short wave radio is unattractive, as searching for the weak signals of domestic or regional short wave broadcasters is a particularly absorbing part of the radio hobby. Satellite radio will inevitably arrive at some point in the next ten years or so, but I think that reports of the demise of short wave radio as a communications means have been much exaggerated.



government of Tonga has been reported as taking steps to become a space broker, applying for tens of orbital positions with a view to selling them off to the highest bidder as the competition increases for the decreasing number of space

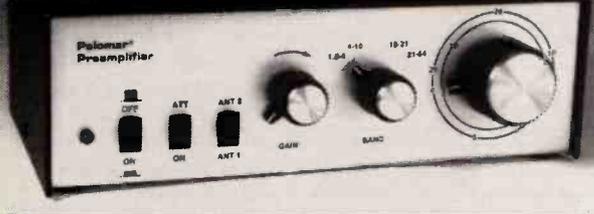
Gadgets and Accessories

Whilst it is possible to be a short wave listener armed only with a receiver connected to an antenna, the listening pleasure is greatly enhanced by the acquisition of appropriate accessories, says Matthew Probert.

A cursory glance through the pages of any radio hobbyist magazine rapidly brings to the attention of the reader the multitude of accessories available for the listening station. The problem restraining the novice short wave listener is which accessories will enhance his or her listening pleasure and which will only aid in the migration of the bank balance

antenna that is poorly matched to the receiver, such as a random long wire antenna, but little or no improvement when used with a correctly matched antenna, such as a commercial active receiving antenna. The a.t.u. has another, less publicised, use—that of reducing overloading effects when a poor quality receiver is used with an external antenna or when a

This unit combines a pre-selector with a pre-amplifier to give the best of both worlds to the listener.



from black to red!

The suitability of any individual accessory will vary from one short wave listener to another, being dependant upon individual circumstances and desire. An understanding of the use of individual accessories will enable a short wave listener to determine which items may prove beneficial in their receiving shack. Respecting the old axiom, 'one man's meat is another man's poison', the following description of accessories is arranged in alphabetical order.

ATU

An a.t.u., or antenna (aerial) tuning unit, is primarily designed for impedance matching the antenna to the receiver. This operation results in stronger signals being received from an

nearby transmitter causes interference on frequencies other than the one at which it is transmitting.

On the negative side, some a.t.u.s will provide little improvement with very badly mismatched antennas. The general opinion amongst experienced radio amateurs and short wave listeners is that an a.t.u. is essential for serious short wave listening.

Audio Filter

An audio filter is a box that connects the receiver and an external loudspeaker or pair of headphones and reduces the amount of noise heard.

Audio filters may be either 'passive' or 'active', an active audio filter being a device that

requires power from an external power supply.

Audio filters may be comprised of one or more of the following:

low pass, high pass, band pass or notch filters.

A low pass filter reduces high pitched (treble) sounds, such as 'monkey chatter' from adjacent s.s.b. transmissions. A high pass audio filter reduces the volume of low frequency (bass) sounds, such as mains hum. A band pass filter is a combination of low and high pass filters to eliminate both high pitched and low pitched noise. A notch filter eliminates a narrow band of frequencies, and is used for removing whistle from a signal.

An audio filter will often improve the readability of a received signal, but it should be remembered that it only affects the audio signal and, as such, distortion caused by adjacent transmissions will not be improved by an audio filter; an audio filter is not a replacement for a high quality i.f. crystal filter!

Cassette Recorder

Many communications receivers allow a cassette recorder to be connected so that transmissions may be recorded. If you are interested in collecting broadcast station QSL cards, then a cassette recorder will prove to be invaluable so that you may record a programme and play it back whilst making notes of the programme's contents for reception reporting.

If your communications receiver is equipped with a timer and remote socket, a cassette recorder may be used for recording programmes whilst you sleep or are otherwise engaged.

Clock

A clock is vital for noting the time of programme details when reporting reception to broadcast stations. Notice that the time should be UTC (GMT as it used to be called) and must be accurate!

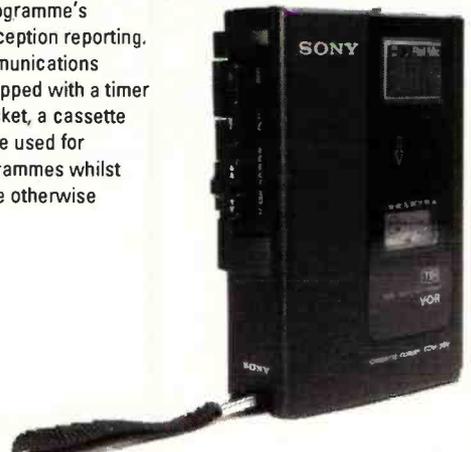
Computer

A computer can be used for controlling some communications receivers or, with suitable software, for decoding Morse code, RTTY, FAX and slow scan TV signals. The only problem with a computer in the shack is the large amount of interference that can be generated by the computer, which unless you can find some way of preventing it reaching the receiver will obliterate all but the strongest signals. The problem of interference should not be underestimated, but is not guaranteed to be a problem.

External Loudspeaker

The readability of received signals will often be improved by the connection of an external loudspeaker. An external loudspeaker is also useful for use with an audio filter.

This Sony cassette recorder was reviewed in the September 1991 issue of SWM.



for Short Wave Listeners

Frequency Allocation Table

It is essential when searching for specific radio signals to know their approximate location within the short wave spectrum. A frequency allocation table will provide you with the allocations of each part of the short wave band to the various services; Amateur, aviation, marine, military, etc. Alternatively, a good frequency guide is a valuable aid.

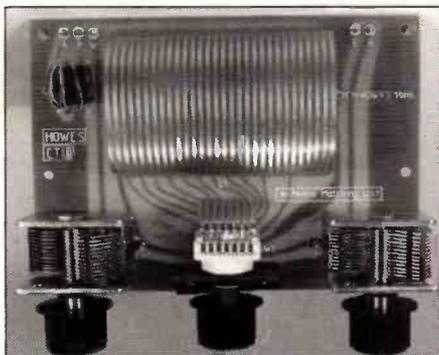
Great Circle Map

A Great Circle Map is a world map in a circular format centred on an individual country or town, often London. Around the edge of the map are printed directional bearings from 0 to 360°. If you are using a rotatable directional antenna, a great circle map centred on your country will enable you to point your antenna at the desired part of the world.

Headphones

A pair of headphones are essential for maintaining domestic peace during those midnight DX sessions! At other times, headphones keep out domestic noise and interference ranging from the sound of the TV to requests to do the washing up. All things considered, a useful addition to the shack!

If you don't want to buy a ready-made a.t.u., why not have a go at building your own?



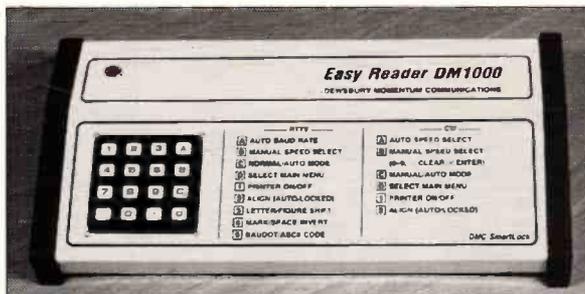
Log Book

A log book enables details of transmissions received to be recorded for posterity and cross referencing. A log book can be very useful for reminding you when and where a particular broadcast station may be received, and for keeping track of how many countries have been received.

Morse/RTTY Decoder

A Morse/RTTY decoder or reader is a box that connects to the external loudspeaker socket of the communications receiver and decodes the received tones into text that may be displayed either on a built-in monitor or on a connected television screen.

At first thought these little black boxes are quite fantastic,



decoding all those bleeps and whistles from government embassies and Morse signals from low power amateur stations effortlessly. There may be, however, a few negative issues. Depending upon your receiver, the decoder may have

to be connected to the external speaker socket of the

communications receiver. It is then not possible to simultaneously listen for suitable signals and decode them. Instead, you must tune into a signal, plug in the decoder and hope you have tuned in correctly. If not, you have to tune in 'deaf', always assuming that the station being decoded is still transmitting! Even if you do get tuned in correctly, these automatic decoding machines can have trouble with hand-sent Morse code.

Pre-selector

If you have a receiver that is prone to overloading, or if you are bothered by local transmitting stations breaking through into the other received transmissions a pre-selector may help reduce the problem. A pre-selector is a box that connects between the receiver

it will need to be connected to an external power supply.

Receiver Pre-amplifier

Weak signals may be boosted by a receiver pre-amplifier connected between the antenna and the receiver. These devices should be used with care as they can cause overloading of the receiver front-end, which manifests itself in symptoms of distortion, noise and broadcasts being heard on frequencies other than the one they are transmitted on. This symptom being called 'harmonic reception', and is a very big nuisance to short wave listeners.

By now hopefully, you will have some idea of what is available for the enhancement of your listening pleasure, and know a little more about those peculiar add-on devices which are so frequently advertised, and yet so rarely described. I'm sure some of you can think of others, but at least this article may start you thinking that a radio and antenna isn't the whole picture.

Good listening!



and the antenna and allows you to tune it to only accept radio signals with a narrow band of frequencies reaching the receiver antenna socket. Some pre-selectors are passive devices, others may contain a pre-amplifier to boost the

wanted signal, in which case

Both these decoders are popular with s.w.l.s. You don't need a computer, just plug these into the external speaker socket. It's a good idea to invest in a 'Y' adaptor so that you can plug in an external speaker as well as the decoder.

Organise your DX Time

Do you ever feel you are not using your DXing time as effectively as you could? Perhaps you have missed a programme because you were unable to find your note of the station's new frequency. Or you have an hour or so to spare but can't decide on a station or band to try for the most likely success. Roy Spencer believes a little time organising your listening post could help overcome these frustrating problems.

A reasonably active DXer or short wave listener can accumulate a surprising amount of paper in a short period. Along with replies to letters and reception reports, there may be unsolicited new schedules and magazines. Add to these notes of new stations to listen out for and details of stations already heard and you can have quite a pile!

Many of us have demands other than DXing on our spare time, so it is useful to have our listening post in some sort of order. Then when you

in time order. If your DXing time is always during the same hours, you will, of course, not need details for the whole day.

On each card, I enter details of those stations which I might be able to hear at that particular time. A typical entry shows the station's name, country, frequencies used and the time the broadcast is expected to end. An example of a card is shown in **Fig. 1**.

If I wish to spend some time DXing at 2000, for example, I simply

Schedules

Most international broadcasters send out two or more frequency schedules or programme guides each year. It doesn't take long before they form an unruly heap on the desk or the floor. It is worthwhile to extract useful information from

each schedule as soon as possible, then file it away.

When a new schedule arrives, transfer the required details onto the appropriate time cards, ready for use. Mark all entries in pencil, so they may be erased when necessary.

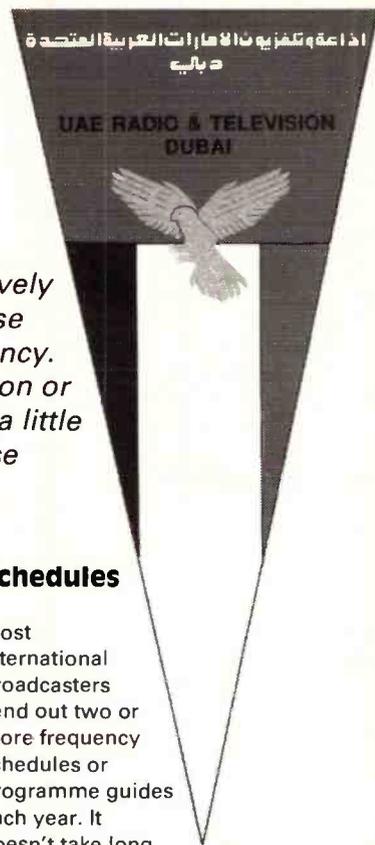
File schedules

away in alphabetical order - first of country, then name of station. They may be stored in a variety of ways, from ring binders to shoe boxes or perhaps in a drawer. So long as they are easy to find if they are needed again!

Log Book

A log book is invaluable for recording facts to help in finding a particular station on a later occasion, as well as bring of historical interest.

My own log records details of



2000

WCSN, USA 13770 (2000)
Switzerland 3985, 6165, 9535 (2030)
Portugal 11740 (Mon-Fri only) (2030)
Pyongyang 9325, 11760 (2100)

Fig. 1: A typical index card.

Fig. 2: A page from a log book.

Frequency	Date	Time Start	Time End	Station & Country	Programme details	SINPO
5930	2	1819	1827	R. Prague International	'Listeners' Review' - pornography in Czechoslovakia	54444
15575	2	1828	1829	R. Korea, Seoul	Mineral water in Korea	44334
21480	2	1905	1910	HCJB, Ecuador	Preview of 'DX Partyline'; News	44343
6190	2	2256	2300	Swiss R. International	'Swiss Shortwave Merry-Go-Round'	54444

have a few spare moments, the time is not wasted by hunting around for the latest programme schedule or the address for a reception report.

Probably the most important information to keep to hand is details of what you can expect to hear during your DXing hours. The way you keep the information is a matter of personal taste but it must be easily found when needed. I keep a series of index cards, measuring about 150 x 100mm. There is a separate card for each 15 minutes of the day, from 0000 to 2345 and filed

find the card for that time and check the notes for suitable stations/frequencies to try.

You may prefer to keep the information in an exercise book or loose-leaf binder. I have found that these methods, while fairly satisfactory, are more awkward than cards to work with and pages soon become worn.



broadcasts heard as follows: the date, start and finish times, frequency in kilohertz, station name, country, location of transmitter if relay is in use, brief details of the programme, language if other than English and SINPO rating. A few entries in typical log are shown in **Fig. 2**.

It may be useful to keep separate log books for different types of station, such as a.m., f.m., s.w., utility, amateur and so on, depending on your interests.

Letters Sent

It is a good idea to keep track of correspondence sent and awaiting reply. To do this, I use sheets of A4 paper, divided into columns for the destination, date sent and date of any reply which is later received. A notebook would be equally effective for this purpose.

A quick glance at the Reply column shows which letters are outstanding at any time.

Additional columns may be included according to your own needs. They might be for the cost of any return postage submitted, the length of time taken to receive a reply or brief details of the correspondence.

Stations Heard

If you have heard or verified a number of stations, you may be



unable to remember whether or not you have a QSL card for a given station. I use index cards for this purpose also. Using a card for each station, they show the broadcaster's name and country, with notes of the date that the broadcaster was first heard and whether a QSL card is held or awaited. Like schedules, the cards are filed in order first of country, then station.

Clock

It is almost essential to keep a 24-hour clock in the shack, set to UTC/GMT at all times. It can be more than a little confusing to hear announcements in UTC when looking at a clock which is set to BST!

Reception Reports

Whilst it is not really necessary, it can be useful to keep a carbon copy of each reception report which is sent. It may be convenient to file these in date or station order, according to the number you send out.

New Information

DX news, hints and tips can come from a variety of sources, from specialist radio programmes and club bulletins to the 'Long, Medium & Short' section of *Short Wave Magazine*.

It is vital to record this new information as soon as possible so it can be used whilst it is fresh. Record suggestions for new frequencies to try on the index

cards for the appropriate time. As many news items lose their validity after a short time, I also note the date of the item on the card. If I have been unable to confirm a

particular tip after a few weeks, it is erased.

QSL Cards

I used to display my QSL cards on the wall of my listening post but as my collection grew, there were constraints on space. I tried storing them in country order in a shoe box, but as the cards do not come in a standard size this was far from satisfactory.

I now keep QSLs in scrap/cuttings books, which are available from most stationers, newsagents and even some supermarkets.

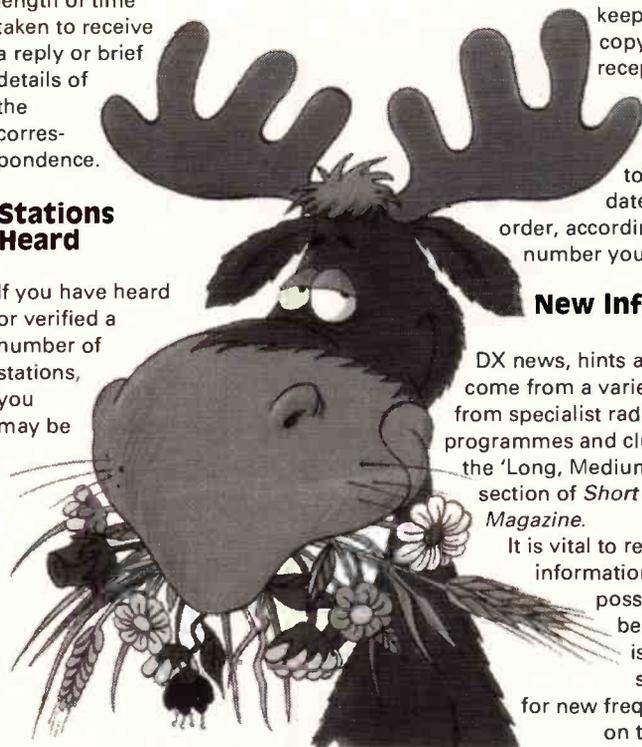
The cards themselves are held firmly into place by transparent photograph corners. Each cuttings book comfortably stores about 100 QSLs. As QSLs may only be displayed with one visible side, it is possible to enter any desired information adjacent the appropriate card.

Stickers and Pennants

Stickers may be used to decorate covers of the QSL books, but this is impossible for those which are intended for display in a car window. These may be displayed in picture frames, by sticking the outward side of the sticker to the glass. A disadvantage of this, apart from the obvious cost involved, is the amount of wall space taken up by the frames.

Pennants pose a different problem. They are best displayed by pinning to the wall as decoration, although they do seem to attract dust - particularly those produced in fabric. To avoid dust, pennants may also be displayed behind glass, but due to their size this could be expensive.

There are probably a few other ways you could improve the efficiency of your listening post, depending on your level of activity and interest. Although the initial setting up of a system similar to that described here may take a few hours, the investment in time is well worthwhile for later listening sessions.



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Aids to Better Reception

It's not everyone who can afford the latest hi-tech short wave receiver these days, so one is tempted to look around for alternatives if one wants to improve one's receiving facilities. This can often be done by the addition of supplementary units, says Arthur C. Gee.



The performance of the middle range short wave receiver can be much improved by the addition of two units that are all too often ignored by the s.w. listener. I have recently invested in a couple of such units that have produced a very worthwhile improvement to reception facilities.

The first of these is a pre-selector for the antenna side of the set-up. One so often spends considerable amounts of time and money erecting as effective an antenna as one can and yet the improvement in the antenna system possible by the use of a pre-selector unit is quite overlooked.

For the past year or so, I have been using a Hamgear PMX Pre-selector made by **Hamgear Electronics, 125 Wroxham Road, Sprowston, Norwich**. This is a very nice little unit that fits conveniently on top of my Trio R-600 receiver. It tunes in six switched ranges covering 1.7 to 34MHz, with antenna load and gain controls brought out to the front panel. It requires a minimal 12V 40mA d.c. power supply that can be provided by a battery or a.c. power supply.

The literature that comes with it gives full instructions on how to connect up and tune for the best results. Attention is drawn to the improvement made when used with the antennas frequently pushed into use by the average s.w. listener, such as any odd length of wire, be it vertical or horizontal, where restricted space only is available or when anything from the picture rail, loop antennas, window sill whips or even garden fence is used as an

antenna. Experience over the past few months thoroughly confirms the value of installing such a unit.

The second unit recently installed is an audio filter unit. As I wanted something to enhance c.w. signals, I was more interested to hear of a unit being launched onto the market by Stuart Dodson G3PDD, an old friend of mine who now lives in the next village to me. A phone call soon brought him round with one to try out.

Its principle facility is its ability to copy very weak signals which are below the level the human ear can resolve or are buried in the noise. It does this by wiping out the noise present in the receiver output and then amplifying the signal.

Audio filters really come into their own when band conditions are going out and the ionised layers of the ionosphere, which are responsible for refracting the radio waves, are breaking up when only low angle singles are refracted.

With such conditions only DX stations can be heard but not copied due to heavy noise present and the very weak nature of the signals. Obviously something is required to cut out most of the noise and at the same time provide some useful amplification.

This is when an audio filter comes into its own. A demonstration of Stuart's prototype receiving a c.w. signal through heavy noise, so weak that one would not have bothered to try to copy it, soon proved the claims

made for it. The filter easily changed it into a signal too loud to wear headphones. Such comments as 'Using the filter is as good as having a four-element beam at sixty feet' and 'With this filter you will be able to listen to the insects talking to one another!' are thoroughly justified. This latter comment led to the unit being named the Insect Filter.

Not surprisingly, a filter of this high performance and gain requires both input and output attenuators. These are provided with front panel controls. These are calibrated in S-points rather than dB as S-point indication is more understandable to the uninitiated dB. Up to 10 S-points or 100dB of attenuation are provided for.

It comes in a smart metal case 200mm wide by 150mm deep by 75mm high and requires a d.c. power supply around 13.8V. Listeners with computers will be interested to learn that provision can be made for a built-in flexible computer terminal giving outputs at audio frequencies, t.t.l. and RS232C.

The unit is available as a kit or ready-made and tested and a 'get you going alignment service' is available if required. Full details from: **Stuart Dodson, The Haven, Lound Road, Blundeston, Lowestoft NR32 5AT. Tel: (0502) 732322.**

Pre-selector and Audio Filter units both built-up and in kit form are readily available, of course, apart from the two mentioned herewith, but the principle of the improvements made is the same no matter what the origin of the units might be.

A Short Wave Tour of the Caribbean

No matter how Central America and the Caribbean were created they offer any number of interesting and enticing targets for DXers. My purpose here is to review the current short wave broadcasting scene in this area and, I hope, offer some help in tuning in these stations.

Short wave broadcasting in Central America, as well as the Caribbean, is in nowhere near as healthy a state as it was 20 or 30 or 40 years ago. A quick check of the 1967 edition of the *World Radio TV Handbook* shows listings for more than 20 short wave stations in Honduras, over 25 in the Dominican Republic, over 20 in Haiti, seven in Nicaragua. A decade ago, Nicaragua was down to four, Honduras and the Dominican Republic seven each and Haiti four.

The numbers have slipped even further in the past decade. Trinidad, Jamaica, the Turks and Caicos Islands, Grenada, Martinique, Panama and Belize had stations years ago but are not represented on short wave today. Central American short wave seems to be an endangered species, particularly the commercial stations for which short wave doesn't really serve much of a purpose any longer.

It seems that fewer and fewer people in Central America own or listen to short wave radios. Even most of the governments no longer operate short wave stations, though most have at one time or other in the past.

The short wave transmitters of commercial stations are, in many cases, little more than an afterthought - sometimes even a now and again hobby of a station owner or chief engineer and not high on the list of priorities when it comes to making a living. If a transmitter breaks down it may not get attention any time soon - if ever!

Still, given all these negatives, every now and then a new religious or even commercial short wave station does appear and hope springs anew that perhaps, just perhaps, a resurgence is right around the corner.

The stations often operate with split schedules, meaning they are on the air for a few hours in the local morning and again for a period in the local evening. This is sometimes due to economic factors, perhaps to conserve fuel or because of electric power supply shortages, or it's a

case of there really being no need to be on in the middle of the day.

The numerous church or missionary-run stations devote much of their broadcast time to programming in local Indian languages, so Spanish is not necessarily the language one will hear.

I've supplied mailing addresses for DXers who like to send reception reports and seek QSL replies. Except for the larger, more established religious broadcasters (such as AWR and TIFC) reports in Spanish are recommended. Return postage should also be included - in the form of mint stamps of the country in question or International Reply Coupons, though IRCs are of little use in the smaller towns.

This listing does not include the BBC and Deutsche Welle relays at Antigua nor the new Radio Exterior de Espana Costa Rica relay since they are quite easily heard and provide no local flavour in their programming.



XEQ at the University of San Luis Potosi, Mexico, is active on short wave only rarely.

Costa Rica

Costa Rica has a fairly even mix of religious and commercial broadcasters, though the commercial stations are not as consistently active.

Radio Reloj is one of the oldest continually active short wave

When God flung the earth into orbit, He may well have grabbed the globe right in the middle of the Western Hemisphere; that big squeeze creating Central America - with little bits spitting out into the waters, becoming islands in the Caribbean. Gerry Dexter takes us on a radio tour around the area.

stations in all of Central America, even without tracing its roots back to its short wave predecessor, Radio Cristal. Part of the large Sistema Radiofonica HB group, TIHB operates 24 hours a day on 4.832 and 6.006MHz, using 3kW on each frequency. It's easily spotted by the time checks aired every minute. In between are news headlines, sports results, social and general announcements. The station proclaims itself 'numero uno en Costa Rica'. Reception reports go to Apartado 341 1000 San Jose.

Faro del Caribe, the 'Lighthouse of the Caribbean' is one of the world's older missionary stations, but unfortunately, not as well heard as it was years ago, due to frequency and schedule changes. TIFC began in 1948 and was Costa Rica's first non-commercial station. The frequency of 5.055MHz is used with 5kW between 1000-2000 and 2300-0600 (with English from 0300 to 0400), 6.175MHz with 2.5kW operates from 1000 to 2000 and 9.655MHz, with 500W, from 1000 to 1800. The station is a good verifier. The address is Apartado 2710, 1000 San Jose.

AWR Latin America, also known as Radio Lira, is one of the several short wave stations operated by Adventist World Radio. It expanded its original facilities after the purchase of the transmitters once used by the now silent Radio Impacto, located at the town of Cahuita. The frequencies used are 5.030, 5.970, 6.150, 9.725 (sometimes 9.722.5), 11.870, 13.750 and 15.460MHz, with transmitter powers of 20 and 50kW. The main broadcast periods are 1100-1500 and 2300 to 0500, though not all frequencies are in use for both. Each period includes from one to two hours of English. The station is an excellent verifier of

Central America and



Radio K'ekchi', 4.845 MHz, serves those speaking the K'ekchi' language and is well heard in North America.

reception reports, which can be directed to: Apartado 1177, 4050 Alajuela, Costa Rica.

Radio Casino, at Puerto Limon is usually a difficult catch, even for listeners in North America who are, obviously, in a much better position to log it. That's due to the station's frequency (variable 5.953MHz), which often means it's buried under signals from strong international broadcasters. TIQ runs one kilowatt and is scheduled from 1030-0600, including English from 0400 to 0600 and at 1100 to 1200. It's also said to carry some Spanish language programming from the Voice of America. The most opportune time for reception would seem to be during the last hour or so its UTC morning schedule. Write to: Apartado 287, 7301 Puerto Limon.

Radio Rumbo, TICAL, located near the town of Cartago (at the foot of the Irazu Volcano), is one of many Central American stations that seem to be active on only a periodic basis though perhaps, in this case, it may simply be that we're unable to hear the station on anything like a consistent basis. It runs 3kW on 6.075MHz, operating from 1100 to 0530 with all Spanish, commercial programming, featuring mostly Latin American music. The potato cartoon character on its QSL is a reflection of the area's agricultural speciality. The mailing address is Apartado 140, 7050 Cartago, but the transmitter is actually at nearby Taras.

Radio Universidad de Costa

Rica is a non-commercial outlet carrying news, educational and cultural programming as well as programs from various international broadcasters. It first went on the air in 1948, although short wave activity has been on a rather on/off basis over the years. The station is located near San Jose, at San Pedro Montes de Oca, on the Rodrigo Facio campus of the University of Costa Rica. TIUCR uses 6.105MHz with 2kW from 1258 to 0400. Reception reports should be sent to Ciudad Universitaria Rodrigo Facio, 1000 San Jose.

Radio For Peace International.

This station was established seven years ago on the campus of the United Nations-affiliated University for Peace and is also connected with World Peace University of Eugene, Oregon. The programming is largely in English and is a rather eclectic mix that tends to tilt to the left of the political spectrum. Radio For Peace International has expanded steadily, adding hours, frequencies, transmitters and higher power. It now operated 24 hours a day, though not all frequencies are in use around the clock. Transmitter powers are 2, 5 and 30kW. Check 7.375MHz (24 hours), 7.385MHz (mostly using upper sideband) running 0000-1200, 13.630MHz 24 hours, mostly in u.s.b., 15.030MHz variable, 1400- to 0800 and 21.465MHz variable operating 24 hours. Reception reports go to Apartado 88, Santa Ana, Costa Rica.

Cuba

It will be interesting to see what happens to the broadcasting picture in Cuba after Castro retires. Surely we can expect an explosion of private broadcasting! Perhaps some will even use short wave. Meantime, the choices are limited.

Radio Havana Cuba is the only government-operated broadcaster in the area that uses short wave on a regular basis. Although economic hard times have forced RHC to drop some of its languages, services and frequencies, many are still in operation and RHC is not hard to find on the short wave dial. Try English beamed to Europe from 2100 to 2200 on 17.705MHz. QSLs may take a while to arrive. RHC's address is

Apartado 6240, Havana, Cuba.

Radio Rebelde - Named after the clandestine station Castro had up in the mountains before he came to power, Radio Rebelde is one of several multi-station networks in Cuba. The two short wave transmitters are located at Bauta and use 3.365MHz variable with 500W and 5.025MHz with 10kW. The schedule nominally runs from 1030 to 0500. Reports go to Apartado 6277, Havana 6, Cuba.

Dominican Republic

Short wave broadcasting from the Dominican Republic is not in a healthy state, although there have been two or three times in the past couple of years when the patient seemed to improve, only to have a relapse. Radio Clarin, the best known Dominican Republic station in recent years, is permanently off short wave.

La N-103, or simply 'La N', this station made a brief appearance during 1992 then vanished. It is worth keeping an ear out for a possible return, however. The station, with call letters HIQQ, relayed its sister f.m. outlet on a 60m frequency varying slightly around 4.800MHz, operating between 1000 and 0600. Address: Apartado 320, Santiago.

Radio Barahona is another station that came on short wave (18 July 1990) was active for a time, but then disappeared. Whether this is to be permanent or not is impossible to say. HI5V was using a healthy 5kW on somewhat variable 4.930MHz. Check between 0000 and 0400. It can be reached at Apartado 20339, Santo Domingo. Incidentally, there are at least two Dominican Republic broadcasters that have licences to operate on short wave but have never done so.

Radio Cima Cien is another fairly new one on the short wave bands. The programming is almost all local music - the salsa and caniendo. The few announcements during the late evening (local) are usually only mentions of 'Cima Caniendo' and 'Cima Salsiendo'. HIVR operates on variable 4.960MHz with 1kW from 2100-1000, though it often signs off as 0400 or 0500. The first QSLs from this one are now being received from Apartado 804, Santo Domingo.

Radio Amanecer Internacional is operated by the Seventh Day Adventist church and has been fairly

A Short Wave Tour of Central



consistent in its operation in recent years. H1J uses 6.025MHz with 5kW between 1000 and 0400. At one time it aired programmes intended for listeners in the United States and may still. Reports go to Apartado 1500, Santo Domingo. The station is pretty good about replying to reception reports.

Radio Estrella is the newest short wave station from the Dominican Republic. Radio Estrella is 6.205MHz (power and call unknown) and runs a quite variable schedule. It's been heard to sign off as early as 0010 and as late as 0439. The address is Apartado 135-2, Santo Domingo.

Radio Santiago, HIAZ, is often heard on one of the few 31m band frequencies in use in Central America. It has a history of irregular operation, however. Check variable 9.878MHz between 2300 and 0400. There are occasional English identification announcements on this commercial station - 'This is Radio Santiago, International Wave'. the address is Apartado 282, Santiago.

El Salvador

There is only marginal short wave activity from this tiny country. The former clandestine station Radio Venceremos has now 'gone legit' and is operating an f.m station. Now and then this also appears on short wave. It is scheduled from 1200 to 1500 and again at 0000 to 0300 or 0400 but operations are irregular. The last reported frequencies were, variously, 6.300, 6.320 and 6.750MHz. The government's Radio Nacional continues to ignore short wave, as it did through the civil war.

Guatemala

Commercial short wave broadcasting is not allowed in Guatemala, so the only stations on the air are the religious and educational types. some are run by Catholic groups, others by Protestants. In many cases the stations operate on a split schedule - a few hours in the local morning, off during the daytime, then back in the evening. Most of the stations broadcast all or part of their day in local indian languages. You'll hear a lot of ranchera and marimba music, too. All frequencies mentioned may be slightly variable.

Radio Maya de Barillas. Run by

the American Evangelist Missionaries, Radio Maya was founded in 1962 and uses two transmitters - TGBA on 2.360 and 3.325MHz, both operating from 1030 to 1400 and 2330 to 0330 and both using 1kW. Not surprisingly, the 90m band outlet will be much easier to hear than the 2.360MHz frequency. Reports may be sent to Radio Maya, 13026 Barillas, Huehuetenango, Guatemala.

La Voz de Atitlan. Located at Santiago Atitlan, on the shores of the famous lake, this station was started by the Diocesis de Oklahoma (USA) in 1968 and later turned over to a local community group. In 1980 the station director was kidnapped and murdered by a right-wing military group. Several other community leaders also disappeared and are believed to have been murdered. Broadcasts stopped in 1980 and resumed in 1982. TGDS uses 1kW on 2.390MHz between 2200 - 0115 (Sundays 1900 to 0000). The address is simply Santiago de Atitlan, Departamento, Solola.

Radio Cultural, popularly known as TGNA, got going in 1950, under the operation of the Central American Mission (now CAM International). It broadcasts religious, cultural and educational programming in Spanish, English and several indian languages. TGNC uses 3.300MHz with 10kW from 0955-0630, with English from 0300 to 0430 (Sunday 2345-0430). TGNA uses 5.955MHz with only 250W from 1000-0630. Its QSL card, showing the quetzal bird, is in many an s.w.l.'s collection. Reports go to Apartado 601, 01901 Guatemala City.

La Voz de Nahuala is operated by the Diocesis de Spokane (USA) and airs the majority of its

Radio XE UJ, Linares, Nuevo Leon, Mexico on 5.980MHz has been inactive for some time, but apparently still holds its short wave licence.

programming in the Quiche language. TGVN uses 3.360MHz with 1kW between 1100 and 1400 and again from 2100 to 0300. The same hours apply to the 5.040MHz transmitter, also operating with 1kW. Letters to La Voz de Nahuala, Nahuala, Depto Solala.

Radio Tezulutlan began in 1975 and is largely funded by the Catholic church in Guatemala. The name, incidentally, is a K'ekchi indian word for 'land for war'. TGTZ began using 3.370MHz with 1kW two years after it opened with 5kW on 4.835MHz. The schedule is 1100 to 1600 and 2100 to 0300, though that will vary at times. Reports go to Apartado 19, 16901 Coban, Alta Verapaz.

Radio Chortis, from Jocotan, a town of about 2500 in Chiquimula Department, is operated by the Jocotan Catholic church. Like all the other Guatemalan short wavers, Chortis concentrates on educational programming for a local audience along with religious and cultural programmes, announcements on behalf of individuals (called 'avisos') and a radio school of the air. It operates TGCH on 3.380MHz using 1kW from 1100 to 1300 and 2100 to 0300. Address: Central Social, 20004 Jocotan, Chiquimula.

Radio Buenos Nuevas. On the air since mid-1987, this station is owned by a group of 29 Mam churches to serve the approximately half a million Mamindians in the area. The station operates with 1kW on 4.800MHz from 1100 to 1400 and 2200-0230. listen for the Spanish language ident 'desde el corazon del territorio Mam en San Sebastian, transmite Radio Buenas Nuevas'. Reports to TGBA go to 13020 San Sebastian, Huehuetenango.

Radio Mam, not surprisingly from its name, also specialises in serving speakers of the Mam language. It is owned by the Asociacion Cultural Mam (Mam cultural Association) and has been broadcasting since 1975, with TGMN, 1kW on 4.825MHz from 1300 to 1700 and 2000-2330. The station can be addressed in care of Acu'man, Cabrican, Dept Quetzaltenango.

Radio K'ekchi' recently celebrated its fifth year of service to the K'ekchi' indian population in Alta Verapaz Department. The station is funded by an association of Baptist churches serving this part of Guatemala. programmes are in both K'ekchi' and Spanish. TGVC's 2.5kW

America and the Caribbean

Radio Reloj de Costa Rica is one of the region's most stable stations when it comes to short wave activity.

signal can be heard on 4.845MHz from 1100 to 1700 and 2100 to 0300. Reports go to the station in the small town of Fray Bartolome de las Casas, 16015 Alta Verapaz.

Union Radio/AWR Guatemala - Also known as La Voz de la Iglesia Adventista in Latinoamerica, the station was originally intended to be AWR's main outlet in Latin America, until that honour was given to the Costa Rican station. AWR Guatemala operates from large and modern studios in the capital and, in addition to its own programming, airs programmes from a number of different AWR production sources. A single 5kW transmitter operates on variable 5.982MHz (usually slightly lower) from 1200 to 1500 and 0000 to 0200. The call letters are TGUMA. The address: Apartado 51-C, Guatemala City.

Haiti

Several Haitian medium wave stations used to be at least occasionally active on short wave - Radio Citadelle, Radio Lumiere, La Voix de l'Ave Maria, La Voix du Nord Ouest, among others. The last one known to be active, 4VEH Cap Haitien on 4.930MHz, has not been heard from in some time and is believed to be silent on short wave. It most recently used 1.5kW and broadcast to about 2300 a sign-off.

Honduras

Although there are not many stations on the air from Honduras, there is, at least, a mix of religious and commercial outlets, although the latter are on-again, off-again situations with little real effort put into maintaining a short wave service, much less building one. A couple of stations, Radio Landia - 4.965MHz in particular, appear briefly every few years and then go off again.

Radio Luz y Vida (light and Life) is operated by the Emmanuel church of Honduras and supported by the US-based Evangelistic Faith Missions. HRCP, with 1kW on 3.250, slightly variable, has been on the air since 1980. It operates from 1230 to 1630 and 2200 to 0400 and is located on a ranch north of the town of San Luis. The mailing address is Apartado 303, San Pedro, Sula.

Sani Radio started broadcasting in mid-1986, using 4.755MHz and

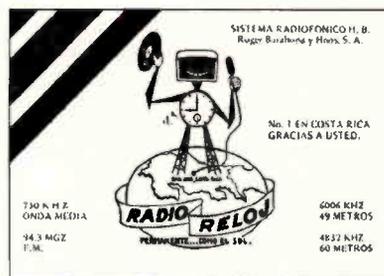
running 10kW. Then it went silent for a period, later appearing on 6.299. In recent months, however, it seems to have gone silent yet again. The station was financed, in part anyway, by the United States government's Agency for International Development (USAID). A nominal schedule is 2000 to 1600 and 2000 to 0200 in several different indian languages. It is located in hot and steamy Puerto Lempira. The mailing address is Apartado 113, Le Ceiba.

La Voz de Evangelica, another Protestant religious broadcaster, has been on short wave since 1965. The station is certainly one of the longest and most consistently operating short wave station in Central America. HRVC is widely heard with its 5kW transmitter operating on 4.820MHz from 1030 to 0500, with English aired on Mondays from 0300 to 0500. The station is owned by the Conservation Baptist Home Mission Society, based in the USA. Address: Apartado 3252, Tegucigalpa.

La Voz de Evangelica Mosquita has been a come and go performer since it first went on the air in 1981 as a service of the Global Outreach Mission. The problems are partly a lack of operating funds and the difficulty in getting replacement parts into the Puerto Lempira area, which is not serviced by any roads. Power to the station is supplied by its own generator, the fuel brought in via dugout canoe to Tansin Island, where the station is actually located (on the campus of the Miskito Baptist Institute). As this is written HRXK is in one of its active periods, using about 100W on 4.910MHz slightly variable. Broadcasts are in Spanish at 2300, Miskito at 0000 and English at 0200. The address is simply Puerto Lempira, Honduras.

La Voz del Junco is a commercial broadcaster and makes only occasional appearances on its assigned 6.075MHz frequency. when it does, HRMH uses one kilowatt. Broadcasts began in 1973, stopped on short wave in 1980, re-started in 1983 and have been spotty since. the name is taken from the term for a locally made sombrero. If you catch their signal, reports may be sent to Apartado 6, Santa Barbara.

Radio Copan International has



not yet began a regular service, although it is expected to at almost anytime, with assigned call letters HRJA. It did air brief test broadcasts at least twice last year. It is affiliated with the planned station Radio Miami International, also expected to initiate broadcasts soon. Watch 9.950, 15.675 and 15.690MHz for future broadcasts. Reports may be sent in care of Radio Miami International, 8500 SW 8th St., Suite 252, Miami, Florida 33144, USA.

Mexico

Only a couple of Mexican short wave broadcasters are active on anything like a regular basis. The others are heard only briefly about once per year. These inactive station go on the air to keep the Mexican telecommunications authority from terminating their licences. Unfortunately, s.w.l.s can never be sure when these transmitters will be turned on.

Radio Huayacocotla. Also known as Radio Huaya, and 'La Voz de los Campesinos' XEJN began in 1965 as a radio school of the air. It is essentially that today, although now part of a different organisation. The 2.390MHz frequency is its only representation on any radio band. And, with just 800W, it isn't heard all that often, even in North America. Broadcasting hours are from 1200 to 1500 and 2100 to 0100. Note that it uses the same frequency as La Voz de Atitlan in Guatemala. Address: Apartado 13, Huayacocotla, Veracruz.

Radio XEUJ, though still listed, has not been reported in some years and is probably inactive. It is listed for 5.980 from 1100 to 0300, using 500W. Address: Apartado 62. 67700 Linares, Nuevo Leon.

Radio Mexico International, operated by the Mexican government, seems to follow the inconsistent pattern of most of the private Mexican station. It has recently been active on its 5.985 and 11.770MHz frequencies from 1255 to 1700 and 9.705 from 2000 to 0500. Reports go to Apartado 19-737, 03900 Mexico DF.

Radio Mil is a long-time Mexican broadcaster although, due to

A Short Wave Tour of Central America and the Caribbean

Radio for Peace International is located on the campus of the University for Peace in Costa Rica.

reception vagaries, it's difficult to know if it operates on a regular basis. Every now and again XEOI is heard on its 6.010MHz spot with its Spanish language commercial programming. It's scheduled from 1200 to 0600, later on weekends. Reception reports go to Nucleo radio Mil, Insurgentes Sur 1870, 01030 Mexico DF.

La U de Veracruz, also known as El Eco de Sotavento and Nucleo Radio Oro, is part of a five station broadcast group. It, too, is not active all the time, but every now and then its 250W signal shows up on 6.020MHz. The nominal schedule for XEUW is 1130 to 0600. The address is Ocampo 119,91700 Veracruz.

Radio Universidad de San Luis Potosi, is, as its name suggests, owned by the University of San Luis Potosi. Unfortunately, the station is very seldom active. When it is, XEXQ uses 6.045MHz with 250W between 1300 and 0500. The address is Apartado 456, 78000 San Luis Potosi.

Musica Romantica is another dormant outlet. XECMT is licensed for 6.090 with 1kW from 1200 to 0400, though in past years it was running much later. The address is Apartado 79, 89800 Ciudad Mante, Tamaulipas.

Tus Panteras is part of a large broadcasting organisation called Sistema Radio Yucatan. Apparently, it has relayed various medium wave outlets in the past, which explains the several different names it has used over the years. Unfortunately, this one is also inactive most of the time. XEQM is assigned 6.105MHz with 250W from 1200 to 0600. It has a history of being difficult to QSL. Reports go to Apartado 217, 97000, Merida, Yucatan.

Radio Universidad de Sonora, is another university station that is off the air much more than it is on. When it is on it airs cultural programming in Spanish on 6.115MHz (XEUDS) with 1kW and is nominally scheduled between 1500 and 0715. The address is Apartado 1817,83000 Hermosillo.

La Voz de la America latina is another very large Mexican radio broadcaster. Medium wave XEW (250kW on 900kHz) is the key station of the Sistema Radiopolis Sa and, when the short wave (XEWV) is active, XEW is the station one is actually hearing. Once a regular on short wave, XEWV is now heard



only on occasion. Check 6.165, 9.515 and 15.165MHz, each listed with 500W and supposedly 24 hours per day - when on! The address is Ayuntamiento 52 06070, Mexico DF.

Radio Education is quite a steady performer. XEPPM is part of the government's education department and operates on 6.115MHz 24 hours a day, using 5kW. It airs a lot of cultural and classical music programming, relaying programmes from the radio departments of other Mexican universities as well as its own. The address is Angel Urraza 622, 03100 Mexico DF.

la Hora Exacta broadcasts time signals each minute and airs news and other announcements and adverts on a 24 hours a day basis. It is a service of the Instituto Mexicana del Radio. XEQK operates with 500W 24 hours a day (when active!) using 9.555MHz. Reports to: Instituto Mexicano de la Radio, Margaritas 18 Colonel Florida, 01030 Mexico DF.

Radio Unam (National Autonomous University of Mexico) is not always active either, though it is more active than many. It has had a short wave voice since 1937, though it went off in 1984, then returned a few years ago, this time on an occasional basis. In addition to its educational and classical music programming it airs transcriptions from some of the major international broadcasters. XEYU broadcasts on 9.600 with 1kW between 1400 and 0000. The address is Adolfo Prieto 133,col, del Valle, Mexico DF.

La Q Mexicana is part of the group that operates XEW. XEWV previously and, like those, is only rarely heard on short wave. When active, XEQQ (relaying medium wave XEQ) will be on 9.680MHz with 500W. The address is the same for La Voz de America Latina.

Netherlands Antilles

Trans World Radio at Bonaire has probably been heard by most short wave listeners. Those who haven't logged it yet will probably want to get it done soon. As most know, the station is leaving short wave at the end of June and will use satellites instead. TWR Bonaire currently airs English at 0400 to 0500 and 1100-1330. Check 9.535, 11 815, 11.930 and 15.345MHz. They are offering a special QSL (a replica of their first) for the remainder of the time they are on the air. Address: Trans World Radio, Bonaire, Netherlands Antilles.

Nicaragua

The end of civil war here hasn't brought a flood of short wave broadcasters. What little activity we've seen has been on the same pattern as that of the Dominican Republic.

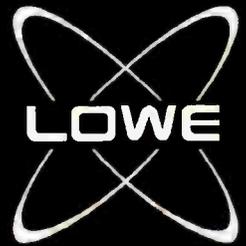
Radio Rica - the name is an acronym for Radio Informaciones de Centro America - showed up briefly a year or more ago, then vanished. The station used nominal 4.920MHz with a listed 1.2kW and had an address of Apartado 38, Managua. Will it return? We can but wait and see.

Radio Nicaragua, the government station, was active when the Sandinistas were in power. The new government hasn't returned it to the air and there's probably little reason to expect to see this one come back anytime soon, if ever. The assigned frequency is 5.950 with 50kW.

Radio Miskut was active for a period last year, but hasn't been reported recently. Assigned to 5.970MHz it began on such spots as 4.560 and 4.690MHz, later appearing on 5.560MHz. The power is supposed to be 1kW and a nominal schedule 1100 to 2330 in effect, broadcasting all or most of the time in the Miskito language. Address: Puerto Canezas. And that's the end of the tour. Good luck in adding most - no, all of them - to your log!

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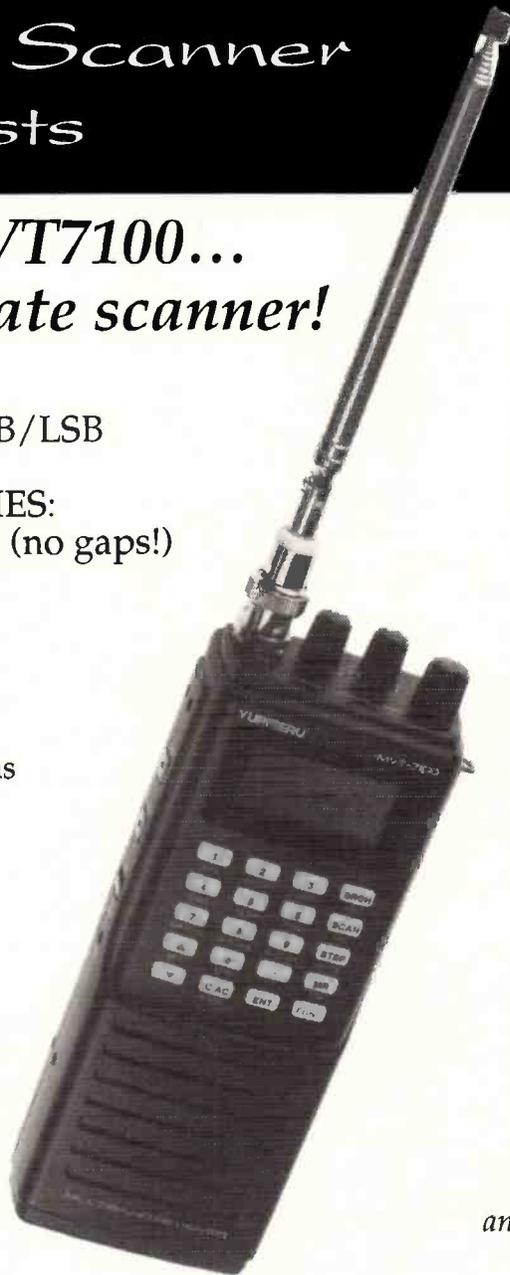
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