FREE INSIDE

24-Page Guide To Short Wave Listening Magazine

Including

Yupiteru MVT-7100 Review
Gadgets & Accessories For The Short Wave Listener
Short Wave Tour Of Central America & The Caribbean
Organise Your DX Time
Radio Of The Future
Listening For Tips
Aid To Better Reception

REVIEWED THIS MONTH
Yaesu FRG-100 Communications Receiver

PLUS
Economising The 328R Receiver
Time Signals - No DX Enthusist Should Be Without The Correct Time

And Regular Features Covering
IN A Continuous Coverage
100KHz - 14.50MHz
- A 1000 Memory Channels
- All Mode Reception
  (including SSB & CW)
- High Scan Speed

The MVT-7100 is a new handheld sensation with
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Batteries, Car Connector,
UK Charger, Carrying Strap,
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NEVADA COMMUNICATIONS
189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (0705) 662145 Fax: (0705) 690026
Economising the 328R Receiver
Bill Wilson

Time Signals from Broadcast & Other Sources
Philip C Mitchell

The Real Cause of Sunspots
Greg Baker

The Sun - The Source Part 6
Kevin Fox

A Light-weight UHF Dipole - Useful Info

FRG-100 Communications Receiver Reviewed
Peter Shore & Mike Richards

Free Pull-out Magazine
Guide to Short Wave Listening

Airband
Amateur Bands Round-up
Bandscan
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Decode
DXTV Round-up
Editorial
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Junior Listener
Letters
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Trading Post

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.

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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 G8VFH

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No Morse Licence

Dear Sir

I see that the B licensees are still whining. 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 whining 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

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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 f.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 antennas. 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**

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**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 dial level.

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

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**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**

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**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:

- GKA (4.23790) should be 4.2474MHz
- GKA (17.09850) should be 17.0984MHz
- GKB (22.44860) should be 22.4487MHz
- GKA (22.4690) should be 22.4670MHz

I cannot comment on the non-Portishead frequencies.

3: Portishead only remotely controls the Radiotelex machines 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 (Radiocommunications Agency). High-traffic vessels having Princes that are not at the start of our lists! Both vessels have since re-registered under the Bahamas flag.

4: 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.

5: 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.

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

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

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
- UJJ - Kaliningrad Radio, CIS
- FUX - French Naval Radio, Le Port, Reunion Is
- CTP - NATO Radio, Lisbon
- FUV - French Naval Radio, Dijbouti
- VXO - No trace on my files
- CFH - Halifax Radio, Canada
- 6WV - French Naval Radio, Dakar, Senegal
- VRP - 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**
April 18 Marsey-bye-the-Sea Radio Rally will be held in the Marsey Leisure Centre, High Street, Marsey-bye-the-Sea near Southam. Doors open at 11am. There will be the usual traders, a Bring & Buy and refreshments. Talk-in will be on 322, 5707 evenings.

May 2 The Dartncourt Radio Club Rally will be held at a new and larger venue, the Velventon War Memorial Village Hall, Belvedere. Talk-in is on 322, 5707 evenings.

May 9 Marsey-bye-the-Sea Radio Rally will be held by Marsey Mobile Radio Society. Doors open at 10:30am. All the usual traders, a flea market, a Bring & Buy, club stands, the family rally. Peter GODR. Tel: 0268-411150.

May 30 Plymouth Radio Club Rally will be held at Plymouth School, Plymouth. Doors open from 10:30am to 4pm. There will be car parking, a Bring & Buy, Talk-in, Raffle and refreshments. Derek Foster G6RZB. Tel: (0372) 787161.

June 6 The Spalding & Districts are holding their Jubilee Mobile Radio Rally at Spalding Green, Spalding. T. Kettheuwel. Tel: (0175) 229240.

June 27 The 36th Longleat Amateur Radio Club Rally will be held at Longleat House, near Warminster, Wiltshire. Shaun. Tel: (0262) 873908.

July 4 The York Radio Rally will be held at the Tattersall Building, York Racecourse, York. Doors open from 10am to 5pm and will take place at the Flight Refuelling School Sports Hall. Tony Nightingale G8DRN. Tel: (0904) 708164.

July 11 The Horndean Amateur Radio, Electronics & Computing Fair will take place at the Queen Elizabeth's Grammar School Sports Hall, Tiptree. T. Nightingale G8DRN. Tel: (0206) 320924.

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 exibits, car boot sale and field events. Overnight camping facilities available for the 7th. Talk-in on 322.

Richard Hughes G4QVD. Tel: (0222) 651021.

September 5 The Telford Rally will be held at the Telford Exhibition Centre, Telford. Bob G7BWQ. Tel: (081) 701002.

September 5 The Bristol Radio Rally will be held at The Great Train Shed, Temple Meads Railway Station, Bristol. Murray Baker G4YJF. Tel: (0272) 653426.

September 9 The Vange ARS Annual Rally will be held at The Landam Community Centre, London High Road/Aston Road, Landon, Basildon. Doors open from 10:30am. Admission £5.50. There will be traders, a Bring & Buy, raffle, refreshments, good car parking, talk-in on 322. Mike Musgrove G4NTK. Tel: (01344) 462700.

October 10_Marske-by-the-Sea Radio Rally will be held in the Killyheaven Hotel, Enniskilin. Talk-in is on 322. Always a great event. Alwyn G0NKT. Tel: (0287) 610030.

October 17_Grampian rallies, it could be worth 'phoning 7.45pm. Room 12, Loughton Hall, Debden.

November 14_Meadow & DARCs will be held at the Cemetry Hotel, 470 Bury Road, Rochdale. Talk-in 7.45pm. Room 12, Loughton Hall, Debden.

November 21_Grampian rallies, it could be worth 'phoning 7.45pm. Room 12, Loughton Hall, Debden.

December 5_Bedfordshire rallies, it could be worth 'phoning 7.45pm. Room 12, Loughton Hall, Debden.

December 12_Grampian rallies, it could be worth 'phoning 7.45pm. Room 12, Loughton Hall, Debden.
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 Radiocommunications 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!

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 lka 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 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 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 include in the list of prizes. The wavy line at the base is like those painted on the body for Melanesian dances and 'sing-songs', 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 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.

Listener 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.

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 someone 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.
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 alternately between 11 regional offices including Stockholm. In next door Finland, MTV (or Mainostelevisio) Ab) is to take over the third channel leaving the YLE to fill the gaps in the schedule previously filled on the 1st and 2nd networks.

There have been 88 applications for private TV licences in Greece, 78 for local coverage and the others for national networking through a few aren already on air. Network applications include Mega Channel, Sky TV, Helias 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 Q200-1100 period daily, a local paper has highlighted the method for gaining free access to the BBC service by decoder adjustment which has attracted large audiences.

FM-TV Busybody is the name of an English language f.m., TVOX 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 Laponen, Nox 7, 05001, Hyvinkaa, Finland. Postal order account is Helsinki 1388 116, add another 25 FIM if using giro.

Tim Anderson, 2 Burry Road, St. Leonards on Sea, E. Sussex TN37 6DX wrote the program. Another disk called Amscan version 2.0 is available for scanner enthusiasts at £9.50 - write with s.a.e. for information.
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 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 or wire diameters. Inductances from 1µH to 470µH 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 7NG. 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.

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.I 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, Bossett 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 50-75Ω 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

Short Wave Magazine, April 1993
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
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,
Woolston,
Newcastle Upon Tyne
NE20 9DF
Tel: 0661 860418

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

Dave G4KFN at
NEWCASTLE
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Tel: 0223 311230

Sim GM3SAN at
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Cumbernauld,
Scotland
G68 OHH
Tel: 0236 721004

Tony G4CYE at
BRISTOL
79/81 Gloucester Rd,
Patchway,
Bristol
BS12 5JQ
Tel: 0272 771770
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 radio activities in the area, and keep themselves informed. Both have many years professional experience to draw on and you still have the back up of the years professional experience to draw on and you still have the back up of the years professional experience to draw on. In addition, both have many years professional experience to draw on and you still have the back up of the years professional experience to draw on.

Here to help you are:
John G3OQT
Beryl G7LME, Julie
Rob G8MPT, Bill G8LXN
Peter G0MUT
Steve G6URJ

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

HEATHROW
6 Cherwell Close, Slough, Berks
SL3 8XB
Tel: 0753 345255

Steve G1WSY at

LOWE

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 this 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

NEXT?

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.
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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!

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ICF-SW 77: £399.99

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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.

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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.

Short Wave Magazine, April 1993
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 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

Short Wave Magazine, April 1993
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**

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrolytic</td>
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<tr>
<td>47μF</td>
<td>1</td>
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<tr>
<td>100μF</td>
<td>1</td>
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<tr>
<td>Resistors</td>
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<td>10Ω</td>
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<td>33Ω</td>
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<td>680Ω</td>
<td>1</td>
</tr>
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<td>1kΩ</td>
<td>1</td>
</tr>
<tr>
<td>Potentiometers</td>
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</tr>
<tr>
<td>Preset 100Ω</td>
<td>1</td>
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<tr>
<td>Variable 10kΩ</td>
<td>1</td>
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<tr>
<td>Capacitors</td>
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<td>Integrated Circuit</td>
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</tr>
<tr>
<td>TBA820M</td>
<td>1</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1</td>
</tr>
<tr>
<td>Switch s.p.s.t.</td>
<td>1</td>
</tr>
<tr>
<td>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.</td>
<td>1</td>
</tr>
</tbody>
</table>

---

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

‘BEST COMMUNICATIONS RECEIVER 1992’

FRG-100

As awarded by the World Radio TV Handbook in their 1993 Radio Industry Awards. This is what they have to say about the new FRG-100 . . .

“Yaesu has succeeded in bringing improved technology and features within the price range of a much wider group of shortwave broadcast listeners. It has been a long time since Yaesu revamped their broadcast receiver but for many listeners it will be worth the wait! A good package at an affordable price.”

WHAT MORE NEED WE SAY!
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The widest range of receivers in the UK.
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**New AR1500EX**  - Enhanced model extra. Completely new version of this popular handheld receiver featuring new printed circuit boards for even better performance. This is a special model for the U.K. market only. Coverage is from 500 kHz all the way to 1300 MHz without any gaps in the range. Channel steps are programmable in multiples of 5 kHz and 12.5 kHz up to 995 kHz, the BFO will allow tuning between these steps for SSB operation. All popular modes are provided: NFM, WFM, AM and SSB (USB, LSB and CW) with the BFO switched on. The receiver is supplied with a comprehensive selection of accessories: DA900 wide band flexible aerial, NiCad pack, Dry battery case (for use with 4 x AAA alkaline cells), Charger, DC lead fitted with cigar lighter plug, Earphone, Soft case, 5W aerial terminated in a BNC connector for shortwave reception and Operating manual. Versatility is excellent. The AR1500EX may be powered from its internal NiCad pack. Spare dry batteries may be carried for extended operation and used with the dry battery case, the set may also be plugged directly into the cigar lighter socket of a motor vehicle (external input range 11 - 18V DC). **Suggested Retail Price £349.00 including VAT.** (UK Carriage free)

With the **AR3000A** (base-mobile receiver) your listening horizons are truly extended providing receiving coverage from 100 kHz all the way up to 2036 MHz without any gaps in the range. The AR3000A offers the widest coverage on the market today with a high level of performance and versatility from long wave through shortwave, VHF and onward to the upper limits of UHF and SHF. Not only will the AR3000A cover this extremely wide range it will allow listening on any mode: NFM, WFM, AM, USB, LSB AND CW. The AR3000A also features an RS232C port for computer control. **Suggested Retail Price £949.00 including VAT.** (UK Carriage free)

---

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1. Brand new arrivals from Japan with slight cosmetic damage, possibly a small scratch or soiled packaging. 2. Dead on arrival (or near-arrival) which has been refurbished - often in the Japanese factory. Be rest assured, any faults in the early days tend to be of a minor nature, of course any such faults are cleared and the equipment fully tested prior to placement into “Nearly New” stock. 3. Equipment returned subject to a re-stocking charge within a few days. This is most unusual and would only be the subject of an unwanted Christmas or Birthday present etc.

Terms: Equipment is sold subject to the company’s current terms and conditions, a copy of which is available upon request. The company reserves the right to change prices, terms and conditions and specifications due to changes in cost and currency fluctuation. All prices are shown in pounds Sterling £ and include VAT. E&OE. “Nearly New” equipment carries a 12 month parts and labour warranty. Due to the nature of this offer, we cannot accept returns to change prices, terms and conditions and specifications due to changes in cost and currency fluctuation. All prices are shown in pounds Sterling £ and include VAT. E&OE.

### “Nearly New” Price Indicator

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
<th>Suggested Retail Price</th>
<th>“Nearly New” Price</th>
<th>Saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR3000A</td>
<td>The ultimate. Unique all mode extremely wide band base-mobile receiver. Coverage is from 100 kHz to 2036 MHz with no gaps. Fitted with RS232 computer port.</td>
<td>949.00</td>
<td>799.00</td>
<td>150.00</td>
</tr>
<tr>
<td>AR1500e</td>
<td>Compact all mode hand-held receiver. Receive coverage 500 kHz to 1300 MHz... AM/NFM/WFM &amp; SSB using BFO. Enhanced model.</td>
<td>Was 299.00</td>
<td>250.00</td>
<td>49.00</td>
</tr>
<tr>
<td>AR15500</td>
<td>Compact all mode hand-held receiver. Receive coverage 500 kHz to 1300 MHz... AM/NFM/WFM &amp; SSB using BFO. Latest model.</td>
<td>349.00</td>
<td>299.00</td>
<td>50.00</td>
</tr>
<tr>
<td>AR2800</td>
<td>Competitively priced full featured base - mobile scanning receiver. All mode operation AM/NFM/WFM &amp; SSB using a BFO. Coverage is 500 kHz to 600 MHz &amp; 800 - 1300 MHz. Includes Internal NiCad.</td>
<td>449.00</td>
<td>375.00</td>
<td>74.00</td>
</tr>
<tr>
<td>AR2500</td>
<td>Base - mobile receiver 5 - 550 MHz &amp; 500 - 1300 MHz fitted with BFO. Has an RS232 computer port.</td>
<td>Was 419.00</td>
<td>325.00</td>
<td>94.00</td>
</tr>
<tr>
<td>AR2000</td>
<td>Hand-held receiver 500 kHz - 1300 MHz without gaps. AM/NFM/WFM.</td>
<td>309.00</td>
<td>250.00</td>
<td>59.00</td>
</tr>
</tbody>
</table>

*“Nearly New” equipment is truly supplied as-new and is not the result of worn out used equipment through trade-in deals etc.*
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 x 10^-7) and the daily deviation less than 1 part in 10^3. 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 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 Circuit can supply both a receiver and

---

**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.
display kit for those keen enough to desire an ultimate time-keeping facility.

Radio-controlled time pieces would seem, therefore, to be a pointer to future developments similar to the gradual replacement of mechanical clocks and watches with more accurate quartz crystal-controlled ones.

Ref 1: Wireless World,
Ref 2: LP70M kit £19.95. Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR. Tel: (0702) 554161.
Ref 3: 40-06002 MSF RX £17.16 + carriage REWBICHRON 2 £44.89 + carriage. Cirkit Distribution Ltd, Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (0992) 444111.

Fig. 2: WWV QSL card.
MAY ISSUE ON SALE 8 APRIL

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Short Wave Magazine, April 1993
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 1869 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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**Supa Special Offers**

Are You Keen On The Key - Or Would You Like To Be?

Or Are You One Of The Many Satisfied Kenwood Receiver Or Transceiver Owners? If So, Here's An Opportunity To Increase The Versatility Of Your Rig.

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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**The Supa-Tuta Plus**

The Supa-Tuta Plus is a self-contained unit, ideal for everyone from absolute beginner to advanced student. The unit offers a full-featured introductory course, with full check lists to the comprehensive handbook. And when you're ready to go on the air, it's a full-function electronic keyer.

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 selection via an internal keyer and headphones socket. There are also 90 different testing 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 - (six learners' handbook). 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, single paddle memory, single paddle operation, variable speed operation between two and 99 w.p.m. and variable sidetone between 500 and 1250Hz.

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**The Supa-Keya**

The Supa-Keya uses microprocessor technology to provide: sidetone pitch between 500 and 1250Hz, sidetone volume control (applicable), eight stored messages (non-volatile), and you can add/edit or clear stored messages. The Supa-Keya accepts keyboard operation, has subkeys for dot and dash memories, enables a relay output for transceivers, has a Morse check and transceiver function. 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 spot it and sound an error signal (in audible in normal use). And, to complete a very useful package, the Supa-Keya is also fully portable. measuring 150 x 145 x 40mm (sloping to 20mm), and is powered from an external power supply of between 9-14V.

---

**The Supa-Tuna**

The Supa-Tuna has been designed to make the use of the Kenwood range of receivers and transceivers even easier to use. The Supa-Tuna provides the following facilities: Rapid frequency selection, v.f.o. selection, frequency scanning up or down, memory channel (and here's where applicable), mode selection, and transmit/receive (where applicable). The Dewsbury Supa-Tuna is housed in an attractive metal case measuring 130 x 145 x 40mm (sloping to 20mm), and is powered by an external 9-14V power supply.

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

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- **AR-1500**: Hand-held. Covers 500kHz to 1300MHz receiving NFM, WFM, AM and SSB.
- **AR-3000A**: Multimode scanner — covers 100kHz-2036MHz. Modes: USB, LSB, CW, AM, FM, WFM
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**SHORT WAVE MAGAZINE, APRIL 1993**

**PRICING**
- **YAESU MVT-7100**: Hand-held. Covers 530kHz to 1650MHz
- **YAESU FRG-1000**: The most promising general coverage receiver yet.
- **AOR AR-1500**: Hand-held. Covers 500kHz to 1300MHz receiving NFM, WFM, AM and SSB.
- **AOR AR-3000A**: Multimode scanner — covers 100kHz-2036MHz. Modes: USB, LSB, CW, AM, FM, WFM
- **AOR AR-2000**: Hand-held wide band scanning receiver 1000 memories.
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.*

[Diagram showing ionosphere, critical frequency, and maximum usable frequency.]
Theory

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:

\[ \text{MUF} = \frac{f_0 \csc A}{2} \]

Where \( f_0 \) 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 \( \csc A \)). 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', aurora 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 WWW 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 303-495-8129! 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 formulate 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 (MMDYYYY), 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 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.
When you see the review of the new MVT-7100 in this month's SWM pull-out magazine, and you like what you read, then call me NOW for a natter! Buy your new set from MARTIN LYNCH using INTEREST FREE payments over 9 months!

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AR1500 HANDHELD

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  - Dry cell battery case
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- For scanners with tight angle

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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.

<table>
<thead>
<tr>
<th>Description</th>
<th>Farnell Order Code</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T Adaptor 50Ω</td>
<td>251-197</td>
<td>£2.96</td>
</tr>
<tr>
<td>BNC to 4mm 50Ω</td>
<td>GE35011</td>
<td>£1.98</td>
</tr>
<tr>
<td>Right-angle 50Ω</td>
<td>150-658</td>
<td>£5.98</td>
</tr>
<tr>
<td>BNC Straight Plug 50Ω</td>
<td>105-545</td>
<td>£1.92</td>
</tr>
</tbody>
</table>

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.

This picture shows how the various BNC plugs are assembled to form the central section of the dipole.

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 8BD. 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.

I hope our new gadget opens Grandad's wallet.

Grandad by Leon Bulen & David Leverett

Short Wave Magazine, April 1993
**SHORTWAVE CORNER**

**ASL5 Kit: £15.90**

No mods to the set are needed. Crystal filters! The ASL5 connects the page. These simple and easy to build receivers offer amazingly good results!

**Hardware**
- ASL5 2m/70cms RX £275
- DXR-112E 2m wide band RX £39
- DJ-180 2m + wide band RX £385
- DR-599E 2m/70cms + wide band RX £54
- SPF-490 2m/70cms + wide band RX £6

**PCB Module: £25.90**
- AA4 25 to 1300MHz ACTIVE ANTENNA
- AA2 150kHz to 30MHz ACTIVE ANTENNA
- AA4 Kit: £15.90
- AA2 Kit: £8.90

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Hot up your radio's selectivity with this excellent accessory! The CW filter has a narrow 300Hz bandwidth, and the speech filter is at least 15dB down at 3kHz—sharper roll-off than most crystal filters! The ASL5 connects between the radio and the external speaker or headphones, so no mods to the set are needed.

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**DXR10 Kit**
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**YAESU**
- FT-850N 2m/70cms + wide band NICAD FREE!

**ICOM**
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'4-go' Yaesu FRG-100
- A sure contender.

Yaesu FRG-100
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**TRF3**
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- £269

**SCANNER CORNER**

**ALINCO SAVERS**

**DxRx20/40/80**
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**DJ-580E**
- 2m/70cms + wide band

**DR-112E**
- 2m wide band RX £275

**RANDOMLY SELECTED**

**HP-2000E**
- New improved version
- 0.1-1300MHz.

**OPT-2300**
- No scanner should be without one!
- 0.1-3.6GHz includes nicads and charger
- £149

**NATIONAL PRODUCTS**

**SPA4 4 to 1300MHz Pre-Amp.**
- Boost the signals from your discone, nested dipoles etc. with the SPA4 receiver pre-amp! Using a special IC amplifier giving at least 5dB gain with low noise, the SPA4 is easy to build, and is very effective for weak signal areas.

**SPA4 Kit: £15.90**

**ACTIVE VHF AIR-BAND ANTENNA**

The HOWNES AB118 covers 118 to 137MHz. It has a band-pass filter to reduce out of band signals, a tuned halfwave end-fed antenna element for good low angle (long distance) reception, a low noise pre-amplifier and switched 10dB attenuator. The antenna fits standard 1.5" plastic pipe for easy weather-proof installation. Interesting to build, and should transform your reception if you are still using that whip on the back of the scanner! AB118 Kit: £18.80

**AA2 150kHz to 300MHz ACTIVE ANTENNA**

Use 6 to 8 feet of wire with the AA2 module and you get broad-band performance right across the long, medium and shortwave bands. There are two gain settings, and the strong signal performance is designed to be compatible with the popular SWL sets (SR-1 and others). Don't settle for less!

**AA2 Kit: £8.90**

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Designed as the neat, compact, unobtrusive alternative to the discone, the AA4 is deservedly popular with those who want broad-band performance without having to have a antenna that shouts "scanner"! Fits in standard 1.5 inch water pipe for outdoor use, or use uncased indoors.

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**Tel:** 0327 60178

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**FREE PARKING** *
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 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 frequency knob until the memory to be recalled is found, and then either UP or DOWN to step through each of the broadcast bands from long wave to the 11 metre band. The rotary MEM knob at the bottom left of the front panel appears in the digital display.

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 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 2kHz, 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 pressing the VFO/MEM key to switch from v.f.o. to memory.

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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 880kHz. 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 leaning on 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 replace 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 system 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 ±3kHz 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 f.l. 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 using 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 over the main 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 45kHz second i.f.

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

### Specification

<table>
<thead>
<tr>
<th>Frequency Range:</th>
<th>50kHz - 30MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reception Modes:</td>
<td>u.s.b., l.s.b., c.w., a.m. (f.m. optional)</td>
</tr>
<tr>
<td>Stability:</td>
<td>c&lt;100p.p.m. from -10 to +50°C</td>
</tr>
<tr>
<td>Standard Tuning Steps:</td>
<td>10Hz/100Hz (c.w./s.s.b.)</td>
</tr>
<tr>
<td>Sensitivity:</td>
<td>&lt;0.25µV 1.8-30MHz s.s.b./c.w. (2.4kHz)</td>
</tr>
<tr>
<td>Selectivity:</td>
<td>1µV 1.8-30MHz a.m. (6kHz)</td>
</tr>
<tr>
<td>Intermediate Freq:</td>
<td>&lt;0.5µV 1.8-30MHz f.m. (15kHz)</td>
</tr>
<tr>
<td>Squelch Sensitivity:</td>
<td>c.w. (narrow option) 500Hz -6dB, 1kHz -60dB</td>
</tr>
<tr>
<td>IF Rejection:</td>
<td>2.4kHz - 6dB, 4.5kHz -60dB</td>
</tr>
<tr>
<td>Image Rejection:</td>
<td>a.m. narrow 4kHz -6dB, 15kHz -50dB</td>
</tr>
<tr>
<td>Audio Power:</td>
<td>a.m. 6kHz -6dB, 1kHz -60dB</td>
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<tr>
<td>Antenna Impedance:</td>
<td>f.m. (optional) 15kHz -6dB, 30kHz -60dB</td>
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<tr>
<td>Supply Voltage:</td>
<td>47-219kHz, 655kHz</td>
</tr>
<tr>
<td>Power Consumption:</td>
<td>120V -240V (c.c., negative ground)</td>
</tr>
<tr>
<td>Dimensions:</td>
<td>238mm (wide) x 93mm (high) x 243mm (deep)</td>
</tr>
<tr>
<td>Weight:</td>
<td>3kg (approx.)</td>
</tr>
</tbody>
</table>

### Accessories:

- **Weight:** 1.2A max.
- **Dimensions:** 238mm (wide) x 93mm (high) x 243mm (deep)
- **Frequency Range:** 50kHz - 30MHz
- **Reception Modes:** u.s.b., l.s.b., c.w., a.m. (f.m. optional)
- **Stability:** c<100p.p.m. from -10 to +50°C
- **Standard Tuning Steps:** 10Hz/100Hz (c.w./s.s.b.)
- **Sensitivity:** <0.25µV 1.8-30MHz s.s.b./c.w. (2.4kHz)
- **Selectivity:** 1µV 1.8-30MHz a.m. (6kHz)
- **Intermediate Freq:** 1µV 1.8-30MHz f.m. (15kHz)
- **Squelch Sensitivity:** c.w. (narrow option) 500Hz -6dB, 1kHz -60dB
- **IF Rejection:** 2.4kHz - 6dB, 4.5kHz -60dB
- **Image Rejection:** a.m. narrow 4kHz -6dB, 15kHz -50dB
- **Audio Power:** a.m. 6kHz -6dB, 1kHz -60dB
- **Antenna Impedance:** f.m. (optional) 15kHz -6dB, 30kHz -60dB
- **Supply Voltage:** 47-219kHz, 655kHz
- **Power Consumption:** 120V -240V (c.c., negative ground)
- **Dimensions:** 238mm (wide) x 93mm (high) x 243mm (deep)
- **Weight:** 3kg (approx.)

---

Short Wave Magazine, April 1993
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 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 you can 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 receiver is a step above the 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.

**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. 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.

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---

**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 S0S 3BY. Tel: (0703) 265111 for the loan of the review model.
Propagation
by Ron Ham
Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

From Edinburgh or Glasgow, depending where he was at the time, Ron Livesey, using a small refractor telescope ahead of a projection screen, identified four active areas on the sun’s disc on December 3, 4, 25 & 26 and live on the 18th and 29th. Although his January solar observations were sometimes hampered by mist and overcast skies, Cmdr Henry Hatfield (Sevenoaks), using his spectrophotolscope, located one sunspot group, 2 filaments, 1 medium ‘hedgerow’ and 4 very small quiescent prominences on December 1, 14, 18, 20, 29 & 30. ‘Corona structure’ on the active plage on the 13th, 19th, 28th & 29th, ray bundles on the 7th & 29th, Astronomical Association received auroral made by Patrick on his projection Fig. 1 and 2 are copies of the drawings the same time on the 14th, Fig. 2. Both what looks like a couple of groups at sunspots at 1000 on the 8th, Fig. 1 and efforts revealed a number of individual bursts of solar noise on January 1, 16 and 23.

Auroral
The auroral co-ordinator for the British Astronomical Association received reports describing a glow or unspecified form for the overnight periods on December 1, 14, 18, 20, 29 & 30, ‘quiet arc or band’ on the 19th & 29th, ‘ray bundles’ on the 7th & 29th, ‘active flaming’ on the 13th, 19th, 28th & 30th and ‘corona structure’ on the 29th, from observers ranging from Ireland, through Scotland to North Dakota. Radio or visual observations of auroral activity and details of magnetic disturbances were welcomed by Ron at Flat 1/2, East Parkside, Edinburgh EH16 5XJ.

Magnetic
The various magnetometers used by Karl Lewis (Saltash), Ron Livesey, David Pettitt (Carlisle) and Tom Rackham (Goostrey), between them reported activity in the earth’s magnetic field on December 3, 7, 8, 9, 10, 12, 15, 16, 17, 18, 19, 28 & 29. Storm conditions were recorded on days 17 & 28.

Propagation Beacons
First, my thanks are due to Gordon Foote (Didcot), Simon Griggs (Chelmsford), Henry Hatfield, Ted Owen (Malton), Ted Waring (Bristol) and Ford White (Portland) for their 28MHz beacon logs which, when I combined their efforts, enabled me to compile the monthly chart, Fig. 3, of beacon signals heard in the UK between December 26 and January 25.

“It’s been very quiet indeed,” said Simon Griggs who is right when he reports that the beacon signals ‘have thinned out’ since his November offering. Reports of new beacon signals being heard this time came from Gordon Foote, who copied EA2ZRA on January 16 and Ford White who logged KO4N and NOJAR on 13th & 21st. Signals being heard this time came from Aberdeen, Ashkirk, Black Hill, Forfar, Holme Moss, Humberside, Sandale and Whitby, Classic FM from Black Hill, Lincs FM from Belmont and possibly a Scandinavian signals on 93.3MHz. Variations in the atmospheric pressure for the period December 26 to January 25 can be seen in my television column elsewhere in this issue.

Short Wave Magazine carries some books on propagation, which may interest readers of Ron Ham’s column.

Introduction to Radio Wave Propagation BP293. “How does the sun and sunspots affect the propagation of the radio waves that are the basis of our hobby? They affect the ionosphere, but differing frequencies react differently. Find out how to use charts to predict frequencies that will be the most profitable. What effect will noise have on the signal? The answers to these questions and other can be found in this book.” This book costs £3.95.

Two other books are Introduction to Amateur Radio BP257 and Introduction to VHF/ UHF for Radio Amateurs BP281, both by Ian Poole. These books cover various aspects of propagation and cost £3.50.
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Many Radio Amateurs and SWLs are puzzled. Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amator you'll know – but what about the many other signals?

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then rose. A mystery signal, again transmissions. In the Gulf War, 3°E undoubtedly the Starbird SNG unit is from January 22, with colour bars and on standby lest the sabres rattle again. 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 Marco Polo 1 and 2 at 31°W appears on 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 12°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 arrive on 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 lead to rumours that Ted Turner (alias CNNI) has launched his own kids channel latter 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 11.579GHz vertical trdr 37. Based in Lyons, France, the audio subcarriers include English, French, Italian and German.

Satellite News

Two changes to widebeam footprint coverage on Eutelsat II F3 16°E with the Egyptian Channel dropping superbeam and changing to 11.796GHz 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 18months. Coverage from the new bird ranges from Northern Scandinavia to the Sahara, East to the Urals and West to the Canaries. Eutelsat II F5 should be in an inclined orbit as the signal downlinking into Europe in Ku band 'EBU Moscow' ident across the centre. Has been seen colour bars with the caption 'UKI 88' had appeared on 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 12°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.

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Identification logo for the Egyptian Space Channel over Eutelsat II F3 at 16°E.
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**T**he 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 FM, 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 may mean more room for other broadcasters on the short wave 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 FM 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 added 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 15.94MHz.

With the split of Czechoslovakia in 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, 6.955 and 5.96MHz, at 1930 on 7.345 and 6.055MHz and at both 2100 and 2200 on 5.605, 7.345, 6.055 and 5.96MHz. Slovakian overseas broadcasting will, from the beginning of April, include French, English and German. The full time schedule I have received suggests the following times and frequencies:

1130-1200 in English on 11.99, 9.505 and 7.345MHz
2030-2100 in English on 7.345MHz 0200-0230 in English on 9.58 and 5.93MHz

Radio Vliunis’s English service is reduced to just on short wave channel 7 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 1557MHz and at 2130 on medium wave on 1557 and 5665kHz, 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.
writes, "I can't give a frequency because the dial on my Vega is unspecific." Quite right Tim, channel numbers suffice for the majority of television viewers, it is mainly set designers, engineers and DXers, using instruments, 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 £15.55 plus £1 P&P.

**Band I**

The normal range of signals from stations operating in Band I can be greatly increased by sporadic-$E$ and 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 smears, unlockable and often overlapping each other, the signal does sometimes steady itself and lock.

This was proved by Lt Col. Rana Roy (New Radnor) 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 19th and Thailand on the 17th and 23rd. Among the items he saw here, being on the coast," said David Glenday (Arbroath) measured 4.00in 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 Gleday (Aberroth) 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."

**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 6 years.

**Satellite TV**

While using his satellite receiver at 1305 on November 20, Rana Roy saw a Russian TV news programme, on band 'C', Fig. 9, from an unknown origin. "Sound and pictures 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 (ESCI), Fig. 13, on the 28th.

**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 2°C during day and 11°C at night. Normally at this time of year it should be between 0°C at night and 15°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 98mb 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.
Fig. 6: Czechoslovakia.

Fig. 7: Sweden.

Fig. 8: Switzerland.

Fig. 9: Russian News.

Fig. 10: Deutsche Welle TV.

Fig. 11: The Netherlands.

Fig. 12: Tunisia.

Fig. 13: Egypt.

Fig. 15: SSTV.

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 Blenday 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 INED1,2 &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. Andrews," 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 ‘CD’ card from DK2AN in Germany, Fig. 15 and a new year greeting, Fig. 16 and a ‘CD’ 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 G6LEXM, 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.

Short Wave Magazine, April 1993
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 desensitise.

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. To make your own 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 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 isfor agents may have closed as they have Czechoslovakian Drums and Trumpet also thinks the Romanian Skylark and Tiare Publications in the USA, where it changes. Simon Mason is quite an but there have been quite a number of of relationships between east and west would seem that despite the warming happening with numbers stations. It As promised, a look at what is

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Perhaps the event of the month is the P5RST (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 60 000 contacts in the log. It is understood that logs for 6/80/160 are with JA1HST, and the rest are following, Romeo Stepanenko ZVOBR, plus UB5JDM, UV0MTF, UT5Y, and SWI. Ole 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 possibilities.

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 Guam; this will be the PAXAM group. Bhatu is also coming into the 'possible' class, thanks to the good work of Jim Smith VK9NS. There are hopes of an activity too, where DX7PE 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 Hafnarfjordur in Iceland. Geoff is rather restricted as to what he can put but does a Datong AD370 with a larger-than-normal antenna. Since the last report, Geoff has added computer-based decoding for FAX, RTTY and SSTV. The AMTOR based decoding for FAX, RTTY/AMTOR/RTTY/RTTY is now in Geoff's possession. He has reported regularly to Justin Cooper. Marcquardt writes from Hereford after a trip to Bermuda - like a science fiction program!

Geoff's turn of phrase about the aurora 3.5 and 7MHz have done well. We like the echo has been in strong evidence. and 21MHz we didn't yield much, but on 21MHz Geoff adds that the AMTOR (Desecheo), P43LJP, TZ6W, VP2EY, EA9LZ, KP2BH, WP4AZT, KP4AAO, DAB7, Y5FQ, KP4MT, TH4C, LU1W, 9K2MU, HS1HSJ, KP4REJ, Y4VM, HK1HHX, KF5B, JA1VKK, NPA4M, TASC, KP4GD, and YV1GOT. 3.5MHz saw and enormous crop of sideband Ws, and d.x. from all over, including OA4/LA7JQ, ODS/SP1/MHV, RTTY from lots of Europeans, and a d.f. or c.w. stations in came in from Europe. Finally, on Top Band, no real DX but lots of Phone and c.w. from a d.f.f. of c.w. stations in Europe and various parts of the UK.

More Letters

Vince Cutajar in Malta tried 24MHz for WA4DAN/KP5, J28BB, and on 18MHz were added OM3TZW, 3X0HLU, OK1AJN, ZS4BI and AH1A on Howland for a bit of real DX not reported by others.

Simon Griggs in Chelmsford who writes from Banwick-in-Eremen, and runs a Sony IC-F5000 fed by the Sony active antenna. On 3.5MHz this netted C4MDL, CN8HR (DSL to C8NAS), JT1I RUSLU, KP2BS, KP4UP, KW9/K9P (Deschutes), K4BQ, JN2BP, KF2Y, VZ5B, ZS6FT (Box 29, 2814), 3A2LU, 4N4BH, 4U1UN, 7X4AN, 7X2BK, 7X2O, 7X2WAK ICATS, and Europeans. 24MHz saw of K17A, and on 14MHz D44BC, VK2AMD, VK5AG, VK5BSV, VK5GO, and VK6AKB were logged.

Around The Bands

Another newcomer yet is Nigel Dunhill who writes from Banwick-in-Eremen, and runs a Sony IC-F5000 fed by the Sony active antenna. On 3.5MHz this netted C4MDL, CN8HR (DSL to C8NAS), JT1I RUSLU, KP2BS, KP4UP, KW9/K9P (Deschutes), K4BQ, JN2BP, KF2Y, VZ5B, ZS6FT (Box 29, 2814), 3A2LU, 4N4BH, 4U1UN, 7X4AN, 7X2BK, 7X2O, 7X2WAK ICATS, and Europeans. 24MHz saw of K17A, and on 14MHz D44BC, VK2AMD, VK5AG, VK5BSV, VK5GO, and VK6AKB were logged.

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 Hamming who now sports 2E5A/CN 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 'XCU' to cover the bands of interest. John has a simple way of ensuring he can never 'do over it' with the Sommerkamp set-up - he uses a crystal mic, which promptly distorts if he goes over the limit! On the antenna side, John sticks to a home-madefed 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.

G3RR

Rolls Royce Amateur Radio Club OSL card.

Paul Essery GW3KFE, PO Box 4, Newtown, Powys SY16 1Z2

Short Wave Magazine, April 1993

45
MOMENTUM ELECTRONICS

THE AIRBAND SPECIALISTS

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Short Wave Magazine, April 1993
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 on to random selection since no-one gave the correct break-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 Mylenk at RAF Brize Norton, appears this month. The prize of a v.h.f. radio controller goes to C. Smith (Oldham). John Chappell of New York 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 1986. While parked, it was struck by a taxiing SQ3-30. The hydraulic pressure accumulator was faulty on the Shorts and this caused the brakes to fail. Jack is a fellow aviation enthusiast and a 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 Turbull, 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 of his doing its job of filtering out signals that are beyond its operating range. Connecting the long wire directly 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 am advised 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 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 (airport 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 airport is closed for a reason other than poor weather.

Julie Stafford (The Aviation Hobby Centre, 1st Floor, Main Terminal, Birmingham International Airport B28 3JQ) 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&O 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 Humblett, G8AAI (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 1JH.

A clearer view of the Christmas Quiz aircraft. Christine Mylenk.

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. Ittells 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 shackleton 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 at 123.875 and 118.5MHz 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 these 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, provoking 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 scrapping 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 (Llughate) on 121.75MHz according to Alan Jarvis (Cardiff). Although this is the same frequency as Edinburgh Ground (see above), the separation allows safe channel of the channel.

Looking now at GASILG of 19/3 from the CAA, Gloucestershire’s Radar has changed from 125.65 to 120.975, Newcastle’s Approach from 125.65 to 124.35 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 9990MHz). Both ATZ and MATAZ 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/landals to 12°W. A number of airways, with UH designations, are affected along with UR11B 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.

Short Wave Magazine, April 1993

CONTINUED ON PAGE 49
guess that advertisements for the new hand-held scanner from Yaesu 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 MV-7100 and is styled in the same manner as the current MV-7000, but just take a look at all the improvements Yaesu 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: a special software 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 choice of many hand-held enthusiasts 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 special 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 as long as there are enthusiasts who 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 upload/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 graphic interface 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 DSR is likely to take over part of the existing u.h.f. CB allocation at 55MHz.

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 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 333-335MHz with a 25kHz channel spacing paired with the band 868-869MHz for repeater inputs if they are used. Computers are likely to control this and the transceivers may ripple through to other EEC countries.

UK TESTING AND DEVELOPMENT LICENCE FREQUENCIES (MHz)

<table>
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<tr>
<th>BASE/MOBILE</th>
<th>USE</th>
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<tbody>
<tr>
<td>5.750</td>
<td>h.f Fixed and Mobile</td>
</tr>
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<td>7.565</td>
<td>h.f Fixed and Mobile</td>
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<td>456.850</td>
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<tr>
<td>898.500</td>
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<td>153.200</td>
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<td>345.735</td>
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<td>p.m.r. &quot;Low&quot; (also short term hire)</td>
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<td>p.m.r. &quot;Hi&quot; (also short term hire)</td>
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<td>85.875</td>
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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

Road Construction Communications

Until DSSR becomes established, most large scale construction projects will rely on simple radio communication systems to co-ordinate work on site. The DTIRadiocommunications 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 bankman 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 48) 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.
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 - 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 137.8MHz. 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 glide-slope (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.
That 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 1430UTC 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 over as well. I have kept the image, so if anyone else uses Timestep Weather Systems' PROsatll or PCSATll 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 137.85MHz) and 3-4 (on 137.30MHz). 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 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 also transmit, but at lower resolution. These METEOR WXSATs orbit about 1200km up, so we see them when they are further away than the American NOAAs, which are about 800km high. This means that we get a greater coverage from the METEORS, and Fig. 1 is a METEOR 3-4 visible image showing the whole of Lapland.

METEOSAT-3 Schedule

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 U.S. 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 000km 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 -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.

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

Fig. 2: NOAA 12 visible image from Mark Pepper. 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 telephonenumber 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.

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

Lawrence Harris
5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB
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 it was delighted. Four pictures were sent and I was delighted. Four pictures were sent.

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I an McDermid has been a keen listener since the 1950s and has devised his own methods of learning Morse code. One of the techniques was simply to listen to station call signs 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 call sign. 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 call signs, you can move on to five letter groups.

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 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 option 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 Loeve HF-150 coupled to the popular ERA Microreader decoder. He also uses a Grundig 500 for general 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 GSVR, 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 Antron 99 CB antenna and a WX290 vertical tri-band. John’s current ambition is to pass the RAE and he’s working hard to achieve this.

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 i.e.d. based status and mode indications of the 232 and looks to be a great improvement. The old i.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/K3NG hardware. Both of these are low cost plug-in options. If you’re controlling the PK-900 using a PC compatible there’s now a new PC-Pakratt for Windows program available. ICS will be importing a limited number of units.

Utility OSLs

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, WDM 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 a few lines from a book or a newspaper. This is especially useful when it comes to reproducing the FAX photographs.

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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 you logged the station over a period of time, you may notice some useful information from the report. 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.

VHF Utilities

A recent letter from Michael McRoberts asks if there are any utilities in the VHF, UHF and bands. Michael has a realistic Pro-2006 that he would like to use with his Dragon 64 computer for utilities. If you are 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 1800MHz. 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 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. Reynolds, Les Griffiths, Robert Hall and Day Watson. The format is the usual: frequency, mode, speed, shift, callsign and time. 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.


[Table of FAX stations and their frequencies]

### Melbourne Met chart.

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency</th>
<th>Mode</th>
<th>Speed</th>
<th>Shift</th>
<th>Callign</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melbourne Meteo 2</td>
<td>35.5kHz</td>
<td>RTTY</td>
<td>96</td>
<td>400</td>
<td>R0070</td>
<td>1858</td>
</tr>
<tr>
<td>Melbourne Meteo 3</td>
<td>40.5kHz</td>
<td>RTTY</td>
<td>96</td>
<td>400</td>
<td>R0070</td>
<td>1858</td>
</tr>
<tr>
<td>Melbourne Meteo 4</td>
<td>45.5kHz</td>
<td>RTTY</td>
<td>96</td>
<td>400</td>
<td>R0070</td>
<td>1858</td>
</tr>
<tr>
<td>Melbourne Meteo 5</td>
<td>50.5kHz</td>
<td>RTTY</td>
<td>96</td>
<td>400</td>
<td>R0070</td>
<td>1858</td>
</tr>
</tbody>
</table>

[More detailed information about Melbourne Meteo, including frequencies and modes]
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Short Wave Magazine, April 1993

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Notes: Entries marked * were logged during darkness. All other entries were logged during daylight or in darkness.
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, 350m a.s.l. Using a Nevada MS-1000 connected to the car radio antenna he logged CKXG Boston 1150 at 0100, CJYD at 0210, CJCB 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 the few Ferrites (Hotchkiss) to receive his first ever transatlantic signal, it was CJYD 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 CKXM Grand Falls on 520 at 0215.

A weak signal from CJYD was heard at 2235 by Darren Beasley in Bridgwater. By 2340 it was peaking 2222, so he searched the band! During the next half hour he logged V0CM as 2212, VOAR as 2329 and DBG Gander on 1420 as 2111. In Worthing, Ken Damp logged CJYD as 2222 at 0400, but he was unable to detect any other transatlantic signals.

Favourable conditions were observed on January 27 by Ted Barning in London. He logged CJYD as 1123 at 0915, WINEV, NY 1130 as 2133 at 0203, VOCM as 12331 at 0211, WTP Washington 1500 as 3112 at 0229, also WDGL as 2122 at 0247. Sky wave signals from some m.s. stations in the Middle East were heard as well, again the UK, see chart. There was a good deal of Local Radio 0X about too but, in E.Gineast, John Wells found reception from the north to be exceptionally good. He logged first for 130km. A Greenside accidental in January 11 was Ross Lockley (Stirling) picking up BBC R.Germany for 1141 for about five minutes before co-channel BBC R.Derby faded up again! He uses the broadcasts from Isle Of Wight Ron 1242 as a pointer to propagation conditions.

If you enjoy listening to records from the 50s, 60s & 70s, then note: Entries marked ' were logged during darkness. All other entries were logged 0700-1550. S10333 at 1524 by Ted Walden -Vincent in Gt.Yarmouth; heading to cover N.Africa. During a test on January 17, Gerry Richards in the Mendip Hills, spent the early hours of January 3 on the top of the Mendip Hills, 350m a.s.l. Using a Nevada MS-1000 connected to the car radio antenna he logged CKXG Boston 1150 at 0100, CJYD at 0210, CJCB 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 the few Ferrites (Hotchkiss) to receive his first ever transatlantic signal, it was CJYD 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 CKXM Grand Falls on 520 at 0215.

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Short Wave Reports

Considerable h.f. propagation variations were evident during January. Directional reception areas was often poor or non-existent. An notable evening feature was the very early closure of Tropical band DXing often existed at night. At times 25W (11m) band signals were so unobservable 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 0800-0830) was noted in the UK since they changed their beam headings to cover N.Africa. During a test on January 17, Gerry Haynes logged their signal in Bushy Heath as 53334 at 0808, 45533 at 0633 and 55444 at 0648.

Also active in the band are UAE Radio in Abu Dhabi on 250.690 (Ar? 0800-1030) 25443 at 0915 by Eric Shaw in Chester; R.Norway Int, Oslo 25.730 (Norway to Asia, Aust 0800-0830 & 0900-0930, Norv to W.Africa 1300-1330, 'Eng Sat Sun) 44333 at 1325 in Hafnarfjordur, Iceland; R.Denmark via RNI 25.740 (Du to W.Africa 1330-1355) 45544 at 1330 in Stirling; DW via Julie 25.740 (Ger to M. East, E.Africa 1100-1135) 50250 at 1100 by Kenneth Buck in Edinburgh; RFI via Iosoudon 25.850 (Fr to E.Africa 0700-1550) 50303 at 1524 by Ted Waidie-Vincent in St. Gourmont. R.Nederlands via Flevó 9570 (Du to W.Africa 1000-1115, Sun only) 45344 at 1030 by Eddie McKewan in Newry.

Some of R.Australia’s 21MHz (13m) signals have been heard in the UK in the early morning. Early risers tuned to 21.525 from Darwin (Eng to SE Asia 0100-0800) 23223 at 0740 by Robert Connolly in Kilkeel, or to 21.580 from Carnarvon (Eng to Pacific areas 0100-0900) 23225 at 0837 in Sydney, Australia. Nowtish! Later, 21.252 from Darwin (Eng to SE Asia 0800-1030) has often been clearly heard. A typical rating of 35444 at 1040 was noted in Brenchley by Darren Taplin. Whilst visiting Litchororo, Greece Zacharias of Fangar (Thessaloniki) logged it as 44333 at 1100. Up in Hafnarfjordur it was 42223 at 1225.

Also heard in the morning were R.Japan via Noyabu 21.575 (Eng, Jap to E U 0700-0800) 35434 at 0740 by Chrisighthouse in Huddersfield, BBC via Iliamna 21.470 (Eng to M. East, E.Africa 0430-1615) 30434 at 1015 in Edinburgh and 31044 at 1100 by Jenny Anaichalam in Thumair, Oman; R.Denmark via R.Norway...
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Long Medium & Short Waves

58 Short Wave Magazine, April 1993
The device then controls customers the programme messages for 24 hours. Transmitted data service transmit, so during one minute, 30 self-addressed common type of Teleswitch has a 24 hour metering. The most receivers giving them remote control introduction of Radio Teleswitching contained and individually decodable signal in reverse. The maximum phase phase retard. A data ‘0’ is simply this phase advance followed by 20ms of a data signal, representing encoded digit in a nationwide message. Biscay. This makes these low cost, south-east Iceland to Finisterre and Western Europe, and sea areas from the UK, much of includes the entire UK, much of 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 obtained from BBC Engineering and the Electricity Association. The equipment pictured is manufactured by GEC Meters, Stonefield Works, Stone ST5 1RS.

Incoming Messages

Radiofax had a meeting with the ‘Man from the Ministry’ last year. Early optimism was dashed by the revival of the novostyle 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&B pages for details). The lack of a 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 Ross Revenge Support Group. Their address is, 121 Monkton Street, Monkton, Nr. Ramsgate, Kent CT12 4QJ. 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 close following the next issue of Bulletin, the organisation’s quarterly magazine. Promotions Manager John Burch is writing a book about offshore radio, which will be sent free to all of their members with valid subscriptions.

Mystery Stations

Richard Gasnell 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 MHz. 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 Conciadna? No trace of them has been found on the regular band. Another unidentified station has reached Alan Roberts in Quebec, Canada. He reports receiving “Radio Nove” 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 Middley writes from Liverbridge 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 0.642, 9.131, 7.887, 8.464, and 9.251 between 1930 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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Short Wave Magazine, April 1993
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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 cooperation 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 than 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
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 strong signals do not overload the front-end circuit.

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 to 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 PASSed will no longer be scanned next time round. When you decide that you want to include the PASSed 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

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 PASSing 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 though them; this is almost an eleventh bank of 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 A 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 PASSed 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 PASSed 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
The Yupiteru MVT-7100 wide-band receiver

MVT-7100 Technical Specification.

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

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 an 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 10.0522MHz (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 I.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, 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 maybe 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

<table>
<thead>
<tr>
<th>Day</th>
<th>Time (UTC)</th>
<th>Station</th>
<th>Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>0830, 0230 &amp; 0500</td>
<td>HCJB, Ecuador</td>
<td>DX Party Line</td>
</tr>
<tr>
<td></td>
<td>0915 (0815 summer)</td>
<td>Adventist World Radio</td>
<td>World DX News</td>
</tr>
<tr>
<td></td>
<td>0900, 0930, 1000 &amp; 1030</td>
<td>RGB</td>
<td>GB2RS News</td>
</tr>
<tr>
<td></td>
<td>1230, 1330, 1630 &amp; 2330</td>
<td>Radio Austria Int</td>
<td>Austrian SW Panorama</td>
</tr>
<tr>
<td></td>
<td>0018, 0218 &amp; 0418</td>
<td>Swiss Radio International</td>
<td>Swiss Short Wave Merry-Go-Round</td>
</tr>
<tr>
<td></td>
<td>0405</td>
<td>WWCR</td>
<td>Glenn Hauser's World of Radio</td>
</tr>
<tr>
<td></td>
<td>1800</td>
<td>RGB</td>
<td>GB2RS News</td>
</tr>
<tr>
<td></td>
<td>0635, 1035, 1135, 1250,</td>
<td>Radio Korea</td>
<td>Short Wave Feedback</td>
</tr>
<tr>
<td></td>
<td>1435, 1635, 1835 &amp; 2105</td>
<td>Radio Sofia, Bulgaria</td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td>0930</td>
<td>Radio Austria Int</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0930</td>
<td>WWCR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0000 &amp; 1330</td>
<td>Radio Korea</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0035 &amp; 0635</td>
<td>Radio Germany</td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td>0930, 1130, 1530, 1730</td>
<td>Radio Australia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&amp; 1930</td>
<td>Polish Radio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1335, 1605, 1830 &amp; 1935</td>
<td>Radio Sweden International</td>
<td>Media Scan</td>
</tr>
<tr>
<td>1st &amp; 3rd</td>
<td>Thursday</td>
<td>WWCR</td>
<td>Glenn Hauser's World of Radio</td>
</tr>
<tr>
<td>Tuesday</td>
<td>0730</td>
<td>Radio Netherlands</td>
<td>Media Network</td>
</tr>
<tr>
<td></td>
<td>0750, 0950, 1150, 1350</td>
<td>Radio Sofia</td>
<td>Glenn Hauser's World of Radio</td>
</tr>
<tr>
<td></td>
<td>&amp; 1550, 1750 &amp; 1950</td>
<td>WWCR</td>
<td>Media Network</td>
</tr>
<tr>
<td></td>
<td>0030, 0415</td>
<td>Radio Netherlands</td>
<td>DX Partyline</td>
</tr>
<tr>
<td></td>
<td>2215</td>
<td>Radio Sophia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0050, 0250, 0350</td>
<td>HCJB</td>
<td>Short Wave Merry-go-Round</td>
</tr>
<tr>
<td></td>
<td>2115 &amp; 2330</td>
<td>Swiss Radio International</td>
<td>Communications World</td>
</tr>
<tr>
<td></td>
<td>0815</td>
<td>Spanish National Radio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1100</td>
<td>Radio Hauser's World of Radio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0045</td>
<td>Radio Austria Int</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0415</td>
<td>Swiss Radio International</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0818, 1118, 1318, 1518</td>
<td>Spanish National Radio</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&amp; 1718, 2018 &amp; 2218</td>
<td>Voice of America</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1930 &amp; 2130</td>
<td>Austrian SW Panorama</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2110</td>
<td>Radio Sweden International</td>
<td>Media Scan</td>
</tr>
</tbody>
</table>
| 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 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.
These are just a part of our stock, phone me for the best prices.

Phil GW4 REX

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- ICW21E: Easy to operate dual band hand-held
- IC21E: Surely the smallest 2 metre handheld

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- Yupiteru MVT7000: One of the best hand-helds
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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
Around US$50 (£38). Each set would have a telescoping Yagi-type antenna with 13-15 dB 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 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 '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 BSS-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 'dyed 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.
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 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.

**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 (bas) 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 broadcasts or 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 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 preselectors are passive devices, others may contain a pre-amplifier to boost the wanted signal, in which case 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!
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 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.

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

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<table>
<thead>
<tr>
<th>Frequency/Date</th>
<th>Time Start/End</th>
<th>Station &amp; Country</th>
<th>Programme Details</th>
<th>SINPO</th>
</tr>
</thead>
<tbody>
<tr>
<td>5930</td>
<td>2 1819-1827</td>
<td>R. Prague International</td>
<td>'Listeners' Review' - pornography in Czechoslovakia</td>
<td>54444</td>
</tr>
<tr>
<td>15075</td>
<td>2 1828-1829</td>
<td>R. Korea, Seoul</td>
<td></td>
<td>44234</td>
</tr>
<tr>
<td>21480</td>
<td>2 1905-1910</td>
<td>HCJB, Ecuador</td>
<td>Preview of 'DX Partyline': News</td>
<td>44234</td>
</tr>
<tr>
<td>6190</td>
<td>2 2256-2300</td>
<td>Swiss R. International</td>
<td>'Swiss Shortwave Merry-Go-Round'</td>
<td>54444</td>
</tr>
</tbody>
</table>
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.
Please mention Short Wave Magazine when replying to advertisements
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 new 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.

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.

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 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 15.480MHz, 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.

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, 1400-0800 and 21.465MHz variable operating 24 hours. Reception reports go to Radio 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 thee 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
consistent in its operation in recent years. HI1J 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 0130 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 Diocesia 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 1982 and resumed in 1988. TGDG 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 TGN, 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 quetzel 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 Diocesia de Spokane (USA) and airs the majority of its programming in the Quiche language. TGVN uses 3.300MHz 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 Solola.

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 4.935MHz. The schedule is 1100 to 2300 or 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 Missionaries. Like all the other Guatemalan short wave stations, 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-1967, 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 corazan del territoria Mam en San Sebastian, transmite Radio Buenos 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 Aci'man, Cabricon, 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
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 4.765MHz 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** 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, it runs 1kW. 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 13, Huayacocotla, Veracruz.

**Radio Copan International** has not yet begun 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 XEIJF**. 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 XEOL 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 XEUUV 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, XEQX uses 6.045MHz with 250W between 1300 and 0500. The address is Apdo 456, 78000 San Luis Potosi.

Música 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 Apdo 79, 89000 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.

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 (XEUOS) with 1KW and is nominally scheduled between 1500 and 0715. The address is Apdo 217, 79000, Merida, Yucatan.

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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 (XEWW) is active, XEW is the station one is actually hearing. Once a regular on short wave, XEWW 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 advertises on a 24 hours a day basis. It is a service of the Instituto Mexicano del 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.XEWW 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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