IC-R7000, 25-2000 MHz, Commercial quality scanning receiver

ICOM introduces the IC-R7000, advanced technology, continuous coverage communications receiver. With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz.

The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto-M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-colour fluorescent display. Other features include dial-lock, noise blanker, attenuator, display dimmer and S-meter and optional RC-12 infra-red remote controller, voice synthesizer and HP 1 headphones.

IC-R71E, General coverage receiver.

The ICOM IC-R71E 100KHz to 30MHz general coverage receiver features keyboard frequency entry and infra-red remote controller (optional) with 32 programmable memory channels, SSB, AM, RTTY, CW and optional VFO's scanning, selectable AGC, noise blanker, pass band tuning and a deep notch filter. With a direct entry keyboard frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency is altered without changing the main tuning control. Options include FM, voice synthesizer, RC-11 infra-red controller, CK70 DC adaptor for 12 volt operation, mobile mounting bracket, CW filters and a high stability crystal filter.

Helpline: Telephone us free-of-charge on 0800 521145. Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.

Datapost: Despatch on same day whenever possible.

Access & Barclaycard: Telephone orders taken by our mail order dept, instant credit & interest-free H.P.

Icom (UK) Ltd.
Dept SW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.
Introduction to DX-TV
Part 13

SWM Review
Realistic PRO-38 Scanner
Three-Band SSB Receiver
Part 4

Tuning in the 1930s

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George Hewlett

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Jack Aldridge

Cover The Roberts Radio reviewed in this issue is an interesting, quality domestic receiver which should prove of use both in the lounge and radio room alike.

Part 3 of Tim Wright's series on the Eddystone 940 has, once again fallen foul of space problems and will not appear until the next issue. Behind the Scenes at Radio Australia - Part 2 has also had to be held over for the same reasons.

First Word
A Word in Edgeways
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Keith Hamer & Garry Smith
Mike Richards
C. M. Lindars

Editorial
Your Letters
Latest News & Products
Club News
Special Event Stations
Where to Go

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Amateur Bands Round-Up
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Paul Essery GW3KFE
Mike Richards G4WNC
Pat Gowen G3OR
Ron Ham
Ron Ham
Brian Oddy G3FEX
In the centre of this issue is another pull-out supplement produced in conjunction with the European DX Council. The one we produced last November to go with the EDXC stand at Telecom 87, Geneva was well received and this one should be just as popular. The BBC Show is being held at Earls Court, London from September 30 to October 2 and Short Wave Magazine has a joint stand with EDXC. We will not be able to be in attendance throughout the Show as we have two magazines to publish and what with holidays and an imminent visit from the stork to a key member of our staff, time is precious. However I am hoping to get along to the show for some of the time and I do know that Simon Spanswick of EDXC will be getting the Press Gang out to round up members for stand duty.

One of the problems with publishing constructional articles for anything to do with radio or electronics is the speed with which technology outdates what has just been published. However, I did think that I would be safe with the simple s.s.b. receiver currently being serialised. Every component used is so commonplace and easy to obtain that there should be no problems. Well, it now seems that it is becoming impossible to obtain Denco products. An item in the current issue of Television magazine states that Denco coils are no longer available. How does this affect our project? Well — the coil former and dust-iron cores are Denco parts. As well as affecting our small project this devastating piece of news has other implications. A lot of projects aimed at the beginner to short wave radio construction are based around Denco coils and it now looks as if some serious thought will have to be given to finding some suitable alternatives. If anyone has ideas, or has already found a solution then I will be only too pleased to share it with our readers. In the meantime we are working on a solution to the coil former problems for builders of the "Three-Band SSB Receiver". Eddystone, Weyrad, Repanco and now Denco — whatever is the world coming to?

Those of you following Tim Wright's series on the Eddystone 940 receiver will be interested to know that Tim has let me have some further information which has come to light since the articles were written. Also, whilst manning our stand at the RSGB's show at the NEC recently, I managed to acquire a 940 in showroom condition. I have been having a great deal of fun with it in its standard condition from my QTH in East Dorset. With just a simple 18m long wire antenna strung from the bedroom window to the tree in the front garden I have been able to listen to some interesting DX on the 14 and 21MHz amateur bands — in spite of lousy image rejection at these frequencies. However, I have a dilemma! Bearing in mind the condition of the set, do I leave it alone and put up with the performance problems — or do I carry out Tim's modifications and improve the performance?

Talking about having fun, on the first day of the show the set was parked on a table at the back of our stand. George Dobbs G3RJV spotted it and went into raptures, spinning the tuning knob first up, then down the dial with a flick of the wrist that tended to give away his age. "They don't make them like that anymore."

"I said, giving it yet another spin. After that I took the set away to my hotel room as I could see it being worn out before I had managed to use it!

DICK GANDERTON

A WORD IN EDGECWAYS

Sir

The photograph of VP4WD, the first amateur on Tobago, on page 17 of your July issue 1988 is very interesting.

Jack (VP4WD) appears to be resting his drink on top of a complete B2 wireless set of 1942-43 vintage. These sets were carried in a small suitcase and were used for clandestine work by parachutists in WWII. In the photograph the transmitter is on the upper left hand and shows clearly the plug in coil. The RX is at the bottom and the power unit is on the right. The power unit could be adapted to the mains supplies of several countries.

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

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to other magazines.

Sir

Having just retired I have been interested in Short Wave listening and having acquired a Codar C45 minus the valves, I wondered if any reader could let me know which type this set used. I would also like to get hold of a circuit diagram of this receiver.

CODAR RADIO did have an address in Lancing, Sussex, I believe the transmitter had an input of about 7 watts to the final power amplifier stage.

"CW only of course!"

JAMES GLANVILLE COVENTRY

but wonder if they are still around, as this was quite some time ago. Trusting you can help me to enjoy my retirement.

W.D. COBB

BEXHILL-ON-SEA

EAST SUSSEX

WHAT'S NEW

The Government has decided not to introduce broadcast services into Bands I and III. In a written answer, Lord Young, Secretary of State for Trade and Industry, stated:

"The technical feasibility study has shown that there is insufficient scope within Band III to accommodate a broadcast channel without the risk of serious mutual interference with adjacent mobile services. In Band I, there is potential scope for a single broadcast channel covering at most some, but not all, major conurbations. But even this restricted coverage could not be achieved unless a number of existing mobile radio services were to be moved at very substantial expense.

Additionally, the re-introduction of high power broadcasting in this band could be very difficult and costly to negotiate with our international neighbouring administrations who would regard a policy reversal by the UK as a serious disruption of the international understandings on which their domestic planning over the past few years has been based.

Band I also suffers from a seasonal pattern of interference, known as Sporadic-E, whereby broadcasts from 1000km or further away can be reflected from the ionosphere, completely obliterating the wanted signals for prolonged periods. Finally, the Civil Aviation Authority have advised us that the re-introduction of broadcasting could pose some threat of harmonic interference to aircraft navigational and communications systems. With so many actual or potential disadvantages in return for, at best, an extremely restricted coverage, we have concluded that the re-introduction of broadcasting into Bands I and III is not a viable option and that it is in the interests of all concerned to make that conclusion public at the earliest possible date."
New Kits from Cornwall

While at the Cornish Rally this year I came across two interesting kits from GOFKI & G4IKR – a Transistor/Crystal Tester and a t.r.f. Short Wave Receiver.

The Receiver Kit is aimed at the beginner who has mastered the simple art of soldering. Built on a glass-fibre printed circuit board with high quality components, the receiver is claimed to tune over the range 6 to 12 MHz when using a 400pF tuning capacitor. Following the trend with receiver kits, the constructor is left to supply his own case so that, as well as keeping initial costs down he can choose a style of case that suits his whim. No tuning capacitor is provided, but for those who do not have a junk box GOFKI & G4IKR can supply a suitable variety with slow-motion drive as an optional extra. Comprehensive instructions are provided which include an information sheet explaining the resistor colour code. A nice touch is the s.a.e. and the note asking for comments or suggestions.

The t.r.f. receiver is available as a kit without the tuning capacitor for £9.60, and as a ready-built p.c.b. for £14.60. The tuning capacitor costs an extra £3.15 on top of the kit or board price. (All these prices include post and packing.)

The Transistor/Crystal Tester will be of interest to those who cannot refuse bargain packs of untested components. The completed unit will test just about any variety and species of transistor as well as crystals on their fundamental frequencies. It can also be used, with a suitable crystal in circuit, as an accurate signal source for testing and calibrating receivers. Available only as a kit, the Tester costs £7.35 inc. post and packing.

GOFKI & G4IKR
Lowena Merritts Hill
Illogan
Redruth
Cornwall TR16 4DF
Tel: (0209) 218649

Veneered Cabinets

If you are trying to renovate an elderly piece of hi-fi equipment or enjoy building reproduction vintage gear, one problem you often encounter is where to obtain the proper cabinets from.

We’ve heard of a new company that aims to provide quality veneered loudspeaker cabinets. There are two sizes available at the moment: L5/35A in black ash or walnut (£45 per pair) 30 litre in black ash or walnut (£60 per pair)

The prices quoted include VAT but not carriage, which will be at cost.

If you would like more information on the cabinets, contact:
Vulcan Loudspeaker Company
64 Leedham Road
Rotherham S65 3EB
Tel: 0709 544105

MK From STC

MK Products are now available from STC Electronic Services. On the leaflet they sent recently five different products were detailed.

There were filtered mains sockets, designed to combat the effects of voltage spikes and transients on the mains wiring. These can be very useful if you run computers and the like. The sockets provide ‘two-way filtering’ so preventing a noisy piece of equipment from creating local transients.

Another product range is the residual current circuit breakers. MK produce both the type that plugs into any standard 13A socket outlet and the type which replaces sockets. In each case the trip current is 30mA.

For more details of these and other MK products that STC now stock, contact:
STC Electronic Services
Edinburgh Way
Harlow
Essex CM20 2DF
Tel: 0279 26777

Giant Dual Band

The Diamond X500 Dominator is a giant dual band vertical providing the maximum gain that is practical for most locations. Standing no less than 1.5m high, it provides a gain of 8.3dBi on 144MHz and 11.7dBi on 430MHz when compared with a quarter wave.

The power handling is 200 watts and the antenna is fully encapsulated in white glass fibre. Using ‘C-loading’, it is the equivalent of three 5/8 antennas on 144MHz and no less than eight 5/8 antennas on 430MHz.

The v.s.w.r. is quite flat, being better than 1.5:1 across both bands and is typically 1.1:1 at the centre frequency. The e.r.p. when compared with a quarter wave (running 25 watts input) is approximately 200 watts on 144MHz and 400 watts on 430MHz. A ground plane of three radials is incorporated and the base socket is an “N” type for low loss.

The complete antenna comes with all necessary hardware for masts up to 2.25in diameter and the antenna breaks down into three sections for transport. Even the spanners are included in the kit. The price for this giant is £129 including VAT.

Waters & Stanton Electronics
18 – 20 Main Road
Hockley
Essex SS5 4QS

Thanet Electronics Club

The Thanet Electronics Club meets every Monday evening at 7.30pm in the Quarter Deck Centre, Zion Place, Margate.

They provide lots of other fun activities for “kids”, like visits and Youth Hostel Trips. There are opportunities for lots of real interest in science, model and project making and history of science as well as talks and article writing.

If you are in the area and think this group for youngsters is interesting, contact:
Richard on Thanet 61821 or
Chris on Thanet 221131
WHAT’S NEW

Medium Wave News Re-styled

Medium Wave News is published by the Medium Wave Circle, a specialist radio club for all medium wave enthusiasts worldwide. Now, in its 33rd year, MWN has been re-styled to offer much more to the reader.

The first major change took place in the autumn of 1987 when MWN changed from loose-leaf A4 to A5 pamphlet. This change proved so successful that from the August 88 edition they will be increasing the size and content by 25% (up to 20 pages).

Each issue of MWN contains up-to-date DX News, station information, DX Logs and a QSL corner. It also regularly carries articles on a wide range of topics, e.g. antennas, receivers, DXpeditions, etc.

A sample copy of MWN is available free on request, although IRCs are needed for outside Europe, and a suitable s.a.e. would probably be appreciated.

Harold Emblem
137A Hampton Road
Southport
Wirral PR8 5DY

HF Convention 1988

The lecture programme for the HF Convention on September 25 at the Belfrey Hotel, Milton Common, Oxford has been finalised.

1030 — 1130 — "EMC — The Politics and the European Community Directive" by Dan Bernard G4RLE (EMC Committee Chairman) and Alan Dearlove G1WZZ (EMC Committee Member).

1145 — 1245 — "HF Equipment — New or Second-hand?" by Angus McKenzie G3OSS.

1330 — 1415 — Trophy Presentation by the President, Sir Richard Davies G2XM.

1430 — 1530 — "QRP Forum" by Peter Linsley G3PD and members of the G-QRP Club.

1545 — 1800 — DX Slide Presentations:


Doors open to the Convention at 9.30am and the admission is £3. Other attractions are a car boot sale, WAB stand, Southern 10m FM Group, RNARS ORQ c.w. tests, Doctor DX Computerised Contesting, Pile-up Copying Competition and there will be refreshments available and the bar will be open.

RSG
Lambda House
Cranborne Road
Potters Bar
Herts

Moves to Ban Illegal CB

A reply to a Written Parliamentary Question recently made interesting reading.

"I have tabled an Order under Section 7 of the Wireless Telegraphy Act 1967 banning the import, sale, manufacture or possession of 27MHz Citizens Band Apparatus which cannot be legally used, and also updated Regulations requiring that 934MHz CB equipment conforms to the appropriate specifications. The widespread sale of unapproved apparatus has led to interference to authorised radio services including, most seriously, to emergency services. The introduction of these measures will ensure that unapproved equipment is removed from the market and that the range of approved equipment covers the new CEPT CB radio service, in harmony with the rest of Europe."

Better late than never I suppose!

Armada 400 Antique Wireless Show

Mr Robert Symes, well-known for his Tomorrows World appearances on BBC TV as well as other television programmes including "Open University" and some very interesting modelling programmes, opened the Antique Wireless Show on July 9 at Effingham near Guildford.

The show was put on to celebrate the 400th Anniversary of the defeat of the Spanish Armada and, as Effingham supplied the English Fleet Commander in the guise of Lord Howard of Effingham, as every schoolboy knows, what better place. Lord Howard probably wished that he could have had something as useful as wireless to help him — although the gales that helped sink the Armada would probably have blown down his mast!

A working amateur station, with the call sign GB2ARM was on the air during the day providing a suitable counterpoise for the vintage equipment on show. This included early crystal, valved and transistor radio sets, 1914-18 Army Trench sets, the first Aeroplane Spark transmitters and a Zeppelin transmitter. World War II equipment from Britain, USA and Germany were also being displayed, alongside the suitcase Sets used by SOE operators in France in 1943.

The photograph, by Alan Caspard G8ZOF, shows Robert Symes with Stan Caspard G3XON intently listening to the HMV dog and letting the vintage BR coffee go cold.

Klippon Catalogue

Klippon has produced a new full-colour catalogue on its extensive range of cable cutting, stripping, crimping, terminating and testing tools.

The 35 page publication features several new tools including Strips KT7, KT7-1000 cutters; the CT1 6 crimp; the HTF sub-D crimp, etc.

It’s illustrated and gives such details as ferrule requirements and NATO numbers. The catalogue is available, free-of-charge from:

Klippon Electricals Ltd
Power Station Road
Sheerness
Kent ME12 3AB

The Royal 1300

This antenna is a 25 — 1300MHz discone, manufactured in the UK. It is made of stainless steel and chrome plated brass machined components with UR67/RG213U coaxial cable and Greenpar ‘N’ connectors.

The price for this antenna is £59.95 including VAT and is available from Raycomm Communication Systems Ltd.

Further details are available from:

Raycomm Communication Systems Ltd
International House
963 Wolverhampton Road
Oldbury
Warley
West Midlands B69 4RJ

Change of Address

J & P Electronics Ltd., have moved premises due to continued expansion. The new address is:

J & P Electronics
Unit 45
Meadowhill Est
Dixon Street
Kidderminster
DY10 1HH

The telephone number remains unchanged as:

Tel: 0562 753893.
### Short Wave Magazine October 1988

#### Communication

Communication is the monthly journal of the British DX Club. The subscription rates for the British DX Club, for one year, are:

- UK (including 1st Class posting of Communications) - £7.50
- Irish Republic and Overseas (surface mail) - £8.50
- Irish Republic and Overseas (airmail) - £11.00.

If you are interested in taking out a subscription, send it to:

- Dave Kenny
- 10 Hemdean Hill
- Caversham
- Reading
- Berks RG4 7SB

#### Radio Netherlands Schedule

This guide is arranged to cover one whole day of broadcasting. The 0300UTC broadcast is therefore put at the end of the list since, although the day has changed in the Netherlands, it is still the previous evening on the West Coast of North America.

<table>
<thead>
<tr>
<th>Time (UTC)</th>
<th>Main Area Served</th>
<th>Frequencies</th>
<th>Length (mins)</th>
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<tbody>
<tr>
<td>0400</td>
<td>M. East/E. Africa</td>
<td>9.895 &amp; 7.210MHz</td>
<td>25</td>
</tr>
<tr>
<td>0530</td>
<td>W. Africa</td>
<td>11.930 &amp; 9.855MHz</td>
<td>25</td>
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<tr>
<td>0730</td>
<td>New Zealand</td>
<td>9.715 &amp; 9.630MHz</td>
<td>55</td>
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<tr>
<td>0830</td>
<td>New Zealand</td>
<td>9.630MHz</td>
<td>25</td>
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<tr>
<td>0830</td>
<td>SE. Asia</td>
<td>21.485 &amp; 17.575MHz</td>
<td>55</td>
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<tr>
<td>1030</td>
<td>Australia/Caribbean</td>
<td>9.505 &amp; 6.020MHz</td>
<td>55</td>
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<tr>
<td>1130</td>
<td>Middle East/Asia</td>
<td>21.480, 17.575 &amp; 15.560MHz</td>
<td>55</td>
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<tr>
<td>1330</td>
<td>Europe</td>
<td>17.605, 9.715 &amp; 9.595MHz</td>
<td>55</td>
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<tr>
<td>1430</td>
<td>SW. Asia</td>
<td>17.575, 15.560, 17.370, 11.735 &amp; 5.955MHz</td>
<td>55</td>
</tr>
<tr>
<td>1630</td>
<td>S. E. Africa</td>
<td>15.570 &amp; 6.020MHz</td>
<td>55</td>
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<tr>
<td>1830</td>
<td>Europe</td>
<td>6.020 (parallel to African service)</td>
<td>55</td>
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<tr>
<td>0530</td>
<td>Western N. America</td>
<td>9.715 &amp; 6.165MHz</td>
<td>55</td>
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#### Forthcoming HCJB Programmes

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<td><strong>Call of the Andes</strong>: A special event happens every two weeks at a jungle post. Can you guess what it could be?</td>
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<th>September 24</th>
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<th>September 25</th>
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<td><strong>Call of the Andes</strong>: The true state of our faith shows when death threatens.</td>
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<th>September 26</th>
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<tbody>
<tr>
<td><strong>Ham Radio Today</strong></td>
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<th>September 27</th>
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<tr>
<td><strong>Happiness Is</strong>: Part II of the Life and Writings of George MacDonald.</td>
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<th>September 28</th>
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<tr>
<td><strong>Call of the Andes</strong>: How and why was the Amazon River discovered by Europeans? Did the Indians know it was there?</td>
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<tr>
<th>September 29</th>
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<tbody>
<tr>
<td><strong>Passport</strong>: The panda is an international sign for mankind to preserve all that God has given us to manage and enjoy, Polly MacHarl treats the subject of the endangered Panda bear. 1900UTC: 15.270 &amp; 17.790MHz (target area - Europe); 0100UTC: 15.155, 11.775 &amp; 9.720MHz; 0500UTC: 17.775, 9.720 &amp; 6.230MHz (target area - N. America).</td>
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<tr>
<th>September 30</th>
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<tbody>
<tr>
<td><strong>Call of the Andes</strong>: What would you look for if you had planted fruit trees? An interesting application.</td>
</tr>
</tbody>
</table>

**Passport**: The panda, see September 29. 0900UTC: 9.745 & 11.925MHz (target area - S. Pacific).
GRASSROOTS

Lorna Mower

Biggin Hill ARC meet 3rd Tuesdays, 7.30pm at The Victory Social Club, Kehill Gardens, Hayes. October 18 is a Surplus Equipment Sale. Geoff Mlle G3UMI on Hayes 2689.

Wimbledon & District ARS have Future Simple Tuesday Nights on 27 October at 7.30pm. Visit the Club in their new premises at 644 Wimbledon Village W8.

Norfolk ARC meet Wednesdays, 7.30pm at The Norfolk Dumpling, The Livestock Market, Harford. September 21 is an Informal/Committee Meeting, the 28th is TV DXing G4UAM, October 5 is an Informal, the 12th is Norwich City Planning Officer’s 8th at a Side Show, Ray Sewell, the 19th an Informal/Committee Meeting and the 26th is “PSE QSL OM”, bring your favourite or unusual QSLs.

Isle of Man ARC meets Mondays, 8pm at the Howstrake Hotel, Harbour Road, Onchan, IOM. Anthea Matthewson G04WQ on Douglas 22295.

The East Kent RS have their AGM and Construction Contest on October 6. 1st & 3rd Thursdays, 7.30pm at Parkside Lodge, Kings Road, Herne Bay. Brian Dimdon G4RIS on Whitstable 262042.

Keighley ARS has a Games Evening on September 27, an Informal on October 11, East Riddlesden Hall Special Event Station on the 15/16th and a Junk Sale on the 25th. 2nd & 4th Tuesdays, 8pm in the Club Room, rear of Victoria Hall, Kathy G11GH on Bradford 496622.

Norfolk ARC meet alternate Wednesdays, 8pm at Englishcombe Inn, Englishcombe Lane. September 28 is an Equipment Sale, October 12 a Video Night and the 26th a Constructors Competition. Details Eric Otten G4GEV on Combe Down 832156.

Yeovil ARC have a Natter Night on September 29. Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. David Bailey G1MMN at 7 Thatcham Close, Yeovil BA21 3RS.

Wiral ARS have their AGM on October 5 and First Aid by G4YWD on the 19th. Natter Nights each Tuesday. R. E. Bridson G3VEB on Wallasey 1346.

Ambury & District ARC have arrangements for exhibition station on September 27 and RAE registration at Castle School on the 29th. October 1/2 is Examination Station at Oldbury Power Station, the 11th G8AZT on Valves and the 25th a Natter Night. H. T. H. Cromack G0FGJ on Thornbury 41062.

Bath & District ARC meet Tuesdays, 8pm in Ossett Community Centre, Prospect Road. October 4 is a Practical Evening, the 9th an RSGB 21/28MHz Contest, the 16th is Members Home Construction Display and the 18th is On the Air G1WRS/G3WRS. John Roberts G1XYT at 1 Pomfret Place, Garforth, W. Yorks LS25 2NL.

Rugby ATS meet Tuesdays. 7.30pm at the Cricket Pavilion outside Rugby Radio Station. An AGM on October 11 and talk and demo on Weather Satellites G8VX8 on the 18th. Kevin Marriott GBTWH on Rugby 77986.

The Road ARS have a talk and demo on various computers in September. Meet Mondays, 7.30pm at the Horse Country Equestrian Centre, Newham Road, Camberley, 1QW. 1st Mondays are Auctions, last are Lectures. Bob Griffiths G0ISB at 29 Dubbera, Godishill, 1OW.

Derby & District ARC meet Wednesdays, 7.30pm at 119 Green Lane. A Junk Sale on October 5 and Crime Prevention - a talk by Sgt Wood of Derbyshire Police on the 12th. Kevin Jones G4FPY on Derby 669157.

Exeter ARS have their AGM on October 10. 2nd Mondays, 7.30pm at the Community Centre, St. Davids Hill. Ray Donno G3YBK on Exeter 787110.

Workshop ARS have Simple Transceiver for top band by G4BVV on September 27, Natter Nights on October 4/18, a Junk Sale on the 11th and their AGM on the 25th. Meeting place and time from Mrs C. S. Gee on Workop 486614.

Dunstable Downs RC meet Fridays, 8pm in Room 3 of Chess House, High St (South). A Natter Night on September 23 and Members Slides on the 30th. Tony Kelsey-Steed GCOQ on Luton 508259.

Mid-Warwickshire ARS have a Club Open Day on September 27 and Clandestine radio on the Burma-Siam railroad on G3BA on October 11. 2nd & 4th Tuesdays, 8pm at St. John Ambulance HQ, 61 Emcotte Road. P. Brown on Morton 632370.

Horndean & District ARC have their AGM on October 4. 1st Thursday, 7.30pm at Merchistoun Hall. Dan Bernard G4RLE on Portsmouth 755274.

Felixstowe & District ARS meet alternate Mondays, 8pm at the Scout Hut, Beth Road. Socials in the Grosvenor Hotel. October 3 is a Visit to Felixstowe Docks, the 17th a Social. Paul Whiting G4QVC on Ipswich 642595 daytime.

Midland ARS meet Tuesdays, 7.30pm with classes from 7pm in Unit 16, 60 Regent Place, B’ham. Wednesday ARS is Morse, 7.30pm at a Talk by Sgnt Wood of Rugby Radio Station. A Junk Sale on October 18 is their AGM. Tom Brady G8GAZ on 021-357 1924.

Todmorden & District ARS meet 1st & 3rd Thursdays, 8pm at the Queen Hotel. They have a Surplus Equipment Sale on October 3 and a Natter Night on the 17th. Val Mitchell G1GBZ on Todmorden 7572.

Wyre ARS have a Morse Class on September 28. Pie and Peas Social Night on October 12, G4FSF Reetwood scouts JOTA on the 15/16th and Horse wrestling GOAJW on the 26th. 2nd & 4th Wednesdays, 8pm in Breck Sports & Social Club. Dave Westby G4UH on Lancashire 854745.

Ponfract & District ARS meet Thursdays, 8pm in Carleton Community Centre, Carleton Road. Second Saturdays, 7.30pm is Exercise - “Went Valley Hike” and the 29th is On the Air. October 6 is RSGB Night with Martin G3ZX2 Liaison Rep, the 13th is a Committee Meeting at The 20th Satellite TV by G4FPA and the 27th is On the Air. Eddie Grayson G60JX on Knottingley 83792.

North Cheshire RC are running RAE Courses as from Sunday 25 September in the Morley Green Social Club, Mobberley Road, Morley Green. Details from P. J. Kersop G4WGE on Hale 51725.
Have you Got a Special Event Station we should know about? If so, write and tell us

GB8AER: This station will be operational on 144MHz f.m. for the 8th Army El Alamein Reunion of October 29 from the Winter Gardens, Blackpool. The station will be situated at the top of the Opera House Stairway and they would like especially to work RSARS, RAFAIRS and RNARS members.

GB2DHV QTHR

GB75OLD: The Thornbury & District ARC will be operating this station from the Old Severn Nuclear Power Station near Bristol on September 30 – October 2. It’s to celebrate the RSGB’s 75th anniversary and the power station’s 21st anniversary and station Open Days. The station will be operational on Friday evening and from 1200 on Saturday to 1800 on Sunday. They should be using all bands including ATV. All are welcome to look around the radio and power stations during the open days from 1200 to 1700 on Saturday and 1100 to 1700 on Sunday. There’s free car parking. Special QSLs for 5.w.i.s.

RALLIES

September 24/25: The first El Hamfest will take place at the Grand Hotel, Malahide, Co. Dublin. There will be a dinner on the 24th, with the rally starting at 5.15pm sharp on the 25th. The weekend will consist of sessions on all aspects of amateur radio together with lectures by Louis Varney, GS5R and it is rumoured that Hugh Turnbull, the Director Atlantic Division of the ARRL will be giving a lecture too. Talk-in will be on S2. More details on all the events and accommodation at the hotel can be obtained from:

Christopher Yeates E17AAB
Tel: Dublin 215145

September 25: The 1988 Harlow Mobile Rally will be held in the Harlow Sports Centre. Doors open at 10am and the admission has been held at £1 for adults, accompanied children free. There is ample free parking adjacent to the sports hall and there will be reserved parking for the disabled. Morse tests will be available and can be booked through the RSGB Catering will be available in the new Time Out cafeteria and lounge bar. Details from:

G4MIS
Tel: 0279 722622 (evenings and weekends).

September 30 - October 9: The BBC Radio Show will take place at Earls Court, London. Doors are open from 10am to 10pm except Saturdays and Sundays when it’s 11am to

* SWM in attendance

7pm. It’s a “one-off” event, timed to celebrate 21 years of broadcasting by Radios 1, 2, 3 and 4 and local radio.

• October 2: The Great Lumley AREs are holding their rally at The Community Centre, Great Lumley, Co. Durham. Doors open 11am. Talk-in on S2, R80 and GB3NT

G1OKA
46 Donelaw, Great Lumley Chesterley-Street, Co. Durham

• October 2: The Welsh Amateur Radio Convention is at the usual venue, Oakdale Community College, Blackwood, Gwent. More details from:

B. Davies GW3KYA Tel: 0495 225825

October 9: The Armagh Radio Rally is to be held in the Drumill House Hotel. Doors are open from 12 noon to 6pm. For more details of this successful rally, contact:

J. A. Murphy Tel: Armagh 522153

October 18: ELH0EX 88 (Electronic Hobbies Exhibition) is being organised by The Horsea ARC in the Floral Hall, Horsea. There will be traders, AMTOR and Packet demos, clubs stands and much more there. Doors open 11am.

G4IGY
Tel: 0864 533331

October 23: The first privately organised Warrington Communi-Constructor Fair will be held at the Great Sankey Forum, close to junction 7 of the M62. Doors are open from 10.30am to 4pm. The event will have a strong emphasis on constructor’s components, communications and computer related equipment. It’s also expected that there will be a vintage radio, valve and hi-fi presence.

Bernard Tel: 0772 435858

November 5: The Eighth North Devon Radio Rally is to be held in Bradworthy Memorial Hall (near Holsworthy). Doors are open between 10.30am and 5pm. There will be the usual attractions, including a bring and buy. Talk-in will be on S2.

GB9MXI
QTHR

November 20: The Bridgend & District ARC rally will be held at the Bridgend Recreation Centre, Angel Street, Bridgend. Doors open 11am. There’s free parking, a bring and buy, bar facilities, etc. Talk-in will be on S2.

Mike G6WXC
Tel: 0656 724041

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Dear Newsagent,

Please reserve/deliver my monthly copy of SHORT WAVE MAGAZINE
The NRD-525 from JRC

Those of you who have read about the NRD-525 will recall that I gave some background information about the JRC company. What I was trying to get across was the fact that a company with such a long history in the communications business can endow its products with a host of subtle details based on actual operating experience. JRC are in many ways similar to the Marconi Company (as it was), in that they can meet every possible need of their professional customers. Any owner of an NRD-525 will rejoice that a company such as JRC decided to bring their quality to the non-professional user.

But what of the NRD-525 itself? What will it do for you as a dedicated listener? In such a limited space as this page I cannot possibly cover all its outstanding features so I will draw some extracts from the Rainer Lichte review. Here's what he says:

**Accuracy and stability:**

"The signal quality under adverse conditions is remarkable, e.g. the 40 metre band here in Europe is fairly cluttered with high-power stations and most receivers just quit when you try to extract some intelligence from a weak radio amateur signal. The NRD-525 is unimpressed and functions in a truly professional manner."

In other words, there is virtually nothing you cannot resolve. If it cannot be received by the NRD-525, it cannot be received by anything. As a final quote from the review, let me give some conclusions:

"This receiver is a joy to operate and a joy to listen to."

"The new NRD-525 very impressively manifests itself as the No. 1 receiver outside the commercial/military bracket."

"Performance-wise, the NRD-525 is way ahead of the competition because this receiver delivers outstanding results in all modes of operation."

What you will find about the NRD-525 is that with all its undoubted performance, it is so very easy to use and never thrusts itself at you like a knob bedecked military receiver. If you want to use it as a high quality broadcast receiver, then that is what it will be. As you discover more and more about the art of listening you find that the NRD-525 contains every operating feature and convenience that you might need, and there is almost nothing you cannot hear with it even when listening conditions are really difficult.

If you want to extend the use of the receiver, you will find a range of optional accessories to broaden the horizons, including a VHF/UHF converter which extends the already impressive 90kHz-34MHz range to include 34-60MHz, 114-174MHz, and 423-456MHz. (And the converter fits inside the receiver).

When you get deeper into the art, you may decide that specialised listening requires specialised receiver bandwidths, and a range of high performance filters is available for your choice.

One final comment from Rainer Lichte with which I totally agree is his remark that the internal speaker in the NRD-525 is really only suitable as a monitor, and does not do justice to the high quality available from the receiver. This being so, if voice communications are your forte I recommend the matching JRC loudspeaker the NVA-88. If however you really want to enjoy the audio from broadcast stations, we carried out a long series of tests and decided that the Wharfedale Diamond III loudspeaker produces the most excellent sound from this and many other receivers. Normally of course these loudspeakers are sold as pairs, for stereo listening, but we split the pairs and can sell you a single Diamond III to enhance your listening pleasure.

"Truly happy listening."

- John Wilson

NRD-525 £1095 inc VAT

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INTRODUCTION TO DX-TV

Keith Hamer and Garry Smith
Part 13

Pivoted Mast

To enable a pole mast to be raised and lowered safely, some form of pivot arrangement is necessary at ground level. Ready-made assemblies can be obtained as we mentioned in Part 12, but a simple and cost-effective mechanism can be made by the judicious use of heavy duty antenna clamps. These are of the type normally used for fastening an array having a boom diameter of 1in, to a support mast of up to 2in outside diameter. The suggested mechanical arrangement is shown in Fig. 1 and it was used successfully for several years by one of the authors until a lattice mast was installed.

The pivot assembly is relatively easier to provide than the “flag-pole” system described last time which made use of the two parallel vertical wooden posts set in concrete. With the system now under discussion a concrete foundation is not necessary and the uprights consist of two 2in diameter lengths of aluminium scaffold pole. These are hammered directly into the ground to a depth of approximately 1m leaving about 300mm protruding. Ensure that the poles are truly perpendicular, but note that such a pivot arrangement cannot be used to provide a free-standing mast because of the lack of an upper support.

The only possible snag with this approach is that unless the exact whereabouts of the underground water pipes are known, a team from the local water authority may suddenly have to be called away from their tea break if the inevitable disaster should occur! However, it may be some consolation to note that while some insurance companies will gladly pay out for accidental damage to a water pipe, they are reluctant to do so when a leak occurs on its own accord.

Mast Material

Aluminium tubing having an outside diameter of 2in (50mm) was chosen for its lightness and durability. Although somewhat heavier, steel sections could have been used for reasons of economy but only in the short-term since rusting would have been a problem after a period of time. The antenna-carrying support pole used by one of the authors during the early seventies was made of 1.5in diameter steel tubing to suit the rotator. This made for a sturdier structure, but it rusted after a few years service and was eventually replaced by an aluminium support.

The main mast once used by one of the authors consisted of a 4.8 and a 3in section of aluminium tubing. These two lengths were connected by means of a standard 380mm metal jointing sleeve, thus giving a total length of 7.8m.

An antenna rotator of West German manufacture was attached to the end of the mast and in order to carry a number of arrays an alignment bearing was incorporated. This was positioned at approximately 710—760mm below the antenna rotator as per the fitting instructions.

It should be remembered that although the individual components do not weigh very much, once the mast has been assembled on the ground and is ready for hoisting the true mass of the structure will soon be all too apparent. An aluminium mast of this type will bend as it is being lifted, the amount depending on whether an antenna rotator is fitted, the number and size of the arrays and whether an alignment bearing is used. The type and length of antenna support pole above the rotator will also influence the amount of bending. These remarks also apply to low-loss coaxial cable. A mast carrying four antennas will require four downleads and the cable will add considerable weight to the system.

A structure this size cannot be left unsupported for obvious reasons, therefore guy lines will need to be used to provide support. A decision has to be made on whether to have a set of three guy lines in triangular configuration or accommodate four in a square or rectangular layout. This will largely be influenced by the shape of the area likely to be the most suitable site for the mast and also where the ground anchor points for the guy lines are envisaged. In some cases, at least one set of guy lines could be attached to the wall of a building but individual circumstances will dictate whether or not this is desirable. Three or four guy lines can be attached to the antenna rotator.

The distance between the mast base and the guy wire anchor points at ground level will influence the effectiveness of the guy lines and consequently the stability of the system. If the distance is too small, then the angle between the guy lines and the mast will be acute and their effectiveness will be less than if the anchor points were located further away, thus enlarging the angle. To achieve improved stability with acute angles, an increase in guy wire tensioning would be required, therefore imposing more mechanical stress on the structure. In many respects, the greater the distance between the mast base and the anchor points the better, although there may be limitations which will be governed by the site dimensions. A distance of 5 to 6m is ideal for a mast where the upper guy wire is attached at approximately 9or 10m above the ground. These suggested measurements have been used by the authors on a number of systems over the years and seem to be adequate, perhaps over generous. Any lower sets of guy wires will form a greater angle when the same anchor points are used.

A second set of guy lines should be used lower down the mast for additional support, especially for pole lengths in excess of 6m. A non-rotating guy wire hook of the type shown in Fig. 2 can be easily clamped to the mast and is a simple way of attaching the guy wire. These are available in three or four guy wire versions. It may be as well to consider some method of preventing the guy wires from becoming detached from the hook.

At one time rotatable guy line hooks were available, thus allowing the pole to be turned manually. These consisted of two metal assemblies separated by a nylon bearing forming a sandwich. The lower part of the assembly was fixed to the mast using Allen bolts — the guy lines were attached to the upper disc assembly.
Some form of bearing at the mast base was also required. Nowadays, the added complexity would not be justified in order to save the cost of purchasing an electronic rotator. As we mentioned last time, rotators are relatively inexpensive and are convenient to use.

**Ground Anchor Points**

The anchorage points are made from aluminium poles hammered directly into the ground at an angle facing away from the mast. The 2n diameter poles will make sufficiently strong connection points if banged into the ground to a depth of about 1m. It is useful to drill two 10mm diameter holes in each pole before positioning them in the ground as an aid in making good anchorage points: the wire can be passed through the holes and then wrapped around the pole several times, or a more elegant type of termination used which will be described later.

**Guy Wire**

Careful selection of good quality guy wire is essential since the wire is the only means of support. Another factor to be borne in mind with the scaffold pole mast is the method chosen to hoist it into its vertical position — the mast is raised by pulling on the guy lines. It goes without saying that if very thin or inferior quality guy wire is used, it may snap and inflict serious injuries.

The type of guy wire can vary. The variety used by the authors consisted of seven strands of twisted 18 gauge wire similar to that which is supplied in chimney-lashing kits. Note that many chimney-lashing kits are sold in 5m length coils which are obviously not long enough for use as guy lines.

The seven-strand wire is quite strong and easily manageable. It is also galvanised and does not rust very easily, so an eyeore to neighbours isn’t created (whether or not some neighbours would call the whole installation one big eyesore is another question!)

To loop a guy wire, a device commonly known as an “eye” or perhaps more correctly known as a 6mm thimble should be used (see Fig. 3) to provide a suitable termination. Two types are available: plastics and plated metal and the latter type should be used. The loop is secured with two 10mm wire clamps known as cable grips. The grips should be spaced about 150mm apart with the first grip positioned adjacent to the eye, otherwise the guy wire may slip over it.

**The Post Office Wrap**

It sounds funny, but it isn’t! It is a method of terminating the ends of multi-stranded wire and is known colloquially as the “Post Office Wrap”, a distant reminder of the days before British Telecom was created to look after the telecommunication interests of the Post Office. This method of termination could be used as an alternative to cable grips as it is capable of achieving a surprisingly strong bond. The strands of the guy wire are untwisted for approximately 200mm and each strand is then individually wrapped around the guy wire after it has been shaped around the thimble. The basic way in which to make the wrap is shown in Fig. 4. Both wraps and grips could be used for extra security as the latter are relatively cheap and the wraps take only a few minutes to perform.

For terminating the lower end of the guy lines which are attached to the mast, it is suggested that cable grips are used rather than the wrapping method. This is because the cable grips can easily be removed to provide coarse adjustment to the length of the wires. Turnbuckles are then used to provide a final adjustment.

To provide some kind of adjustment for guy lines, devices known as turnbuckles can be used. These enable any slackness on the guy lines to be taken up and thus allow for periodical adjustment which may be necessary due to guy line stretch and mast settling, etc. Remember that turnbuckles must be almost completely unscrewed initially otherwise there is no room to make adjustments. A typical turnbuckle installation is shown in Fig. 5 which also gives details of the guy wire anchor posts. Position the turnbuckle at approximately 1.2m from the anchor point.

Once the turnbuckles are installed, it is essential that the screw threads are thoroughly greased otherwise it will be impossible to make further adjustments after they become seized up. This lesson has been learnt from bitter experience and replacement turnbuckles don’t come cheap anymore! Unfortunately, there is a slight tendency for the turnbuckles to unscrew after a period of time, possibly through vibration transmitted along the guy wires. To prevent this from happening, a piece of spare guy wire can be threaded through the turnbuckle and then looped through both the eyes, this will also eliminate any possibility of the lower eye from becoming detached.

If the guy lines are cut to the correct length this will save precious time. The exact length of each guy line can be predetermined by using the ever-useful theory of Pythagoras. No, not a maths lecture, we hear you say!

Most of us realise that there is a mathematical relationship between each side of a triangle. If the distance is known between the base of the mast and the guy line anchorage points on the ground and also the height of the guy line clamp up the mast, then it is easy to calculate on paper the minimum length of guy line required. We say minimum because you must remember to take into account the excess amount required for the “Post Office Wrap” at the top of the line and the cable grip termination at its lower end.

The mathematical theory states that the square of the hypotenuse is equal to the square of the other two sides. For instance, consider the triangle in Fig. 6 representing the mast and guy line. Suppose the height of the guy clamp is 4m (side a) and the ground anchor point is 3m (side b) from the mast base then by using the mathematical equation $a^2 + b^2 = c^2$ the minimum guy wire length (side c) can be easily calculated.

In this example $a = 4 \ b = 3 \ c = \ unknown$

$c^2 = (4 \times 4) + (3 \times 3) = 16 + 9 = 25$

$c = \sqrt{25} = 5$

The minimum length of guy line required in this example would be 5m.

**Tighten Nuts**

Always ensure that every nut and bolt has been tightened sufficiently before erecting a mast, otherwise Newton’s Law will be hammered home the hard way! It is easy to forget or overlook such an important task.
in all the excitement. It should be remembered, however, that overtightening can cause stress and metal fatigue and ultimately a weakened structure.

Before the mast is erected all nuts, bolts and screwheads should be smothered with a liberal application of grease to prevent corrosion, resulting in them becoming impossible to loosen at a later date should any modifications be contemplated. It can be both a messy but rewarding ritual! A plastic cap should be placed over the top of the mast to prevent acidic rain running down the inside and creating erosion problems at a later date. It also prevents birds from falling down and becoming trapped. The stench of a decaying bird is something you should wish to avoid at all costs. Support poles at ground level should be similarly protected with a generous application of grease on the heavy-duty clamps. In short, grease anything which is likely to be removed, adjusted at a later date, or may corrode.

Delegating Help

When the mast is finally ready to go up it is an advantage to have a willing army of helpers at your disposal. It is possible to have too many cooks spoiling the broth especially if they have little or no idea what to do. It is always wise to weed out and brief any potential havoc-makers as to exactly how they can help. The last thing you want is someone who is appointed an important task not to know what to do once the crucial moment arrives. So, if you feel someone is unsuitable for the task in hand tactfully transfer them to another, perhaps more important, job of the day such as brewing the tea.

An Uplifting Experience

Raising the mast to attain a vertical position is fairly simple and can be achieved without the danger of it being left unsupported while guy lines are attached. Since guy lines are necessary to keep the structure upright, two of these can be connected to their respective ground anchor points in advance. (Their exact length will have to be determined first and the formula is given earlier.)

Once the lengths are calculated, it may be advisable to erect the pole must before the antennas are fitted to ensure that the guy lines are indeed the correct length, otherwise the mast may not assume a truly vertical position. If you forego this small task, you may regret it later.

By attaching two of the guy lines to their ground anchor points prior to erection, the pole mast can be hoisted to its vertical position by a pulling with the remaining guy lines once the pole has been lifted by volunteers past a certain angle (see Fig. 7). It is advisable to allocate two people for each guy line whilst everyone else is attempting to guide the pole to an upright position. Once vertical, the remaining guy lines can be attached and the turnbuckles adjusted to take up any slackness.

With the described mast, using the simple pivot assembly, there are no foundations so it may prove wise to place a flat metal plate between the bottom of the mast and the ground to prevent any possibility of it sinking into the ground under its own weight.

As we mentioned in a previous article, good quality coaxial cable is a must for all bands. It is imperative that the cable is of the low-loss type in order to preserve as much of the original signal picked up by the antenna.

The cable can be secured to the mast simply by wrapping PVC adhesive tape around the pole. The cables can be laid side-by-side for convenience rather than be formed into a bundle. It may be more economical to buy a 100m drum of cable rather than per metre. For many installations with antennas around 10 to 11m high, 50m or more of coaxial will easily be swallowed up. Don’t be afraid of cutting the cables too long — you can always shorten them. If you cut them too short initially then you may have to resort to joining the cable out of doors which is not recommended.

Don’t forget to leave an adequate loop of cable just above the rotator to enable the arrays to move the full 360° without the cables becoming taught. This particular point is extremely important and should be carefully considered and taken into account when installing the mast. A small stand-off arm could even be attached to the top of the mast to help keep the cables clear of the rotator.

The spacing between antennas deserves some mention. If the arrays are too close to their performance can be degraded but on the other hand too much spacing implies a longer antenna support pole and may prove unstable during high winds. Over the years the authors and many other enthusiasts have opted for a spacing between the antennas in the region of 1m. If mast-head amplifiers are used they should be fitted a certain distance from the array to discourage feedback problems. The manufacturer’s installation notes will normally give advice on this particular aspect.
The Realistic PRO-38 scanner is a simple 10-channel device which has been optimised for simplicity of operation and portability. Its compact size (only 178 x 67 x 35mm) means that it will fit neatly in the hand or the pocket.

One point to note before all the air-band fans get too excited is that the PRO-38 is f.m. only and does not cover the aircraft band.

**The Manual**

The supplied manual was to Tandy’s usual high standard and was printed in English only as opposed to the common multi-lingual types. There were a total of 22 pages covering all aspects of the scanners operation. The most complicated part of the operation was the programming and very detailed descriptions and diagrams were provided to help the operator.

There were even some tips to help speed operation as you become more familiar with the controls. As with most scanners there are some known “birdies” (i.e. spurious signals which are not really signals). In order to help the operator to avoid these the most common ones are listed in the manual.

There are the usual sensible warnings and advice regarding the care and maintenance of the PRO-38 too.

For those who find themselves in difficulty there is a very simple-to-use help chart to enable you to eliminate operator error before returning an apparently faulty unit to the dealer.

The final section of the manual gives the technical specification which is reproduced along with some of my measurements in this review.

**Functions**

One important point to note with this scanner is that you can only listen to frequencies which are stored in the memories. The PRO-38 is equipped with ten memories, each of which can be programmed to any frequency within the range of the scanner. The actual programming of the memories is slightly unusual due to the fact that the display only shows one digit at a time. Hence, when entering a frequency, each new digit over-writes the previous one. Although this might seem a little cumbersome, it doesn’t take long to get familiar with the technique.

In order to check what frequency is stored in any particular memory there is a REVIEW button. When pressed, it displays the frequency stored in that memory digit by digit. Again, rather unusual but relatively easy to use.

The mechanics of programming the memories on the PRO-38 is quite standard. After choosing which memory you wish to program you recall this by pressing MANUAL, the memory number, and enter the desired frequency, including decimal point, followed by the ENTER key. If by any chance you try and enter a frequency outside the range of the scanner, an E is displayed. This, obviously, means error!

There are two ways of operating the PRO-38, either manual or scan. With the manual mode, you can listen to any one of the ten memories continuously. When in the scan mode, the scanner will look through the ten memories at a rate of ten channels per second. If it crosses across a signal on any of the memories that is greater than the squelch threshold, the scanning stops until the signal disappears. So that you don’t miss the other half of a conversation, there is a pause of three seconds before the PRO-38 resumes its scan after the signal has disappeared.

When scanning, any annoying signals can be locked out and will be ignored on subsequent sweeps through the memories. This can be very useful as it saves having to re-program memories if one frequency happens to be occupied for a long period of time.

When listening portable with the PRO-38 it would be very annoying if inadvertent key presses undoes all the programming you’ve so carefully made. Fortunately there is a key lock facility that disables all the keys except the mode selectors, volume and squelch.

**Other Facilities**

In addition to the memory programming buttons described earlier, there are two rotary controls on the top panel. The first is the squelch control. This control has two functions. The first is to determine the level of signal required to stop the scan when it is in operation. The second function allows the operator to suppress background noise in the absence of a signal. The other control is a simple, combined volume and on/off switch.

There are three sockets available on the PRO-38, the first, and largest, of these is the antenna socket. This is a standard 50Ω BNC socket which, although intended for the supplied rubber helical antenna, can be used for the connection of many different types of external antenna.

The ear phone socket is usually covered by a small plastics plug. I assume this is to minimise the ingress of moisture when the radio is used under portable conditions. The socket is a standard 3.5mm jack suitable for connecting to an 8Ω load. The full output power is available on this socket, which means that an external speaker could be used. It also means that both your ears and your headphones could be damaged if care is not taken as 260mV is a lot of volume.

The power socket is mounted on the left hand side of the radio. It is a standard power jack, the kind you find on most external power supplies. When used in conjunction with an external 12V supply, by moving a switch tucked away in the battery compartment, NiCad batteries inside the radio can be charged. The PRO-38 is slightly unusual in that it uses five AA size batteries — many sets use either four or six.

**Features**

One unusual feature about the PRO-38 is the length of time the memories are retained after the batteries have been removed. Usually it’s something less than a minute, with this radio you have 30 minutes to change the batteries — long enough to go out to the shops and buy them too! You should also get caught out with dead batteries though as there is a low battery alarm. The radio emits a beep...
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KLINGENFUSSELL PUBLICATIONS

48 Short Wave Magazine October 1988
With the increasing availability of scanning receivers covering ever wider frequency ranges, many of the major communication equipment manufacturers and system operators are turning their attention to security — or the lack of it — in conventional radio systems. The idea of scrambling or encrypting information before it is transmitted is of course not new. People were devising various codes and ciphers long before the first electronic means of communication had even been thought of. The main problem with encoding information is that at some stage it has to be converted back into its original form. Obviously the more complicated the means of encryption the more difficult it is to convert whilst avoiding errors creeping in. Especially with noisy or fading radio paths.

The more complicated methods of encryption make allowances for distortion and展长 in the transmission chain, but until now they have been far too expensive and bulky to use for anything but the most sensitive applications. In many ways human speech is one of the worst types of information to try and disguise. It has evolved over many thousands of years into a form which can be understood even under the most arduous of listening conditions. Just imagine how weak or distorted a short wave station has to be before it becomes impossible to understand the programme content, especially to the ears of an experienced listener.

Over the years various forms of speech scrambling have been developed, perhaps the simplest of these is speech inversion. In this system the audio frequencies forming the speech signal are reversed. Taking a typical telephone quality signal as an example we would expect to see speech frequencies ranging from around 300 – 3000Hz. If by some means we swap the frequencies around such that speech at 300Hz now occurs at 3000Hz and vice versa, then to a listener the speech would appear garbled. Not unlike listening on a receiver to s.s.b. with the wrong sideband selected. However, as I mentioned earlier, speech is a difficult thing to disguise and with concentrated effort it may still be possible to understand what is being said. Particularly after listening for several minutes to material encrypted in this way.

This method of scrambling is therefore only suitable for protection against casual listening, however it does have the great advantage of being cheap and very simple to implement.

A more secure method of encryption based on speech inversion is called split band scrambling. In this system the original speech signal is split up into two or more separate frequency bands. Each band is then inverted and shifted in frequency by differing amounts, producing a much more confusing output than that of a simple inversion system (Fig. 1).

Obviously this type of system is more complex than the first type we looked at but offers a much greater degree of security. During the war a five-band “scrambler” of this type was used on transatlantic conversations between Churchill and Roosevelt. Built in 1943, the equipment was so large that it occupied the basement of Selfridges department store in Oxford Street. With modern components two-band scramblers are now available small enough to fit inside even the most miniature of transceivers, making listening without a descrambler difficult.

Incidentally part of the wartime scrambler, which was developed by Bell Telephone Laboratories and code named SIGSALY is still on display in the Imperial War Museum Cabinet War Rooms in Whitehall, London.

So far we have only considered scramblers which use a fixed method of encryption. This makes the system much simpler, as it is not necessary to send any control information along with the speech in order to ensure correct descrambling at the other end. So if anyone wished to listen to a scrambled conversation of this type all they would have to do would be to obtain the same type of equipment being used by the people they wished to monitor.

The next technique is to make the frequency bands change over a period of time, so that even if anyone listening with a descrambler did happen to hit on the correct series of settings it would only be valid for the period of time that combination of settings was being used. This could be a very short period of time, with the combination changing several times per second. This makes descrambling very difficult even with the correct equipment unless the coding sequence is known. The name commonly used for continuously changing sequences of this type is a rolling code.

The drawback with this system is that all the scramblers/descramblers have to be synchronised with each other in order to maintain the same point in the pre-set sequence as each other. To be able to do this it is necessary to transmit synchronising information, usually in the form of data bursts. In most systems this occurs at the start of and every few seconds during, a transmission in order to prevent large chunks of the conversation being unintelligible due to loss of synchronisation during signal fades or bursts of interference.

In order to reduce the amount of information that has to be transmitted in the synchronising data burst, and to improve the security of the system a special type of sequence is used to form the basis of the encryption system. The basic sequence is produced by a simple logic circuit, a shift register, which has the output of each stage fed-back via a series of logic gates to its previous stages. The effect of this is to modify the output of the shift register such that it follows a set sequence, which due to feedback produced by the logic gates is very long in length. This type of circuit is called a pseudo-random binary sequence generator and is a very important element of most modern speech and data encryption systems. The sequence that is produced is, as the name suggests, almost random but follows a mathematical law, which may only start to repeat itself after...
several hundreds of hours. Not only that, but by altering the way in which the logic gates are connected it is possible to create many other completely different sequences of similar lengths. So in a practical system the user has a key in the form of a number, perhaps ten digits long which has to be set on a series of thumbwheel switches before the correct sequence is selected. In order to be able to descramble this type of traffic it would be necessary not only to know how the shift register was configured but also the users key combination.

Another method of encoding speech using this type of synchronisation is termed time domain scrambling. In this system speech is broken into very small blocks which are then stored and reassembled in a different order before being transmitted — rather like cutting a magnetic recording tape into several short lengths and rearranging the order before being replayed. Of course at the receiving end it is necessary to know which order the blocks have been arranged in, so that the opposite process can be used to descramble the message (Fig. 2).

All of the systems I have described so far have used analogue techniques and as such are capable of being descrambled — given enough time and effort. The fact is that for most users these systems are secure enough. By the time a message has been decoded — which may take several days even with the fastest computers available — it is usually too late to have any real value.

For very secure communication, where lives or political decisions are involved, digital techniques take over. In these systems speech is first converted to a binary stream of ones and noughts, high speed logic circuits then perform mathematical functions before finally combining the resulting data with — yes you guessed it — a pseudo-random binary sequence. This produces a very secure system with many units offering over 10,000 million different code combinations. Most of the top of the range units are claimed to be unbeatable, or at least make it so difficult that it is more economical for most eavesdroppers to try other methods of obtaining the information.

If you are interested in constructing your own scrambler/descrambler several designs have appeared over the past few years. A simple inversion type scrambler circuit was published in the January '87 issue of Practical Electronics, and a more sophisticated split-band circuit was featured in the June 1988 issue. If you want to find out more about digital encryption methods then The Radio Hacker’s Code Book by George Sassoon, published by Duckworth 1986 ISBN 0 7156 2068 1 is a good starting point.

**New Wall Chart**

HMSO bookshops should by now be stocking a broadsheet detailing UK Frequency allocations. The exact details are unknown at this stage but I expect that it will be based on the HMSO booklet United Kingdom Table of Radio Frequency Allocations which was first published in 1965. However I assume that the new chart will include many of the recent changes made to the spectrum, and should make a useful addition to any scanning enthusiast’s wall.

On the subject of official publications The Department of Trade and Industry has recently published the Radio Communication Division’s Annual Report. This is an interesting publication detailing the many varied aspects of the departments work. Contact The Library, Radio Communications Division, Room 605, Waterloo Bridge House, Waterloo Road, London SE1 8UA for your free copy.

**Mystery Mast**

Jim Mason of Falkirk has been picking my brains again. He was wondering what a radio mast near Stirling was used for. Now I don’t claim to know what every radio mast in the UK is used for (before you all start writing in) but in this particular case I was able to help. It is in fact part of a radio navigation system constructed several years ago by the communications company, Decca. The system was originally designed to provide a navigation aid for shipping in the days before satellites were available for the purpose.

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* Output & input impedance 50 ohms
* 1dB compression: +10dBm
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Some outstanding results have been reported by customers and some of our early units are still in use after 24 years.

There are four pages of free information available on the PMX, one devoted to 6 unusual antenna experiments using the PMX, non-technical and well illustrated. The PMX can be supplied unpowered (you provide 12v DC) or mains powered. Unpowered PMX £69.00
Mains powered PMX £78.00

Hamgear Electronics 125 Wroxham Road, Norwich NR7 8AD.
Tel: Norwich (0603) 40661.
The preselector is assembled on a small tag-strip — the type having a central earth tag with two tags on either side. When you have soldered the components to the tags as shown in Fig. 4.2 and have checked your work, the tag-strip is carefully soldered onto the moving vane tag of the preselector variable capacitor, C2. The capacitor used for the prototype was bought cheaply at a rally but could be salvaged from a cheap radio set or you could use Maplin FG75S (AM/FM Varitune). In this case the two sections connected together in parallel add up to a maximum of 230pF so you might need to experiment with the number of turns on the secondary winding of T1 to give the coverage needed. The other two tags are connected together as shown in Fig. 4.2 and to the appropriate tag.

**YOU WILL NEED**

**Preselector**
- Resistors: 1/4W 5% Carbon film
  - 1kΩ 1 R2
- Capacitors
  - Polyester: 10nF 1 C1
  - 0.1µF 1 C3
- Variable Diodecon: 0–350pF 1 C2 (see text)
- Semiconductors
  - Transistors: 2N3819 1 Tr6
- Miscellaneous
  - Tag strip, Tinned copper wire.

**Mixer Board**
- Resistors: 1/4W 5% Carbon film
  - 1kΩ 1 (see text)
- Potentiometers
  - Min. horizontal pre-set: 1kΩ 1 R2
- Semiconductors
  - Diodes: BAR28 1 D1,2
- Inductors
  - Open wound r.f. choke: 1.5mH 1 L1 (Maplin HX15R (choke 1.5mH))
- Miscellaneous
  - Matrix board 6 x 20 holes.

**Filter Board**
- Capacitors
  - Polyester: 0.05µF 4 C5,6,7,8
- Miscellaneous
  - Matrix board 10 x 30 holes; Pot core assembly, comprising Core LA4345 Bobbin DT2470 and Clips DT2396 (2).

In this part we finish building the remaining modules of the receiver — the preselector and mixer sections along with the optional filter. With these we have the main component parts of the complete receiver ready to be installed into a case.

**The Mixer**

The mixer stage is mounted on a small section of plain matrix board, introducing you to yet another simple form of construction. The position of each component is shown in Fig. 4.3. Start by inserting the three leads of the pre-set potentiometer, R2 through the appropriate holes and slightly bend the leads over under the board to keep the component in place. Now bend the leads of the two diodes D1 & D2 so that they fit as shown, bending the leads over.
under the board, to make contact with the leads of R2 as shown. Carefully solder these joints together. Repeat this process for the r.f. c. L1, finally adding the leads for the earth, etc. Although not shown on the drawings, it has been found that the performance is improved by connecting a 1kΩ resistor in parallel with C4.

The Filter

The filter board is also built on a piece of plain matrix board as shown in Fig. 4.4. The two inductors, L2 & 3 are wound onto special ”Pot Core” assemblies made up of two ferrite core halves which are clamped around the bobbin after the windings have been put on.

The inductance required is 22mH and to achieve this each bobbin will need around 235 turns. If you are very neat and careful with your winding you will be able to use 30s.w.g. enamelled copper wire, thus using the same size wire for all the coils in the receiver. If you are at all doubtful then use a smaller gauge wire — say 32 or 34s.w.g.

Start winding by scraping the enamel coating from one end of the wire and winding it tightly around one of the pins moulded into the bobbin. About three or four turns will be enough. Now pass the wire through the slot in the bobbin cheek and start winding, keeping count of the number of turns as you go. When you have wound 235 turns pass the wire through the opposite slot to the start, scrape off the enamel and wind three or four turns around the opposite pin to that used for the start. Now carefully solder the wire ends to the pins and assemble the ferrite core halves over the bobbin, making sure that you do not scratch the enamel coating on any of the windings. Hold the two halves tightly together and put the two clips on to keep everything in place. Repeat for L3. The ”Pot Core” assemblies are available from Maplin and you will need to order two HX06G (Core Type 2), two HX07H (Bobbin Type 2) and two pairs HX06J (Clips Type 2) from their catalogue to make up the two assemblies needed for L2 & 3.

The filter components can now be assembled onto the matrix board as shown, the component pins being connected together under the board with lengths of tinneled copper wire. (You could use ”hook-up” wire with the plastics insulation stripped off). If you are observant you may have noticed that the photograph of the filter board differs slightly from the drawing (Fig. 4.4). This is because when the prototype board was being constructed 0.55µF block polyester type capacitors were not to hand so C5 & 8 were made up from 0.33 and 0.22µF capacitors connected in series to make 0.55µF — near enough. C6 & 7 are also in parallel and could be combined into a single capacitor of 1.12µF — the nearest ”preferred value” to this is 1µF and so this was used instead.

We now have all the major parts of the receiver and next time we will put them all into a case and complete the wiring.

---

**SCANNING**

Each chain is comprised of four stations — a master and three slaves (see Fig. 3). The slave stations are phase locked to transmissions from the master station, so a mobile station with a suitable receiver can determine its position from the phase relationship of the received signals. Each transmission takes a slightly different time to reach the receiver depending on the distance the signal has to travel. The site Jim came across transmits on 70.538kHz — yes kHz. This gives the system a range of around 100 — 250 nautical miles from each master station, with an accuracy of around 50 metres. Originally the position of the receiving station had to be calculated by hand using a special receiver which incorporated a simple form of analogue computer, but now of course the usual microprocessor or two has found its way into the equipment.

By now you may be thinking — 70kHz, isn’t that a bit low in frequency for this section of the magazine? After all those sort of frequencies are only of interest to bats! — Well that’s not quite true. You may remember I mentioned a few months ago that several of the major communication companies were looking at ways of providing a location system for vehicles in transit, carrying dangerous or high value loads. Securicor Communications/Wimpey Construction have launched ”Datatrak”. This uses a similar method of position fixing, but with one extra ingredient. The positional information is computed in a special receiver and the resulting information, along with details of the vehicle, is transmitted back to a central control station on v.h.f. The position of the vehicle and its status is continuously updated so that in the case of an emergency it can be quickly located. A novel new adaptation of an old technique, it will be interesting to see what other uses will be found for location systems such as this over the next few years.

Well the end of the column for another month, keep those letters coming in to the usual address, PO Box 1000. Eastleigh, Hants SO5 5HB. Remember, it helps me if you enclose an s.a.e. when you require items returning. I hope you enjoyed the item on encryption. Until next month — Ging Loodenist!
Thanks for all your letters again this month; without them, it wouldn't be our column.

The Matsui MR4009 was causing Tom Smith (Swindon) trouble (see July "Airband") - spurious signals are always present around 443-463kHz. This receiver is the same as the ATS-803 according to Neil Wheatley (Newcastle-upon-Tyne) and also the Saisho SW5000 to Alan Brignull (Loughborough). Similar problems were also experienced by Leslie Sargent (Runcon) and by R. Aldridge (Winchester) who doesn't think that there's a cure. The explanation by ex-Civil Aviation Authority (CAA) engineer Martin Lines (Reading) tells why — and yes, I am "kicking myself for not thinking of the answer." The intermediate frequency is 455kHz. The set will also tune around this frequency in which case "all it receives is its own oscillations!" Apparently this is not the only make of receiver currently available that has this problem, thanks to everyone who has written in about it.

Side Slips

Martin's collected some amusing anecdotes in his time such as this one. Captain's entry in technical log at end of flight: "Aircraft touched down heavily and to the right of centre line during autoland." Engineer's reply: "Autoland not fitted to this aircraft!" Seriously though, there is normally a small cockpit placard giving the autoland or weather minima category capability of the aircraft. This reminds me of one I've heard. Student pilot has control. At this moment, air traffic control (a.t.c.) passes information about conflicting traffic; instructor spots other aircraft in question and replies "I have it." Student mistakenly thinks that instructor has now taken control. After touchdown the instructor tells the student that this has been the worst landing the student had ever done and is surprised by the answer "But I thought that you were flying it!"

Martin notes the installation of airfield surface movement radar at Heathrow. Some white noise specks would sometimes show up and one engineer persuaded a controller to think these were rabbits on a taxiway. The controller was so taken in by this that he even expounded on the sensitive rabbit-detecting properties of the system when he was interviewed on television.

Frequency Information

It seems likely that there will be an extension to the v.h.f. band after 1 January 90 but only from 136-137MHz.

As well as the company frequencies on v.h.f. longer distance traffic can go via Portsmouth Radio, Chris Durkin (Ormskirk) says that 11.306MHz is used by day and 8.960MHz at night although other available frequencies are 6.237, 8.185, 10.291, 12.133, 13.865, 14.890 and 16.370kHz. During the present difficulties with a.t.c. strikes in Europe the company frequencies will be busy with aircraft trying to resolve delays.

Neil Wheatley reports that he has found the Blackpool n.d.b. (BPL: dah-dah-dit, di-dah-di-dit, 278.5kHz) on 30m NE of the radar installation nearly 1nm from the 28 threshold. It's in a brick hut with a vertical mast.

The CAA General Aviation Safety Information Leaflet 7/88 carries an important list of frequency changes that I can only summarise here.

Biggin Hill: Tower 134.8MHz not available at weekends.

Blackbushe: Aerodrome flight information service (a.f.i.s.) 122.3MHz may be downgraded to air/ground service.

Blackpool: Approach 135.95MHz withdrawn.

Dowreay: A.f.i.s. 122.4MHz now air/ground service only.

Shannon: Automatic terminal information service frequency changed to 130.95MHz.

Woodford: Radar 130.75MHz unserviceable.

Clacton: Automatic direction finding (a.d.f.) (CLN) 669.5kHz operates 0700-1900 Monday-Friday excluding public holidays.

Fawley: A.d.f. (FAW) 370kHz unserviceable.

**Abbreviations**

| a.d.f. | automatic direction finding |
| a.f.i.s. | aerodrome flight information service |
| a.t.c. | air traffic control |
| CAA | Civil Aviation Authority |
| D&D | distress and diversion |
| ft | feet |
| g.p. | glide path |
| h.s.i. | horizontal situation indicator |
| i.l.s. | instrument landing system |
| kg | kilogram |
| kHz | kilohertz |
| l.o.m. | locator outer marker |
| m | metre |
| m | mile |
| Mhz | megahertz |
| m.s.a. | minimum safe altitude |
| nav | nautical miles |
| n.d.b. | non-directional beacon |
| n.m | nautical mile |
| RAF | Royal Air Force |
| s.i.d. | sudden ionospheric disturbance |
| v.h.f. | very high frequency |
| v.o.r. | very high frequency omnidirectional radio range |

Oxford: A.d.f. (OX) 403.5kHz withdrawn.

Westcott: A.d.f. (WCO) frequency changed to 211.5kHz from 25 August 88.

Looking at CAA Aeronautical Information Circular 62/1988 I deduce that a Belfast runway has changed from 08/26 to 07/25 and that at Hatfield the unlicensed 14/32 grass strip has been withdrawn.

Follow-ups and Foul-ups

Apologies to Tony Bernascone (Middlesbrough) for an incorrect reference in August "Airband." His suggestion was actually Volume 2 of the Admiralty List of Radio Signals which includes coastal beacons and n.d.b.s receivable from near the coast. The map volume 2A is called Diagrams Relating to Radio Beacons (Leigh) and has also pointed this out.

Bernie Surtees (West Auckland) tried out the increased scan speeds on his Tandy 4000 and is well pleased (see August "Airband"). He also notes that an altimeter calibrated to give one revolution per 100m will provide poorer resolution than one giving 1000ft per revolution of the largest pointer.

It was mentioned by retired airline pilot Leslie Grevelle-Smith G4SJJ (Wolverhampton) that the flight plan in August's "Luton to Dusseldorf" by Malcolm Wayland is a little obscure to unfamiliar readers and I'm happy to provide some explanation now. On page 28 the only difficult part of the header to the nav log is "Av Tr." which indicates the destination to lie on an average track bearing of 100° true from the point of departure. Under clearance, Malcolm has written the initial airways clearance as s.i.d., squawk and first London frequency. The next block down gives track, distance and flight level in the event of diversion to either of the "alternates" (Cologne or Hannover in this case). I'll mention wind component later.

Looking at the main part of the plan, Malcolm has written the communications frequencies down the left hand side for each step of the way. MSA (minimum safe altitude) is the altitude above sea level (with QNH set on the altimeter) below which flight would become endangered by the risk of striking the ground or other obstacles on the surface. FL isn't recorded in most cases, but would be altimeter reading (in hundreds of feet) when one of 1013.25 millibars is set. Then comes the airway that will bring the aircraft to the next waypoint (a beacon, a reporting point or the destination airport). Between waypoints there is a distance in nautical miles, ground speed (which depends on aircraft speed through the air and the effects of wind causing drift), time elapsed estimated arrival time, actual times of arrival, fuel required and fuel on board.

One the reverse of the nav log (page 29)
of Malcolm’s article) is a fuel table. Each horizontal group is for a particular flight level, with the first and last two fuel numbers to choose from. Wind component (vertical groups) is given for headwinds of 100 to 20 knots, still air (0 knots of course), and tail winds of 20, 40 and 60 knots. In this case there is a ring around the figures for FL230, M.72, with a 20 knot tail wind. Thus, this flight is predicted to last 54 minutes and 2420 kg of fuel will be “burnt off.” It is this latter figure that is entered into the fuel calculation; extra fuel for taxi, diversion, etc., is also added. Note that wind rarely obliges by blowing from dead ahead or astern; the oblique wind vector must be resolved in to sideways and fore-and-aft components.

The last item is the weather — by now familiar to regular readers. Briefly it consists of wind direction and speed, visibility, significant weather such as thunderstorms or snow, cloud (oktas at each height above ground), temperature, dew point, QNH and any forecast trend (“NS” means no significant trend). Think you can plan the next flight?

You Write

Norman Hartford (Telford) wants to know what happens in an emergency. Civil pilots will put out a Mayday call on either the frequency in use at the time or on the 121.5 MHz distress channel. These events are rare! On 121.5 the emergency is handled by the Distress and Diversion (D&D) Cell at the London Air Traffic Control Centre, Porters Way, West Drayton, Middlesex or at the Scottish Air Traffic Control Centre, Prestwick. If the emergency occurs at or near an airfield the relevant controller will first summon the airfield’s own fire/rescue service and then if necessary contact local authority fire and ambulance stations for further help. Many airfields have crash gates and emergency service rendezvous points so that all these vehicles can be co-ordinated; if you are visiting, never cause an obstruction here!

I guess from his letter that A. A. Williams (Hayes) works for a certain large airline that wants “to be the best.” Temperature and dewpoint are given in weather reports for the reason that W. Gwynne (Blackwood) rightly supposes they affect icing. It might be necessary to switch on engine anti-icing at take-off if conditions are bad enough; but as this uses hot air bled from the gas turbine engine’s compressor, there is a slight loss of performance that must be taken into account as the take-off run will be longer for a given weight. Now let me ask why outside air temperature is always given to pilots when starting turbine engines. Your answer is awaited…

A favourite amateur radio v.h.f. site at Old Redding, Harrow, has another advantage as found by C. Craig (Harrow) — forgive me if I haven’t deciphered the name correctly. One end of this road is very high fliese to the 4361 ft spot height on

Information Sources

Thank you “Fly-By-Night” (Swansea) for the spare copy of the RAF En Route Supplement British Isles and North Atlantic. Let me reassure you that you need not remain anonymous as civilians are indeed able to see these publications which are not restricted. Look at the supplement’s page 2 section 5 (Procurement) sub-section c (Civil) which states: “All RAF Flight Information publications are for civilian customers. Order forms and price lists may be obtained from 1 AIDU, RAF Northolt, West End Road, Ruislip, Middlesex HA4 6NG.” From the same source (price £3.40 by post) comes HFI/RT Network Chart as recommended by John Donkersley (Sheffield). Is it true that a new airport is planned for your part of the world, John? His other tips help resolve weaker Morse signals (including beacon identifications): listen at night (in the case of m.f. stations); use headphones at high volume (but please be careful of your ears, limit the amount of time you listen like this); tune high in frequency and switch the b.f.o. off, and make use of the null of a directional antenna.

Another supplement is published by Aerad Customer Services, Len Adlard (Leigh-on-Sea) who learnt about spark transmitters at the South Wales Wireless Training College in 1928 now uses this supplement. As Bealine House is also a name from the past (remember those smart red wings?) let me give you the new address: Building 254, P.O. Box 10, Heathrow Airport (London), Hounslow, Middlesex TV6 2JU.

Certain flight numbers can be identified simply by asking your travel agent for the relevant timetable as E. G. Sampson (Hunsanton) has found. He also uses Flight Routings 1988 — The A2 Guide to Airline Flights With the UK compiled by T. T. Williams price £4 plus postage from our SWM Book Service.

Finals on the ILS

At the end of the last extended edition of “Airband” (July) I left you in mid-air having established on the instrument landing system (I.L.S.) localiser for runway 23 at Stansted. By popular demand I will now finish the job off and bring you in to land!

Not surprisingly the i.l.s. gives the pilot two separate indications concerning the final approach: direction and height. The direction signal is called the localiser (lcl) and the height is provided by the glide path (g.p. or glide slope). Certain frequencies are set aside in the v.h.f. navigation band for the lcl and when one of these is tuned (110.5 MHz, identity ISX: di-di, di-di, dah-di-di dah— in this case) the corresponding one of forty g.p. channels is automatically selected from the 329.15-335.0 MHz range on a separate receiver. One other radio component is available: the markers, which are fixed points along the localiser path over which

AIRBAND

The Godfrey Manning Aircraft Museum

Godfrey tries his hand on a light aircraft simulator. Photo: Christine Mynek.

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the aircraft must fly thus intercepting a 75MHz vertical fan-shaped radio beam.

At Stansted, the most distant marker (the outer marker) is co-located with the SAN non-directional beacon (n.d.b.). This combination enables the aircraft to home in on the outer marker, as described in July; thus there is a known starting point for the approach procedure. The outer marker / n.d.b. combination is termed a locator outer marker (l.o.m.) The SAN l.o.m. is about 3.3 nautical miles from the 23 threshold and the next nearer marker (middle marker) is at about ¾ n.m. At jet aircraft speeds the inner marker (at the threshold) is obsolete so it is omitted at Stansted.

The runway 23 heading is of course 230°(to the nearest 10 degrees) but the precise magnetic course of 227° is set on the horizontal situation indicator (h.s.i.). The aircraft's heading may vary a little either side in order to nose into the oncoming wind. Rarely is the wind so obliquely as to blow directly along the runway! When establishing the loc, the beam bar on the h.s.i. must be kept central: it is a pictorial representation of the way in which the localiser beam lies relative to the aircraft. Let's say it has drifted to our left, this would be like walking up the right-hand pavement of a straight street when really we should be on the opposite side. The aircraft has to "cross the road" but, unlike the way we were taught during kerb drill, an oblique path will be taken. The aircraft is turned on to a new heading just a couple of degrees to the left; imagine stepping out in to the road to your left. On reaching the opposite pavement, you must turn back those couple of degrees to the right again to regain the correct heading. When the beam bar comes back to the centre, it is necessary to make precisely this right-turn correction.

Somewhere along the way the g.p. is intercepted from below. A second (horizontal) bar swings down in to view; as it comes central, the throttles are pulled back and the nose pushed down. Extra flap might be selected and, by the reassuring glow of three green indicator lights (one per undercarriage), the landing gear should be confirmed as locked down. The g.p. angles up from the runway threshold at 3° to the horizontal (conventionally, but a sharp 7° g.p. is employed for short take-off and landing airfields operated by the Dash-7 and others). The beams are both wedge-shaped, getting narrower towards the runway, and so finer control movements are called for in the later stages of approach.

This has been a precision approach: at any distance from the runway, the height of the g.p. is known. When the middle marker is crossed an orange light flashes and alternating dots and dashes are heard in the headset, the altimeter should be checked against the expected reading. Some i.f.s. systems even incorporate a distance measuring equipment (d.m.e.) transponder. As further confirmation it would be possible to start a stop-watch on crossing the outer marker; the middle marker and threshold will be passed at a time dependent on speed. A gross error would show up as either point being missed just after the appropriate time has passed. At a pre-determined minimum decision height the pilot must complete the landing by visual reference to the runway or, if weather obscures the view, a go-around must instead be initiated. Today the cloud base is well above the 200 foot height limit and visual procedure can be followed for a smooth landing at Stansted. Go-arounds seem to catch passengers by surprise; they are the alternative ending to any approach! So, be prepared for a go-around; after all, the flight crew are.

As usual there has been far more of interest in all of your letters than I've possibly got room for here but I do hope that I've given at least a mention to everyone. I look forward to reading your next contributions.

---

REALISTIC PRO-38 SCANNER

D12

Frequency: 66-88/144MHz 5kHz steps
Coverage: 136-174MHz 5kHz steps
406-512MHz 12.5MHz steps

i.f. 10.95MHz 46dB
Squ: Less than 1.9uV (0.71uV)
Sensitivity: 260mV in 80 (250mV)
Output: 50mA
Drain: 110mA

Dimensions: 178mm high, 67mm wide, 35mm deep
Weight: 238g

Figures in brackets give the measured results.

<table>
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<th>136-174MHz</th>
<th>406-512MHz</th>
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<td><strong>Weight</strong></td>
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**Abbreviations:**
- dB: decibel
- f.m.: frequency modulation
- i.f.: intermediate frequency
- kHz: kilohertz
- mA: milliampere
- MHz: megahertz
- mm: millimetre
- mW: milliwatt
- Ω: ohms
- s/n: signal-to-noise
- u.h.f.: ultra high frequency
- μV: microvolt
- V: volt
- ν.H.F.: very high frequency

**Current:**
- 50mA

**Drain:**
- 110mA

**Power:**
- Full power

**Dimensions:**
- 178mm high, 67mm wide, 35mm deep

**Weight:**
- 238g

**Features:**
- Useful for a radio of this type.
- I was less than happy with type of frequency display (only one digit shown at any one time), but I found that I soon got used to it and it ceased to be a problem. I'm still not sure I am completely happy with only being able to listen to the frequencies stored in the ten memories. I am used to being able to search between the two points on the spectrum. Though you have an interest in only a limited part of the spectrum or a limited number of set frequencies (e.g. the marine band or amateur 144MHz or 430MHz), this type of radio would probably be more useful.

The PRO-38 costs £99.95 and is available from branches of Tandy (U.K.) Ltd. Many thanks to the head office for the loan of the scanner.
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150kHz-29 999MHz, AM/FM/LSB/USB/CH/12 memories
with back up 100, 129, 220, 240, plus 12 V.C.E operation (optional). Click and timer on/off preset – last row true dual lock – computer control socket. FRV9000 VHF CONVERTIBLE £1065.00
118-174MHz direct read out – plug in FRV/WFM £49.00 (wide band FM unit)

R5000 £875.00
The frequency range is continuous from 100kHz to 30MHz and its modes of operation are USB, LSB, CW, AM, FM and VSB. An optional VHF converter (VC20) extends the frequency range to include 108 to 174MHz.

FRG 9600 £498.00
All-mode scanning receiver providing features never offered before, covering 50 through 900 MHz continuously, with 100 memory/expandable memory channels.

AR2002 £487.30
The frequency range is from 25 to 560 and from 800 to 1300MHz. Modes of operation are wide band FM, narrow band FM and AM. The receiver has 20 memories, memory scan and a search mode which checks frequencies between user designated limits and a push button keypad for easy frequency entry and operation. A front panel knob allows the listener to quickly step up or down in either 5, 12.5 or 25kHz steps from the frequency initially chosen.

LOWE HF-125 £375.00
Coverage is continuous from 30kHz to 30MHz and operating modes are AM, LSB, USB with an optional FM and synchronised AM board. A comprehensive range of bandwidth filters are standard. 5, 5. 7 or 10kHz. There is a 400kHz audio filter for CW reception. Controls are very simple and the frequency tuned is displayed on a large back lit liquid crystal display. Power requirements are 12V D.C. at around 250mA and internal NiCd batteries give around 10 hours portable operation. The lithium battery gives back-up for the 30 memories for some ten years.

VHF HANDIE RX An extremely compact yet tough little monitor receiver weighing only 680 grammes, fits comfortably into the palm of the hand or jacket pocket. Controls functions are simplicity itself – merely dial up the channel frequency required on the thumb wheel switches and set the volume/touch controls to acceptable levels. The receiver is fitted with a PLL out of lock tamper on the top which indicates that an out of range frequency has been selected or that the batteries are nearly drained which can be subsequently rectified by the charger that is supplied as standard. SPECIFICATIONS: Frequency coverage: 144-148.99 MHz Channel steps: 2.5 kHz - IF filtering: 25kHz (permits reception of 25 and 12.5 kHz transmitters). Power: built in NiCd batteries (re-chargeable). Sensitivity: typically 0.5uV. Accessories: Wall charger 24V AC supplied standard. Helical aerial, supplied standard. Ear plug, supplied standard. Re-chargeable units supplied standard.

£132.25

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New Italian Station To Start on SW

ITRS is not a pirate station, but is simply taking advantage of a loophole in Italian law. Unlike the recently defunct short wave service Radio Milano International, IRRS is being set up on purely commercial lines. There are groups, especially in America, that would like to be heard on the European airwaves.

The current broadcasting set up in many countries doesn't allow them to air the own broadcasts, so IRRS has built a facility in Northern Italy with the aim of hiring out the airtame. Although using only a modest power output of 5kW, the operation is using a high-quality transmitter that allows the use of more efficient modulation techniques such as suerp-carried single sideband. The antenna will be omnidirectional, although IRRS say the transmitting location offers a good take-off.

The station is still registering its frequencies with the Italian PTT as we go to press, but look for the service in the 7, 9, and 13MHz bands, initially on Saturday and Sunday only.

Anti-Anti-Nicaraguan Operation

A group of American citizens opposed to the Reagan Administration's Central American policy have drafted a proposal for an anti-Contra radio station. It is to be staffed and financed by North Americans sympathetic to the Sandinista regime. Radio Veterans For Peace would be based in Nicaragua with the capacity to broadcast on m.w. in Spanish and English to audiences in the region, including United States troops based in El Salvador and Honduras. It plans to use interview material from war veterans in all countries who have become peacekeepers.

Through locally produced and satellite-transmitted programmes, Radio Veterans for Peace will incorporate local, regional and international newscasts. It would take a stand supporting the Nicaraguan revolution and include programmes produced by US and other war veterans, including special information segments addressed to US soldiers.

At the moment, the plans suggest the station would be part of Nicaragua's People's Radio Broadcasting Corporation. Assuming funds are forthcoming, a 10kW transmitter with a directional antenna broadcasting from northern Nicaragua could be running by the end of next year. It would be powered by diesel generators.

The Latest Relay

At the moment, hardly a month goes by without another swap between broadcasters being announced. Reporters have been circulating in the last couple of weeks that Austria and Canada are close to a short wave relay agreement. Radio Austria International would broadcast some two hours a day to North America via the Radio Canada International transmitter site at Sackville. In return, Canada would get two hours a day for early morning broadcasts in English and French beamed to the Middle East, via Radio Austria International's facilities at Moosbrunn.

RCI has no plans for an Arabic service. Sources in Vienna told us that talks between the two organisations are taking place, but are in a very early stage. Austria has received other offers from stations outside Europe which it also wants to consider.

Specialists Unite!

When you first start listening to short wave, it is pretty easy to find and verify 50 radio stations. After a year or so though, it becomes a bit more difficult. Some people with only a passing interest in radio drift off to do other things. Others, often with either a technical or cultural interest in the world of international radio, take it further.

One of RCI's many different QSL cards.

After two years of planning, an organisation called the Italian Radio Relay Service has announced plans to start test broadcasts on short wave. The chief engineer of the service says it should be in the next three weeks or so, probably at the weekends.

Propagation is a mystery world unto itself. Restoring an old communications receiver, or experimenting with antennas are other branches you can take. Back in the 70s, some active listeners got together in North America and formed a closed circle of members. A low cost newsheet was produced each week, which a volunteer printed and sent to other people in the group. It simply was not possible to expand the operation. One of those groups, called "Fine Tuning", has just launched a new book which is designed for the specialist.

Fine Tuning Proceedings 88 is the title of a 232 page loose leaf bound book with 24 specialist articles in it. The Delta Loop, The Drake R-7 revised, Trans Polar Solar Blanking, D/Xing New Guinea, the titles speak for themselves. The cost of the book is 15 US dollars 50 cents. Postage to the UK is extra, 3 dollars for surface mail and 15 dollars if you want it airmail anywhere in the world. The price difference is simply because the book is heavy. The address for further information about this non-profit project is: Fine Tuning Publications, R.T. Number 5, Box 14, Stilwater, Oklahoma, 74074 USA.

From Poland comes the news that 15 illegal Radio Solidarity stations are active at the moment. The four major stations are in Warsaw, Szczecin, Gdansk and Krakow. The programmes are simply put together and broadcast by clandestine transmitters. Although the various stations cooperate with each other and exchange some tapes, they can't really be described as a network. The use of a small 200W transmitter and an unattended tape-recorder means that broadcasts are kept short. Police can usually direction find and capture the illegal equipment within 30 minutes.

Most transmissions use the same frequency as one of the Polish TV channels, popping up as an audio programme only as the official channel signs-off. In the past three years those caught have been sentenced to up to five years in jail for the offence.

BBC World Service Changes

The BBC has asked a leading merchant bank, to undertake a joint study on how best to get their World Television News project off the ground. The move comes nearly five months after the Government decided not to provide £3 million of public money to help finance the BBC's proposed nightly half-hour satellite news programme.

The editorial focus of the proposed programme would marry the news radio coverage of the BBC World Service, which Parliament already funds directly with the facilities of BBC Television. The late Douglas Muggeridge, former head of the BBC External Service, once described the idea as radio with pictures.
There was no VOA, Berlin International, or even a BBC World Service — Britain could only muster one station broadcasting on the short waves according to the list.

But likewise there was no jamming — a product of the war — although a heterodyne whistle or two might well have been audible, coming from a nearby over-tuned r.f. receiver which had no “front end”, just a detector plus one or two valves in its output stage.

Nor were there any 500kW stations, not even 100kW, to cause co-channel or sideband problems or interference.

Station Lists

The scraps of paper list the stations that were operating in the early 1930s: a combined long and medium total of 150, and a further 38 on the short waves.

Pittsburgh (on 11.870MHz and 6.140MHz) and Schenectady (9.530MHz), both in the USA, were the high-power transmitters using 40kW to reach the world’s short wave listeners.

There is a story, true as far as I know, whereby an enthusiastic living beneath the Pittsburgh antenna system used its radiated power to light his rooms. He was fined for “stealing” the radiated energy!

At that time it was nothing unusual for a station’s antennas to drape across rooftops.

The lowest power in the list is that of Guatemala City (6.667MHz) — just 10W.

Britain appears to have shown a great lack of foresight in having but one station in the list: that of G5SW who operated at Chelmsford using 12kW on 11.750MHz.

But who was G5SW? A licensed amateur like Gerald Marcuse (G2NM), who had carried out experiments in the 1920s, or an experimental station with the necessary authorisation to broadcast?

Unaccountably, there are omissions in the list for who among the world’s old-time s.w.i.s will ever forget the warm and friendly greeting of PCJ’s announcer: “Good morning, good afternoon, good night — wherever you may be”.

PCJ was the callsign of the Dutch station at Eindhoven, the home of Philips, a name well-known today in the world of radio and music. The list does give Eindhoven as being in Portugal (CT1AA) using 2kW on 9.560MHz! Must surely be an error!

And what about Kermlavosa-Chiba-Ken for a station name? Today it is known as Radio Japan. Fifty-odd years ago it would have been heard on 7.880 and 15.490MHz, its power is not given.

Listeners seeking a QSL would probably have received a polite letter of acknowledgement, as I did.

At that time my favourite stations wereBound Brook (W3XAL) and Schenectady (W2XAF) from one of which a country and western programme, Home on the Range, was a regular switch-on.

The three pages from the 50-year old reference book.

But how many old-timers recall the play, The End Of The World relayed by one of the American stations? It was so realistic that scores of frightened listeners phoned in, having missed the station’s opening announcements!

Other Side of the World

At the other side of the world the Australian Post Office had taken over transmitters such as VK3AR at Lyndhurst, and was broadcasting on 9.530MHz (Sydney VK2ME, 12kW) and on 9.510MHz (Melbourne VK3ME, 5kW), and to hear either on a one-valve receiver was an achievement!

HCJ8, the Voice of the Andes, (Quito, Ecuador), broadcast on 5.714MHz, power not given. Moscow, too (6.611MHz, callsign RENI), one of only two Russian Stations on the short waves, the other being Khabarovsk (4.273MHz, 20kW).

And there was the League of Nations station in Switzerland (on 7.444MHz), Spain’s QSL card — EAO (on 9.860MHz, 20kW) — showed that very fine cathedral at Cordoba. Once a mosque, it was built in Moorish style.

If the list is anything to go by then China wasn’t to be heard, but you might have tuned into Kuala Lumpur (Malay States) on 6.000MHz. Its callsign was VSZ5AB.

Vienna had an experimental station on 6.072MHz (UOR2); Tenerife Radio Club in the Canary Islands could be heard on 7.211MHz, 50W, callsign EAR 58; Radio Colonial Paris on 11.705MHz.

The world was now wide open: India (Calcutta, 6.109MHz, 50W, YUCO; Canada, Winnipeg, 6.147MHz, 3.5kW, VE9CL). From South America to Morocco (Rabat, Radio Maroc, 9.300MHz, 12.800MHz, latter had a power of 20kW), and Casablanca relayed Rabat on 6.250MHz (CN8MC).

Long and Medium Waves

And what about the long and medium waves? Well, Daventry is listed on 200kHz, using 30kW, sharing the frequency with Ankara, Turkey (7kW). Daventry then carried the national programme. Today, the transmission at Driptwich is powered at 400kW, sharing the frequency with two Scottish stations, Burghhead and Westerglen, each using 50kW.

On the medium waves the British Isles came under a regional grid with the addition of a few local stations. Midland Regional would be found at one end of the dial (1767kHz, 25kW), while at the other end were Bournemouth (300kW) and Plymouth (100kW) sharing 1.474MHz.

As to who was G5SW? There might be a clue in the April 87 issue of SWM (A Voice from England.
ROBERTS RCS-80 REVIEW

Jack Aldridge

Roberts Radio have been around for more years than I care to remember. They've always been famous for their fine quality domestic portable radios — and they're a truly British firm.

that's so you can feed a tape recorder. The great advantage of this socket is that the output level is independent of the volume control. That way I could record signals with the volume turned down (and not get moaned at too much). The actual signals on this socket are fed via 47kΩ resistors with the same level being available on pins 1, 3, 4 and 5. Pin 2 is used for the ground connection. I got this gem of information from the circuit diagram included with the small handbook. Circuit diagrams aren't commonplace anymore, but can provide lots of information — if you know what you're looking for.

The Displays

As I said earlier, the main changes with this model are the electronics. They've done away with the old analogue dial and pointer and replaced them with a modern, liquid crystal, digital display. Actually, there are two displays, one which indicates the operating frequency and mode and the other which shows the time and alarm details. Both are quite "tastefully designed" and they don't spoil the lovely traditional design of the set. (I can't help being old fashioned).

Tuning Options

There are three ways of selecting your frequency. You can search for a station, tune it in manually or recall it from the memory. The "default" condition is the search option, which I found remarkably easy to use. All you have to do is select the required band (l.w., m.w. or v.h.f.) and press the UP or DOWN button to tune in the required direction. As soon as the RCS-80 finds a suitably strong signal, it stops searching and un-mutes the audio. The threshold at which it stopped on a signal seemed to be set at a good optimum level. I hate it when sets stop on every crackle on the band, I prefer to have a decent signal when the audio comes up.

If you want to tune to a particular station, you can use the manual tuning option — that's provided you know what frequency the station you want is on. This time all you need do is keep the ALARM/ MAN button pressed whilst you select either UP or DOWN as before. You know when to stop as you can see the frequency change on the display, when it reaches the one you want, take your finger off the button!

The tuning steps are fixed. They're 1kHz on l.w., 9kHz on m.w. and 50kHz on v.h.f., so they're not too bad for general listening. The biggest problem arises if you try to listen to stations on the medium wave band that are outside the "standard" 9kHz spacings, like those who use 10kHz. You don't have to poke the UP or DOWN button for each tuning step on l.w. you'd soon get fed up. If the button is held down for more than one second, the electronics take over and move the frequency steadily either up or down. To stop the changes, you just take your finger off the button.

The last, and probably the most useful, tuning mode is the memory. This allows you to store all your favourite frequencies for instant recall. This proved to be most useful in this household for tuning in the "domestic" frequencies. I don't have too much trouble remembering where my favourite stations are to be found, others here don't seem to remember from one day to the next!

Again, Roberts have made the operate quite simple. Once you have tuned to the station you want to keep in a memory, you just press the MEMORY key and then one of the eight memory buttons. You can't get much simpler than that, although I did have to make a little card out detailing which stations were in which memory — there's no helping some people! There are actually sixteen memories available, eight on v.h.f. and another eight between the l.w. and m.w. bands. So perhaps I was expecting a bit much for someone to remember the contents of sixteen memories.

Clock Functions

Because there's a digital clock, that also means that there are other associated functions provided. The most obvious is...
an alarm facility, and I defy anyone to ignore it when it goes off — the cat went into orbit the first time I tried it out!

The alarm can be set to either turn the radio on at a pre-set time or the set emits an alarm signal. That alarm signal was a "beep" of about 1 kHz every half second, it actually starts at a very modest level too. If, however, you should be foolish enough to ignore it (and I was), the level increases in three steps to an amazing volume. I can't imagine anyone being able to sleep through it. You know if the alarm function has been selected, as a little picture of an alarm clock appears in the corner of the clock display — very neat.

In addition to the alarm function, there is a snooze facility (much more civilised). That allows you to drop off to sleep with the radio playing, very pleasant if your local station goes into the small hours with "gentle" music. The amount of time the radio plays for can be pre-set from one minute to one hour.

A Look Inside
I can never resist looking inside a set when I get to play with it, and this set was particularly rewarding. The technically minded will be delighted to hear that, despite the long history of the Roberts Radio Co., the technical design of the RCS-80 is very much state-of-the-art. They've made extensive use of integrated circuits, ceramic i.f. filters and diode switching. Because I'm not quite so familiar with modern components as I used to be, it took me a little time (and a bit of outside help) working out what some bits and pieces were.

The reception technique on all bands is single conversion superhet with the standard i.f.s. of 10.7 MHz for v.h.f. and 450 kHz for long and medium wave. Varicap tuning is used throughout with f.e.t. i.f. amplifiers used on both l.w. and m.w. Despite the extensive use of integrated circuits, there are approximately 50 transistors which are used mainly for interfacing between the various integrated circuits.

One of the main features of this type of radio is the audio quality and the Roberts RCS-80 performs very well on this count. The key to the very pleasant sound is the use of a good sized loudspeaker which in this case was approximately 110 mm diameter. This was further enhanced by the wooden cabinet with the result being a very mellow and easy-to-listen-to sound quality, the type that would have been described in the past as a good tone!

The basic audio performance can be tailored to suit individual preferences by using the separate bass and treble controls on the front panel. These can also be used when trying to identify DX stations as you can use them to try and minimise the noise on a signal. The range of adjustment available from these controls was really very good and should satisfy all tastes.

Obviously the final audio quality depends very much on the programme source and as expected, the best results were to be found on v.h.f. When listening to long and medium waves the sound quality was still surprisingly good and the wide ranging tone controls were particularly useful here to optimise the sound. It certainly went down well in the domestic situation in this household!

The Verdict!
I must admit I was very pleased with the RCS-80 throughout the review period and I would have no hesitation in recommending it as an ideal domestic radio. In fact, I was not the most popular of people when I mentioned it had to go back. The only point I can find to criticise is that the back-light for the i.c.d. is far too dim to be of any practical use, that's hardly a serious complaint! The sound quality and i.f. performance was also well optimised for domestic use. So if you're looking for a radio that has to serve two purposes, especially if your favourite DXing line is local radio stations, this radio could solve a few problems.

The RCS-80 is available from any Roberts retail outlet and costs £110.

My thanks to Roberts Dynatron & Co. Ltd., Molesey Avenue, Moseley, Surrey KT8 ORL for the loan of the review model, and Peter Brownbridge of Johnsons Shortwave Radio for arranging it.

Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>f.e.t.</td>
<td>field effect transistor</td>
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<tr>
<td>f.m.</td>
<td>frequency modulation</td>
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<tr>
<td>i.f.</td>
<td>intermediate frequency</td>
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<tr>
<td>kHz</td>
<td>kilohertz</td>
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<tr>
<td>kW</td>
<td>kilowatt</td>
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<tr>
<td>l.c.d.</td>
<td>liquid crystal display</td>
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<td>l.w.</td>
<td>long wave</td>
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<td>mm</td>
<td>millimetre</td>
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<tr>
<td>mV</td>
<td>millivolt</td>
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<tr>
<td>m.w.</td>
<td>medium wave</td>
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<tr>
<td>r.f.</td>
<td>radio frequency</td>
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<tr>
<td>V</td>
<td>volt</td>
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<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
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<tr>
<td>Ω</td>
<td>ohm</td>
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Subscriptions
Subscriptions are available at £17 per annum to UK addresses and £19.00 overseas by Accelerated Surface Post outside Europe. For further details see the announcement on page 20 of this issue. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both Short Wave Magazine and Practical Wireless are available at £27.00 (UK) and £30.00 (overseas). Three year subscriptions are also available for SWM at £45.00 (UK), £50.00 (overseas).

Components for SWM Projects

In general all components used in constructing SWM projects are available from a variety of component suppliers.

Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

The printed circuit board for the SWM Audio Filter, July '87 issue, is available price £2.75. The printed circuit board for the SWM Active Weather Satellite Antenna, June '88 issue, is available price £4.20. Orders for Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP. Prices of p.c.b.s include VAT and P&P.

Back Numbers and Binders

Limited stocks of most issues of SWM for the past 10 years are available at £1.45 each, including post and packing to addresses at home and overseas (by surface mail). Binders, each containing one volume of the new style SWM, are available price £3.50 plus £1 post and packing for one binder, £2 post and packing for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for p.c.b.s, back numbers and binders, P.W computer program cassettes and items from our Book Service, should be sent to PW Publishing Ltd., FREE-POST, Post Sales Department, Enefco House, The Quay, Poole, Dorset BH15 1PP, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole 10202) 678558. An answering machine will accept your order out of office hours.
The transmission and reception of broadcast quality speech and music via single sideband (s.s.b.) and independent sideband (i.s.b.) point to point h.f. links has been the concern of professional radio engineers for some years. Quite soon all s.w.l.s will need to be aware of the techniques involved, because the last World Administrative Radio Conference (WARC) on the future of h.f. broadcasting decided to allocate the ever increasing congestion in the broadcast bands by replacing the existing amplitude modulated (a.m.) transmissions with s.s.b. systems in the future – they actually set the date for the cessation of all a.m. s.w. broadcasts as 31 December 2015!

This revolutionary decision will affect broadcasters and s.w.l.s alike, because new transmitters will be required and most of the existing receivers will be unsuitable for the reception of transmissions using the s.s.b. system. In view of this, the conference requested the ITU and associated member organisations to urge receiver manufacturers to commence production of suitable low-cost s.s.b. receivers by the end of 1990.

The basic principles of generating s.s.b. signals and some of the advantages to be gained from them have already been outlined in this series – SWM August '88. The saving in spectrum space resulting from their adoption will enable about twice as many broadcasts to be accommodated within the present h.f. bands! The format of the transmitted signal to be used for this new concept in s.w. broadcasting is unknown at present, but it seems likely that the system employed on many h.f. point s.s.b. links will be adopted.

Because of the nature of the modulating audio signal from a studio centre, special techniques have to be employed when demodulating the modulated sideband information of broadcast quality s.s.b. transmissions. Simply inserting the locally generated reference signal within 10 or 20Hz of the correct frequency at the receiving point, as described last month in this series, would result in a change of pitch in the demodulated audio which would be unacceptable to any listener! To obtain acceptable results, the reference has to be inserted at exactly the correct frequency and phase.

Pilot Carrier

In order to meet this requirement it is necessary to send to the receiving point a low level sample of the original carrier, called a pilot carrier, along with the sideband information so that it can be used to effectively synchronise the carrier insertion oscillator (c.i.o.) in the receiver. The level of the pilot carrier required is usually quite low, being typically -26dB below the peak s.s.b. signal on many of the present h.f. point to point s.s.b./i.s.b. music link transmissions, but levels of -16dB or even -6dB may be selected when poor conditions arise.

Although one of the techniques described last month in this series may be used to demodulate single sideband suppressed carrier transmissions which convey speech for communication purposes, an entirely different approach is required when music or some other man-made or natural sound is contained in the modulating waveform.

The pilot carrier may be extracted within a receiver at the final intermediate frequency (i.f.) with a limiting amplifier and then be used to synchronise the c.i.o. It is possible to simply inject the pilot carrier at i.f. into a free-running c.i.o. thereby forcing it to lock-up in frequency and phase, but a more reliable approach is to use the i.f. sample of the pilot carrier as the master reference in a phase locked loop (p.l.l.) system.

The basic principles of phase locked loops have already been outlined in this series – SWM, May '88. In this application a voltage controlled oscillator (v.c.o.) operating at the last i.f. frequency acts as the c.i.o. for the product detector – see Fig. 1. Samples of the pilot carrier reference at i.f. and the v.c.o. output are applied to a phase comparator. The phase comparator produces an error voltage proportional to the difference in frequency between the v.c.o. and the i.f. reference. The error voltage is applied to the v.c.o. and adjusts its frequency so that it coincides with the i.f. reference – the v.c.o. is thereby locked-up and is effectively in phase-coherence with the original carrier. Any change in the incoming i.f. reference frequency is sensed and the resulting error voltage readjusts the v.c.o. frequency.

Until fairly recently it has been necessary to use numerous components in p.l.l. systems, but advances in technology have now made it possible to incorporate all of them into a single integrated circuit!

DSB Reception

These techniques can also be used for the demodulation of double sideband (d.s.b.) suppressed carrier transmissions. Since both sidebands contain identical information it is essential that the output from the receiver c.i.o. be phase-coherent with the original carrier. The effect of inserting a reference a few cycles off the correct frequency would be to raise the pitch of the demodulated audio from one sideband and lower the pitch of the audio from the other sideband – the resulting distortion would be totally unacceptable!

Although considerable saving in transmitter power can be obtained by generating a d.s.b. suppressed carrier signal, the bandwidth of the signal will be similar to that of a.m. and so saving in r.f. spectrum space cannot be achieved. The d.s.b. system is therefore seldom used commercially, but some radio amateurs have adopted this mode because it enables a suppressed carrier signal to be obtained at low cost by using a simple balanced modulator in the final stages of a transmitter. By using a communications receiver in the s.s.b. mode, either the upper or lower sideband of the d.s.b. signal may be selected and then demodulated to provide a communications quality audio signal.

ISB Reception

In contrast, the independent sideband (i.s.b.) transmission system is used a good deal commercially, since two quite separate broadcast quality audio signals may be sent to a distant receiving point via the independent upper and lower sidebands of a single transmission – see page 37, SWM August '88. A pilot carrier has to be sent with the sideband information so that the c.i.o. in the receiver may be synchronised.

In order to demodulate the independent sideband information simultaneously a special receiver has to be used, but a listener equipped with a communications receiver capable of selecting the upper or lower sideband could monitor these transmissions – albeit with poor audio quality!

The special receiving techniques used commercially involve routing the final i.f. via two separate amplifiers and quartz crystal lattice filters so that one chain handles the upper sideband and the other...
Synchronous AM Detection

It may be worth mentioning at this point that synchronous detection can also be used to advantage with amplitude modulated (a.m.) signals, since it can help to counteract the effects of fading. Even though an incoming a.m. signal may be fading quite deeply, the c.i.o. should still remain phase-locked to the carrier at i.f. and provide a constant reference signal at the detector — an adequate carrier to sideband ratio will therefore be maintained and the severe audio distortion which often arises during deep fades may be avoided.

Another technique, known as excited carrier detection, may be used with an s.s.b. receiver to improve the reception of an a.m. signals during periods of severe adjacent channel interference. In this system the a.m. signal is treated as though it is a single sideband signal with carrier, however the choice of which sideband to use is left to the receiver operator! Any normal s.s.b. communications receiver may be employed, but since the c.i.o. is not phase locked to the incoming carrier only transmissions involving speech may be demodulated satisfactorily.

With the mode switch set initially to either upper or lower sideband, the receiver main tuning should be carefully adjusted so that the c.i.o. is zero beat with the desired incoming carrier. If the interfering signal lies above the desired signal, as depicted in Fig. 3, it can be eliminated by selecting the lower sideband. If the interfering signal lies below the desired signal the upper sideband would be selected. Note that the main receiver tuning may need to be readjusted from time to time to ensure that the incoming carrier and the c.i.o. are zero beat.

**IF Bandwidth**

The bandwidth of the receiver i.f. amplifiers is important if optimum performance is to be achieved in any particular mode. Most communications receivers offer a selection of quartz crystal lattice i.f. filters which have a steep side response — see "Starting Out" SWM March ’88. Some of the double conversion receiver designs employ quartz filters in both i.f. chains so as to minimise unwanted mixing products and improve the overall response — typical bandwidths provided by the filters being of 5.5kHz for a.m., 7.2kHz for s.s.b. and 500Hz or less for c.w. signals.

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**BANDSCAN**

> The bank's mission is to scrutinise appropriate commercial options for funding the production and distribution of the programme, and come up with a viable package for the international television market. It won't be easy. Superchannel, one of the pan-European TV channels has been running a nightly, half-hour, news bulletin at 10pm for the last year. Now they've decided to break it up into small pieces and intersperse it through the evening. Despite English being regarded as a universal language, the language of news is difficult to follow without subtitles.

Meanwhile John Tusai, Managing Director of BBC External Broadcasting, has said the title of the entire organisation will shortly change to BBC World Service. Until now, the term World Service was only applied to the English Service, now all languages will identify as the World Service. That will surely cause some interesting mix-ups in the mail room for a while.

As reported last month, the BBC Indian Ocean Relay station has now opened. Check for it on 6.005 and 7.165MHz from 1645-2300UTC, 9.600MHz from 0300-0400UTC, 11.750MHz from 0300-0500UTC, 11.860MHz from 1400-1600, 15.420MHz from 0400-0630 and 0900-1600, and finally 17.885MHz from 0500-0630 and 1900-1400UTC. Note that if you write to Bush House they will only acknowledge your report with a no-data postcard, and not a QSL card. This, they say, is for cost reasons.

**25MHz Daredevils**

It is still over a year before we reach the peak in the sunspot cycle. It is only in the peak period that 25MHz becomes a useful broadcast band but Radio Denmark is not waiting for that. As from September 5 they have been using 25.850MHz for a broadcast to Australia at 1200-1320UTC. If it disappears in the course of October, then you will know that their bet on interference-free reception has been a bit too early. Radio Denmark normally changes channels that don’t work after three weeks on the air.

**Computer Buzz On MW**

If you check 1000kHz on Mondays between 2035 and 2100UTC, you may well hear a lot of weird noises. This is the Dutch domestic service, NOS, busy with broadcasting computer programs in BASICODE.
VHF SCANNERS

This picture is a screen photo of a NOAA image decoded by our popular VHF software and receiving station for the BBC. Take a look at the evaluation disk before paying over the odds for an inferior system. Our complete NOAA system, built and ready to go only £29.35.

THE SPACECRAFT WX.PHOTO FOR THE ACORN ARCmede

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**SHORT WAVE MAGAZINE OCTOBER 1988**
Even if we haven’t so far had much in the way of summer weather we’ve certainly had summer band conditions. Yesterday evening produced a case in point; while 21MHz was all but dead — a couple of South Americans on c.w. and just above the noise — a switch down to 14MHz showed — the band apparently well open, but the static level all but intolerable whichever way the bit. However, a little later the interest enough I ended up working V07AA who was well out of the noise, but over in St. John’s he was hearing me at 98 plus a lot on a band that to him didn’t seem too noisy at all.

Antennas? Not too likely, because of the principle of Reciprocity. This says that, in general, conditions are the same on both ways on any given path. Thus, imagine a chop with a horning working a chop with a wet string antenna. The transmission path for him is out of the p.a., into the horning, through space to the wet string to the receiver. The return path is transmitter-wet string antenna-space-rombic antenna-receiver. Receiver sensitivity is about the same, transmitter power about the same, give or take a little. Thus, both ends should be giving and receiving similar signals — not too likely. Thus, a far-apart stations each having a wet string antenna are unlikely to make any contact regardless of power or the state of the band. On the other hand, there is no lack of documented evidence that sunspots and volcanoes affect the horizon, and high, can span an array into a decent, and high, array can span the world. Indeed, transcontinental contacts have been made on consider-ably less than omni-directional antennas. Thus, an efficient amateur or s.w.l. set-up, antennas are far and away the most important. Get an ideal antenna system and then use a war-surplus receiver, is much more technically sensible apparatus even an old receiver finds the receiver and hope to do good with a minimal skywave system. There hasn’t been any significant improvement in using a war-surplus receiver for 1.8-30MHz since the twenties, for the simple reason that, alas, the received natural man-made noise from all the ill-designed and worse, maintained electrical/electronic pollution that surrounds every suburban location.

Our New Competition

The full rules are given in the box, now recall the old saying: “if all else fails, read the instructions!” Seriously, read ‘em through carefully, and let’s have your entries; don’t forget there is the chance to acquire some wallpaper for your radio shack, to show visitors your abilities, and to stop that eternal folder infestation. “And what, Johnnie, is the range you can cover?”

Justin

He has begged a space to thank all those of you who wrote to wish him a happy retirement and to advise him how you know him. He would like it to be known that his first retirement task is the creation of a complete, all-homebrew, new world in which crime will have disappeared and every radio amateur will receive a sixty-foot tower complete with beam and planning permission for it with his licence. After that, there are a few rather more realistic schemes for him to play with. As for radio; he might just consider a transmitting licence.

Letters

Let’s make a start with Bill Prior (Lochcarron) who has gone up to SBJ prefixes heard in the RTTY mode, thanks to the erection of a five-band equiangular gales that funnel through Lochcarron way, between the hills.

Next we have Mr. F. Waters of Manx Radio, who wants us to take a look at the Amateur Radio Maintenance Service. Basically you pay a premium, for some reason, to AMS pays the bill. Get the details from ARMS, Fred, Omnikar, Lacs L393 AAB. Of course, this is different from an insurance on the station against the usual fire, theft, falling antennas, etc., since these can be covered in various other ways.

Now over to the E. J. McGlone (Limerick) who has a very useful book, published recently by our sister magazine, Practical Wireless — over 150 DXCC Prefixes.

Graham Johnson (Nuneaton) has been a s.w.l. for some five years now, and is a member of the Intercontinental Listeners Association. Graham uses a Panasonic DR49 as the main receiver, plus a motley collection of portable domestic sets. Favourite band is 14MHz, though Graham occasionally strays to other bands; this was how he heard the PY5EG and PY7WH when he was doubly pleasing as they were found on 28MHz. 21MHz gave 98, 25.50, 4.4AF, and 76MHz a 275MHz, which is good, from Haywards Heath area.

Edie M. Gauci (Siema, Malta) sent in his latest Prefix List. Among the interesting prefixes were F6H88B, F5/PACS/EIC/M. Congratulations are due to Simon Burgess (Stockport) who has passed RAE and is in the throes of building two metre transmitter while waiting for the licence. Simon didn’t find the bands up to much on the occasions when he found time for a listen, but nonetheless it is a pity the number of South Americans — these are like hen’s teeth at the GW3KFE QTH (we say, hellish, probably), probably a presence of a mountain in that direction! The distant Ws — W6 and W7, are given some indication of Simon’s listening times.

A new entrant is R. Watters, who lives at St. Austell in Cornwall; Robert has a TR7-700. We look forward to hearing from you.

a.t.u., fed from about twenty metres wire some 8 metres high. Possibly the stars of the show are the two SB3 stations, (SB3J and SB3H) and the EP2DL, who was being chased by quite a pile of US stations. In fact, Robert’s list only needed a humble European to complete the continent — the only “European” logged was in fact G3JJS/VE8I

David Peat (Mansfield) is quite sure about his Star Turn this month: it was VU2DNL who was a strong signal and the first heard from the Indian sub- continent — VU2DNL was working a KH6 who was quite inaudible to David. Again I notice all continents bar Oceania were represented in the log, which must say something about conditions.

Conditions

Conditions, as I loosely use the word, covers a multitude of sins. For example, there might be a path between places A and B if not one is operating at one time, or B, the path, would then be end will be written off as “dead”; and as far as Africa is concerned much of the “poor conditions” are down to absence of any licensed activity or stations. By the same token, two stations are unlikely to make any contact, even if they pass all the prescribed tests, are not granted licenses in some of the countries, even expatriates have difficulty obtaining licenses.

And of course, there are always “preferred times,” for the more distant parts of the world. VK2/L in the mornings spring to mind. At other times there is not necessarily anything wrong — just something that isn’t working — but something uniat in the skywave system over a really abnormal time. In such a case you need to check out to satisfy yourself that your ears haven’t misled you.

Again, you may have a local noise level — not on complete silence, but perhaps with a few squelches. Naturally, one can look out of the window at the 144MHz repeater mast up on the hill, and say, “I’m going to drop into the noise for a few seconds as the clouds go over” and after watching the cloud pass over, turn back to finish the contact. Thus rain static, which is incidentally somewhat more noticeable on vertical antennas can give you the impression that to persevere is wasted effort. The same goes for heavy static due to thunder — although if it approaches near enough to be really bad, the time has come to pull the plug out of the a.u. and earth the skywave side firmly down.

Activity, as another example, often lacks on a band/path until a major contest weekend. For example, the CQWW, the ARRL DX, the CO-M contests will suddenly cause activity on 28MHz.

SWM Prefix Awards

1. The object is to hear and log as many DXCC prefixes as possible; a prefix can only count once, whatever band it is heard on. The starting date for the competition is 1 October 1988.

2. Only calls issued for amateur radio operations may be included. Undercover and pirate calls will not even taking part may any MARS stations be claimed.

3. The object is to hear prefixes not countries, thus there is no discrimination between say MP9B and MP9K which count as one prefix.

4. When the prefix is changed, both the old and the new may be counted.

5. Awards will be made as follows: Bronze — over 75 DXCC Prefixes heard

Silver — over 50 DXCC Prefixes heard

Gold — over 300 DXCC Prefixes heard

6. QSL cards may be asked for to substantiate an claim for an award.

7. Claims for the new awards should be sent to: SWM DXCC Prefixes, c/o Paul Essery, PO Box 4, Newton, Powys SY16 1ZZ.

8. The prefix list is based on those shown in the current Radio Amateur Prefix Country List published by Geoff Watts, 62 Belmont Road, Norwich NR7 0PU.

at least to have a "feel" for, the difference between conditions and activity. Taking a leaf from the v.h.f.ers book, beacon have been established in various places; for example the string of 14MHz beacons which operate "serially" over period of about ten minutes. Although I hear that the Lynchpin of this network, W5XW, was pitched recently, so there is a gap in the coverage! The beacons — a list was published recently by our sister magazine, Practical Wireless — are usually low power with omni-directional antennas. A daily paddle through the beacons on 14 and 28MHz before starting general listening is a very valuable guide to what to expect. In addition, over your favourite path and band, you will note nearby stations that give you valuable clues; they too are serving as beacons.

Old Receivers

Whatever happens to them? Back in the late fifties and early sixties, most of us had receivers of the war-surplus variety, or even home-brew. Some folk were even so enthusiastic that they got a portable, the carrier by tuning another receiver local oscillator and adding the coupling to suit by moving the two receivers relative to each other. Many of those old receivers, if they had a good local oscillator, were better performers than modern receivers using their phase-lock loop oscillators with their

The next three deadlines for your letters are:

October 19, November 15 & December 19

Short Wave Magazine October 1988
Readers' Letters

It seems to have been a bumper month for letters, perhaps everyone is home from their summer holidays.

Edward Swan has written to me on several occasions and this time he has included station details. Just to give you some background, Edward has been a keen short wave listener for over 70 years so he knows what he is talking about! The receiver he uses is the very popular Icom IC-71E giving coverage from 100kHz to 30MHz with the antenna being a simple long wire. For the reception of RTTY Edward uses a Tono 550 decoder, which takes audio output from the receiver and produces a display on a standard video monitor. Actually, you may like to keep an eye open for Tono decoders in the second hand columns as they seem to be dropping in price quite dramatically. In addition to the h.f. equipment he also runs a Yaesu FRG-9600 scanner and 33MHz c.b. for local chats.

Kay Strutt sent me an interesting letter describing her entry to the world of ultry listening. Kay's initial problem, which is not an unusual one, was how on earth to recognise the different types of signal. Just to complicate matters even further she has found it necessary to change equipment several times finally resorting to a Belcom LS102L and Danant AMT2 as the receiver and an AMT2 as the decoder. Kay's main rig is a modified Yaesu FRG-9600 Ma-5 which is currently awaiting repair. In order to help her on her way she would like to make contact with other listeners who are using FRG-9600 Ma-5 for ultra listening, if you let me know I will pass the details on to Kay.

The reception of FAX charts from Offenbach seems to cause readers a lot of problems including C. M. Bates. He uses a Kenwood R-2000 receiver, ICS Electronics Fax1 and a 16m long wire antenna. Probably the single most important point, when trying to receive v.f.f. stations, is to make sure that the long wire antenna is directed to the antenna terminal on the rear of the receiver and doesn't pass through any a.c. or d.c. wiring. The reason for this is because the majority of a.t.u.s on the market are not designed for use on v.f.f. and consequently tend to have a high loss at low frequencies.

Michel van der Steen writes again from Belgium. He is the one who sent all the details of the ATI ST Users Group, ASTUR. His station is quite impressive and comprises a GSRV antenna coupled to a NRD-525 receiver via an Universal Trans-Match a.t.u. The decoder is a PK-32 which has been upgraded with the latest software releases which feeds an ATI 520 ST computer (what a surprise!). In addition he uses a Brother M1009 printer for RTTY, FAX and AMTOR and an Akai M10 tape recorder. The system obviously works well as he included a frequency list of nearly two hundred RTTY, FAX and AMTOR stations recently received.

As usual, Chris Norfolk sends in lots of information with his reports on things like the weather and whether or not the arc welder next door is running! The letters are getting so fat now that the postman has to put them through the cat door! He was able to supply me with some interesting Russian and German schedules which I hope to have space for next month.

Ivor Cooper has sent in news of a frequency change for QRA Meteor (OLT3). They have apparently moved to 124.6kHz. Ivor has monitored this station and they appear to be transmitting a satellite photograph at 30 minutes past the hour. He reports that reception is not good and is only really practical after dark at his location.

After waiting patiently for my overdose replies, Jack Bres takes in details about the Universal Model 7000 which he is hoping to purchase soon. Regular readers may remember me mentioning the Inotech M6000 multi-mode decoder some months back. The Model 7000 appears to be from the same stable, but is the latest version. The specification is extremely impressive and covers just about every mode I can think of without resorting to lots of extra expensive options. No doubt Jack will fill in with more details of how it actually works once he takes delivery of it.

After mentioning the idea of a cassette with pre-recorded data comms signals on it and a data tutorial, I am now phoning out from under the letters asking for more details! So, we're looking into the practicalities of this, as it doesn't seem like there is one already produced by anyone else. It will probably take a bit of time, but your pleas haven't been forgotten or ignored. I'll give more details as soon as we've worked something out.

Schedules

The first schedule this month was supplied by Chris Norfolk and is for the CTX news service. The information is given as: .........

Mike Richards G4WNC
200 Christchurch Road, Ringwood, Hants BH24 3AS

An example of the type of pictures possible when using the J & P Electronics Fax program.


Same as Monday to Friday except for transmissions between 1800 and 2030.

Sundays


As to what you can expect to see, the area served is the North Atlantic/North Sea. This time the information is given as: ...

As to what you can expect to see, the area served is the North Atlantic/North Sea. This time the information is given as: ...
QSLing

In the August issue, I mentioned the QSL letter from Norman Hartford received from Tass. Well, Jan Nieuwenhuis seems to have gone one better. He has been a utility stations listener for several years and, to date, has received 148 QSLs from utility stations in 64 different countries.

Despite the fact that these stations don't need reception reports from listeners, apparently some of the stations have helpful cards. Jan has offered to send some of these cards to me so we can use them in the column to brighten things up. To help other readers, Jan has sent a list of stations that are "good verifiers".

Press Bureau: AA, AFA, CNA, CTK, APP, ADN, MTFA, KYODO, JNA, MAP, Agress and TASS.

Time Signal Stations: VNG, CHU, Y2S, IFB, MSF and WWV

Some Navy and Coast Guard Stations: RAN, CNR, MNH, FN, La Regine, GN Paireus and RNW Nauako.

Owls!

Last month, it seems that the addresses "fell off" the column somewhere along the line. For those who would like to know what they were:

1. Ian Brothwell, BARTG, 56 Arnold Hill Road, Arnold, Nottingham NG5 610.
2. Microwave Modules, Brookfield Drive, Altrincham, Liverpool L9 7AN.
3. Public Satellite Network, Wincosome House, Beacon Road, Crowborough, Sussex TN6 1UL.

Flight Service and VOLMET Stations:

New York, Gander, Sydney, Narobi, Kinshasa and Shannon.

Jan does remind us that you must be a little careful with reporting to these stations. You must never mention your personal item you may have heard in the transmission.

I'm investigating some books that look as though they could provide plenty of the addresses you need for QSLing. When I find out more I shall report as soon as possible.

What to Listen For

I have received a few corrections to August's frequency list.

124.6MHz, 120L.p.m., 576 i.o.c., received by Ivor Cooper at 2230 on 21.8.88

8.05MHz RTTY 75/7 UJJY2 Kaliningrad
9.053MHz RTTY 50/7 Y2V2 ADN English News
10.7145MHz RTTY 75/7 CCF Chilean Navy
11.127MHz FAX 120/576 Narobi
12.777MHz FAX 120/576 Yekosuka Japan
13.998MHz RTTY 50/7 Paris Diplom
14.136MHz RTTY 50/RTASS English News
16.268MHz RTTY 50/7 Y7A65 MFA Berlin
18.340MHz FAX 120/576 Auckland New Zealand
18.348MHz RTTY 77/7 CLN451 Pensa Latin Cuba
17.230MHz SITOR A UFN Novorossyisk
19.70MHz RTTY 100/R Moscow APN
18.697MHz RTTY 50/7 DPA Hamburg

19.525MHz RTTY 50/7 JMG5 Tokyo Meito

Frequency List

Don't forget that I have a frequency list available for an s.a.e. It details the stations that have been heard by other readers in the past few months. In some cases not all details about the station are in the list, perhaps if you can fill in the blanks you'll let me know so I can keep the data base up to date. The first three hundred and something entries are available, and the reports sent in recently will swell the list even more. So there should be plenty of stations for readers to listen for, FAX, RTTY and AMTOR have all been included.

By the way, don't send your s.a.e.s to the SWM office, they won't have a clue what you are asking for. The correct address is the one at the start of this column.

INFO IN ORBIT

Pat Gowen G3/OR

17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6XD

Cat. No. International Designation Satellite
01293 85 16F OSCAR 3
03029 67 11A ATS-3
04021 70 06B OSCAR 5
06230 72 82B OSCAR 6
06920 73 86A NOAA 3
07552 74 89A NOAA 4
06230 73 89B NOAA 5
06307 77 78A NOAA 6
10703 78 20G OSCAR 8
11065 78 10A RS-1
11065 78 10B RS-2
11186 79 57A NOAA 9
11238 80 61A MEETOR 1.0
11362 80 73A MEETOR 2.6
12456 81 43A MEETOR 1.4
12544 81 57A MEETOR 1.7
12553 81 59A NOAA 7
12655 85 86A MEETOR 1.31
12698 81 100B MEETOR 2.9
12697 81 120A RS-3
12998 81 120 B RS-8
12998 81 120C RS-5
13000 81 120D RS-4
13001 81 120E RS-7
13002 81 120F RS-6
1311 82 25A MEETOR 2.8
13182 83 32A SALUTY 7
13278 82 116A MEETOR 2.9
13523 83 22A NOAA 8
14129 83 58A OSCAR 10
14372 83 99A COSMOS 1500
14452 83 109A MEETOR 2.10

Cat. No. International Designation Satellite
14781 84 21B OSCAR 11
15009 84 72A METER 2.1A
15315 84 105A METER 1.05
15516 85 13A METER 2.12
15632 84 110A NNSS 3000
16427 84 122A NOAA 9
16935 85 66A NNSS 30240
15936 85 66B NNSS 3000
16995 85 85A COSMOS 1686
16919 85 100A METER 2.13
16906 85 119A MIR
16613 86 19A SPOT 1
16735 86 39A METER 2.14
16881 86 55A COSMOS 1766
16908 86 51A AJSA
16909 86 61B FO-12
16969 87 73A NOAA 10
17290 87 01A METER 2.15
17351 87 22A RS-3
17385 87 30A KVANT
17851 87 30C SPACETUG
18129 87 54A RS-1011
18222 87 63A COSMOS 1530
18312 87 68A METER 2.16
18620 88 05A METER 2.17
18699 87 104A SOYUZ-TM4
18665 87 101A COSMOS 1900
19045 86 02A COSMOS 1903
19315 89 100A AO-13
19215 88 05A METEOSAT P2
19217 88 051C PANAMSAT

Satellite Designations

Those readers who have access to the NASA listings directly or through library facilities will recognise the problem in finding the satellite designations in the catalogue number and the international designation given.

The following list has been jointly created and provided by Harry Johnson L44X of Oslo and Nico Jansen PA0DLO of Eindhoven. It overcomes the difficulty by giving us the actual satellite name by which we know it from the data provided.

The total list runs to some 700 different objects in space and far too long to print our limited column but, you should find the main satellites of interest included, some of which are dead, but which may become resurrected.

OSCAR-9

Suddenly, a new signal is heard to be coming from UoSAT-1, in the form of the 14.001MHz c.w. telemetry beacon, which has been silent since the launch of the spacecraft. Why it has suddenly appeared is a complete mystery, as it was earlier assumed that the non-deployment of the gravity gradient boom also used as the h.f. antenna was to blame. The University of Surrey UoSAT team and centre would appreciate reports on this beacon, which should be sent to them at UoSAT, Department of Electrical and Electronic Engineering, University of Surrey, Guildford, Surrey GU2 5XH. Your report will be acknowledged on the UoSAT bulletin and a handsome QSL is available on request with an s.a.e. Of particular interest would be the relative strength of the signal pre- and post horizon, or related to the times when the 145.825MHz beacon is heard. The 21.001MHz beacon is also active, and reports on this are wellcome too, as the behaviour of paths from a source close to the ionised layers adds valuable information to propositional studies.

The next three deadlines are: October 19, November 15 & December 19
Weather Satellites

METEOR 92 was launched in late July and has the following set of Keplerian elements to put into your computers for tracking.

Epoch Year/Day:
209.33466001

Decay (drag factor):
0.0000039

Inclination:
82.5447

Argument of Perigee:
45.4408

Eccentricity:
0.0014809

Right Ascension of Asc. Node:
274.4004

Mean Anomaly:
55.5443

Mean Motion:
13.16766025

Rev./Epoch/Orbit No.: 15

Using this set, we get a reference equatorial crossing of 0043UTC on 25 September 1988 at 143 degrees west.

The satellite will appear northbound over the equator 103.9 minutes later and 2.4 degrees further west. For an equivalent orbit on each following day, we need to add 91 minutes and 25 degrees west. Since September we have pass acquisitions of signal at 0110 at 349 degrees, 0301 at 346, 0452 at 338, 1337 at 133, 1524 at 184, 1716 at 233, 1912 at 286, 2110 at 334 and 2302UTC at 348 degrees bearing. Only passes in daylight are expected to be on, and the frequency has yet to be determined.

Since his earlier input to our column on the use of the Lyra computer for producing superb weatherpictures, Gordon Train has received over thirty enquiries from readers, but has yet to learn of any commercial interest in adapting the system to any other computer. He has now increased the resolution of his frame-store to 512 x 256 (still with 256 levels) and sends us two examples of the result. The photograph in Fig. 1 is from NOAA-9, taken on a UK pass at 1633 on Easter Monday. "Although a good photo," says Gordon, "it shows some of the problems that are there. The horizontal 'doty' line passing through Scotland and the top of Northern Ireland is due to the local Vodaphone pager, which can transmit up to once a minute at busy times. The lower horizontal lines are due to the cassette recording, as was the signal. So when this succeeded in SOYUZ-TM-5, during which time the cosmonauts, often with different opinions, discussed the 'cyclograms' of schedules sent up by RTTY." Chris also observed the crew watching the TV linked Netherlands v USSR football match whilst they were also climbing in and out of their spacecrafts, checking pipes, and inflating and deflating them. Contrary to press reports, they did not see much of the match, as they (especially Titov) were far too busy.

On 30 June, Chris had earlier deduced by his observations, the EVA had not been successful, as he overheard during orbit 13683 between 0636 and 0643 Manarov say to the TsUP ground station "... in one of the newspapers our EVA had been compared with surgery. This comparison is good, for we acted like surgeons indeed. We also used 'surgical gloves' but these were a lot bigger than used by real surgeons. But then our instruments are bigger and more terrifying, as you all can see. We have to have a patient... the sick man... did not recover. We did not succeed in repairing the data transmission section of the T.T.M. telescope." Titov was heard to say, "In the first place the crew got problems with electrical plugs, fixed in the data transmission units. These mini-plugs fixed with mini-screws, had to be unplugged. Also the cable, tightly fixed to the outside of Kvant, had to be removed. For this part of the operation, twenty minutes had been planned... we needed one and a half hours for it!"

The second problem came as a complete surprise. Just like a fellow coming home and breaking his key due to an unholed lock, the poor fellow is left standing before a closed door. Such a situation we met! Possibly the conditions for work were too extreme (low temperatures) for the material of a very important tool... it broke...

At this critical and exciting point in the conversation, MIR disappeared below Chris's horizon (Murphy's Law's play a major part in space physics). The accuracy of the automatic KURS system was demonstrated during the docking of the PROGRESS-37 Freighter which was launched at 2115UTC on July 18. Cosmonaut Titov and the TsUP command were heard exchanging data between 2222 and 2228 UTC on the left and 2231 and 2233 UTC on the right. The X-axis was quoted at 1 degree, the Y at 1/100, and the Z at 4/100 of a degree. The speed was given at 1.6 and the fuel consumption as 179kg. Chris was able to check out the details of the cargo that arrived, consisting of the usual items such as fuel, water, technical and scientific equipment, and also tools and spare parts for the repair of the T.T.M. telescope. "Thus," says Chris, "We can expect a further EVA in the near future."

This is a short precis of a vast amount of information that he has gleaned and written from his studies of following the 143.625MHz, MIR v.h.f. space to ground voice frequency, which is a very strong signal, easily picked up when the spacecraft is above the observers horizon.

It is difficult to provide specific times when the MIR cosmonauts are active and within our radio horizon, as the orbit of the spacecraft is constantly changing to meet the requirements of upcoming crew and supply missions, and to satisfy the many scientific, medical and environmental needs. Fellow MIR enthusiasts regularly report the current passes times on the 1015am Sunday, 7.00pm Monday and 7.00pm Saturday AMSAT-UK nets, on 3.780MHz +/- QRM.

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Short Wave Magazine October 1988
was monitoring fluttered rapidly between S1 and S9. I was looking for DXTV stations from his car at the top of Cain O’Mouth, George Garden (Edinburgh), using a Sharp car radio, added many new stations above 25MHz to his score. At 1600, he heard Radio Broadland on 102.4MHz advertising things in Diss. Later he received strong signals in stereo from this low-power transmitter which serves the Great Yarmouth and Norwich areas.

George also heard BBC Radios Cleveland, Newcastle, Norfolk and York and IRLS Radio Hallam with local news of Doncaster, a weak signal from Metro Radio on Tyneside, Viking Radio and a German station around 103MHz in good stereo. He identified these stations by listening patiently at each spot for an announcement before continuing his search. Well done George it’s best to be sure.

**Reports**

I counted at least 15 f.m. signals from European broadcast stations between 66 and 73MHz at 1815 on July 29 and at 1900 on the 31st. These stations have a normal range of about 80km, but while a Sporadic-E disturbance is in progress this range can increase more than tenfold.

In Airbroath, David Glenday received a test card from Russia and a film and the TP clock caption from Poland in Ch. R3 11045 on July 20. At 1935 on the 21st he logged an Italian radio station on 87.6MHz. David used a D-100 converter into a Philips u.h.f. receiver to find the vision channels R3 (77.25MHz), 4 (85.25MHz) and 5 (93.25MHz). The sound frequency for these channels is 83.75, 91.75 and 99.75MHz respectively.

On August 5, Simon Hamer (New Radnor) received signals from Belgium, Denmark, France, East and West Germany, Holland, Ireland (Radio Telefís Eireann) and Luxembourg.

“...This has been an excellent year for Band II Sporadic-E openings. Many of the usual Italian and Spanish stations have been received far better (surprisingly) in the upper half of the band,” wrote Brian Renforth (Newcastle) on August 13. Brian uses an Alba 8000G Radioram fed by a home-brew indoor antenna. Among the Sporadic-E DX in his log is Radio Yugoslavia on July 9 and stereo transmissions from Italy on the 31st. During the earth’s passage through the Perseids meteor shower, Brian logged “pings” of signals from stations in Belgium, France and Germany around 100MHz.

**TELEVISION**

It is always interesting to see, and hear about, the new equipment in use at other people’s stations. Bob Brooks installed at Great Sutton, Fig. 1, is no exception. The top shelf houses the Sony 2001 and Realistic PRO-200B receivers and below are 3 popular TV items, the D-100 converter, JVC CX610GB colour set and the Plustron TVRD5 monochrome top.

In Basingstoke, John Woodcock put his once discarded Bush TV135 back into service. He cleared the faults, made a few mods, and fitted a home-brew dipole for Band 1 in his loft. By August 13, he had picked up Holland, Iceland, Spain, Switzerland and the USSR in his log. He recently added another dipole so that he can change direction between the two which face roughly east-west and north-south. A good idea John.

“Conditions have been better this past month than during the previous four weeks,” wrote David Glenday from Airbroath on August 11, David’s roof-top antennas, Fig. 2, a feed to a D-100 converter and a Philips u.h.f. receiver.

The next three deadlines are: October 19, November 15 & December 19

When George Garden from Edgware goes DX hunting from Cain O’Mouth, he usually takes a high-gain wide-band, u.h.f. Yagi and a JVC CX610 portable receiver. He sets up the station inside his car.

Band I

Sporadic-E hung about for most of July 21 and at 1930 I logged a strong test card from Iceland, sometimes in colour, plus fading pictures and sound on Chs. E2 and 3. A tone was up on the E4 sound channel, so I assumed that this was accompanying the Iceland test card. Around 0000, a programme schedule with “DAG” at the top left came up, followed by an ornamental clock showing 1900 and a young lady anunciator.

Between 1830 and 1930 on the 23rd, I had strong pictures on Chs. R1/2, saw the C不动 (sport) logo on the USSR, plus some sport, news and a wildlife programme. These channels faded and at 1925 I saw the captions Redaktion and 1-in-Perf Spkan, below colour pictures, of yachts at sea on Ch. E2.

At 1725 on July 29, I noticed Text-TV 5649 at the top of a chart on Ch. E2, followed by what looked like “UADRET”. The signal was fading rapidly.

During a short opening at 1904 on August 5, one of Spain’s TV logos appeared followed by an episode of M.A.S.H., dubbed in Spanish.

Les Jenkins (Gosport) is pleased with the Ladbeare Televerta which he recently added to his station. By August 5, he had seen pictures from Italy (RAI), Norway (NRK), Portugal (RTPI, Spain (TVE) and Sweden (TV1 Sverige).

As usual Edwina and Tony Mancini (Beijing) had a good haul of signals during the month prior to August 10. These included advert from Portugal (RTPI) and Spain (TVE2), cartons from France (Canal+)and Spain (TVE1); films from France (France+) and Italy (RAI), Spain (TVE2) and the USSR (TSS): news from Czechoslovakia (CST1), Italy (TGI, Spain (TVE1) and the USSR (BPEVR and HBOCTN) and test-cards from Austria (ORF F51), Belgium (RTBF1 Liege), Czechoslovakia (Bratislava, DD2 and RS-KH), Denmark (DR), Finland (YLE TV1), West Germany (ARD1 Grunten and SWF-Baden), Holland (PRT-NED1) Iceland (RUV Island), Norwegian regions (Bgn, Bremer/ger, Gamle, Guten, Hadel, Hennes, Katek/ko a rare one, Kongskrig, Melhus and Steigen), Poland (TVPI), Portugal (RTPI Porto), Spain (TVE) Porla Manana and TVE2), Sweden (SRT-Kanal1), Switzerland (SPT.SRG1), Romania (TVR), the USSR (Eesti Tallinn, Latvias TV and Optical) and Yugoslavia URT Ljubljana.

Among the logos and titles seen by David Glenday during Sporadic-E openings were Estonia at 1240 on July 19 and Kepusjag (Hungary) followed by the MTV clock at 1022, Poland’s TP clock on Ch. R3 1036 and the open Oedipus Rex from Prague at 1110 on the 20th. Then came Televisny Noviny (news) from Czechoslovakia at 1620 on the 21st, Germany’s ARD1 at 1640 on the 24th, Prana from Czechoslovakia at 1930 on the 25th, La Vida Sigue from Spain at 2030 on the 31st, Aktuelle (news) from Austria at noon on August 1 and HBOCTN (news) from the USSR at 1235 on the 9th. David’s camera is at the ready when DX is about and he always takes this very strong test card, in colour, from Finnland (Fig. 3) at 1045 on July 26.

In New Radnor, Simon Hamer added Albania (RTSH) and Hungary (MVT) on August 6 and 7 to the countries already listed. During the Perseids meteor shower on the 12th, Simon identified “pings” of test-cards from Czechoslovakia (CST – Ch. R2), Denmark (DR – Chs. E4/5), Finland (YLE – Chs. E3/4/9), Ireland (RUV – Ch. E4), Norway (NRK – Ch. E4), Poland (TV – Chs. R1/2) and Sweden (SRT – Chs E4/8).

Maurice Peall (High Wycombe) logged pictures from Poland and Spain on July 20, Iceland on the 23rd and August 7 and Finland on the 10th.
At 1900, on July 27, Brian Renforth (Newcastle) watched 76 days of Glory from Norway and between August 1 and 13 he logged captions or logos from Hungary (MTV1 - Budapest) and Spain (Esta Noche, Panorama Regional, Telediario and TVE-Santiago), in addition to test cards from France, Iceland, Norway and the USSR. Brian reports that both MTV and RUV were noise-free and perfect on the 7th and were easily selected on his turret tuner.

As the programme contents from the 17 countries received by Bob Brooks (Great Sutton) between July 20 and August 14, were adverts from Portugal; clock captions from Austria, West Germany, Hungary, Iceland, Poland, Spain and the USSR; films from France, Italy and Spain and the logos Porto Matio (Italy) and Barcelona (Spain).

**Tropospheric**

"On July 16, while up in Laurencekirk, my barometer showed a slight fall...I then tried the TV in my upstairs room and received good colour and strong sound from the Black Hill transmitter in Central Scotland," wrote George Garden from Edinburgh. He continued, "As conditions were good, I then took my JVC up to the top of Cairn O’ Mount, along with a high gain wide-band antenna and my three channelled A, B, C/D amplifiers". George selected these amplifiers as required. At 1400, he saw the film Achilles in colour from the Bilsdale transmitter of IBA Tyne Tees on Ch. 29 and a faint picture of golf from BBC1 on Ch. 44 in the Emley Moor area.

Around 1500 he watched racing from Newmarket, in colour with good sound, on Channel 4 from the Pontop Pike transmitter on Ch. 54. "Over the week-end of August 6 to 8, Black Hill was coming in strong at Laurencekirk," said George. On the 8th he decided to take his gear to his favourite spot on Cairn O’ Mount. "It was thick fog (see Fig. 11) for most of the day...you could not see any land, the fog drifted past the antenna, condensation drops hung from the dipole," wrote George. However, his efforts were rewarded when he found pictures, in reasonable colour, from Austria (ORF) on Ch. 30, Germany (ZDF and NDR1) on Chs. 35 and 41 and Holland (PTT-NED 3) on Ch. 45.

From the UK he logged signals, "as good as a local", from Bilsdale on Ch. 29. On Ch. 49 he saw a test card carrying the words "NDR RB SFB". He told me that this continental opening was limited to u.h.f. and that he found the v.h.f. band dead.

When I left home for Alfriston on July 27, the pressure was rising and apart from a few short heavy showers, building thunder clouds (Fig. 4) with some static (see also Band II DX), the weather was good. However, on the way home the sky had a strange changeable look at, and at 2037, I tried my Pluurst with its own rod antenna and received strong, negative, pictures from France (Canal+) in Band III.

A slight fall again on August 3 and while on my journey home negative pictures from France were beginning to appear. Signals from Canal+ and RTE fluctuated in Band III and co-channel patterning was strong on some u.h.f. channels throughout the evening of August 5.

During the tropospheric opening on August 8, David Glenday received colour pictures in the u.h.f. band from Belgium (BRT-TV1 — Ch. 43 and BRT-TV2 — Ch. 46) Fig. 5, Denmark (Vegle - Ch. 30), France (TF3/RES 3 - Ch. 45), Holland (PTT-NED2 — Ch. 47 and NED3 Chs. 30/35) and Germany (ARD — Ch. 56, NDR1 Hannover — Ch. 56 Fig. 6, NDR3 HMBG — Chs. 43/44/48 and ZDF — Ch. 30). In addition he logged pictures from Dover and Sudbury (BBC1 — Chs. 50/51), Chatsur and Tacleston (BBC2 — Chs. 45/55) and the news from the Anglia and TVS transmitters at Sudbury, Ch. 41 and Dover, Ch. 66 (Fig. 7). He also photographed the TV weather map, Fig. 8, showing the east-coast fog, mentioned earlier by George Garden, which was a major contributor to these lively conditions.

Simon Hamer had a good u.h.f. haul on July 19, August 5 and 7, when he received pictures from Belgium (BRT1...
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**Complete Price:** £20.50

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<tr>
<th>Item</th>
<th>Description</th>
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<tr>
<td><strong>Fernesh Antenna S1814</strong></td>
<td>High Gain 14-Element Wideband VHF</td>
<td>£18.25</td>
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<tr>
<td><strong>Antiferece AP1000</strong></td>
<td>Amplifier, covers 45-220MHz</td>
<td>£16.30</td>
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73 from Dave G4KOH, Technical Manager
and RTBF1), France (TDF), Holland (NED1/2/3) and Ireland (RTÉ1/2). In Band III he added Denmark (DR), Luxembourg (RTL+1) and East and West Germany (DFF and ARD-NDR1 and WDR) to the score.

In Co. Dublin on the 6th, Doug Haywood, using the built-in antenna of his u.h.f. receiver, logged pictures from BBC1 and 2 on Chs. 32 and 28 and RTBF1.

On the 7th and 8th, Maurice Peall (High Wycombe) identified test cards from Belgium (Wave — Channel 8) and West Germany (ARD) at 1517 and 1742 respectively. He has provided consistent u.h.f. reception from Boulogne (A2, FR3 and TF1).

At 1735 on the 16th, I received strong negative pictures in Band III, from France while parked in the grounds of Herstmonceux Castle, the Sussex home of the Royal Greenwich Observatory.

News from India

From his home in Meerut, Lt Col Rana Roy logged pictures during Sporadic-E disturbances effecting Band I, from China on May 1, 11, June 20, 24 and July 7; Dubai on May 5, June 7, 23 and July 18; the USSR on May 7, 27, 28, June 1, 12, 18, 22, 27, 30 and daily from July 4 to 11 inclusive. He saw aerobic exercises from the USSR (Fig. 9) accompanied by a Russian TV, basket-ball cartoons and Teletext in Arabic and feature films, aired by ARD, Stuttgart, Jewish news (HOBOCTN), orchestral music, programmes for children, puppets and test-cards from the USSR.

In addition to Arabic and Russian cartoons he also saw Beatle Bailey, Popeye, Tom and Jerry and Yogi Bear. The fluctuations during a Sporadic-E event is described in Rana's log entry for July 11 which reads: "1915 Ch. R2 saw multiple signals from Russia. At times could make out European football. At 2000 saw a clock showing 2030 which means that the station was Alma Ata. At 2005 saw a Russian feature film for a very short time and then multiple signals again. 2015 saw news from Russia with the HOBOCTN caption on left side. At 2030 temperatures of various cities were shown followed by the caption TASHKENT and an announcer. Another caption was seen at 2035 and again multiple signals off 2200."

While tropospheric openings were in progress on May 31, June 8, 12, 13 and 21 Mr. Rana saw broadcast cartoons, news and some programmes from Band III transmitters in Agra, Batinda, Kasauli, Jullundur and from Lahore and Pakistan TV, Figs. 11 and 12.

The number of TV transmitters has increased from 40 to 259 in the last four years covering 72 per cent of the population," said Rana. He told me that the number is expected to reach 450 in the next three years and that at present there are four low power u.h.f. transmitters to cover cities and small towns.

In July, Fred Pearce (Duffield) using a Trio R200 receiver, DRAE converter and MG1 Mini quad, made several SSTV pictures from stations in Bulgaria, Finland, East and West Germany, Poland and Sardinia and has QSL cards from Finland and Sardinia.

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**Long Medium & Short**

Brian Oddy G3FXE
Three Corners, Merryfield Way, Storrington, West Sussex RH20 4WS

**Long Wave DX**

<table>
<thead>
<tr>
<th>Freq (kHz)</th>
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<td>171</td>
<td>Kainzing</td>
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<td>A.D.E.*G.K.Y</td>
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<td>176</td>
<td>Olsztyn</td>
<td>Poland</td>
<td>D.E.<em>I.K.</em></td>
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<td>Spalbor</td>
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<td>3.E.<em>D.G.F;P</em>H.U.K</td>
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<td>USSR</td>
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<td>216</td>
<td>Oslo</td>
<td>Norway</td>
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<td>A.D.*H</td>
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<td>286</td>
<td>Moscow</td>
<td>USSR</td>
<td>C.E.*C.D.E.<em>G.I.K</em></td>
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Note: Entries marked * logged during darkness. All other entries were logged during daylight.

**Other MW DX**

Many sky wave signals reach the UK at night from stations in other countries and the distances involved are often considerable. Two broadcasts from Algeria were received by Howard Newell in Great Missenden at 2000, from Ain Beida 531 (300Kw) and Algiers 891 (600/300Kw) — both in Arabic. Listening in Cambridge, David WATTEN heard a broadcast in Arabic from Les Trombles, Algeria 549 (600Kw) at 2151 rated 4444 and 2474. Later, he picked up another broadcast in Arabic, from Sidi Benhouri, Morocco 540 (600Kw) and rated as 3444 at 0247.

Using a Grundig Satellit 1400SL portable in Great Yarmouth, Ted WALDEN-Vincent heard Radio Tirana via Lushne, Albania 1386 (100Kw) at 0215. Some time after this, Howard NEWELL heard radiowaves from Nieuwkoop, The Netherlands, via TVN and via NLW, Kiev, Ukraine 1404 (30Kw) logged by Ciaran Fitzsimons as 45354 at 2120; Monte Carlo, Monaco 1447 (100Kw) logged by Martyn Williams at 2145.

---

**Notes:**

- **DXers:** A: Ian Baxter, Poroc, Yugoslavia
  B: David Edwards, Walsend
  C: Colin Kenneth, Chester
  D: Howard Newell, Great Missenden
  E: Philip Rembou, Macclesfield
  F: Stewart Russell, Leatherhead
  G: Tim Shirley, Bristol
  H: Phil Townsend, London
  I: Neil Wheatley, Lytham St. Annes
  J: Martin Williams, Sunningdale
  K: David WATTEN, Cambridge
  L: Don Broadley, Walsend

---

*SEEN & HEARD*

**April 1988**

- Screenshot of a page from 'Short Wave Magazine October 1988'
- The page contains text and tables related to radio listening, particularly focusing on DXing and logging of various broadcast stations.
- The text discusses various aspects of radio reception, including Sporadic-E events and their impact on reception.
- The page includes a table listing frequencies, stations, countries, and power levels for DXers.
- The text also mentions notable DX events and locations, such as Sporadic-E activity, Sporadic-E events, and the effects on radio reception.\n- The page features a table with columns for frequency (kHz), station, country, power (kW), and DXer.
- The text provides insights into the technical aspects of radio reception, including equipment used and the conditions under which signals are received.
- The page includes a section on other MW DX, mentioning many sky wave signals reaching the UK at night from stations in other countries.
- The text highlights the distances involved and the distances involved are often considerable.
- The page features a table listing various DX events and locations, such as Sporadic-E activity and Sporadic-E events, and the effects on radio reception.
- The page includes a section on other MW DX, mentioning many sky wave signals reaching the UK at night from stations in other countries.
inadequate at his home location. Using a 9-band Yoke portable in Chartres, 60km SW, of Paris, he received a very strong signal from Orfordness and in Nancy it rated as 4545 at 1430.

Much to his surprise, Ian Baxter heard his first broadcast from Orfordness while on holiday in Yugoslavia rated as 3333 at 2223. Broadcasts from other countries reached him by various wave paths at night, e.g. Slot, Hungary 42000 (20000) 44444 and Aberdon, Iran 580 (10000) 44444; Latvia, Spain 639 (10000) 44444; and Cork 720 (20000) 44444; Barcellona, Spain 738 (25000) 34444; Kavala, Greece 672 (8000) 44444; Italy 846 (80000) 44444; Murcia, Spain 855 (12500) 33433; Torino, Italy 910 5583333; and Tripoli, Libya 1050 (50000) 33333.

During the day, Ian heard several of the local broadcasts via ground wave paths, including 2565 (50000) 33333; Sarajevo 846 (54000) 44444; Murcia, Spain 855 (12500) 33433; Torino, Italy 910 5583333; and Skopje 1314 (10000) 33333.

Writing from Creteil, France, Jean-Yves Carnus says he took a receiver with him on holiday to the Atlantic coast. His location was just 85m from the sea and the level of electronic interference was found to be very low. The excellent sea path towards Spain enabled him to hear many of their local stations during daylight hours. Wave paths were from: Radio Bilbao 990 (10000) as 45444; Radio Vigo 1026 (10000) 35333; Sagunto 45554; Radio Popular, Bilbao 1134 (10000) 55444; Zarigue 1143 (10000) 35443; and Skopje 1314 (10000) 33333.

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The next three deadlines are: October 19, November 15 and December 19.
most nights although they are intended for other areas. Their transmission via Short Wave Magazine October 1988

Writing from Fremantle, Western Australia, the BBC External Service is keeping me up to date with the news at home. The overall listening is mostly at 15.070 and 7.325, both frequencies provide very

strong clear signals”, UK based transmitters at Daventry, (Northants), Radyo Rajmahal (Cumbria) and Woolfoot (Shropshire) operate on both frequencies, sometimes without which is involved in Deyve omitted to quote the usual times of transmission.

This band is the hub of activity for many listeners and dedicated DXers because so many interesting broadcast stations are on both frequencies. For a few hours of the day and night. Some of them beam their programmes in a variety of languages to the same destination. For example, during the morning – they include UAE Radio Dubai 14.455 (Ar, Eng, Frl, Nr, Dn 0200-0830) logged at 2100 by Richard Bradex in Exeter; VXI Tehran, 15.103 (Frl, Fr, Fr, Far, Ar, 0530-2330) 45554 at 2000 by John Parry in Northwich; Voice of Vietnam, Hungarian Service, Russin, Viet, Viet, Fr, Sp 1600-2130) logged at 2015 by Ted Walden-Vincent; Radio Baghdad, iraq 15.230 (Fr, Eng, 1800-2151) 51222 at 2055 by Philip Rambaut and Richard Bradex in Exeter; Voice of Pakistan, Islamabad 15.650 (Ur, Eng 0715-1120) 43443 at 1100 by Andy Keddie. The daytime service is broadcast to Africa by

P Guruprasad in Botswana, namely RII via Naen, GDR 0915 from 1415-1515 (5000K) 55555 at 1805; Radio Sweden via Horby 15.240 from 1830-1930 (350K) 58555 at 1900; Radio Bucharest, 15.270 from 1900-2000 (250K) 53133; Radio Nederlands via Frievo, Holland 15.560 from 1900-2000 (2150K) 44334 at 2035.

The 13MHz (22m) band, Andy Keddie logged 0915 via Sottern, Sweden 13.885 at 1900. David Wratten noted

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Radio HCB Quito, Ecuador 9.810 (Ger, Eng 0600-0800) SIO 444 at 0755 by Philip Rambaut; AWR via Sines, Portugal 9.670 (Pol, Eng, Ger 0600-0830) 4444 at 0815 by Ian Curry; RFI via Nauen, GDR 9.665 (Ger, Fr, Ar 1030-1400) 5555 at 1100 by Darran Taplin; Radio Pongyang, N. Korea 9.345 (Eng, Fr, Russ, Ko, Sp, Ger 1300-2150) SIO 333 at 1700 by Michael Williams; BBC via Rampisham, UK 9.140 (Eng 1600-2115) 4554 at 1800 by Ian Baxter in Pond; VORI Tehran, Iran 9.420 (Pers, Fr, Tur, Ger, Fr, Sp 1530-2230) 4554 at 1930 by Bill Griffith; Vatican Radio, Rome 9.645 (It, Fr, Eng 1810-2010) 5544 at 1950 by Sheila Hughes; Radio Baghdad, Iran 9.770 (Fr, Ger, Eng 1800-2155) 433 at 2003 by Kenneth Buck; RHC Habana, Cuba via USBS 9.560 (Fr, Eng 2100-2300) 4333 at 2230 by Robert Cowell.

Many of the broadcasts in the 7MHz (41m) band stem from stations in Europe, but a number from other continents may also be heard. Kenneth Reece logged WJHI South Bend, USA 7.400 (Eng to Europe 0000-0600) at 0523; Bill Griffith noted Radio ABC via ABN 2200 at 0815; Ian Australia 7.205 (Eng to S.E. Asia, Europe 1430-2030) as 4345 at 1850; Edward O'Donoghue heard IRA in the Far East, N. India 7.410 at 1845-2230, Ian Baxter logged Radio Bangladesh, Dhaka 7.505; RHC Belf Scoremaster South America 1715-2000) as 3322 at 1822; Andy Kiddie rated radio Korea Seoul, S. Korea 7.960 (Ger, Eng, Sp, Port, Porto to E. Africa 1845-2245) as 44434 at 1930.

Many of the broadcasts from the two major foreign language stations in the 6MHz (49m) band are being heard through Europe. ABC and SBS also have some transmissions in Europe which are worth listening to.

SEEN & HEARD
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WHAT RECEIVER

Lowe SRX300 Communications Receiver

- COVERAGE 500 - 300MHz
- MODES a.m., s.s.b., b.i.f. (b.i.f.)
- SENSITIVITY 10dB IS > NIN for an input of 0.3µW on s.s.b. 1µW on a.m.
- RESOLUTION
- SELECTIVITY s.s.b/c.w. 1kHz and 4kHz at -60dB respectively
- IF REJECTION
- SPURIOUS REJECTION
- FREQUENCY STABILITY
- AUDIO OUTPUT speaker plus 50mW into 5Ω for a recorder
- IF STAGE 45MHz, 2 - 3MHz tunable, 45kHz
- FEATURES
- REVIEWED: Practical Wireless April 1982
- PRICE: Available on the second-hand market

Panasonic RF8600LE Communications Receiver

- COVERAGE 150kHz - 420kHz, m.w. 520 - 1615kHz.
- S.W. 1.611 - 29.999kHz; f.m.: 87.5 - 108MHz
- MODES a.m., f.m., s.s.b., RTTY, c.w.
- SENSITIVITY Input for 10dB (5 + N)/N, s.s.b/c.w. RTTY 5µV <1.8kHz 0.15µV > 1.8kHz, a.m. 3µV <1.6MHz 0.5µV > 1.5MHz, f.m.: 0.3µV for 120dB SINAD > 1.5kHz.
- RESOLUTION 10kHz, 100kHz f 1kHz.
- SELECTIVITY: Width control at maximum, s.s.b/c.w. RTTY 2kHz at -6dB, 4.2kHz at -60B; c.w. (RTTY/DIG) 500Hz at -6dB, 1.5kHz at -60B; a.m. 6kHz at -6dB, 1kHz at -60B; 15kHz at -60B: 25kHz at -60B.
- IMAGE RESPONSE: Better than 7dB.
- IF REJECTION: At 29.015MHz better than 76dB.
- SPURIOUS REJECTION: More than 60dB.
- FREQUENCY STABILITY
- AUDIO OUTPUT: More than 2W in 8Ω.
- IF STAGE 70.451MHz, 9.0115MHz & 45kHz
- FEATURES: Optional f.m. modules, independent digital v.f.o.
- REVIEWED: Practical Wireless April 1984
- PRICE: Available on second-hand market

Kenwood R-2000 Communications Receiver

- COVERAGE 150kHz to 30MHz
- MODES a.m., f.m., c.w., s.s.b., b.i.f., b.i.f. (b.i.f.)
- SENSITIVITY 150kHz to 2MHz s.s.b./c.w., -25dB, 2MHz to 30MHz a.m. -46µV.
- RESOLUTION 50µHz, 500µHz, 5kHz.
- SELECTIVITY a.m. wide 6kHz at -6dB, 1kHz at -50dB; s.s.b./c.w. 2.7kHz at -6dB, 5kHz at -50dB.
- IMAGE RESPONSE: 70dB.
- IF REJECTION: >70dB.
- IF STAGE 60dB.
- FREQUENCY STABILITY: ±300µHz for first hour, ±50Hz after.
- AUDIO OUTPUT: 1.5W at 8Ω and 10% distortion.
- IF STAGE: Triple conversion: 48.855MHz, 9.855MHz and 45.5kHz.
- FEATURES: 50Hz step digital v.f.o., 10 memory freqs., memory scan, programmable band scan, lithium battery memory backup, fluorescent digital display, dual 24hr quartz clocks, 3 built-in i.f. filters, all-mode squelch circuit, noise blanker, r.f. step attenuator, 10 meter.
- REVIEWED.
- PRICE: £199.95

Trio R-1000 Communications Receiver

- COVERAGE 200kHz - 30MHz
- MODES a.m., s.s.b./b.i.f., b.i.f./b.i.f. (b.i.f.)
- SENSITIVITY Below 2MHz - 5µV s.s.b., 50µV a.m.
- RESOLUTION 25µHz.
- SELECTIVITY s.s.b./c.w. 5µHz at -6dB, 25kHz at -50dB (narrow: 6kHz at -60B, 1kHz at -80B).
- IMAGE RESPONSE: Better than 60dB.
- IF REJECTION: Better than 70dB.
- SPURIOUS REJECTION.
- FREQUENCY STABILITY ±2kHz max from 1 to 60 minutes after switch-on, ±300Hz max in any subsequent 30 minutes.
- AUDIO OUTPUT: 1.5W into 8Ω for 10% distortion.
- IF STAGE 48.055MHz ± 455kHz
- FEATURES
- REVIEWED: Practical Wireless May 1980
- PRICE: Available on the second-hand market

Yaesu FRG 7700 Communications Receiver

- COVERAGE 15kHz to 100MHz
- MODES a.m., f.m., s.s.b. (s.s.b./b.i.f., b.i.f.)
- SENSITIVITY Below 300kHz: 30µV a.m.
- RESOLUTION 1kHz.
- SELECTIVITY a.m. 1kHz at -6dB, 25kHz at -50dB (narrow: 6kHz at -60B, 1kHz at -80B).
- AUDIO OUTPUT 1.5W at 8Ω for 10% distortion.
- IF STAGE 48.055MHz ± 455kHz
- FEATURES: Clock, timer and sleep timer.
- PRICE: £350

Yaesu FRG 8800 General Coverage Receiver

- COVERAGE 15kHz to 29.9999MHz
- MODES a.m., c.w., s.s.b./b.i.f. (b.i.f.)
- SENSITIVITY 150kHz to 1kHz a.m., 30µV/50µA 1.6kHz to 29.9999kHz, 0.3µV/50µA.
- RESOLUTION 1kHz.
- SELECTIVITY 0.5µV at -6dB, 15kHz at -50dB; a.m. 2.7kHz.
- IMAGE REJECTION.
- IF REJECTION.
- SPURIOUS REJECTION.
- FREQUENCY STABILITY ±300Hz during first 1hr, ±50Hz during any 30min period after warm up.
- AUDIO OUTPUT: 1W at 8Ω and 10% distortion.
- IF STAGE 47.055MHz ± 455kHz.
- FEATURES: 8-bit c.p.u., keypad for digital freq. entry, 12 internal memories, multi-function scanner, noise blanking, dual 24hr clocks, all mode squelch, tune and attenuation.
- REVIEWED.
- PRICE: £539

SHORT WAVE MAGAZINE October 1988

ICOM IC-R70 Communications Receiver

- COVERAGE 25 to 20000MHz continuous.
- MODES: f.m. wide, f.m. narrow, s.s.b. lower.
- SENSITIVITY f.m., <0.5µV for 12dB SINAD; f.m. wide, <1µV for 12dB SINAD; f.m. wide, <1µV for 10dB SINAD; a.m., <1µV for 10dB SINAD.
- RESOLUTION 0.1, 1, 10, 12.5 and 25kHz.
- SELECTIVITY f.m. narrow, 6kHz at -6dB; f.m., 1kHz at -6dB; 150kHz at -6dB; f.m. wide, 150kHz at -6dB; s.s.b 2.8kHz at -6dB.
- IMAGE RESPONSE: >80dB.
- IF REJECTION: >80dB.
- SPURIOUS REJECTION: >80dB.
- FREQUENCY STABILITY ±2ppm at 0°C to +50°C.
- AUDIO OUTPUT: 2.5W at 8Ω at 10% distortion.
- IF STAGE: Multiple i.f.s between 45.5kHz and 9kHz depending on mode.
- FEATURES: Dual-colour fluorescent display, dial lock, noise blanker, attenuator, display dimmer, 5 meter.
- REVIEWED.
### WHAT RECEIVER

**JRC NR D 525 General Coverage Receiver**
- **Coverage**: 90kHz to 34MHz (approximately to 45MHz in steps)
- **Modes**: RTTY, FAX, C.W., SSB, LSB, USB, AM, F.M.
- **Sensitivity**: 1.6 to 34MHz with 0.5uV/1.6 to 34MHz
- **Audio Output**: > 76dB
- **IF Reaction**: > 76dB
- **Spurious Rejection**: > 76dB
- **Frequency Stability**: ±3 p.p.m.
- **Price**: £1195

**Kenwood R-5000 Communications Receiver**
- **Coverage**: 10kHz to 30MHz
- **Modes**: C.W., SSB, A.M., F.M., F.S.K.
- **Sensitivity**: 1.8 to 30MHz with C.W., F.S.K., 0.025uV to 500kHz to 1.8MHz
- **Selectivity**: > 76MHz
- **Image Rejection**: > 76dB
- **Frequency Stability**: ±10 p.p.m. or better
- **Audio Output**: > 75W at 10% distortion
- **IF Stage**: Double conversion, S.I.F.: 112.5 and 88.3MHz
- **Features**: Typical steps of 10kHz, 50kHz, 1kHz, 15kHz, 50kHz, 6kHz, 1kHz
- **Price**: £925

**Edystone Model 1850 Communications Receiver**
- **Coverage**: 10kHz to 30MHz
- **Modes**: A.M., SSB, USB, LSB, C.W., C.W.S, S.B.
- **Sensitivity**: 1.2dB/s in s.b. for 1V/µV input
- **Resolution**: 8kHz
- **Selectivity**: At 6dB, 400kHz, 1kHz, 2.4kHz, 3kHz
- **Audio Output**: > 50W
- **Image Rejection**: Typically 100dB
- **Spurious Rejection**: Typically 100dB
- **Frequency Stability**: 10ppm above 1kHz
- **Price**: £69.50

**Sonny IC-FW 1 Portable Receiver**
- **Coverage**: 150kHz to 300MHz
- **Modes**: A.M., S.S.B., U.S.B., L.S.B.
- **Sensitivity**: 0.05µV for 10dB SNR
- **Resolution**: At 1kHz, 60Hz
- **Selectivity**: < 0.5kHz, 1kHz
- **Image Rejection**: > 89dB
- **IF Reaction**: > 78dB
- **Spurious Rejection**: > 75dB
- **Frequency Stability**: ±55Hz in first 15 mins., +25kHz in next hour
- **Audio Output**: 0.75W into loudspeaker, 1.25W into external 40 speakers
- **IF Stage**: 15-45kHz
- **Price**: £925

**Loewe HF-125 General Coverage Receiver**
- **Coverage**: 30kHz to 300MHz continuous, optional 16kHz to 21.5kHz restricted coverage
- **Modes**: A.M., S.S.B., U.S.B., L.S.B.
- **Sensitivity**: 0.05µV for 10dB SNR
- **Resolution**: At 1kHz, 60Hz
- **Selectivity**: < 0.5kHz, 1kHz
- **Image Rejection**: > 89dB
- **IF Reaction**: > 78dB
- **Spurious Rejection**: > 75dB
- **Frequency Stability**: ±55Hz in first 15 mins., +25kHz in next hour
- **Audio Output**: 0.75W into loudspeaker, 1.25W into external 40 speakers
- **IF Stage**: 15-45kHz
- **Price**: £925

**Tourport 220 Broadcast Receiver**
- **Coverage**: 155-218kHz, 532-1611kHz, 2.3-4.251MHz, 5.45-6.455MHz, 7.1-7.735MHz, 9.5-10.135MHz, 11.65-12.251MHz, 13.10-15.733MHz, 17.5-18.133MHz, 21.340-21.975MHz, 25.500-26.135MHz, 87.5-108MHz
- **Modes**: a.m., f.m.
- **Sensitivity**: 3.4-4½mV for 20dB SNR
- **Resolution**: 1, 3, 5, 10kHz
- **Selectivity**: I.F. Rejection
- **Price**: Available on request

**Realistic DX-200 5-Band Communications Receiver**
- **Coverage**: 150-400kHz, 520kHz-30MHz
- **Modes**: A.M., S.B., U.S.B., L.S.B.
- **Sensitivity**: 0.05µV for 10dB SNR
- **Resolution**: At 60Hz, 1kHz
- **Selectivity**: At 60Hz, 1kHz
- **Image Rejection**: At 50kHz, 1kHz, 2.4kHz
- **Spurious Rejection**: > 30dB
- **Frequency Stability**: ±10kHz
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- **IF Stage**: 45kHz
- **Price**: £930

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- **Coverage**: 15kHz-2.95kHz, 76kHz-100kHz
- **Modes**: A.M., F.M., S.S.B., U.S.B., L.S.B.
- **Sensitivity**: I.F. in m.w. = 30dB; S.F. = 20dB
- **Resolution**: 10kHz, 1.5, 3, 5, 10kHz
- **Selectivity**: ±3kHz (50dB)
- **Image Reaction**: I.F. in m.w. = 7MHz, f.m. = 40dB
- **Spurious Rejection**: ±55Hz
- **Frequency Stability**: ±55Hz
- **Audio Output**: 30W at 10% T.H.D.
- **IF Stage**: 55k, 55kHz, 45k, 10kHz
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- **Modes**: A.M., F.M.
- **Sensitivity**: M.W. = 30dB; L.K. = 26dB; F.M. = 12dB; V.C. = 30dB
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13 The European DX Council
14 BBC World Service

Simon Spanswick
Dick Ganderton G8VFH
Glen Ross
G.D.Rawnsley
Welcome

Welcome to this special booklet produced jointly by Short Wave Magazine and the European DX Council to coincide with the BBC Radio Show being held from September 29 to October 9 at Earls Court, London.

Short Wave Magazine and the EDXC have taken a joint stand at the forthcoming BBC Radio Show and will be telling the public that there is more to radio than just Radio One. This booklet will help to explain the fascinating world of international broadcast listening, and introduce you into the absorbing hobby of listening to radio transmissions on the airbands. The wonderful world of amateur radio is not forgotten either so why not read on and if you are not already convinced that radio makes an ideal hobby then we hope that by the time you have finished and have visited our stand you will be eager to go away and try it for yourself. However - be warned. Radio can become an all-consuming passion!

As long as everything goes according to plan both the EDXC and Short Wave Magazine staff will be present during the Radio Show, although not necessarily all the time, and we look forward to meeting many readers and short wave listeners on our stand, and hope to encourage new people to take up our hobby. If you are visiting the Show why not come and have a chat? You will find us on Stand 42.

GOOD LISTENING

Dick Ganderton G8VFH
Editor Short Wave Magazine

Simon Spanswick
Assistant Secretary General EDXC

Listening to the World
a special booklet for the 1988 BBC RADIO SHOW

Edited by:
Dick Ganderton,
Short Wave Magazine
&
Simon Spanswick,
European DX Council

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World Wide Short Wave Radio...

by Simon Spanswick

We take it for granted - turn a switch, and radio programmes can be summoned out of the airwaves in a split second. The radio medium certainly has come a long way since the days of Marconi, the father of it all.

Today it is possible to listen to a tremendous number of different programmes from around the country - the four national BBC networks, plus all the local stations. But have you ever tried to tune around the medium wave band after dark? You may well have listened to Radio Luxembourg, but perhaps when turning the radio dial looking for a particular station you may have come across other radio signals - stations broadcasting in English, but not from studios in the UK: Radio Moscow, Radio Sweden, Radio Prague or Deutschlandfunk - four international broadcasters which transmit programmes in English every day, all of which are easy to hear in Britain.

For radio is a very special means of communication, a medium which transcends national boundaries, and which offers the listener unrivalled access to news, information and opinion - not just from his or her own back doorstep, but from every corner of the world.

Almost every country in the world boasts an international radio service, the aim of which is to present that country to listeners everywhere, using short wave radio.

Unlike medium wave or long wave radio signals, programmes sent out on short wave radio can travel thousands of kilometres - in fact, right round the Earth!

The reason short wave signals travel the distances they do is because, unlike medium wave or long wave signals, which rely on a 'ground wave' signal path, or in effect, travel in a straight line out from the transmitter, and peter out after a few hundred kilometres, short wave signals rely on a 'sky wave' path. Signals from the transmitter travel upwards to a part of the atmosphere known as the ionosphere. Formed of different layers, the signals are reflected back to earth, and sometimes this can be repeated several times, the signal in effect bouncing its way around the world, enabling radio programmes from Australia, for example, to be heard here in Europe.

Engineers working at international radio stations are able to calculate how many of these hops are needed to get transmissions to particular areas of the world (target areas), and choose frequencies which will provide optimum reception. Now you may find it odd to discover that frequencies need to be chosen for international broadcasts, for surely Radio Luxembourg has always appeared on the same part of the dial, and the BBC uses the same frequencies for its programmes all the time. Life is different on the short wave bands, though, as conditions which affect how signals travel around the world can change from season to season, and as a result, international broadcasters use different frequencies at different times of the year and to reach specific target areas. The short wave bands are much larger than the medium wave and long wave bands, running from around 3MHz up to 30MHz, with certain frequencies allocated to international broadcasting.

In general, these parts of the short wave bands are shown in the table below.

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Matsui MR-4099

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Who is on the Air?

Switch on a short wave radio and the world will leap from the loudspeaker. The choice of programmes is endless, with short wave radio stations providing an unquenchable thirst of information, entertainment and education, twenty four hours of the day, every day of the year.

News from Montreal or Moscow, Melbourne or Madrid, Buenos Aires or Brasilia, Jerusalem or Johannesburg.

Current affairs, comment, documentaries, reports - all at the turn of a dial.

Music and drama, sport and travel.

International radio listening offers an ear on the world, with unparalleled access for gathering knowledge of a breadth and depth unavailable from any other medium.

In some parts of the world, radio broadcasts from abroad may be the only way in which some people may be able to get reliable, uncensored news about their own country, let alone the rest of the world.

Listeners know that the news from Swiss Radio International, or the BBC World Service, for example, will be accurate and up-to-date, and that programmes from Radio Moscow will present the Soviet government's stand on affairs at home and abroad. Radio Australia's news programmes, whether in its twenty-four hour English service, or one of its languages such as Thai, Cantonese or Tok Pisin, for instance, will cover developments in the increasingly important Pacific region, whereas Radio Pong-gang from North Korea and South Korea's Radio Korea will provide two differing insights into life on that divided peninsula.

All of the stations which we have mentioned broadcast in English as well as a whole variety of other languages - from Norwegian to Uzbek, Arabic, Albanian to Portuguese - for the international audience is spread throughout the globe, and speaks many hundreds of different tongues.

And speaking of languages, you could perhaps be interested in learning one using short wave radio as your tutor, as many international radio stations broadcast language lessons. Try your hand at Russian, German, Chinese....
EDXC & SHORT WAVE MAGAZINE

WORLD WIDE SHORT WAVE RADIO

Now that you have discovered a little of what can be heard, how do you set about listening? An obvious requirement is a radio which has short wave capabilities. These vary in price from around £30.00 through to well in excess of £1000. Many listeners first start finding their way around the short wave bands using an inexpensive Russian-built radio from the Vega range of equipment. These sets cover most parts of the short wave bands used by international broadcasters and are suitable for listening to the world's major stations from Radio Canada International to Radio Japan.

The next stage up might perhaps be a small 'travel portable' with a digital display of frequency, and perhaps push-button tuning, rather like a calculator keypad. The major Japanese and European manufacturers all produce this type of short wave radio receiver, starting in price at around £100.00.

From then on you enter the 'communications receiver' market, where sets can cost upwards of £400.00, and are capable of receiving not only international broadcasters, but also radio amateurs, or ship-to-shore communications and transmissions from news agencies using rty (radio-teletype), although a special decoder will also be needed.

It really boils down to what your budget is, and how often you intend to listen. Points to look out for, though, when buying a receiver are selectivity, sensitivity and frequency coverage.

Selectivity is the ability of the radio to separate the signal you are trying to listen to from those all around. This is rather important, as short wave is very crowded, with stations competing for your attention, and you don't want to have Radio Tirana from Albania breaking in mid-sentence of a broadcast from Radio Netherlands!

Sensitivity is the ability of a receiver to pick-up weak signals - less important for the listener who tunes in only to the stronger international broadcasters who use transmitters of incredible strength.

Frequency coverage is all important, too, for as the short wave bands become more crowded, broadcasters are moving away from the main parts of the bands allocated to them, to frequencies which are just at the edge of the bands. Some radios may not cover these out-of-band channels, and only a few receivers at the lower end of the price range include the 13MHz or 21metre band, which is only just coming into use by broadcasters.

To find out what receivers are available, look at the 'What Receiver' feature which appears in Short Wave Magazine on a regular basis.

Reviews of new equipment are also broadcast in the media and communications programmes on several international radio stations. A list of

WHEN IT COMES TO CHOOSING THE RIGHT BANK MAKE SURE YOU're LOOKING IN THE RIGHT DIRECTION.

Does your bank respond to your needs as quickly as it might? Or is it taking too long to make vital decisions?
If so, it could be time you started looking around for a better service.
Look no further.
At The Royal Bank of Scotland

we believe we can offer you that better service, because we're prepared to go out of our way to help you in any way we can.
So why not come in and see us?
We don't regard ourselves as just another bank. That's why we won't regard you as just another customer.

The Royal Bank of Scotland plc

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these programmes is included towards the end of this article.

**Travelling the Short Waves**

With hundreds of different stations competing for your ear, how do you know where to start looking for interesting broadcasts? Many people, using their first short wave radio, simply find stations by trial and error, but there are many sources of information about where and when stations are on the air. Several books are published to help listeners, including:

**World Radio TV Handbook**

This is an annual database of all the world's broadcasters both domestic and overseas, with times and frequencies, together with languages, addresses, maps and features on international broadcasting.

**International Radio Stations Guide**

This is a guide to the short wave bands, with tables showing the use of all the broadcasting frequencies, together with a handy listing of programmes in English.

**Passport to World Band Radio**

An American reference book, with a frequency listing of the short wave bands, together with features and receiver reviews.

All of these books are available from the *Short Wave Magazine* Book Service and on the EDXC-SWM stand at this show.

Information is also published regularly by clubs devoted to short wave radio listening - or dxing, as it is known by enthusiasts (dx is an old radio term meaning distant communication). Details about these clubs appear in the section of this booklet about the European DX Council.

**Greenwich - Centre of the Radio World**

Britain still has an important role in international broadcast-

ing - and we don't just mean the BBC! Because the world is divided into different time zones, telling the time on short wave is based on Greenwich Mean Time (GMT). All stations refer to either GMT or UTC, which is rather convenient for listeners in the United Kingdom where during winter, GMT is local time! UTC, by the way stands for Universal Co-ordinated Time - yes I know that should be UCT but the French had to get in on the act somewhere!

**Media Programmes on Short Wave**

Communications is one of the growth industries of the world, and many international broadcasters carry regular programmes which look at the ever changing world of the electronic media. Some of the programmes which may be of interest to the general short wave listener are:

**BBC World Service Waveguide**

This programme is broadcast Sundays 0750, Mondays 0450,

Tuesdays 1115 and Thursdays 0130 UTC

**Radio Nederland Media Network**

Broadcast on Thursdays in all Radio Nederland's English broadcasts including to Europe at 1150, 1450 and 1850 UTC

**Radio Australia Communicator**

This programme is broadcast on Sundays, and is audible in Europe at 0730 UTC

Details of frequencies are available in the publications mentioned earlier.

The world is at your finger-tips through short wave radio - GOOD LISTENING!
Amateur radio is the truly international hobby. As a licensed radio amateur you can communicate - talk is too restricting a word - to other enthusiastic amateurs in almost every country of the world. You will find radio amateurs amongst people in all walks of life from the humblest to the highest - even amongst Royalty.

In the United Kingdom there are some 50,000 licence holders whose ages range from the youngest at 14 - the minimum age at which you can hold a licence - to well over 80. There are, at present, two classes of licence - Class A and Class B. Both classes require the licence holder to have passed the two-part 'Radio Amateurs' Examination', usually referred to as the RAE. This examination is held twice each year, in May and December, and is in the multiple-choice format. There are no exemptions from taking the examination, which requires some commitment from the potential amateur if he is to be successful. Your local College of Further Education may well hold evening classes in preparation for the exam, as may your local radio club. Just passing the two parts of the RAE entitles you to apply for a Class B licence. This allows you to use the frequencies allocated to the radio amateur service in the v.h.f., u.h.f. and microwave bands. In broad terms this means all amateur frequencies except the h.f. allocations.

To gain access to the h.f. bands with all that this means in being able to communicate world-wide entails passing a Morse Test in receiving and sending at 12 words per minute. Like the RAE, success in the Morse Test lasts you for life. With the Morse Test added to your RAE you can take out a Class A licence and the world is your oyster!

Although the youngest age at which you can hold a licence is 14 years do not think that this is the youngest age at which you can become interested in amateur radio. There is no age limit on listening, and becoming an active short wave listener is, in several ways, the ideal way of getting into the hobby. Both the Girl Guide/Brownie and the Scout/Cub movements actively encourage an interest in amateur radio through their 'Thinking Day on the Air' and 'Jamboree on the Air' events. Here you will find children as young as 8 years old sending greetings to other stations as if they have been doing it for years!

Variety is the spice of life and amateur radio offers variety. You would have to be very hard to please if you cannot find some facet of amateur radio which takes your fancy! You might be interested in experimenting on the very frontiers of radio technology, following in Marconi’s footsteps, perhaps trying to extend your knowledge in the microwave frequencies. Or you might just want to be able to chat to others around the world, exchanging details of weather and social life. Amateur radio can accommodate both these extremes.

Amateurs have been instrumental in pioneering radio developments and opening up higher and higher frequencies.

### QRP

Perhaps you fancy trying to get your signal as far as possible with the minimum of power. QRP, as low-power transmissions are called, is a very popular facet of amateur radio. Transmitters are simple to build and cheap to run and the antenna system offers scope for d.i.y. both in design and construction in a bid to get the most signal out. QRPers have their own club catering for their interests - the G-QRP Club.

### Repeater

A large number of amateurs have mobile radio installations fitted in their cars to enable them to contact other amateurs while they are travelling. The most popular bands for this activity are 144MHz (2m) and 430MHz (70cm). As both of these bands have limited range enterprising amateurs have designed and constructed a country-wide network of 'repeaters' for both of these bands. These repeaters receive the signals from a 'mobile' on one frequency and retransmit it simultaneously on a different frequency. As the repeater is sited in a favourable location it gives a much wider coverage and it is possible for two or more mobiles to be in communication through a repeater even though they are not within direct radio range of each other. The networks of repeaters are built and operated by groups of dedicated amateurs for the use of all amateurs, although regular users are encouraged to join the local group and thus help to run the repeater.

### Data Communications

A rapidly growing area of interest is data communications. With the advent of readily available home computers, transmission modes such as rtt (radioteletype), which previously had required the use of noisy and oily mechanical teletypewriters, came within the reach of any amateur who was interested. What is more the computer allowed the amateur to experiment with many different modes by simply loading different programs and possibly using a different terminal unit or interface between the computer and the transceiver. Now many amateurs operate packet radio, facsimile, rtt and AMTOR stations. The needs of the data communicator are met by the British Amateur Radio Teleprinter Group (BARTG), and the Remote Imaging Group (RIG) for those into facsimile.

### Icom IC-28E v.h.f. f.m. mobile transceiver

A young St. John Ambulance member is at ease on the microphone of a special event station while Ted G6ODA of the Grafton club looks on.
Amateur Television

Amateur television takes two forms. The lowest frequency allocation capable of taking the wide bandwidth signal needed by fast scan TV is the 430MHz band and there is a wide following of amateurs who transmit full-spec. colour television pictures on this band and the lowest microwave band at 1296MHz. Below 430MHz only ‘slow-scan’ or sstv pictures can be transmitted. On the h.f. bands, of course, this does mean that sstv pictures can be sent round the world. The appropriate club for amateur tv enthusiasts is the British Amateur Television Club (BATC).

Amateur Satellites

Although it may sound far-fetched to anyone not involved in amateur radio, amateurs have been building, launching and operating sophisticated satellites for a quarter of a century. AMSAT is the international organisation which coordinates the design, building, launching and operation of the OSCAR range of amateur satellites. OSCAR is the acronym for Orbiting Satellite Carrying Amateur Radio. Amateurs can use the OSCAR satellites at certain times as repeaters, enabling them to communicate world-wide on v.h.f. and u.h.f.

The Russians, of course, have their own series of satellites for amateur use. As well as satellites several of the US Space Shuttle missions have carried astronauts who have been licensed amateurs and who have had permission to operate from the Shuttle itself. AMSAT UK is the UK end of AMSAT.

In the space available here it has been possible to give but a brief outline of some of the many facets that make up amateur radio. You can get further information by reading Practical Wireless and Short Wave Magazine every month and by joining the Radio Society of Great Britain. Your local radio club is also worth joining, as here you will be able to meet with other radio enthusiasts and participate in the many different activities organised by the club. Many clubs run courses for beginners, and old hands, in preparation for both the Morse Test and the RAE.

Addresses

| Radio Society of Great Britain (RSGB) | AMSAT UK | G-QRP Club | British Young Ladies
| Lambda House | Ron Broadbent G3AAJ | Rev. George Dobbs G3RJV | Amateur Radio
| Cranborne Road | 94 Herongate Road | St Aidsen Ycarage | Association (BYLARA)
| Potters Bar | London E12 5EQ | 438 Manchester Road | Mrs Dawn Corallini G4YOS
| Herts EN6 3JE | | Rochdale | 35 The Green
| | | | Kings Hill
| | | | Ware
| | | | Herts SG12 0QW

BARTG
Pat & John Beedie
Flynnonlas'
Salem
Llandeilo
Dyfed
Wales SA19 6EY

G3RJV

Remote Imaging Group (RIG)
Phil Seaford GBXTW
14 Nevis Close
Linslade
Beds LU7 7XD

Good News from the Land of the Equator . . . .

Acclaimed by listeners as one of the best of its kind in the world of broadcasting.

HCJB broadcasts from Ecuador around the world in 12 languages.

Hear HCJB in English for Europe at:
06h45 - 06h30 gmt 9.610MHz
19h30 - 20h00 gmt 17.79MHz
21h30 - 22h00 gmt 17.79MHz

for programme schedules write to Casilla 691, Quito, Ecuador or phone the HCJB answerline on UK (0274) 721810 International +44 247 721810.
One of the more interesting aspects of short wave listening is eavesdropping on the aircraft bands. This is made possible both by the number of dedicated receivers which are now available and also the increasing sale of general coverage scanners. The law regarding listening to these frequencies says that you should not do so, but seems to be applied with a considerable degree of elasticity when you see the number of people on the viewing galleries using airband receivers. Hardly an undercover activity and it has been tolerated for many years.

**Frequencies**

The v.h.f. band is situated between frequencies of 118 and 136MHz and is split into 25kHz steps. Most of the traffic you will hear is from commercial airlines and private planes. Military aircraft may also be heard when they are travelling in controlled airspace and are subject to the same safety regulations as other operators.

Charts of frequencies are published by several organisations but, due to the fact that planes are passed on from one sector to another, and the new frequency to be used is stated over the air, it is not too difficult to make up your own listings. Some frequencies are in virtually constant use and to get you started here are a few of them:

- Scottish Airways 128.50MHz
- London Airways 132.05MHz
- Bristol Sector 132.80MHz
- Clacton Sector 133.45MHz
- Daventry Sector 134.75MHz
- Seaforth Sector 135.05MHz

The emergency frequency is 121.50MHz and is frequently used by pilots of light aircraft who have got themselves lost.

**Equipment**

The simplest and cheapest is probably the small transistor portable type which is usually available around £25 and often includes the domestic v.h.f. f.m. broadcast band as a bonus. These are really only useful for listening to local transmissions as the sensitivity of most of these receivers is very poor. Another problem is that the tuning dial arrangements are such as to cramp the band into a very small dial length or, to put it another way, they are usually lacking in bandspread.

**The Scanner**

A far better arrangement is the scanning receiver, both on the grounds of increased sensivity and also the fact that these normally have a fair number of memories available. By loading the most used frequencies into these memories you will be able to keep track of aircraft as they are handed on from sector to sector across the country.

**Antennas**

If you are operating portable you are likely to be stuck with the telescopic rod antenna that comes with the set. If, however, you are setting up a receiver at home then great improvements can be made by erecting a vertical dipole. This should be situated well clear of obstructions such as trees or buildings and as high as possible so as to maximise the range.

Possibly the easiest way to do this is to get a v.h.f. broadcast band dipole together with a suitable mounting bracket from your local d.i.y. antenna shop and simply saw off equal lengths from both ends to make the overall tip-to-tip length of the dipole 1.14m. This will tune it to the centre of the v.h.f. band. The antenna can be connected to the receiver using cheap 75 ohm television coaxial cable. The slight mismatch into the receiver - for the technically minded reader it means an s.w.r. of only 1.5:1 - being of no consequence at these frequencies.

**Distances**

The mode of propagation on these frequencies is starting to become 'line-of-sight', so you may well find that you cannot hear ground-based stations more than about 80km away under normal conditions. This is not much of a problem as all messages from the ground to the aircraft are repeated back, so you will hear both sides of what is going on. Line-of-sight to an aircraft flying at perhaps 35000ft means ranges of several hundred kilometres but the real excitement comes when radio conditions are good and the television companies are giving warnings of continental interference. Then you will find that your set up has been transformed and it is possible to hear aircraft and the control stations up to 4800km away.

**The Jargon**

Like almost all activities, the air traffic control (a.t.c.) people have developed their own language which is internationally recognized no matter what the home country of the operator may be; although the accepted language for the purpose is English. Whilst an aircraft is under a.t.c. control there are six points which are of maximum interest - identity, time, direction, height, distance and speed.

**Identity**

The obvious thing is that the a.t.c. people need to know who they are talking to, but a less obvious point is that on the radar screen at a busy airport like Heathrow, there may be dozens of different aircraft visible at any one time, so the controller needs to know which one of those blips he is talking to. This is sometimes done by asking the aircraft to change heading slightly and watching for a matching movement of one of the blips on the screen. The other method is to ask the plane to 'squawk ident'. The plane then sends a series of blips which are decoded and shown on the radar screen, thus giving foolproof identification.

**Time**

This is always given in UTC and not in terms of the time in the aircraft's local time zone. The hours are not mentioned and it is simply given as the number of minutes after the current hour. For example 'estimating arrival at twenty five', simply means arriving at twenty-five minutes past the current hour.

**Direction**

The direction in which the aircraft is heading is always given in compass or magnetic degrees, and is known as the aircraft's heading. An aircraft heading East is said to be on a heading of 'nine zero'. Once a heading has been given, and accepted, it is then frequently...
spoken of as the 'radar heading' by both sides.

**Height**

The height at which an aircraft if flying is known as the flight level and is always given in feet but with the two least significant digits missing. Thus a height of 28000ft will be referred to as 'flight level two eight zero'. The device used for measuring height is frequently a form of barometer and as such is sensitive to atmospheric pressure changes and needs to be reset to accommodate these. You may hear requests for the QFE, which is the setting that will give a zero height reading at local ground level, or for QNH, which will result in a reading of zero feet at sea level. The setting used depends on the type of journey to be undertaken.

**Distance and Speed**

Distances are usually referred to in nautical miles and are frequently stated as from specific beacons. The aircraft carries equipment which monitors these and gives an automatic update of the distance from the beacon. Aircraft speeds are always given in knots, a knot being equal to a nautical mile per hour. Often, speeds are reported in terms of a Mach number, Mach 1 being the speed of sound. You may well hear reports from Concorde of Mach 2 while the less speedy Jumbo jets will be reporting Mach 75 or even less.

**What Next?**

Here you have all the information you need to listen to all the local traffic on the air bands and to understand something of what is going on. What happens when an aircraft leaves local airspace? To hear that you will need a h.f. receiver and to listen on the international frequencies; but that is another story.
Whatever the role of the short wave radio may be it is evident that it is an extremely important and influential one. After all, short waves can travel thousands of miles, from state to state, continent to continent, carrying the voice of the largest super-power and the smallest dominion alike.

Anyone who has ever listened to a short wave receiver will know the thrill of hearing programmes which are being broadcast from the other side of the world. This is heart-warming for ex-patriots who wish to stay in touch with the news, events and culture of their mother country; a relief for tourists who are consoled by the friendly voice of either their own world-service or the country's they are visiting, allowing them to get to know the country a little better; fascinating and invaluable for the news-hound wherever he may be, permitting him to hear world-shattering news 'whenever and wherever it happens'.

Short wave stations would say that their principal role is to provide entertainment for all who are able to listen to their broadcasts. But how far are the programmes just innocent entertainment or blatant propaganda? Radio is a powerful medium and short wave radio can carry the hopes and despair; they can ensure friendliness or provoke intolerance. Voices are able to be heard that would otherwise remain silent, either through censorship laws or the fact that the country is thought too unimportant to be of any relevance to world events.

**Propaganda**

Say the words 'propaganda' and 'censorship' to anyone and immediately you will conjure up pictures of the Soviet Union and Communism in the recipient's mind. However far this may be true, and it is not being disputed here that such countries are guilty of propaganda, there is evidence that the West, the 'Free' West, is not entirely innocent of the crime. Indeed, it could be said that every country broadcasting on the short wave bands is out to promote the interests of their own politics, thoughts and ideologies.

Radio Moscow World Service is an example that springs to mind. The short wave bands are full of this station broadcasting in English and every other known language. By listening to the news on the hour and half-hour one can gain an insight into their interests. In spite of wars being fought all over the globe and natural and man-made disasters happening almost daily, the news on Radio Moscow World Service will always begin with stories of what is happening in the Communist Bloc and the Communist government. Do they feel that such items are the most important? After all, it is a 'World Service' and does not broadcast just to Russian ex-patriates. It seems that they have got their priorities wrong.

Of course, their stories always conflict with those of the Voice of America, particularly over diplomatic issues and peace negotiations. Who is right and who is wrong? That is left entirely up to the curious listener to decide!

Another example of this is the 'war of words' being fought on the air waves between Iran and Iraq. Each is constantly accusing the other of war-crimes and atrocities while hurling insults.

**Ideologies**

So far I have given examples of nations who are at odds with each other; either they are at war with each other or they crave domination by their individual ideologies. But religion can also be heard on the short wave bands. Trans-World, Monte Carlo and the World Service of the Christian Science Monitor are just two examples from many I could quote. Harmless messages of hope, you may think, the radio acting as a latter day missionary - but it is still propaganda of a kind.

Most of the stations encourage listeners to write to them with views, questions and comments. This gives the station a chance to convey a favourable picture of the 'host' country, its political and economic systems. Many 'freebies' are available, usually on request but often accompanying QSL verification cards.

I have had experience of this myself. After receiving a QSL card from Radio Prague, Czechoslovakia, I duly found two books dropping through my letter-box, on entitled Seventy years of the New Age concerning the growth of Communism and Czechoslovakia Foreign Policy. I was very grateful for these publications and found them interesting reading, but the books are pure propaganda, stating how wonderful their system is compared to the Capitalist system.

It is probable that western stations such as VOA, BBC World Service, etc. send similar items to listeners in the Eastern Bloc but about our systems. Once again it cannot be stressed enough that propaganda is not just a product of adopting the Communist way of life.

**Clandestine**

When considering the use of short wave radio, we are compelled to discuss the many clandestine operations such a medium is used for. We all know of the nations wrapped up in the turmoil of civil war who use radio as an instrument of policy - the Contras in Nicaragua, the Rebels in Afghanistan. But there are others who use this form of medium for espionage purposes.

Did they espionage? Surely not. All that stuff ended with the Cold War - didn’t it? The answer has to be no! There is now conclusive evidence that...
the number stations which can often be heard on the short wave bands are broadcasting some form of code. For many years it has been thought that such signals were being used for technical purposes by stations and although this is, in the main, still the case, there is no doubt that some of these signals mean something - not to technicians and engineers, but to spies in possession of a code-book.

Are coded messages confined solely to number signals that only the elite understand? I feel this is a most important question that demands an answer.

During the second World war the British sent messages to the Undergound in the occupied countries. These messages were never coded as the 'number signals' are but were simple sentences that were intermixed with others items such as the news, weather, etc. This provokes the question, could this still be the case today? How do we know that certain phrases used in the programmes from stations broadcasting are not secret messages that mean something to someone somewhere? The answer is that we don't, but it raises the possibility. Espionage is not James Bond with secret transmitters in the soles of his shoes!

This question of espionage on the wave bands raises the question of safety. It has already been noted that stations encourage listeners to write to them, but how safe is it to give your name and address to so-called enemy countries? Who knows what happens to these facts. They may be just ignored or filed away for use at some later date.

As I near the end of this essay, I would like to examine an issue close to every listener who, like myself, is a news-hound as well. The reliability of what is heard.

We have already discussed the fact that competing nations and ideologies use the short wave broadcast bands to promote their ideas. Should we take all that we hear with a pinch of salt? Who do we believe and who do we not believe? It is very much the same as the issue of the reliability of newspapers. As long as you keep an open mind and remember what the broadcasters are attempting to do, you can't go far wrong.

In the course of this article I have raised some very thought provoking issues. I hope that I have not been too biased. I also hope that I have conveyed the picture that I am extremely serious about my hobby. Indeed it is my hobby and I get many hours of pleasure and information from listening to the world on short wave radio.

However, I do believe that what I said at the beginning is true. Short wave radio plays an extremely important and influential role in today's world and that as long as we don't believe everything we hear, and are a little more careful about what information we give to radio stations, particularly those of nations considered to be enemies, short wave listening will remain one of the most worthwhile activities you can engage in - as anyone already into the hobby will tell you.

If you don't already listen then try it, it really is fun.

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**THE EUROPEAN DX COUNCIL**

The European DX Council is an association of short wave radio listeners' clubs and dx organisations in the European continent. EDXC was founded in 1967 in Denmark, but its headquarters are currently located in the United Kingdom. Since its formation, the Council has done much work in increasing cooperation amongst European listeners, and enhancing contact between listeners and the broadcasters, and has assumed an important role in promoting short wave radio listening in Europe.

The European DX Council has operated from Britain since 1980, when the current Secretary-General, Radio Station 54 in Cardiff, was established. Simon Spanswick was elected to its post. The headquarters are in the Cambridgeshire town of St Ives, where the Secretary-General is based, but in 1986 a separate office responsible for public relations, exhibitions and conferences was established under the Assistant Secretary-General in the Thames Valley town of Wallingford.

The Council is a non-profit making foundation, which is funded by its member clubs, and the income derived from its range of publications. The European DX Council also receives occasional sponsorship enabling full representation at events such as World Telecommunications Exhibitions in Geneva and other events in Europe.

**EDXC Conference**

Each year since 1967, the Council has organised a meeting for listeners, broadcasters, engineers and others involved in the international radio medium. In recent years, the event has taken place throughout Europe, including Paris, London, Madrid, Helsinki, Antwerp and Stockholm. Delegates travel from the Secretary-General and the world to take part in these important Conferences which provide a unique forum for the discussion of the short wave broadcasting industry and the chance to meet colleagues from both sides of the microphone.

The international broadcasting scene is constantly changing, as the reader of this publication will have noticed. The Council has been a constant, a channel for information exchange between both sides of the microphone.

**UK International Listening Clubs**

There are five national clubs devoted to short wave radio or medium wave radio in Britain:

- **British DX Club**
  - The British DX Club was founded in 1972 and is currently the fastest growing dx club in the United Kingdom. The club publishes a 24-page monthly bulletin called Communication, which is geared towards the needs of the active dxer. Short, medium and long wave broadcasting, as well as TV, VHF, pirate and clandestine broadcasts as well as QSLs are amongst the topics regularly covered in this publication. It is an invaluable source of up-to-date information. The club's members receive its monthly bulletin, Radio Stations in the United Kingdom, is published annually by the club - the 7th edition is available now and costs £1.00 from the British DX Club, 54 Manton Road, Southport, LONDON SE5 1TE. A sample copy of the club's bulletin and subscription rates are also available from this address.

- **DX Association of Great Britain**
  - The Association publishes a News Letter eleven times a year, which contains comprehensive frequency information such as the broadcast schedules, programmes, technical articles and news of the European DX Council. Features on important radio stations are regularly published in the club's newsletter, and new members receive its copies by post less than ten days after the press deadline.

- **Medex Wave News**
  - Medium Wave News is published monthly (except for a summer break) and comprises 20 pages of news, views and feature articles on all aspects of medium and long wave radio. Regular features include the very latest radio news as well as reports by members of radio stations recently heard.

- **World DX Club**
  - WDXC celebrates its 20th anniversary this year. Membership is spread throughout the world, with nearly 30 per cent of members outside the UK. The club's monthly bulletin, CONTACT, has a first-of-the-month editorial deadline with publication over the second weekend of the month ensuring that the information in the bulletin is always up to date. Contact runs to 36-40 pages including logs for short wave, medium wave, tv, and dx of QSL reports, dx news, latest schedules and members' letters. Programme listening is also covered with 'Broadcasting Review' covering programmes which have been heard and 'Future Waves' predicting what will be on the air. A radio nostalgia section looks back at the history of radio.

- **Any one interested in broadcast band listening is invited to seek further details. Sample copies of the club's magazine are available for a small contribution.**

**International Short Wave League**

The International Short Wave League '87 produces a monthly journal entitled Monitor, which regularly includes both broadcast and amateur sections. Of 42 pages plus cover, Monitor also features articles of short wave interest.

- **Contests are held throughout the year, with an award for the highest total score in any one year, and a trophy being awarded for life to the winner.**

**ISWL is affiliated to the Radio Society of Great Britain and to the European DX Council.**

Details of membership are available from the Hon Secretary, J. May G1GWG, 10 Clyde Crescent, Warton, Winstoft, Chester.

**Medium Wave Circle**

- Medium Wave News is published by the Medium Wave Circle, a specialist radio club catering for all listeners with an interest in Medium and Long Wave Radio. The newsletter, now in its 33rd year, is the prime source of information in the UK dealing with the international medium wave scene.

- Medium Wave News is published monthly (except for a summer break) and comprises 20 pages of news, views and feature articles on all aspects of medium and long wave radio. Regular features include the very latest radio news as well as reports by members of radio stations recently heard.

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**THE EUROPEAN DX COUNCIL AND INTERNATIONAL SHORT WAVE RADIO - partners for the future.**
EDXC & SHORT WAVE MAGAZINE

WHilst Parliament allocates money to BBC World Service especially to reach audiences abroad, up to one and a half million people in Britain tune in at least once a week.

Most of these, of course, listen in English and one of the main attractions is the World News - events as seen from a global viewpoint rather than a British one.

The BBC’s World News is broadcast several times a day, but most people will need a short wave set for listening during the daytime. World News uses several short wave frequencies, and full details are in ‘London Calling’, a kind of monthly ‘Radio Times’ for the World Service, obtainable on subscription from:

Publicity Department (London Calling) at BBC World Service, Bush House, LONDON WC2B 4PH.

Programmes in other European languages can be heard at times in Britain on short wave, but those which go further afield by satellite to be re-broadcast on short wave on overseas relay stations are not generally audible in the United Kingdom.

Besides English, BBC World Service broadcasts in 36 languages altogether. If you would like information about any of them, or if you are going abroad and would like to know how to listen whilst away, write to BBC World Service Publicity at the address given above.

HOW THE RED CROSS SPEAKS TO THE WORLD

The International Committee of the Red Cross began broadcasting in May 1945. In Europe, many prisoners of war were waiting to be taken back to their homes, and they wanted their families to know they were alive. However, normal communications had broken down. Until the end of the 1940s, lists of prisoners of war and of displaced civilians were broadcast by the ICRC from the studios of Radio Geneve, and were heard by listeners in various parts of Europe. (In the first 3½ years of operation, more than 600,000 names were broadcast).

The ICRC realised the usefulness of radio for rapid communication in times of crisis. The 1948 International Broadcasting Conference in Mexico City granted the ICRC its own frequency - a unique asset among international humanitarian organisations.

Test transmissions began in 1951 with the object of finding out whether listeners in different parts of the world could hear the broadcast. These continued sporadically until 1965, when the ICRC installed its own studio at its Geneva headquarters and formed the Red Cross Broadcasting Service. Broadcasts became more regular, and in 1978 the Swiss PTT gave permission for the ICRC to broadcast once a month omni-directionally in English, French, German, Spanish and Arabic. Beamed transmissions were also made to Africa, Asia and the Middle East.

Today, RCBS broadcasts omni-directionally twice a month on 7210kHz, in English, French, German and Spanish. Furthermore, broadcasts in English, French, Spanish, Portuguese and Arabic are beamed to Africa, Asia, Latin America and the Middle East. The programmes are broadcast from the Swiss PTT’s transmitters at Schwarzenburg (directional) and Beromunster (omni-directional); facilities are placed at the ICRC’s disposal free of charge by the PTT and Swiss Radio International. Listeners’ reports are received from every continent, and are regularly answered by QSL card.
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Further information available from:
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