Short Wave Magazine

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OCTOBER 1988

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FREE PULL-OUT SUPPLEMENT FREE

LISTENING TO THE WORLD

ROBERTS RADIO RCS8 REVIEWED

Build our 3-band s.s.b. receiver

What Receiver?

For The Radio Listener

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

ICOM introduces the IC-R7000, advanced technology, continous 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 freqencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected freqency 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, attentuator, 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 freqency 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.
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Icom (UK) Ltd.
Dept SW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

VOL 46 ISSUE 10 OCTOBER 1988
ON SALE SEPTEMBER 22nd

NOVEMBER ISSUE ON SALE
OCTOBER 27

|27| **Roberts Radio RCS 80**

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.

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Short Wave Magazine

REGULARS

SEEN & HEARD

GOOD LISTENING

FIRST WORD

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 9 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 formers 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 dilema! 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", he 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 EDGEWAYS

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 clandenstine 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.

I believe the transmitter had an input of about 7 watts to the final power amplifier stage.

CW only of course!
JAMES GLANVILLE
COVENTRY

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, 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

Broadcasts Not to be Introduced in Band I and Band III

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:

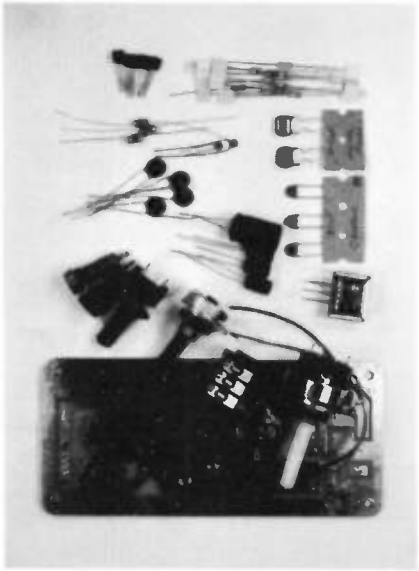
"The technical feasibility study has shown that there is insufficient scope within Band III to accommodate a broadcast channel without the risk of serious mutual interference with adjacent mobile services. In Band I, there is potential scope for a single broadcast channel covering at most some, but not 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."

WHAT'S NEW



New Kits from Cornwall

While at the Cornish Rally this year I came across two interesting kits from G0FKI & 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 good quality components, the receiver is claimed to tune over the range 6 to 12MHz 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 G0FKI & 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.

G0FKI & 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:
LS/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 your 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 5.2m high, it provides a gain of 8.3dB on 144MHz and 11.7dB 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 5λ/8 antennas on 144MHz and no less than eight 5λ/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

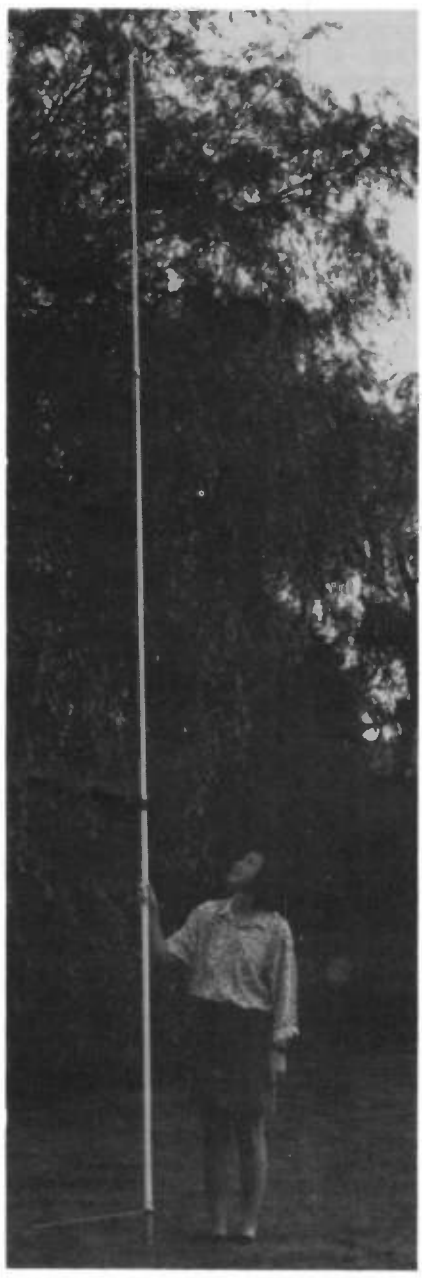
Thanet Electronics Club

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
Merseyside 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 G3PDL and members of the G-QRP Club.

1545 – 1800 – DX Slide Presentations: "Building a US Contest Super-station" by Paul Bittner W0AIH. "The 1988 DXpedition to Kingman Reef, Palmyra and Kiritimati Is" by Paul Granger F6EXV.

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 QRQ c.w. tests, Doctor DX Computerised Contesting, Pile-up Copying Competition and there will be refreshments available and the bar will be open.

RSGB
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!

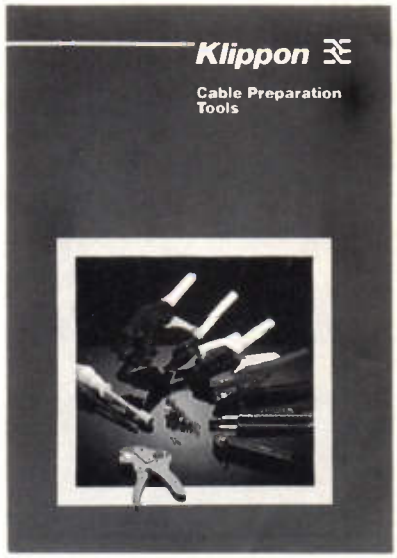
Armada 400 Antique Wireless Show

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 school-boy 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 masts!

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 G8ZDF, 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 Stripas KT7, KT7-1000 cutters; the CT1 6 crimper; the HTF sub-D crimper, 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.

WHAT'S NEW

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

Forthcoming HCJB Programmes

September 22

Passport: Bird calls that inhabit Ecuadorian music. 0900UTC. 9.745 & 11.925MHz (target area — S. Pacific).

September 23

Call of the Andes: A special event happens every two weeks at a jungle post. Can you guess what it could be? 0200UTC. 15.155, 11.775 & 9.720MHz; 0500UTC. 11.775, 9.720 & 6.230MHz (target area — N. America): 0645UTC. 11.835 & 9.610MHz (target area — Europe): 0830UTC. 6.130 & 9.745 (target area — S. Pacific).

Passport: Our world is especially beautiful when you consider the multiplicity of colours available to us. Nature shows the way as it demonstrates the creator behind the colours. 1900UTC. 15.270 & 17.790MHz (target area — Europe): 0100UTC. 15.155, 11.775 & 9.720MHz; 0500UTC. 11.775, 9.720 & 6.230MHz (target area — N. America).

September 24

Happiness Is: Stories on rock climbing, soccer and much more. 0730UTC. 9.610 & 11.836MHz (target area — Europe): 0730 & 1000UTC. 11.925, 9.745 & 6.130MHz (target area — S. Pacific): 1230UTC. 17.890, 15.114 & 11.740MHz; 0430UTC. 15.155, 11.775 & 9.720MHz (target area — N. America).

Passport: Nature shows the way, see September 23. 0900UTC. 9.745 & 11.925MHz (target area — S. Pacific).

September 26

Call of the Andes: The true state of our faith shows when death threatens. 0200UTC. 15.155, 11.775 & 9.720MHz; 0500UTC. 11.775, 9.720 & 6.230MHz (target area — N. America); 0645UTC. 11.835 & 9.610MHz (target area — Europe): 0830UTC. 6.130 & 9.745MHz (target area — S. Pacific).

September 28

Ham Radio Today: What kind of propagation characteristics exist within the 160m amateur band? John Beck will investigate those and automatic spacing for c.w. keyers. 0800 & 1030UTC. 6.130, 9.745 & 11.925MHz (target area — S. Pacific): 2130UTC. 15.270 & 17.790MHz (target area — Europe): 0230 & 0630UTC. 15.155, 11.775, 9.720 & 6.230MHz (target area — N. America).

Happiness Is: Part II of the Life and Writings of George MacDonald. 0730UTC. 9.610 & 11.835MHz (target area — Europe): 0730 & 1000UTC. 11.925, 9.745 & 6.130MHz (target area — S. Pacific): 1230UTC, 17.890, 15.115 & 11.740MHz; 0430UTC. 15.155, 11.775 & 9.720MHz (target area — N. America).

Call of the Andes: How and why was the Amazon River discovered by Europeans? Did the Indians know it was there? 0200UTC. 15.155, 11.775 & 9.720MHz; 0500UTC. 11.775, 9.720 & 6.230MHz (target area — N. America: 0645UTC. 11.835 & 9.610MHz (target area — Europe). 0830UTC. 6.130 & 9.745MHz (target area — S. Pacific).

September 29

Passport: The panda is an international sign for mankind to preserve all what God has given us to manage and enjoy. Polly MacHarg treats the subject of the endangered Panda bear. 1900UTC. 15.270 & 17.790MHz (target area — Europe): 0100UTC. 15.155, 11.775 & 9.720MHz; 0530UTC. 17.775, 9.720 & 6.230MHz (target area — N. America).

September 30

Call of the Andes: What would you look for if you had planted fruit trees? An interesting application. 0200UTC. 15.155, 11.775 & 9.720MHz; 0500UTC. 11.775, 9.720 & 6.230MHz (target area — N. America): 0645UTC. 11.835 & 9.619MHz (target area — Europe): 0830UTC. 6.130 & 9.745MHz (target area — S. Pacific).

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

Radio Netherlands Schedule

This guide is arranged to cover one whole day of broadcasting. The 0530UTC 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.

Time (UTC)	*Main Area Served*	*Frequencies*	*Length (mins)*
0400	M. East/E. Africa	9.895 & 7.210MHz	25
0630	W. Africa	11.930 & 9.895MHz	25
0730	New Zealand	9.715 & 9.630MHz	55
0830	New Zealand	9.630MHz	25
0830	SE. Asia	21.485 & 17.575MHz	55
1030	Australia/Caribbean	9.505 & 6.020MHz	55
1130	Middle East/Asia	21.480, 17.575 & 15.560MHz	55
1130	Europe	17.605, 9.715 & 5.955MHz	55
1430	SW. Asia	17.575, 15.560, 13.770, 11.735 & 5.955MHz	55
1630	S./E. Africa	15.570 & 6.020MHz	55
1830	S./Central Africa	21.685, 17.605, 9.540 & 6.020MHz	55
1830	Europe	6.020 (parallel to African service)	55
2030	West Africa	15.560, 11.740, 9.540 & 9.895MHz	55
0230	Eastern N. America	9.895, 9.590, 6.165 & 6.020MHz	55
0530	Western N. America	9.715 & 6.165MHz	55

Radio Netherlands in English

Most of Radio Netherlands English language broadcasts, except those on a Sunday which carry the *Happy Station* programme, begin with a bulletin of world news, followed by their current affairs magazine programme *Newsline*. This looks at the background to international events. This means that listeners in Africa (at 1630, 1830 & 2030UTC) can expect regular *Newsline* programmes that concentrate more on developments that affect the African continent. With the exception of broadcasts at 0400, 0630 and 0830UTC (at 0830 only 9.630MHz is affected), all transmissions are then followed by a 31 minute feature programme — detailed later. Feature programmes between September 17 and October 1 will be five minutes shorter to make way for an Olympic round-up.

Mondays

The Research File is a new science and technology review. They cover discoveries and developments that affect us, examining new designs from the European patent office and reporting on location from scientific centre.

Tuesdays

Images is where they highlight film, theatre, opera, authors and serious music. Suggestions on what literary and musical events should be covered are always welcome.

Wednesdays

For most listeners, Wednesdays is documentary or series day. *Asiascan* is beamed to listeners in Asia.

Thursdays

Media Network is a weekly award-winning survey of communications developments compiled with the assistance of over 175 monitors across the globe.

Fridays

European/American/Pacific transmissions only. *Rembrant Express.*

Asian transmissions only. A second edition of *Asiascan* but not a repeat of the Wednesday programme.

African transmissions only. The weekly Africa orientated magazine programme *Airtime Africa* examines news and looks at how the Europe media is covering African Affairs.

Saturdays

Over to You is a listener contact programme. On the last Saturday of each month, they focus on a special theme to stimulate questions and comments.

Sundays

0400 and 0630UTC only. *Sunday Spotlight* prepared by the Airtime Africa team. All other transmissions carry *Happy Station* family entertainment. This programme celebrates its 60th anniversary this year.

GRASSROOTS

Lorna Mower

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

Wimbledon & District ARS have Facts and Fallacies about Learning Morse G3ESH on September 30 and their AGM is on October 14. 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Road. Tom Mansfield G3ESH on New Malden 1418.

Sutton & Cheam RS meet 3rd Fridays, 7.30pm at Downs Lawn Tennis Club, Holland Avenue, Cheam. Natter Nights are 1st Mondays in Downs Bar. September 25 is RSGB HF Convention at the Belfry Hotel near Oxford. John Puttock G0BWV on Sutton & Cheam 9945.

Cheshunt & District ARC have Natter Nights on September 28, October 12 and 26th. October 5 is G3OSS on Reviewing and Lack of v.h.f. Activity and the 19th an Equipment Evening. Wednesdays, 8pm in the Church Room, Church Lane, Wormley. Peter Davies G1KQA on Lea Valley 764930.

Vale of Evesham RAC meet 1st & 3rd Thursdays, 1st Thursdays are Formal at 7.30pm in The Meb Club, Worcester Road. October 6 is G0EMS on his US Visit. Mike G4UXC on Evesham 831508.

Southgate ARC meet 2nd & 4th Thursdays, 7.45pm in the Holy Trinity Church Hall (Upper), Winchmore Hill. On September 8, ICOM UK will be giving a demo of various products, including the new IC781. The 22nd is an Informal. Brian Shelton on Winchmore Hill 2435.

Acton, Brentford & Chiswick ARC will be hearing reports of Members Holiday Activities on October 18. Alternate Tuesdays, 7.30pm at Chiswick Town Hall, High Road. W. G. Dyer G3GEH on Acton 3778.

Chelmsford ARS have their AGM on October 4. 1st Tuesdays, 7.30pm in Marconi College, Arbour Lane. Roy Martyr G3PMX on Chelmsford 353221 Ext. 3815 (Office).

Torbay ARS meet Fridays, 7.30pm at the ECC Club, Ringslade Road, Nr Highweak. September 24 is G3ABU on Satellite Working. Bob McCreadie G0FGX on Haytor 233.

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 — Ray Sewell, the 19th an Informal/Committee Meeting and the 26th is "PSE QSL OM", bring your favourite or unusual QSLs. Craig Joly G0BGD on Norwich 485784.

Isle of Man ARS meet Mondays, 8pm at the Howstrake Hotel, Harbour Road, Onchan, IOM. Anthea Matthewman GD4GWQ 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 Didmon G4RIS on Whitstable 262042.

Keighley ARS have 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 G1IGH on Bradford 496222.

KARS

Stevenage & District ARS meet 1st & 3rd Tuesdays, 8pm at SITEC Ltd, Ridgemond Park, Telford Avenue. Morse tuition and practice from 7.30pm. September 27 is a Committee Meeting at 7 York Road, October 4 is Construction and Test Equipment, the 15/16th is JOTA Weston Park, the 18th a Slide Show talk by PI Repeater Group and the 25th a Committee Meeting at 82 Lingfield Road. Peter Daly G0GTE on Stevenage 724991.

Darenth Valley RS have Ancient Horrors, talk by G2WI on September 28, Slow Scan TV — demo by G1JEC on October 12 and a Surplus Sale on the 26th. Generally meet 2nd & 4th Wednesdays, 8pm in Crockenhill Village Hall near Swanley, Kent. Sheila Hillman G1MNX on Orpington 26951.

Bath & District 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 G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.

Wirral 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.

Thornbury & District ARC have arrangements for exhibition station on September 27 and RAE registration at Castle School on the 29th. October 1/2 is Exhibition Station at Oldbury Power Station, the 11th G8AZT on Valves and the 25th a Natter Night. H. T. H. Cromack G0FGI on Thornbury 411062.

Wakefield & District RS meet Tuesdays, 8pm in Ossett Community Centre, Prospect Road. October 4 is a Practical Evening, the 9th an RSGB 21/28MHz Contest, the 11th 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 Activity Night on October 11 and talk and demo on Weather Satellites G8VXB on the 18th. Kevin Marriott G8TWH on Rugby 77986.

Binstead ARS have a talk and demo on various computers in September. Meet Mondays, 7.30pm at the Horse Country Equestrian Centre, Newnham Road, Binstead, IOW. 1st Mondays are Auctions, last are Lectures. Bob Griffiths G0ISB at 29 Dubbers, Godshill, IOW.

Derby & District ARS 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 78710.

Worksop 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 Worksop 486614.

Dunstable Downs RC meet Fridays, 8pm in Room 3 of Chews House, High St (South). A Natter Night on September 23 and Members Slides on the 30th. Tony Kelsey-Stead G0COQ on Luton 508259.

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

Horndean & District ARC have their AGM on October 6. 1st Thursdays, 7.30pm at Merchistoun Hall. Dan Bernard G4RLE on Portsmouth 755274.

Felixstowe & District ARS meet alternate Mondays, 8pm in the Scout Hut, Bath Road. Socials in the Grosvenor Hotel. October 3 is a Visit to Felixstowe Docks, the 17th a Social. Paul Whiting G4YQC on Ipswich 642595 daytime.

Midland ARS meet Tuesdays, 7.30pm with classes from 7pm in Unit 16, 60 Regent Place, B'ham. Wednesday is Morse, Thursdays a Night on the Air. October 18 is their AGM. Tom Brady G8GAZ on 021-357 1924.

Todmorden & District ARS meet 1st & 3rd Mondays, 8pm at the Queen Hotel. They have a Surplus Equipment Sale on October 3 and a Natter Night on the 17th. Val Mitchell G1GZB on Todmorden 7572.

Wyre ARS have a Morse Class on September 28, Pie and Peas Social Night on October 12, GB4FS Fleetwood scouts JOTA stn on the 15/16th and Horse wrestling G0AJW on the 26th. 2nd & 4th Wednesdays, 8pm in Breck Sports & Social Club. Dave Westby G4UHI on Lancashire 854745.

Pontefract & District ARS meet Thursdays, 8pm in Carleton Community Centre, Carleton Road. September 24 is RAYNET Exercise — "Went Valley Hike" and the 29th is On the Air. October 6 is RSGB Night with Martin G3ZXZ Liason Rep, the 13th is a Committee Meeting, the 20th Satellite TV by G4FBA and the 27th is On the Air. Eddie Grayson G6OJX 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. Kirsop G4WCE on Hale 5173.

LISTEN OUT FOR

GB2LNM: The Loch Ness Monster special event station will be on the air over the weekend September 24 to 26. Operation will be on 3.5 to 28MHz using mainly 3.7MHz±, 7.065MHz, 14.140-14.240 and other bands as conditions permit. The long awaited Nessie Appreciation Society Certificate should now be available, for more details, contact:

Paddy GM3MTH. QTHR or
Danny GM4LDU. QTHR.

GB8EAR: This station will be operational on 144MHz f.m. from the Great Hall, Town Hall, Hove for the El Alamein Reunion on October 22.

G2DHV
QTHR

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, RAFARS and RNARS members.

G2DHV
QTHR

GB75OLD: The Thornbury & District ARC will be operating this station from the Oldbury-on-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 s.w.l.s

RALLIES

* SWM in attendance

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 G5RV 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 S22. More details on all the events and available 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 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 S22, RB0 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 Drumsill 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: ELHOEX 88 (Electronic Hobbies Exhibition) is being organised by The Hornsea ARC in the Floral Hall, Hornsea. 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 S22.

G8MXI
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 S22.

Mike GW6XCG
Tel: 0656 724041

SHORT WAVE RECEIVERS are our speciality (and all that goes with them)

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 about:-

Accuracy and stability.

"The tuning accuracy and the matching display are impressive indeed. Still the more impressive is this receiver's frequency stability. Drift is virtually non-existent, it was measured at less than 5Hz/hour."

And about dynamic range:-

"ICP 3rd order (3rd order intercept point) was measured at +17dBm at 7MHz and +14dBm at 25MHz. These are excellent values, and they are not the result of decreased sensitivity. The 'NRD-525 is amongst the most sensitive receivers I've measured so far. . . . Dynamic range was computed to 102dB, an equally outstanding value."

All very well you may say, but what does this technical jargon mean in real life? Let me quote Rainer Lichte again:—

"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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Send 50p to cover the postage and we will send you, by return of post, your FREE copy of "THE LISTENER'S GUIDE" (2nd edition), a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will, I am sure, result in a "good read" but underneath the humour lies a wealth of experience and expertise. You will also receive detailed leaflets on our range of receivers and a copy of our current price list.

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INTRODUCTION TO DX-TV

Keith Hamer and Garry Smith

Part 13

In the previous article we discussed ideas for constructing a simple pole mast, suitable for a small antenna system. We continue this month with ideas for larger systems and their means of support.

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 3m section of aluminium tubing. The 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.

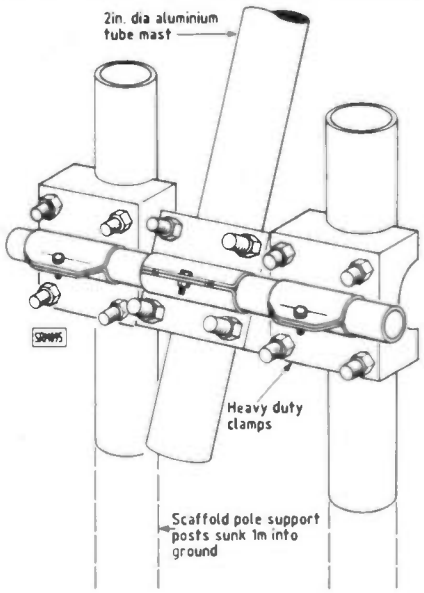


Fig. 1: A simple pivot assembly using heavy-duty clamps.

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.

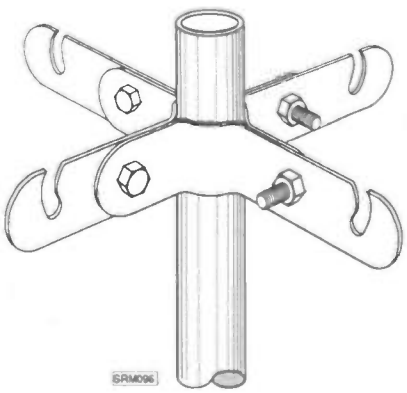


Fig. 2: A four-hook guy wire collar.

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 9 or 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 lines 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 2in 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 eyesore 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 from 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.

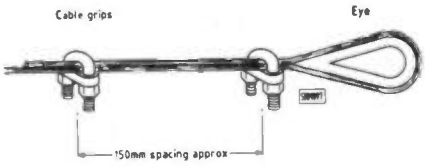


Fig. 3: Using an "eye" and cable grips to terminate a guy wire.

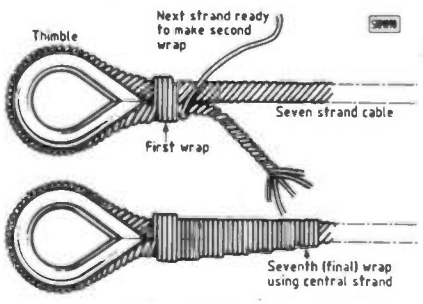


Fig. 4: The "Post Office Wrap" method of terminating a guy wire.

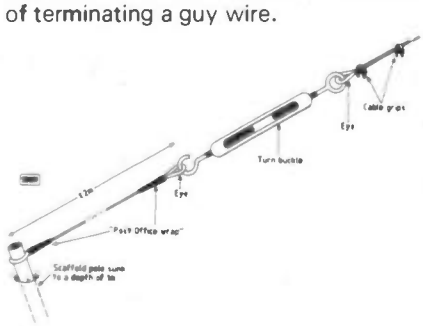


Fig. 5: A method of installing turnbuckles. The guy wire anchor point is also shown.

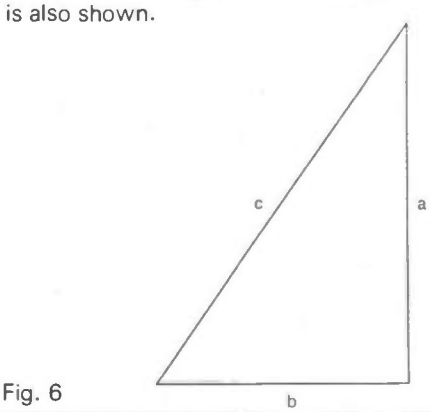


Fig. 6

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 pre-determined 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 **minimun** 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 over-tightening 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 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.)

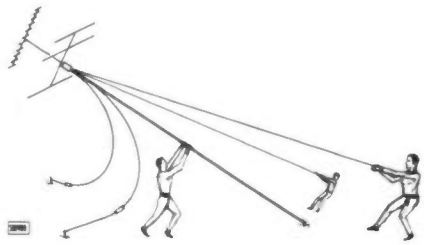


Fig. 7: Raising the mast to a vertical position with two of the guy lines already attached to their anchor post.

Once the lengths are calculated, it may be advisable to erect the pole mast 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 height, 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 cabling 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 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. □

REALISTIC PRO-38 SCANNER

Mike Richards

Are you looking for a simple v.h.f./u.h.f. scanner? If so, the realistic PRO-38 reviewed here could well be just for you.

The Realistic PRO-32 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,

MANUAL. Then 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 comes 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 inadvertant 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 surpress 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 260mW 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 shouldn't get caught out with dead batteries though as there is a low battery alarm. The radio emits a beep

▷22

SCANNING

Alan Gardner

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 encripting information before it is transmitted is of course not new. People were devising various codes and cyphers 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 encription the more difficult it is to convert whilst avoiding errors creeping in. Especially with noisy or fading radio paths.

The more complicated methods of encription make allowances for distortion 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

This month I thought it would be interesting to take a look at a subject I believe will play an increasing role in Radio Communications over the next year, Speech Scrambling.

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 encripted 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 encription 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.

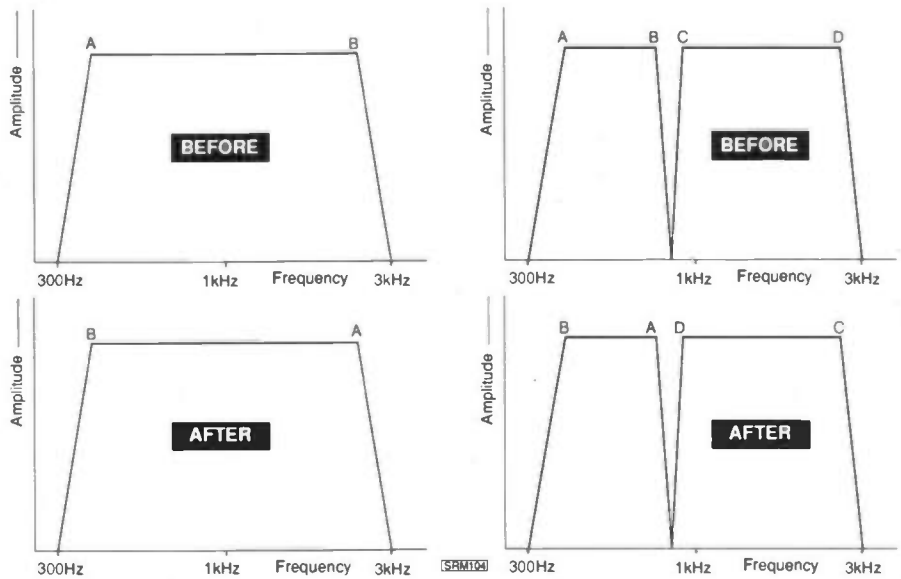
So far we have only considered scramblers which use a fixed method of encription. This makes the system much simpler, as it is not necessary to send any control information along with the speech in order to ensure correct descrambling at the other end. So if anyone wished to listen to a scrambled conversation 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 encription 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 encription 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

Fig. 1



Original speech	HELLO HOW ARE YOU?
Division into blocks and storage	|HE|LL|O – |HO|W – |AR|E – |YO|U?|
Re-ordering & synchronisation	|••|AR|LL|YO|E – |W – |HE|U?|O – |HO|
Transmission	••ARLLYOE – W – HEU?O – HO
Reception	••ARLLYOE – W – HEU?O – HO
Detection of sync & recovery of blocks	|••|AR|LL|YO|E – |W – |HE|U?|O – |HO|
Re-ordering of blocks	|HE|LL|O – |HO|W – |AR|E – |YO|U?|
Re-assembled speech	HELLO HOW ARE YOU?

Fig. 2: Example of Time Domain Scrambling.

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 10000 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 encription 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 1985. 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.

The system works by transmitting a series of signals from several different

SRM105

▷19

Fig. 3

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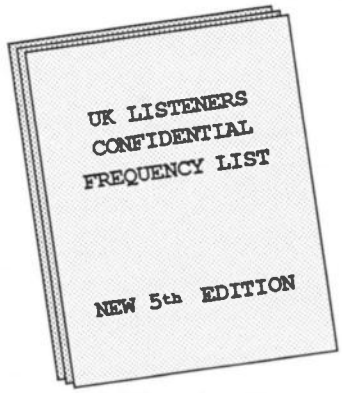

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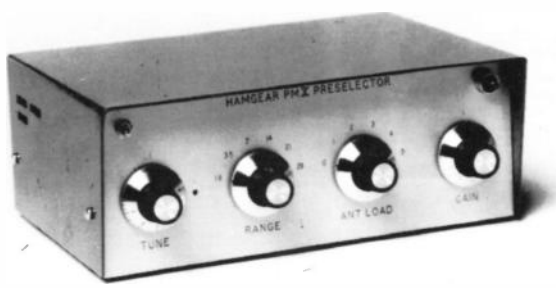

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THREE-BAND SSB RECEIVER

C. M. Lindars

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 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 280pF 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 then to the appropriate tag.

YOU WILL NEED

Preselector

Resistors
¼ W 5% Carbon film
1kΩ 1 R2

Capacitors
Polyester
10nF 1 C1
0.1μF 1 C3

Variable Dilecon
0–350pF 1 C2 (see text)

Semiconductors
Transistors
2N3819 1 Tr6

Miscellaneous
Tag strip; Tinned copper wire.

Mixer Board

Resistors
¼ W 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, min. block
0.56μF 4 C5,6,7,8

Miscellaneous
Matrix board 10 x 30 holes; Pot core assembly comprising Core LA4345 Bobbin DT2470 and Clips DT2396 (2).

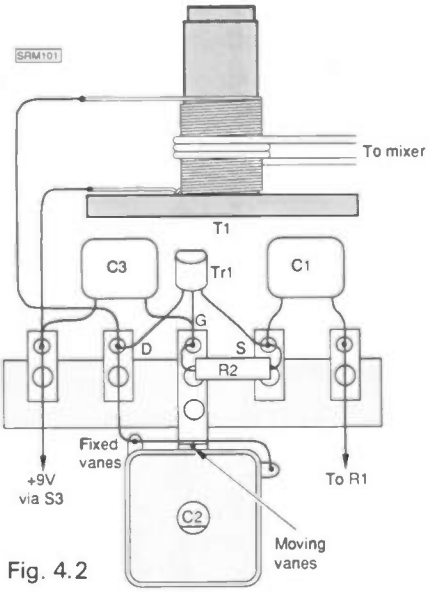


Fig. 4.2

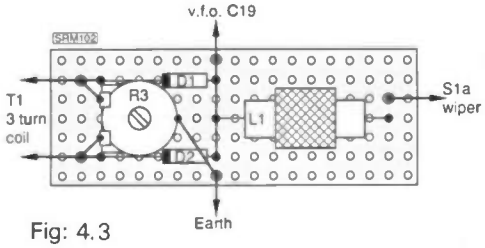


Fig: 4.3

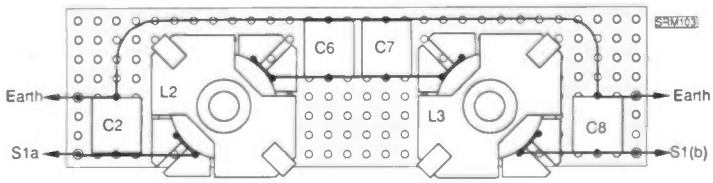
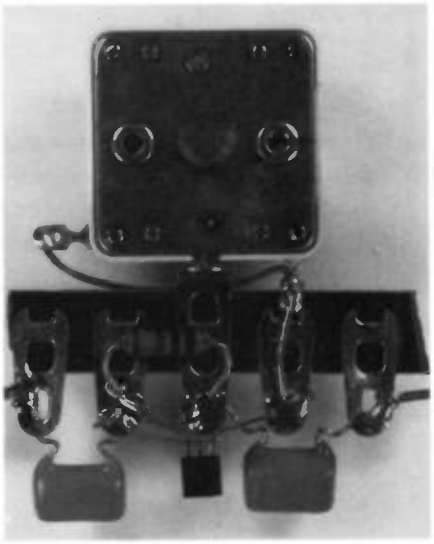


Fig 4.4

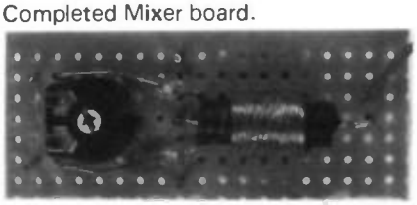
The Mixer

The mixer stage is built 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 & 2 so that they fit as shown, bending the leads over,



Completed Pre-selector.

Completed Mixer board.



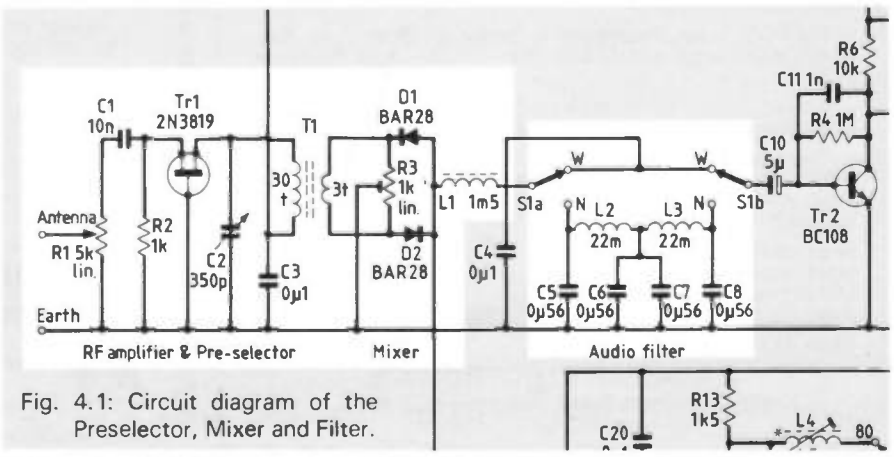


Fig. 4.1: Circuit diagram of the Preselector, Mixer and Filter.

THREE-BAND SSB RECEIVER

Part 4

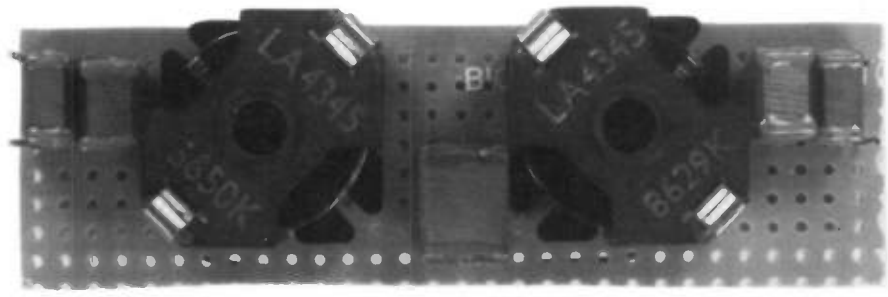
under the board, to make contact with the leads of R2 as shown. Carefully solder these joints together. Repeat this process for the r.f.c. L1, finally adding the leads for the earth, etc. Although not shown on the drawings, it has been found that the performance is improved by connecting a 1kΩ resistor 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 HX08J (Clips Type 2) from their catalogue to make up the two assemblies needed for L2 & 3.



Completed Filter board. In the prototype C5&8 have each been made up from two smaller capacitors in parallel and C6&7 have been combined into one larger capacitor.

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 tinned 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 0.56μF 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

▷17

chains of transmitter sites. 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 taking 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 encription. Until next month – Ging Loodenist! □

AIRBAND

Godfrey Manning G4GLM

Thanks for all your letters again this month; without them, it wouldn't be **our** column.

The Matsui MR4099 was causing **Tom Smith** (Swindon) trouble (see July "Airband") as 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 exerienced by **Leslie Sargent** (Runcorn) 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 centreline 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 Portishead 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 16.370MHz. During the present difficulties with a.t.c. strikes in Europe the company frequencies will be busy with aircraft trying to resolve delays.

Godfrey explains in more detail the flight plan used in the recent article "Luton to Dusseldorf". He also finishes off his explanation of i.l.s., started in the July column, and brings us in to land.

Neil Wheatley reports that he has found the Blackpool n.d.b. (BPL: dah-di-di-dit, di-dah-dah-dit, di-dah-di-dit, 278.5kHz) about 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* now carries an improved 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.

Dounreay: 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	kilograms
kHz	kilohertz
l.o.m.	locator outer marker
m	metre
m	mile
MHz	megahertz
m.s.a.	minimum safe altitude
nav	navigational
n.d.b.	non-directional beacon
nm	nautical mile
RAF	Royal Air Force
s.i.d.	sudden ionospheric disturbance
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional 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*. **Donald Symonds** (Eastleigh) has also pointed this out.

Bernie Surtees (West Auckland) tried out the increased scan speeds on his Tandy 2004 and is well pleased (see August "Airband"). He also notes that an altimeter calibrated to give one revolution per 1000m will provide poorer resolution than one giving 1000ft per revolution of the largest pointer.

It was mentioned by retired airline pilot **Leslie Greville-Smith G4SUJ** (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 QNE (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, within which there are two Mach 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 FL290, M.72, with a 20 knot tailwind. 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 in to 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?

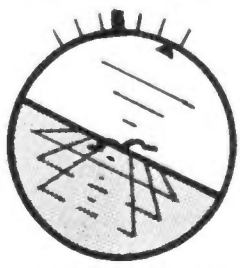
You Write

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 121.5MHz 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 (close to the 436ft spot height on my map) and from here you can see aircraft going in to Heathrow and some on the ground as well! Is Northolt in view too? Who needs radar? This place is just north of the London Control Zone so light aircraft have a right to be there if below 2500ft altitude. The best chart that shows the area in detail is *Helicopter Routes in the London Control Zone*, from the CAA (Chart Room, CAA House, 45-59 Kingsway, London WC2B 6TE. Tel: 01-379 7311 Ext. 2569). To answer your question about v.o.r. radials, let's imagine a square map (north being towards the top as usual). On the right-hand margin, half-way up, is a v.o.r. beacon. An aircraft commences a journey heading due north along the left-hand margin (i.e. bottom left to top left). The pattern seen on the horizontal situation indicator (h.s.i.) depends on the selected radial, so let's pick the 270° one. This extends horizontally across the map from the beacon towards the half-way point on the left-hand edge. In other words, halfway through its journey the aircraft will intercept then pass the selected radial. The beam bar of the h.s.i. will be horizontal, and will descend the face of the instrument from top to bottom. When it is dead centre, the aircraft has the beacon exactly over the pilot's right shoulder; this position is said to be **abeam** the v.o.r. (same expression as used by mariners!). The aircraft is positioned on the radial just at that moment, and will soon leave it behind. Let me know if you would like more explanation.

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



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 sale to 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 *HF/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. on; 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 TW6 2JA.

Certain flight numbers can be identified simply by asking your travel agent for the relevant timetable as **E. G. Sampson** (Hunstanton) has found. He also uses *Flight Routings 1988 – The A-Z Guide to Airline Flights Within 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 (loc) 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 loc and when one of these is tuned (110.5MHz, identity ISX: di-dit, di-di-dit, dah-di-di-dah in this case) the corresponding one of forty g.p. channels is automatically selected from the 329.15-335.0MHz 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 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 ¾nm. 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 hoizontal 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 obliging 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 7½° 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.l.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

▷12

every 15 to 30 seconds to alert you to the fact that the batteries need changing soon.

There are two screw holes on the back panel of the PRO-38. These are so that a belt clip can be attached, this is provided along with the necessary screws.

Performance

I had a brief opportunity to put the PRO-38 through the *SWM* test lab and was pleasantly surprised by the results. The scanner actually bettered the published specification on most counts.

The sensitivity was good compared with the results Tandy give in their own manual. The only exception was at the extreme top end (512MHz) where the sensitivity was slightly worse than quoted. The i.f. (intermediate frequency) rejection was particularly good, exceeding the specification by 40dB.

The on-air performance was quite respectable for a radio of this type. Initially 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 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 f.m. bands), this type of radio would probably be more useful.

The PRO-38 costs £99.95 and is available from branches of Tandy (UK) Ltd. Many thanks to the head office for the loan of the scanner. □

SPECIFICATION

Frequency Coverage:	66-88MHz 5kHz steps. 136-174MHz 5kHz steps. 406-512MHz 12.5MHz steps.
i.f Frequencies:	First i.f. 10.85MHz Second i.f. 450kHz
Sensitivity:	66-88MHz 0.5μV (0.32μV) 136-174MHz 0.7μV (0.6μV). 406-512MHz 0.7μV (0.88μV). All for 20dB s/n ratio.
Selectivity:	+ – 10kHz –6dB (11.75kHz). + – 17kHz –50dB (16kHz).
i.f. Rejection:	10.85MHz 45dB (86dB).
Squelch Sensitivity:	Less than 1.8μV (0.71μV).
Audio Output:	260mW in 8Ω (250mW).
Current Drain:	50mA squelched (45mA). 110mA full power (140mA).
Dimensions:	178mm high, 67mm wide. 35mm deep.
Weight:	298g.

Figures in brackets give the measured results.

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
v.h.f.	very high frequency

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BANDSCAN

Peter Laughton

New Italian Station To Start on SW

IRRS 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 their own broadcasts, so IRRS has built a facility in Northern Italy with the aim of hiring out the airtime. 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 supress-carried single sideband. The antenna will be omni-directional, 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 to United States troops based in El Salvador and Honduras. It plans to use interview material from war veterans in all countries who have become peacemakers.

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 informational 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. Reports have been circulating in the last couple of weeks that Austria and Canada are close to a

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.

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

One of RCI's many different QSL cards.

hours a day for early morning broadcasts in English and French beamed to the Middle East, via Radio Austria International's facilities at Moosbrun.

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 relay 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.

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 revisited, Trans Polar Solar Blanking, DXing 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, RRT Number 5, Box 14, Stillwater, 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, Szczezin, Gdansk and Krakow. The programmes are simply put together and broadcast by clandestine transmitters. Although the various stations co-operate 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.

▷ 31

Abbreviations	
BBC	British Broadcasting Corporation
IRRS	Italian Radio Relay Service
kHz	kilohertz
kW	kilowatt
MHz	megahertz
m.w.	medium wave
RCI	Radio Canada International
TV	television
US	United States
UTC	Universal Co-ordinated Time (= GMT)
W	watt

TUNING-IN IN THE 1930s

G. E. W. Hewlett

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 side-band 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 98 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 enthusiast 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 roof-tops.

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?

Three scraps of paper, pages taken from an old reference book printed over 50 years ago, give some idea of what pre-World War II short wave listeners tuned in to.

Unaccountably, there are omissions in the list for who among the world's old-time s.w.l.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 still well-known today in the world of radio and music. The list does give Eindhoven as being in Portugal (CT1AA) using 2kW on 9.586MHz! Must surely be an error!

And what about Kemilawoa-Cho-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 were Bound Brook (W3XAL) and Schenectady (W2XAF) from one of which a country and western programme, *Home on the Range*, was a regular switch-on.

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 9.590MHz. (Sydney VK2ME, 12kW) and on 9.510MHz. (Melbourne VK3ME, 5kW), and to hear either on a one-valve receiver was an achievement!

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

And there was the League of Nations station in Switzerland (on 7.444MHz). Spain's QSL card – EAQ (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 Lumpar (Malay States) on 6.000MHz. Its callsign was VS2AB.

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, Winnepeg, 6.147MHz, 3.5kW, VE9CL). From South America to Morocco (Rabat, Radio Maroc, 9.300MHz, 12.880MHz, latter had a power of 20kW), and Casablanca relayed Rabat on 6.250MHz (CN8MC).

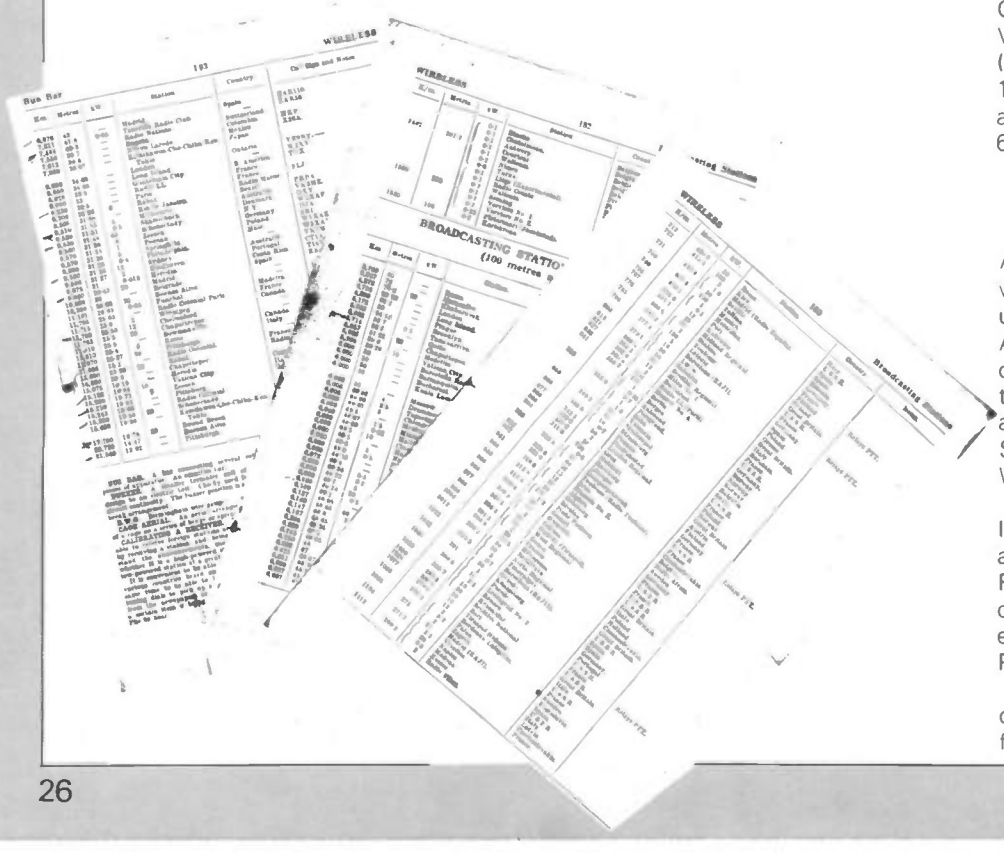
Long and Medium Waves

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 Droitwich is powered at 400kW, sharing the frequency with two Scottish stations, Burghead 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 (767kHz, 25kW), while at the other end were Bournemouth (300W) and Plymouth (100W) sharing 1.474MHz.

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

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



ROBERTS RCS-80 REVIEW

Jack Aldridge

It all started when the editor sent me a little book all about the history of the Roberts Radio Company, you may have seen it in "Bookcase" a few months back. It was a very interesting read too, with the history of the company nicely told. Then, when I was asked would I like to look at the RCS-80, I quickly agreed .

The RCS-80 represents the latest development from Roberts and comes complete with "By Appointment" notices from Her Majesty The Queen, Her Majesty Queen Elizabeth the Queen Mother and HRH The Prince of Wales — so who am I to argue!

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.

What it Looks Like

The styling owes a lot to the company's past, with the basic cabinet (wooden, of course) looking very similar to its predecessors. Traditional looking, I think that's the modern way of describing a radio like this. The main changes are the front panel and the electronics.

It can be powered either from internal batteries (you'll need six R14 size batteries), or alternatively from 220-240V mains using the internal power unit. The change-over from battery to mains operation, and *vice versa*, is completely automatic which is useful. Although, there is a disadvantage (isn't there always). If the mains power should fail, or be accidentally switched off, the radio will continue to operate happily, but will drain your batteries. Not a serious problem, but one to watch out for should you be in the position of sharing the radio with someone in the kitchen, for example.

The RCS-80 has a minimal number of external connections, but the ones provided seem to have been thought out beforehand. It also makes the radio simple to operate. From the point of view of antennas, the radio is self-contained. There's an internal ferrite rod for medium and long wave, with a standard rotatable telescopic antenna for v.h.f. If you need improved v.h.f. reception, there is a standard Belling-Lee coaxial socket on the side panel so you can connect an external antenna of your choice. I think this is probably of most use domestically if you are in a fringe area, but proved fine for v.h.f. DXing.

What is Sounds Like

As for the audio side of the set, there are two external connections. The first is a standard 6.3mm stereo headphone jack on the top panel. This should prove suitable for the majority of headphones on the market as it will drive an impedance range of 8 to 1000Ω. I certainly found my 'phones worked OK. Don't be misled by the stereo jack. The sound output is mono, with the same signal fed into both earpieces.

The second audio connection is a five-pin DIN socket mounted on the side panel. This means you can get an audio output at about 50mV and 30 per cent modulation, 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!). 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 storing 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

ROBERTS RCS-80 REVIEW

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 1kHz 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 10.7MHz for v.h.f. f.m. and 450kHz for long and medium wave. Varicap tuning is used throughout with f.e.t. r.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 110mm 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!

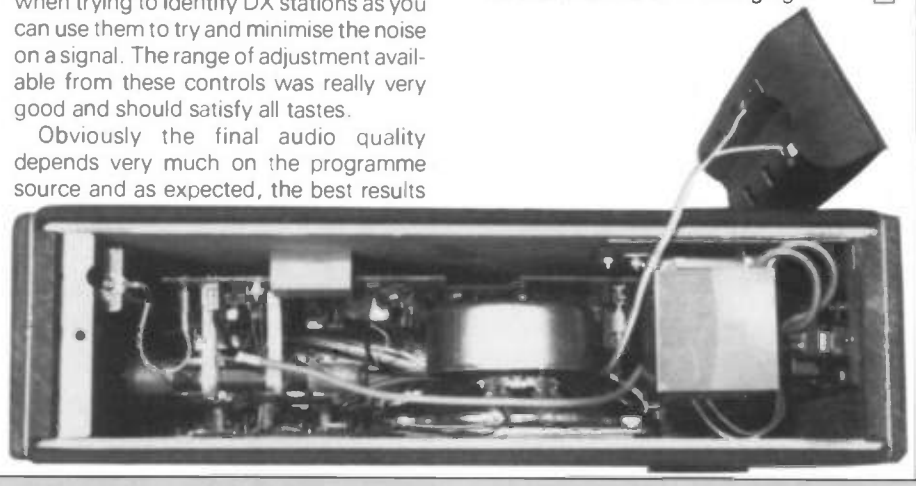
The Verdict!

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 backlight for the l.c.d. is far too dim to be of any practical use, that's hardly a serious complaint! The sound quality and r.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 0RL** for the loan of the review model, and Peter Brownbridge of **Johnsons Shortwave Radio** for arranging it. □

Abbreviations	
f.e.t.	field effect transistor
f.m.	frequency modulation
i.f.	intermediate frequency
kHz	kilohertz
kΩ	kilohm
l.c.d.	liquid crystal display
l.w.	long wave
mm	millimetre
mV	millivolt
m.w.	medium wave
r.f.	radio frequency
V	volt
v.h.f.	very high frequency
Ω	ohm



SERVICES

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 to 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 taking 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, *PW* 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.

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STARTING OUT

Brian Oddy G3FEX

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 alleviate the ever increasing congestion in the s.w. 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 broadcasts 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 s.w. 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 radiated 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

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.

–16dB or even – 6dB may be selected when poor conditions arise.

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

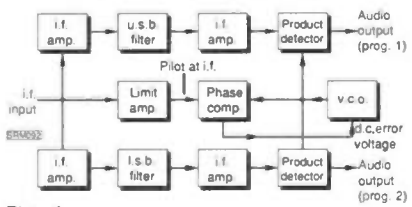


Fig. 1

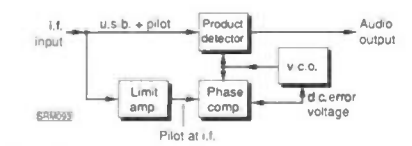


Fig. 2

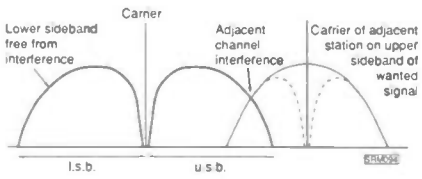


Fig. 3

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 a 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 an a.m. transmission and so a 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 either 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

STARTING OUT

chain the lower sideband – see Fig. 2. The s.s.b. output from each i.f. chain enters a separate product detector, but the locally generated reference is a common one derived from a v.c.o. which is phase locked to the i.f. sample of the pilot carrier. The audio output from each product detector will be the original modulating signal.

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 **exalted carrier detection,** may be used with an s.s.b. receiver to improve the reception of 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. amplifier(s) 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 sided 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., 2.7kHz for s.s.b. and 500Hz or less for c.w. signals. □

Abbreviations	
a.m.	amplitude modulation
c.i.o.	carrier insertion oscillator
c.w.	continuous wave (Morse)
dB	decibel
d.c.	direct current
d.s.b.	double sideband
h.f.	high frequency
Hz	hertz
i.f.	intermediate frequency
i.s.b.	independent sideband
ITU	International Telecommunications Union
kHz	kilohertz
l.s.b.	lower sideband
p.l.l.	phase locked loop
r.f.	radio frequency
s.s.b.	single sideband
s.w.	short wave
s.w.l.	short wave listener
u.s.b.	upper sideband
v.c.o.	voltage controlled oscillator
WARC	World Administrative Radio Conference

BANDSCAN

▷28

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 Tusa, 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 7.185MHz 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 0900-1400UTC. 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 4 they have been using 25.850MHz for a broadcast to Australia at 1200-1252UTC. 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 1008kHz on Mondays between 2035 and 2100UTC, you may well hear a lot of wierd noises. This is the Dutch domestic service, NOS, busy with broadcasting computer programs in BASICODE.

It is the same system that the BBC Radio 1/4 programme *The Chip Shop* tried a few years back. The UK software experiments were doomed to failure because of the synchronous transmitter system used on Radio 1.

In The Netherlands, the system still has some 300 000 loyal fans, though even the broadcasters admit that the long term goal is software broadcasts in the IBM MS-DOS format. The new Hobbyscoop broadcast times have been introduced to reduce the errors due to fading on m.w. For further details you can write to NOS Hobbyscoop, Box 1200, 1200 BE, Hilversum, The Netherlands. □

The sticker telling all about the Hobbyscoop times and frequencies.

SEEN & HEARD

AMATEUR BANDS ROUND-UP

Paul Essery GW3KFE

PO Box 4, Newtown SY16 1ZZ

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 beam was pointed. Interestingly enough I ended up working VO7AA who was well out of the noise, but over in St. John's he was hearing me at S9 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 both ways on any given path. Thus, imagine a chap with a rhombic working a chap with a wet string antenna. The transmission path for him is out of the p.a., into the rhombic, through space to the wet string to the receiver. The return path is transmitter-wet string antenna-space-rhombic 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 reports. By the same token, two far-apart stations each having a wet string antenna are unlikely to make any contact regardless of their power or the state of the band. On the other hand, there is no lack of documented evidence to show that a few milliwatts into a decent, and high, array can span the world. Indeed, transcontinental contacts have been made on considerably less than one milliwatt. Thus, for 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 a much more technically sensible approach than to spend all on the receiver and hope to do good with a minimal skywire system. There hasn't been any significant improvement in useful sensitivity in receivers for 1.8-30MHz since the twenties, for the simple reason that, alas, the received natural noise sets a limit, let alone the 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 (and infernally irritating!) question: "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 to occupy it! He would like it to be known that his first retirement task is the creation of a complete, all home-brew, 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 idealistic 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 583 prefixes heard in the RTTY mode, thanks to the erection of a five-band trap dipole which yielded a new country in the shape of Argentina. With Bill's problems of the winds off the sea, I wonder how well this one will last in the equinoctial gales that funnel through Lochcarron way, between the hills.

Next we have **Mr. F. Waters** of Maidstone, who wants to know about the Amateur Radio Maintenance Service. Basically you pay a premium, and if your rig goes pop, you send if off to the repair-man and ARMS pays the bill. Get the details from ARMS, Freepost, Ormskirk, Lancs L39 3AB. Of course, this is different from an insurance on the station against the usual fire, theft, falling antennas, etc., risks; but these can be covered in various other ways.

Now over the water to EI: **D. McGlone** (Limerick) has been listening on 14MHz, with A92, CR7, FO5, a gaggle of Yanks, Asiatic Russians, VK8, VP5, VR6, YB, YY, ZC4 and one claimed as a 5K6.

Graham Johnson (Nuneaton) has been a s.w.l. for some five years now, and is a member of the International 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 latched on to PY5EG and PY7ZZ which were doubly pleasing as they were found on 28MHz. 21MHz gave 9V1WU and 4J4F, and on 7MHz GB75HHC was good, from Haywards Heath area.

Eddie M. Gauci (Sliema, Malta) sent in his last Prefix List. Among the interesting prefixes were F6/HB9RB F/PA3CIE/M.

Congratulations are due to **Simon Burgess** (Stockport) who has passed RAE and is in the throes of building a 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 can't have been too bad judging by the number of South Americans — these are like hens teeth at the GW3KFE QTH for some reason, probably related to the presence of a mountain in that direction! The distant Ws — W6 and W7 — also give some indication of Simon's listening times.

A new entrant is **R. Watters**, who lives at St. Austell in Cornwall; Robert has an FRG-7700 plus FRT-7700 a.t.u., fed from about twenty metres of wire some 8 metres high. Possibly the stars of the show are the two S83 stations (S83J and S83H) 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 cover all continents — the only "European" logged was in fact G3ZJS/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 — but if no-one is operating at either A or B, the path from the other 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 amateurs. It must be remembered that most of the activity is by expatriates; as these leave, locally born candidates for licenses are either not forthcoming or, even if they pass all the prescribed tests, are not granted licenses. In some of the countries, even expatriates have difficulty obtaining licences.

And of course, there are always "preferred times" for the more distant parts of the world. VK/ZL in the mornings spring to mind. At other times there may not normally be any predictable propagation — but something up aloft may produce a signal at a totally 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 which completely covers all but the biggest signals. Locally, 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 cloud goes over" and after watching the cloud pass over, come 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.t.u. and earth the skywire side firmly down.

Activity, as another example, often lacks on a band/path until a major contest weekend; watch how, for example the CQ WW, the ARRL DX, the CQ-M contests will suddenly cause activity on 28MHz.

Thus, there is a need for us to know or at least to have a "feel" for, the difference between conditions and activity. Taking a leaf from the v.h.f.ers book, beacons 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, W6WX, was pinched 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 taking s.s.b. on an ordinary portable, injecting the carrier by tuning another receiver local oscillator and adjusting 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 phase-locked loop oscillators with their

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 callsigns will not be credited, nor may any MARS stations be claimed.

3: The object is to hear prefixes not countries, thus there is no discrimination between say MP4B and MP4K 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 150 DXCC Prefixes heard
Gold — over 300 DXCC Prefixes heard

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

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

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

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

attendant noise floor; all are worth someone's trouble to restore. Some, after restoration, might well be useful to, for example RAIBC members or newcomers for their first 'prentice efforts. Let GW3KFE know if you have any which might be useful in the ways indicated.

Clubs

Many s.w.l.s are a bit reluctant to join the local club. The reason is usually given along the lines of "I don't really know enough about the subject". Don't forget that all the others started off in the same boat. Provided you are prepared to "show willing" in the sense of meeting the others half-way, being game to join in, and so on, you'll find it well worth while. Those who claim they didn't get a welcome are usually those who sit to one side, don't offer to speak, and answer in monosyllables when spoken to — when treated like this, the members soon get the message and leave that person alone. If he goes off and says he wasn't made welcome, he has only himself to blame! Do then, join a club. You will have a lot of fun, and you will learn a lot. That's what its all about!

Well, I've cut short my offering this time, to give plenty of room for setting out the new award arrangements. However, I do need lots of reports and your questions about any aspect of the amateur-bands s.w.l. game which I can answer in the column for everyone's benefit. The more queries, the more fun it is to write, and the more fun to read, so we are both happy! See you next time, when conditions should be at the autumn peak. Don't forget those QSL cards either.

DECODE

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

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 his 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 is the very popular Icom ICR-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 934MHz c.b. for local chats.

Kay Strutt sent me an interesting letter describing her entry to the world of utlity 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 the matter further she has has to change equipment several times finally resorting to a Belcom LS102L and Datong VC1 as the receiver and an AMT2 as the decoder. Kay's main rig is a modified Yaesu FRG-9600 Mk5 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 Mk5 for utility station monitoring. 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 FAX-1 and a 16m long wire antenna. Probably the single most important point, when trying to receive v.l.f. stations, is to make sure that the long wire antenna connects directly to the antenna terminal on the rear of the receiver and doesn't pass through any a.t.u. This is because the majority of a.t.u.s on the market are not designed for use on v.l.f. and consequently tend to have a high loss at low frequencies.

Michel Geeraert has written again from Belgium. He is the one who sent all the details of the Atari ST Users Group, ASTUR. His station is quite impressive and comprises a G5RV antenna coupled to a NRD-525 receiver via an Universal Trans-Match a.t.u. The decoder is a PK-232 which has been up-graded with the latest software releases which feeds an Atari 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 Prague Meteo (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 overdue replies, **Jack Birse** has sent in details about the Universal M7000 he's hoping to purchase soon. Regular readers may remember me mentioning the Infotech M6000 multi-mode decoder some months back. The M7000 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 me in with lots 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 climbing 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 CTK news service. The information is given as: Time (UTC); Frequency (MHz); Target Area; Language.

Monday to Friday:

0630-0730. 17.525. Asia. English
0630-0730. 18.985. Asia. English
0800-0845. 18.985. Africa. English
0800-0845. 13.6475. Africa. French
0920-1000. 17.525. Asia. English
0920-1000. 18.985. Asia. English
1030-1130. 18.985. Asia. English
1030-1130. 17.525. Asia. English
1200-1245. 18.985. Africa. English
1200-1245. 13.6475. Africa. French
1320-1400. 13.6475. Asia. English
1320-1400. 17.525. Asia. English
1500-1600. 15.8975. Africa. English
1500-1600. 13.6475. Africa. French
1630-1745. 17.525. Asia. English
1630-1745. 9.353. Asia. English
1800-1900. 13.6475. Asia. English
1800-1900. 5.917. Asia. English
1930-2030. 9.353. Africa. English
1930-2030. 8.1425. Africa. French

Saturdays

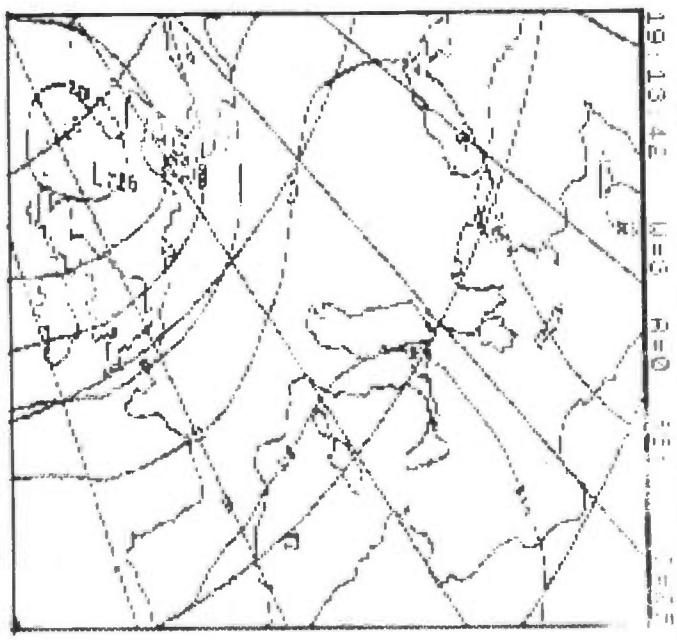
Same as Monday to Friday except for transmissions between 1800 and 2030.

Sundays

1600-1700. 15.8975. Africa. English
1600-1700. 13.6477. Africa. French
1800-1900. 13.5975. Asia. English
1800-1900. 5.917. Asia. English
1930-2030. 9.353. Africa. English
1930-2030. 8.1425. Africa. French

The second schedule this month was supplied by **Jan Nieuwenhuis**. He received this information on Northwood Fax from the Royal Navy on July 26. The information is presented as: Frequency (MHz); Callsign; Times.

2.81385. GYA1. 1630-0730
Sept 30-Mar 31
3.43685. GZZ6. 1930-0400
Apr 1-Sept 29
3.43685. GZZ6. 1530-0830
Sept 30-Mar 31
4.24785. GZZ2. Continuous
6.43685. GYJ3. Continuous
8.49485. GZZ40. Continuous
12.74185. GZZ44. Continuous
Apr 1-Sept 29
12.74185. GZZ44. 0730-1630
Sept 30-Mar 31
16.93885. GYA61. 0400-1900
Apr 1-Sept 29
16.93885. GYA61. 0830-1530
Sept 30-Mar 31



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

As to what you can expect to see, the area served is the North Atlantic/North Sea. This time the information is given as: Time of Transmission; Message; Time of Observation (where appropriate).

0300. Schedule.
0315. Surface Analysis. 0000
0340. Significant Surface Wind/ Weather Prognosis. 1800
0630. Surface Analysis. 0000
0705. Significant Surface Wind/ Weather Prognosis. 1800
0800. Gale Warnings.
0940. Surface Analysis. 0600
1005. Satellite Picture.
1030. Gale Warnings.
1055. Sea Surface Temperature Analysis.
1305. Significant Surface Wind/ Weather Prognosis. 0600
1330. Sea state Prognosis. 0600
1355. Satellite Picture.
1500. Surface Analysis. 1200
1710. Satellite Picture.
1735. Gale Warnings.
1800. Surface Analysis. 1200
1825. Significant Surface Wind/ Weather Prognosis. 0600
1850. Sea State Prognosis. 0600

SEEN & HEARD

QSLing

In the August issue, I mentioned the QSL letter that 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 beautiful 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 8ureaus: AA, ATA, CNA, CTK, AFP, ADN, MTI, IRNA, KYODO, JNA, MAP, Agerpress and TASS.

Time Signal Stations: VNG, CHU, Y3S, IBF, MSF and WWV/WWVB.

Met Stations: Quickborn, Potsdam, Wellington, Bangkok, Jamestoen, Bracknell and Moscow.

Some Navy and Coast Guard Stations: RAN Canberra, PN Horta, BN Oostende, DN Aarhus, FN La Regine, GN Piraeus and RNZN Waiouru.

Oops!

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 Arnot Hill Road, Arnold, Nottingham NG5 6LQ.

2: Microwave Modules, Brookfield Drive, Aintree, Liverpool L9 7AN.

3: Public Domain Software Library, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL.

Flight Service and VOLMET Stations: New York, Gander, Sydney, Nairobi, Kinshasa and Shannon.

Jan does remind us that you must be a little careful with reporting to these stations. You must never mention any 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.

2.716MHz is Goeteborg and not Ostend.

5.457MHz isn't LZF9 Sofia, but unknown.

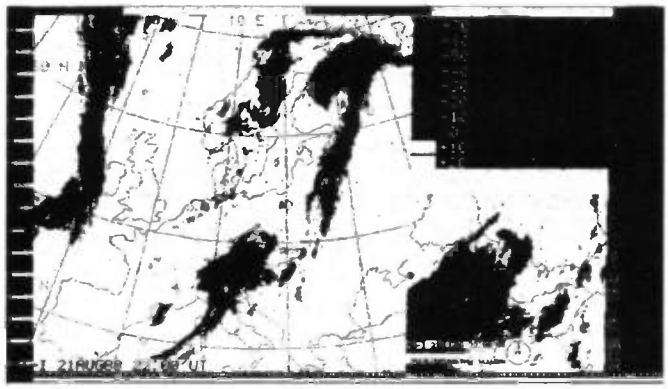
9.169MHz is probably a Swiss Embassy.

11.0615MHz is identified as STK Khartoum Air.

18.358MHz TASS should have been 18.385MHz — finger trouble!

Many thanks to the faithful band of readers who send in their reception reports. Without their efforts, this list would look quite sad. The usual format of frequency, mode, speed, shift and callsign have been used.

122.5kHz FAX 120/576 Halifax Canada (may only just be audible in UK)
2.691MHz RTTY 100/? DHJ51 Grengel Meteo
6.528MHz RTTY 50/? FDY FAF Orleans
7.760MHz RTTY 50/? RGH77 Arkhangelsk Meteo
8.1228MHz RTTY 50/? TNL Asecna 8razzaville
8.352MHz RTTY 75/? 78YLQ Spanish Navy



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

8.605MHz RTTY 75/? UJY2 Kaliningrad
9.053MHz RTTY 50/? Y2V8 ADN English News
10.7145MHz RTTY 75/? CCF Chilean Navy
11.127MHz FAX 120/576 Niarobi
12.777MHz FAX 120/576 Yokosuka Japan
13.998MHz RTTY 50/? Paris Diplo
16.136MHz RTTY 50/R TASS English News
16.268MHz RTTY 50/? Y7A65 MFA 8erlin
16.340MHz FAX 120/576 Auckland New Zealand
16.348MHz RTTY ?/? CLN451 Prensa Latina Cuba
17.230MHz SITOR A UFN Novorossyisk
18.170MHz RTTY 100/R Moscow APN
18.697MHz RTTY 50/? DPA Hamburg
19.529MHz RTTY 50/? JMG5 Tokyo Meteo

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.

8y 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 G3IOR

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

Satellite Designations

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

The following list has been jointly created and provided by **Harry Johnsen LA4XC** of Oslo and **Nico Janssen 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.

Cat. No.	International Designation	Satellite
01293	65 16F	OSCAR-3
03029	67 111A	ATS-3
04321	70 088	OSCAR-5
06236	72 82B	OSCAR-6
06920	73 86A	NOAA-3
07529	74 89A	NOAA-4
07530	74 89B	OSCAR-7
09057	76 77A	NOAA-5
10703	78 26B	OSCAR-8
11084	78 100A	RS-1
11085	78 100B	RS-2
11416	79 57A	NOAA-6
11848	80 51A	METEOR 1-30
11962	80 73A	METEOR 2-6
12456	81 43A	METEOR 2-7
12544	81 57A	METEOSAT-2
12553	81 59A	NOAA-7
12585	81 65A	METEOR 1-31
12888	81 100B	OSCAR-9
12997	81 120A	RS-3
12998	81 120B	RS-8
12999	81 120C	RS-5
13000	81 120D	RS-4
13001	81 120E	RS-7
13002	81 120F	RS-6
13113	82 25A	METEOR 2-8
13138	82 33A	SALYUT-7
13718	82 116A	METEOR 2-9
13923	83 22A	NOAA-8
14129	83 58B	OSCAR-10
14372	83 99A	COSMOS 1500
14452	83 109A	METEOR 2-10
14781	84 21B	OSCAR-11
15099	84 72A	METEOR 2-11
15331	84 105A	COSMOS 1602
15516	85 13A	METEOR 2-12
15362	84 110A	NNSS 30500
15427	84 123A	NOAA-9
15935	85 66A	NNSS 30240
15396	85 66B	NNSS 30300
16095	85 86A	COSMOS 1686
16191	85 100A	METEOR 3-1
16408	85 119A	METEOR 2-13
16609	86 17A	MIR
16613	86 19A	SPOT 1
16735	86 39A	METEOR 2-14
16881	86 55A	COSMOS 1766
16908	86 61A	AJISAI
16909	86 61B	FO-12
16969	87 73A	NOAA-10
17290	87 01A	METEOR 2-15
17561	87 22A	GEOS-7
17845	87 30A	KVANT
17851	87 30C	SPACETUG
18129	87 54A	RS-10/11
18222	87 63A	COSMOS 1530
18312	87 68A	METEOR 2-16
18820	88 05A	METEOR 2-17
18699	87 104A	SOYUZ-TM4
18665	87 101A	COSMOS 1900
19045	88 032A	COSMOS 1939
19216	88 051B	AO-13
19215	88 051A	METEOSAT P2
19217	88 051C	PANAMSAT
19218	88 051D	ARIANE 4
19274	88 056A	OKEAN 1
19336	88 064A	METEOR 3-2

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 command 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.s.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 welcome too, as the behaviour of paths from a source close to the ionised layers add valuable information to propagational studies.

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

SEEN & HEARD

Weather Satellites

METEOR 3-2 was launched in late July and has the following set of Keplerian elements to put into your computers for tracking.

Epoch Year/Day/ decimal day:	209.33466061
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:	85.5443
Mean Motion:	13.16768025
Rev.Epoch/Orbit No:	15

Using this set, we get a reference equator crossing of 0043UTC on 25 September 1988 at 143 degrees west. The satellite will appear north-bound over the equator 109.3 minutes later and 27.4 degrees further west. For the equivalent orbit on each following day we need to add 91 minutes and 25 degrees. On September 25 we have pass aquisitions 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 final frequency has yet to be determined.

Since his earlier input to our column on the use of the Lynx computer for producing superb weathersat pictures, Gordon Train has received over thirty enquiries from readers, but has yet to learn of anyone who has succeeded in adapting the system to any other computer. He has now increased the resolution on 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 1630 on Easter Monday. "Although a good photo,' says Gordon. "it shows some of the problems that can be encountered. The horizontal 'dotty' 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 when the signal has reached the maximum grey scale level it has caused the a.g.c. in the cassette recorder to operate. I have since changed to an Alba cassette recorder with a meter."

Shown in Fig. 2 are two passes joined together in the frame store, although not quite full width to give a full join. The right hand side is from NOAA-10 at 1000, whilst the left is from a METEOR some 40 minutes later. Gordon explains that they fit so well together because of the angle of inclination of two satellites. Gordon took the pictures from a colour monitor using a 5 x 4 camera, the negative was then contact printed. To conclude, Gordon poses a question. "Whilst listening on 137.8MHz in early July I received a good signal two days running which did not sound like the usual METEOR transmission, as it was transmitting at 4 lines per second instead of the usual 2, and had totally different 'syncs'. Unfortunately it only lasted 30 seconds, so I was unable to make much of a picture. Does anyone have any information?"

MIR

Our photograph Fig. 3 was taken by G3IOR in the UoSAT command station at the University of Surrey. It shows Chris van der. Bergh, with Leonid Labutin UA3CR on the left, and Michael Meerhan G0/PA3BHF on the right. Chris is an avid MIR observer and rarely misses a pass. As he speaks fluent Russian, Chris is able to follow the events in and around the manned space station to fully understand the numerous happenings.

He followed closely the unscheduled EVA (Extra-Vehicular Activity) which was much talked about since the departure of the Soviet-Bulgarian mission return to earth, but postponed due to lack of spare parts for the Dutch-British Roentgen telescope aboard the Kvant module. These had to come from the University of Birmingham via the SOYUZ-TM-5.

"The spare parts," explains Chris, "were for the Ishcheyka-s, i.e. the scanner, detector, etc, for other telescopes, for the Mariya device and for the detection of the TDRS beacons. We had to wait a long time for the SOYUZ-TM-4 return and there-docking of SOYUZ-TM-5, during which time the cosmonauts, often with different opinions, discussed the manuals and 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 spacesuits, checking pipes, hoses, cables, inflating and deflating them, etc. Contrary to press reports, they did not see much of the match, as they (especially Titov) were far too busy.

On 30 June, as Chris had earlier deduced by his observations, the EVA came between 0718 and 0725UTC on orbit 13589. "The work was very difficult," explains Chris, "There were bolts which would not unscrew, necessitating a saw, plugs which would not pull out, and difficulty with the gripping equipment, and parts needing access out of reach." He earlier had ascertained that they had to be back in "P.Kh.O" (Perekhodnoy Otsek) transition module at 0957 to re-pressurise until 1003UTC, which did not give them time to complete the planned full schedule, which had included a porthole check.

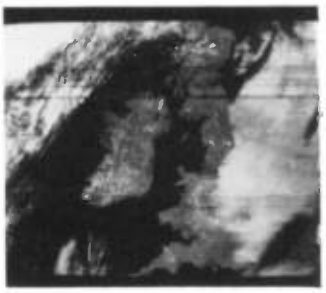


Fig. 1

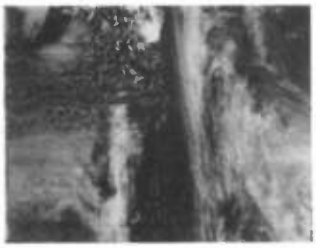


Fig. 2

Since that time, Chris learned from his observations that the EVA was not 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 are very sorry to have to say that the 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 unoiled 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 Laws 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 on orbit 13941, giving the three X, Y and Z co-ordinates in angles and fractions of a degree. The X-axis was quoted at 1 degree, the Y at 1/100, and the Z as 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, food, 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 pass times on the 1015am Sundays and 7.00pm Monday and Wednesday AMSAT-UK nets, on 3.780MHz +/- QRM.

Fig. 3

BAND II DX

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Portable DXing

Although the atmospheric pressure was nearly 30.1in (1019mb) and rising when I left home for Alfriston, East Sussex, early on July 27, there were a few heavy showers and, up until late afternoon, large thunder cells and black clouds, Figs. 1 and 2, kept building up and discharging static. Frequent checks on Band II with my Plustron TVR5D and its own rod antenna inside my car indicated that all was quiet on the DX front. However, on the way home the sky looked very changeable and at 2037 French stations were coming in around 98MHz.

At 1952 on August 3, we stopped on the way home after a really fine day and logged French stations around 100MHz. This coincided with a slight fall in pressure and although my car was parked under trees these signals were very strong. We spent a hot sunny day looking at the astronomical exhibition at Herstmonceux Castle, Sussex, on August 16, but as the cool evening air developed inter-station "warbles" came up at 93 and 95MHz and French stations began appearing between 98 and 100MHz. At 2011 an aircraft went over the area where I was parked and the signal from the French station that I

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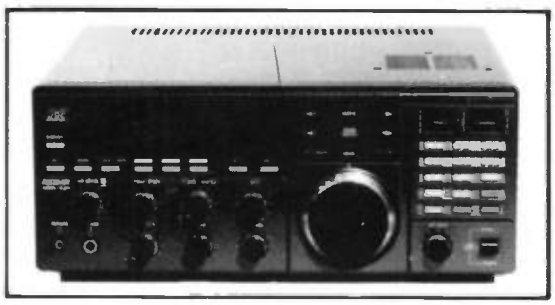

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was monitoring fluttered rapidly between S1 and S9.

While looking for DXTV stations from his car at the top of Cairn O' Mounth, **George Garden** (Edinburgh), using a Sharp car radio, added many new stations above 95MHz 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 ILRs 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 waiting 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 east European broadcast stations between 66 and 73MHz at 1815 on July 29 and at 1900 on the 31st. These signals have a normal range of about 80km, but while a Sporadic-E disturbance is in progress this range can increase more than tenfold.

In Arbroath, **David Glenday** received a test card from Russia and a film and the TP clock caption from Poland in Ch. R3 between 1000 and 1045 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.

"As conditions have been so good lately, especially over the last weekend, the log I'm sending is for July 31 as I've been picking up stations on most of the same frequencies, but this was my best log over the last few weeks," wrote **Ken Lancaster** (Rotherham) on August 9. In addition to identifying Belgian, Dutch, French, German, Italian and Spanish languages, he also logged strong signals from BBC Radio Norfolk and ILRs Chiltern, Hallam, Hereward and Signal Radio. "All not usually heard under normal conditions," said Ken.

Tropospheric conditions looked promising on August 7 and, at 1810, I logged Dutch, French and German stations and found inter-station "warbles" scattered through the band.

David Glenday identified the same Belgian station on 98.6 and 100.1MHz at 2020 on the 8th and a variety of continentals, above 98MHz, around 1700 on the 11th.

On August 5, **Simon Hamer** (New Radnor) received signals from Belgium, Denmark, France, East and West Germany, Holland, Ireland (Radio Telefis 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 8006D Radiogram 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.

Fig. 1

Fig. 2

TELEVISION

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

It is always interesting to see, and hear about, the equipment in use at other people's stations. **Bob Brooks** installation at Great Sutton, Fig. 1, is no exception. The top shelf houses the Sony 2001 and Realistic PRO-2008 receivers and below are 3 popular TV items, the D-100 converter, JVC CX610GB colour set and the Plustron TVR5D monochrome portable.

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 I in his loft. By August 10, he had pictures from Germany, 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 Arbroath on August 11. David's roof-top antennas, Fig. 2, feed 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 Edinburgh goes DX hunting on Cairn O'Mounth, 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 Icelandic test card. Around 2000, a programme schedule with "iDAG" at the top left came up, followed by an ornamental clock showing 1900 and a young lady announcer.

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

At 1758 on July 29, I noticed Text-TV 5469 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 TVE logos appeared followed by an episode of *M.A.S.H.*, dubbed in Spanish.

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

As usual **Edwina and Tony Mancini** (Belper) had a good haul of signals during the month prior to August 10. These included adverts from Portugal (RTP1) and Spain (TVE2); cartoons from France (Canal+) and Spain (TVE1); films from France (Canal+), Italy (RAI), Spain (TVE2) and the USSR (TSS); news from Czechoslovakia (CST1), Italy (TGI), Spain (TVE1) and the USSR (8PEMR and HOBOCTN) and test-cards from Austria (ORF-FS1), Belgium (RTBF1 Liege), Czechoslovakia (8ratislava, DDK2 and RS-KH), Denmark (DR), Finland (YLE-TV1), West Germany (ARD1 Grunten and SWF-Baden), Holland (PTT-NED1) Iceland (RUV Island), Norwegian regionals (Bagn, Bremanger, Gamlem, Gulen, Hadsel, Hemnes, Kautokeino a rare one, Kongsberg, Melhus and Steigen), Poland (TVP1), Portugal (RTP1 Porto), Spain (TVE1 Porla Manana and TVE2), Swden (SVT-Kanal1), Switzerland (+PTT-SRG1), Romania (TVR), the USSR (Eesti Tallinn, Latvijas TV and Optical) and Yugoslavia (JRT Ljubljana).

Among the logos and titles seen by David Glenday during Sporadic-E openings were Estonia at 1240 on July 19 and Kepujsag (Hungary) followed by the MTV clock at 1022, Poland's TP clock on Ch. R3 1036 and the opera Oedipud Rex from Prague at 1110 on the 20th. Then came Televisny Novny (news) from Czechoslovakia at 1620 on the 21st, Germany's ARD1 at 1640 on the 24th, Prana from Czechoslovakia at 1930 on the 29th, La Vida Sique from Spain at 2030 on the 31st, Aktuele (news) from Austria at noon on August 1 and HOBOCTN (news) from the USSR at 1235 on the 9th. David's camera is at the ready when DX is about and this time he caught a very strong test card, in colour, from Finland (Fig. 3) at 1045 on July 26.

In New Radnor, **Simon Hamer** added Albania (RTSH) and Hungary (MTV) 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), Iceland (RUV — Ch. E4), Norway (NRK — Ch. E4), Poland (TVP — Chs. R1/2) and Swden (SVT — 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.

SEEN & HEARD

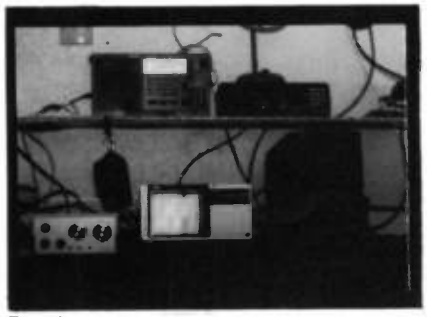

Fig. 1

Fig. 2

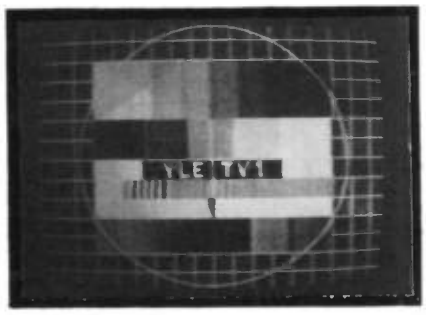

Fig. 3: Finland

Fig. 4

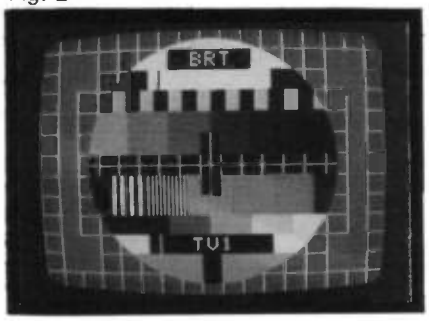

Fig. 5: Belgium

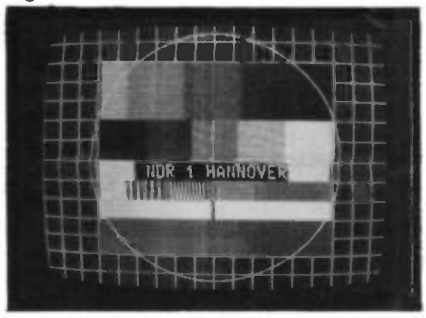

Fig. 6: West Germany

Fig. 7: UK

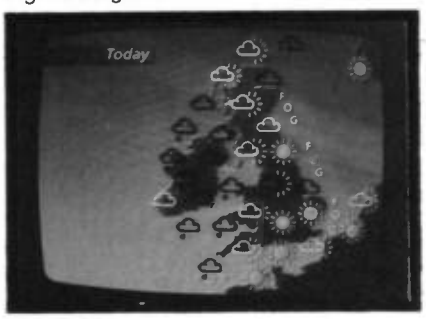

Fig. 8: UK

Fig. 9: USSR

Fig. 10: Dubai

Fig. 11: Lahore

Fig. 12: Pakistan

At 1900, on July 27, **Brian Renforth** (Newcastle) watched *16 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.

Among 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).

Troposperic

"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' Mounth, along with a high gain wide-band antenna and my three channelised 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' Mounth. "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 dipoles," wrote George. Howęver, 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, billowing 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 and, at 2037, I tried my Plustron 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 (Vejle — Ch. 30), France (TDF FR3/RES.3 — Ch. 45), Holland (PTT-NED2 — Ch. 47 and NED3 Chs. 30/35) and Germany (ARD1 — 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), Chatton and Tacolneston (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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and RTBF1), France (TDF), Holland (NED1/2/3) and Ireland (RTE1/2). In Band III he added Denmark (DR), Luxembourg (RTL+) and East and West Germany (DFF1 and ARD/NDR1 and WDR1) to the score.

In Co. Dublin on the 6th, **Paul Hegarty**, using the built in antenna of his u.h.f. receiver, logged pictures from BBC1 and 2 on Chs. 32 and 28 and HTV Wales on Ch. 25.

On the 7th and 8th, **Maurice Peall** (High Wycombe) identified test cards from Belgium (Warve — Canal B) and West Germany (WDR1) on Chs. EB and 9 respectively and u.h.f. signals from Holland (NED 1/2/3) on the 8th. While using his receiver in Margate, Maurice had 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 2, 7, 23 and 25 and the USSR on May 7, 26, 27, 28, June 1, 6, 12, 18, 22, 27, 30 and daily from July 4 to 11 inclusive. He saw aerobic exercises from the USSR (Fig. 9) announcers (Fig. 10) from Dubai TV, basket-ball cartoons and Teletext in Arabic and feature films, European football, judo, marine life, 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 4 which reads:

"1915 Ch. R2 saw multiple signals from Russia. At times could make out European football. At 2000 saw a clock showing 1830 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 till 2200."

While tropospheric openings were in progress on May 31, June 8, 9, 12, 13 and July 6, Rana saw Breakfast TV, cartoons, news and some programmes from Band III transmitters in Agra, Bathinda, 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 422 in the next three years and that at present there are four low power u.h.f. transmitters beaming programmes to people in Punjab and Rajasthan on Chs. 31 and 33.

SSTV

In July, **Fred Pearce** (Driffield) using a Trio R200 receiver, DRAE converter and HQ1 Mini quad antenna logged SSTV pictures from stations in Bulgaria, Finland, East and West Germany, Hungary, Italy, Luxembourg, Poland and Sardinia and has QSL cards from Finland and Sardinia.

LONG MEDIUM & SHORT

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

Long Wave DX

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (= GMT).

A holiday in Porec, NW. Yugoslavia enabled **Ian Baxter** (Blackburn) to check the band in an entirely new environment. Using a Sangean ATS803A portable with just the built-in antenna, he was quite surprised to hear BBC Radio 4 via Droitwich, UK 198 at 2208 as SINPO 23232. Other interesting broadcasts were heard during the evening, the most potent signal stemmed from Junglinster, Luxembourg 234 (2000kW), a remarkable 44444 at 2211. Ian was particularly pleased to hear Plovdiv, Bulgaria 263 (500W) for the first time as 33343 at 2212.

The high level of electrical noise from drills, hedge-trimmers and other appliances came as a surprise to Phil **Townsend** when he searched the band during two Saturday afternoons in London. Despite this he logged several distant stations including Radio Volga via Burg, E. Germany 263 (200kW).

A round up of the latest football results and reports from the grounds in *Le France Football*, broadcast via Allouis, France 162 (2000kW) on Saturdays and Tuesday evenings at 1930 attracted **David Edwards**on in Wallsend. He says it is fairly easy to understand their comments, as many of the football terms are the same in French and English.

Writing from Bristol, **Tim Shirley** says that he has been hearing the broadcasts from Leningrad, USSR 198 (150kW) quite clearly around 2359. Their signal often interferes with BBC Radio 4 from Droitwich, UK 198 (400kW) at that time. Tim has received an attractive QSL card and stickers from Topolna, Czechoslovakia 272 (1500kW) to confirm his reception of their signals at 2300 earlier in the year.

Another visit to Lytham St. Annes has provided **Neil Wheatley** (Newcastle-on-Tyne) with an opportunity to check the band. The log from **Ciaran Fitzsimons** was compiled in Chertsey this time.

MW Transatlantic DX

This aspect of our hobby tends to be neglected by many DXers during the summer months. Some DXers search the band during all seasons of the year as there are often some interesting stations to be heard, but it may be necessary to stay awake until the early hours of the morning!

The latest report from **Simon Hamer** in New Radnor shows the kind of results possible if one is prepared to listen around 0300. Using a Grundig Satellit 1400 portable, he picked up the broadcasts from six stations in the USA and from five in Canada.

Tim Shirley seems to have been active at all hours of the night! He used a Sony ICF-2001D portable with a home-made loop antenna and added several stations to his extensive list of DX. He has received QSL letters from KCMO in Kansas City, Missouri B10 and KFLT in Tucson, Arizona B40. Some of the other stations noted in his report, CHAB B00; WINZ 940; KBBW 1010; KLRA 1010 and CHSM 1250 have not been mentioned in this series before and are subject to confirmation by QSL.

Writing from Randburg, S. Africa, **Leo Gieske** says, "Overall, I think conditions are less favourable at my location than during the previous years". His latest log includes several stations in Central and South America. The signal from the Caribbean Beacon, Anguilla rated as 43333 at 043B, others were 33333 with Radio Bahamas peaking at 23333. Only one broadcaster in the USA was heard this time, WPTR Albany, NY 1540, rated as 33333 at 0440.

Phil Townsend decided to try transatlantic DXing during two nights. He used a Panasonic RF 16B0L portable on the first occasion and may have received WINS in New York 1010 during two short bursts, but he could not obtain a positive ident before going to bed at 2235UTC. He says, "It was pretty obvious that another hour would have to pass before an acceptable level of reception would be possible". On the second occasion he used a Codar valve communication receiver plus Codar a.t.u. and random wire antenna, but he had no luck at all. The good news is that Phil has not been put off by these attempts.

Freq kHz	Station	Country	Power (kW)	DXer
153	Brasov	Romania	1200	A,C,D
153	DLF Donebach	W. Germany	500	D,E*,G,I,J,K
162	Allouis	France	2000	A,B,C,D,E*,G,H,I,J,K
171	Kaliningrad	USSR	1000	A*,D,E*,G*,K*
171	Medi 1-Nador	Morocco	1200	D*,E*,G*
177	Oranienburg	E. Germany	750	D,E*,I*,K*
183	Saarlouis	W. Germany	2000	D,E*,H,I,J,K
189	Motala	Sweden	300	D*,E*,G,K
189	Caltanissetta	Italy	?	G
198	BBC Droitwich	UK	400	A*,D,E*,F,G*,H,I,J,K
198	Leningrad	USSR	150	E*,G*
207	DLF Munich	W. Germany	500	A,D,E*,K
209	Azilal	Morocco	800	C*,E*
216	Oslo	Norway	200	C*,E*,G,I*
216	Roumoules	Monaco	1400	C*,D,E*,H,I*,J,K
225	Konstantinow	Poland	2000	A*,D*,E*,I*,K*
234	Junglinster	Luxembourg	2000	A*,D,E*,H,I,J,K
245	Kalundborg	Denmark	300	C*,D,E*,H,I,J,K
254	Tipaza	Algeria	1500	D,E*,I*,K*
254	Lahti	Finland	200	E*
263	Plovdiv	Bulgaria	500	A*
263	Burg	E. Germany	200	D,E*,H
263	Moscow	USSR	2000	C*,K
272	Topolna	Czechoslovakia	1500	A*,C*,D,E*,G*,I*,K*

Note: Entries marked * logged during darkness. All other entries were logged during daylight.

DXers:
A: Ian Baxter, Porec, Yugoslavia.
B: David Edwardson, Wallsend.
C: Ciaran Fitzsimons, Chertsey.
D: Howard Newell, Great Missenden.
E: Philip Rambaut, 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 Wratten, Cambridge.

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 Wratten** heard a broadcast in Arabic via Les Trembles, Algeria 549 (600kW) at 2151 rated as 44444. Later, he picked up another broadcast in Arabic, from Sidi Bennour, Morocco 540 (600kW) and rated as 34444 at 0247.

Using a Grundig Satellit 1400SL portable in Great Yarmouth, **Ted Walden-Vincent** heard Radio Tirana via Lushnje, Albania 1396 (1000kW) at 2145. Some more distant broadcasts reach us at night, e.g. Marseille, France 675 (600kW) 44444 at 2240 by David Wratten; Rome, Italy 846 (540kW) heard at 2015 by Howard Newell; Kiev, Ukraine 1404 (30kW) logged by Ciaran Fitzsimons as 45354 at 2120; Monte Carlo, Monaco 1467 (1000kW) logged by **Martyn Williams** in Sunningdale; Vatican Radio, Rome 1530 (150/450kW) heard at 2300 by Howard Newell.

Vatican Radio, Rome 1530 has also been heard in S. Africa by Leo Gieske! He rated their signal as 23233 at 0419. Interesting signals from other areas include Reunion Island in the Indian Ocean 666 44444 at 1610 and 4QD in Emerald, Queensland, Australia 154B (50kW), rated as 23333 at 1600.

The broadcasts from AFN via Stuttgart, W. Germany 1143 (10kW) attracted **Paul Hegarty** in Co. Dublin. He rated their signal as 22322 at 0147. He also heard Radio Moscow via Leipzig, E. Germany 1323 (150kW) 43343 at 0145. A holiday in France enabled Paul to hear the BBC multi-lingual broadcasts via Orfordness, UK 648 (500kW) for the first time, as they are

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inaudible at his home location. Using a 9-band Yoko portable in Chartres, 60km SW. of Paris, he received a very strong signal from Orfordness and in Nancy it rated as 45545 at 1430.

Much to his surprise, Ian Baxter heard the BBC 648 broadcasts via Orfordness while on holiday in Yugoslavia rated as 33333 at 2223. Broadcasts from other countries reached him via sky wave paths at night, e.g. Solt, Hungary 540 (2000kW) 44444; Aberdan, Iran 580 (100kW) 21222; La Coruna, Spain 639 (100kW) 22322; Sfax, Tunisia 720 (200kW) 23222; Barcelona, Spain 738 (250kW) 34444; Kavala, Greece 792 (500W) 22222; Rome, Italy 846 (540kW) 44444; Murcia, Spain 855 (125kW) 33433; Torino, Italy 999 as 33233 at 2239; also Tripoli, Libya 1053 (50kW) 33333.

During the day, Ian heard several of the local broadcasts via ground wave paths. They were radiated by Maribor 558 (100/20kW) as 22222; Sarajevo 612 (600kW) 33333; Beograd 684 (2000kW) 44444; Titograd 882 (100kW) 45444; Zadar 1134 (100kW) 55444; Zagreb 1143 (100kW) 33443; also Skopje 1314 (100W) 33333.

Writing from Creteil, France, **Jean-Yves Camus** says he took a receiver with him on holiday to La Rochelle on the Atlantic coast. His location was just 85m from the sea and the level of electrical interference there proved to be very low. The excellent sea path towards Spain enabled him to hear many of their local stations during daylight. The most potent were from Radio Bilbao 990 (10kW) as 45444; Radio Vigo 1026 (10kW) 35333; Santander 1107 (20kW) 45554; Radio Popular, Bilbao 1134 (10kW); Radio San Sabastian 1260 (10kW) 45444. The 4kW regional station of Radio France Pays Basque in Bayonne 1494 was regularly heard at 35333 at 1000.

The broadcasts from Manx Radio via Foxdale, Isle of Man 1368 (20kW) reached **Leo Barr** in Sunderland as 44444 at 2224. Three of the official broadcasts from S. Ireland were mentioned in the reports from UK listeners; RTE-1 via Tullamore 567 (500kW) and RTE-2 via Dublin or Cork 1278 (10kW) were heard at night by **Edward Broadsmith** in Worcester and RTE-2 via Athlone 612 (100kW) was rated as 44444 at 2218 by David Wratten.

Other DXers mentioned Radio Prague, Czechoslovakia 21.705 (Eng, Cz to SE. Asia 0730-0930) rated as 43443 at 0730 by Sheila Hughes; RNI via Kvitsoy, Norway 21.700 (Norw, Eng, Sp to Africa, Sundays 1300-1345) 44444 at 1300 by **Andy Keddie** in Lincoln; Radio Sweden via Varberg 21.555 u.s.b. (Sw to Africa 1100-1600) Tim Shirley at 1400; SRI via Schwarzenburg, Switzerland 21.630 (Eng, Fr, Ger to Middle East 1515-1700) 54444 at 1530 by David Wratten; Radio DW via Wertachtal, W. Germany 21.600 (Eng, Swa, Fr to E. Africa 1500-1750) SIO 454 at 1615 by Kenneth Buck; Radio Nederlands via Bonaire, Ned. Antilles 21.685 (Eng, Fr to W. Africa 1830-2025) 44343 at 1930 by Howard Newell; WYFR via Okeechobee, Florida 21.525 (Eng, Ar, Fr, Port to W. Africa 1600-2245) SIO 111 at 2031 by **Julian Wood** in Buckie.

Using a Philips D-1835 portable with just the built in whip antenna in Molepolole, Botswana **P.R. Guruprasad** logged Radio Nederland via Madagascar 21.485 (Eng, Ind, Du to S.Asia 0830-1125) as 55555 at 0830; Radio DW via Julich, W.Germany (Eng to S.Asia 0900-0950) as 51254 at 0930; BRT via Wavre, Belgium 21.810 (Du, Eng to C.Africa 1600-1655) as 55544 at 1630; Radio Sweden 21.690 as 53554 at 2115.

Reception conditions in the **17MHz (16m)** band have also been affected by solar events.

The broadcasts from Radio Australia in this band are not intended for listeners in the UK, but nevertheless reach our shores when the conditions are suitable. Their transmissions stem from Shepparton, SE.Australia 17.795 (Eng to C.Pacific and W.USA 2200-0630); Darwin, N.Australia 17.750 (Eng, Chin to E. Australia, C.Asia 0000-0900); also Carnarvon, W.Australia 17.715 (Eng to S. Asia 0100-0915). **George Hewlett** has been monitoring all of them in Torquay at 0400 and noted reception as variable. Listening at 0635, David Edwardson noted their transmission via Carnarvon 17.715 as 34433. Edward Broadsmith has also been listening to this transmission and most mornings he has found reception to be good at 0700.

The broadcasts from Radio Japan have also been reaching the UK in the early morning although they are intended for listeners in SE.Asia. Their transmission via Yamata, Japan 17.810 (Jap, Eng 0100-1100) was logged by **Kenneth Reece** in Prenton during several mornings. Using a Trio R5000 receiver, he rated their signal as 25333 at 0540. He has also been hearing KYOI in Saipan, N.Mariana Islands 17.780 (Eng to E.Asia 0200-0800) as 34433 at 0453.

Many broadcasters beam their programmes in a variety of languages direct to Europe during the day. They include the Voice of Israel, Jerusalem 17.555 (Heb 0515-1255) 35333 at 1230 by Jean-Yves Camus while in La Rochelle; UAE Radio Dubai 17.865 (Ar, Eng 0615-1645) SIO 544 at 1600 by Martyn Williams; Voice of Israel, Jerusalem 17.630 (Eng, Fr 1000-1100) 44444 at 1000 by David Wratten; Radio Pakistan, Islamabad 17.660 (Ur, Eng 0715-1120) SIO 343 at 1100 by Cyril Kellam during a dictation speed news bulletin in English; Radio RSA Johannesburg, S. Africa 17.755 (Eng 1400-1600) SIO 444 at 1530 by Kenneth Buck; Radio Cairo via Abu Zaabal, Egypt 17.670 (Ar 1200-1800) 222 at 1700 by Philip Rambaut; Radio Surinam International, Paramaribo via RNB Brasillia, Brazil 17.875 (Du, Eng 1700-1745) 44333 at 1725 by Sheila Hughes; RCI via Sackville, Canada 17.820 (Russ, Uk, Fr, Eng, Pol, Ger, Hung, Cz 1330-2100) 333 at 1710 by Philip Rambaut.

Some broadcasts to other areas were logged by DXers during the day, e.g. Radio Bucharest, Romania 17.805 (Eng to Australia 0645-9715) 44444 at 0645 by **Bill Griffith** in London; Radio Finland via Pori 17.795 (Fin, Sw, Eng to Australia and SE.Asia 0700-1000) SIO 444 at 0800 by Philip Rambaut; Radio Afghanistan via Tula, USSR 17655 (Pa, Eng, Tur to SE.Asia 0430-1230) 22222 at 1020 by Alan Curry; Vatican Radio, Rome 17.840 (Fr, Eng to Africa 1100-1230) 44344 at 1115 by Andy Keddie; Radio DW via Wertachtal, W.Germany 17.810 (Eng, Swa, Fr to E.Africa 1500-1750) 44444 at 1500 by **Darran Taplin** in Tunbridge Wells; BRT via Wavre, Belgium 17.595 (Du, Eng to C.Africa 1600-1655) 45344 at 1645 by P.R.Guruprasad in Botswana; RTM Rabat, Morocco via Tangier 17.815 (Eng, Port to Middle East 1700-1900) 44333 at 1700 by Howard Newell; the Voice of Turkey, Ankara 17.760 (Eng, Tur to SE.Asia 2200-0350) 45444 at 2230 by David Wratten.

Freq MHz	Station	Location	Time (UTC)	DXer
		USA		
690	KHEY	El Paso, TX	0330	C
810	KCMO	Kansas City, MO	0330	C
840	KFLT	Tucson, AR	?	C
870	WWL	New Orleans, LA	0300	C
940	WINZ	Miami, FL	?	C
1010	KBBW	Waco, TX	0330	C
1010	KLRA	Little Rock, AR	0130	C
1010	WINS	New York, NY	0330	B
1050	WFAN	New York, NY	0335	B
1090	WBAL	Baltimore, MD	0330	B
1130	WNEW	New York, NY	0255	B
1210	WCAU	Philadelphia, PA	0300	B
1510	WSSH	Boston, MA	0305	B
1540	WPTR	Albany, NY	0440	A
1560	WQXR	New York, NY	0300	C
		Canada		
580	CFRA	Ottawa, ON	0330	C
590	VOCM	St. John's, NF	0600	C
800	CHAB	Moose, Jaw, SA	0500	C
920	CJCH	Halifax, NS	0320	B
930	CFBC	St. John, NB	0300	B
930	CJYQ	St. John's NF	0255	B
1140	CBI	Sydney, NS	0430	C
1220	CKCW	Moncton, NB	0330	B
1250	CHSM	Steinbach, MN	0100	C
1570	CKLM	Lavel, PQ	0315	B
		C. America & Caribbean		
1540	R. Bahamas	Nassau, Bahamas	0437	A
1570	Atlantic Beacon	Turks & Caicos Ils	0438	A
1610	Caribbean Beacon	Anguilla	0438	A
		South America		
1260	R. Muhler	Sao Paulo, Brazil	0425	A
1350	R. Buenos Aires	Argentina	0436	A

DXers
A: Leo Gieske, Randburg, S. Africa.
B: Simon Hamer, New Radnor.
C: Tim Shirley, Bristol.

Short Wave DX

The latest schedule from Radio Norway International, Oslo indicates that their daily broadcasts to Africa in the **25MHz (11m)** band will have resumed by the time this issue of *SWM* arrives on the bookstalls. Their transmission via Fredrikstad, Norway 25.730 (350kW) in Norwegian may be heard from 1200 until 1245. There has been a considerable increase in the number of solar sunspots since they used the band earlier in the year, so it will be interesting to hear how well their latest transmissions reach their target. If you can hear their broadcasts, be sure to send a detailed report to them — and please send one to me for this series!

Most broadcasters have been reluctant to establish a regular service in this band, but a tentative schedule implies that Radio Denmark intend to beam their programmes in Danish to listeners in S.Asia and Australia via Copenhagen on 25.850 and 1200 until 1250. If these transmissions prove to be reliable, other broadcasters may well decide to follow their example.

Although daily variations in the reception conditions prevailing in the **21MHz (13m)** band have been evident and solar flares have disrupted reception from time to time, many potent signals have been received in the UK during the day.

The 13m broadcasts to Europe from Radio Japan are relayed via Moyabi, Gabon from 0700 until 0830 on 21.695 and their wide ranging programmes in English and Japanese make interesting listening. Using a Sony ICF 7600DS portable with a short wire antenna in Sheffield, **Cyril Kellam** rated their signal as SIO 444. They also broadcast to Europe and N. Africa in English and Japanese via Gabon from 1500 until 1700 on 21.700, David Wratten logged them as 3544 at 1500.

The direct broadcasts to Europe from Radio RSA in Johannesburg, S. Africa 21.590 are popular. Programmes in Dutch and German commence at 0800, but change to English and French at 1100. At 1400 their main broadcast in English may be heard. During most days their signal is so potent that it is easy to forget the vast distance it has travelled to reach the UK, the 55544 quoted by **John Nash** in Brighton being a typical rating.

Although Arabic is the main language used during the daily broadcasts from UAE Radio Dubai 21.605, a news bulletin in English may be heard at 1030, followed by a report on the weather in Dubai. A cultural series then follows. Their signal is usually quite potent for the whole of their transmission which extends from 0615 until 1400. While trying out a Panasonic RF 4800 receiver with an inverted **L** antenna, Sheila Hughes rated their signal as 45444 at 1030.

The Voice of Israel, Jerusalem 21.660 beam their programmes in several languages to listeners in E. Europe during the day (Rus, Eng and Fr 0900-1100; Russ, Buk, Geo, Far and Yi 1300-1640). Listening in Macclesfield, **Philip Rambaut** logged them as SIO 322 at 1515.

Two broadcasters in the USA beam their programmes towards Europe during the afternoon. WHRI in South Bend, Indianna 21.655 may be heard from 1500 until 1700. Their transmission in English was logged by David Wratten as 45444 at 1610. The religious broadcasts from WYFR in Oakland, California reach Europe via Okeechobee, Florida 21.615. Their programmes in Eng, Ger and Fr may be heard from 1600 until 1945. **Kenneth Buck** rated their signal in Edinburgh as SIO 444 at 1929.

The generally improved conditions have enabled DXers to log many of the broadcasts to areas other than Europe

during the day. The report from Philip Rambaut included BBC via Wooferton, UK 21.470 (Eng to E. Africa 0900-1030) noted as SIO 211 at 0940; Radio Moscow via Frunze, USSR 21.515 (Russ to E. Asia 0500-1100) 322 at 0943; BBC via Rampisham, UK 21.710 (Eng to Africa 0900-1615) 211 at 0951; RTB via Wavre, Belgium 21.460 (Fr, Ger to Africa 1000-1755) 111 at 1647; VOA via Monrovia, Liberia 21.485 (Swa to E. Africa 1630-1730) 322 at 1648; WCSN scotts Corner, Maine 21.640 (Eng, Fr, Ger to Africa 1600-1745) 333 at 1656.

The broadcasts from BBC Radio Ulster, N. Ireland reach listeners via Lisnagarvey 1341 (100kW) and relays in Enniskillen B73 (1kW) and Londonderry 792 (1kW). The relays are seldom mentioned by DXers, but the transmission from Lisnagarvey may be heard in many areas of the UK at night. Leo Barr rated their signal as 34344 at 2154. He also heard the 10kW BBC Radio 4 relay from Lisnagarvey 720, 23443 at 2202 with a slight echo effect on the audio. Radio 4 is also relayed on 702 via Lots Road, London (0.5kW) and Londonderry (0.25kW) which may account for this effect.

The *Sweden Calling DXers* programme from Radio Sweden via Solvesborg 1179 is popular with many listeners. Using a Vega 206 portable in Morden, **Sheila Hughes** rated their signal as 43343 at 2100. Edward Broadsmith enjoys the programmes broadcast during the evening by Radio Norway via Kvitsoy 1314 (1200kW). The programmes from BRT International via Wolvertem, Belgium 1510 (600kW) are regular favourites with many UK listeners — **Graham Johnson** rates their signal in Nuneaton as 4444 at 2100.

MW Local Radio DX

The new BBC Radio Gloucester is due to commence full operation in early October on 603kHz. Listening at 1000, David Wratten logged one of their test transmissions as SIO 333, they were relaying BBC Radio 2. He sent them a reception report and was delighted to receive their QSL letter and a very attractive sticker.

While in Lytham St. Annes, Neil Wheatley spent some time checking the local radio scene again. He added three stations to the growing list of DX he has heard there, BBC Radio Leeds 774 (1IW), BBC Radio Foyle 792 (1kW) and ILR Downtown Radio 1026 (1.7kW). BBC Radio York 666 and BBC Radio Stoke-on-Trent 1503, noted in his last log, were inaudible this time.

When in Bristol, **Francis Hearne** often listens to ILR Swansea Sound 1170 (0.58kW), but he was very surprised to hear their signal one night while in Ilford! Using an inexpensive two band Sony portable with just the built-in antenna, he was expecting to hear ILR Radio Orwell on 1170 (0.2Bkw) at 2300, but instead he heard an announcer with a Welsh accent and the Swansea Sound station ident! While in Ilford, Francis also logged ILR Saxon Radio 1251 (0.76W) at 0700.

BBC Radio Furness B37 (1kW) was logged for the first time by **Chris Nykiel** in Leeds. He found the conditions to be rather unusual and was surprised to hear a fading signal from the 2kW BBC Radio Newcastle transmitter on 1458 during most days of the month as it is usually masked by the other local stations on that frequency. Chris used a Crown CSC-615L stereo radio-recorder.

Using Codar receiver with a random wire antenna and an a.t.u., Phil Townsend added ILR Leicester Sound 1260 to his list of DX heard during daylight. The signal from their 0.29kW transmitter was SIO 222. Most of the stations logged by **Christian Pritchard** in Cambridge were also heard during daylight, he used a Trio R2000 receiver with a random wire antenna and an a.t.u. Before installing a new car radio with p.l.l. tuning, Paul Hegarty put it through its paces indoors with a random wire antenna and logged several of the local radio radio stations in England during daylight.

It is a long haul from Stockton-on-Tees to Bedfordshire, but **Alan Curry** heard the 0.27W signal from the Kempston transmitter of ILR Chiltern Radio 792 during daylight. He uses an Icom R70 receiver with a random wire antenna at present.

Sheila Hughes has been hearing ILR Red Dragon Radio via Newport 1305; BBC Radio Guernsey 1116 and several other distant stations during daylight. A Vega 206 portable and a home built loop antenna form part of her essential kitchen equipment during the morning!

A QSL from BBC Radio Devon has been received by Leo Barr, it confirms his reception at dusk of their broadcasts via Barnstaple B01 (2kW), some 456km from Sunderland. Leo has built a "Sooper Loop" and a number of distant stations were logged for the first time while using it with his Steepletone MBR-7 portable. Like most other DXers who have tried this design, he is most impressed with its performance. The full constructional details of the "Sooper Loop" designed by **Dave Mayhew** (Yapton) appeared in the July '86 issue of *Practical Wireless*.

Although the effects of solar events have also been observed in the 15MHz (19m) band during some days, the reception conditions have been generally good. The reception of signals over long distance paths has been especially interesting, as the broadcasts from Radio New Zealand have reached the UK during some nights! Their 7.5kW transmissions from Wellington 15.150 (Eng to Pacific area 1830-2115) have been inaudible here during the last few months due to co-channel interference and propagation changes, however their broadcasts to Australia (2345-0330) have been heard recently by Howard Newell around 0300 at 12221. Listening at 0500, David Edwardson logged one of their transmissions to the Pacific area (0345-0730) as 24442.

The broadcasts from Radio Australia have been reaching the UK well during

Freq kHz	Station	ILR BBC	Power (kW)	DXer
585	R. Solway	B	2.00	A,C,G,H,K,N
603	R. Gloucester	B	?	P
603	Invicta Sound	I	0.10	F,G,I,J,K,M,O,P
630	R. Bedfordshire	B	0.30	G,H,I,J,M,P
630	R. Cornwall	B	2.00	G,K
657	R. Clwyd	B	2.00	A,F,G,H,M,N,P
657	R. Cornwall	B	0.50	G
666	OevonAir R.	I	0.34	G,K,P
666	R. York	B	0.50	A,C,G,H,I,M,P
729	BBC Essex	B	0.10	F,G,I,K,P
756	R. Cumbria	B	1.00	A,N,P
756	R. Shropshire	B	1.00	E,G,H,K,N,P
765	BBC Essex	B	0.50	G,I,J,P
774	R. Kent	B	0.70	G,P
774	R. Leeds	B	1.00	A,H,I,K,M*,N
774	Severn Sound	I	0.14	G*,K
792	Chiltern R.	I	0.27	C,F,G,I,K,M,P
792	R. Foyle	B	1.00	N
801	R. Oevon	B	2.00	A,E,G,P
828	2CR	I	0.27	D
828	R. WM	B	0.20	G,M*
828	R. Aire	I	0.12	A,H,K*
828	Chiltern R.	I	0.20	F,G,M,P
837	R. Cumbria	B	1.00	E,N
837	R. Furness	B	1.00	A,H,K,N
837	R. Leicester	B	0.70	F,G,I,M,P
855	R. Oevon	B	1.00	G
855	R. Norfolk	B	1.00	F,G,M,P
855	R. Lancashire	B	1.00	A,H,N
873	R. Norfolk	B	0.25	F,G,H,J,P
936	GWR	I	0.18	F,G,K,P
945	R. Trent	I	?	G,K*,M,N,P
954	OevonAir R.	I	0.32	G*,P
954	R. Wyvern	I	0.16	G,P
990	R. Aberdeen	B	1.00	A
990	Beacon R.	I	0.09	G,K*,P
990	Hallam R.	I	0.25	H,J,P
999	Red Rose R.	I	0.80	A,C,E,H,N
999	R. Solent	B	1.00	F,O,P
999	R. Trent	I	0.25	M,P
1026	R. Cambridgeshire	B	0.50	F,G,I*,M,P
1026	Owntown R	I	1.70	M*,N
1026	R. Jersey	B	1.00	G
1035	R. Kent	B	1.00	F,G,M,O,P
1035	Northsound R.	I	0.78	A,C,M
1035	R. Sheffield	B	1.00	H,M
1107	R. Northampton	B	0.50	F,G,I,M*,O,P
1116	R. Oerby	B	0.50	C,G,N
1116	R. Guernsey	B	0.50	F,P
1152	BRM8	I	3.00	D
1152	R. Broadland	I	0.83	O*,M,P
1152	LBC	I	23.50	G,J,M,P
1152	Metro R	I	1.80	I
1152	Piccadilly R.	I	1.50	N
1161	R. Bedfordshire	B	0.08	G,I,J,P
1161	R. Sussex	B	1.00	G
1161	Viking R.	I	0.35	H,M,P
1170	R. Orwell	I	0.28	I,M,P
1170	Signal R.	I	0.20	O*
1170	Swansea Sound	I	0.58	O,G
1170	R. Tees	I	0.32	H
1170	Ocean Sound	I	0.12	O
1242	Invicta Sound	I	0.32	F,G,I,M,P
1251	Saxon R.	I	0.76	F,G,M,P
1260	GWR	I	1.60	F,G*
1260	Marcher Sound	I	0.64	N
1260	Leicester Sound	I	0.29	L,M,P
1260	R. York	B	0.50	I
1278	Pennine R.	I	0.43	G,H
1305	R. Hallam	I	0.15	H,P
1305	Red Oragon R.	I	0.20	F,G,I,P
1323	R. Bristol	B	1.00	P
1323	Somerset Sound	B	?	P
1323	Southern Sound	I	0.50	F,G,J,O,P
1332	Hereward R.	I	0.60	F,G,M,P
1359	Essex R.	I	0.28	G,M,P
1359	Mercia Sound	I	0.27	P
1368	R. Lincolnshire	B	2.00	H,M,P
1368	R. Sussex	B	0.50	F,G,O
1431	Essex R.	I	0.35	F,I,M,P
1431	Radio 210	I	0.14	F,G,J,O,P
1449	R. Cambridgeshire	B	0.15	G,I,P
1458	R. Cumbria	B	1.00	E
1458	R. London	B	50.00	G,I*,J,O,P
1458	R. Newcastle	B	2.00	H
1458	R. Manchester	B	5.00	N
1458	Radio WM	B	5.00	P
1476	County Sound	I	0.50	F,J,O,P
1485	R. Humberside	B	1.00	H,I,M*,P
1485	R. Merseyside	B	2.00	E,N
1485	R. Oxford	B	0.50	G,J,P
1485	R. Sussex	B	1.00	F,G,O
1503	R. Stoke-on-Trent	B	0.50	B,C,G,H,P
1521	R. Mercury	I	0.64	F,G*,J,O
1521	R. Nottingham	B	0.50	I,M,P
1530	R. Essex	B	0.10	G,P
1530	Pennine R	I	0.74	H
1530	R. Wyvern	I	0.52	G*,P
1548	R. Bristol	B	5.00	G*
1548	Capital R	I	97.50	G,I,J,M,O,P
1548	R. City	I	4.40	N
1548	R. Cleveland	B	1.00	H
1548	R. Forth	I	2.20	G
1548	R. Hallam	I	0.74	G*
1557	R. Lancashire	B	0.25	N
1557	Northants 96	I	0.76	G,I,P
1584	R. Nottingham	B	1.00	H,M,P
1584	R. Shropshire	B	0.30	B,G
1602	R. Kent	B	0.25	G,P

Note: Entries marked * were logged during darkness. All other entries were logged during daylight.

DXers:

A: Leo Barr, Sunderland.
B: Edward Broadsmith, Worcester.
C: Alan Curry, Stockton-on-Tees.
O: Francis Hearne, Bristol
E: Paul Hegarty, Co. Oublin.
F: Sheila Hughes, Morden.
G: Howard Newell, Great Missenden.
H: Chris Nykiel, Leeds.
I: Christian Pritchard, Cambridge.
J: Stewart Russell, Leatherhead.
K: Tim Shirley, Bristol.
L: Phil Townsend, London.
M: Ted Walden-Vincent, Great Yarmouth.
N: Neil Wheatley, Lytham St. Annes.
O: Martyn Williams, Sunningdale.
P: David Wratten, Cambridge.

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

SEEN & HEARD

most nights although they are intended for other areas. Their transmission via Shepparton on 15.240 is probably the most consistent signal here (Eng to S.Pacific 2100-0730) 35444 at 2300 by Andy Keddie; 45444 at 0235 by David Wratten; 35543 at 0415 by David Edwardson; 44433 at 0541 by Kenneth Reece; also 43233 at 0724 by Alan Curry. George Hewlett monitors all of their broadcasts via Shepparton at 0400, he rated 15.240 as SIO 444; 15.160 (Eng, Fr to C.Pacific 2100-0700) as 433; 15.320 (Eng, Fr to Pacific/W.USA 2200-0500) as 433; but noted 15.315 (Fr, Eng to C. Pacific 0500-0700) as fair to poor.

Writing from Fremantle, Western Australia Davy Hossack says, "The BBC External Service is keeping me up to date with the news at home. The outlets I listen to most are 15.070 and 7.325, both frequencies provide very strong clear signals". UK based transmitters at Daventry, (Northants), Rampisham (Dorset), Skelton (Cumbria) and Woofferton (Shropshire) operate on both frequencies at some time during the day, but it is not obvious which station is involved because Davey omitted to quote the usual times of his reception.

This band is the hub of activity for many listeners and dedicated DXers because so many interesting broadcasters operate here at all hours of the day and night. Some of them beam their programmes in a variety of languages towards Europe during the morning — they include UAE Radio Dubai 15.435 (Ar, Eng 0615-1645) SIO 333 at 1033 by Kenneth Buck; Radio Pakistan, Islamabad 15.605 (Ur, Eng 0715-1120) 43433 at 1100 by Andy Keddie; Radio Finland via Pori 15.400 (Eng, Fin, Sw 1100-1400) 44444 at 1333 by Alan Curry.

Later, many more may be heard, including RNB Brasilia, Brazil 15.265 (Eng, Ger 1800-1950) rated 34433 at 1900 by Darran Taplin; RCI via Sackville, E.Canada 15.325 (Ger, Hung, Cz, Pol, Eng, Fr, Russ 1630-2200) logged at 2100 by Richard Bealey in Exeter; VOIRI Tehran, Iran 15.084 (Sp, Fr, Far, Ar 0530-2330) 45554 at 2000 by John Parry in Northwich; Volce of Vietnam, Hanoi 15.010 (English, Russiđn, Viet, Fr, Sp 1600-2130) logged at 2015 by Ted Walden-Vincent; Radio Baghdad, Iraq 15.230 (Fr, Ger, Eng 1800-2155) SIO 222 at 2055 by Julian Wood; VOA via Tangier, Morocco 15.205 (Eng 1700-2200) 33433 at 2120 by Leo Barr; Voice of Israel, Jerusalem 15.590 (Heb, Russ, Fr, Eng 1730-2225) 54444 at 2123 by Ian Curry in Stockton-on-Tees; Radio HCJB Quito, Ecuador 15.270 (Cz, Ger, Eng, Fr, Sw, Norw, Dan 1800-2200) SIO 433 at 2145 by Philip Rambaut; RAE Buenos Aires, Argentina 15.345 (Ar, Eng, Fr, Ger, It, Sp 1700-2155) 44242 at 2155 by David Wratten; VOFC Taipei via Okeechobee, Florida 15.440 (Ger, Eng 2100-2300) 54444 at 2200 by Christian Pritchard.

Some of the broadcasts to other areas were logged in the morning. They stemmed from RFI via Issoudun, France 15.155 (Fr to Africa 0400-0900) 53333 at 0650 by Robert Cowell in Blackpool; AFRTS via Ismaning, Germany 15.265 (Eng to Middle East 0700-1300) SIO 444 at 0930 by Martyn Williams; Radio Sweden via Horby, Sweden 15.390 (Eng to Australia 0930-1030) logged by Ian Bond (Wirral) at 0945; SRI via Schwarzenburg, Switzerland 15.570 (Eng, Fr, Ger, It to SE.Asia 1045-1300) 44444 at 1100 by Andy Keddie.

More were logged during the afternoon, Radio Korea, Seoul, S.Korea 15.575 (Eng. Kor to N.America 1300-1500) rated as 44333 at 1400 by Christian Pritchard; Radio Sweden via Horby 15.345 (Eng, Sw, Fr to N.America 1400-1530) 55555 at 1415 by Alan Curry; Radio Bucharest, Romania 15.250 (Eng, Far, Ar to S.Asia 1500-1725) 43333 at 1500 by Sheila Hughes; KUSW Salt Lake City, USA 15.225 (Eng to E.USA 1600-1900) 13322 at 1710 by Howard Newell; Africa No.1 Moyabi, Gabon 15.475 (Fr, Eng to W. Africa 1700-2100) SIO 545 at 1716 by Martyn Williams.

Later, Darran Taplin logged radio Sophia, Bulgaria 15.310 (Eng, Port, Fr to Africa 1430-2030) 33433 at 1818; John Parry rated the BBC World Service via Ascension Island 15.400 (Eng to Africa 1515-2030) 45554 to 1855; Ted Walden-Vincent heard Radio Portugal via Sao Gabriel, Portugal 15.250 (Port, Eng, Fr to Africa 1700-2000) at 1905; Kenneth Buck logged WCSN Scotts Corner, USA 15.390 (Eng, Fr, Ger to N.Africa 1800-1955) SIO 444 at 1937; Ian Curry noted VOA via Greenville, USA 15.580 (Eng to W. Africa 1600-2200) 44222 at 2155; Tim Shirley heard KUSW Salt Lake City, USA 15.580 (Eng to E.USA 2200-0100) at 2200; Philip Rambaut logged VOA via Tinang, Philippines 15.290 (Eng to E.Asia 2200-0100) SIO 211 at 2316; David Wratten noted WINB Red Lion, USA 15.145 (Eng, Port to S.America 2348-0330) 24333 at 0300.

The signal ratings of several of the broadcasts to Africa were noted by P.R.Guruprasad in Botswana, namely RBI via Nauen, GDR 15.145 from 1415-1815 (500kW) 55555 at 1805; Radio Sweden via Horby 15.240 from 1830-1930 (350kW) 55555 at 1850; Radio Bucharest, Roumania 15.270 from 1730-1735 (250kW) 53133; Radio Nederlands via Flevo, Holland 15.560 from 2030-2125 (300kW) 44343 at 2035.

On the 13MHz (22m) band, Andie Keddie logged SRI via Sottens, Switzerland 13.685 at 1100 as 43434. David Edwardson noted Reykjavik, Iceland 13.790 as 43343 at 1235. Kenneth Buck logged Radio Prague, Czechoslovakia 13.715 as SIO 455 at 1652; Radio Austria, Vienna 13.730 as 555 at 1655; also radio DW Cologne, W.Germany 13.790 as 455 at 1749. Philip Rambaut heard Radio Pakistan via Karachi 13.665 at 1645, their signal was SIO 222. At 1700 he heard RBI via Leipzig, E.Germany 13.610 at SIO 333. He logged Radio Nederlands via Flevo, Holland 13.700 as 333 at 1750.

Several broadcasts from the USA were noted, WCSN Scotts Corner, Maine 13.760 as 45444 at 1430 by David Wratten; WYFR via Okeechobee, FL 13.760 SIO 344 at 1745 by Kenneth Buck; WHRI South Bend, IN 13.760 44444 at 2030 by Sheila Hughes; WYFR via Okeechobee, FL 13.695 33333 at 2145 by Ian Curry; WRNO New Orleans, LA 13.760 32222 at 2230 by Alan Curry.

During the night, Kenneth Reece heard the Voice of Israel, Jerusalem 13.750 at 0346, their signal was 45534 and Radio for Peace International, Costa Rica 13.660, noted as 34322. This was also heard for the first time by Tim Shirley at 0500.

There is certainly plenty to interest the DXer in the 11MHz (25m) band. Radio New Zealand, Wellington 12.045 (Eng to Australia 0345-0730) was logged by Tim Shirley at 0430, he has sent a cassette tape recording of their transmission to them and is awaiting their QSL. Their broadcasts were also logged by David Edwardson as 22432 at 0425 and David Wratten as 23232 at 0415.

The broadcasts from Radio Australia via Shepparton 11.910 (Eng to Europe and S.Pacific 0400-0630) are monitored from 0400 daily by George Hewlett, on average, their signal is SIO 434. He also monitors their transmission to S.Africa via Shepparton 11.945 (Eng, French 0300-0700) from 0600, when the co-channel BBC broadcast via Limassol, Cyprus closes down.

There are many interesting broadcasts to Europe throughout the day. They include Radio HCJB Quito, Ecuador 11.835 (Russ, Sp, Ger, Fr, Eng, Sw, Norw, Dan 0200-0830) rated as 43343 at 0800 by Sheila Hughes; UAE Radio Dubai 11.730 (Ar, Eng 1405-2050) 433 at 1602 by Kenneth Buck; Radio Beijing, China 11.500 (Ger. Eng 1800-2155) 43323 at 2013 by Colin Godwin in Malvern; WYFR via Okeechobee, Florida 11.580 (Eng, Ger, Fr, It, Sp 1800-2245) SIO

DXers:
A: Leo Barr, Sunderland.
B: Ian Baxter Porec, Yugoslavia.
C: Jean-Yves Camus, La Rochelle, France.
D: Robert Cowell, Blackpool.
E: Alan Curry, Stockton-on-Tees.
F: David Edwardson, Wallsend.
G: Bill Griffith, London.
H: Davy Hossack, Fremantle, W. Australia.
I: Cyril Kellam, Sheffield.
J: Howard Newell, Great Missenden.
K: Fred Pallant, Storrington.
L: John Parry, Northwich.
M: Christian Pritchard, Cambridge.
N: Kenneth Reece, Preston.
O: Tim Shirley, Bristol.
P: Phil Townsend, London.
Q: David Wratten, Cambridge.

Freq MHz	Station	Location	UTC	DXer
2.470	R.Cacique	Brazil	0230	O
3.200	TWR	Swaziland	0420	N
3.220	R.HCJB Quito	Ecuador	0440	N
3.230	ELWA Monrovia	Liberia	2147	Q
3.230	R. RSA	S. Africa	0407	N
3.270	SWAB 1, Namibia	SW. Africa	2130	J,M,Q
3.295	SWAB Windhoek	SW. Africa	2120	K
3.300	R. Cultural	Guatemala	0336	F,N
3.320	R. Orion	S. Africa	2055	B,M
3.325	FRCN Lagos	Nigeria	2054	B
3.330	R. Kigali	Rwanda	1925	Q
3.340	R. Altura	Peru	0440	N
3.355	R. Botswana	Gabarone	2100	B
3.365	GBC Radio 2	Ghana	2055	B,E,J,K,M,Q
3.395	R. Zaracay	Ecuador	0325	F
3.915	BBC Kranji	Singapore	2216	J,Q
3.955	BBC Daventry	England	2030	M
3.955	R. Orion	S. Africa	2130	M
3.955	R. Suid Afrika	S. Africa	2055	K
3.965	RFI Paris	France	2030	J,K,M,Q
3.980	VOA Munich	W. Germany	2000	L
3.985	R. Beijing, China	via SRI Berne	2100	A,E,I,J,P
3.985	SRI Berne	Switzerland	2045	J,K
3.990	RFE Munich	W. Germany	2221	Q
3.995	DW Cologne	W. Germany	2100	J,K,M,Q
4.500	Xinjiang	China	2200	F
4.735	Xinjiang	China	2225	J,M,Q
4.740	R. Afghanistan	via USSR	1845	K,M
4.750	R. Bertoura	Cameroon	2015	K
4.755	Sani Radio	Honduras	0100	O,Q
4.760	ELWA Monrovia	Liberia	1915	K,Q
4.765	R. Moscow	via Cuba	0447	N
4.770	FRCN Kaduna	Nigeria	2115	K,M
4.775	R. Gabon, Libreville	Gabon	1915	J,K
4.780	V. Carabobo	Venezuela	0420	F
4.785	RTM Bamako	Mali	2204	J,O
4.790	R. Atlantida	Peru	0255	F
4.795	R. Douala	Cameroon	2030	K
4.800	LNBS Lesotho	Maseru	1950	J
4.805	R. Nac. Amazonas	Brazil	0201	Q
4.810	R. Yerevan	USSR	2030	B,K,M
4.815	R. diff TV Burkina	Ouagadougou	2100	J,K
4.820	R. Botswana	Botswana	1912	J,M,O

Freq MHz	Station	Location	UTC	DXer
4.820	R. Paz y Bien Ambato	Ecuador	0130	O
4.820	La Voz Evangelica	Honduras	0327	N,O
4.830	Africa No. 1	Gabon	2000	A,B,F,J,K,M,P,Q
4.830	R. Reloj	Costa Rica	0230	F,G,M,N,O,Q
4.830	R. Tachira	Venezuela	0200	F,J,M,N,Q
4.835	RTM Bamako	Mali	2030	B,J,K,M,Q
4.845	R. Nacional, Manus	Brazil	0110	F,J
4.845	ORTM Nouakchott	Mauritania	2030	B,G,J,K,M,Q
4.850	R. Yaounde	Cameroon	2115	K
4.850	R. Capital, Caracus	Venezuela	0330	F,M,N,Q
4.865	V of Cinaruco	Columbia	0339	F,N
4.870	R. Cotonou	Benin	2030	B,F,J,K,N,Q
4.880	SABC Radio 5	S. Africa	2120	E,J,K,N,P,Q
4.890	ORTS Dhaka	Senegal	2140	J,M,Q
4.895	R. Ashkabad	USSR	2120	K
4.895	R. Bare, Manaus	Brazil	0352	N
4.905	R. Nat. N'djamena	Chad	2041	B,F,J,K,N,Q
4.908	Voice of Kampuchea	Kampuchea	1100	H
4.915	R. Anhanguera	Brazil	0340	F
4.915	R. Ghana, Accra	Ghana	2110	B,J,K,P,Q
4.920	R. Quito	Ecuador	0455	N
4.940	R. Kiev	USSR	1955	J,K,M,N,Q
4.945	Caracol, Neiva	Columbia	0415	F
4.955	R. Marajoara, Belem	Brazil	0211	Q
4.960	R. Baku	USSR	2022	Q
4.980	Ecos del Torbes	Venezuela	0305	F
4.990	R. Animas, Chocaya	Bolivia	1830	D
4.990	FRCN Lagos	Nigeria	2200	E,F,G,J,K,N,Q
4.990	R. RSA, Johannesburg	S. Africa	0400	N
4.990	R. Yerevan	USSR	2015	K
5.005	R. Nacional, Bata	Eq. Guinea	2031	B,J,K,N,Q
5.010	R. Garoua	Cameroon	2000	B,K,M,Q
5.030	R. Impacto	Costa Rica	0330	C,F,G,N,Q
5.030	R. Los Andes	Peru	1000	H
5.035	R. Alama Ata	USSR	0505	N
5.035	R. Bangui	C. Africa	2015	B,K
5.045	R. Cultura do Para	Brazil	0115	F,N
5.045	R. Togo, Lome	Togo	2205	J,N,Q
5.055	Faro del Caribe	Costa Rica	0356	F
5.055	R. Catolica Nacional	Peru	0600	H
5.057	R. Tirana Gjirokaster	Albania	2034	J,O,Q
5.095	R. Sutatenza, Bogata	Columbia	2345	M

SEEN & HEARD

322 at 2142 by Philip Rambaut; Radio Kuwait, State of Kuwait 11.665 (Eng 1800-2100) 55444 at 2100 by Christian Pritchard; Radio Damascus, Syria 12.085 (Ger, Fr, Eng 1835-2105) 44444 at 2005 by Howard Newell; AIR via Aligarh, N.India 11.620 (Eng 1845-2230) 43553 at 2050 by John Parry; Radio Japan via Moyabi, Gabon 11.800 (Jap, Eng 2200-0000) 44434 at 2300 by Andy Keddie.

Some of the broadcasts to other areas stem from UAE Radio Dubai 11.955 (Ar, Eng to N.Africa, Middle East 0615-2050) SIO 333 at 1603 by Kenneth Buck; FEBC Manila, Philippines 11.580 (Eng to SE.Asia 0830-0930) 34333 at 0827 by David Wratten; Radio Beijing, China 11.600 (Eng to S.Asia 1400-1555) logged at 1500 by Ted Walden-Vincent; Radio Prague, Czechoslovakia 11.685 (Eng, Cz, Ar to Middle East) 43343 at 1435 by Sheila Hughes; Radio Nederlands via Talata Valon, Madagascar 11.740 (Eng to W.Africa 2030-2125) 32422 at 2104 by Ciaran Fitzsimons; Radio Finland via Pori 11.757 (Eng, Fin, Sw to S.America and SW.Europe 2100-2205) 43334 at 2100 by Colin Godwin; Radio Vilnius, Lithuania 11.790 (Eng, Lith to N. America 2200-0030) logged at 2200 by Francis Hearne; RHC Habana, Cuba 11.760 (Sp to S. America 2200-0140) 43444 at 2315 by Bill Griffith; Voice of Israel, Jerusalem 11.605 (Eng, Heb to N.America 2300-0125) 45444 at 0020 by Darran Taplin; Radio Japan via Yamata, Japan 11.870 (Jap, Eng to N.America 0200-0700) 33343 at 0300 by Christian Pritchard.

The broadcasts from Radio Australia have been reaching the UK well in the **9MHz (31m)** band. Their transmission to Europe via the "long path" from Shepparton 9.655 (Eng 0700-1000) was logged by David Wratten as 34343 at 0855. Their broadcasts to SE.Asia from Shepparton 9.770 (Eng 1000-1100) have often reached the UK via the "short path", David noted them as 35344 at 1000.

The broadcasts from KTWR on the remote island of Guam in the Pacific 9.820 (Eng to S.Asia 1500-1640) were logged at 1515 by David Wratten as 33333. Listening late at night, David Edwardson picked up the Voice del CID, Costa Rica 9.940 (Spanish to C.America 0940-0240) 34443 at 0232.

Many broadcasters use this band to reach listeners in Europe, including Radio HCJB Quito, Ecuador 9.610 (Ger, Eng 0600-0800) SIO 444 at 0755 by Philip Rambaut; AWR via Sines, Portugal 9.670 (Pol, Ger, Eng 0600-0830) 44434 at 0815 by Ian Curry; RBI via Nauen, GDR 9.665 (Ger, Eng, Fr, Ar 1030-1400) 55555 at 1100 by Darran Taplin; Radio Pyongyang, N.Korea 9.345 (Eng, Fr, Russ, Kor, Sp, Ger 1300-2150) SIO 333 at 1700 at Michael Williams; BBC via Rampisham, UK 9.410 (Eng 1600-2115) 45544 at 1800 by Ian Baxter in Porec; VOIRI Tehran, Iran 9.020 (Russ, Far, Tur, Ger, Fr, Eng, Sp 1530-2230) 45455 at 1930 by Bill Griffith; Vatican Radio, Rome 9.645 (It, Fr, Eng 1810-2010) 54444 at 1950 by Sheila Hughes; Radio Baghdad, Iraq 9.770 (Fr, Ger, Eng 1800-2155) 433 at 2003 by Kenneth Buck; RHC Habana, Cuba via USSR 9.590 (Fr, Eng 2100-2300) 43333 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 WHRI South Bend, USA 7.400 (Eng to Europe 0000-0600) as 55444 at 0523; Bill Griffith noted Radio Australia via Carnarvon, W. Australia 7.205 (Eng to S.Asia, Europe 1430-2030) as 43454 at 1650; Edward Broadsmith heard AIR via new Delhi, N.India 7.410 at 1845 (Eng to Europe 1845-2230); Ian Baxter logged Radio Bangladesh, Dhaka 7.505 (Eng, Beng to Europe, Middle East 1815-2000) as 33222 at 1822; Andy Keddie rated radio Korea Seoul, S.Korea 7.550 (Ger, Eng, Fr, Sp, Port to E.Africa 1845-2245) as 44434 at 1930.

Radio Korea, received by P.R. Guruprasad


Richard Bealey at his listening post in Exeter.

Abbrv	Language
Ar	Arabic
Beng	Bengali
Buk	Bukharian
Cz	Czechoslovakian
Dan	Danish
Du	Dutch
Eng	English
Far	Farsi
Fin	Finnish
Fr	French
Geo	Georgian
Ger	German
Heb	Hebrew
Hung	Hungarian
Ind	Indonesian
It	Italian
Jap	Japanese
Kor	Korean
Lith	Lithuanian
Norw	Norwegian
Pa	Pashto
Pol	Polish
Port	Portuguese
Russ	Russian
Sp	Spanish
Swa	Swahili
Tur	Turkish
Uk	Ukranian
Ur	Urdu
Viet	Vietnamese
Yi	Yiddish

There are many **6MHz (49m)** broadcasts to Europe throughout the day. They include Radio Nederlands via Flevo, Holland 5.955 (Du, Eng 1430-1525), SIO 222 at 1509 by Julian Wood; BRT Brussels, Belgium 5.910 (Du, Eng 1700-2000), heard by **Wyn and Eileen Mainwaring** in Cowes, IOW; VOA relayed via Woofferton, UK 6.040 (Eng 1600-2200) SIO 544 at 1925 by Kenneth Buck; RCI Montreal, Canada relayed via Daventry, UK 6.030 (Eng, Fr 2000-2100) 43343 at 2008 by Graham Johnson; Radio Sweden, Stockholm 6.065 (Fr, Sw, Ger, Eng 1500-2130) 44454 at 2100 by Christian Pritchard; Radio Finland via Pori 6.120 (Eng, Fin, Sw 2100-2205) 53334 at 2105 by Ian Bond; Radio Polonia Warsaw, Poland 6.135 (Ger, Fr, Eng 2100-2355), heard at 2315 by Francis Hearne.

Station Addresses

BBC Radio Gloucester, London Road, Gloucester GL1 1SW. ILR Red Dragon

Radio, Radio House, West Canal Wharf, Cardiff CF1 5XJ.

All India Radio, Director of External Service, P.O. Box 500, New Delhi 110001, India.

IBRA Radio, S-105 36 Stockholm, Sweden.

Radio Kiev, External Service, Radio Centre, Kiev, Ukrainian SSR, USSR.

Radio Kaduna, P.O. Box 250, Kaduna, Kaduna State, Fed. Rep. Nigeria.

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WHAT RECEIVER

Lowe SRX30D Communications Receiver

- *COVERAGE*: 500 – 30MHz
- *MODES*: a.m., s.s.b. (u.s.b. & l.s.b.)
- *SENSITIVITY*: 10dB (S + N)/N for an input of 0.3μ on s.s.b. 1μV on a.m.
- *RESOLUTION*:
- *SELECTIVITY*: s.s.b./c.w. 8kHz and 4kHz at – 6dB respectively
- *IMAGE REJECTION*:
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: speaker plus 60mV into 5kΩ for a recorder
- *IF STAGE*: 45MHz, 2 – 3MHz tunable, 455kHz
- *FEATURES*:
- *REVIEWED*: Practical Wireless April 1982
- *PRICE*: Available on the second-hand market

Icom IC-R70 Communications Receiver

- *COVERAGE*: 100kHz – 30MHz
- *MODES*: a.m., f.m., s.s.b., RTTY, c.w.
- *SENSITIVITY*: Input for 10dB (S + N)/N, s.s.b./c.w./RTTY 1μV <1.6MHz 0.15μV >1.6MHz, a.m. 3μV <1.6MHz 0.5μV >1.6MHz, f.m. 0.3μV for 12dB SINAD >1.6MHz
- *RESOLUTION*: 10Hz, 100Hz & 1kHz
- *SELECTIVITY*: Width control at maximum, s.s.b./c.w./RTTY 2.3kHz at – 6dB, 4.2kHz at – 60dB; c.w. (N)/RTTY(N) 500Hz at – 6dB, 1.5kHz at – 60dB; a.m. 6kHz at – 6dB, 18kHz at – 60dB; f.m. 15kHz at – 6dB, 25kHz at – 60dB.
- *IMAGE REJECTION*: Better than 79dB
- *IF REJECTION*: At 29.01MHz better than 76dB
- *SPURIOUS REJECTION*: More than 60dB
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: More than 2W in 8Ω
- *IF STAGE*: 70.451MHz, 9.0115MHz & 455kHz
- *FEATURES*: Optional f.m. modules, independant digital v.f.o.s
- *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. (u.s.b., l.s.b.)
- *SENSITIVITY*: 150kHz to 2MHz s.s.b./c.w., <2μV; 2MHz to 30MHz a.m., <4μV
- *RESOLUTION*: 50Hz, 500Hz, 5kHz
- *SELECTIVITY*: a.m. wide 6kHz at – 6dB, 18kHz at – 50dB; s.s.b./c.w. 2.7kHz at – 6dB, 5kHz at – 50dB
- *IMAGE REJECTION*: >70dB
- *IF REJECTION*: >70dB
- *SPURIOUS REJECTION*: >60dB
- *FREQUENCY STABILITY*: ±300Hz for first hour, ±50Hz after
- *AUDIO OUTPUT*: 1.5W at 8Ω and 10% distortion
- *IF STAGE*: Triple conversion: 48.85MHz, 9.85MHz and 455kHz
- *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, S-meter
- *REVIEWED*:
- *PRICE*: £595

Panasonic RFB600LBE Communications Receiver

- *COVERAGE*: l.w.: 150 – 420kHz; m.w.: 520 – 1610kHz; s.w.: 1.611 – 29.9999MHz; f.m.: 87.5 – 108MHz
- *MODES*: a.m., f.m., s.s.b.
- *SENSITIVITY*: l.w.: S/N 6dB 70μV/m (at 280kHz), S/N 26dB 600μV/m (at 280kHz); m.w.: S/N 6dB 35μV/m (at 1000kHz), S/N 26dB 400μV/m (at 1000kHz); s.w.: 400Hz 30% mod 50mW S/N 6dB 1.2μV (50Ω) at 6MHz, S/N 26dB 10μV (50Ω) at 6MHz; f.m.: 2.5μV/75Ω (– 3dB limit sens), 2.5μV/75Ω (S/N 26dB)
- *RESOLUTION*:
- *SELECTIVITY*: l.w. (wide): ±3.5kHz (– 6dB), ±7kHz (– 60dB), (narrow): ±1.5kHz (– 6dB), ±4kHz (– 60dB); m.w. (wide): ±3.5kHz (– 6dB), ±7kHz (– 60dB), (narrow): ±1.5kHz (– 6dB), ±4kHz (– 60dB); s.w. (wide): ±3.5kHz (– 6dB), ±7kHz (– 60dB), (narrow): ±1.5kHz (– 6dB), ±4kHz (– 60dB)
- *IMAGE REJECTION*: l.w.: 35dB; m.w.: 40dB; s.w.: 50dB; f.m.: 30dB
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*: Within 50Hz during any 60 minutes after warm-up time
- *AUDIO OUTPUT*: 2W r.m.s. max
- *IF STAGE*: l.w., m.w.: 450kHz, s.w.: 39.9 – 40MHz, 450kHz, f.m.: 10.7MHz
- *FEATURES*:
- *REVIEWED*:
- *PRICE*: £499.95

Trio R-1000 Communications Receiver

- *COVERAGE*: 200kHz – 30MHz
- *MODES*: a.m., s.s.b. (u.s.b. & l.s.b.), c.w.
- *SENSITIVITY*: Below 2MHz – 5μV s.s.b., 50μV a.m. Above 2MHz – 0.5μV s.s.b., 5μV a.m.
- *RESOLUTION*:
- *SELECTIVITY*: a.m. (wide); 12kHz at – 6dB, 25kHz at – 50dB. a.m. (narrow); 6kHz at – 6dB, 18kHz at – 50dB
- *IMAGE REJECTION*: 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 min 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-8800 General Coverage Receiver

- *COVERAGE*: 150kHz to 29.999MHz
- *MODES*: a.m., c.w., s.s.b. (u.s.b., l.s.b.), f.m. narrow
- *SENSITIVITY*: 150kHz to 1.6MHz a.m., 30μV/50Ω; 1.6 to 29.999MHz s.s.b., c.w., 0.4μV/50Ω
- *RESOLUTION*: 100Hz
- *SELECTIVITY*: a.m., 6kHz at – 6dB, 15kHz at – 50dB; s.s.b., c.w., 2.7kHz
- *IMAGE REJECTION*:
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*: ±300Hz during first ½hr, <50Hz during any 30min period after warm-up
- *AUDIO OUTPUT*: 1.4W 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, tone and attenuation
- *REVIEWED*:
- *PRICE*: £639

Icom IC-R7000 Communications Receiver

- *COVERAGE*: 25 to 2000MHz continuous
- *MODES*: f.m. wide/f.m. narrow/a.m. upper/s.s.b. lower
- *SENSITIVITY*: f.m., <0.5μV for 12dB SINAD; f.m. narrow, <0.5μV for 12dB SINAD; f.m. wide, <1.0μV for 12dB SINAD; s.s.b., <0.3μV for 10dB SINAD; a.m., <1.0μV for 10dB SINAD
- *RESOLUTION*: 0.1, 1, 5, 10, 12.5 and 25kHz
- *SELECTIVITY*: f.m. narrow, 6kHz at – 6dB; f.m./a.m., 15kHz at – 6dB; f.m. wide, 150kHz at – 6dB; s.s.b., 2.8kHz at – 6dB
- *IMAGE REJECTION*: >60dB
- *IF REJECTION*: >60dB
- *SPURIOUS REJECTION*: >60d8
- *FREQUENCY STABILITY*: ±5 p.p.m. at 0°C to + 50°C
- *AUDIO OUTPUT*: 2.5W at 8Ω at 10% distortion
- *IF STAGE*: Multiple i.f.s between 455kHz and 9MHz depending on mode
- *FEATURES*: dual-colour fluorescent display, dial lock, noise blanker, attenuator, display dimmer, S-meter
- *REVIEWED*:
- *PRICE*: about £960

Yaesu FRG-7700 Communications Receiver

- *COVERAGE*: 150kHz – 30MHz
- *MODES*: a.m., f.m., s.s.b. (u.s.b. & l.s.b.)
- *SENSITIVITY*: Below 300kHz; 30μV a.m., 3μV s.s.b./c.w.: 300kHz – 2MHz; 25μV a.m., 2μV s.s.b./c.w.: Above 2MHz; 5μV a.m., 0.5μV s.s.b./c.w., 1μV n.b.f.m. for 10dB S + N/N or better
- *RESOLUTION*: 1kHz
- *SELECTIVITY*: a.m. (wide); 12kHz at – 6dB, 25kHz at – 50dB: a.m. (medium); 6kHz at – 6dB, 15kHz at – 50dB: a.m. (narrow); 2.7kHz at – 6dB, 8kHz at – 50dB: s.s.b./c.w.; 2.7kHz at – 6dB, 8kHz at – 50dB: f.m.; 15kHz at – 6dB, 30kHz at – 40dB
- *IMAGE REJECTION*:
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*: less than ± 1kHz 30 min, after 30 mins ± 300Hz
- *AUDIO OUTPUT*: 1.5W into 8Ω for 10% distortion
- *IF STAGE*: 48.055MHz & 455kHz
- *FEATURES*: Clock, timer and sleep timer
- *REVIEWED*: Practical Wireless December 1980 & March 1981
- *PRICE*: £350

WHAT RECEIVER

JRC NRD-525
General Coverage Receiver

- *COVERAGE*: 90kHz to 34MHz (optionally to 456MHz in steps)
- *MODES*: RTTY, FAX, c.w., s.s.b. (u.s.b., l.s.b.), a.m., f.m.
- *SENSITIVITY*: 1.6 to 34MHz c.w., 0.5μV; 1.6 to 34MHz a.m., 2μV
- *RESOLUTION*: 10Hz, 1KHz, 10kHz, 20kHz
- *SELECTIVITY*: wide bandwidth >4kHz at −6dB, <10kHz at −60dB
- *IMAGE REJECTION*: >76dB
- *IF REJECTION*: >76dB
- *SPURIOUS REJECTION*: >76dB
- *FREQUENCY STABILITY*: ±3 p.p.m.
- *AUDIO OUTPUT*: >0.5W at 4Ω and 10% distortion
- *IF STAGE*: IF2 — 455kHz
- *FEATURES*: scan and sweep, electronic tuning (via main control or key pad), noise blanker, S-meter, sidetone input, mute input, transmission monitor, squelch, dimmer, tone control, clock, timer, i.f. notch filter, passband shift
- *REVIEWED*: Practical Wireless June 1986
- *PRICE*: £1195

Eddystone Model 1650
Communications Receiver

- *COVERAGE*: 10kHz to 30MHz in synthesised steps of 5Hz
- *MODES*: (1650/1) a.m., c.w., u.s.b.; (1650/2) a.m., c.w., u.s.b., l.s.b.; (1650/3) a.m., c.w., u.s.b., l.s.b., i.s.b.
- *SENSITIVITY*: 12dB s/n on s.s.b. for 1μV input
- *RESOLUTION*: 5Hz
- *SELECTIVITY*: At −6dB: 400Hz, 1kHz, 2.4kHz, 3kHz, 8kHz, 14kHz
- *IMAGE REJECTION*: typically 100dB
- *IF REJECTION*: typically 100dB
- *SPURIOUS REJECTION*: typicelly 100dB
- *FREQUENCY STABILITY*: 10 p.p.m. above 1MHz
- *AUDIO OUTPUT*: line (600Ω) 10mW pre-set; loudspeaker 1W max. low/medium impedance
- *IF STAGE*: 1.4MHz
- *FEATURES*: remotely controllable, variable speed tuning, built-in r.f. front end pre-selector option, scan and sweep facility, 99 programmable memories
- *REVIEWED*:
- *PRICE*: On application to Lowe Electronics

Kenwood R-5000
Communications Receiver

- *COVERAGE*: 100kHz to 30MHz
- *MODES*: c.w., s.s.b., a.m., f.m., f.s.k.
- *SENSITIVITY*: 1.8 to 30MHz s.s.b., c.w., f.s.k., <0.25μV; 500kHz to 1.8MHz a.m. (30% mod.), <32μV
- *RESOLUTION*: 10Hz
- *SELECTIVITY*: s.s.b., c.w., f.s.k., 2.4kHz at −6dB, 4.4kHz at −60dB; a.m., 6kHz at −6dB; f.m., 25kHz at −50dB
- *IMAGE REJECTION*: 1.8 to 30MHz, >80dB
- *IF REJECTION*: 1.8 to 30MHz, >70dB
- *SPURIOUS REJECTION*: >80dB
- *FREQUENCY STABILITY*: ±10 p.p.m. or better
- *AUDIO OUTPUT*: 1.5W at 8Ω and 10% distortion
- *IF STAGE*: Double conversion: 58.1125 and 8.83MHz. Triple conversion on f.m: 455kHz
- *FEATURES*: 10Hz step dual digital v.f.o.'s, micro controlled digital p.l.l., 100 memory channels, memory scroll, memory and programmable band scan, selectable i.f. filters, noise blanker, dual 24hr quartz clocks, r.f. attenuator, lithium battery memory backup, keyboard frequency selection
- *REVIEWED*: Short Wave magazine June 1987
- *PRICE*: £875

Icom IC-R71E
General Coverage Receiver

- *COVERAGE*: 0.1MHz to 30MHz
- *MODES*: a.m./c.w./u.s.b./l.s.b./RTTY
- *SENSITIVITY*: s.s.b./c.w./RTTY, <0.15μV for 10dB s+n/n; a.m., <0.5μV; f.m. (optional), <0.3μV for 12dB SINAD
- *RESOLUTION*: 10Hz, 50Hz, 1kHz
- *SELECTIVITY*: s.s.b./c.w./RTTY, 2.3kHz at −6dB, 4.2kHz at −60dB; c.w. narrow/RTTY narrow, 500Hz at −6dB, 1.5kHz at −60dB; a.m., 6kHz at −6dB, 15kHz at −50dB; f.m. (optionel), 15kHz at −6dB, 25kHz at −60dB
- *IMAGE REJECTION*: >60dB
- *IF REJECTION*: >60dB
- *SPURIOUS REJECTION*: >60dB
- *FREQUENCY STABILITY*: <200Hz after switch-on to 60 min., <30Hz after 1hr
- *AUDIO OUTPUT*: >2W
- *IF STAGE*: Multiple i.f.s depending on mode. 70.45MHz, 9MHz and 455kHz
- *FEATURES*: f.m. (optional)
- *REVIEWED*:
- *PRICE*: £825

Touroport 220
Broadcast Receiver

- *COVERAGE*: 153 – 281kHz; 522 – 1611kHz; 2.3 – 4.215MHz; 4.540 – 6.455MHz; 7.1 – 7.735MHz; 9.500 – 10.135MHz; 11.585 – 12.215MHz; 15.100 – 15.735MHz; 17.500 – 18.135MHz; 21.340 – 21.975MHz; 25.500 – 26.135MHz; 87.5 – 108MHz
- *MODES*: a.m., f.m.
- *SENSITIVITY*: 3 – 4μV a.m.f. for 20dB S-N
- *RESOLUTION*: 1, 5, 9 & 50kHz
- *SELECTIVITY*:
- *IMAGE REJECTION*:
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 0.8W into 4Ω with 10% t.h.d.
- *IF STAGE*:
- *FEATURES*: 10-station memory; l.c.d. readout, clock (includes alarm facilities), mains, 6V d.c. or battery options
- *REVIEWED*: Practical Wireless June 1985
- *PRICE*: Available on second-hand market

Lowe HF-125
General Coverage Receiver

- *COVERAGE*: 30kHz to 30MHz continuous, optional 150kHz to 26.1MHz restricted coverage
- *MODES*: a.m., c.w., s.s.b. (u.s.b., l.s.b.), optional D-125 board adds n.b.f.m. and sync. a.m.
- *SENSITIVITY*: s.s.b., <0.3μV for 10dB s/n; a.m., <0.7μV for 10dB s/n at 70% mod
- *RESOLUTION*: 1kHz
- *SELECTIVITY*: At −6dB: 400Hz, 2.5kHz, 4kHz, 7kHz, 10kHz
- *IMAGE REJECTION*: >89dB
- *IF REJECTION*: >78dB
- *SPURIOUS REJECTION*: >75dB
- *FREQUENCY STABILITY*: +55kHz in first 15 mins., +25kHz in next hour
- *AUDIO OUTPUT*: 0.75W into int. speaker, 1.25W into ext. 4Ω speaker
- *IF STAGE*: IF1 — 45MHz, IF2 — 455MHz
- *FEATURES*: tuning step size increases with faster knob rotation, permanent in-circuit noise blanker
- *REVIEWED*: Practicel Wireless March & April 1987
- *PRICE*: HF-125, £375; D-125, £59.50; K-125, £59.50; P-125 Portable Pack (internal NiCads, charger and active whip antenna), £69.50

Sony ICF-SW1
Portable Receiver

- *COVERAGE*: 150 – 528kHz; 530 – 1611kHz; 1.615 – 29.995MHz; 76 – 108MHz
- *MODES*: a.m., f.m.
- *SENSITIVITY*:
- *RESOLUTION*: 5kHz on s.w., 9 or 10kHz on m.w., 25kHz on f.m.
- *SELECTIVITY*:
- *IMAGE REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 250mW at 10% t.h.d.
- *IF STAGE*:
- *FEATURES*: 10 memories, scan function, active antenna, ear phones, rigid plastics carrying case, alarm and sleep functions
- *REVIEWED*: May 1988 SWM (£1.45)
- *PRICE*: around £250

Realistic DX-200
5-band Communications Receiver

- *COVERAGE*: 150 – 400kHz; 520kHz – 30MHz
- *MODES*: a.m., l.s.b., u.s.b., c.w.
- *SENSITIVITY*: for 10dB S/N = 1μV
- *RESOLUTION*:
- *SELECTIVITY*: at −6dB = 4kHz, at −40dB = 8kHz
- *IMAGE REJECTION*: at 250kHz = 55dB, at 1MHz & 2.5MHz = 40dB, at 7MHz = 30dB, at 21MHz = 15dB
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 1.5W at 10% t.h.d.
- *IF STAGE*: 455kHz
- *FEATURES*:
- *REVIEWED*:
- *PRICE*: available second-hand market

Sony ICF-7600A
Compact Multiband Radio

- *COVERAGE*: 430 – 1605kHz; 5.96 – 6.2MHz; 7.1 – 7.3MHz; 9.5 – 9.8MHz; 11.7MHz – 12MHz; 15.1 – 15.45MHz; 17.7 – 17.9MHz; 21.45 – 21.75MHz; 76 – 108MHz
- *MODES*: a.m., f.m.
- *SENSITIVITY*: m.w. = 30dBμV (1MHz), s.w. = −2dBμV (9.6MHz) for 6dB S/N; f.m. = 12dBμV for 30dB S/N
- *RESOLUTION*:
- *SELECTIVITY*: ±7.7kHz (−50dB)
- *IMAGE REJECTION*: m.w. = 33dB at 1.605kHz, s.w. = 27dB for 6dB S/N; f.m. = 30dB for 30dB S/N
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 480mW at 10% t.h.d.
- *IF STATE*: 455kHz and 10.7 MHz
- *FEATURES*: l.e.d. tuning indicator, 3-position tone control, wrist strap, carrying cese and ear phone
- *REVIEWED*:
- *PRICE*: £90

Sony ICF-2001D
Portable Synthesised Receiver

- *COVERAGE*: 153kHz – 29.995MHz; 76 – 108MHz
- *MODES*: a.m., f.m., u.s.b., l.s.b., c.w.
- *SENSITIVITY*: l.w. & m.w. = 30dBμV; s.w. = 2dBμV; f.m. = 11dBμV
- *RESOLUTION*: 100Hz, 1, 3, 5, 10 and 50kHz
- *SELECTIVITY*: ±5kHz/±9kHz (50dB)
- *IMAGE REJECTION*: l.w., m.w. & s.w. = 74db; f.m. = 40dB
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 380mW at 10% t.h.d.
- *IF STAGE*: 55.85MHz, 455kHz & 10.7MHz
- *FEATURES*: 32 memories, digital clock, seperate airband, programmable timer, variable speed tuning, r.f. attenuator, a.c. adaptor, shoulder belt and ear phone
- *REVIEWED*:
- *PRICE*: £350

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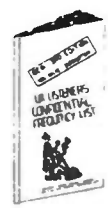

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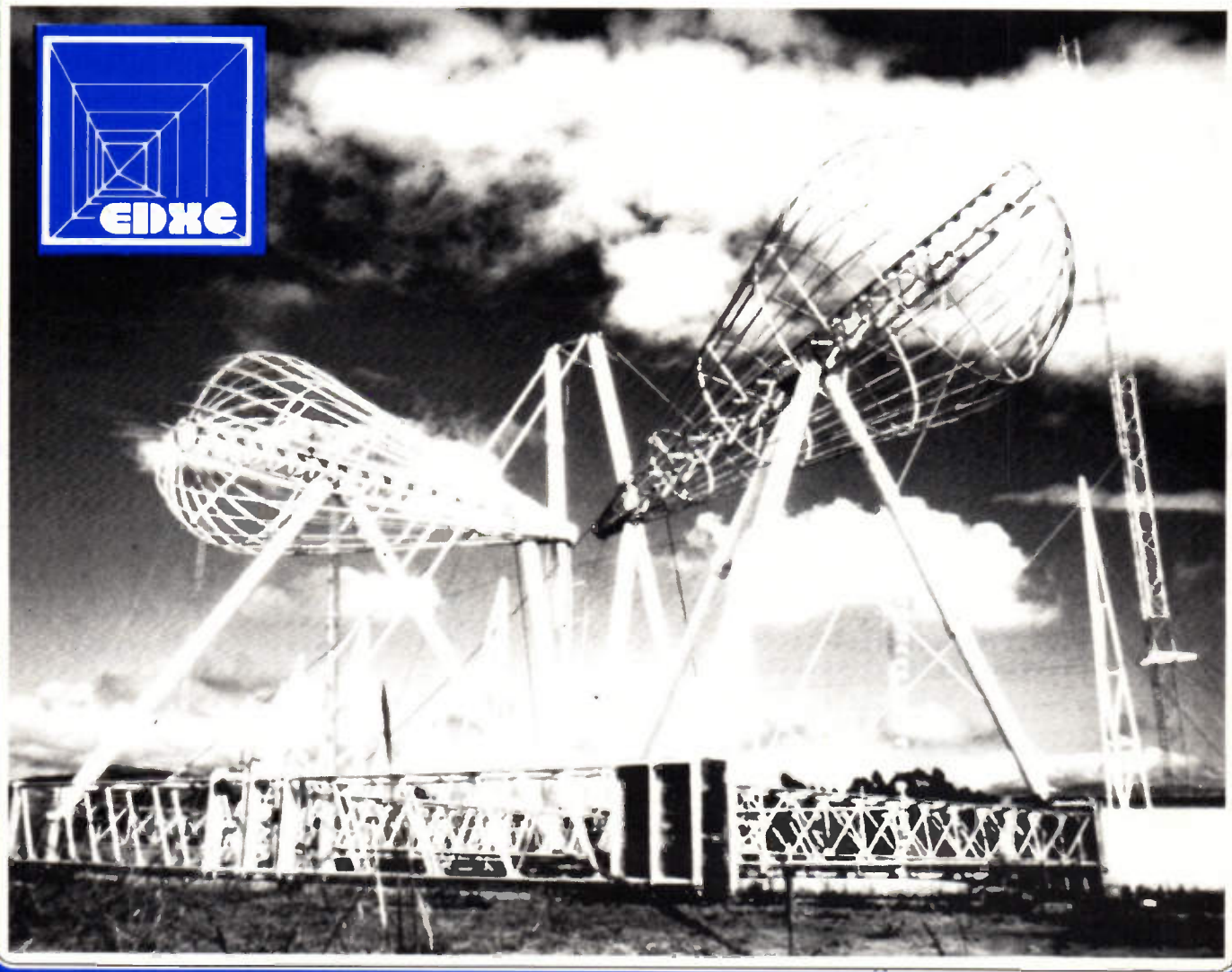

CONTENTS

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

Published by PW Publishing Ltd. and the European DX Council

The views in this publication are not necessarily those of PW Publishing Ltd. or the 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 media 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.

Matsui MR-4099

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.

Broadcasters on short wave will often use more than one frequency to transmit their programmes and indeed Radio Moscow's English-language 'World Service' can sometimes be heard on more than twenty different frequencies. Some stations use relay transmitters in various parts of the world to reach far-off targets, for although short wave signals do travel the world, reception will often be better through relatively nearby transmitters than from the country of origin. Radio Japan uses relays in central Africa and in Canada, Radio Beijing has its programmes relayed from Switzerland and Spain, and the BBC has its own transmitting stations in the Middle East, Africa, the Indian Ocean and the Far East.

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 a unique source 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.

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Music and drama, sport and travel.

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

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 Pyongyang 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, Urdu to 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 broadcasts language lessons. Try your hand at Russian, German, Chinese...

5.950	- 6.200MHz	or	49 metre band
7.100	- 7.400MHz	or	41 metre band
9.450	- 9.950MHz	or	31 metre band
11.650	- 12.100MHz	or	25 metre band
13.700	- 13.900MHz	or	21 metre band
15.000	- 15.550MHz	or	19 metre band
17.550	- 17.900MHz	or	16 metre band

WORLD WIDE SHORT WAVE RADIO

NRD-525 Receiver from JRC.

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 rtty (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 Nederland!

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

Vega Selena short wave receiver from Russia.

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 broadcasting - 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!

Lowe HF-125 communications receiver.

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!

Sony ICF-SW1 pocket portable receiver.

Amateur Radio - *the international hobby...*

by Dick Ganderton G8VFH

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. (30MHz down).

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 (s.w.l.) is 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,

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

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.

Data Communications

A rapidly growing area of interest is data communications. With the advent of readily available home computers, transmission modes such as rtty (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, rtty 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.

Repeaters

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.

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.

Members of Appledore & Parkham AR Clubs operating special event station GB0NBB.

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 co-ordinates 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)
Lambda House
Cranborne Road
Potters Bar
Herts EN6 3JE

BARTG
Pat & John Beedie
'Ffynnonlas'
Salem
Llandeilo
Dyfed
Wales SA19 6EW

AMSAT UK
Ron Broadbent G3AAJ
94 Herongate Road
London
E12 5EQ

BATC
Dave Lawton G0ANO
'Grenehurst'
Pinewood Road
High Wycombe
Bucks HP12 4DD

G-QRP Club
Rev. George Dobbs G3RJV
St Aidens Vicarage
498 Manchester Road
Rochdale
Lancs OL11 3HE

Remote Imaging Group (RIG)
Phil Seaford G8XTW
14 Nevis Close
Linslade
Beds LU7 7XD

British Young Ladies Amateur Radio Association (BYLARA)
Mrs Dawn Corallini G4YOS
35 The Green
Kings Hill
Ware
Herts SG12 0QW

WHAT GOES UP...by Glen Ross

One of the more interesting aspects of short wave listening is eavsdropping 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. airband 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
Seaford 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 at 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 sensitivity 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.

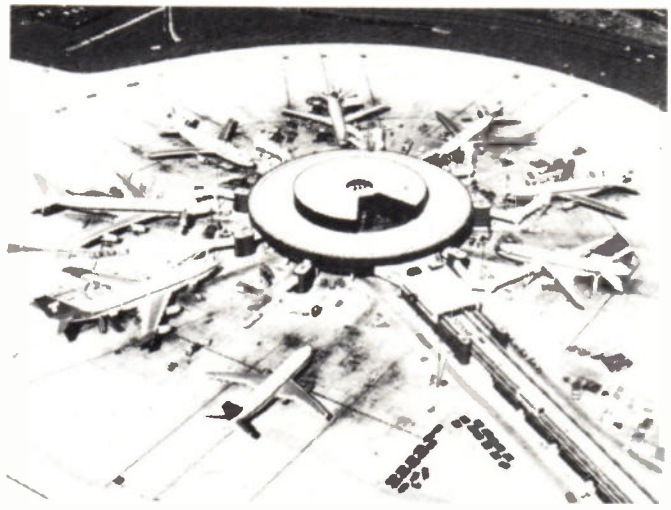
Antennas

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. aircraft 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 Satellite Terminal at Gatwick Airport.

Photo courtesy Gatwick Airport Ltd.

The Jargon

Like almost all activities, the air traffic control (a.t.c.) people have developed their own language which is internationally recognised 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 twentyfive minutes past the current hour.

Direction

The direction in which the aircraft if 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.

You can keep abreast of what is going on in the world of aeronautical radio by reading *Short Wave Magazine* every month. Godfrey Manning runs the regular 'Airband' column and over the last few issues interesting articles on various aspects of air traffic control, aircraft instrumentation and other fascinating aspects of this absorbing hobby have featured in the magazine's pages.

The Role of the Short Wave Receiver...

by G.D.Rawnsley

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-patriates who wish to stay in touch with the news, events and culture of his 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 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 concerned 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.

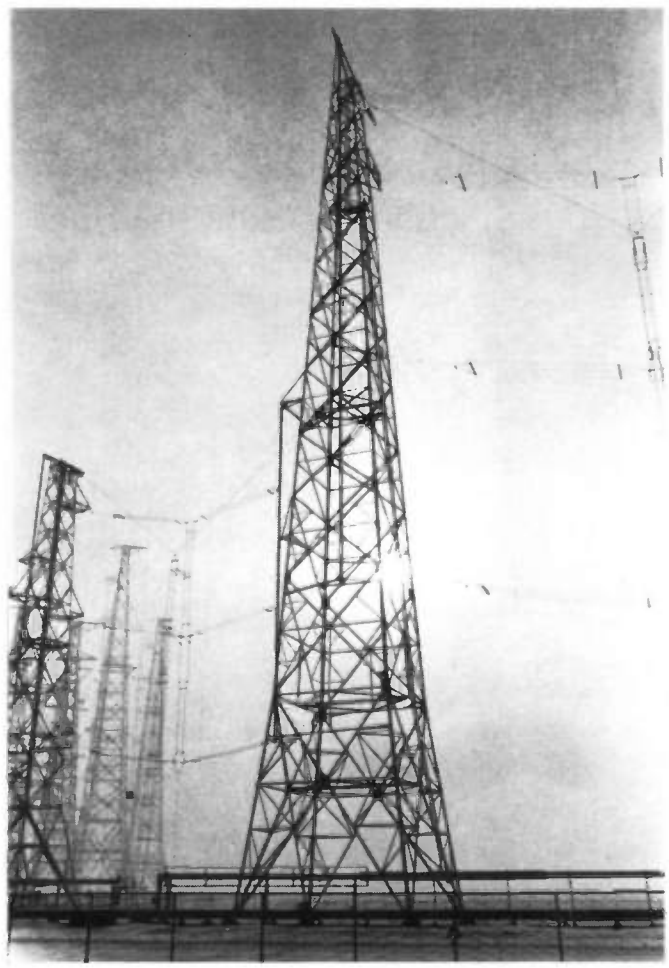
I have had experience of this myself. After receiving a QSL card from Radio Prague, Czechoslovakia, I duly found two books dropping through my letter-box, on entitled *Seventy years of the New Age* concerning the growth of Communism and *Czechoslovakia Foreign Policy* . I was very grateful for these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



Flevo on an autumn day

Photo courtesy Radio Nederland

the number stations which can often be heard on the short wave bands are broadcsting 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 Underground 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 newshound 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.

FOR THE BEST FEATURES, CONSTRUCTION AND EQUIPMENT REVIEWS, PLUS NEWS OF ALL THAT'S HAPPENING IN THE FASCINATING HOBBY OF AMATEUR RADIO, READ *PRACTICAL WIRELESS* EVERY MONTH.

£1.30 from your newsagent

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 co-operation 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, Michael Murray, and the Assistant Secretary-General, Simon Spanswick were elected to their posts. 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.

Reporting to the Secretary-General are a number of specialist Committees which have been set up to examine subjects of particular relevance to listeners and broadcasters, and currently an important committee is re-evaluating the role of reception reporting by listeners to stations.

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 the series of *World Telecommunication 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 all around the world to take part in these important Conferences which provide a unique forum for the discussion of the short wave broadcasting industry, as well as the chance to meet colleagues from both sides of the microphone.

The international broadcasting scene is constantly changing, as the impact of new technology is felt both in this continent and in other parts of the world. The role of the Council is also changing into one of providing a link between listener and broadcaster, and in making the knowledge of the short wave broadcast medium more widely known.

The European DX Council produces a range of specialist publications for the listener, whether a newcomer or an old-hand. These include :

EDXC Reporting Guide
Contains information on how to report to international radio stations with reception report samples in English, French and German and other important radio languages. £1.00

EDXC QSL Survey
This examines the role of the station QSL, or verification, card in the 1980s. Find out how reception reports are used by broadcasters and engineers, and what individual stations want from reports. 50p

EDXC Reception Report Forms
Specially designed reception report forms for listeners reporting to international broadcasters. Prepared in association with short wave broadcasters.
£1.50 for 50 forms

EDXC Radio Landlist
Containing all the world's current and former radio countries for use in conjunction with competitions, or for maintaining a record of countries heard. ...£1.00

EDXC Club List
Comprehensive information on all the Council's world-wide network of member short wave radio clubs. An indispensable guide for anyone interested in joining a radio club. 75p

EURO DX
The monthly journal of the Council, with information about the activities of the EDXC and its member clubs, together with news on the international broadcast media.
12 month subscription : £5.00

All of the European DX Council's publications are available directly from the Council's headquarters or on the EDXC/*SWM* stand.

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, v.h.f., 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 very popular *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 Birkhall Road, Catford, LONDON SE6 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, broadcast schedules, programme news, technical articles and news of the European DX Council.

Feature articles on important radio subjects are published and each month a major 'DX Loggings' section is included, compiled from members' reports by Ronnie Easey. Meanwhile in Edwin Southwell's 'DX News column', members benefit from the inclusion of many international broadcast station schedules. DXAGB will help plan your short wave listening more effectively.

After the first full year of membership, senior citizens, handicapped or disabled members qualify for a reduction in their subscription rate.

Write to E A Rickett, Flat 13, 63 Eton Avenue, LONDON NW3 3ET.

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. Broadcast band contest winners receive an award certificate. A whole range of award certificates are free to members obtaining the specified number of QSL cards. A QSL Bureau is available. Nets are held weekly on 3.5, 7.0 and 14 MHz bands.

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, Wharton, Winsford, Cheshire CW7 3LA. A sample copy of *Monitor* is available for 60p postage paid.

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 news letter, now in its 33rd year, is the prime source of information in the UK dealing with the international m.w./l.w. 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 m.w./l.w. radio. Regular contributions include the very latest radio news as well as reports by members of radio stations recently heard.

The MWC prides itself on the topicality of its reports, since members receive their copies of the newsletter by post less than ten days after the press deadline.

For more information write to : Harold Emblem, Club Secretary, 137A Hampton Road, SOUTHPORT, Merseyside PR8 5DY. For a sample copy of *Medium Wave News*, please send an s.a.e.

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 right up to date. *Contact* runs to 36-40 pages including logs for short wave, medium wave, f.m. and dx-tv, 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' previewing what will be on the air. A radio nostalgia section looks back at the history of radio.

Anyone who is interested in broadcast band listening is invited to seek further details. Sample copies of the club's magazine are available for 65 pence from : Arthur Ward, 17 Motspur Drive, NORTHAMPTON NN2 6LY

The **European DX Council** also has member clubs in other parts of the world which publish English language bulletins. Full information on these is contained in the *EDXC Club List*.

THE EUROPEAN DX COUNCIL AND INTERNATIONAL SHORT WAVE RADIO - partners for the future.

BBC WORLD SERVICE

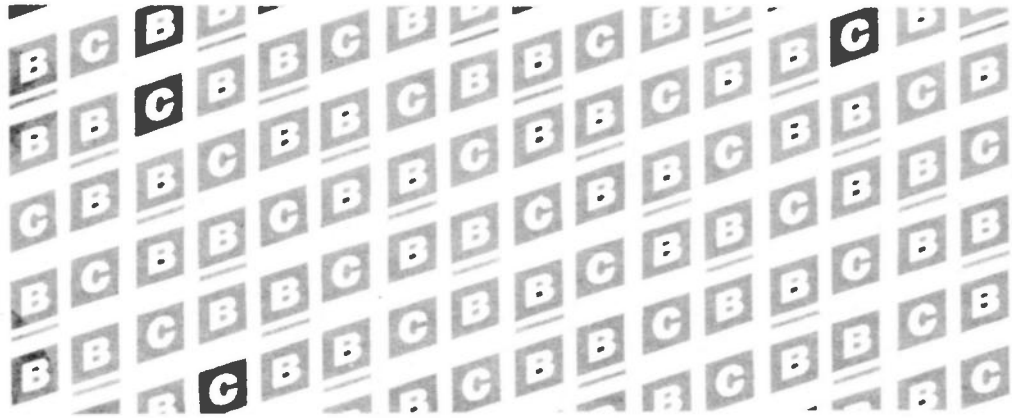
Whilst Parliament allocates money to BBC World Service especially to reach audiences abroad, up to one and a half million people in Britain tune in at least once a week.

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 respected everywhere for its fast, accurate and impartial coverage, and counts kings and presidents among its devotees.

But there is a wide range of other programmes on BBC World Service - sport, music, drama, science, industry, features and much more - to interest the British listener.

People who live in the South-East of England can listen on medium wave - 648 kHz (463 metres). Most of the time this frequency carries the World Service in English, but at breakfast time and late afternoon, plus half an hour before midday, it becomes 'BBC 648', a special service for North West Europe in English, French and German.



This service is especially useful for people driving on to the Continent. It can be heard deep into France and Germany, and through all of the Benelux countries, and contains road and weather reports for that part of Europe.

Because it is aimed at the whole world, BBC World Service is on the air 24 hours a day, and between 12.45 am and 05.45 am it can be heard throughout Britain on Radio Four's long wave frequency of 198 kHz (1515 metres).

However, most people will need a short wave set for listening during the daytime. World Service 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 rebroadcast on short wave on overseas relay stations are not generally audible in the United Kingdom.

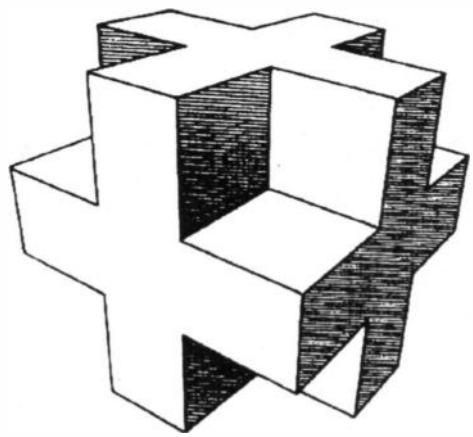
Besides English, BBC World Service broadcasts in 36 languages altogether. If you would like information about any of them, or if you are going abroad and would like to know how to listen whilst away, write to BBC World Service Publicity at the address given above .

HOW THE RED CROSS SPEAKS TO THE WORLD

+RCBS

Red Cross Broadcasting Service

The International Committee of the Red Cross began broadcasting in May 1945. In Europe, many ex-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:
Panasonic Consumer Electronics U.K.,
300-318 Bath Road, Slough, Berkshire.
Telephone: Slough (0753) 34522

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