Short Wave Magazine

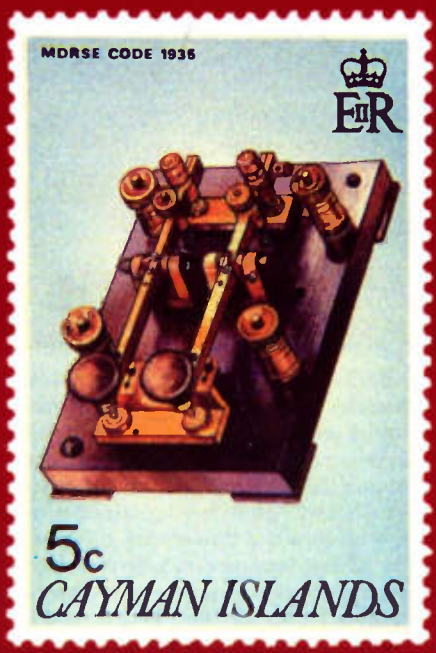
ISSN 0037-4261

£1.45

NOVEMBER 1988

SWM SWM SWM SWM SWM SWM SWM

STAMPS & RADIO
PHILATELY HONOURS WIRELESS



Build our Hi-Lo MW Antenna Matcher

What Receiver?

For The Radio Listener

VOL. 46 ISSUE 11 NOVEMBER 1988

ON SALE OCTOBER 20th

DECEMBER ISSUE ON SALE NOVEMBER 24

|19| **Stamps & Radio**

Cover The story of radio is portrayed on stamps issued by many countries. Raymond Schuessler is a keen US philatalist and the stamps reproduced on the cover and in his article come from his collection. The final part of C. M. Lindar's Three-band SSB Receiver series has had to be held over.

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Short Wave Magazine

SEEN & HEARD

REGULARS

GOOD LISTENING

FIRST WORD

I recently attended a Press Briefing held by the DTI Radiocommunication Division to launch their Consultative Document *The Use of the Radio Frequency Spectrum above 30GHz*. Yes, that really is 30GHz - 30 000MHz! A trifle on the high side for today's scanners but then, whoever would have thought ten years ago that we would have receivers with the sort of performance we take for granted now.

However, the point of the exercise is for the DTI to try to collect as much useful information as possible, in as short a space of time as possible, so that they can promote the use of this very intriguing part of the spectrum. I must admit that I find microwaves much more interesting than the almost d.c. parts of the spectrum below 144MHz but I had always thought that the frequencies under discussion would not be of much real use because of the very short range.

I was obviously mistaken as I had overlooked the re-use factor - especially around the oxygen absorption band at 60GHz. Here the fact that signals are very heavily attenuated means that the re-use factor reduces to a few kilometres, providing a natural filter that man will find very hard to better.

In the past radio amateurs have been at the forefront of technological advance, opening up frequencies that, in their day, were considered to be way above anything likely to be of practical use. Just think, even the s.w. bands were thought to be of no practical use in the early days of radio! Amateurs have pioneered new modes of transmission, opened up ever higher frequency bands and sent signals over longer and longer paths on less and less power. What does the future hold above 30GHz? Well the amateurs have been allocated several bands above this frequency but I wonder how many amateurs will have the access to the equipment needed to produce working millimetric gear?

"Just a minute Fred, old man, I am going to use my new thin-film evaporating gear to modify this 400GHz front-end."

"How much did that set you back then, Bert?"

"Not much, Fred, I picked it up cheap at the club's junk sale last month, but they cost a couple of million pounds new!"

Still, in the past amateurs have always managed to get their hands on gear for seemingly impossible frequencies, so perhaps they will manage it in the future.

I was also interested in some of the potential applications put forward for these frequencies. When I was very young the large Co-operative store in Luton had a fascinating overhead cable-car system which connected the tills to a central accounts department. I found it fascinating to watch as the assistant put your money and the details of your purchases into a cylinder which was deftly hooked onto a special carrier. A quick tug on a string and the cylinder sped on its way across the store, negotiating bends and junctions in a fascinating manner. A few minutes later and back it came bearing your receipt and change. More progressive shops had a vacuum pipe system - slightly less fascinating.

Now, it seems, these devices will be replaced by radio links using frequencies above 30GHz. Along with inter-office telephone links which will require no cabling, these systems utilise the very short range capabilities of the higher microwave frequencies for security and greater re-use capabilities.

I wonder whether, in forty years time the Editor of *SWM* will be mourning the loss of the systems of his childhood?

One of the problems facing the Editor of a magazine such as *Short Wave Magazine*, is how to fit the proverbial quart into the pint pot available. Each month I have to do a juggling act with the features and serials, trying to keep every reader happy while still presenting what I hope is a balanced and interesting magazine. This means that it often becomes necessary to miss parts of series and this month it is the turn of the final instalment of the "Three-band SSB Receiver".

Coming shortly in your favourite radio magazine - two new gripping serials! Starting in the January 89 issue, well-known antenna authority, Fred Judd G2BCX, starts his series explaining all about antennas. Also starting sometime in the new year is a specially commissioned series aimed at the very raw beginner. George Dobbs G3RJV, author of the well-known Ladybird Book on radio which is now sadly unobtainable, has written a series especially for those who are starting right at the bottom of the ladder. So if you are young in either years or radio knowledge then this series is for you.

DICK GANDERTON

A WORD IN EDGEWAYS

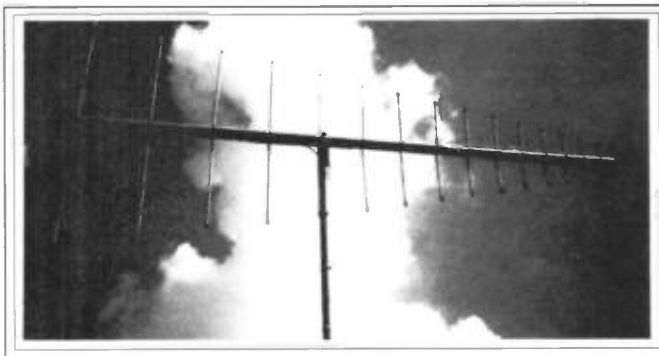
IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER IS USED YOU WILL RECEIVE A £5 VOUCHER TO SPEND ON ANY SWM SERVICE.

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

I wrote recently about tubing suppliers as I wished to construct a home-brew log periodic array, because the purchase price of a ready built is too expensive. Enclosed is a picture of the finished article cost approx £33.00 (inc. mast), a similar aerial made by a manufacturer advertising in your magazine is costed at £85.00. Should other s.w.l.s be interested in experimentation or construction of log periodic arrays, I recommend the relevant section in the VHF Antenna Handbook (ISBN 688006-7144) which can be borrowed from your local library.

A. J. HARDING
STEVENAGE
HERTS



Antenna Details
Forward gain: 13.5dB
Front to back: 15.0dB
SWR: 1.8:1
Freq coverage: 100 - 650MHz
Horizontal beam width: 60 deg.
Vertical beam width: 100 deg.
Impedance: 50 ohms

Sir

G.Hewlett, in his article "Tuning in the 1930s" asks who or what was G5SW. Perhaps I can answer his question.

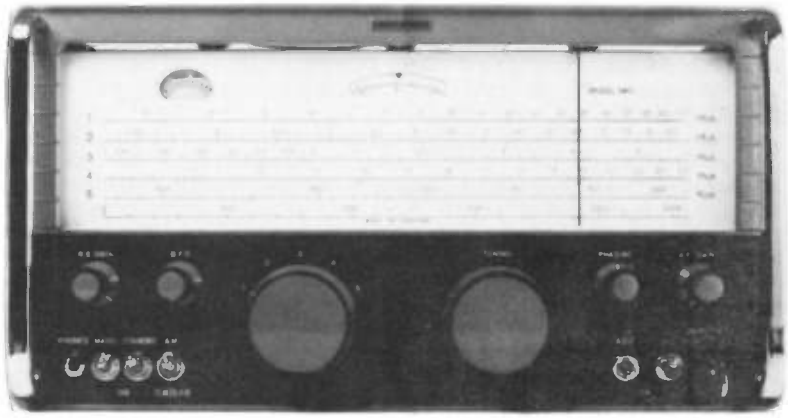
G5SW was a short wave transmitter that the Marconi Company was commissioned to build by the BBC. It was situated at The Marconi Company's works at Chelmsford, and opened on 5 November 1927.

This transmitter remained in service until 17 December 1932, as the Empire Broadcasting Service opened on 9 December 1932 at Daventry.

It is interesting to note that in July of the same year, low-definition television signals were transmitted from this station on a wavelength of 25metres and these signals were received in Australia.

NORMAN E. PILGRIM
LEICESTER

A WORD IN EDGEWAYS



Sir

Do you think that Tim Wright is trying to tell me something with his articles on the Eddystone 940? The 940 is my main receiver and I have two of them. The 940 was introduced about 1967 at around £135, and I purchased mine a couple of years later second-hand. It had, apparently, been used by an amateur transmitter, as a pair of wires had been attached to the stand-by switch, obviously to operate a relay. At that time it cost me £145 - a very good bargain indeed.

It is in constant use for around 10 hours a day, some 350 days of the year. In that time, apart from making three or four major valve changes, I have only had about five valves burn out. Other repairs required being a loose grub screw on the vernier scale and a similar adjustment to the grub screw of the heavy balance wheel two or three times.

The second 940 I bought for £25 to provide spare parts, and is actually in better condition than my "number one" set. It had been "out of order," but I found that the tuning coil inserts had been tampered with. However, it has been brought back into partial service again.

I am still switching-on at 0400 UTC, with morning reception up to around 1030 UTC.

G E W HEWLETT

Sir

I have been very interested to read about Tim Wright's attempts to restore an ailing Eddystone 940 receiver. In my introduction to the now well-known G4DTC "Ultimate Hybrid" (Radio Communication, Dec 87 et seq.) I singled out this receiver as one of the all-time greats, capable of exceptional performance despite its age and low intermediate frequency.

A simple test of the sensitivity of a receiver may be performed as follows. Disconnect the antenna and substitute a dummy load, e.g. a small 50-100 ohm resistor between the antenna socket and ground. Turn the a.f. gain to maximum and you should hear only receiver noise. Now reduce the gain of the i.f./r.f. circuits until receiver noise just disappears. Reconnect the antenna, remove the dummy load, and tune the set to an unused frequency. Any noise then emanating from the speaker must be antenna/cosmic noise. The louder it sounds, the better is the signal to noise ratio of the receiver. (The antenna should ideally present a 50-100 ohm impedance to the set). If your receiver has no i.f./r.f. gain control then you should have bought one which has, since without one you cannot achieve an ideal gain distribution.

I only mention this test because the 940 passes it better than any other receiver I have tried provided one small modification is made: that is to remove the gain control line from the ECC189 r.f. amplifier. Disconnect the gain control line from R4 (150 ohm) and connect the bottom end of R4 to the chassis. The ECC189 produces exceptionally low noise but, unfortunately, the gain control reduces its gain earlier than that of V2, the 6BA6. The result is that the wanted signal, particularly if weak, is reduced more rapidly than receiver noise. This is of consequence in the 940 because it really has too much gain in the r.f. stages and should be operated with the r.f. gain backed well off and the a.f. gain set high. It is this excessive gain which causes frequency-pulling (actually "frequency-locking") which, despite careful design to obviate the problem, can only be expected.

However my suggested modification allows operation at reduced gain and immediately removes the problem. Although I agree that it is not good practice to apply a.g.c. to the mixer since it can alter possibly critical valve working points, its removal appears to have no effect on the pulling on strong signals. This seems to be due to some of the signal arriving at the local oscillator grid and causing it to "lock".

I would also warn 940 owners against diving into the receiver and replacing everything in sight. The 940 at this station still has all of its original components except for one of the notorious screen-dropping resistors. I have tried valve replacements, with no improvement, but I keep an eye on the general performance, re-aligning the set every few years. The practice of interchanging valves can detune circuits and alter the gain distribution. Extremely critical measurements would be needed, and complete re-alignment to decide which valve was best. It looks, and sounds, as though it were fresh from the factory. No leaky capacitors or faulty resistors have been detected. The low i.f. has caused no problems even at the highest frequencies and I believe that, with careful alignment, Eddystone's figure for image rejection can be bettered. The set is exceptionally stable, and dial accuracy incredibly good (although I, too, have fitted a very lightly-coupled buffer to drive a frequency counter).

Tim's fleeting reference to replacing all carbon resistors with metal film types might plunge the unsuspecting into many hours work. Most of them are totally inaccessible without taking the entire coil-pack to pieces and I wonder if he actually attempted this task of micro-surgery. Also, I would not expect any significant improvement; there are hardly any resistors in the signal path and most of those associated with the offending stages are solidly decoupled at r.f. Any improvement is more likely to result from better thermal stability, but even this is doubtful - and where does one obtain 1W and 2W metal film resistors? It should also be mentioned that, as the mains transformer has a 230V tapping, not 240V, all voltages will measure at least 5 per cent high and even 10 per cent in some places.

I would have liked to have seen further qualification of Tim's remarks concerning the tertiary windings on the i.f. transformers. This is an established technique for slightly over-coupling the windings to broaden the response curve and seems to have no undesirable consequences.

Without wishing to sound too clever or hypercritical I must add that I have never taken to the "stenode" circuit, although I have yet to see Tim's application of it. Highly-peaked, single crystal filters are useful for c.w. but introduce considerable harmonic distortion into 'phone signals. The stenode circuit attempts to restore tonal balance by removing the lower audio frequencies but, at the same time, seems to emphasise the distortion products. In addition, tuning becomes extremely critical, demanding a much higher tuning ratio than the 940 possesses, and extreme frequency stability. If the receiver drifts into the sidebands the effect is nerve-grinding.

Tim's article is the first that I have ever seen on this receiver, although I have noticed since my original comments in Radio Communication that a few "wanted" adverts have appeared for it. It was my "control sampler" receiver during the development of the G4DTC "Ultimate Hybrid", while in practice both are limited by cosmic noise.

RAY HOWGEGO G4DTC
CATERHAM
SURREY

WHAT'S NEW

Solar Powered DMM

Whatever will they think of next? Solar powered calculators are quite commonplace but Universal Instruments have just introduced a pocket-size digital multimeter which uses solar power!

In case you are wondering what happens when you are delving into the dark and murky corners of your shack trying to measure the voltages around a piece of sick gear, the Hioki 3242 has an internal rechargeable battery. You don't even have to remember to leave the meter out of its case - the case is made from transparent vinyl so that the battery is recharged even when the meter is not in use. Presumably you have to remember not to put it away in a cupboard or drawer.

The Hioki 3242 is an auto-ranging instrument with a single rotary switch and a 3 1/2 digit liquid crystal display which shows, not only the measurement, but also the units and symbols along with polarity. All voltage ranges are fully protected to 50V and input impedances are greater than 10 megohms.

The instrument measures d.c. voltages from 0.1mV up to 500V in five ranges and with an accuracy of better than 1per cent. Measurement of a.c. voltage is from 1mV to 500V in four ranges. Resistance is measured from 0.1 to 20 megohms in six ranges, along with both visual and audible continuity checking. All the resistance ranges are protected against voltages of up to 250V.

Measuring just 120 x 65 x 18mm including the fully enclosed test lead storage compartment and weighing in at around 110gm the Hioki 3242 costs £60.08 inc. VAT from **Universal Instrument Services Ltd, Unit 62, GEC Site, Cambridge Road, Whetstone, Leicester LE8 3LH. Tel: (0533) 750123.**

Peak Envelope Power Meter Kit

One of the most popular circuits designed by John Fielden GW4NAH and available, until about two years ago, at rallies and by mail order as a ready-made and tested p.c.b. was the peak envelope power (p.e.p.) meter.

Now arrangements have been made for Technical Software to produce the p.e.p. module. This board will convert any power meter to read p.e.p. instead of average power and is very easy to install and calibrate as well as being very effective and cheaper than paying a lot extra for a s.w.r. meter with a built-in p.e.p. capability.

The p.e.p. meter is an indispensable aid to the correct operation of an s.s.b. transmitter if you are to avoid overdriving the p.a. with consequent distortion and wide-band splatter.

The board is available, ready assembled and tested with mounting kit and full instructions for installation, calibration and use at a price of £12.00 inc. VAT and p&p from **Technical Software, Fron, Upper Llandwrog, Caernarfon LL54 7RF. Tel: (0286) 881886.**

Godiva Award

The Coventry Amateur Radio Society have just introduced a new award which is available to all licensed operators and short wave listeners.

Called the Godiva Award, it is given for contacting G2ASF, G7ASF or any other special event station operated by Coventry Amateur radio Society or at least two of their club members. You also have to work, or hear, a sufficient number of stations located within the City of Coventry boundaries to achieve the requisite number of points for the award. 20 points are required for any station located in the British Isles, 15 for other European stations and 10 points for stations outside Europe. You get 5 points for each CARS callsign worked or heard, 2 points for each CARS member worked or heard and 1 point for each Coventry station worked or heard. All contacts must have been heard after 1 January 1988 but there is no time limit for the achievement of the award. Contacts via repeaters are not acceptable for the award.

The cost of the award, which is printed in three colours on high-quality paper for putting up on your shack wall, is £1.50. A full set of rules and further details are available, for a stamped addressed envelope, from **J.Ward G4HHT, 3 Shirley Road, Coventry CV2 2EL**

New Address for GB2ATG

Bob Andrews, who runs GB2ATG has moved. GB2ATG is one of the few amateur radio news broadcast services in the UK and Bob welcomes any item of amateur radio news for possible transmission by GB2ATG. Items of news about amateur radio data activity - RTTY, Amtor, packet and fax - are particularly welcome as GB2ATG is part of BARTG's service to its members.

GB2ATG is transmitted during the **first** and **third** Sunday of each month on 3.590, 14.090 and 144.600MHz. As it is operated by a group of volunteers its schedule is subject to change. However the most recent schedule is always published in *Datacom*, the quarterly journal which is sent to all BARTG members.

BARTG caters for all those who are interested in using data modes - RTTY, packet, Amtor and fax - with amateur radio and currently UK membership costs £8.00 per year. If you are into data communication then contact **Mrs Pat Beedie GW6MOJ, "Ffynnonlas", Salem, Llandeilo, Dyfed, SA19 7NP. Tel: (0558) 822286** who will send you membership details and forms.

Bob G1JZJ is also looking for more amateurs to join his group of volunteers to transmit GB2ATG so if you are interested contact him at **52 Linridge Road, Erdington, Birmingham B23 7HX.**

Connectors

If you are looking for low-cost, good-quality, audio connectors then Rendar of Bognor Regis have just added a useful range to their stock.

Jack sockets and plugs for general use in the three common sizes of 2.5, 3.5 and 6.3mm are available together with a gold-plated range for higher specification equipment use. Panel and p.c.b. mounting sockets are complemented by straight, right-angled and in-line plugs. DIN and Phono plugs and sockets in a comprehensive variety of body materials and designs can be supplied. Connectors for d.c. power use are also included in the range. Other interesting items include a wide range of switches and audio cables.

For more information contact **Gez Smith, Rendar Ltd, Durban Road, South Bersted, Bognor Regis, West Sussex PO22 9RL. Tel: (0243) 825811.**

WHAT'S NEW

Science Museum Radio Station GB2SM

The Science Museum in London has its own amateur radio station which operates under the special event callsign of GB2SM. Here Geoff Voller G3JUL is seen at the console talking on the 144MHz band to the Rt. Hon. Cecil Parkinson MP during his visit to RSGB Headquarters in Potters Bar on 9 September 1988.

DTI Radiocommunications Division Information Sheets

The Radiocommunications Division of the Department of Trade and Industry has just issued three new Information Sheets.

The first one is the *Current List of Information Documents, Application Forms and Publications*, BR81 September 1988. This document gives you a complete list together with information on how to order, of all the Information Sheets, General Publications, Licence Application Forms and Guidance Notes concerning the use of the radio spectrum.

The Radio User's Guide to the Law, BR67, is a new Information Leaflet which explains the regulations governing the use of radio equipment when it is used for civil communications in the UK.

Another new Information Leaflet is *The General role of the Radio Investigation Service*, BR78. This describes the role of the RIS and how to use it and includes a map of the UK showing the District Structure of the Service.

Radio Amateur Information Sheet No. 7: New Amateur Radio Licences, BR80, briefly deals with the recent major revision of the Amateur Radio Licence to be introduced on 1 January 1989.

These Information Leaflets are available free of charge from **The Information and Library Service, Department of Trade and Industry, Radiocommunications Division, Room 605, Waterloo Bridge House, Waterloo Road, London SE1 8UA.** You can also use their 24 hour Answerphone Ordering Service on **01-215 2072.**

Cat's Wiskers Certificate

North Cheshire Radio Club are running their "Cat's Wiskers" award for received Morse at speeds of 14, 18 , 26 and 30 w.p.m. Stations can, of course, pick any, or all of the above speeds and those who have just passed the Morse test can start at 14 w.p.m. and work their way up.

The starting date was Sunday 25 September 1988 on Top Band around 1.820MHz and on 2 metres 144MHz after the Slow Morse broadcast by the RSGB. Approximate starting time is 7.30 p.m. clock time.

Your "Cat's Wisker" text should be sent, together with 50p to cover postage and packing, to **North Cheshire RC, Morely Green Social Club, Mobberley Road, Morley Green, Wilmslow SK9 5NT** or you can deliver it personally.

Opening up the Millimetric Wavebands

The section of the radio frequency spectrum above 30GHz will bring a communications boom if industry grasps the opportunity, according to the DTI's consultative document *The Use of the Radio Frequency Spectrum above 30GHz.*

The DTI sees enormous potential for new types of services not yet catered for which will be made possible by exploiting the different propagation characteristics of these frequencies. Short-range television, very fast data transmission, cable-less internal telephone systems, electronic funds transfer at point of sale (EFTPOS), communications between buildings in line of sight and mobile services such as route guidance for vehicles or portable telephones are among the ideas being suggested. The DTI is calling for responses from users, potential users and industry on how best to exploit this opportunity to be sent to them by 31 December 1988.

At present there are but a few areas of this vast spectrum actually allocated or being used. Among these allocations are several amateur bands which, for obvious reasons, are rather empty at present! In the past, however, radio amateurs have paved the way to the opening up of frequencies which had been deemed impossible to use. Perhaps history will repeat itself here.

A maximum practical range of up to 10 to 15km for these frequencies would seem to be a disadvantage. However, for certain types of services this short range could be turned to advantage, allowing re-use of frequency allocations at short distances, increasing the information carrying capacity of the bands over the country as a whole.

Telecommunications policy allows short telephone links between buildings of the same business across gaps such a roads and line-of-sight millimetre links could provide this connection very effectively at a cost probably considerably lower then providing a wired or optical fibre link. Only a simple annual licence fee would be payable for the use of the frequency.

Industry Minister Robert Atkins said "Efficient communications are so important to success that every new sector of industry and commerce is likely to find uses for this new area of the spectrum. I welcome publication of the report and I want to see imaginative schemes being put to us so that the Government can play its full role.

"If we are to see the maximum benefit to suppliers and users of millimetre waveband equipment, we need to begin the process of collaboration between these groups at the earliest possible time. We need to identify as many uses as possible and approach their implementation in an orderly manner.

"There is also a need to co-ordinate European harmonisation of frequency allocations within the range and the sooner we in the UK get our act together, the better the chance we have of taking a lead in the discussions now starting in Europe."

Copies of the consultative document are available from the **The Information and Library Service, Department of Trade and Industry, Radiocommunications Division, Room 605, Waterloo Bridge House, Waterloo Road, London SE1 8UA.** You can also use their 24 hour Answerphone Ordering Service on **01-215 2072.**

Catalogues

A large number of catalogues are sent into the office covering all manner of items, interesting, useful and otherwise! Some of those received recently and which I felt are of interest are described here.

Tandy
The *Tandy 1988-89 Electronics Catalogue* is now available free from your local Tandy Store. The catalogue contains a full section by section show-case guide to the complete Tandy range of electronic goods.

The 140 pages, in full colour, details the main features of the products which include audio and hi-fi equipment, radios and televisions, electronic toys and games and the Tandy Computers range of IBM PC compatible computers and peripherals.

If you have difficulty in locating your copy write direct to **InterTAN UK Ltd, Tandy Centre, Leamore Lane, Walsall, West Midlands WS2 7PS.**

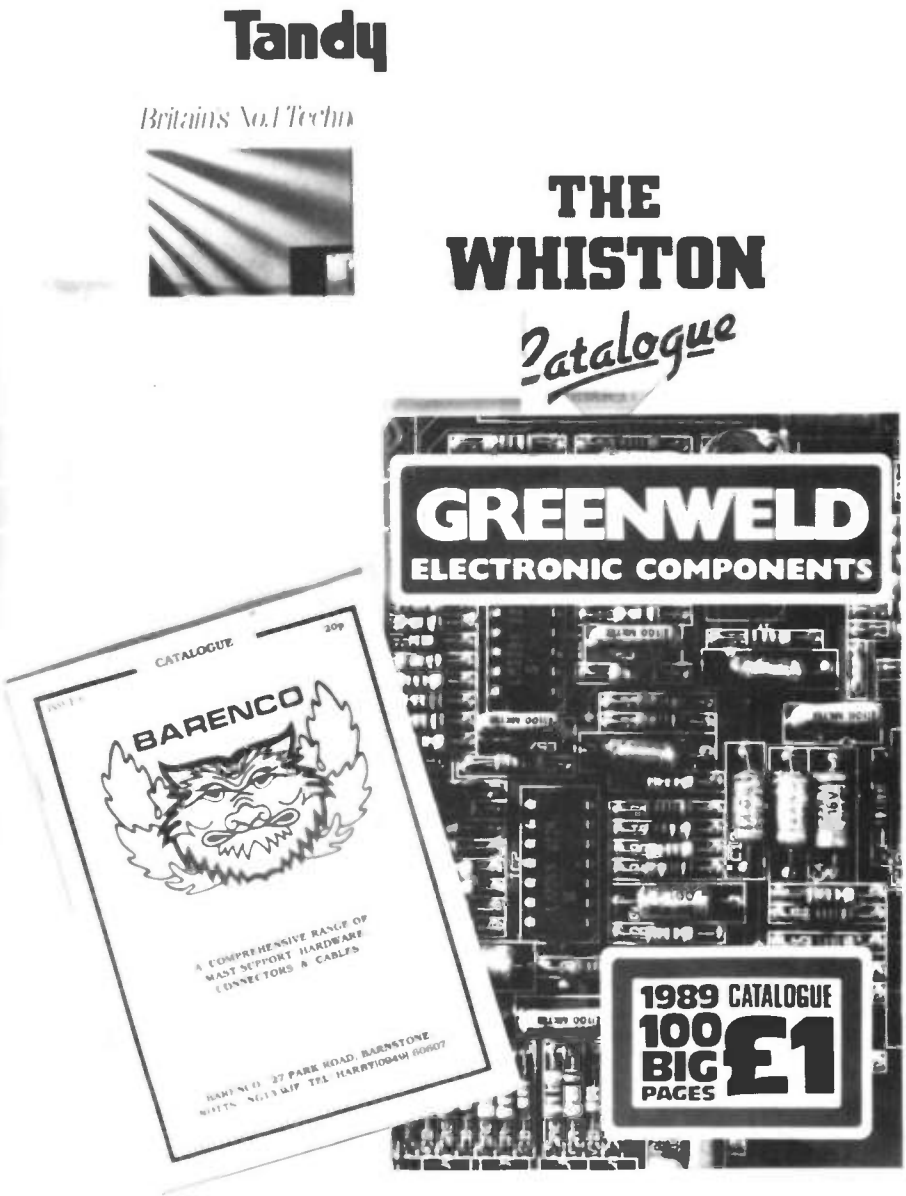
BARENCO
This catalogue, Issue 6, gives details of a comprehensive range of antenna mast support hardware, connectors and cables.

If you need any parts for your antenna mast, r.f. feeder cables or connectors then you need this small booklet. It will cost you 20p from **BARENCO, 27 Park Road, Barnstone, Notts. NG13 9JF. Tel: (0949) 60607.**

Global Specialties
This is the most comprehensive catalogue ever produced by Global Specialties. The 32-page booklet is entitled *The Album* and features the full range of products offered by the company including oscilloscopes, signal sources, power supplies, safety testers and voltage monitors, prototyping and training equipment and a wide range of logic test products and analysers. Information is also provided on wattmeters and multi-meters with a special section on frequency and time measurement counters and capacitance meters.

The Album is available from **Global Specialties, 2nd Floor, 2-10 St. Johns Street, Bedford MK42 0DH.**

Greenweld
The 1989 Catalogue from Greenweld is the biggest they have have ever produced. Inside its 100 pages you will find a wide range of electronic components - everything from plain resistors to complex instruments and audio equipment.



If you are into home construction then you really must get a copy of this catalogue. It will cost you £1.00 from **Greenweld Electronics Ltd, 443L Millbrook Road, Southampton SO1 0HX. Tel: (0703) 772501.**

Whiston
The latest edition of *The Whiston Catalogue* has just arrived. Known as "The Cat" by regular customers this one is No 121 September 1988 and is an indispensable item if you are into home construction - or even car maintenance, d.i.y. or, dare I mention it, model engineering.

Full of items such as nuts and bolts, bearings, electrical items, raw materials such as alloy tube and rod, tools and a whole host of other goodies too numerous to mention - both new or surplus - you can get your free copy by writing to **K.R.Whiston Ltd, New Mills, Stockport SK12 4PT** or phoning their 24 hour Answerphone service on **(0663) 42028.**

Low Frequency Antenna System

There is a demand for a simple, low-cost, l.f. antenna capable of being erected in the confines of the modern garden. Many stations make do with end-fed wires with an a.t.u., but such antennas can give rise to interference problems and in general are poor performers.

Waters & Stanton have introduced their solution to the problem in the form of the LF-8040 dipole kit. This is an 3.5/7MHz (80/40m) dipole with a total length of about 21.3m. This length can be reduced by dropping the ends or installing it as an inverted "V" system.

The kit comprises a pair of 500W traps together with a dipole SO239 centre piece, end insulators, wire and full instructions. The completed antenna operates as an efficient dipole on both bands and can be used without an a.t.u. The feed impedance is 50ohms and by the use of the special coils the size has been reduced to about half-size on the 3.5MHz (80m) band. Price is £29.00 plus £1.00 p&p. from **Waters & Stanton Electronics, 18-20 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835.**

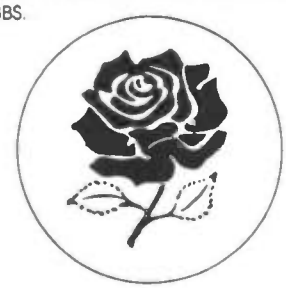
GRASSROOTS

Lorna Mower

Poole RAS have a Review meeting and videos on November 25. Meet in Commander's House, Constitution Hill Road, Poole, Dorset at 7.30pm. Dave Mason G3ZPR on Poole 674539.

Loughton & District ARS meet in Room 20, Loughton Hall, Rectory Lane, 7.45pm. November 4 is Club Sale and the 18th a Film Show. John Ray G8DZH on Loughton 3434 after 7pm.

Yeovil ARC have The Full Wave Dipole G3MYM on November 3, Zener Diode Voltage Stabiliser G3MYM on the 10th, Product Detectors G3MYM on the 17th and a Natter Night on the 24th. Thursdays, 7.30pm at the Recreation Centre, Chilton Grove. David Bailey G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.



East Lancashire ARC have a Home Construction Competition on November 1. 1st & last Tuesdays, 7.30pm at the Conservative Club, Cliffe Street, Rishton. Phillip Drew G1OPV on Accrington 32936.

Grafton RS have RFI in Industry G3ZKE on October 28 and Night on the Air on November 11. 2nd & 4th Fridays, Holy Trinity Church Hall, Stapleton Hall Road. Rod G0JUZ on Southgate 8154.

Wakefield & District RS meet Tuesdays, 8pm in Ossett Community Centre, Prospect Road. November 1 is Practical Evening, the 8th a Pie & Pea Supper at G4OVW and the 15th is Members on the Air h.f. Contest. John Roberts G1XYT at 1 Pomfret Place, Garforth, W. Yorks LS25 2NL.

Bredhurst R & TS meet Thursdays, 8pm at Parkwood Community Centre, Parkwood Green, Rainham. November 3/17 are Natter Nights, the 10th is Simple RX by G3RJV and the 24th a Construction Contest. Trevor Cannon G6YLW on Medway 32153.

South Manchester RC have Halloween d.f. Contest on October 28, Visit to TV Switching Centre on November 4 and their Annual Dinner on the 11th. Fridays, 8pm in Sale Moor Community Centre, Norris Road. David Holland G3WFT on Sale 1837.

Sheffield ARC meet Mondays, 7.30pm at the Firth Park Pavilion, Firth Park. November 7 is Another Mans Hobby by Sid Thackery, the 14th a Film/Video Show and the 21st a Natter Night. Alan G0ILG on Sheffield 670866.

Torbay ARS meet Fridays, 7.30pm in ECC Club, Ringslade Road, Highweek. October 29 is Transistors - their Manufacture G4HTD. Bob McCreadie on Haytor 233.

Farnborough & District RS have their 23rd AGM on November 9 and Chairman'sEvening on the 23rd. 2nd & 4th Wednesdays, 7.30pm in Railway Enthusiast's Club, Hawley Lane. Tim FitzGerald G4UQE on Camberley 29321.

Biggin Hill ARC have Stereo Photography by Les Wilbraham on November 15. 3rd Tuesdays, 7.30pm at The Victory Social Club, Kechill Gardens, Hayes. Geoffrey Milne G3UMI on Hayes 2689.

Sutton & Cheam RS have the Leicester Amateur Radio Show at Granby Hall on October 28/29 and Equipment Reviews G3OSS on November 18. 3rd Fridays, 7.30pm at Downs Lawn Tennis Club, Holland Avenue and Natter Nights are 1st Mondays in Downs Bar. John Puttock G0BWV on Sutton & Cheam 9945.

Pontefract & District ARS meet Thursdays, 8pm in Carleton Community Centre, Carleton Road. November 3 is Contest Operating talk G4OSY, the 10th a Committee Meeting, the 17th PCB talk by Dave Wilcox and the 24th is On the Air. Eddie Grayson G6OJX on Knottingley 83792.

Wyre ARS meet 2nd & 4th Wednesdays, 8pm in Breck Sports & Social Club. November 9 is 1988 Club activities on video and the 23rd is their AGM. Dave Westby G4UHI on Lancashire 854745.

Midland ARS have MAXPACK demo (provisional) on November 15. Tuesdays 7.30pm, classes from 7pm, Unit 16, 60 Regent Place, B'ham. Wednesdays is Morse, Thursdays is On the Air. Tom Brady G8GAZ on 021-357 1924.

Mid-Warwickshire ARS meet 2nd & 4th Tuesdays, 8pm in St. John's Ambulance HQ, 61 Emscote Road. November 8 is Video Night RSGB and the 22nd is Technical Topics by members. Peter Brown G0HIH on Marton 632370.

Derby & District ARS meet Wednesdays, 7.30pm at 119 Green Lane. November 2 is a Junk Sale. Kevin Jones G4FPY on Derby 669157.

Wirral ARS meet 1st & 3rd Wednesdays at Ivy Farm, Arrore Park Road. Natter Nights Tuesdays. November 2 is a Chairman's Night. R. Bridson on Wallasey 1346.

Bath & District ARC have VHF Night on November 9 and a talk on the 23rd. Alternate Wednesdays, 8pm at the Englishcombe Inn, Englishcombe Lane. Eric Otten G4GEV on Combe Down 832156.

Cheshunt & District ARC meet Wednesdays, 8pm in the Church Room, Church Lane, Wormley. November 9/23 are Natter Nights and the 2nd is a talk by G3OUF. Peter Davies G1KQA on Lea Valley 764930.

Wimbledon & District ARS have Weather Satellites G8CYE on October 28 and The Noise Bridge and Its Use G3DWW on November 11. 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Road. Tom Mansfield G3ESH on 01-9421418.

Norfolk ARC meet Wednesdays, 7.30pm in The Norfolk Dumpling, The Livestock Market, Harford. November 2/16 are Informals, the 9th a Quiz - In trivial pursuit of radio and the 23rd G3AMF on Early days of SSB. Craig Joly G0BGD on Norwich 485784.

Stevenage & District ARS have Computer RFI Suppression on November 1 and a Committee Meeting, 8pm at 7 York Road on the 22nd. Meet 8pm at SITEC Ltd, Ridgemond Park, Telford Avenue. Peter G0GTE on Stevenage 724991.

Keighley ARS have an Informal on November 8. 2nd & last Tuesdays, 8pm in the Club Room, rear of Victoria Hall, Victoria Park. Kathy G1IGH on Bradford 496222.

Felixstowe & District ARS have a talk on East Suffolk's New Digipeater G8ONH on October 31st and a Social on November 14th. Alternate Mondays, 8pm in the Scout Hut, Bath Road, all Socials in the Grosvenor Hotel. Paul Whiting G4YQC on Ipswich 642595.

Todmorden & District ARS meet 1st & 3rd Mondays, 8pm at the Queen Hotel. November 7 is Visit & demo by Lowe Electronics and the 21st a Natter Night. Val Mitchell G1GZB on Todmorden 7572.

Rugby ATS meet Tuesdays, 7.30pm at the Cricket Pavilion, outside Rugby Radio Station. November 5 is Fireworks and Barbecue, the 8th an Activity Night and the 15th a talk and demo of Packet Radio G4MTP/G4JTY. Kevin Marriott G8TWH on Rugby 77986.

South East Kent (YMCA) ARC have Natter Nights on November 2/16, Role of the Royal Signals talk by Troop Commander D. Murphy G8ZYZ on the 9th and Simple Side Band on the 23rd. Meet Wednesdays, with Morse or RAE Coaching on Mondays & Tuesdays. John Dobson on Dover 211638.

Chelmsford ARS have a their annual Junk Sale on November 1. 1st Tuesdays, 7.30pm at Marconi College, Arbour Lane. Roy Martyr G3PMX on Chelmsford 353221 Ext. 3815.

Worksop ARS have Natter Nights on November 1/15 and Call my Bluff (Maltby visit Worksop) on the 8th. Meet Tuesdays, time and place from Mrs C. S. Gee G4ZUN on Worksop 486614.

Vale Of Evesham RAC meet 1st & 3rd Thursdays. 1st are Formals in the Meb Club, Worcester Road 7.30pm. 3rd is work on VERAC Contest/Special Event Caravan. November 3 is St. Kilda - the Island on the Edge of the World by G4WBR. Mike G4UXC on Evesham 831508.

Thornbury & District ARC have a Quiz Night on November 8 and Natter Night on the 22nd. Meeting place and time from H. Cromack G0FGI on Thornbury 411062.

Acton, Brentford & Chiswick ARC have Trips to Korea G3XPC on November 15. Alternate Tuesdays, 7.30pm at the Chiswick Town Hall, High Road. W. G. Dyer G3GEH on Acton 3778.

Verulam ARC meet 2nd & 4th Tuesdays, 7.30pm at the RAF Association HQ, New Kent Road. November 8 is an Activity Evening and on the 22nd the Club holds its annual Great Egg Race - an inter-club activity. Hilary G4JKS on St. Albans 59318.

Reading & District ARC have Berkshire Downs Repeaters by G4CCC/G8DOR on November 8, the 22nd is their AGM. Alternate Tuesdays, 8pm at the White Horse Pub, Emmer Green. Mike Anthony G4THN on Reading 774042.

Listen to the World on the HF-125 SHORT WAVE RECEIVER

The HF-125 short wave receiver was conceived, designed and is "Made in Britain" for the DX enthusiast. Its ability to perform on a crowded band with strong adjacent stations was a major consideration in its design. The HF-125 is also easy to use, the controls being simple and sensible. Essential bandwidth filters which are often options on other equipment are fitted as standard. Unnecessary frills are not included and their omission is deliberate. The result is an affordable receiver.

The HF-125 has continuous coverage from 30kHz to 30MHz. Operating modes are AM, USB, LSB and CW. An optional board (D-125) adds FM and Synchronous AM. The HF-125 comes complete with a comprehensive range of bandwidths. For the Morse enthusiast a 400Hz audio filter is included as standard.

Operating the HF-125 is refreshingly simple. The controls are logical in use and a large back-lit liquid crystal displays the operating frequency.

Two buttons, one marked up, the other down, select the correct megahertz and you tune to the required frequency using a large heavy knob with a thoughtfully provided finger recess. The tuning rates relate to a simple design concept of two stations per knob revolution on each mode. As well as providing the optimum tuning rate whilst you are carefully looking for a weak signal, the HF-125 automatically increases its stepping increment as the knob rotation speed increases. The result is an extra rapid frequency shift to a new part of the band. There is also an optional keypad controller (K-125) for even quicker frequency selection.

To further enhance reception other facilities are included. A noise blanker is permanently in circuit to deal with vehicle ignition interference, 20 dB of attenuation can be switched in when required and an HF or LF cut control can be applied to the audio output. The HF-125 provides its owner with outstanding performance.

Connections are included for both 50 and 600 ohm impedance aerials (SO-239 and a terminal block). The receiver has jack sockets on the rear panel, one for an external loudspeaker and the other for tape recording.

The HF-125 operates from 12 volts DC and, as such, is suitable for use from an external battery whilst caravanning or boating. For home use an AC mains adapter is supplied with the receiver. For truly portable listening, in the garden or on a hilltop, an internal rechargeable battery, charger and active whip aerial option (P-125) is available as well as a tough protective carrying case with shoulder strap (C125). Operation on a fully charged Nicad pack is around 10 hours.

Compact and lightweight, the HF-125 is 255mm wide, 100mm high and 200mm deep, a portable high performance short wave receiver.

HF125	£375.00 inc VAT. carriage £8.00
D125	£59.50 inc VAT. carriage £1.00
K125	£59.50 inc VAT. carriage £1.00
P125	£69.51 inc VAT. carriage £2.50
C125	£23.85 inc VAT. carriage £2.50

FREE

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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STAMPS & RADIO

Raymond Schuessler

When the archaeologists of the future unearth our civilisation they will have a good idea of our culture from the stamps they find.

Amateur radio operators have repeatedly been honoured by having stamps issued highlighting their hobby. And why not?

When you hear some of the stories about the deeds of amateurs you know that these "badges of honour" are well deserved. Like the New Orleans radio amateur who, on hearing a Columbian emergency call asking for a snake serum, relayed the call so that the serum could be sent from Miami, saving a boy's leg from being amputated; or helping to save a whaling vessel crew which had struck an iceberg in the Arctic; or the Canadian operator helping to rescue four soldiers in Manitoba 2400km away.

Pioneers

Stamps commemorate the handful of pioneers in 1901 who, inspired by Marconi, the father of wireless communications, grew into an international fraternity with half-a-million members.

Those were the days when all transmitting and receiving apparatus had to be assembled by hand with few books and no magazines available on the subject.

Remember, it was an amateur who helped track the first man-made satellite, who discovered the value of short waves and who opened the way to TV and v.h.f. f.m. broadcasting.

The wartime stamps are well deserved because World War II saw over 25000 "hams" in uniform designing "comms" equipment, setting up global networks and manning radar installations. They were indeed valuable wartime assets.

Israel honoured its amateur radio operators in 1987. The Palestine Radio Club was organised during the British Mandate and eventually became the Radio Amateur Association of Israel. These amateurs played an important role in laying the foundations of the Army Signal Corps, as well as the civilian communications network during the early years of the state of Israel. The association has 900 members, 700 of which hold official licences.

Ascension Island issued a stamp in 1982 showing King George V making his first BBC Christmas Radio Broadcast to the Empire, something which has since become a Commonwealth tradition.

Amateur Equipment

A variety of old amateur equipment is portrayed on some stamps adding to the collectable quality of such stamps. Even Disney's Chip and Dale get into the act on a Bhutan stamp, featured on the cover, celebrating the "History of Communications".

Ever since 1840, when the postage stamp originated in England, postal authorities throughout the world have marked great milestones in science, medicine, arts and history by issuing special stamps. Those receiving such an accolade have earned a permanent niche in world history, for stamps never perish.

If you want to start your own collection, consult a stamp catalogue in your local library (*Scotts, Gibbons* or *Minkus*). They list and/or illustrate all stamps with their official call number and current value. The catalogues are revised annually to include all new stamps and price changes.

Subscribe to a good weekly stamp newspaper (*Linns*), also available at most libraries. Search their advertisements for dealers who specialise in the country whose stamps you are after.

New Issues

You can also subscribe to a "new issue" service in which you will be sent all "ham" stamp issues as they are released.

Visit a local stamp shop. They may have a good selection or be able to fill in the blank spaces. Used stamps are cheaper than mint.

Storage

Stamps should be stored in 3-ring plastic sheets, with windows, to protect the stamps from humidity, dust and creasing. They can be kept in a loose-leaf notebook.

Profits

The greatest profits lie in stamps with printing errors. A man in London went into his local Post Office for a sheet of 100 stamps priced at 9p each. When he got home he found that no price had been printed on them. A stamp shop later bought the sheet from him for £60000.

In 1918, the US airmail stamp of the Jenny plane was printed upside down. A sheet of 100 were purchased at a Post Office window. Recently, one of those stamps was sold at auction for $100000!

Newsletters

Some amateur radio club newsletters have regular columns dealing with philately, while others in countries such as Canada, Sweden, Cuba, Czechoslovakia, Berlin, East Germany, Bulgaria, Belgium and Portugal, carry stamp news over the airwaves.

As an amateur, it should be easy for you to ask other ham-philatelists in foreign countries to send whatever stamps commemorating amateur radio their country has issued to add to your collection. Perhaps you could even trade your own duplicates in this manner.

Rewarding

Just as few hobbies are more rewarding and utilitarian than amateur radio, with its friends, fun and excitement, philately lets you combine your original hobby with a secondary one to give you twice the interest.

Tune in and see. □

RESTORING AN EDDYSTONE 940 RECEIVER

T. J. Wright G1BCR/G9BZW

Remove the a.f. input terminals with the wiring to them on the back of the chassis and fit two BNC sockets in their place. One is to enable a digital frequency counter to be driven from the l.o. and is connected via a small 2.2pF capacitor in series with a 50Ω resistor to the grid of the triode section of V3 (pin 9) using RG174 coaxial cable. The other is for an i.f. output to drive other equipment and is connected via a 10pF 250V capacitor to V7 pin 7, again using RG174 coaxial cable.

The network (C107, R70,71) feeding the PHONES socket on the front panel is removed and the socket rewired across the 2.5Ω winding of the output transformer for use with low-impedance phones. The loudspeaker terminals are removed and two ¼ inch jack sockets fitted in their place. One of these is wired directly across the 2.5Ω windings of the output transformer. The other is connected to the "Tape monitor" output in Fig. 3.1 A 2W 30Ω resistor is soldered across the secondary terminals of the output transformer to prevent it "singing" when there is no load across it.

Squelch Circuit

The squelch circuit (Fig. 3.1) is built on a tagstrip which is attached to the rear bracket of the selectivity switch (S2). Remove the noise blanker front panel switch — it never was very effective — and fit the 10kΩ potentiometer used to set the squelch level (Set trip). This modification is great when you are monitoring an empty frequency, waiting for a transmission, as it removes unwanted background noise — very useful if you do a lot of listening on the aircraft or marine bands.

Stenode Modifications

Part of the stenode circuit modifications have already been detailed in Part 2. These concerned alterations to the switching arrangements of S2 around the crystal XL1. To complete the stenode modification cut the connection between the wiper of the AF GAIN control RV3 and the grid of V9A (pin 2). A parallel RC combination (2.2MΩ & 150pF) is inserted as shown in Fig. 3.1. The rear section of the SELECTIVITY switch (S2c) is wired so that in the MIN position this RC combination is shorted out.

The final part of this series covers modifications to add a tape monitor, local oscillator output to drive a digital frequency display and a useful squelch circuit. The stenode modifications are also completed. Finally, some performance figures are given.

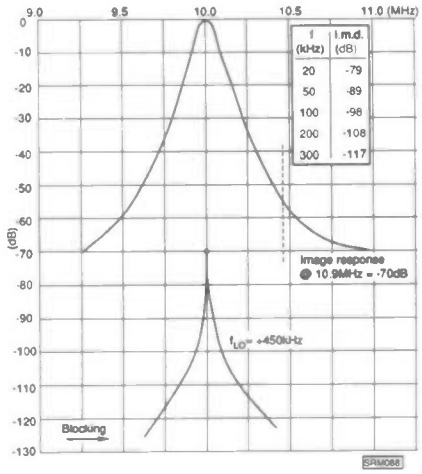
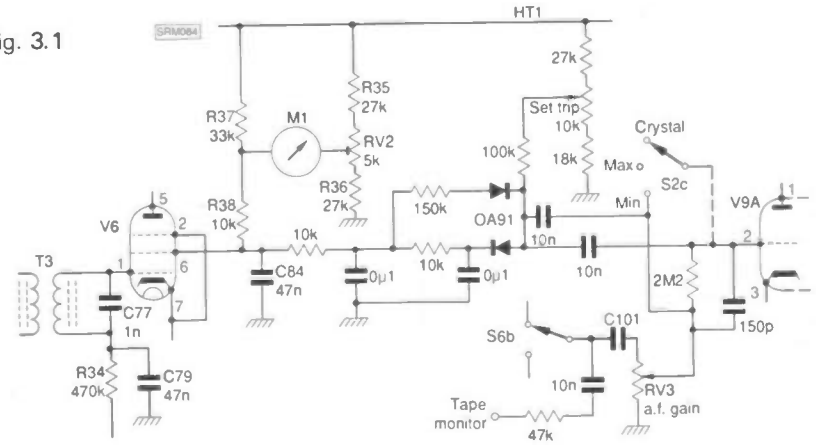


Fig. 3.2

Antenna Sockets

I replaced the antenna and earth terminals with two 75Ω BNC sockets and a subminiature toggle switch used to earth the A2 socket for unbalanced use. A 10nF 250V blocking capacitor allows for d.c. voltages on the antenna feeder such as might be used to remote-tune Varicaps on a loop antenna. Two 100kΩ bypass resistors from each input provide a discharge path for rain static.

Fig. 3.1



Mains Voltage

In areas like mine, where the mains voltage is often above 240V, the mains transformer core losses, and heater voltages, can be lowered a few per cent. This can be achieved by putting the unused low voltage winding on the transformer in series with the neutral leg. Make sure it is wired the right way round, series adding, or it will make matters worse. Check this by measuring the output from the transformer, before and after the modification.

Dial Markings

If you wish, remove the dial glass and, using a water-soluble ink to allow for alterations, underline the various frequency allocation, e.g. broadcast in red, marine in blue, aircraft in green and amateur in black. This makes rapid band searching much easier.

Leave the set running continuously for at least a week to allow the components to settle down and give it a reliability test. Finally do a complete and thorough realignment as described in the *Service Manual* and test the performance.

Results

The end result is, I feel, well worth the effort spent. Since completion my 940 is rarely turned off, so that I don't have drift problems after turn-on, or surges causing premature failure. It has been in use now for over twelve months, given me much enjoyment and proved very reliable.

Performance

The overall performance of the receiver is shown in the charts. However, there is a discrepency in noise figure, taken at 20MHz. One value (7dB) was obtained by taking the equivalent noise bandwidth from the i.f. curve (5kHz) and using a c.w. signal to double the noise output; the other (6dB) by a direct method, irrespective of bandwidth, using a thermal noise source. The most likely reason for this difference is local oscillator sidebands having the effect of increasing the bandwidth. Another possibility is inaccuracies in the equipment used in the test set-up.

While listening to the Eddystone on 5MHz, a Drake 150W transmitter was in use on 3.5MHz, the antennas being some 15m apart; this did not seem to have any detrimental effect on the receiver. Out of curiosity an oscilloscope was "T" connected to the antenna socket of the receiver and about 1.5V of r.f. at 3.6MHz was noted — thus demonstrating the need for good r.f. selectivity in some situations.

Noise

The receiver has enough sensitivity as the output of antenna background noise will exceed internally generated noise, even on

RESTORING AN EDDYSTONE 940 RECEIVER

Part 3

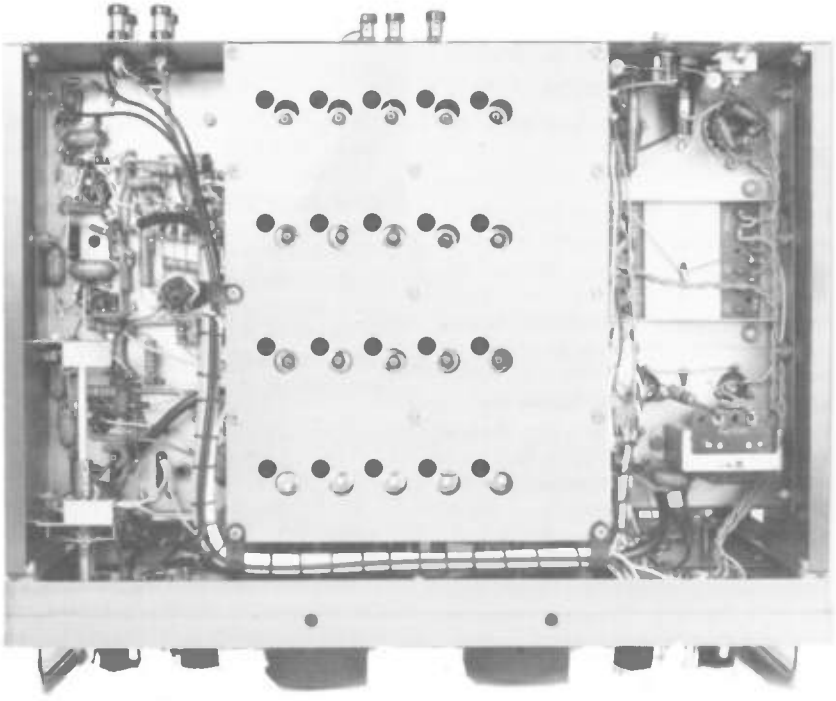
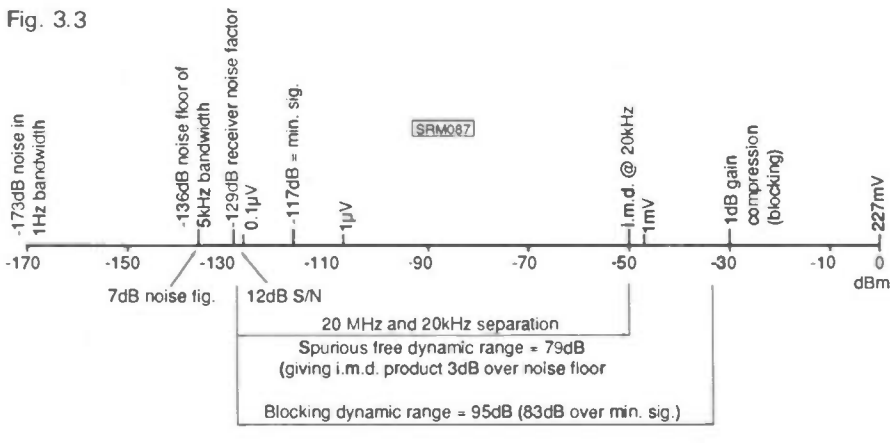
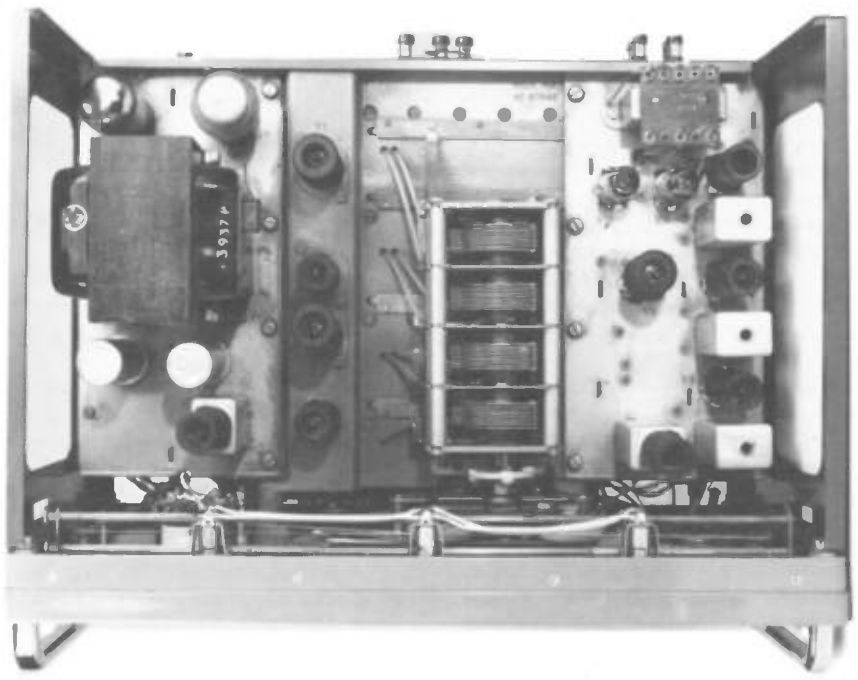


Fig. 3.3





a small antenna. The system is therefore externally noise limited so no further improvement is possible, unless the shape factor of the i.f. passband is reduced or improved, or an antenna with some directivity is employed.

The work suggested here should only be carried out by those with a sound knowledge of radio, or by others prepared to write off the set! The relevant manuals must be obtained from the manufacturer, and of course this type of restoration work could equally apply to other secondhand receivers.

I have refurbished many different models of Eddystone and other similar communications receivers, and am willing to advise anyone contemplating or involved in such an undertaking. □

Abbreviations	
a.f.	audio frequency
BNC	type of coaxial socket
c.w.	continuous wave (Morse)
dB	decibel
i.f.	intermediate frequency
l.o.	local oscillator
nF	nanofarad
pF	picofarad
r.f.	radio frequency

Performance	
Minimum detectable signal:	– 129dBm (0.9µV)
Minimum usable signal (12dB SINAD):	– 117dBm
Noise figure (see text):	– 6 or 7dB
Third order intermodulation distortion (see Note 1.)	
Fx ± 20kHz:	– 79dB
Fx ± 100kHz:	– 98dB
Fx = 20MHz	
Fx ± 300kHz:	– 117dB
1dB gain compression (50kHz separation at 20MHz):	– 95dB above noise floor
Selectivity:	– 6dB ± 2kHz – 60dB ± 8kHz
Image rejection:	> – 110dB at 2MHz – 70dB at 10MHz – 40dB at 20MHz

Notes:

1. Spurious free dynamic range for spurious products 3dB over noise floor.

Top. Underside view of the 940 showing the rugged construction of the r.f., i.f., l.o. and mixer section: Centre. Fig. 3.3 shows the performance of the receiver as measured by the author after modifications. Bottom. View of the above chassis components of the 940. The mains transformer is on the left and the output transformer at the top right.

DX LETTER FROM AMERICA

Gerry L. Dexter

In the second of his quarterly reports from America, Gerry highlights a wide variety of DX station news.

As this is being written we are but a few days away from the date on which the United States Armed Forces Radio and TV Service is due to leave the short wave broadcasting bands. AFRTS programming was carried over the facilities of the Voice of America which rented the time to AFRTS. An increase in those fees is blamed for the loss of AFRTS on short wave.

At this point it is generally expected that a great hue and cry will be raised when the world public finds out AFRTS is no longer available to them since the AFRTS audience includes untold numbers of non-military, non-US citizens around the globe. Many felt that AFRTS, with its string of domestic network news feeds, pop music and play-by-play sports gave a better "feel" for life in the US than other stations in America.

Readers who want to appeal for a return of AFRTS to short wave may write letters to the following: The Chairman, House Foreign Affairs Committee, 2354 Rayburn House Office Building, Washington DC 20515 and Chairman, Senate Foreign Relations Committee, SR-335 Russell Senate Office Building, Washington, DC 20510. Also to Lt. Col. Thomas Hanen, AFIS/AFRTS, 601 North Fairfax, Suite 360, Alexandria VA 22314 and to Mr. Charles Z. Wick, Director, US Information Agency, 301 Fourth Street, NW, Washington DC 20457. If enough letters are received perhaps this valuable source of short wave programming can be returned to the airwaves.

WWCR Nashville

WWCR, the new US short wave station based in Nashville, Tennessee, had to delay its planned September start-up. But if the new intentions went according to schedule it should be on the air about now. Actually, the revised start date was January 2. Check 7520 and 15690 for this one's appearance. Reception reports may be sent to 3314 West End Avenue, Nashville, Tennessee, 37203.

WRNO in New Orleans, through its sales representative for religious programming Pierce International Communications, is offering a special edition QSL card for reception reports on any one of the some 40 different commercial religious broadcasts aired on WRNO each week. If you verify at least 20 of these programs you can get what Pierce terms a "very special QSL card." Reception reports may be sent to Pierce International Communications at 10201 Torre Ave., Suite 320, Cupertino, CA 95014.

Radio Kek'chi

In Guatemala, Radio Kek'chi on 4845 has matched an increased operating schedule to a new 5 kilowatt transmitter with the result being much improved reception in North America. Indeed, Kek'chi dominates the frequency leaving the normally strong Brazilian there completely unheard. The former 0100 sign off now is at 0400 or even later. The programmes include many in the Kek'chi Indian language, religious songs and the like.

In Costa Rica, Radio For Peace International (RFPI) was using two new frequencies during the summer and fall months – 13660 in the 22 metre band was active from 0100 to 1000 and 21555 from 1800 to 0000 during the weekdays. The 22 metre band was reported by some to suffer from jamming. That wasn't noted in several checks at our midwest US location and it's difficult to see who would want to jam this station or why.

Colombia

Colombia has seen some fresh broadcasting activity on short wave of late. New is La Voz del Rio Arauca, a member of the Radio Cadena Nacional (RCN) network, broadcasting on 4895 from the town of Arauca. The call letters on short wave are HJGR and the transmitter runs 3 kilowatts. Sign on is at 1000. The station's address is Calle 16 con Carreras 20 y 21, Arauca, Colombia.

Caracol Bogota now occupies 4755 24 hours per day. Some ten years back this frequency was used by Emisora Nueva Mundo and the new activity is really the same station but using the Caracol network designation, as does Caracol Neiva on 4945. The two frequencies often carry the same programming from Caracol.

Radio Super in Bogota, main station of the Super Network has been reactivated on its former 6065 frequency.

A rare Chilean station has been heard by a few North American DXers recently and perhaps will be logged by a few more if its frequency of 6030 is emptied of AFRTS and the VOA does not place another service there. The station is Radio Santa Maria from Coyhaique, scheduled from 1000 sign on to 0400 close.

The Voice of Nicaragua is using 6100 again instead of its more often used 6015 frequency. The station airs two hours of English per evening (except Sundays) at 0200 and 0500.

In Venezuela there are reports of three stations planning to broadcast on short wave, though none have yet appeared. They are Radio Alto Lano on 5010 from Santa Barbara de Barinas, Radio Continental de Barinas to be at 4940 and Radio Cristobal at San Cristobal which says it will use 9570.

A number of DXers have complained about the frequent refusal of the Falkland Island Broadcasting Service to issue QSLs, even for highly detailed reports. An easier route may be to log the British Forces Broadcasting Service's programming on the FIBS transmitter and then send the report to BFBS, PO Box 1234, London W2, since BFBS has been much kinder with replies. The FIBS 3958 frequency carries BFBS programming at all hours of the day except from 1000 to 1215 and 1730 to 2130 when the programme are those of FIBS.

HCJB in Hawaii

Look for some short wave broadcasting activity from Hawaii a couple of years from now. HCJB (Quito, Ecuador) has applied to the American Federal Communications Commission for a license to build a station in the Hawaiian Islands. The station would improve HCJB's coverage of Asia. Most North American DXers look upon Hawaii (and Alaska, for that matter) as separate "radio countries".

DX Publications

Two limited circulation DX publications based in North America – Fine Tuning and Numero Uno – recently organised a joint committee tasked with several assignments. These include attempting to get the broadcasting administrations or private stations in countries not now using short wave to consider the advantage of adding a short wave service, encouraging stations which do not have schedules which make them hearable in North America to make one-time schedule adjustments or special broadcasts and other special on-the-air events. The committee, as yet without a formal name, is already working on some projects and seeks ideas and suggestions along the lines sketched above. Send your comments and suggestions to Mr. Richard D'Angelo, 2216 Burkey Drive Wyomissing, Pennsylvania 19160.

Frendx

The North American Shortwave Association (NASWA) has long been the largest club on the continent and deals exclusively with short wave broadcast listening and DXing. The club's bulletin, *Frendx*, is undergoing something of a facelift under a new editorial committee and has included some excellent articles over recent months. Sample copies can be had by sending US$2 to NASWA, 45 Wildflower Road, Levittown, PA 19057.

We are out of room for this time. Please send your comments in care of *Short Wave Magazine*. Be assured that your letters are very welcome. Until next time, best wishes from North America!

SEE YOU AT THE LEICESTER SHOW, STAND 36

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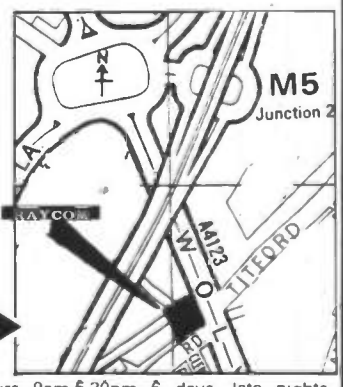

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INTRODUCTION TO DX-TV

Keith Hamer and Garry Smith

Part 14

Lattice masts can be divided into two distinct categories: fixed and tilt-over. The former type is made up of sections, typically 3m in length, and the total height of the structure is determined by how many sections are bolted together. During the construction of the tower, the lower section is normally bolted to a firm foundation and the structure is then assembled vertically. For the amateur, this is fine provided vertigo is not a problem.

Tilt-over towers usually consist of several telescopic sections, thus allowing the structure to be extended, at will, to various heights. Generally speaking, a single winch is used for extending the mast and also for providing the luffing (tilt-over) facility for maintenance and access to the antennas. Tilt-over can only be effected with the lattice sections retracted. This type of mast is available from several manufacturers and is popular with many radio amateurs. A variety of height options are available and some designs of 18m and under are free-standing and do not require the complexity of guy-lines, etc. Various types of mounting posts are available too. Some of the smaller mast systems do not even require a concrete foundation.

Advantage

One bid advantage of a lattice structure over a pole mast is the improvement in accessibility. In the case of a fixed mast, it may be climbed to gain access to the rotator and the various antennas, although with a tilt-over type this may be carried out in complete safety at ground level.

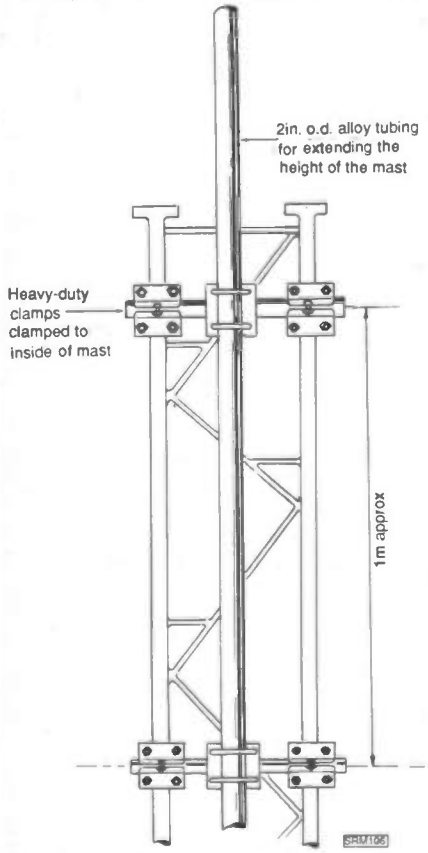

Fig. 1: The height of the mast can be extended by clamping a scaffold pole centrally inside the upper lattice section.

A lattice mast looks impressive to say the least and as well as being functional, their presence implies you take your hobby seriously.

The latter type can also be retracted during periods of inclement weather such as gales or heavy thunderstorms; most systems can be lowered manually within minutes by only one person. The fact that the smaller systems do not require guy-lines means that the system is more likely to meet approval from the planning authorities and the neighbours, but you must be prepared to spend a few hundred pounds for this privilege.

Home-made Mast

Some years ago, the authors and a couple of colleagues were able to obtain a number of second-hand triangular lattice sections at a cost of virtually next-to-nothing. The lattice sections were fabricated from iron and each measured 3m in length. The sections were secured to adjacent ones by means of three bolts.

The idea of a fixed structure was immediately ruled out because of the weight of each section of lattice. It was difficult enough for one person to lift a section off the ground let alone drag it vertically upwards to assemble the mast! It was decided that some form of pivot assembly would need to be designed for easily raising and lowering the mast. In theory, the whole erecting operation should be more predictable too when compared with the pole mast previously used because the rigid lattice structure would not sway and bend.

After the share-out, only two lengths of 3m lattice were available per person, so this meant that some form of extension would be required in order to attain a similar height of the original pole mast.

The extra height was achieved by adding a scaffold pole clamped centrally inside the mast by means of six heavy-duty clamps (see Fig. 1). At the top of the scaffold pole, the rotator was fitted. The rotator used was of the popular offset variety which accepted an antenna support pole of 1.5in diameter maximum. An alignment bearing was also fitted below the motor unit. The rotator conveniently provided a securing point for the upper set of guy lines – the lower set of guy lines were attached to the protruding top lugs of the lattice section. Both sets of guy lines share the same ground anchoring points, but it is important to note that separate turnbuckles must be used.

As with the scaffold pole mast described in Part 13, the guy lines were cut to length prior to erection. Similar hardware associated with the guying, such as turnbuckle and eyes, etc., were also used.

Use was made of a number of heavy-duty clamps arranged to form a pivot and locking arrangement as shown in Fig. 2. A number of clamps were required which may at first seem rather extravagant when the total cost is taken into account, nevertheless, the mast base pivot arrangement has proved to be safe and reliable after eleven years, considering the weight involved.

Initially only a single section of lattice was clamped to the pivot bar. The lattice section was then manually raised and once truly vertical, the "U" bolts were tightened. Note that adjustment is virtually impossible once the mast is completely assembled because of the weight involved. Consequently, great care and accuracy was necessary at this stage.

As with a building, it is vitally important to have a firm and reliable foundation for a mast installation. One made of concrete is strongly recommended, since the downward weight of the mast may be quite considerable, especially in the case of an iron one.

For the type of mast described here, a hole measuring about 0.6 × 0.6 × 1m deep should be excavated. Dig carefully though, there may well be waterpipes or drainage systems present just below the surface. One slip of the spade and you could be up to your neck in it – literally!

Once the excavation is complete, explore around the immediate vicinity with a probe for water pipes which may be lurking a few more centimetres from the bottom of the hole. This important procedure is in preparation for later activities involving hammering in poles for supporting the mast pivot assembly. The hole will eventually be filled with concrete and to give extra strength, a few broken bricks can be added. If your previous arrays brought down the chimney stack during a gale then the remains could be used!

Four lengths of scaffold pole are hammered into the clay at the bottom of the hole. Getting the poles truly vertical and perpendicular must be done by means of a plumb line. If you attempt to align these by sight, you will have difficulties because looking down a hole can create the illusion that the poles are parallel when in fact they are not! Consequently, don't be too alarmed when the poles seem to converge yet the plumb indicates they are vertical.

To make concrete, a mixture of Portland cement and aggregate consisting of sand and coarse gravel should be prepared. When buying aggregate, obtain the type classed as "all-in" which has the sand and

gravel already mixed in. The recommended ratio of ingredients is 1 part cement to 4.5 parts aggregate. These must be throughly mixed dry in sufficient quantity required to fill the hole. Once this has been carried out, small amounts of clean water should be added and, using a spade, turn the mix constantly until it is workable with no dry aggregate present. Eventually, the mix should be stiff enough to hold ridges formed with the edge of the spade but, remember, the mixture will begin to become unworkable after an hour or two. Once the concrete has been poured into the hole, the surface can be smoothed using a trowel.

At least a week should be allowed to give the concrete chance to dry and acquire some strength before fitting the clamps, etc. If possible allow a longer period because the drying-out process continues over many weeks.

When the lattice mast and associated conglomeration of accessories have been laid out along the length of the garden, it soon becomes apparent that great difficulty will be experienced in raising it to a vertical position, especially if the lattice is made of iron. If a willing army of volunteers is available all well and good, but a more elegant approach is to use a winch.

Winches are relatively inexpensive, but the main problem may be finding somewhere to buy one. In this respect, the authors were fortunate in that there was a local yacht chandler in business. A suitable type of winch is one that can take 1000lbs strain – despite this, it is surprisingly small. Suitable rope for hoisting the mast is relatively cheap too, and the type eventually chosen should be suitable for weights up to one tonne.

For the system described by the authors, nylon rope was used in favour of metal cable as a safety precaution in the event of the rope snapping while hoisting the mast. Metal rope could inflict a very serious injury, whereas with nylon rope the only people in any danger are those beneath the lattice mast helping to guide it vertically. Whilst on the subject of safety, it may be wise for all concerned to wear some form of protective headgear, just in case anything does decide to plummet to the ground!

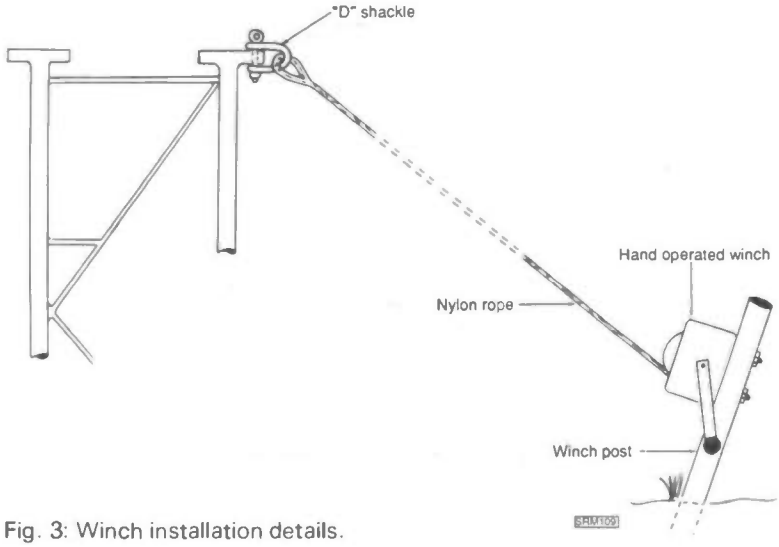

Fig. 3: Winch installation details.

Most lattice sections have protruding upper lugs to which the rope (and guy-lines) can be conveniently attached by means of a heavy-duty "D" shackle. The nylon rope is terminated with an eye and needs to be spliced. The authors were fortunate because the yacht chandler offered to do this rather skilful task which only took a couple of minutes to perform, producing an extremely neat end result.

The general winch arrangement is shown in Fig. 3, which also shows the method of attaching the nylon rope to the lugs of the lattice mast.

A firm anchorage point for attaching the winch is required. A length of aluminium scaffold pole knocked into the ground to a depth of about one metre is sufficient and the winch can be bolted to the face of the protruding upper portion. Remember to knock the tubing into the ground at a slight angle in the same way as for the guy-wire anchor points. The holes for the winch bolts are best drilled after the tubing is in position.

Without a winch, it could take seven or eight people to erect such a mast, but using this device the number is only four – one to operate the winch and three to help raise the mast to a sufficient angle for the winch to take effect. The greatest effort is the initial lifting of the mast, but once past a certain angle it's only a matter of guiding it to its vertical position and helping to keep the winch rope taut.

Once the mast has been erected and its base firmly secured using the heavy-duty clamps, the guy lines can be attached to their respective ground anchor points. Adjustment will be necessary in order to obtain true vertical alignment of the structure. In most cases, the alignment can be checked by comparing it with the corner of the house wall.

Once alignment is satisfactory, the winch rope can be removed and stored for use at a later date should the mast have to be lowered. If the rope is left attached, it may well deteriorate and become weakened. The winch can be unbolted from its support and stored in a safe place rather than being left out to rust. Such a move also prevents it from being stolen.

In practice the system works well. Antenna accessibility is better than a pole mast of similar height, although it's not the type of structure you'd wish to lower on a daily basis! No doubt readers with a greater mechanical inclination would be able to devise a tilt-over system based on similar types of lattice section.

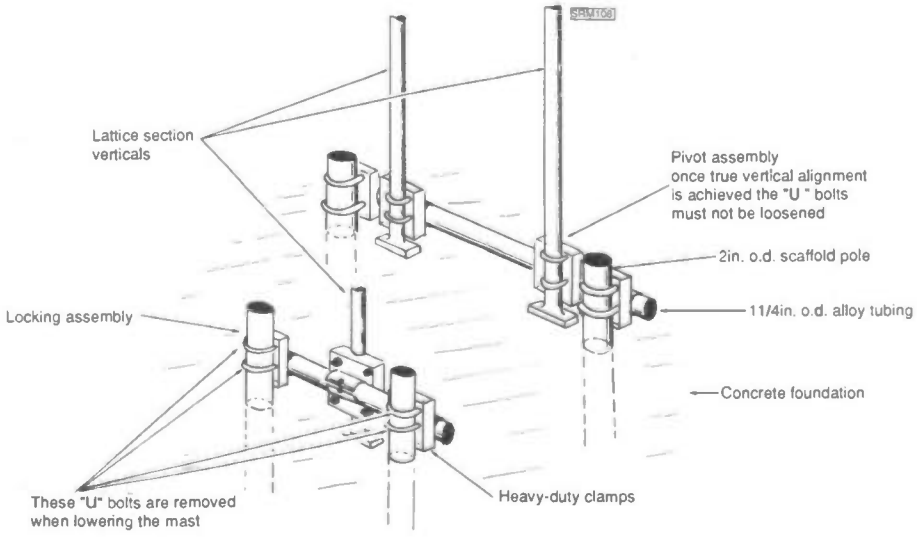

Fig. 2: Pivot and locking assembly details for a mast base.

Larger Antennas

Should a more ambitious antenna system be contemplated in which very large arrays stacked in formation may be incorporated, a sturdier antenna support pole of larger diameter must be used. Consequently, a different type of rotator to the one described above will be required in order to turn the heavier load. This can be mounted inside the upper part of a lattice section (see Fig. 4), although the exact method of mounting will depend upon the type of rotator used. A little careful thought and experimentation should provide a solution. It will be necessary to obtain a

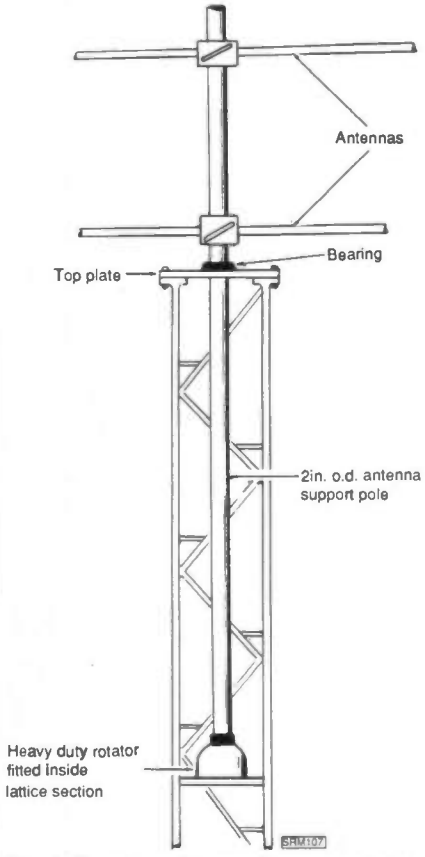

Fig. 4: To cope with very heavy arrays, a sturdier support pole should be used. The rotator can be mounted inside the lattice section.

top plate for the lattice structure and fit some form of bearing to allow the support pole to rotate smoothly. A triangular piece of heavy gauge alloy plate could be used to form the top plate and metal stockists will often cut this to size.

Renovation

If second-hand sections of mast are obtained, they may be in need of renovation. If iron sections are used, rusting may have occurred. So, before the lattice work is erected, it is advisable to remove all traces of rust and then apply a few coats of protective paint. A large mast in the garden may be bad enough for fussy neighbours, but a rusting vertical structure may be too much altogether!

The lattice sections obtained by the authors were definitely in need of renovation, despite the single coat of pre-sale aluminium paint! Casually scrapping away patches of rust soon indicated that the renovation would be both time consuming and extremely boring – but it had to be done. Fortunately, a hot week towards the end of May occurred and the task was undertaken. The wire brush attachment was duly fitted to the electric drill and the work commenced once the necessary protective goggles were worn. Don't attempt to carry out this type of work without eye protection – **it is dangerous.** Similarly, there is plenty of dust created even when the job is done out of doors, so it's a good idea to purchase a pack of disposable masks to prevent the inhalation of rust and old paint, etc.

The most difficult task is getting into the corners where the thin angular struts join the main vertical supports. When all the rust has been removed and the bare iron is on display, some form of rust treatment should be carried out, otherwise your precious time will have been wasted. A liquid preparation known as Jenolite was used for removing the rust and, surprisingly, a small amount goes a long way – so don't be tempted to buy a gallon of the stuff! Follow the instructions carefully when applying it to the bare metal. A primer paint can then be used for the base coat. One containing a rust inhibitor is best. The primer used by the authors was called Rustodian, and it is classed as a "rust inhibiting calcium plumbate lead based primer paint". An industrial or specialist paint supplier should be consulted for this product.

Applying the primer can be fun and there is something satisfying about watching it being "sploshed" on. No matter how careful you are though, there will always be a little bit you will miss, especially with having to treat the inside surfaces and all the nooks and crannies. Two coats are sufficient but you'll have trouble seeing where you have missed a bit with the second coat!

Aluminium paint can be used for the subsequent top coats and it looks good when completed. It is advisable to store the sections for several days or even a couple of weeks to allow the paint to harden fully, otherwise the surface could easily be damaged causing water to penetrate, thus allowing the rust cycle to commence once again. Avoid climbing the mast for a month or two, if possible, for the same reason.

The mast used by one of the authors was originally renovated during 1978 and then again in 1987. The second renovation was an easier task because the few rust patches present were only superficial and complete renovation was not considered necessary. Eventually, it was decided that stripping the various layers and repainting would be beneficial and this time it only took three or four evenings to complete.

Routine Maintenance

It is advisable to periodically check any mast and antenna installation for wear and tear. There is quite a lot of weight involved with antenna masts and their demise can be extremely frustrating. DX reception is not the only thing you could lose – you could also lose a place to put the plants once the greenhouse has been demolished. Ideally, the system should be periodically maintained and frequent checks made for signs of slackness in the guy wires. It's not much fun attempting last minute adjustments and routine checks of this nature during the early hours surrounded by a howling gale.

Antennas can sometimes be dismantled and the oxide removed from the elements and boom to make them look shiny and new again. The use of a soap-filled pad (e.g. a Brillo pad) dipped in warm water to clean aluminium tubing achieves shiny results amazingly fast. All electrical connections should be thoroughly checked (remaking the connections is a good idea) and if there are any signs of water penetration inside the antenna junction boxes, find out why. If penetration has occurred, be prepared to replace the whole of the coaxial cable since capillary action may have drawn in water along its entire length. □

A MESSAGE TO ALL OUR SUBSCRIBERS

We would like to apologise to all our subscribers for the delay in the delivery of their October issue of *Short Wave Magazine.* Unfortunately the Post Office managed to lose the entire October subscription posting – only finding it four weeks later! Thank you for your patience and co-operation, particularly those who took the trouble to telephone and let us know as soon as their copy arrived through the letter box.

SCANNING

Alan Gardner

Pre-amplifiers

This month Alan starts his column with some advice on the use of pre-amplifiers. Icom R7000 memories are discussed with further information on mods to this scanner.

Bert Jackson of Leeds has written asking about adding a pre-amplifier to his scanner. He wonders how much of a difference one would make to the reception of weak signals.

This is a bit of a tricky question to answer, as a lot depends upon the sensitivity of the receiver you intend to use it with, and your location.

Check your existing equipment, starting with your antenna. For example is it in a good location, outside the house and clear of nearby objects? Are you using the best coaxial cable that you can afford? If the answer to either of these two questions is no, then improve this aspect of your station before adding a pre-amp. **The best addition to any station is a good antenna.**

If you tend to listen to just one small band of frequencies, for example one of the Amateur or Air Bands then the best choice may be one dedicated antenna for that particular band. This is because most of the wide-band antenna designs only have limited gain across their frequency coverage. Dedicated antennas on the other hand generally have more active elements for a given size at the frequencies of interest, and so produce more gain.

However to fully exploit the frequency coverage of your scanner a wide-band design is required. The two main types of wide-band antenna are the discone, which gives all round coverage but with only unity gain, and the Log-periodic, which provides increased gain, but is directional and so requires the addition of a rotator.

After the antenna comes the coaxial connecting cable. If you have a cable run of more than 2 or 3 metres and are using thin UR43 type cable then replace it! The thicker UR67 type or better still some Pope H100 will make a big improvement, particularly at the higher frequencies. Beware of cables sold in CB shops as many of these are only intended for use on 27MHz and have a much thinner outer braid than their professional equivalents.

If you are interested in frequencies above 500MHz then seriously consider using Heliax cable such as Andrews LDF 450 or its equivalent. Only after fitting the best antenna and feeder you can afford should you, consider the use of a pre-amplifer.

However before rushing to fit one have a look around your immediate neighbourhood. Do you live near any transmitting stations, radio amateurs or p.m.r. users such as taxi companies? If you live in a city the chances are that you will, in which case you could be asking for trouble if you fit an amplifier. This is because the increased gain brought about by the pre-amplifier, coupled with the strong local signal, can lead to overloading of the receiver. Although this will not cause any physical damage it can create other problems. The most usual manifestation of this is the local signal appearing in the background on other transmissions. In really severe cases it can lead to the wanted signal being blocked out each time the local station transmits.

Of course, this situation can occur without a pre-amplifier in circuit, but adding one will make any small instance of overloading many times worse.

Assuming that you don't run into these problems then adding a pre-amplifier may improve your station. A few guidelines first though. The best site for a pre-amplifier is at the masthead, just below the antenna, with as short a connecting lead as possible. Choosing this location helps to prevent any additional attenuation introduced by the cable worsening the performance of the system. This is because it boosts the very weak signals before they become reduced still further by the losses in the cable run to the receiver. Additionally it helps to prevent these weak signals from being masked by the noise present in the input stages of the receiver.

What should you look for when choosing a pre-amplifier? Well the most important parameter to look at is the noise figure. This is a measure of "goodness" and shows how much additional noise is introduced into the system by the pre-amp. Good figures for wide-band designs are around 1dB at 100MHz and 3dB at 500MHz. The smaller the figure the better, but beware of really low figures as these are generally only valid at one spot frequency.

Many people are misled into believing that the gain of the pre-amplifier is the most important figure. This is not so. In fact many commercial designs have too high a gain for use with the average scanner, which as I mentioned earlier can lead to overloading. If the pre-amp has an adjustable gain control of if you have a variable attenuator that you can put in circuit between the pre-amp and the receiver, then you can set the gain for an optimum value. Put the pre-amp in circuit and set if for maximum gain. Tune the receiver to a weak n.b.f.m. station – select one that you can just understand above the receiver noise. Now reduce the gain until the noise starts to become noticeably worse, this is the optimum gain setting. If the pre-amp is good it should not be introducing more than about 10dB gain at this point. Take the pre-amp and attenuator out of circuit and listen to the signal with the antenna connected directly to the receiver. Does the signal sound any worse? If it does then the pre-amp is making a difference. If it doesn't then the receiver input stages are already as good as, or better than the pre-amp you are testing. The final point to watch for is the signal handling ability of the amplifier. This is particularly important with wide-band designs as they have to deal with many strong signals throughout their frequency range without producing spurious signals. The way in which this is specified is in terms of the 3rd order intermodulation products generated by the circuit.

The method by which this is determined is rather lengthy for this column but the figure to look for is greater than + 10dBm at the input. Beware of figures much larger than this as some companies quote the 3rd order product at the output of the amplifier making the specification look better. In this case the gain of the amplifier has to be taken into account.

From a user's point of view I have found it advantageous to have some means of by-passing a pre-amplifier, for instance in order to check when I suspect overloading of the receiver. Some pre-amplifiers have this facility built in, but in other cases it may be necessary to fit coaxial relays to perform the function.

One other application for a pre-amp is as a distribution amplifier, permitting one antenna to feed several receivers with little degradation of the signals. This can be achieved with a TV antenna splitter fed from the output. Cheap resistive splitters will work, but for the best results use one of the low-loss ferrite types. As well as having lower losses through the splitter they also offer greater isolation between the receiver feeds. (Fig. 1)

With care a pre-amplifier can be a useful addition to your receiving station.

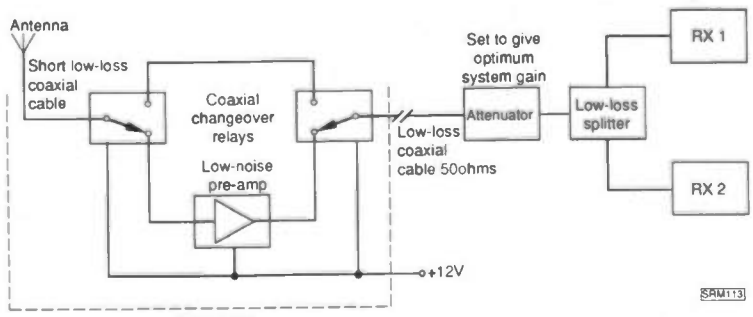

Fig. 1

SCANNING

Icom R7000 Memories

A small problem with the modification to provide 100 extra memory channels I outlined in the May issue has been brought to my attention. Although this was based on an Icom drawing it does suffer from the drawback of discharging the receiver's lithium memory back-up battery rather more rapidly than expected. However there is a solution to the problem which also has the advantage of making the modification easier to perform.

Please read the previous article before attempting any work as most of the details are the same as outlined before, except that IC8 Pin19 on the logic unit is now desoldered and pushed back through the board to the component side. This saves having to cut the p.c.b. track on the underside of the board. (see Fig. 2) The new 47kΩ resistor is now connected between the raised i.c. pin and the anode of D9 which is located just to the right of the multi-way connector used for the remote control option. It is advisable to sleeve the resistor leads before running them along the topside of the board. The lead to the switch is taken from the junction of IC8 Pin19 and the new resistor. You may have to desolder the lithium battery to gain access to this point so ensure that it does not short against the i.c. pin when it is refitted.

Band III Update

Many of the new p.m.r. allocations in the middle of the old 405 Line TV Band III (174-225MHz) are now buzzing with activity as the new networks take on more customers. Most of the systems are becoming fully operational and are now starting to offer regional coverage through interlinking or trunking of the base stations. In principle this is very similar to the cellular telephone system where the user is transferred from base station to base station as he moves around. All the handover arrangements are taken care of automatically by the system, the user being unaware of any changes. Signalling being achieved by means of a 1200baud data burst at the end of each transmission. The advantage of this system is that it offers a much higher quality service than that obtainable from a single base station and additionally permits a greater number of users per block of radio channels. One other bonus for users is the improved protection against casual eavesdropping as a result of the changes of channel each time the user is handed over to the next base station.

Many existing p.m.r. users are expected to move to the new systems as the running costs are much lower than those associated with more traditional systems providing wide area coverage. I believe that over the next few years we will see many of the large radio communication users such as power industries, Water Boards and breakdown services re-engineering their existing systems to take advantage of the new technology.

New Products

By now the latest hand-held scanner from Uniden-Bearcat should be available from dealers. Called the BC-200XLT it offers frequency coverage of the bands 66-88MHz, 118-174MHz, 406-512MHz and 806-956MHz. Other features include 200 memory channels, 10 priority channels, channel lockout, automatic search, scan delay and snap-on battery pack. It does however have the annoying feature present on most scanners originally designed for the American market – no manual mode changing, a.m. being selected automatically on the v.h.f. Airband with no means of changing from f.m. on the other bands. I am sure that this feature will affect UK sales, unless of course a modification is possible. The price should be around £249 with several different dealers offering them, so check the advertisements for details.

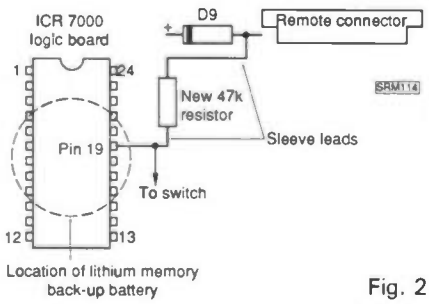

Fig. 2

The other new product should please Icom R7000 or Yaesu FRG9600 owners. This is a new version of the already popular Aircastle Scanner Computer which has been available for use with the AOR 2002 for some time. It is a stand alone unit which connects to the scanner, and provides a whole host of additional features. The only additional items required are a 12V supply and a computer or terminal with an RS232 interface. The scanner computer can then be programmed to operate the receiver automatically, searching out new channels, logging channel occupancy on an external printer or switching a cassette recorder on when certain channels become active.

These are just a few of the tasks possible depending on how you programme the unit. A very interesting product I believe. Contact Aircastle Products, PO Box 78, Bournemouth BH1 4SP. Tel. (0202) 666233 for further details.

The end of another column – I am always interested in receiving your ideas and questions, so keep those letters coming in to the usual address PO Box 1000, Eastleigh, Hants SO5 5HB.

Until next month – Good Listening. □

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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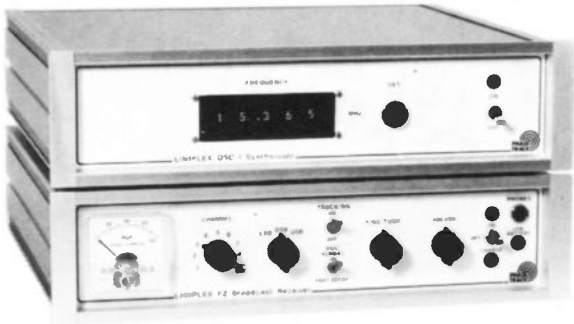

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★ 25th ANNIVERSARY YEAR 1963-1988 ★

BEHIND THE SCENES AT RADIO AUSTRALIA

Peter Shore

Part 2

Radio Australia in the 1980s

We continue our look at Radio Australia by coming up-to-date to see what they are doing in the 1980s and where they are heading in the future.

Radio Australia is a division of the Australian Broadcasting Corporation, the country's national broadcaster. It is funded, by, yet independent of, the Australian Government.

The stations brief is to foster an understanding of the Australian nation and people and to reflect Australia's views on the world and regional affairs. It also promotes regional awareness amongst neighbouring countries and provides and invaluable link back home for expatriate Australians. Priority is given to serving listeners in the Asian and Pacific regions, in particular China, Indonesia, Papua New Guinea, Malaysia, Singapore, Thailand, the Philippines, Vietnam, Japan, Burma, India, Pakistan, Sri Lanka, Bagladesh and the Pacific nations. This it does through its services in English, Indonesian, Standard Chinese, Tok Pisin, French, Thai, Japanese and Vietnamese. All of these services are carried on short wave, using some fifty frequencies daily.

The station's output is to some extent regionalised, with language services targeted to specific areas for the peak listening hours. The studios in Melbourne are never silent, with around 340 hours of programming produced every week.

The Indonesian Service broadcasts morning, afternoon and evening sessions and provides an entertaining mix of news, information and entertainment. A daily English language course is one of the most popular programmes.

Chinese listeners have the benefit of standard Chinese programmes in the morning and evening and Cantonese during the evening too. Programmes have an emphasis on information about Australia, spanning music, talks, news and documentaries. There is also a daily English language course.

The Papua New Guinea Service broadcasts every evening in Tok Pisin and English, with the regular programming comprising talks, interviews and information programmes, together with the modern and traditional music of Papua New Guinea and the Pacific region.

The French service transmits every day to the Pacific, Asia, Indian Ocean and African countries. There is an emphasis on lively music and programmes which focus on issues of importance to developing countries as well as those reflecting Australian life.

Thai listeners have a breakfast time service which focuses on information, particularly world news and current affairs with a strong emphasis on events in South West Asia. English lessons can be heard twice a week.

The Vietnamese Service is broadcast each evening with news, current affairs, topical talks and a segment devotes to Australia and Australians. A wide variety of music is featured including Vietnamese Opera.

The Japanese Service transmits two avenge sessions. The first of these is tailored to a younger audience, concentrating on music, whereas in the second broadcast, entertainment and music are balanced by news, current affairs and information programmes.

News and Current Affairs

All of Radio Australia's programmes include news and current affairs, topical spoken work features and interviews and easy listening music. There is also regular and in-depth sports coverage.

The English Service transmits 24-hours a day, aiming to reflect and showcase modern Australia, its culture and issues, through music and spoken word programmes. It also provides a comprehensive news and current affairs service. The news room is manned 24-hours a day, providing a service to all the language sections, together with major bulletins in English every hour through the day and night. Several broadcasting organisations in the Pacific take some Radio Australia bulletins on relay and either record them for later re-broadcast or transcribe them for translation and broadcast.

Around 230 people work at Radio Australia, with about half born abroad. Language broadcasters are usually recruited from their home countries and work under three-year contracts. The largest single department is News and Current Affairs which employs around 50 people.

Radio Australia is located 18km from the Central Business District of Melbourne in East Burwood. The 18.2 hectare site will eventually comprise all of the ABCs radio, television and administrative departments. The new Broadcasting Centre, which was completed at the end of 1982, replaced leased accommodation in an old factory in Central Melbourne. The new building has three levels with a gross floor area of 6800m², with the upper levels housing studios, programme departments and administration. Level One houses the workshops, storage, staff facilities and plant rooms.

Each programme department is virtually self-contained and in close proximity of the studios — most of which have an external view, a number overlooking the main entrance foyer. There are 18 studios, including 17 in one and two person configurations for presentation and recording work. There is also one multi-track production suite. The six "one-man operation" studios are intended for live on air presentation and are operated by professional announcers/presenters. They, whilst presenting a programme, also control its signal levels via their studio consoles. Five suites of studios and associated control booths are provided for live on air presentation, or for production and recording of taped programmes. For convenience in presentation, most of the music played on Radio Australia is recorded on standard broadcasting cartridges, rather than each presenter using individual discs. Thus, there is a full-time need for transferring music from discs or tapes onto cartridges.

Radio Australia's Master Control Room is a global reception and distribution centre. Every day, the station sends 50 hours of programme in its nine languages to its world-wide audience.

A computer controlled switching system, with a capacity of 40 inputs/outputs is the core handler of all traffic, able to feed material into and out of the Radio Australia centre, as well as from point to point in the building. Sixteen Aussat lines come into Master Control, as well as terrestrial lines from Melbourne Sound Operations Centre and ABC's Master Control in Melbourne. Twenty lines are available to service the transmitters around the country.

Voice reports from the world-wide network of Radio Australia correspondents are received and recorded in a Lines Room for distribution to the programme departments.

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AIRBAND

Godfrey Manning G4GLM

There's no need to dwell on the way in which the postal problems have taken their toll of this month's column but I'll try to catch up on all your letters when they finally arrive. Meanwhile here are some more descriptive "goodies" to keep you going.

You Communicate

Some of this month's offerings from you were of necessity by 'phone! **Tommy Menzies GM1GEQ** (Edinburgh) was until recently pilot of Piper Cherokee G-ARYR but has changed to small high-wing Cessnas with the sale of his previous aircraft. Much of his flying is based at Fife (Glenrothes) which is also the site of an n.d.b. (GO: dah-dah-dit, dah-dah-dah, 402kHz). Another of Tommy's local airfields is Cumbernauld which has recently had an asphalt runway built and will now see increasing use for general aviation training (with an air/ground frequency of 120.6MHz). Tommy knows the cheapest place to uplift Avgas in Scotland; if you'd like to be let in on the secret then please write via the editorial address and, as in all exchanges of information with other readers, enclose both a blank and a self-addressed envelope (stamping each). In this case also tell me your aircraft or flying club details. If it's information you're after then *The Pilots' Database* carries class IIA/B NOTAMS and more. To enquire about membership eligibility write to 85 Malthouse Lane, Earlswood, Solihull, West Midlands, B94 5RZ. Access when permitted is via telephone, modem, and terminal (or PC and emulation). Lucky owners of Prestel equipment will also find aeronautical information on pages 20970, 20971, 209721-209724 inclusive and 209713.

One of our regulars **Geoffrey Powell** (Tamworth) 'phoned in and asked about amateur use of radar, Marine radar would be angled too low as it is intended to help prevent collisions at sea. I'm not sure of the licensing requirements but if used in a built-up area its high-intensity pulses could cause serious interference to neighbours' electronic equipment. I'm not aware of any licensed amateur experiments as the regulations expect the frequency allocations to be used for stations to communicate with one another and not to simply bounce signals off inanimate objects. One effect that can be heard on v.h.f. amateur transmissions is aircraft flutter, a fortuitous event when an aircraft passes through the signal path and momentarily enhances received strength. Of course this gives no clue as to the exact position of the aircraft nor its height or heading, but this is a repetition of the earliest experiments that first demonstrated the feasibility of radar.

Now a report from Sorrento, Italy, where **Graham Whiting** was on holiday: "QNH high, temperature high, visibility high." Sounds ideal! What about the aircraft? I always feel that the flight is an important part of a Mediterranean holiday.

Take off from Edinburgh with Godfrey this month. He also introduces the microwave landing system, and talks about The Royal Aero Club's "Youth in the Air" project for 14-21 year-olds.

Frequency & Operational Information

No apologies for repeating my plea about care at airfields. Don't go where you shouldn't — at Wycombe Air Park (Booker) some visitors transgressed and met with trouble. If you over-indulge your welcome, you will have the Air Navigation Order thrown at you rather than the much kinder law of trespass! And please don't be one of those annoying people who plays their radio loudly as if it's some kind of status symbol. Stick an earpiece in it! Lastly, don't smoke near aircraft, on movement areas or in the hangar. You might not hear the bang!

There are two new frequency changes in the 8/88 issue of the *General Aviation Safety Information Leaflet* from the Civil Aviation Authority (CAA). The Blackpool Approach frequency is temporarily replaced by Tower on 118.4MHz and Land's End has a new frequency of 130.7MHz.

Perhaps the subject of flight safety was invented, along with the hot air balloon, by the Montgolfier brothers. Here is the accident report.

Aircraft type: Mk.1 hot air balloon.
Power plant: One open fire.
Location: France.
Date: 19/9/1783.
Purpose of flight: Air test.
Crew: 3.
Injuries: 1 (fatal).
The three crew members (a sheep, a cock and a duck) embarked in the aircraft. On landing the cock was found to be dead. The investigation centred on the intrinsic safety of the aircraft. However, eye witness evidence stated that the sheep had been seen to kick the cock to death during the flight. The cause of the accident is therefore assumed to be due to the conduct of the crew rather than any pre-accident defect in the aircraft itself.

But I digress. At Biggin Hill the 03R/21L grass strip has been withdrawn. Ground movements control has been introduced at Coventry on 124.8MHz during summer weekends (0930-1900). Edinburgh now has an Automatic Terminal Information Service (a.t.i.s.) on 132.075MHz. The a.t.i.s. broadcasts are very useful when trying to form a general picture of actual weather at various places (e.g. en route). The August "Airband" described the departures now in use at London (City). CAA *Aeronautical Information Circular 72/1988* points out that route A is not just restricted to flights to Paris.

Youth in the Air Year (1988)

The Royal Aero Club (President: HRH The Duke of York) are organising this project to enable individuals and groups of 14-21 year-olds to accomplish something aeronautically-related. Obviously that includes flying but there's no need to leave the ground; the project is very open-ended and other ideas include reducing tension in airport departure lounges, producing a newsletter (will it rival "Airband"?), or improving in-flight catering (not too difficult in some cases!). Now, I've offered to give any assistance that my Museum can provide; remember that here is a resource of technical aircraft equipment and instruments. If any participants need this assistance please 'phone me on 01-958 5113 (weekday evenings). More information about Youth in the Air is available from **Andrew Healey** (Aviation Publicity, Fairoaks Airport, Chobham, Surrey GU24 8HX. Tel: 09905 8670 in office hours). If any of the younger readers out there have an idea for a project, well, you now know what to do! And there are various prizes including a trophy. But hurry — there's little time left this year to send in your application.

Some Theory

Many references have been made in this column to the instrument landing system (i.l.s.) but a new improved microwave landing system (m.l.s.) is now being developed to supersede the older equipment and to provide greater accuracy, less susceptibility to distortion by terrain and other aircraft, and hence improve safety. The transmissions are around 5GHz and include at least the inevitable azimuth localiser and elevation glide slope. In some cases a flare commend signal is crossed just short of the runway threshold and this helps with autoland. The signal is encoded and sweeps across the beamwidth in time. Depending on which code the aircraft receives, the time relation of the signal can be worked out. If this is X milliseconds from the start of the sweep, the displacement of the aircraft from the sweep's origin can be worked out. Some of the British Airways Boeing 757s are currently monitoring an experimental m.l.s. set-up as they land on 27R at London (Heathrow).

Some other nav aids are also mentioned from time to time. Doppler is self-contained within the aircraft. A signal at 8.8GHz is transmitted with a typical power around 1W. Two beams are aimed fore-and-aft and left-right of the aircraft, both angled sharply downwards. The return echo changes frequency according to the Doppler shift and from this the speed and side-drift of the aircraft over the ground is worked out.

When you hear the Morse ident of a beacon, its audio modulation is nominally

AIRBAND

at 1020Hz. The military use the Tactical Air Navigation system (TACAN) which gives both a bearing, rather like a v.o.r., and has distance measuring equipment (d.m.e.d). Civil aircraft can only access the d.m.e. A VORTAC is a beacon where both a v.o.r. and a full TACAN are located; but v.o.r./d.m.e. is the v.o.r. with just the d.m.e. part of a TACAN. There are 126 TACAN channels and the d.m.e. operates at around 1GHz.

Departure from Edinburgh

Larger airports have laid-down standard instrument departure (s.i.d.) procedures for use on take-off. These are devised with not only air traffic control operations in mind but also noise abatement. A few years ago I followed the s.i.d. out of runway 07 at Edinburgh by sitting in the passenger compartment of a Trident 2 and using nothing other than the let-down plates, a reasonable (ex-diving!) magnetic compass and a pair of Mk.1 eyeballs (which didn't work too well in the dark and with the low cloud base). There are two final points to aim for on these departures; a reporting point called GRICE to the north and, on my flight, the southerly point of TALLA which is a v.o.r. (TLA: dah, di-dah-di-dit, di-dah, 113.8MHz). The westerly runway's departure is TALLA 1C but my flight is going out on the easterly TALLA 1D. The path curves away from the town itself, flying basically clockwise round its northern edge and throwing the noise back along the Firth of Forth. Only then does the clockwise track turn south,

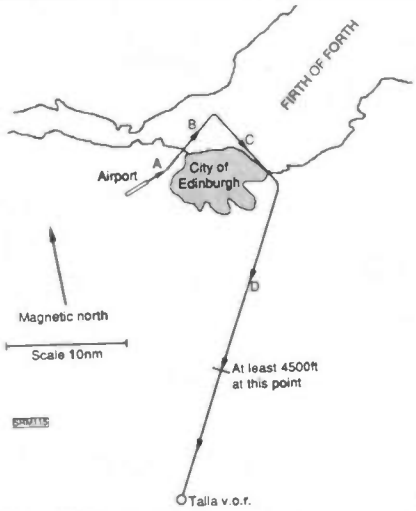

Fig. 1: Talla 1D standard instrument departure from Edinburgh. Leg A Ahead on runway heading to 500ft. Leg B Left turn onto 050° until i.l.s. is 7nm distant. Leg C Right onto 150° until Talla 029° radial is intercepted. Leg D Track the radial inbound to Talla heading 209°, which is the reciprocal of the radial.

leaving the town comfortably over the aircraft's right beam. See Fig. 1.

The 07 i.l.s. (IVG: di-dit, di-di-di-dah, dah-dah-dit, 108.9MHz) is needed because it provides a d.m.e. and the back beam also helps with keeping to the runway heading immediately after take-off. The other nav aid to tune in is the Talla v.o.r. After take-off the runway heading is followed until 500ft is reached (QFE, i.e. above aerodrome elevation). In our noisy Trident, this comes up very quickly indeed! A left turn of around 20° is made to track 050° until the d.m.e. shows 7nm. Then, a right turn on to a magnetic track of 150° is made and the track followed until the Talla 029° (from) radial is intercepted. This radial is itself now tracked inbound to the beacon by making a further right turn on the 209°. By the time we are within 12nm of Talla (using its d.m.e.) the aircraft must be above 4500ft QNH (altitude) is there's high ground ahead.

Back with you again next month, probably with a backlog of your letters. □

Abbreviations	
a.t.i.s.	automatic terminal information service
CAA	Civil Aviation Authority
d.m.e.	distance measuring equipment
GHz	gigahertz
Hz	hertz
i.l.s.	instrument landing system
MHz	megahertz
m.l.s.	microwave landing system
n.d.b.	non-directional beacon
nm	nautical mile
PC	personal computer
QFE	height above airfield
QNH	altitude
s.i.d.	standard instrument departure
TACAN	tactical air navigation system
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range
VORTAC	v.o.r. with TACAN
W	watt

BEHIND THE SCENES AT RADIO AUSTRALIA

▷ 21

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Master Control also houses an extensive monitoring system which can distribute material throughout the building from a variety of sources, including studio output, three short wave receivers, TV audio and f.m. and a.m. tuners.

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There's more to Radio Australia's English language programmes than the brief selection shown here, full details are carried in the Radio Australia programme guide.

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HI-LO MW ANTENNA MATCHER

Richard Q Marris G2BZQ

Many of the better m.w. receivers have an antenna socket quoted as being a "nominal 400 ohms" with others being anything from 300 to maybe 1000 ohms at the AE and E terminals somewhere at the back. Unfortunately this impedance can vary over the band, although connecting your 50/75 ohm loop to these sockets will probably give quite good results in spite of the obvious mismatch.

Matching

If you intend to use a higher antenna impedance RX with a low impedance loop the usual arrangement is to make a wide-band, ferrite ring, matching transformer which can give quite impressive results. Again, this has some limitations over the whole of the medium wave band.

The Hi-Lo m.w. antenna matcher described here was designed to cover this general situation. It is nothing more than a simple variable *CL* matching unit to match low impedance loops to high impedance receivers. Consisting of a carefully designed inductance L and a 1nF variable capacitor all enclosed in a screened box, it has been used to match many low impedance loops to various high impedance receivers and gives that little essential extra needed on a very weak DX signal.

The Circuit

The circuit is shown in Fig. 1. The variable capacitor is a good quality, 500 + 500pF, 2-gang, air-spaced type with both gangs connected in parallel to give a total capacitance of 1000pF. A short length of coaxial cable is plugged into SK1 which is a phono socket. This cable should be kept as short as possible, certainly no longer than 150mm. The other socket, SK2 is the usual coaxial antenna socket used to connect the unit to the loop antenna, using coaxial feeder.

Most medium wave DXers use a good communications receiver with a loop antenna. Loops have a low impedance of 50 or 75 ohms and, while some m.w. communications receivers have a 50 to 75 ohm input allowing direct connection to the loop, many do not. This simple unit will allow you to match a loop into your m.w. receiver.

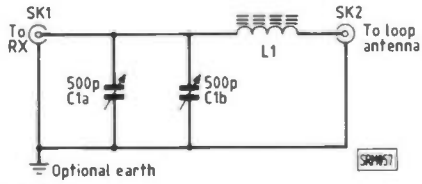

Fig. 1

YOU WILL NEED

Capacitors
Variable, air-spaced
500 + 500 pF 1 CLa,1b

Miscellaneous
Ferrite rod 140 X 10mm; 10mm Terry Clips (2); Metal box (see text); Phono socket (1); Coaxial socket (1); 7/0.2mm (1.1mm o.d.) pvc covered stranded wire; Knob to fit C1.

Construction

The inductance L1 consists of 47 turns, of 7/0.2mm pvc covered wire (1.2mm o.d.), close-wound onto a 10mm diameter ferrite rod 140mm long. The winding is started 12mm from one end of the ferrite rod, leaving a flying length of the wire at each end for connection purposes. The rod is held in two Terry Clips screwed to a length of dry wood 12mm thick and 140mm long, which is then fastened to the bottom of the screened box.

The dimensions of the metal box are not critical – the one used for the prototype measured 212 x 40 x 40mm – and provided that there is plenty of clearance around the ferrite rod you could use any metal box.

Operation

Operation is simple. Just set the variable capacitor to the general search area to which the receiver is tuned, peaking it when the desired signal has been found. You will find that the effect on a weak signal can be quite dramatic! The original unit covered the frequency range 300 to 1580kHz. i.e. the whole of the medium wave band plus the segment down to the h.f. end of the l.w. band. □

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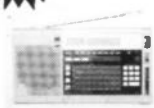

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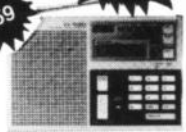

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STARTING OUT

Brian Oddy G3FEX

The strength of an incoming a.m. signal and its associated depth of modulation also determines the level of audio output from a receiver. The relationship between an incoming signal with constant modulation and the audio output power of a typical a.m. receiver in which the r.f. and i.f. gain is preset is shown by curve "A" in Fig. 1. In this example the audio output rises steadily until the input signal reaches 100 microvolts, after which it falls due to overloading of the i.f. stages.

The intensity of the signals present at a receiving site may range from very weak to very potent and result in voltages at the antenna terminals of a receiver of less than 1 microvolt to well in excess of 100 millivolts! High gain r.f. and i.f. amplifiers will be needed in the receiver for the weaker signals, but the stronger signals will easily overload them unless the gain can be reduced. The provision of a suitable gain control is complicated by the fact that the strength of many signals varies in a random manner due to fading.

Manual Gain Control

If the effects of overloading are to be avoided the amplification in the r.f. and i.f. stages must be varied to suit the level of an incoming signal. This could be done manually by varying the bias on one or more of one of the transistors used in these stages, or in a valved receiver the bias applied to variable-mu valves could be changed by simply varying a common cathode resistor.

Varying the gain of the r.f. and i.f. stages will alter the audio output, so the control could also be used to maintain a comfortable listening level. Some care in its adjustment would be needed when tuning across a band however, because the low gain setting required for potent signals could easily result in the weaker signals being missed altogether, whereas the high gain setting needed for weak signals could well result in an unacceptable high audio output when a potent signal is encountered!

Although manual control of the receiver i.f. gain may be satisfactory while receiving a long or medium wave a.m. ground wave signal during daylight, some difficulty may well arise after dark because additional sky wave paths cause fading. The majority of short wave signals also suffer from some form of fading and continual changes in the state of the ionosphere result in widely varying signal levels, so manual control if the receiver gain is impractical.

Automatic Gain Control

In order to counteract the effects of fading and maintain equal audio output levels from all signals received, some form of **automatic gain control (a.g.c.)** is required which will vary the r.f. or i.f. amplification of the receiver in inverse proportion to the strength of an incoming signal. The way in which this can be achieved in practice will depend upon the type of signal involved. One system, which may be used with a.m. signals, is known as **reverse a.g.c.** because an increase in signal strength results in a decrease in the current flowing in the controlled amplifier stages which leads to a reduction in gain.

The basic circuit of the last two i.f. stages of a transistorised a.m. receiver using reverse a.g.c. is shown in Fig.2. The

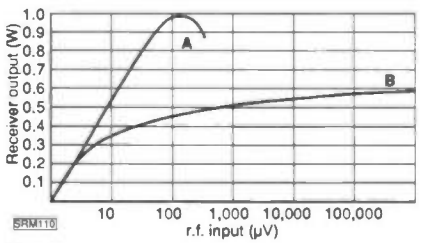

Fig. 1

signal at the output of the last i.f. stage Tr4 is sampled via C1 and then rectified by diode D1 and filtered by R3/C2 so as to create a negative d.c. control voltage which will vary in proportion to the strength of the incoming signal. It is then applied to the base of the bipolar transistor Tr3 in the preceding i.f. stage via R2, where it tends to oppose the positive fixed bias applied via R1 and causes the overall gain to be reduced. An increase in incoming signal strength results in a higher negative control voltage which will further reduce the fixed positive bias on the base of Tr3 and lower the overall gain. Conversely a reduction in signal level, such as during a fade or when tuning into a weaker signal, will reduce the control voltage and allow the positive bias on Tr3 to rise and so increase the overall gain. The rate at which the a.g.c. will respond to variation in incoming signal strength will depend upon the **time constant** or product of R3/C2 in the a.g.c. filter – typically 0.2 to 0.5 seconds is required for a.m. broadcast signals.

To achieve maximum efficiency it is necessary to apply the a.g.c. potential to as many of the r.f. and i.f. amplifier stages as possible so that the majority of the receiver gain is controlled by the a.g.c. system. However, it is not good practice to apply the a.g.c. to the mixer stage(s) since more efficient operation can be obtained by using a fixed point on the transfer curve. High gain at low noise is required in the first r.f. amplifier if a good signal-to-noise ratio is to be achieved, so the a.g.c. is often omitted from this stage too. Because of the limited signal handling capacity of many transistor r.f. stages a variable r.f. attenuator (0-40dB) is often provided in the antenna input circuit so that very strong signals may be attenuated manually before they can reach the input of the first r.f. amplifier.

The overall effect of the a.g.c. system will be to hold the receiver audio output reasonably constant despite wide variations in incoming signal strength – see curve "B", Fig.1. Note however, that if the receiver is operating close to maximum gain when the incoming signal level is at its mean value, it will not be possible for the a.g.c. system to increase the gain sufficiently to maintain a constant audio output when the signal level falls, so it is important that there should be an ample reserve of gain.

One of the disadvantages of the system so far described is that even a very weak signal will be rectified when it reaches diode D1 and result in an a.g.c. control voltage which will reduce the gain and further attenuate the signal! Furthermore, the level of incoming background noise may result in an a.g.c. control potential which could prevent the total receiver gain from reaching a maximum. It is therefore desirable that the a.g.c. action be **delayed** until the level of incoming signal is sufficient to provide a good signal-to-noise ratio. This can be achieved by introducing a small positive delay voltage to the diode D1 via R4 which opposes the

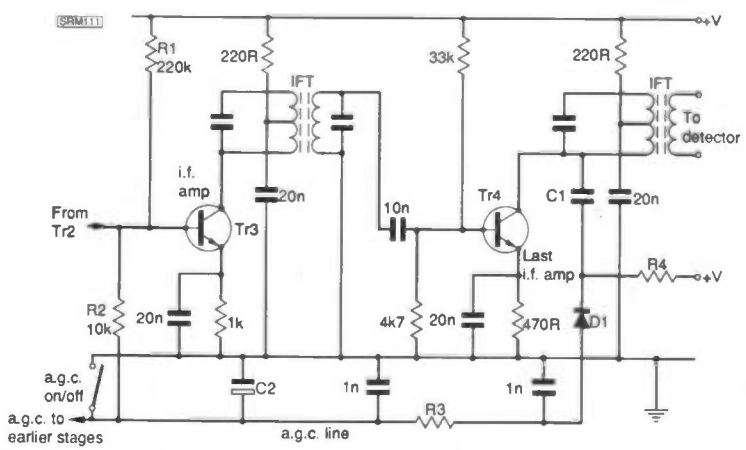

Fig. 2

negative control potential resulting from a weak signal. The a.g.c. action will remain inoperative until the rectified signal voltage exceeds the pre-determined delay voltage.

The reverse a.g.c. system is also employed in many of the a.m. valve receivers still in use, but in most of the older circuits diagrams it was referred to as **automatic volume control (a.v.c.)** rather than a.g.c. The negative control potential is applied as a bias to the grids of variable-mu valves in the r.f. and i.f. stages and any increase in signal strength results in more grid bias which reduces the gain; conversely a weaker signal results in less bias and increased gain.

Full advantage can be taken of high gain low noise amplification in the first r.f. stage of valve receivers without having to resort to a.g.c. to limit the gain, because the signal handling capacity of most valve r.f. amplifiers is superior to their modern transistor counterparts. To cater for very potent signals a manual control marked **r.f. gain** is often provided — this is simply a variable resistor in the cathode circuit of the first stage which enables the applied bias to be increased, thereby reducing the gain. The a.g.c. is not usually applied to the mixer stage(s) because the varying anode current could affect the stability of the associated local oscillator, especially when a single pentagrid or triode-hexode valve performs the dual role of mixer and local oscillator.

Although the reverse a.g.c. system is generally satisfactory in receivers using variable-mu valves, it is far less satisfactory in transistorised receivers employing bipolar and some types of field effect transistors. The main problem is that reducing the gain by lowering the positive bias on the base, decreases the current flowing through the stage to the point where its ability to handle the signal without distortion is severely impaired. In addition, reducing the current causes a rise in the input impedance of the stage — this could effect the i.f. selectivity, especially if the controlled stage follows a crystal filter. Fortunately the signal handling problems can be avoided by using a technique known as **forward a.g.c.**

In the forward a.g.c. system a reduction in gain is obtained by increasing the current flowing in the controlled stages! This can be effected by applying sufficient forward bias to specially designed transistors so that they are operating in the saturated region of their characteristics. A weak incoming signal will result in a d.c. control potential from the a.g.c. rectifier which will slightly increase the forward bias on the transistors and allow a high gain, but a strong signal will result in a high control potential which will drive each transistor deeper into saturation, thus reducing the gain considerably. It follows that the highest current will flow in each stage when it is required to amplify the strongest signal, so this system offers a distinct advantage over the reverse a.g.c. system as far as signal handling and distortion is concerned.

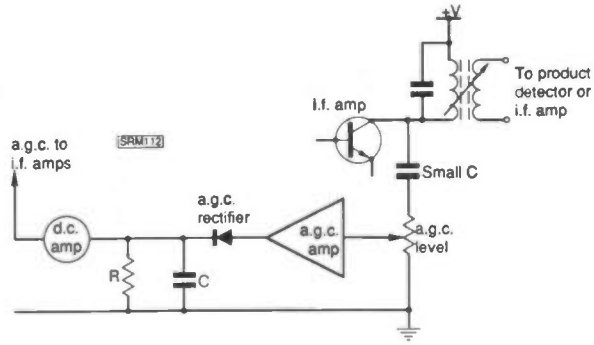

Fig. 3

More Advanced Systems

Both types of a.g.c. system may well prove to be satisfactory in long, medium and short wave a.m. broadcast band receivers, but a more complex approach is often adopted in communication receiver designs. A wider dynamic range than can be provided by these simple diode a.g.c. systems may be required when certain types of m.o.s.f.e.t. are used in the r.f. stages and when the i.f. stages are designed around integrated circuits. A minimal loading on the output of the i.f. stage can be effected by using an **a.g.c. amplifier** to boost the signal sample prior to rectification — see Fig.3. This will also ensure that the a.g.c. diode is driven well into the linear region of its characteristics. The RC network following the rectifier provides a suitable decay time — see later. A **d.c. amplifier** raises the control potential to the required level.

More than one a.g.c. system may be used in some advanced designs. By taking an additional sample of the signal prior to the filter(s) used to restrict the i.f. bandwidth, an a.g.c. potential based on a broader response may be obtained. Strong adjacent channel signals, which will be outside the passband of the filter(s), will result in a control potential which may be applied to the early stages and help to eliminate splatter and cross modulation. Instead of obtaining the a.g.c. control potential from the i.f. signal the amplified audio output from the detector is sampled and rectified in some receivers, but there is really very little to choose between the two systems.

The provision of an effective a.g.c. system for use with a keyed carrier (c.w.) signal conveying Morse code or a single sideband suppressed carrier (s.s.b.) transmission presents a number of difficulties because there is no continuously available signal at the output of the last i.f. stage on which to base the operation of the a.g.c. system!

In many communications receivers a beat frequency oscillator (b.f.o.) is coupled into, or just prior to an envelope detector, so that incoming c.w. signals result in an audible beat note at the detector output — see page 32, *SWM* July '88. Unfortunately the b.f.o. output will also produce a large a.g.c. control voltage which will greatly reduce the sensitivity of the receiver, so it is necessary to disable the a.g.c. system by shorting the control line to ground. In these circumstances it is usual to operate the receiver with the audio gain well advanced and then control the r.f. gain manually.

By screening the b.f.o. and reducing the coupling so that its output only reaches the detector, it may be possible to reduce the control voltage arising from it to an acceptable level, but a better approach would be to sample the incoming signal at the output of the penultimate i.f. stage and then rectify it so as to produce a control potential based purely on the level of the incoming signal. This may not be necessary when a product detector is used for c.w. reception because of the inherent isolation between the signal and b.f.o./c.i.o ports — see page 37, *SWM* September '88.

Since there will be no signal during the key-up periods between the characters of each letter and between words it is necessary to change the a.g.c. time constant so that it decays slowly during the gaps in the signal so that the overall remains reasonably constant. Fast attack (2ms or less) can be obtained with low impedance a.g.c. detectors, but the long decay times required (0.2-1s) can be achieved by using a large value capacitor for C in Fig.3.

Similar problems arise in the a.g.c. systems used with s.s.b. signals because there may well be no output from the transmitter during brief pauses between words etc. Unless a long decay time is employed in the a.g.c. system the gaps between words will result in an objectionable surge of noise as the gain suddenly increases. However, a long decay time also implies that a large interference "spike" can effectively mute the receiver for a long period time after it has gone, so special **hang a.g.c.** systems have been devised, which maintain a steady a.g.c. potential for a pre-determined period after the incoming signal has gone, but the rise and decay times are made very short. Receivers which cater for a.m., s.s.b. and c.w. signals often provide a choice of three a.g.c. conditions — fast, slow and off. □

SEEN & HEARD

AMATEUR BANDS ROUND-UP

Paul Essery GW3KFE

PO Box 4, Newtown SY16 1ZZ

Thanks to the postal strike, I have just three letters to hand this time, so, alas, rather than discussing the doings of contributors I will have to deal in the main with technical points.

Barry Smith (Stocksfield, Northumberland) has returned to the fold after some 25 years; he has bought the Sony receiver recently reviewed in *SWM* and started logging the signals again. At first Barry used the telescopic whip antenna supplied, but has now changed to an antenna comprising some 30 metres of wire. Since erecting this he has found that for much of the time he needs to keep the DX/Local switch at "Local" and wonders why.

At a guess, the DX/Local switch is almost certainly an attenuator fitted between the antenna and the first active stage of the receiver. Most modern receivers and transceivers have such an attenuator, usually 10 or 20dB. The reason for this is that the input to the receiver is inherently the most wideband, so that literally hundreds of signals appear at the base of the first transistor. Some of these are in the amateur band you happen to be listening to, and some — usually the "Really Big Ones" are further away but still mighty big signals even after going through any a.t.u. and the first tuned circuit in the receiver.

Now, as long as the receiver stages are operating linearly no problems arise; but let just one of those signals, whether wanted or not, be big enough to overload the stage. Now the stage is no longer operating linearly, and so it behaves as a mixer of sorts, mixing every signal at its base with every other one. The result of this mixing action is of course just plain noise — so many signals mixing result in broad-band noise. If the "Big One" is the one you are listening to, you may in fact note the sort of behaviour I used to call "blocking" where the audio becomes seriously distorted. Should you be listening to a small signal, then as soon as one of the unwanted signal causes non-linearity, the resulting noise swamps the weak signal totally. If you had an r.f. gain control, you would find that as you turned it down slowly, the noise would fall in volume along with the signal until this resulted in the "Big Ones" ceasing to overload the "front-end" when suddenly, lo! the noise level drops to reveal lots of previously inaudible smaller signals for you to listen to. The noise has dropped far more than the signal level at this point.

The practical situation is that you can either have an r.f. gain control, or an attenuator, or maybe both. Disregarding the attenuator and using the r.f. gain control, a side-effect is that the receiver's "Noise Figure" tends to deteriorate somewhat. Thus an attenuator between the antenna terminal and r.f. stage base is a slightly better bet. Ideally one would like a fully variable attenuator, but anyone who has tried to make a precision step attenuator can tell you that it is one thing to design it on paper, but quite another to guarantee it doesn't "leak" here and there; most of the cost of a precision step or switched attenuator lies in the cost of skilled individual adjustment of component positions as part of the test precedure. Hence a compromise: a receiver with a fixed r.f. attenuator and a separate adjustable r.f. gain control which usually acts by adjusting the bias conditions. In addition the receiver will probably be fitted with an a.v.c. line, which automatically backs the r.f. and i.f. gains down when a big signal reaches the detector.

The problem of course is that a.v.c. (or a.g.c. as it is more properly called) will only control the receiver gain when the wanted signal is the "Big One"; whereas we want to reduce the off-frequency signal which probably never gets as far as the a.g.c. stage. Ideally of course, one would have a lossless crystal filter connected between antenna and r.f. stage — but that would slightly limit one's ability to tune around, to put it mildly. Thus the fixed r.f. attenuator, sometimes correctly labelled, sometimes called a DX/Local switch.

That is, in simple terms, the story. However, when all is said and done, the stage that more often overloads first is in fact the mixer, but the argument doesn't really change much as it is a fact of life that the mixer stage usually, by its very nature, overloads before the r.f. stage. Most of the skill in receiving design lies around the best balance of characteristics, bearing in mind the "spread" of device characteristics. A home constructor can "sort through" the box and select the devices to give the best combination, which is obviously not practical on a mass production line.

One other factor is that so many of the long-distance short wave broadcasters are using up to megawatt of power into, say a rhombic antenna to lay down a mighty signal — great for a listener to that particular broadcaster who has a lousy skywire, but a pain for the s.w.l. who has a good, but relatively wideband, antenna to cover the bands.

And, of course, if you happen to be in an area where the local noise from thermostats, electric drills and other noise-generating devices are strong — which means any residential or industrial area, or even next door to a pub with a fruit machine! — then one of these may be the offending strong unwanted signal.

D. H. Travis (Guiseley) has been a listener for the better part of fifty years. Denis has been trying out a Lowe HF125 receiver, having a listen round in the mornings and having fun listening to the VKs and ZLs. For those who can contrive a directional antenna, these chaps come the long way round first thing in the mornings (i.e. from the west, and usually they fade out on this path and after a short break come in over the short path from the east later on in the morning and sometimes through to the afternoon. The ZLs tend to appear on the long path from the south-westerly direction, changing to north-easterly for the short path, and a look at a Great Circle map based on London shows why.

A Great Circle map of the world shows the more distant parts of the world in a distorted shape, (and a Great Circle map based on say New York or Moscow would look totally different again), because the aim of the Great Circle projection is to show directions and distances correctly. Any map covering a large area is going to distort shape, or direction or apparent distances, for the simple reason that the earth is a globe, and you can't persuade a sheet of paper to lie over a sphere without folding or cutting. Even the local section of the Ordnance Survey map at 1:50000 shows slight distortion, as you can see by looking at the small print at the bottom — even though you can neglect it for all practical purposes on an OS map.

A nice little note from **D. Burt** (Bideford) points out that your's truly was wrong when he referred to BTOZML as the first from Tibet since the days just after the War when AC4RF was there. He points out that the Swedish SM2DWH/BTO expedition to Mt. Everest in 1987 has slipped my mind — right enough to remind me, since Dave actually had a QSL from the expedition, backed by Icom and Swedish Radio Supply. On a different tack altogether, Dave's letter brought back memories for me, as I knew Bideford, Northam and Westward Ho! well enough years ago, and many of my ancestors came from Northam. Alas, I haven't been into Bideford for twenty years or more, though earlier this year while travelling I came within a few miles, crossing the estuary on the new main-road bridge after a visit to Lundy Island.

Antennas

Most listeners, indeed most transmitting amateurs, tend to use several bands. For v.h.f. of course one can use "resonant" antennas, such as dipoles or beams. What do you do at h.f.? Ideally, a beam mounted a half-wave above ground for the favourite band, and rotatable; but be sure that you check the s.w.r. across the band to be sure it is resonant at the middle of the band, or you may get odd results like a reversal of direction as you tune up and down. This can be done with a g.d.o. and sensitive reflectometer or s.w.r. meter.

For the lower bands, about all you can do is hang up the proverbial "Best Bent Wire" and feed it to the receiver in conjunction with an earth, preferably through an a.t.u. of some sort. In these circumstances, the easy part is the antenna and the a.t.u. — but the key to success is the earth system. Here the station earth comprises a short (2 metres) and relatively useless earth spike, which is backed up by as many radials as can be got down under the flower beds and the lawn — just far enough down to avoid them fouling the mower blades is enough — coming to a common point at the earth spike. In addition I have a wire-mesh fence on each side of the garden all bonded together and to the earth, plus a couple of longer above-ground radials, which are of insulated wire and which run right to the end of the garden and then along the wooden fence as far as I can get them without making them obvious. Altogether, it adds up to over a hundred metres of wire in the earth system, but there is no doubt it does help considerably to get the best out of the l.f. bands. Remove the earth system and signals drop about 2½ S-points or more on Top Band where the "top" is a low quarter-wave bent around the garden as best I can, most of the antenna part being about 1.5 metres above ground level.

Older Receivers

Most old-timers started off after Hitler's War with a war-surplus receiver, or if they were lucky an Eddystone S640 or a Denco DCR19 — AR88s and HROs were prized. Most of these older receivers, and indeed such as FRG7s or similar can be picked up for the proverbial song. Provided you have a circuit diagram and are prepared to do a bit of work on these older receivers, they can be very successful for a beginner, and save the valuable cash for a later stage when you know what you want.

Most of these receivers would be welcome in the writer's shack even today. I am prepared to lay a bet that, given no change in the antennas here, an AR88D or a KW77 or whatever in good nick would serve in the receiving situation quite as well as the currently used TS830S which forms the main station rig here. With just one proviso, which is that the old receivers have a crystal filter since our own favourite mode is c.w. After all, in the s.w.l. situation a little drift doesn't matter a cuss to someone whose hand rarely leaves the main tuning knob — the transmitting amateur on s.s.b. is a different case since he picks a frequency to operate through one or more QSOs, and confines himself to fine-tuning using the incremental receiver tuning (i.r.t.) facility on a transceiver.

If you do choose this route, it will be found that the receiver is usually well-filled with valves and 0.1 and 0.01μF paper capacitors. Valves can be checked individually if you can find someone who still has a valve tester — be sure to put them back in the holes from which they came even is they are the same type. As for the capacitors if they are the old-fashioned paper types, replace them all by more modern plastic dielectric capacitors of the same capacitance and voltage rating. Electrolytic capacitors should also be changed, preferably for new ones of the same type and rating, and this work, carefully done on a one-by-one basis will probably liven things up a bit. Re-alignment, though, is a job for the expert. A good check is to connect a dummy load resistor across the antenna/earth terminals, and twiddle the antenna tuning knob on the front panel. If you can hear a peak in the "sharsh" as you twiddle, there isn't much wrong with the sensitivity at all. If the receiver doesn't have such a panel control, you can connect the receiver to an a.t.u. and put the dummy load in place of the antenna, when a slight peak in the "sharsh" will be heard as you tune the a.t.u. To do this test you need to have r.f. and i.f. gain at maximum, preferably a.g.c. off, and audio set so you can detect the change of volume by

The next three deadlines for your letters are: November 15, December 19 and January 16

ear. The writer's "lugs" aren't all that good — only one works at all! — so I sometimes hang an oscilloscope across the headphone leads and see the peak.

Antenna Tuning Units

Antenna tuning units can be quite expensive to buy. If you have a dipole, properly cut and in the clear, or carefully resonated by g.d.o. and s.w.r. meter if not so clear, then you don't really need an a.t.u. on that band. Most of us use one wire or one antenna for all bands, when an a.t.u. is decidedly useful — it might bring signals up as much as a couple of S-points or more on some frequencies. For a first trial, you can wind some wire on to a toilet-roll core, and connect a variable capacitor out of an old transistor portable in parallel with the coil. The aim is to resonate the coil with the tuning capacitor on the chosen band, and to fiddle with the coil until you get about 1.5pF of tuning capacity for every metre of wavelength, 30pF for the Twenty Metre band for example, as judged by eye. Knowing how many pF maximum the capacitor is, and looking at the shape, a reasonable "guesstimate" is quite good enough.

Now you can run a bit of coxial cable between the receiver antenna terminals and the coil. Connect the braid to the earthy end of the coil and the inner conductor to a croc-clip. Connect the antenna by way of a croc-clip. Now fiddle with the position of the croc-clips and tuning on whatever band you are trying. For example, you are trying to peak up 14MHz. Sit in the middle of the band with the receiver r.f. gain well up, a.f. at a reasonable volume, band open. Connect the croc-clips, tune the a.t.u. capacitor for a peak. If you have no joy, move croc-clips and repeat. When you get some joy, adjust the croc-clips and tune with more care for the best result. You are aiming for a situation where the a.t.u. peaks the incoming signals, sharply, but not so sharply as to call for a slow motion drive.

You've just made an a.t.u.! I had one here for years made like this, sat on a packet of envelopes on the window sill, with the wire led straight through the wooden, opening, window surround. Of course, you can elaborate with a case and chassis, and a better former — or a lick of shellac varnish — and make it cover two or three bands by winding the coil for the lowest band, and then shorting out a proportion of the turns for a higher band. The principle is unchanged, though.

Finis

That's it for this time. I gather that the Post Office are handling the current mail but leaving the backlog for spare time, at least in some offices, so please let me have your letters as usual, and those that haven't yet surfaced but do so in time for our next issue, will be added to the pile. Could well be a Bumper Number next time! See you further down the log, as our Yank friends say.

DECODE

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

Readers Letters

My idea of a tape containing sample RTTY signals seems to be very popular, **Mr M. Newbold** of Derby has written expressing an interest in these tapes to help him resolve amateur RTTY signals though no doubt this will lead to a wider interest in utility stations. His station currently comprises a Yaesu FRG-9600 receiver with an AEA PK-232 multi-mode terminal unit. The computer is a Commodore 64 and the antenna is a Datong active unit.

The international response to this column is still growing and this month John Dimond of Green Point South Africa has written describing his success with utility station QSLs. Since obtaining his copy of the *Utility Address Handbook* by Richard Klein-Arendt in April '86 he has managed 98 successful QSLs which is pretty impressive. John hasn't sent me his full station details, but I can tell you that he uses a Kenwood R-2000 receiver.

I've only received one plea for help this month and that comes from **Harold Pinkney** who uses a Spectrum+ computer with his Trio R1000 receiver to receive SSTV and FAX signals. Harold would like to know if anyone can help him dump FAX images from his computer to his Citizen 102D parallel printer. If you can help please drop me a line.

My second international letter comes from **Eric Sillick** in Ontario, Canada. Eric has been involved in radio since joining the RAF in the 1940s, though he has lived in Canada since 1946. One point he makes concerns equipment prices which are generally about half the UK price! Perhaps because of this, Eric operates a very impressive station with a NRD525 receiver (including RTTY filters) taking pride of place and a Sony 2010 (known as 2001 in the UK) used when travelling. In addition to this he runs a couple of scanning receivers namely the Yaesu FRG-9600 and the Realistic PRO-2021. Utility station decoding is achieved using the Infotech M-7000 multimode unit, which decodes FAX in addition to most of the RTTY modes. The antennas in use are a 25m long wire, commercial trapped dipole and a random length of wire in the loft. Just to prove how successful his station is, Eric has sent in a log with over 1000 RTTY loggings as well as a large number of FAX and ARQ logs! To complete the picture Eric is a member of the Ontario DX club which has a thriving utility section within it's membership of over 1000.

My last international contact this month is **Colyn Brookes** from Cape Town, South Africa. He finds utility station DXing "a dream" from his location as he has a clear run into the Pacific via Indonesia. He can even log fishing boats off of the Polnesias without too much trouble. He writes the utility column for the 34 DX Club, a club for those living on the 34 degree parallel. Hopefully I shall have the space to add a few of his loggings into future lists.

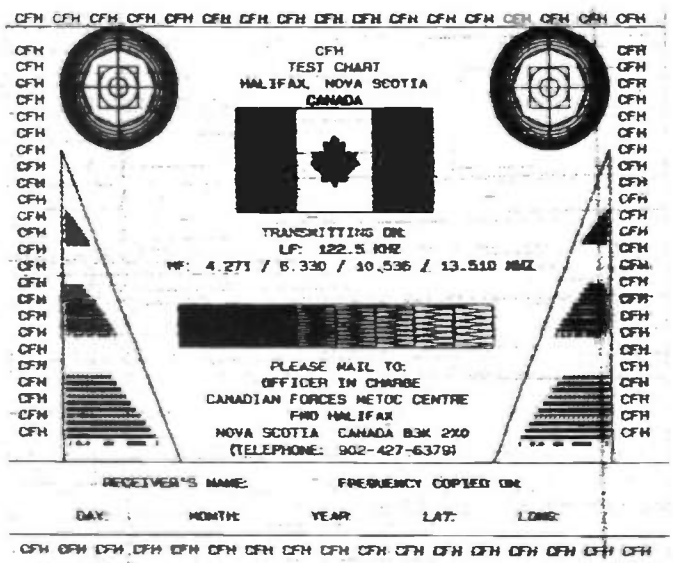

Fig. 1: A test chart from Halifax CFH, received on 10.536MHz.

Frequency List

The frequency list seems to be very popular, so much so that I must ask you to be patient. By the time you read this we will have our hands full with the newest member of the family and a lot of the letters are caught up in the postal dispute. Hopefully, once the post is back to normal you should be getting your s.a.e.s back with the latest frequency list quite quickly. Don't forget, if you have even one logging that can be added to the list I am always pleased to hear from you. Also, once you receive your copy of the list if you can fill in any of the blanks, like callsign, etc., please drop me a line so I can keep the list as up-to-date as possible.

Computer Prices

During my recent visit to the BARTG rally at Sandown Park I thought I would check-up on current second hand computer prices. This rally is generally very good for computers as it is aimed specifically at the data enthusiast. I found the exercise quite interesting as the spread of prices and value for money was amazing. These are the sort of prices I found:

Atari 800XL — £30*
BBC-B — £195**
BBC Electron — £35*
Commodore +4 — £20
Commodore C16 — £30*
Commodore Vic-20 — £25*
Mitac IBM compatable — £410**
Sinclair Spectrum — £70**
Sinclair Spectrum+ — £80*

The ones marked with a single star have only a very limited amount of software support, whereas those with two stars are quite well supported. I haven't given the poor old Commodore +4 any stars as I don't know of any RTTY software for this model. If you happen to know different, whether about this machine or any other, then please let me know.

PC-Monitor

I have just received news of a new public domain program from **Simon Collings G4SGI**. Simon has written the program to allow total control of a Yaesu FRG-8800 receiver with an IBM PC or compatible computer. The facilities included are quite impressive:

1: Keyboard entry of frequencies.
2: Tuning using the arrow keys with selectable step sizes.
3: One key mode selection.
4: One hundred memories which can store mode and a fifty character comment.
5: Ten channel seven day timer.
6: Manual or automatic scanning of the memory channels.
7: On-line frequency usage information.
8: Integral logbook facility.
9: On screen help file.
10: Optional Morse identification of mode.
11: Can also handle the optional v.h.f. and f.m. modules.

The logbook facility sounds very useful and can store date, frequency, mode, time, report and a 255 character comment.

PC-Monitor was developed in Turbo Pascal and should run on any IMB compatible that allows direct screen access.

The program is available in two formats, the first contains the executable and documentation files, which is all you need to actually run the program. This is available directly from Simon[1] by sending a double sided, double density disk together with a cheque or postal order for £2.50.

If you are interested in modifying the program to run with other receivers, Simon is prepared to release the full source code for £22.50, again you need to supply a DSDD disk.

Decoded on Wednesday 28 September 1988
Ruth Laura — congratulations to
Elaine & Mike Richards

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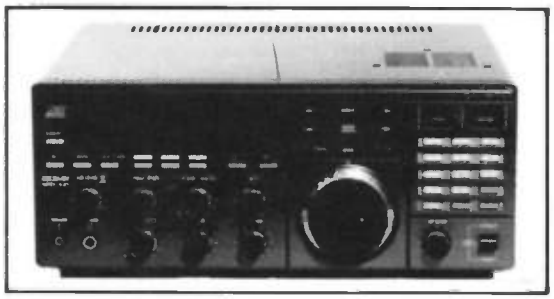

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SEEN & HEARD

Schedules

The schedules this month came via **Chris Norfolk**. The first is for the TASS news service. The information is given as: Time (UTC); Language; Frequencies (MHz).

0600-0800. French/Arabic; 11.670 15.590 16.190 alt. 13.410 (scrambled)
0815-1315. French. 15.590 16.190 18.836 alt. 20.585 20.965 (scrambled)
1330-1615. French. 10.165 irregular
1615-1845. French. 7.615 7.695 alt. 18.540
0600-1100. French. 19.105
0600-1545. French. 15.930 17.570 18.125 18.160 18.405 19.235 alt. 12.325 15.865 18.870 19.830 20.585
1600-1845. French. 9.110 9.850 10.675 alt. 10.880 11.495 12.315 12.325 15.930
0600-1345. English. 12.315 14.490 15.865 16.140
1400-2200. English. 5.830 6.870 6.950 8.140 alt. 5.470 7.525
0500-1600. English. 14.700 17.510 18.385 19.865 alt. 17.520 22.782
0600-1600. English. 18.050 18.460 19.060
1215-2230. English. 7.645 8.030 8.060 10.270 alt. 10.465
1400-1730. English. 14.928 alt. 14.901 Havana relay
1500-1900. English. 9.140 10.235
1500-1900. English. 10.880 11.470 12.250
0830-1500. Portuguese. 17.600 19.210 alt. 19.035
1515-1800. Portuguese. 9.145 10.240 alt. 19.035

Our last schedule is for PID news service. The times apply to the winter schedule. During local summer time, all transmissions are one hour earlier starting 0700-0750 until 1315-1345. The information is given as: Time (UTC); Language; Frequency (MHz).

0800-0830. German. 16.199 19.445

Fig. 2: Meteosat infra-red image received via Offenbach on 134.2kHz by Ivor Cooper.

0800-0850. German. 6.974 9.078 11.459 14.460
0800-0900. German. 9.062 9.140 14.569 16.243 19.390
0800-0900. German. 20.840 22.722
0815-0900. German. 8.008 8.086
0830-0900. German. 16.199 19.445 alt. 16.268 14.747
0915-1000. German. 20.840 22.722
0915-1000. German. 9.062 9.140 141.569 16.243 19.390
1200-1300. German. 20.840 22.722
1200-1300. German. 14.569 16.243
1200-1245. German. 10.429 11.448 13.538 13.9465 16.199
1200-1300. German. 20.020
1300-1330. German. 8.008 9.086
1300-1330. German. 6.974 9.078 11.459 14.460
1330-1345. German. 14.569 16.243 19.390 20.840 22.722 22.950 24.000
1315-1345. German. 17.395 alt. 13.436 14.747
1415-1445. German. 17.395

Frequency List

This month's frequency list is a little bit different as I have included a few frequencies from the log supplied by Eric Sillick in Ontario. I have picked some of the more interesting stations which hopefully should be receivable in the UK. Also, with the postal dispute, a lot of the regular contributors haven't been able to get their letters through to me. All signals received from outside the UK have been marked *. The usual format has been employed, i.e. frequency, mode, speed, shift, callsign and notes. The letter N or R after the shift indicates that the shift was either normal or reversed.

6.805MHz RTTY 50/R SOG280 Warsaw Press
6.985MHz RTTY 50/R Chinese Met.
7.61MHz RTTY 50/R Cairo Press
8.0297MHz RTTY 50/N Rome Press
7.753MHz* RTTY 50/850 WFA57 New York ITT
8.031MHz* RTTY 50/250 5UA Niamey, Nigeria
8.475MHz RTTY 50/N Sea weather forecasts
8.820MHz* RTTY 50/750 CA17E Easter Is.
9.255MHz* FAX 120/576 Kato Soli, Greece
10.6785MHz* FAX 60/288 Buenos Aires
11.1MHz* RTTY 50/850 CAK Santiago, Chile
11.486MHz* RTTY 50/300 TUH Abidjan, Ivory Coast
12.704MHz* RTTY 75/850 NRK Keflavik, Iceland
13.086MHz* ARQ 100/170 PCH Scheveningen Radio
13.540MHz RTTY 50/R LRO81 Buenos Aires Press
13.665MHz* RTTY 50/425 6VU73 Dakar, Senegal
13.77MHz* RTTY 75/425 Tangier Morocco
14.560MHz RTTY 50/R JYF2 Amman Press
17.216MHz* ARQ 100/170 WCC Chatham MA, USA

(1) S. Collings G4SGI, Southwold, Harnham Lane, WIthington, Cheltenham, Glos GL54 4DD.

INFO IN ORBIT

Pat Gowen G3IOR

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

Weather Satellites

A new signal is to be heard on 137.4MHz emanating from a brand new satellite from the USSR stable called OKEAN-1. As may be guessed from the name, it is an Ocean Reconnaissance Satellite, not so much like the ailing COSMOS-1900, but one giving visible, microwave sounding and RADAR pictures! The view observed during the course of a pass can suddenly change from the normal definition weathersat type expected, complete with the usual cloud cover to one of very high definition and a complete absence of cloud. Our regular correspondent **Lawrence Harris** of Plymouth has obtained some very interesting pictures, which are reproduced here. Our first, Fig. 1, is assumed to be the microwave sounder, and was captured on 14 July 1988. Fig. 2 is of the same date, at 2032 UTC, and depicts the microwave image, the RADAR image (before enhancement), the phase bars and the "piano key" telemetry, Fig. 3 is the left hand side of a double picture, which was taken by Lawrence to be an image from the microwave sounder over the Gulf of Bothnia. Fig. 4 is the other half of the previous and probably a RADAR map of the same area of the Gulf of Bothnia.

He points out that the 137.4MHz transmission is not continuous, but is on particularly for the eastern passes, i.e. those within range of the USSR, "it transmitted one of the first pictures at 2031 UTC on 14 July for some thirteen minutes" says Lawrence, "it included the 'piano key' telemetry plus two images, one of which appeared to be RADAR and the other a low visibility image. Since then I have seen a very good RADAR image of the Norwegian coast with an adjacent picture of the same area taken with another instrument, possibly a microwave sounder, but I am not sure how to interpret some of these images".

The most recent set of Keplerian elements for this satellite read as follows:

Epoch Year:	88
Epoch Day:	192.9294
	20651
Inclination:	82.5181
Right Ascension:	91.6982
Eccentricity:	0.0022022
Argument of Perigee:	259.1511
Mean Anomaly:	100.7431
Mean Motion:	14.73246649
Decay or Drag Factor:	4E-6
Rev. or Orbit Number:	80

This set, taken at 1954:03 on 10 July 1988 may have drifted a little since then, as in the long term the solar flux is rising fast and expanding the atmosphere. This elevates the drag factor, and reduces the period.

Based on this set of data, we can predict to within a few minutes a reference orbit close to the time you read this column to apply to those of you who prefer to use trackers, plotters, or even mathematical means to locate your satellites. OKEAN-1 should cross the equator northbound at 0015 UTC on 30 October 1988 when it will be at 53 degrees west longitude. The following orbit will cross 97.7 minutes later at 24.5 degrees west. For calculations on the day following, we find the first equatorial crossing occurring 26.1 minutes later than the prior day, and 8 degrees further west than the previous days, e.g. 0041.1 UTC at 61 degrees west longitude.

Aquisition of signals for passes on 30 October 1988 will commence at 0536 UTC at 4 degrees azimuth, at 0714 at 352 degrees, 0853 at 339, 1034 at 312, 1825 at 74, 1957 at 152, 2136 at 205, and 2316 UTC at 261 degrees azimuth. It would be as well to start looking well before these times to allow for the expected added drag factor with solar flux escalation likely.

The GM4IHJ "eqxer" Spectrum computer program produced Fig. 5 which shows the expected sub-satellite points. These are marked by "S" at 0720 and 2003 UTC on 30 October, which will help identify any pictures received from the new satellite.

Chinese Weathersat?

Pictures from early September monitoring on 137.8MHz show a strong resemblance to those received from the NOAA series, with similar edge markings and enumerations. At first it was believed that NOAA-11 was up and active at long last, but no indication has yet been given of this launch from source. It is now believed that the signals come from a new Chinese weather satellite, for which no details or Keplerian elements are yet available. As soon as they are to hand, a set, plus some pass times, will appear in this column.

SEEN & HEARD

Fig. 1

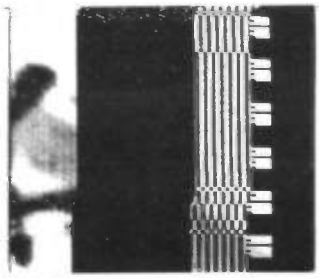

Fig. 2

Fig. 3

Fig. 4

COSMOS-1900

This rogue satellite, first reported some two months ago to be falling out of orbit at some 100 metres per day with its 50kg nuclear power plant still attached, is now falling fast, descending at almost one mile per day in early September. This rate of descent will by now be increasing very rapidly, so as it brakes further and meets denser atmosphere, the orbit circumference will reduce, thus bring it into even greater drag.

The "RORSAT" USSR family of satellites, and their USA counterparts, monitoring shipping movements on and probably in the worlds oceans, as they are purported to be capable of detecting the motion of submarines in deep water, by scanning, doppler shift and phase measurement of the surface bow wave created, COSMOS-1900 will undoubtedly re-enter close to the time that you are reading this column, and may have descended by late September or early October, but could equally well still be coming in, dependent upon several non-determinate variables. To help you attempt to track using your computer programs, the latest Keplerian element set for this threatening incoming cargo reads as follows:

Epoch Year:	88
Epoch Day:	233.6855-77263
Inclination:	64.9727
Right Ascension:	353.1053
Eccentricity:	0.0016015
Argument of Perigee:	282.7903
Mean Anomaly:	77.1552
Mean Motion:	16.17846017
Decay or Drag Factor:	0.00074563
Rev. or Orbit Number:	4057

The decay rate will be going up rapidly with elevating solar flux, the mean motion increasing, the altitude decreasing, and in fact it may well decay before this column is available to you to be able to use this latest information. The chances of it descending on a highly populated area are not high, as most of the earth is covered by oceans. At this point in time it is almost impossible to say where and when it will come down, and only that it will be somewhere between north and south latitudes 65 degrees, and at any longitude. The chances of "hitting" any one area are quite small, being that ratio of the area considered to that of the entire earth's surface between 65N and 65S. As the vast majority of that surface is open sea, the chances are that it will miss a land mass altogether. It may burn completely, and spread a diluted radio-active vapour over a wide area of atmosphere, or it may come down in large pieces, giving a highly dangerous concentration over a very small area.

A secondary automatic safety factor has been built in, that is sensitive to sudden changes of orientation, pressure and temperature, such as will occur when the satellite reaches between 115 and 124km altitude (according to atmospheric density at the time) as friction causes the spacecraft to tumble and heat up. At this point the system should boost the nuclear power source into a 800-900km orbit out of harms way for a good while longer. As radio contact and telemetry are lost, it will not be known if this last-ditch safety measure has succeeded until after the time it is due to re-enter.

A reference orbit for 30 October 1988, if it is still in orbit, is 0026 UTC at 315 degrees west. The dangerous periods for the UK currently appear to be from 1136 to 1140 and 1743 to 1748 on 20 October, 1113 to 1119 and 1720 to 1725 on the 21st, 1050 to 1055 and 1658 to 1702 on 22nd, 1028 to 1032 on 23rd, 1005 to 1009 on 24th, 0942 to 0947 on 25th, 0918 to 0923 on 26th, and 0855 to 0902 on 27th, of October, plus, of course, those graphed times on adjacent days. The reduced period and lower increment in the last few orbits will alter the times given accordingly.

Space Missions

USSR Cosmonauts Lyakov, Polyakov and Afghan visitor Mohmand all made a successful docking with the MIR space station, and were heard en route from the SOYUZ module by many listeners to the Airbands, where their strong f.m. signal amidst the air traffic a.m. ones was very noticeable. This launch was particularly interesting, as it was the first manned flight to MIR using a window normally reserved for the PROGRESS automatic supply docking missions. After a short stay with the existing long term crew of Vladimir Titov and Musa Manarov, Lyakov and Mohmand returned whilst medical doctor Valery Polyakov stayed aboard to keep an eye on the health of the stay-on crew as they approach the duration at which problems of prolonged weightlessness began to tell on the previous crew. At this time all is well, the crew are in good health and spirits, and are busy studying high frequency radiations from other galaxies.

It was on the return of Lyakov and Mohmand from MIR that a potentially serious problem arose. When they went to fire the retro-rocket for a 230 second burn to commence the re-entry procedure, the computer switched off the propulsion system after only one minute. It would appear that the earth horizon sensor was unable to determine the infra-red edge when the background was changed from sunlight to darkness, and thus automatically aborted the re-entry burn. A further attempt was made, but this time the attitude was wrong, so the system had to be manually shut off by the highly experienced Lysol to avoid incineration. Following re-adjustment of the SOYUZ attitude, a third and successful attempt was made, which brought the cosmonauts back safely to earth in Kazahkstan 24 hours after the intended landing.

The problem was not so serious as one might have been led to believe by the more sensationalist media, as alternative landing sites exist around the world, and Lyakov was well in control of the situation at all times. After all, the first manned missions were, literally, manually controlled, and managed quite well without computer control.

Leonid Labutin VA3CR, during a recent stay with G3IOR reported that at this time there are no radio-amateurs in the Soviet space crews, but, one cosmonaut is a keen short wave listener, who may be taking his licence examinations soon so as to permit a MIR "ham in space" mission.

PHOBOS Lost

Whilst PHOBOS-2 is functioning perfectly, all signals have been lost from PHOBOS-1, one of the pair of USSR exploration satellites that were to explore Mars and its major moon. Informed sources relate that an incorrect piece of software was loaded to the satellite commanding both the turning of the high gain antenna away from earth, and also steering the solar panels out of the sun so shutting down the power system. At this time no commands are possible, and no feedback either, so it has to be assumed to be lost.

Shuttle Missions

After many modifications, the US Shuttle programme is about to resume after a very long delay. The first mission, already suffering from a series of postponements, the latest being the threat of Hurricane "Gilbert" to the Houston Space Center mission control, may well be effected by the time these words reach you. The long wait has meant a re-scheduling of the numerous scientifically valuable planetary missions, and the long delayed £1000 000 000 Hubble Radio Telescope that will permit "visibility" of stars and nebulae out to 14 billion light years (the present limit is 2 billion) and so increase our knowledge of the Universe enormously has been further postponed to February 1990. This is to permit planetary positional dependent programmes to result. The Magellan Venus mapping mission is now scheduled for April 1989, the Galileo for 1989, whilst the Ulysses mission is now planned for October 1990. Astronaut and AMSAT member, Ron Parise WA4SIR, will be manning the flight scheduled for March 1990, and an amateur radio event, including high definition amateur radio television, is planned.

Polar Ski-Trek

The many of you who followed the joint Soviet-Canadian trans-polar expedition by listening to the nets and the positional information and bulletins on the VoSAT-2 OSCAR-11 satellite transmission will probably be keen to see some of the photographs taken by the successful group. Some of the extreme difficulties in negotiating the harsh terrain can be seen in Fig. 6, showing the joint Canadian Russian group crossing the impacted ice floes.

Some more pictures from the VA/VE Trans-arctic Expedition will be appearing in the "Amateur Satellites" column of *Practical Wireless*.

Okean-1* AT 0720 ON 30/10/88 Fig. 5

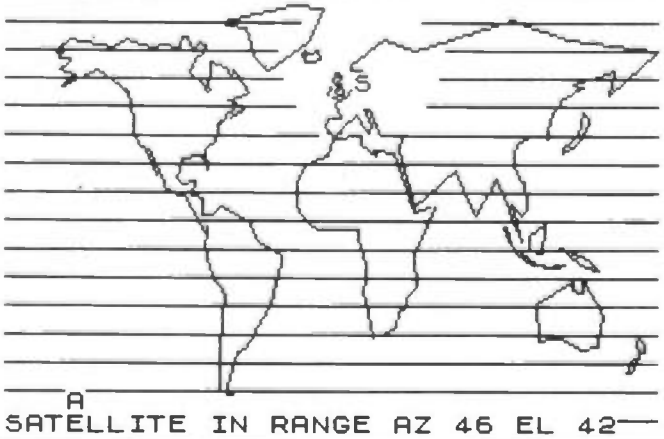

Fig. 6

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BAND II DX

Ron Ham
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During the summer months we were receiving stations in Band II (88-108MHz) from the Middle East to Scandinavia via Sporadic-E, but now the 1988 Sporadic-E season has ended and any DX that we receive over the coming winter period will be mainly European caused by minor or major tropospheric openings. With this in mind, keep an ear on the band, an eye on the barometer and the TV weather charts for high pressure systems especially when they begin to move. It will add interest and scientific value for future reference if you include the atmospheric pressure readings for, say, noon and midnight, in the log each day, plus a few notes about your local weather at the same time.

Most readers know that in my office at home, I use an ex-military R216 v.h.f. communications receiver, fed by a chimney mounted Revcone for Band II, and when out in the car I frequently check the band with a Plustron TVR5D and its own rod antenna. Also in the car I have an ex-RAF altimeter which gives my height above sea level and the prevailing atmospheric pressure. In addition, your scribe keeps an eye on the sky and horizon for possible weather changes that can bring DX, as in Fig. 1, or be dramatic, like Fig. 2 and produce heavy rain. This is sometimes electrically charged causing a temporary "shriek" in receivers with outside antennas (precipitation static) and/or thunder static. Fig. 1 is a weather change seen from the west of my home and I photographed the storm clouds gathering, Fig. 2, when I visited Trundle Hill, a beauty spot, overlooking Goodwood, on the Sussex Downs on July 13th. When clouds like those in Fig. 1 begin to appear after a prolonged clear period, I usually hear signals from Radio Telefis Eireann and the BBC and IBA stations in Wales.

Fig. 1

Fig. 2

New Stations

At 0220 on August 27, I received a strong signal on 98.8MHz saying. "This is Radio 1 FM testing", ready for their start on September 1 and in Arbroath, David Glenday heard the f.m. test transmissions for Radio 1 and 4, on 98.6 and 95.8MHz respectively, from Black Hill at 1400 on the 28th. "Must say how delighted I am to be receiving clear Radio 4 now," said David.

The next three deadlines are: November 15, December 19 and January 16

Reports

Despite fine weather and high atmospheric pressure in the south on September 6, I noted that a low, with some rain, was moving across Ireland toward the north of England and Scotland. No doubt this was responsible for a limited troposperic opening, because during the day I logged signals from Belgium, France, Germany and Holland and at 2000 I heard a jingle from Ireland's RTE FM III and the programme announcement for "Invitation To Music" on 94MHz. At the same time I received Radio WM from Birmingham at good strength. At 1650 on the 7th, I used my Plustron TVR5D, with its rod antenna, while parked at Ightham Mote, Kent and logged very strong signals from four French stations between 99 and 106MHz. Although the pressure was still high during the afternoon and evening of the 10th, a movement of colder weather had begun and at 1600 I counted seven strong foreign voices between 87.5 and 103MHz and inter-station "warbles" on five spots from 90 to 95MHz. By 2045 signals from continental and UK stations were very strong and many were overlapping each other.

The high pressure (30.5in – 1032mb) was falling during the evening of the 20th and, true to form, I logged many "warbles" and some hefty signals from France and Germany on many spots between 87 and 102MHz and from Ireland (RTE FM III) on 94MHz. I frequently found French stations again on the 21st while parked at various spots while en route to Sheffield Park, West-Sussex.

From Molepolole, Botswana, P.R. Guruprasad wrote, "On August 24, 1988, I could hear Radio Mabatho on f.m. from 1715 to 1730 UTC and the transmission was really very good with very clear signals, though there was some 'hissing' present without impeding quality". He uses a Philips D1835 receiver with its own rod antenna and I will be looking forward to adding his future reports to this column.

TELEVISION

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

On August 28, I had the pleasure of meeting John Woodcock (Basingstoke), while he was looking at the vintage television receivers in the Radio Exhibition at the Chalk Pits Museum, Amberley, Sussex. John has a special interest in the early sets made by Bush because he recently renovated one of their models for his TV-DXing. I think that the mouths of many television collectors will be watering when they see the latest addition to the Museum's Radio Exhibition (Fig. 1). Yes, it's a 1937/8 HMV, Model 905, table television receiver with radio combined. The vertical radio dial, situated between the loud-speaker and the 7in screen, has the usual 3-wavebands with a dual speed tuning drive and a spinning logging scale (centre right of dial) for the short-wave band. The larger knobs are for volume and radio tuning, the outers of the lower four are twin controls for brilliance/contrast and line/frame holds and the inner knobs set the radio wave-change and focus. This combined receiver, which retailed for £36.15s.0d. (£36.75). has a fine polished cabinet, 16 valves including two rectifiers and an Emiscope 3/2 cathode ray tube.

Fig. 1

Many pre-1939 receivers were put back into service after WWII when television re-commenced in June 1946 on 45MHz, with a range of under 50 miles, from London's Alexandra Palace. My archives contain a copy of the *Daily Mail Television Handbook*, which I think was published in 1949, price 1s. (5p). This book contains a map of the Home Counties and has concentric circles graduated from 10 to 75 miles centred

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Fig. 2: London 1947

Fig. 3: Eire

Fig. 4: Spain

Fig. 5: Dubai

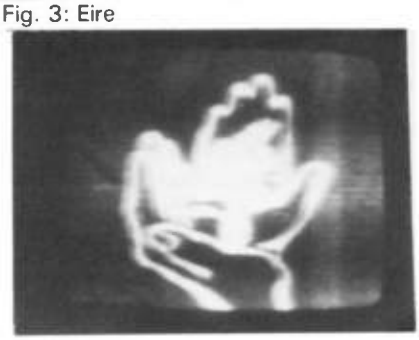

Fig. 6: USSR

Fig. 7: Lahore

Fig. 8: Lahore

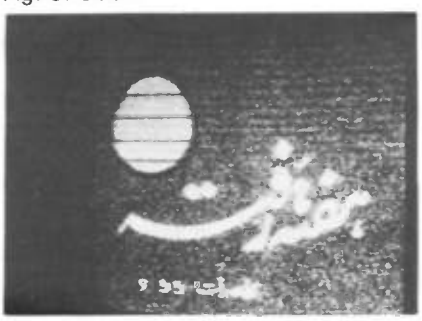

Fig. 9: Pakistan

Fig. 10: Delhi

Fig. 11: USSR

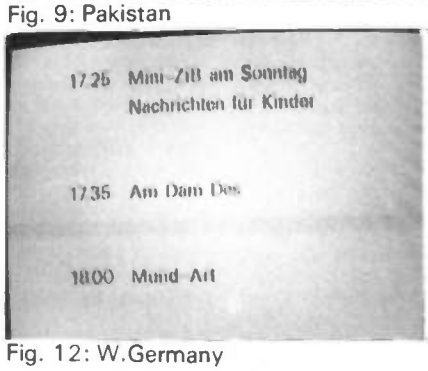

Fig. 12: W.Germany

Fig. 13

on AP with the caption, *"The concentric circles enable intending viewers to estimate how far they live from the transmitting station. The heavy circle of 35 miles radius encloses the main areas in which reception is generally satisfactory according to the BBC although in many cases excellent transmisison is received well beyond this distance."*

In spite of any limitations enthusiasts will always try for the impossible and in 1947, a friend of mine, **Bruno Parfect**, built a pre-amplifier, using two SP61 (ex-radar) valves, and received a programme from London, which he thinks was called *The Queen's Hussars*, Fig. 2. Bruno lived in Rothley about 10km north of Leicester and just over 160km from the transmitter. He used a pre-war Ultra set with a standard vertical "H" antenna, somewhat different to the domestic u.h.f. antennas in use today some 41 years later and 18 times higher in frequency. We are still DXing, hi.

In Batley, **W. H. Licence** has made a start with a Yoko receiver and although he is too late for the 1988 Sporadic-E season, it is always worth checking around Chs. E2/R1 (48.25/49.75MHz) in the early mornings and afternoons during the winter months.

While DXing on June 16 and 27 **Stephen Moore** (Newquay) photographed a programme schedule from Ireland (RTE2), Fig. 3 and news of the Airbus crash in France which was being shown on Spain's TVE1, Fig. 4.

Having seen test-cards and programmes from Andhra Pradesh, Hyderabad or Sri Lanka interfering with the local transmissions visible at his home in Tamilnadu, **P. R. Guruprasad** plans to add DX-TV equipment to his present short wave station and I will certainly look forward to having his reports in this column.

News from India

At his home in Meerut, India, **Lt. Col. Rana Roy** received pictures from Dubai TV, Fig. 5, on Ch. E2 and the USSR, Fig. 6, on Ch. R2 during Sporadic-E disturbances on May 5 and July 5 and Lahore TV, Figs. 7 and 8, in Band III while tropospheric openings were in progress on March 6 and 15. Looking back to 1987, Rana's tropo log included a next day's programme schedule from Pakistan TV on January 9, Fig. 9 and Teletext from the low-power transmitter in Delhi on December 4, Fig. 10.

Band I

From the archives of **Bob Brooks** (Great Sutton) comes a photograph of news from the USSR which he logged in 1987, Fig. 11, (note the TACC-TASS at the bottom) and during the latter half of the 1988 Sporadic-E season **Mike Bennett** (Slough) received programmes and/or test-cards from Austria (ORF-FS1), Czechoslovakia (RS-KH), Finland (YLE-TV1), France (Canal +), Iceland (RUV-Island), Italy (RAI-Televidio), West Germany (BR-Grunten and SWF-Badn1), Holland (PTT-Ned1), Hungary (MTV), Norwegian regional (BAGN, Bremanger, Gamlen, Hadsel, Hemnes, Melhus, Steiggen), Poland (TVP), Portugal (RTP), Spain (TVE), Sweden (Kanal 1-Sverige), Switzerland (PTT-SRG1), the USSR (TSS) and Yugoslavia (RTV-Ljubljana). Around 1045 on August 8, Mike logged five of the Norwegian regionals in full colour and saw the Dutch PTT-NL-AVVC letters over colour bars on Ch. E4 at 0750 on the 8th and 10th.

Stephen Moore received pictures from Spain and the USSR on July 20 and 23, Iceland and Norway on August 7 and 8 and Austria on the 14th.

David Glenday (Arbroath) reports an intense Sporadic-E opening throughout the afternoon of August 14 when he logged strong signals from Spain. At 1406 on the 23rd he watched a Soviet news programme and logged a test-card from Sweden (Kanal 1 Sverige) and test-cards from Spain and the USSR and programmes from Spain between 1000 and 1200 on the 25th. David added Finland (YLE-TV1), Norway (Steigen) and Sweden during the morning of the 26th.

In High Wycombe on August 24, **Maurice Peall** received a strong test-

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card from the USSR on Chs. R1/2 (49.75 and 59.25MHz) followed by their clock and the HOBOCTN (news) caption. In addition he logged test-cards from Austria (QRF-FS1), Czechoslovakia (RSKH) and West Germany (Grunten) on September 1, Austria, Hungary (MTV1 Budapest), Italy (RAI) and Yugoslavia (JRT-ZRGB1 and TV2 Zagreb) for most of the 4th and Italy on the 6th.

Tropospheric

During previous tropospheric openings a programme schedule from West Germany, Fig. 12, was received by **Peter Lincoln** in Aldershot and my visit to Hever Castle in Kent on August 22, coincided with the filming for the television programme *Smiths Superchamps* of fast boats on the lake at the end of Heaver's grounds. The lift carrying the cameras is seen overlooking the lake in Fig. 13.

Mike Bennett found tropo conditions good early on August 7 when he logged test-cards from Holland (PTT-NED1) and West-Germany (NDR1 and WDR1) in Band III. Although the atmospheric pressure was only 29.9in at 0220 on the 27th, I noticed patterning on Channel 4 in the u.h.f. band and when I checked outside the temperature was 59 degrees and it was like a "steam bath". Although the barometer was high and the sun was shining, clouds were coming from the west on September 6 and a weather forecast during the day said that rain was moving across Ireland towards Scotland, so it was no great surprise when I logged a test card at 1130 and a programme caption at 1915 from Ireland (RTE1) in Band III. While parked at Ightham Mote, Kent, around 1700 on the 7th and using my Plustron TVR5D with its rod antenna I saw strong negative pictures from France on Chs. 5 and 7 in Band III and Chs. 21 and 25, plus some patterning on UK stations in the u.h.f. band. This co-channel interference persisted throughout the evening and was remarked about in the late BBC2 weather programme.

Maurice Peall received a test-card from Belgium (RTBF1 Wavre), many transmissions from France (Canal +) and Breakfast TV from Luxembourg (RTL1) in Band III on the 6th and Belgium (BRT-TV1 and RTBF1-Leglise), West Germany (SWF-BADN-1) and Luxembourg on the 7th.

Between 1315 and 2245 on the 7th, David Glenday received Channel 4, possibly from Crystal Palace, on Ch. 30, a test card from Egem (BRT TVI) on Ch. 43 and a Dutch subtitled film from Smilde on Ch. 47.

I received strong negative pictures from Canal + when the pressure was falling during the evening of the 20th and also while out in my car on the 21st.

Co-channel interference affected several channels in the u.h.f. band again during the evenings of the 6th, 10th and 20th.

LONG MEDIUM & SHORT

Brian Oddy G3FEX
Three Corners, Merryfield Way, Storrington,
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More and more facilities are being offered by the receiver manufacturers these days. Frequency synthesisers and digital frequency displays are becoming commonplace and some of the more advanced designs have vast memory banks, memory scanning, band searching, clock/timers and even offer a voice synthesiser to announce a selected frequency. What will the designers think of next?

The stability of the more advanced receivers is so good that it is now possible to engage in a little DXing while asleep. It is simply a matter of tuning the receiver to the frequency of a known DX station and setting the built-in timer to turn the receiver and a cassette recorder on/off for a pre-determined period before going to bed. The tape can be checked while enjoying breakfast and a reception report posted off to the station concerned while on the way to work!

Long Wave DX

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC.

Although the frequencies in the long wave band are allocated to the broadcasters on a shared basis, some of their signals can only be heard here via sky wave paths at night. The longer dark evenings now provide listeners with a good opportunity to hear some of them without the need to burn the midnight oil.

Using a Trio R2000 receiver with a random wire antenna in the loft, **Fred Pallant** (Storrington) has been searching the band for DX for the first time. He logged all of the signals he could hear via ground wave paths during daylight and then re-checked the band after dark. A total of sixteen stations were heard. Eleven of them were audible during both periods, although the SIO ratings of six of them changed around dusk. The broadcasts from DLF via Munich, W. Germany 207 (500kW) rated as SIO 233 during daylight, but they became inaudible after dark. Four additional signals were heard after dark, stemming from Brasov, Romania 153 (1200kW); Kaliningrad, USSR 171 (1000kW), rated as SIO 243; Montala, Sweden 189 (300kW), SIO 133 and Konstantinow, Poland 225 (2000kW), SIO 334.

David Wratten has also been checking the long wave scene in Cambridge and has sent along a log of thirteen stations for the chart. He checked the band first at 1515 and it is interesting to note that the ground wave signals from Allouis 171, Saarlouis 183 and Junglinster 234 rated the same as Droitwich at SIO 444, whereas those from Donbach 153, Oranienburg 177, Munich 207 and Kalundborg 245 were 344. He checked the band again around 2250 and found that the sky wave signals from Kaliningrad 171, Roumoules 216, Konstantinow 225 and Toplona 272 rated as 444, but Kishinev 234 was only 222.

MW Transatlantic DX

Writing from Grimsby, **Jim Willett** says he found the reception conditions to be rather variable during the five nights he searched the band for transatlantic DX. His interesting log of some twenty stations gives a good indication of what to expect if one is prepared to stay awake until 0330!

The signal from CJYQ in St. Johns, Newfoundland 930 was heard at SIO 322 around 0030 and is once again providing a useful and early indication of reception conditions. Of the eight Canadian stations logged between 0030 and 0230, the signal from CHYQ in Musgraveton, Newfoundland 670 proved to be the best, rating as 333 at 0130. The only other signal to achieve a similar rating stemmed from WINS in New York 1010 at 0200.

Other MW DX

Five broadcasts from N. Africa were logged by Fred Pallant between 1930 and 2000. Three were in Arabic from stations in Algeria, Ain Beida 531 (300kW), rated as SIO 344; Les Trembles 549 (600kW), 444; Algiers B91 (600/300kW), 333 and two stemmed from Sebaa Aioun in Morocco, with French on 612 (300kW), 333 and Arabic on 1044 (300kW), 233. He picked up several broadcasts from Spain around 2000, including RNE-1 via Madrid 585 (200kW), rated as 444; RNE-1 via Saville 684 (250kW), 444; RNE-1 via Barcelona 738 (250kW), 344; SER Radio Bilbao 990 (10kW), 333; Radio Popular, Madrid 999 (20kW), 232. At 2030 he heard Radio Sud, Andorra 819 (900kW), noting their signal as 333. At 2100 three of the Italian stations were heard, Rome 846 (540kW), rated as 344; Milan 900 (600kW), 244; Rome 1332 (300kW), 344.

Despite the 1400km which separates **Sheila Hughes** in Morden and Radio Tirana in Albania, their 1000kW transmission via Lushnje 1395 rated as 32222 at 2130. Using a Vega 206 portable with a home made loop, Sheila has been listening to the religious broadcasts from TWR in Monte Carlo, Monaco 1467 (1000/400kW) and rated them as 54444 at 2150. Another 1000kW broadcast was also mentioned in her report, Radio Moscow World Service via Kaunas 136B, which is about 1330km from Morden. Their signal rated as 43443 at 2130.

The broadcasts from Radio Finland via Pori 963 were mentioned in the report from **Cyril Kellam**, he rated their signal in Sheffield as 444 at 2045. The programmes from AFN via Frankfurt, W. Germany 873 (150kW) have been attracting his attention during the evening, their signal peaks 444, but suffers from deep fading. Some of the other broadcasts from W. Germany were noted in the reports including DLF via Neuminster 1269 (600kW), logged by **Alan Curry** in Stockton-on-Tees at 1B15 and Radio Bremen 936 (100kW), rated as 333 at 2030 by Fred Pallant. The broadcasts from Radio Luxemburg on 1440 stem from a 1200kW transmitter in Marnach and reach most areas of the UK very well at night via sky wave paths. **Julian Wood** (Buckie) reminds pop music fans that they broadcast a "Top Twenty" record list on Sundays at 2200.

The sky wave signals from Manx Radio via Foxdale, Isle of Man 136B (20kW) also reach many areas of the UK well after dark. They were rated as SIO 333 in Sussex by Fred Pallant at 2030 and reported as good at 2300 in Stockton-on-Tees by Alan Curry. They welcome detailed signal reports and comments on their programmes and confirm them with an attractive QSL card. If requested, they may also be able to send a leaflet about the history of the station, which makes very interesting reading.

A number of signals from distant locations may be heard via ground wave paths during daylight. No doubt the long sea path helped the 20kW transmission from AFN via Stuttgart, W. Germany 1143 to reach Alan Curry at 0735, he uses an Icom R-70 receiver with a random wire antenna. Listening in Wootten, IoW **George Millmore** has been hearing a 5kW transmission from a BRT-2 station in Kuurne, Belgium on 1188 during the day.

Freq MHz	Station	Location	Time (UTC)	DXer
		USA		
660	WNBC	New York, NY	0300	A
880	WCBS	New York, NY	0320	A
1010	WINS	New York, NY	0200	A
1030	WBZ	Boston, MA	0230	A
1050	WFAN	New York, NY	0200	A
1220	WGAR	Cleveland, OH	0230	A
1540	WPTR	Albany, NY	0245	A
		Canada		
580	CFRA	Ottawa, ON	0250	A
590	VOCM	St. John's, NF	0200	A
610	CKYQ	Grand Bank, NF	0145	A
670	CHYQ	Musgravetown, NF	0130	A
750	CBGY	Bonavista Bay, NF	0230	A
930	CJYQ	St. John's, NF	0030	A
950	CHER	Sydney, NS	0215	A
1220	CKCW	Moncton, NB	0130	A
		C. America & Caribbean		
770	R. Jamaica	Spur Tree, Jamaica	0300	A
1570	Atlantic Beacon	Turks & Caicos Ils	0130	A
1580	VOA	Antigua	0300	A
		South America		
950	R. Vision	Caracas, Venezuela	0215	A
1220	R. Globo	Rio, Brazil	0300	A

DXer
A: Jim Willett, Grimsby.

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KENWOOD R5000 £875.00

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

R2000 £595.00

This is an innovative all-mode SSB, CW, AM, FM receiver that covers 150kHz-30MHz. With an optional VC-10 VHF converter unit, coverage of the 118-174MHz frequency range is possible. New microprocessor controlled operating features and an "UP" conversion PLL circuit assure maximum flexibility and ease of operation.

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- 40-station random preset memory
- 2-position AM selectivity
- SSB and narrow FM reception*
- Squelch controller (auto & manual)

ICF 2001D £299.00

Super-wide coverage (150-29999.9kHz, 76-108MHz, 116-136MHz) with the versatility of both digital and "precise-feel" analog tuning. There's also two types of scan modes, either auto-stop or 1.5-second hold. 2-position AM selectivity, AM RF-gain control, AM attenuator, 3-position tone control, direct meter band access, 4-event programmable timer and SSB* reception. Plus an external antenna for AM, FM and AIR Band. In short, everything an enthusiast could ever want in a high-performance receiver — and can only get from Sony!

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Direct access digital keyboard and large, easy-to-read LCD Multi Display. Advanced quartz-locked PLL-synthesizer. With the memory preset, you can select one of your 10 favourite stations at the touch of a button. There's also auto-scan or manual tuning with the up/down keys. A sensitivity select switch for all bands, from 153 to 29995kHz and 76 to 108MHz, plus SSB fine-tuning reception, 2-position tone control, a built-in clock and timer, a sleep switch.

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- Carrying belt and earphone

AR 2002 £487.30

The frequency range is from 25 to 550 and from 800 to 1300 Mhz. Modes of operation are wide band FM, narrow band FM and AM. The receiver has 20 memories, memory scan and search mode which checks frequencies between user designated limits and a push button keypad for easy frequency entry and operation. A front panel knob allows the listener to quickly step up or down in either 5, 12.5 or 25 kHz steps from the frequency initially chosen. A socket for the optional RS232 interface (RC PACK) is provided on the rear panel.

LOWE HF-125 £375.00

Coverage is continuous from 30kHz to 30 MHz and operating modes are AM, USB, LSB and CW with an optional FM and synchronous AM board. A comprehensive range of bandwidth filters are standard: 2.5, 4, 7 or 10kHz. There is a 400Hz audio filter for CW reception. Controls are very simple and the frequency tuned is displayed on a large back-lit liquid crystal display. Power requirements are 12V d.c. at around 250mA and internal NiCad batteries give around 10 hours portable operation. The lithium battery gives back-up for the 30 memories for some ten years.

CHALLENGER BJ200 Pocket Scanner — £225.00

The Challenger BJ200Pocket Scanner covers CB and Amateur Band frequencies as well as the 200MHz Military Band. It has switchable AM/FM and the accessories which come as standard include a NI-CAD battery pack built in and battery charger, carrying case, helical rubber antenna, earphone and TNC(M) adaptor. **Carriage £3.00**

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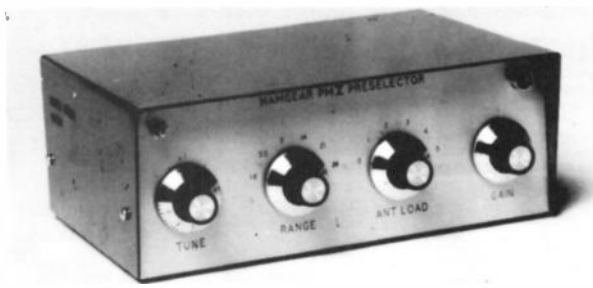

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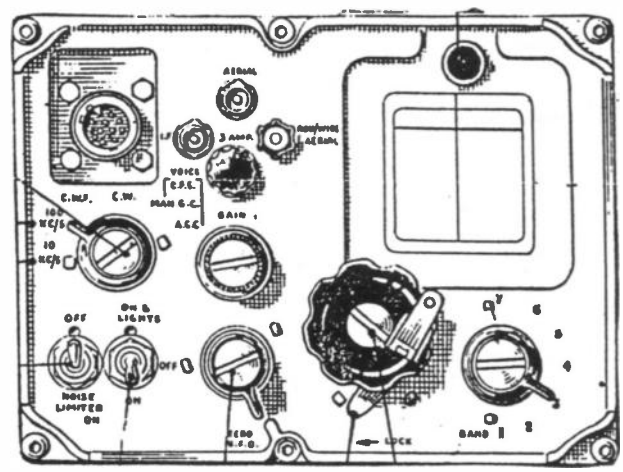

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SEEN & HEARD

MW Local Radio DX

Following his report last month of test transmissions on 603 from the new BBC Radio Gloucester station, David Wratten has been hearing their broadcasts at SIO 333 around 0925. He used a Philips D2999 receiver with a loop antenna to compile his latest list for the chart, which included the 0.5kW transmission from BBC Radio Guernsey 1116, rated as SIO 333 at 0933.

Some remarkable feats of long distance reception during daylight were noted in the reports this time. Using a Trio R2000 receiver with an a.t.u. and a random wire antenna in Cambridge, Christian Pritchard picked up the signal from the 2kW BBC Radio Solway transmitter in Dumfries. The broadcasts from BBC Essex via their 0.5kW transmitter in Chelmsford 765 have been reaching Alan Curry in Stockton-on-Tees. He was also delighted to hear BBC Radio Bedford via Mangotsfield (0.3kW). Listening in Morden at 0815, Sheila Hughes heard BBC Radio Clwyd via Wrexham 657 (2kW) and noted their signal as 43333.

A Racal RA17 receiver enabled George Millmore to hear BBC Radio Nottingham via Clipstone 1584 (1kW) for the first time. He also logged two stations which have proved to be rather elusive in the past, BBC Radio Leicester via Freeman's Common 837 (0.7kW), last heard in January '88; BBC Radio Cambridgeshire via Gunthorpe 1449 (0.1kW), last heard in March '88. His extensive log for the chart was compiled between 0800 and 1130.

A very warm welcome to Mark Selby of Aldershot. He took up short wave listening as a serious hobby last year and has found it to be very informative and interesting. Having read of the achievements of other listeners in this column he decided to try local radio DXing, his first log certainly makes an impressive entry in the chart.

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

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

DXers:
A: Leo Barr, Sunderland.
B: Alan Curry, Stockton-on-Tees.
C: Sheila Hughes, Morden.
D: George Millmore, Wootton, IoW.
E: Christian Pritchard, Cambridge.
F: Mark Selby, Aldershot.
G: Jim Willett, Grimsby.
H: David Wratten, Cambridge.

Short Wave DX

The 25MHz (11m) band is now in regular use by three broadcasters. Radio Norway International beam their programmes in Norwegian to Africa via Fredrikstad on 25.730 each day between 1200 and 1245. So far, no reports have been received from regular contributors in S.Africa to indicate just how well their transmissions are reaching the target, but the reports on the amateur signals reaching S. Africa from the UK in the 28MHz (10m) amateur band suggest that reception will be excellent. On average, their signal rates as SIO 343 here, which is rather better than earlier in the year — however that is relatively meaningless as their broadcasts are not intended for the UK.

Radio Denmark now broadcast in Danish to S.Asia and Australia via Copenhagen on 25.850 between 1200 and 1255. Although no reports on their signal have been received from overseas readers, I am hoping to hear from Davy Hossack in Freemantle and John Ratcliffe in Southport, Queensland in the near future. Meanwhile I have been monitoring their transmission here, which rates as SIO 243.

The third broadcaster who has decided to make daily use of this excellent band is Radio France International, Paris. Their broadcast in French may be heard between 0900 and 1200 on 25.820, but the target area is not known to me at the time of going to press. There was no mention of their transmissions in recent logs, but they rate as SIO 343 here. No doubt all three broadcasters will be glad to receive detailed reception reports from any location.

During the years leading up to and beyond the peak of the last solar sunspot cycle, both the BBC World Service and Radio Moscow could be heard in the 11m band during the morning. The BBC transmissions stemmed from Daventry on 25.650 and could be heard between 0900 and 1300. Radio Moscow broadcast on 25.620 from 0930. It may be worth checking both of these frequencies for test transmissions or actual broadcasts during the coming months.

Although the conditions prevailing in the 21MHz (13m) band have been disturbed from time to time by solar flares, reception from many areas has been good and many potent signals have been reaching the UK.

Some of the broadcasts to Europe were noted in the reports, Radio Japan via Moyabi Gabon 21.695 (Eng, Jap 0700-0830), rated as 35444 at 0727 by David Wratten; UAE Radio Dubai 21.605 (Ar, Eng 0615-1400), 44434 at 1030 by Sheila Hughes; Voice of Israel, Jerusalem 21.675 (Eng, Fr, Heb 1000-1530), 45444 at 1024 by David Wratten; Radio RSA Johannesburg, S.Africa 21.590 (Eng, Fr, Ger, Du 1400-1800), SIO 444 at 1400 by Cyril Kellam; Radio Japan via Moyabi, Gabon 21.700 (Eng, Jap 1500-1700), rated as SIO at 1508 by Kenneth Buck in Edinburgh, he also heard WHRI South Bend, USA 21.655 (Eng 1500-1700), noted as SIO 455 at 1621. At 1900, Andy Keddie (Lincoln) heard WYFR via Okeechobee, Florida 21.615 (Eng, Ger, Fr 1600-1945), rated as 55545.

Many of the broadcasts to other areas were logged by DXers, including Radio Prague, Czechoslovakia 21.705 (Eng, Cz to S.E.Asia 0730-0930), rated as 44433 at 0730 by Sheila Hughes; Radio Nederlands via Talata Volon, Madagascar 21.485 (Du, Eng, Ind to S.E.Asia 0700-1125), 25343 at 0830 by David Wratten; Radio DW via Julich, W. Germany 21.650 (Eng to S.Asia 0900-0950), 43333 at 0900 by Andy Keddie; BSKSA Riyadh, Saudi Arabia 21.495 (In to S.E.Asia 1000-1155), 34333 at 1009 by David Wratten; Radio Moscow, USSR 21.630 (Eng to Africa/Middle East 0500-1500), rated as 45545 at 1300

Freq kHz	Station	Country	Power (kW)	DXer
153	Bechar	Algeria	?	D
153	Brasov	Romania	1200	B
153	DLF Donebach	W. Germany	500	A,E
153	Ufa	USSR	100	D*
162	Allouis	France	2000	A,B,D,E
171	Kaliningrad	USSR	1000	A*,B*,E*
171	Medi 1 Nador	Morocco	1200	D*
177	Oranienburg	E. Germany	750	A,B,E
183	Saarlouis	W. Germany	2000	A,B,E
189	Motala	Sweden	300	B,D*
198	BBC Droitwich	UK	400	A,B,C*,D,E
198	Leningrad	USSR	150	D*
207	DLF Munich	W. Germany	500	A,B,E
209	Azilal	Morocco	800	B*,D*
216	Oslo	Norway	200	B*
216	Roumoules	Monaco	1400	A,B,C*,E*
225	Konstantinow	Poland	2000	A*,B*,C*,E*
234	Junglinster	Luxembourg	2000	A,B,C*,E
234	Kishinev	USSR	1000	B*,E*
245	Kalundborg	Denmark	300	A,B,C*,E
254	Tipaza	Algeria	1500	A,B*,C*,D*
254	Lahti	Finland	200	B*,D
263	Burg	E. Germany	200	B,C*
263	Moscow	USSR	2000	A
272	Topolna	Czechoslovakia	1500	A,B,C*,D*,E*

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

DXers:
A: Fred Pallant, Storrington.
B: Philip Rambaut, Macclesfield.
C: Phil Townsend, London.
D: Jim Willett, Grimsby.
K: David Wratten, Cambridge.

SEEN & HEARD

by Andy Keddie; Radio DW via Cyclops, Malta 21.680 (Ur, Hi, Eng to S.Asia 1430-1650), 44434 at 1650 by Leo Barr (Sunderland); SRI via Schwarzenburg, Switzerland 21.630 (Eng, Fr, Ger to Middle East 1515-1700), 45444 at 1515 by David Wratten; WCSN via Scotts Corner, Maine 21.640 (Eng, Fr, Ger to Africa 1600-1755), 455 at 1600 by Kenneth Buck; RTB via Wavre, Belgium 21.460 (Fr to Africa 1600-1755), 34444 at 1605 by David Wratten; Radio DW via Cyclops, Malta 21.680 (Ur, Hi, Eng to S.Asia 1430-1650), SIO 455 at 1620 by Kenneth Buck; Radio Nederlands via Bonaire, Ned.Antilles 21.685 (Eng, Fr to Africa 1830-2025), logged at 2019 by Ron Pearce using a one valve (955) receiver in Bungay; WYFR via Okeechobee, Florida 21.525 (Eng, Ar, Fr, Port to W.Africa 1600-2245, rated as 34433 at 2155 by Leo Barr.

There is plenty to interest the DXer in the **17MHz (16m)** band, although reception has been disturbed from time to time by solar events. The broadcasts from Radio Australia to Asia and the S. Pacific areas via Shepparton 17.795 (Eng 2200-0630) are being heard occasionally in the UK, but the latest report from **Geoge Hewlett**, who monitors most of their transmissions on a daily basis in Torquay on behalf of Telecom Australia, indicates that reception has deteriorated during the last month. He has been hearing their transmissions to S.Asia via Carnarvon 17.715 (Eng 0100-0915) around 0600, but found reception poor. Using a Sangean ATS-803A receiver with a 3m wire antenna, **Richard Radford-Reynolds** has been hearing their 17.715 transmission in Southampton around 0800 and rated their signal as 24222.

Listening at 0645, Cyril Kellam heard KYOI in Saipan, N.Mariana Islands 17.780 (Eng to E.Asia 0200-0800) and logged their signal as SIO 322. Later, he heard Radio Afghanistan, relayed to SE and S.Asia via the USSR on 17.655 (Pa, Eng, Tu, Ur, Pa 0430-1700), noted as 333 at 0900. Cyril used his Sony ICF-7600DS portable with a short vertical wire antenna when listening to KYOI, but substituted a Sony AN-1 active antenna for the reception of Radio Afghanistan.

Using a Panasonic RF-4800 receiver, Sheila Hughes has been listening to "Northern Report", broadcast by Radio Finland via Pori 17.795 (Fin, Sw, Eng to Australia/S.E.Asia 0700-0825), their signal was 44444 at 0800. A dictation speed news bulletin broadcast in English at 1100 by Radio Pakistan, Islamabad 17.660 (Ur, Eng to Europe 0715-1129) has been keeping Sheila up to date with the events there. Reception is usually good, 43443 being a typical rating.

During the day, **Leslie Hollis** (Grantham) has been hearing Radio DW via Kigali, Rwanda 17.800 (Eng, Ha, Fr to W.Africa 1130-1350), noted as 34543 at 1130; also Radio Cairo, Egypt 17.595 (Eng, Beng to Asia 1215-1430), 34432 at 1215. Kenneth Buck listened to UAE Radio Dubai 17.865 (Ar, Eng to Europe 0615-1645), 333 at 1332; also to Radio RSA Johannesburg, S.Africa 17.755 (Eng to Europe, W.Africa 1400-1600) 444 at 1514. The broadcasts in English from RTM via Tangier, Morocco 17.595 (Fr, Eng to Middle East/N.Africa 1400-1700) have been proving of special interest to Leslie and reception has been generally good, averaging 44544. At 1700 their broadcast is transferred to 17.815 (Eng, Fr to Middle East/N.Africa 1700-1900) and continues in English with a full news bulletin plus interesting features and music until 1800. This transmission rates as 45534.

During the evening, Kenneth Buck heard RCI via Sackville. Canada 17.875 (Eng, Fr to Europe 1830-2130), rated as SIO 455 at 1840; Radio Nederland via Bonaire, Ned. Antilles 17.605 (Eng, Fr, Du to W.Africa 1830-2125), 354 at 1855; RFI via Issouden, France 17.620 (Fr to W.Africa 1900-2030), 353 at 1900; VOA via Greenville, USA 17.785 (Eng to W.Africa 1600-2200), 322 at 1902; RCI via Sackville. E.Canada 17.820 (Eng, Fr to Africa 1800-2000) 343 at 1912; also REE via Noblejas, Spain 17.845 (Sp to S.America), 445 at 1930.

The programmes from HCJB Quito, Ecuador 17.790 (Cz, Ger, Eng, Sw, Norw, Dan, Fr, Sp to Europe 1800-2230) have been attracting the attention of Richard Radford-Reynolds, he rated their transmission in English at 1911 as 44434. Their DX programme is especially popular with listeners around the world.

Solar events have also affected the conditions prevailing in the **15MHz (19m)** band, but reception of the broadcasts from most areas has been good. The long distance paths have been open and some of the broadcasts from Radio Australia have been reaching the UK at considerable strength despite the fact that they are intended for other areas.

The most consistent signal from Radio Australia stems from their Shepparton station in S.E.Australia on 15.240 (Eng to S.Pacific Area 2100-0730). The 43433 rating noted at 2200 by Alan Curry is typical and their signal can be clearly heard on the one valve (955) receiver used by Ron Pearce. This transmission was rated as 35553 at 0505 by **David Edwards**on in Wallsend, he uses a Trio R600 receiver with a trap dipole.

Some of the other 19m broadcasts from Shepparton include 15.160 (Eng to C.Pacific 2100-0700), rated as 54454 during line up at 2052 by Richard Radford-Reynolds; 15.180 (Eng to E.Asia 0100-0300), noted as 33333 at 0200 by Christian Pritchard, he also heard their transmission to W.USA and the C.Pacific Area on 15.395 (Eng 2100-0200), which he rated as 34433 at 2200.

Many of the broadcasts on this band are intended for listeners in Europe. Some of those heard during the daytime were Radio Pakistan, Islamabad 15.605 (Ur, Eng 0715-1120), rated as 34543 at 1000 by Leslie Hollis; UAE Radio Dubai 15.435 (Ar, Eng 0615-1645), noted as SIO 444 at 1335 by Kenneth Buck, who also heard Radio Kuwait, State of Kuwait 15.505 (Ar 0800-1800), he rated their signal as 444 at 1600. Radio Korea Seoul, S.Korea 15.575 (Ar, It, Eng, Sp, Port, Ger 1545-2200) was logged as 43444 at 1700 by **Patrick Travers** in Sheffield, using a Trio R1000 receiver with an a.t.u. plus 10m wire antenna.

Many more were heard during the evening, including WRNO New Orleans, USA 15.420 (Eng 1700-2100), SIO 333 at 1745 by Cyril Kellam; Radio Bras Brasilia, Brazil 15.265 (Eng, Ger 1800-1950), 43344 at 1800 by Christian Pritchard; Voice of Vietnam, Hanoi 15.010 (Eng, Russ, Viet, Fr, Sp 1600-2130), heard at 1812 by **Philip Bartlett** in Co.Dublin; VOA via Tangier, Morocco 15.205 (Eng 1700-2200), 55455 at 1930 by Andy Keddie; UAE Radio Dubai 15.300 (Ar 1650-2050), 434 at 1947 by Kenneth Buck; Radio Damascus, Syria 15.095 (Ger, Fr, Eng 1835-2105) 34543 at 2030 by Leslie Hollis; RCI via Sackville, Canada 15.325 (Eng, Fr

Freq MHz	Station	Country	UTC	DXer
2.485	ABC Katherine	Australia	2115	M
2.560	Xinjiang	China	2330	L
3.200	TWR	Swaziland	0105	L
3.210	R. Mozambique	Mozambique	0300	L
3.215	R. Orange	S. Africa	0330	F,L
3.225	R. Occidente	Venezuela	0300	L
3.230	ELWA Monrovia	Liberia	2200	L,M
3.270	SWABC 1, Namibia	S.W. Africa	2130	F,L
3.320	R. Orion	S. Africa	2230	F,L
3.325	FRCN Lagos	Nigeria	2130	F
3.355	R. Botswana	Gabarone	0400	F
3.365	GBC Radio 2	Ghana	2126	C,E,F,L,M
3.915	BBC Kranji	Singapore	0010	L
3.965	FRI Paris	France	1930	C,E,F,
3.985	R. Beijing, China	via SRI Berne	2100	C,F
3.985	SRI Berne	Switzerland	1930	E
3.995	DW Cologne	W. Germany	2000	F
4.035	PBS Xizang Lhasa	Tibet	0100	L
4.060	R. Moscow Kharkov	USSR	2200	F
4.080	R. Ulan Bator	Mongolia	2300	L
4.220	PBS Xinjiang	China	2200	F
4.500	Xinjiang	China	2230	B,D
4.735	Xinjiang	China	2240	B,C,L,M
4.740	R. Afghanistan	via USSR	1910	E,F,
4.750	R. Bertoura	Cameroon	1930	E
4.755	Sani Radio	Honduras	0245	H
4.760	ELWA Monrovia	Liberia	1815	E
4.760	R. Afghanistan	via USSR	1900	L
4.770	FRCN Kaduna	Nigeria	2000	F,H,L,M
4.775	R. Gabon, Libreville	Gabon	2111	E,H
4.785	RTM Bamako	Mali	2112	E,F,H
4.795	R. Douala	Cameroon	2100	L
4.800	LNBS Lesotho	Maseru	1945	F,L
4.805	R. Nac. Amazonas	Brazil	0030	M
4.810	R. Yerevan	USSR	1930	E
4.815	R. diff TV Burkina	Ouagadougou	2114	H,L

Freq MHz	Station	Country	UTC	DXer
4.820	R. Botswana	Botswana	1900	F
4.830	Africa No. 1	Gabon	1950	E,F,G,H, J,K,L,M
4.830	R. Reloj	Costa Rica	0330	F,L
4.830	R. Tachira	Venezuela	0200	D,F,M
4.835	RTM Bamako	Mali	1923	E,F,H,M
4.845	ORTM Nouakchott	Mauritania	2110	E,F,H,M
4.850	R. Yaounde	Cameroon	1930	E,F
4.850	R. Capital, Caracus	Venezuela	0157	H,M
4.865	PBS Lanzhou	China	2142	M
4.870	R. Cotonou	Benin	2000	E,H,M
4.880	SABC Radio 5	S. Africa	2050	E,F,L,M
4.885	Voice of Kenya	Kenya	2000	E
4.890	ORTS Dhaka	Senegal	2050	E,M
4.895	R. Ashkabad	USSR	2050	E
4.990	V de la Rev. Conakry	Guinea	1915	E
4.905	R. Nat. N'djamena	Chad	2117	H
4.910	R. Zambia, Lusaka	Zambia	1745	B
4.915	R. Ghana, Accra	Ghana	2055	A,E,M
4.915	Voice of Kenya	Kenya	1924	B,F,M
4.920	ABC Brisbane	Australia	????	I
4.925	R. Nacional, Bata	Eq. Guinea	2250	L
4.930	R. Moscow, Tbilisi	USSR	2100	E
4.940	R. Kiev	USSR	1930	A,E
4.955	R. Marajoara, Belem	Brazil	0159	D
4.980	Ecos del Torbes	Venezuela	0100	H,L
4.990	AIR New Delhi	India	0035	M
4.990	FRCN Lagos	Nigeria	2200	L
5.005	R. Nacional, Bata	Eq. Guinea	2119	H
5.015	R. Moscow Arkhangelsk	USSR	2000	K
5.030	R. Imapcto	Costa Rica	0355	D
5.035	R. Bangui	C. Africa	2245	L,M
5.045	R. Cultura do Para	Brazil	2350	D,H,L
5.045	R. Togo, Lome	Togo	2100	F
5.065	R. Candip, Bunia	Zaire	2330	L
5.095	R. Sutatenza, Bogata	Columbia	0100	L

DXers:

A: Leo Barr, Sunderland.
B: Robert Cowell, Blackpool.
C: Alan Curry, Stockton-on-Tees.
D: David Edwardson, Wallsend.
E: Fred Pallant, Storrington.
F: Christian Pritchard, Cambridge.
G: Richard Radford-Reynolds, Southampton.
H: Philip Rambaut, Macclesfield.
I: John Ratcliffe, Southport, Queensland, Australia.
J: Alan Smith, Duston.
K: Phil Townsend, London.
L: Jim Willett, Grimsby.
M: David Wratten, Cambridge

P. R. Guruprasad.

SEEN & HEARD

1830-2200), SIO 222 at 2048 by Julian Wood; RAE Buenos Aires, Argentina 15.345 (Ar, Eng, Fr, Ger, It, Sp 1700-2155), 44343 at 2155 by David Wratten; WINB Red Lion, USA 15.185 (Eng 2003-2245), 33433 at 2144 by Richard Radford-Reynolds; VOFC Taipei via Okeechobee, Florida 15.440 (Ger, Eng 2100-2300), 44333 at 2200 by Sheila Hughes.

This band is the hub of listening activity for many DXers, consequently their reports detailed many broadcasts in a variety of languages to other areas. Some of those logged were AFRTS via Ismaning, Germany 15.265 (Eng to Middle East 0700-1300), rated as SIO 444 at 0730 by Cyril Kellam; Radio Finland via Pori 15.245 (Eng, Fin, Sw to E.Asia 0830-1000), 35553 at 0855 by David Edwardson; Vatican Radio, Rome 15.090 (Hi, Ta, Eng to E.Asia 1430-1510), 43333 at 1500 by Sheila Hughes; Radio Prague, Czechoslovakia 15.165 (Cz, Eng, Ar to S.Asia, Middle East 1500-1725), 444 at 1500 by Kenneth Buck; Radio Pakistan, Islamabad 15.605 (Ar, Ur, Eng to N.Africa and Middle East 1200-1630), 44444 at 1603 by Patrick Travers; Voice of Greece, Athens 15.630 (Gr, Eng to Africa 1800-1850), 343 at 1840 by Kenneth Buck; Radio RSA Johannesburg, S.Africa 15.320 (Eng to W.Africa 1900-2100) 45544 at 2000 by Andy Keddie; VOA via Greenville, USA 15.410 (Eng to W.Africa 1600-2200), logged at 2152 by Alan Curry; KUSW Salt lake City, USA 15.580 (Eng to E.USA 2200-0100)— 33322 at 2255 by Christian Pritchard; BBC via Hong Kong 15.435 (Eng to E.Asia 2245-0045), 44444 at 2310 by David Wratten.

Several of the broadcasters using the **13MHz (22m)** band were mentioned in the reports this time. Leo Barr listened at 1635 to the financial news, a weather report and sports news in English broadcast by Radio Austria, Vienna 13.730, which he noted as 34434. Radio Prague, Czechoslovakia 13.715 (Eng, Cz, Ar to S.Asia, E.Africa, Middle East 1400-2125) was logged at 1800 by Andy Keddie as 43344. Two broadcasts from Germany were logged, Radio DW via Wertachtal, Germany 13.790 (Eng, Port to E.Africa 1800-2050), picked up by Leslie Hollis at 1835 and noted as 45544; Kenneth Buck rated the transmission in English from RBI via Leipzig, Germany 13.610 (Pol, Eng, Fr to Africa 1830-2045) as SIO 444 at 1920. A religious broadcast in English from WHRI in South Bend, USA 13.760 (Eng to Europe 1800-2100) was heard by Sheila Hughes at 2015, noted as 44444. RUV Reykjavik, Iceland 13.770 (Ic to Europe 1855-1930) was logged as 55444 at 1930 by David Wratten. A broadcast of "pop" music from WRNO in New Orleans, USA 13.760 (Eng to E.USA 2100-0000) was heard at 2103 by Richard Radford-Reynolds, rated as 24422.

The effects of solar flares have also been observed in the **11MHz (25m)** band, but the propagation conditions are generally more reliable than on the higher frequencies. Many interesting broadcasts from several continents may be heard at some time during the day or at night.

The long distance paths have been open and some of the broadcasts from Radio Australia have been reaching the UK during the early morning and later in the day. The report from George Hewlett notes their transmission on 11.910 via Shepparton (Eng to S.Asia, Europe 0400-0630) as SIO 322 at 0400, rapidly improving to 433 by 0415, but from time to time he has heard a jammer on the h.f. side of their signal. Their signal at 0630 was rated as 433 by **Alan Smith** in Duston, he uses an ITT Touroport 220 with an a.t.u. and outdoor folded dipole. Their transmission via Darwin 11.730 (Chin to C.Asia 2100-2200) was logged by Christian Pritchard as 34333 at 2100.

The broadcasts from FEBC Manila, Philippines 11.850 (Eng to S.E.Asia 0830-0930) were noted in the log from Sheila Hughes as 33323 at 0835, this may well be one to add to your list of DX. Some of the other long distance signals noted in the reports stemmed from WYFR via Okeechobee, Florida 11.580 (Eng to W.Africa 0700-0900), 433 at 0700 by Alan Smith; Radio HCJB Quito, Ecuador 11.835 (Russ, Sp, Ger, Sw, Norw, Dan, Fr, Eng to Europe 0200-0830), rated as 33343 at 0821 by Leo Barr; KYOI Saipan, N.Mariana Islands 11.900 (Eng to E.Asia 0800-1600), 34543 at 1100 by Leslie Hollis; AWR Guam, Pacific 11.810 (Eng to S.Asia 1500-1600), 34333 at 1505 by David Wratten; BBC World Service via Kranji, Singapore 11.750 (Eng to S.Asia 1030-1615), rated as 34533 at 1530 by Leslie Hollis; Radio Pakistan, Islamabad 11.616 (Ur, Eng to N.Africa 1315-1630), 333 at 1600 by Alan Smith; Radio Beijing, China 11.500 (Ger, Eng to Europe 1800-2215), 45555 at 2000 by Andy Keddie; AIR via Aligarth, N.India 11.620 (Eng to Europe 1845-2230), 45434 at 2207 by Richard Radford-Reynolds; RAE Buenos Aires, Argentina 11.710 (Eng, Sp to S.America 2200-0500), noted as 32222 at 2200 by Christian Pritchard, he also heard RNB Brasilia, Brazil 11.745 (Eng to USA 0200-0250), rated as 33333 at 0200.

The primary target area for the **9MHz (31m)** broadcasts from Radio Australia is Europe. Their transmission via Shepparton 9.655 commences at 0700. George Hewlett quoted SIO 444 in his report at that time, but their signal usually deteriorates and fading occurs later. Leo Barr noted 23343 in his log at 0800 and **Philip Rambaut** (Macclesfield) quoted SIO 111 at 1000, quite a contrast to the excellent reception a few months ago.

Many of the broadcasters using this band beam their programmes towards Europe at some time during the day. They include TWR Monte Carlo, Monaco 9.610 (Norw 0700-0720), logged as 54444 at 0700 by **Robert Cowell** using a Hammarlund HQ 180XE receiver in Blackpool (see Fig.1.); WCSN Scotts Corner, Maine 9.495 (Eng, Fr, Ger 0600-0755), rated as 44344 at 0730 by Leo Barr; Radio HCJB Quito, Ecuador 9.610 (Ger, Eng 0600-0830), 44444 at 0740 by David Edwardson; AWR via Sines, Portugal 9.670 (Eng 0800-0830), 44444 at 0800 by Sheila Hughes; Radio Yugoslavia, Belgrade 9.620 (Ar, Eng 1400-1500), 45544 at 1445 by Leslie Hollis; Radio Polonia, Warsaw 9.540 (Ger, Pol, Eng 1500-1730), SIO 111 at 1711 by Julian Wood; Radio Beijing, China 9.820 (Ger, Eng 1800-2155), 42242 at 2000 by Andy Keddie; Radio Baghdad, Iraq 9.770 (Eng, Ger 1800-2155), logged at 2040 by Alan Curry; VOIRI Tehran, Iran 9.022 (Fr, Eng, Sp, Far 1845-2230), logged at 1948 by Ron Pearce using his one-valver and rated as 454 by Kenneth Buck; Radio Cairo, Egypt 9.900 (Ger, Fr, Eng 1900-2245), rated as 34333 at 2130 by Christian Pritchard; RHC Havana, Cuba relayed via USSR 9.590 (Fr, Eng 2100-2300), 43333 at 2230 by David Wratten.

Some of the broadcasts to other areas were logged by DXers, TWR Guam, C.Pacific 9.820 (Eng to S.Asia 1500-1640), rated as 34432 at 1500 by Leslie Hollis; Radio Beijing, China 9.700 (Eng to Australia 0830-1025), 22222 at 0830 by Andy Keddie; Medi 1 Nador, Morocco Radio 9.575 (Ar, Fr to N.Africa 0745-2045), SIO 333 at 1215 by **John Evans** in Shawforth; Pyongyang, N.Korea 9.977 (Kor, Eng, Fr to Africa 1400-2150), 24332 at 1515 by Leslie Hollis; Voice of Greece, Athens 9.425 (Gr, Eng to USA 1500-1550), 44333 at 1540 by Sheila Hughes; Voice of Revolution Addis Ababa, Ethiopia 9.660 (Ar, Eng, Fr to Middle East 1200-1855), logged at 1550 by Ron Pearce using his one-valver and rated as SIO 333 at 1800 by John Evans; WYFR via Taipei, Taiwan 9.955 (Russ to N.Asia, E.Europe 1505-1705), logged at 1700 by Philip Rambaut as SIO 322; Voice of israel, Jerusalem 9.010 (Eng, Fr to Africa 1900-1955), noted as 24423 at 1923 by Richard Radford-Reynolds, he also heard KYOI Saipan, N.Mariana Islands 9.495 (Eng to E.Asia 1800-2200), rated as 34544 at 2003. Philip Bartlett logged the Voice of Turkey, Ankara 9.445 (Eng, Tur to USA 2200-0350) at 2210.

The **7MHz (41m)** band probably ranks as the most congested of all the s.w. broadcast bands, but some interesting signals were logged by DXers. During the early morning, John Evans heard SFAX Tunisia 7.475 (Ar to Europe 0430-0600), which he rated as SIO 444 at 0615. Alan Smith listened to WYFR via Okeechobee, Florida 7.355 (Russ, Ger, Eng to Europe 0400-0745) and noted SIO 544 in his log at 0630. A seldom mentioned station, the Voz del Cid, Costa Rica 7.380 (Sp to C.America 2300-1050), was logged at 0752 by Philip Rambaut as SIO 322.

During the evening, Philip heard the BBC via Masirah Island, Oman 7.160 (Fa, Eng to Middle East 1600-1900) and rated their signal as SIO 222 at 1715. He also heard their broadcast via Hong Kong on 7.180 (Chin to C.Asia 2215-2245, noted as 322 at 2220. Leslie Hollis listened to Radio Bangladesh, Dhaka 7.505 (Eng, Beng to Europe, Middle East 1815-2000) and rated their signal as 33543 at 1835. Richard Radford-Reynolds heard Radio Australia via Carvarvon 7.205 (Eng to Europe, S.Asia 1430-2030), rated as 53443 at 1923. Sheila Hughes logged IBRA Radio via Cyclops, Malta 7.110 (Pol, Ger, Eng to Europe 2000-2115) as 44444 at 2045. Leo Barr listened to AIR via Delhi, India 7.410 (Eng to Europe 1845-2230) and noted 33343 in his log at 2050.

John Nash (Brighton) has just received a QSL from Radio Sophia, Bulgaria almost one year after sending a report to them, it is apparently one of a series of cards which lead to a bronze diploma, but John says "I wonder how many years that would take?"

While checking the **6MHz (49m)** band in Shawforth, at 0555, John Evans picked up VOA via Greenville, USA 5.995 (Eng to Europe 0400-0700) and noted SIO 333 in his log. At 0654, Richard Radford-Reynolds heard Radio Australia via Shepparton 5.995 (Eng to W. Pacific 0700-1900) and logged their signal during line-up as 22222. At 1700 he heard the BBC via Kranji, Singapore 5.975 (Eng to S.Asia 1615-1830) at a surprising 34544.

The broadcasts from Radio Australia via Carnarvon 6.035 (Eng to Asia, Europe 1530-2030) were mentioned in several reports, Alan Smith rated their signal as SIO 333 at 1627, but by 1845 it had deteriorated to 322. A programme about farming in China, broadcast by Radio Beijing, China 6.955 (Eng to W. Africa 1930-2125) attracted the attention of Leslie Hollis at 1950, he logged their transmission as 34543.

Abbrv	Language
Ar	Arabic
Beng	Bengali
Bur	Burmese
Chin	Chinese
Cz	Czechoslovakian
Dan	Danish
Du	Dutch
Eng	English
Far	Farsi
Fin	Finnish
Fr	French
Ger	German
Gr	Greek
Ha	Hausa
Heb	Hebrew
Hi	Hindi
Hung	Hungarian
Ic	Icelandic
Ind	Indonesian
It	Italian
Jap	Japanese
Kor	Korean
Norw	Norwegian
Pa	Pashto
Pol	Polish
Port	Portuguese
Russ	Russian
Sp	Spanish
Sw	Swedish
Swa	Swahili
Ta	Tamil
Tu	Turkman
Tur	Turkish
Ur	Urdu
Viet	Vietnamese
Yu	Yugoslavian

Fig. 1: Robert Cowell's listening post in Blackpool

LW MARITIME RADIO BEACONS

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

Numerous Maritime Radio beacons have been installed around the UK and many other countries of the world. They provide a navigational aid for yachtsmen, fishermen and other small boat owners, but they also attract a large number of DXers who simply log them.

All of the British beacons operate in the long wave band between 285 and 315kHz. The majority of them operate continuously throughout the 24 hours of each day on shared frequencies in groups, but a certain number are only operational during fog. A minority operate for a period of six minutes two or four times an hour.

They send a repeated identification signal consisting of a two letter callsign in Morse code for about 22 seconds, followed by a long dash lasting for 25 seconds. The callsign is then repeated once or twice for 8 seconds and a silent period lasting at least 5 seconds then follows. By using a receiver with a built-in directional ferrite rod or loop antenna and a compass, two bearings from nearby beacons may be obtained during the long dash period — where they cross when plotted on the relevant chart will indicate the position at sea.

Most DXers find it helpful to use a directional antenna with their receiver, but this is by no means essential. In order to identify the location of a station it may be necessary to visit your local library and refer to a copy of *Reed's Nautical Almanac,* however, a few of the stations are already detailed in the first beacon chart, which will appear quarterly.

Please note that this column will only be published quarterly. The next one will appear in the February '89 issue.

Freq kHz	Call Sign	Station Name	Location	DXer
287.3	DG	Douglas	IoM	C,E*
287.3	FN	Walney Island	off Lancs.	C,E*
287.3	PS	Point Lynas	Anglesey	E*
291.9	KD	Kinnairds Head LH	Aberdeen	B
294.2	DA	Pladda Light	Is of Arran	C
294.2	RN	Rhins of Islay	Is of Islay	C
296.5	MA	Cabo Machicharo LH.	N. Spain	A
296.5	FT	Cap Ferret LH	W. France	A
301.1	CN	Cregneish	IoM	C
301.1	PY	Point of Ayre	IoM	C,E*
301.1	SR	Skerries LH	Anglesey	C
301.1	SU	South Rock LV	Co. Down	C
301.1	WK	Wicklow Head Light	Co. Wicklow	B,C
303.4	FB	Flamborough Hd LH	E. Yorkshire	B
303.4	GX	Ile de Groix LH	NW. France	A
303.4	LM	May Island	Fife	B,D*
303.4	SJ	Souter Light	Sunderland	B,D*
303.4	YE	Ile d'Yeu LH	France	A

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

DXers:
A: Jean Yves-Camus in La Rochelle, France.
B: David Edwardson, Wallsend.
C: Bill Eyre, Stockport.
D: Glen Glen-Davison, Newcastle-on-Tyne.
E: Neil Wheatley, in Lytham St. Annes.

ADVERTISERS INDEX

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WHAT RECEIVER

Panasonic RF-B40DL
Multi-band Portable Receiver

- *COVERAGE*: l.w. 146 – 288kHz, m.w. 520 – 1611kHz, s.w. 1.615 – 29.995MHz, f.m. 87.5 – 108MHz
- *MODES*: a.m., f.m.
- *SENSITIVITY*: f.m. 2.5μV, l.w. 563μV at 281kHz S/N 20d8, m.w. 45μV, s.w. 11μV at 6MHz S/N 20dB
- *RESOLUTION*: 5 and 9kHz
- *SELECTIVITY*:
- *IMAGE REJECTION*:
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 550mW (r.m.s. max)
- *IF STAGE*: 459kHz (a.m.)
- *FEATURES*: Mains adaptor included; operation key lock switch; a.m. sensitivity switch; 27-station pre-set tuning and l.c. display
- *REVIEWED*: Short Wave Magazine September 1987
- *PRICE*: £139.95

Sony ICF-7600DA
Portable Receiver

- *COVERAGE*: f.m.: 87.5 – 108MHz, l.w.: 150 – 285kHz, m.w.: 531 – 1602kHz, s.w.l.: 3.050 – 3.585MHz, s.w.2: 3.7 – 4.215MHz, s.w.3: 4.65 – 5.165MHz, s.w.4: 5.8 – 6.315MHz, s.w.5: 6.95 – 7.465MHz, s.w.6: 9.375 – 10.010MHz, s.w.7: 11.525 – 12.16MHz, s.w.8: 13.375 – 14.010MHz, s.w.9: 14.975 – 15.61MHz, s.w.10: 17.475 – 18.11MHz, s.w.11: 21.325 – 21.96MHz, s.w.12: 25.475 – 26.1MHz
- *MODES*: a.m., f.m.
- *SENSITIVITY*: l.w. & m.w.: 31dBμV at 999kHz, s.w.: 3dBμV, f.m.: 10dBμV
- *RESOLUTION*: 5kHz on s.w., 3kHz on l.w., 3/10kHz on m.w., 50kHz on f.m.
- *SELECTIVITY*: l.w., m.w. & s.w.: ±6.5kHz – 50d8, f.m.: 53dB (±400kHz)
- *IMAGE REJECTION*: 63.5dB on s.w. and m.w. 44.5dB on l.w.
- *IF REJECTION*: 50dB
- *SPURIOUS REJECTION*: 50dB
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 450mW at 10% t.h.d.
- *IF STAGE*: 10.7MHz. 455kHz
- *FEATURES*: digital and analogue display, clock and alarm, 15 memories, telescopic antenna
- *REVIEWED*: Short Wave Magazine August 1987
- *PRICE*: £159.95

Realistic DX-360
Portable Receiver

- *COVERAGE*: l.w.: 150 – 265kHz, m.w.: 520kHz – 1620kHz, s.w.1: 4.5 – 5.5MHz, s.w.2: 5.8 – 7.5MHz, s.w.3: 8.2 – 10MHz, s.w.4: 11.4 – 14MHz, s.w.5: 14.6 – 18.2MHz, s.w.6: 21 – 26.1MHz
- *MODES*: a.m., f.m.
- *SENSITIVITY*: At –6dB; 600kHz, 250μV; 1000kHz, 250μV; 1400kHz, 250μV
- *RESOLUTION*:
- *SELECTIVITY*: At 600kHz; 28dB normal 20dB limit; at 1MHz; 30dB normal 24dB limit; at 1.4MHz; 38dB normal 30dB limit
- *IMAGE REJECTION*: l.w.: 260kHz 36dB; a.m.: 1400kHz 38d8; f.m.: 106MHz 34d8; s.w.1.: 5.5MHz 22d8; s.w.2: 7.4MHz 20dB; s.w.3: 10MHz 18dB; s.w.4: 14MHz 16d8; s.w.5: 18MHz 14d8; s.w.6: 26MHz 10dB
- *IF REJECTION*: l.w.: 260kHz 28d8; a.m.: 600kHz 28dB; f.m.: 90MHz 85d8; s.w.1: 4.5MHz 70dB; s.w.2: 6MHz 75d8; s.w.3: 8.4MHz 78dB; s.w.4: 11.5MHz 80dB; s.w.5: 15MHz 80d8; s.w.6: 21MHz 80d8
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 660mW
- *IF STAGE*: 10.7MHz
- *FEATURES*: telescopic antenna, low battery indicator, wrist strap
- *REVIEWED*: Short Wave Magazine July 1987
- *PRICE*: £59.95

Grundig Satellit 400 International
Multi-band Portable Receiver

- *COVERAGE*: 148 – 353kHz, 513 – 1611kHz, 1.6 – 30MHz, 87.5 – 108MHz
- *MODES*: a.m., f.m., s.s.b.
- *SENSITIVITY*:
- *RESOLUTION*:
- *SELECTIVITY*:
- *IMAGE REJECTION*:
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 3 watts
- *IF STAGE*:
- *FEATURES*: Automatic waveband scan; l.c.d. clock; sockets for headphones, external antenna, line in, line out and external d.c. supply and peak tuning meter.
- *REVIEWED*:
- *PRICE*:

Panasonic RF-B10
Compact Portable Receiver

- *COVERAGE*: m.w. 520 – 1610kHz, s.w.1 5.95 – 6.20MHz, s.w.2 7.10 – 7.30MHz, s.w.3 9.50 – 9.90MHz, s.w.4 11.65 – 12.05MHz, s.w.5 15.10 – 15.60MHz, s.w.6 17.55 – 17.90MHz, f.m. 87.5 – 108MHz
- *MODES*: a.m., f.m.
- *SENSITIVITY*: f.m. 3μV, m.w. 100μV, s.w. 4μV
- *RESOLUTION*:
- *SELECTIVITY*:
- *IMAGE REJECTION*:
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 200mW
- *IF STAGE*:
- *FEATURES*: Operation hold switch, a.m. sensitivity switch; l.e.d. tuning indicator, carrying case and earphone included.
- *REVIEWED*:
- *PRICE*: £59.95

Sony ICF-PRO80
Portable Receiver

- *COVERAGE*: 150kHz – 108MHz; 115.15MHz – 223MHz (using supplied frequency converter)
- *MODES*: a.m., f.m., n.b.f.m.
- *SENSITIVITY*: l.w., m.w.: 42dBμV (999kHz), s.w.: 2dBμV (ext a.m.), –4dBμV (ext n.b.f.m.), f.m.: 9dBμV
- *RESOLUTION*: l.w.: 3kHz, m.w.: 10kHz, s.w.: 5.50kHz, f.m.: 50kHz
- *SELECTIVITY*: ±3.8kHz/±6kHz (50dB)
- *IMAGE REJECTION*: 77dB
- *IF REJECTION*: 63dB
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 500mW at 10% t.h.d.
- *IF STAGE*: l.w., m.w. & s.w.: 55.85MHz, 455kHz; f.m.: 50kHz
- *FEATURES*:
- *REVIEWED*: Short Wave Magazine March 1988
- *PRICE*: £350

Panasonic RF-B60
Portable Receiver

- *COVERAGE*: l.w.: 155 – 519kHz, m.w.: 522 – 1611kHz, s.w.: 1.615 – 29.999MHz, f.m.: 87.5 – 108MHz
- *MODES*: a.m. and f.m.
- *SENSITIVITY*: +21dBμV at 3MHz
- *RESOLUTION*: 5kHz steps on s.w., 9kHz on m.w. and l.w., 100kHz steps on v.h.f. f.m., 1kHz fine tune on l.w., m.w. and s.w.
- *SELECTIVITY*: 6dB at ±3.1kHz, 60dB at ±6.35kHz
- *IMAGE REJECTION*: 60d8
- *IF REJECTION*:
- *SPURIOUS REJECTION*:
- *FREQUENCY STABILITY*:
- *AUDIO OUTPUT*: 550mW
- *IF STAGE*: 450kHz, 10.7MHz, 55.845MHz
- *FEATURES*: S-meter, telescopic antenna, 36 memory channels, digital display, scanning, dual-time clock and alarm, timer, external antenna socket, headphones socket
- *REVIEWED*: Short Wave Magazine May 1987
- *PRICE*: £170

Panasonic RF-B20L
Compact Portable Receiver

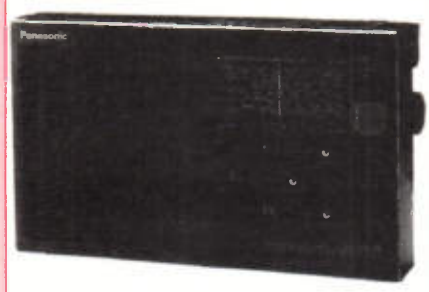
- *COVERAGE*: l.w. 150 – 285kHz, m.w. 520 – 1610kHz, s.w.1 5.95 – 6.20MHz, s.w.2 7.10 – 7.30MHz, s.w.3 9.50 – 9.90MHz, s.w.4 11.65 – 12.05MHz, s.w.5 15.10 – 15.60MHz, s.w.6 17.55 – 17.90MHz, s.w.7 87.5 – 108MHz
- *MODES*: a.m., f.m.
- *SENSITIVITY*: l.w. 126μV, m.w. 100μV, s.w. 1.4μV (averagel, f.m. 2μV
- *RESOLUTION*
- *SELECTIVITY*
- *IMAGE REJECTION*
- *IF REJECTION*
- *SPURIOUS REJECTION*
- *FREQUENCY STABILITY*
- *AUDIO OUTPUT*: 400mW
- *IF STAGE*
- *FEATURES*: Operation hold switch; l.e.d. tuning indicator and extemal speaker/earphone socket
- *REVIEWED*
- *PRICE*: £74.95

WHAT RECEIVER

Grundig Yacht Boy 215 Portable Receiver

- *COVERAGE:* 150 – 260kHz, 510 – 1620kHz, 5.9 – 21.9MHz, 87.7 – 108MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:*
- *RESOLUTION:*
- *SELECTIVITY:*
- *IMAGE REJECTION:*
- *IF REJECTION:*
- *SPURIOUS REJECTION:*
- *FREQUENCY STABILITY:*
- *AUDIO OUTPUT:* 0.4 watts
- *IF STAGE:*
- *FEATURES:* Carrying strap; 3.5mm headphone socket; l.c.d. clock and snooze and sleep facilities
- *REVIEWED:*
- *PRICE:*

Panasonic RF1680L Portable Receiver



- *COVERAGE:* l.w.: 150 – 285kHz; m.w.: 520 – 1610kHz; s.w.: 5.9 – 18MHz; f.m.: 87.5 – 108MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* l.w.: 56.3μV/m/50mW output; m.w.: 56.3μV/m/50mW output; s.w.: 11.2μV/50mW output; f.m.: 0.4μV/50mW output (– 3dB limit sens)
- *RESOLUTION:*
- *SELECTIVITY:*
- *IMAGE REJECTION:*
- *IF REJECTION:*
- *SPURIOUS REJECTION:*
- *FREQUENCY STABILITY:*
- *AUDIO OUTPUT:* 1.2W r.m.s.
- *IF STAGE:* l.w., m.w., s.w.: 455kHz; f.m.: 455kHz
- *FEATURES:*
- *REVIEWED:* Short Wave Magazine July 1988
- *PRICE:* £39.95

Sony ICF-5100 Portable Receiver

- *COVERAGE:* m.w.: 530 – 1605kHz; s.w.1: 5.85 – 6.35MHz; s.w.2: 6.95 – 7.45MHz; s.w.3: 9.4 – 9.9MHz; s.w.4: 11.6 – 12.1MHz; s.w.5: 15 – 15.5MHz; s.w.6: 17.55 – 18.05MHz; s.w.7: 21.4 – 21.9MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* m.w.: 36dBμV, s.w.: 1dBμV (9.6MHz), f.m.: 13dBμV
- *RESOLUTION:*
- *SELECTIVITY:* ±7.2kHz (– 50dB)
- *IMAGE REJECTION:* m.w.: 32dB (1605kHz), s.w.: 49dB, f.m.: 30dB
- *IF REJECTION:*
- *SPURIOUS REJECTION:*
- *FREQUENCY STABILITY:*
- *AUDIO OUTPUT:* 100mW at 10% t.h.d.
- *IF STAGE:* m.w.: 455kHz, s.w.: 10.7MHz & 455kHz, f.m.: 10.7MHz
- *FEATURES:*
- *REVIEWED:*
- *PRICE:* £80

Uniden CR-2021 Portable Receiver

- *COVERAGE:* 150 – 29.999MHz, 76 – 108MHz
- *MODES:* a.m., s.s.b., f.m.
- *SENSITIVITY:* Input for 10dB (S + N)/N, a.m. 5μV, s.s.b./c.w. 5μV, f.m. 2μV for 6dB (S + N)/N
- *RESOLUTION:* 1, 3, 50 or 100kHz
- *SELECTIVITY:* narrow 5kHz at – 6dB, 10kHz at – 50dB, wide 6kHz at – 6dB, 12 kHz at – 50dB
- *IMAGE REJECTION:* 70dB at 7.1MHz, 26dB at 106MHz
- *IF REJECTION:* 80dB (1st i.f.), 60dB (2nd/3rd i.f.) at 7.1MHz, 70dB at 78MHz
- *SPURIOUS REJECTION:* 60dB
- *FREQUENCY STABILITY:* within ±1kHz after one hour
- *AUDIO OUTPUT:* 1.2W in 4Ω for 10% distortion
- *IF STAGE:* 1st 65.15MHz, 2nd 10.7MHz, 3rd 455kHz, f.m. 10.7MHz
- *FEATURES:* Available on second-hand market
- *REVIEWED:* Practical Wireless June 1984
- *PRICE:* Available on second-hand market

Grundig Satellit 650 International Multi-band Portable Receiver

- *COVERAGE:* 148 – 420kHz, 510 – 1620kHz, 1.6 – 30MHz, 87.5 – 108MHz
- *MODES:* a.m., f.m., s.s.b. (u.s.b. & l.s.b.)
- *SENSITIVITY:*
- *RESOLUTION:* 1, 5, 10, 100kHz
- *SELECTIVITY:*
- *IMAGE REJECTION:*
- *IF REJECTION:*
- *SPURIOUS REJECTION:*
- *FREQUENCY STABILITY:*
- *AUDIO OUTPUT:* 15 watts
- *IF STAGE:*
- *FEATURES:* Sockets for external antenna, line in, line out, cassette recorder, external loudspeakers and headphones; clock; mains or battery operated; peak tuning meter and separate bass and treble controls.
- *REVIEWED:*
- *PRICE:*

Sony ICF-7600DS Portable Receiver

- *COVERAGE:* l.w.: 153 – 519kHz, m.w.: 522 – 1611kHz, s.w.1: 3.9 – 3.995MHz, s.w.2: 4.7 – 5.195MHz, s.w.3: 5.9 – 6.195MHz, s.w.4: 7.1 – 7.395MHz, s.w.5: 9.5 – 9.995MHz, s.w.6: 11.6 – 12.195MHz, s.w.7: 13.5 – 13.795MHz, s.w.8: 15.1 – 15.595MHz, s.w.9: 17.5 – 17.995MHz, s.w.10: 21.4 – 21.9MHz
- *MODES:* a.m., c.w., s.s.b., f.m.
- *SENSITIVITY:* l.w., m.w.: 37dBμV (999kHz); s.w.: 3dBμV, f.m.: 9dB
- *RESOLUTION:* l.w.: 3kHz, m.w.: 10kHz, s.w.: 5kHz, f.m.: 100kHz
- *SELECTIVITY:* l.w., m.w., s.w.: ±5.6kHz (– 50dB); f.m.: 53dB (±400kHz)
- *IMAGE REJECTION:* 50dB
- *IF REJECTION:* l.w., m.w., s.w.: 68dB; f.m.: 40dB
- *SPURIOUS REJECTION:*
- *FREQUENCY STABILITY:*
- *AUDIO OUTPUT:* 450mW at 10% t.h.d.
- *IF STAGE:* l.w., m.w., s.w.: 55.845MHz & 455kHz; f.m.: 10.7MHz
- *FEATURES:*
- *REVIEWED:*
- *PRICE:* £180

Panasonic RXC34L Portable Stereo System

- *COVERAGE:* l.w.: 148.5 – 285kHz; m.w.: 520 – 1610kHz; s.w.: 5.9 – 18MHz; f.m.: 87.5 – 108MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* l.w.: 141μV/m/50mW output; m.w.: 79μV/m/50mW output; s.w.: 4μV/50mW output; f.m.: 1.8μV/50mW output (– 3dB limit sens)
- *RESOLUTION:*
- *SELECTIVITY:*
- *IMAGE REJECTION:*
- *IF REJECTION:*
- *SPURIOUS REJECTION:*
- *FREQUENCY STABILITY:*
- *AUDIO OUTPUT:* 8W r.m.s. max
- *IF STAGE:* 470kHz, 10.7MHz
- *FEATURES:*
- *REVIEWED:*
- *PRICE:* £59.95

Grundig Music Boy 160 Portable Receiver

- *COVERAGE:* 150 – 260kHz, 510 – 1620kHz, 87.5 – 108MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:*
- *RESOLUTION:*
- *SELECTIVITY:*
- *IMAGE REJECTION:*
- *IF REJECTION:*
- *SPURIOUS REJECTION:*
- *FREQUENCY STABILITY:*
- *AUDIO OUTPUT:* 1.5 watts
- *IF STAGE:*
- *FEATURES:* 3.5mm headphone socket
- *REVIEWED:*
- *PRICE:*

Matsui MR4099 Portable Receiver

- *COVERAGE:* 150 – 29.999MHz, 87.5 – 108MHz
- *MODES:* a.m., f.m., s.s.b., c.w.
- *SENSITIVITY:* for 12dB SINAD with 90% a.m. 2.4MHz – 114dBm, 3.3MHz – 113dBm, 4.9MHz – 112dBm, 6.0MHz – 111dBm, 11.8MHz – 109dBm, 25.8MHz – 109dBm, 800kHz – 112dBm, 200kHz – 98dBm, f.m. with 45kHz deviation 96MHz – 94dbm
- *RESOLUTION:* 1, 9, 10 or 50kHz
- *SELECTIVITY:* narrow ±2.3kHz at 6dB, ±8kHz at 60dB, wide ±4.7kHz at 6dB, ±10kHz at 60dB
- *IMAGE REJECTION:*
- *IF REJECTION:*
- *SPURIOUS REJECTION:*
- *FREQUENCY STABILITY:*
- *AUDIO OUTPUT:* 1.2W for 10% distortion
- *IF STAGE:* AM1 55.845MHz, AM2 450kHz, FM 10.7MHz
- *FEATURES:* External antenna socket, sleep timer; b.f.o. control; l.e.d. signal strength indicator and 9 memories
- *REVIEWED:* Short Wave Magazine September 1987
- *PRICE:* £99.99

Short Wave Magazine

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SWM November 88 TP

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