Short Wave Magazine

ISSN 0037-4261

SEPTEMBER 1938

EDDYSTONE 940 RECEIVER

Improving its Performance

SONY ICF-2001D REVIEWED

For The Radio Listener

ICOM

Count on us!

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

ICOM introduces the IC-R7000, advanced technology, continous coverage communications receiver. With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz. The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto-M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall freqencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected freqency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-colour fluorescent display. Other features include dial-lock, noise blanker, attentuator, display dimmer and S-meter and optional RC-12 infra-red remote controller, voice synthesizer and HP 1 headphones.

IC-R71E, General coverage receiver.

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

Helpline: Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.
Datapost: Despatch on same day whenever possible.
Access & Barclaycard: Telephone orders taken by our mail order dept, instant credit & interest-free H.P.

Icom (UK) Ltd.
Dept SW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

VOL 46 ISSUE 9 SEPTEMBER 1988

ON SALE AUGUST 25th

OCTOBER ISSUE ON SALE SEPTEMBER 22

|27| **Eddystone 940 Receiver**

Cover The Eddystone 940 short wave receiver was deservedly popular in its day and is still very much sought after, both by collectors who want to preserve a bit of the past and listeners looking for a simple, "no frills" set. Tim Wright continues with his short series on improving the performance of the 940 in the light of modern day conditions.

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SEEN & HEARD

GOOD LISTENING

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 OF *SWM* SERVICES.

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

In your issue of July 1988, Mr Rees of Dyfed, as well as missing the point of my letter and getting my name wrong, contrives also to show his ignorance of both technical monitoring and grammar.

For Mr Rees's guidance, in addition to their technical duties using more advanced equipment, technical monitors reporting to the major broadcasting organisations in Europe are nowadays required to listen several times per day to ''one hop'' transmissions on cheap equipment, using only the incorporated antenna.

This is precisely so as to evaluate the reliability or limitations of such transmissions when heard on simple receivers.

Systematic monitoring is one thing; random reception reporting another. I continue to maintain that Mr Steel's point of view last January remains eminently valid.

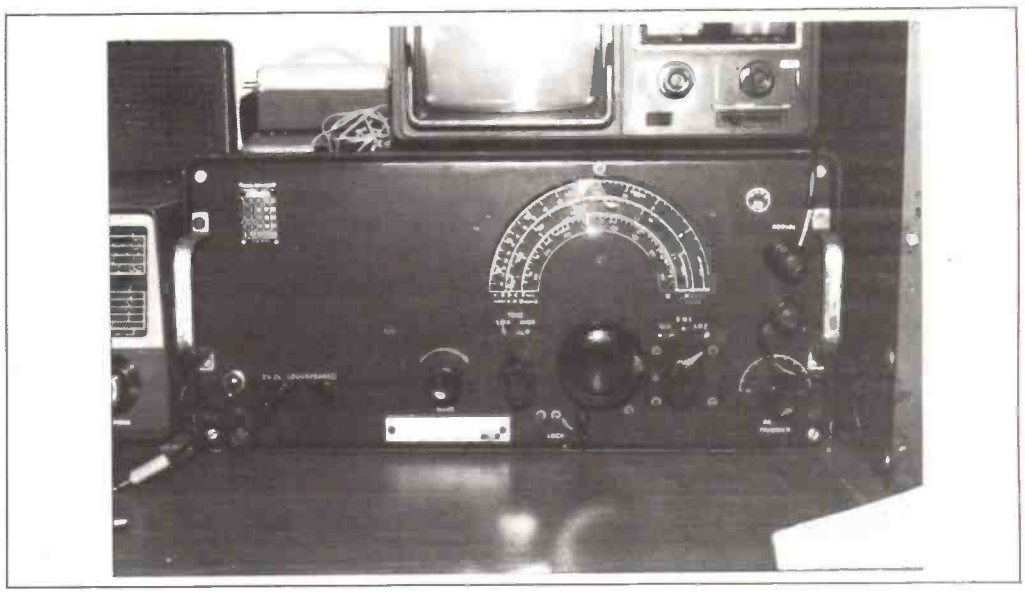
According to the reports, the recent EDXC Conference in Antwerp underlined the growing dissatisfaction of the big short wave broadcasters with the general level of reporting. Things have mightily changed these past few years. Broadcasters in Europe are certain that their powerful ''one hop'' signals are reliably received. The emphasis on reception has moved significantly towards programme content.

Messrs Rees & Smith might, therefore, usefully enlarge their activities to include reporting on the quality of HCJB hymns, which would perhaps be of more utility to the broadcaster and good for their souls.

GERARD CASEY
BORDEAUX
FRANCE

Sir

I have recently been given what I think is an old ex-army general coverage receiver in very good condition and is in full working order. The plate on the front has on it (RECEIVER BROADCAST. P.C.R. No3 Mk 1/2 ZA 30607 SERIAL No R/RAC/PE/196). It was a rack mounted set with external power source but has been converted to a 240V transformer. This was done, I think, by the makers because there is a modification plate also on the front which has No 1 crossed off. Anyway I have enclosed a slide photograph of it. I would appreciate any information on the set as to who its manufacturers were and are manuals available?



I am also having a go at the Audio Filter by Rev. G. C. Dobbs G3RJV, SWM *July 1987.*

I am interested in all aspects of short wave listening and I especially like ''Airband'', (being only a short distance from Manchester Airport), so having a monthly article on the subject is much appreciated, in fact the whole magazine is very good and is read from cover to cover as soon as it arrives, so carry on the good work. Anyway I will sign off now and hope you or fellow readers can come up with the name of that receiver.

R. BRADLEY
OLDHAM LANCS.

Sir

I have been following closely recent articles and letters featuring Rebecca/ Eureka and thought the following notes may be of interest.

I recently visited the Yorkshire Air Museum at Elvington near York where dedicated enthusiasts are restoring and fitting out with appropriate equipment the World War II control tower, associated buildings (NAAFI, etc) and a Halifax bomber. Not only does the museum have a display of radio, navigation aids and radar of the period, it also runs a video show which includes a training film on Rebecca/ Eureka. All the more remarkable for being in colour (1943 vintage I believe), the film shows how the equipment, installed in a Halifax bomber, was used to locate paratroop drop zones. It covers setting up the Eureka beacon and the use of the airborne c.r.t. display to guide the pilot to the beacon. Well worth a visit!

A well illustrated description of Rebecca/ Eureka's use in clandestine operations is contained in Pierre Lorain's book Secret Warfare. *It shows how the equipment was used to guide aircraft carrying supplies and agents to the resistance in occupied France. It suggests a maximum range of 90 miles. The book is an encyclopaedia of equipment used by the French Resistance and has extensive coverage of wireless sets and communication techniques. Several circuit diagrams of ''spy'' sets are included.*

Finally my first encounter with this ingenious equipment came as a budding radio enthusiast in the early 60s with the purchase of an AN/PPN2, the American model of the Eureka beacon. This was widely available on the surplus market as a glance through issues of Practical Wireless *of those years will reveal. The Rebecca set was the AN/APN2 and the equipment operated also in the 200 – 220mc/s (sorry MHz) range. I believe it was also used in an air-sea rescue role working in conjunction with rubber dinghy rescue beacons. Alas my acquisition got broken up for components which included the popular ''Acorn'' valves which had been designed for use up to around 450MHz.*

How about a series on some of the World War II equipment such as GEE, OBOE, etc?

MICHAEL OLDFIELD G8TJI
AYLESBURY BUCKS

A WORD IN EDGEWAYS

Sir

Through the courtesy of your columns may I say how much the letter from Mr Darrel Rees, in the July issue, was appreciated. I felt that Mr Gerard Casey was a mite too scathing about the activities of part time, non-professional DX reporters. Certainly my letter in the February issue was not intended as an attack on HCJB, a radio station backed by an organisation well able to speak for itself if the need arose.

As for the one-hop coverage aspect, Deutsche Welle have relay stations in Malta, Kigali, Antigua, Montserrat, Sines, Canada and Trincomalee, all listed in the WRTV Handbook. *As a matter of fact I have a QSL Card confirming reception of the Trincomalee Relay on the 16th August 1985. After sending DX reports to several far-away places over many years, my choice of a European radio station was a deliberate change as I felt that listening to such a station and its relay satellites, was a challenge; particularly from the German language angle. The experience has been very worthwhile and I hope that my reporting to that station can go on for several more years.*

In 1973 the international s.w. fraternity promoted the "World DX Friendship Year". Like many other DX-ers I made several contacts during that year, a few of those contacts still remain to our mutual enjoyment. The attitude taken by Mr Casey is neither in keeping with the spirit of that 1973 event, nor the spirit of love and fellowship promoted by radio station HCJB.

Thank you again, Darrel Rees. Your letter proves that the International Friendship Year slogan — "73s in '73" still means something to many of us. Short Wave Magazine *is playing an important part in keeping that spirit alive.*

ALAN SMITH
DUSTON
NORTHAMPTON

Sir

In your July issue you printed a letter from Alwyn Saul of Leamington Spa. I would suggest that Mr Saul should read the book Television To-day and To-morrow *by Sydney A. Moseley and H. J. Barton Chapple, published by Sir Isaac Pitman & Sons Ltd. 1933 (Third edition). I find it a most fascinating book as it covers the development of television both in the UK and abroad from April 1926 when the first public demonstration was given in Selfridges. The book is full of diagrams and pictures which will serve to let Mr Saul see the construction of the equipment as well as the circuit diagrams. By 1928 Colour and Stereoscopic Television using red, green and blue filters was a fact. The book stops at 1931!*

ADRIAN E. COLEMAN
HARLESTON
NORFOLK

WHAT'S NEW

Marco Expansion

Marco Trading of Wem are pleased to announce the opening of its third retail shop, Supertronics.

Supertronics is five minutes walk from New Street Station and Birmingham's main shopping area. It's next door to Rusty Lee's restaurant. They have over 1000sq ft of sales areas offering not only a wide selection of components, including transistors, i.c.s, resistors, cable, etc., but also speakers from 4W to 200W. There's also test equipment (new and second-hand), alarm equipment, and also an on-site audio and video repair service.

They're open Monday to Saturday 9am to 6pm, closed Wednesdays.

Supertronics
65 Hurst Street
Birmingham B5
Tel: 021-666 6504

DXAGB

The DX Association of Great Britain have always published a monthly newsletter, but until now it's been A5 size. We have seen a copy of the "new" newsletter, that's the April/May edition, in its A4 size.

The new size certainly made a difference to the section on loggings, these were much easier to read. There's a section on DX Information, Members Loggings and a Shortwave Logbook. As always, everyone else seems to have done better than ever.

If you would like more details on the activities of the DXAGB, then send an s.a.e. to:

A.G. Brimming
43 Atwood Drive
Lawrence Weston
Bristol
BS11 0SR

The DM 4351

Electronic Temperature Instruments Ltd have recently added the DM4351 digital multimeter to their range.

It offers the user the choice of auto or manual ranging and will measure d.c. or a.c. volts, current, resistance and will operate as a continuity tester. The most sensitive range is 200mV, and voltages of up to 1000V d.c. and 750V a.c. can also be measured. The current ranges available are from up to 200mA and up to 10A.

The DM4351 includes a continuity bleep which is useful for cable tracing or short circuit detections. For diode testing the unit has an open circuit voltage of 1.5V on the continuity mode and continues to read ohms.

The unit comes complete with a soft carrying case, probes and batteries and costs £39.

ETI
PO Box 81
Worthing
West Sussex BN13 3PW
Tel: 0903 202151

Screen Europe

Screen Europe is a bi-monthly magazine for DXTV fanatics. The issue we saw contained loggings, some history, scanner news, a home-brew project and an article on using computers.

The subscription rate is £4.75 per year. They also have available an extensive range of data sheets for the beginner on many subjects: Propagation, Antennas for DXTV, Photographing and Videoing DXTV and a French TV data sheet. Apparently this can be very useful if you live in the south of the country as it includes a list of all the French TV companies and style of programming as well as a map of France with all TV transmitters and channels marked.

If you would like to know more about the magazine, then send an s.a.e. to:

Tim Anderson
2 Burry Road
Silverhill
St. Leonards
East Sussex.

WHAT'S NEW

The Radiophile

Some readers may remember reading about a publication called *RadioGram* in the past. Well, it's changed its name to *The Radiophile*.

This is because the former title was derived from "radiogram", the early term for a mesage sent by radio. With the scope of the magazine being increasingly widened, they believe that the new name will more aptly reflect the purpose and content of a publication devoted to the interests of those who have a great affection for all aspects of vintage radio.

The June/July issue that landed in our office has articles on the Ekco AD65 receiver, The EMI Story A home-made Accumulator and some very interesting short stories.

The subscription rates are £8 for six issues or £15 for twelve issues in UK and Ireland, £10 for six issues or £19 for twelve issues for Europe and Scandinavia. Other areas need to write first. The magazine is published bi-monthly.

The Radiophile
Larkhill
Newport Road
Woodseaves
Stafford ST20 0NP

RSGB 75 Award

To celebrate the 75th Anniversary of the Radio Society of Great Britain, the Society has decided to introduce the RSGB 75 Award. To qualify for the award, stations must achieve the following:

UK Amateurs and s.w.l.s

One contact with any of the following stations —
GB75RS (throughout the year)
GB75HO (July 1988)
GB75AC (9-17 July 1988)
GB75ER (9-17 July 1988)
or 10 other GB75 calls PLUS contacts with a total of 75 different RSGB members.

Overseas Amateurs and s.w.l.s.

A total of 75 points made up from the following —
GB75RS (10 points)
GB75HQ (15 points)
GB 75AC (15 points)
GB75ER (15 points)
Other GB75 calls (5 points)
RSGB members (1 point)

Contacts may be made on any band using any mode, including satellites, but must NOT include any duplicate contacts or contacts via repeaters. All contacts must take place between 1 January 1988 and 31 December 1988. Short wave listeners, in both categories, will be able to apply for the award on a "stations heard" basis.

Claims must be postmarked no later than 1 April 1989 and be accompanied by a cheque or postal order for £1.50 made payable to RSGB to cover postage and packing. Ten IRCs are required for overseas applicants.

When you have the required number of contacts or points, you should send a certified log entry (QSL cards not required) to:

Mr John Harvey G4IVJ
RSGB 75 Award Manager
38 Bodenham Road
Northfield
Birmingham R31 5DS

Memory Problems Eliminated

One problem with NiCad cells in their gradual loss of capacity, brought about by recharging before the cells have first been totally discharged. This loss occurs because cells tend only to remember the level of charge put back rather than the original capacity.

Cirkit Distribution have manufactured the NC101 discharge/charge cycler to combat this problem. It is completely automatic from start cycle through to fully charged condition. Four current selectable ranges are available for a variety of battery packs.

Once the batteries have discharged to one volt per cell, charging commences under the control of a precision crystal oscillator at charging currents determined by electronic constant current control circuitry. When full charge is reached, charging stops and an indicator shows that the batteries may be removed.

The discharge period varies with the initial discharge state of the batteries. The maximum cycle time is 8 hours 33 minutes, but will normally be around 6 hours says Cirkit. The unit has two outputs, the first with fixed settings for an eight-cell NiCad battery pack of either 500 or 600mAh and the second for a four-cell NiCad battery with selectable capacity of 225, 500, 600 or 120mAh.

For safety, outputs are short circuit protected, and there is audible warning of reverse battery polarity. Open circuit protection, a split bobbin transformer and internal mains fuse are fitted as standard.

The NC101 is available ready built at £49.95 including VAT, or in kit form (comprising board level kit at £27.10 and hardware kit at £12.50, both including VAT).

For more details on the NC101, contact:

Cirkit Distribution Ltd
Park Lane
Broxbourne
Herts EN10 7NQ
Tel: 0992 444111

DSWCI Publications

The Danish Short Wave Clubs International have a couple of publications available that may interest readers. The first is *DSWCI Tropical Bands Survey*. It's now in the 16th edition and contains 32 A4 pages. Most, if not all, active broadcasting stations in the 2-5.9MHz frequency range are listed by frequency with their power and transmission times. It is completely updated and based upon monitoring information from DXers all over the world. Each station is classified by a code which tells you how often the station has been reported since May 1987 worldwide and in Europe.

This publication is available for 7IRCs surface mail or 9 IRCs airmail.

The second publication is *Clandestine Stations List*. This is 12 A4 pages on active clandestine radio stations all over the world. The first section lists stations by frequency, the second section is in time order and the third section gives additional information including addresses and verification policy.

The *Clandestine Stations List* is available for 4IRCs surface mail or 5 IRCs airmail.

DSWCI
C/o Bent Nielsen
Betty Nansens Alle 49
DK-200 Frederiksberg
Denmark

TV Antenna Amplifier

An increasing number of households now possess two (or more) TV sets, most usually working off the one antenna. Maplin Electronics have introduced an antenna amplifier which serves to boost the signal to one TV set or overcomes the losses which occur when two TV sets are operated from one antenna.

The white amplifier box (151 × 79 × 52mm) can be fixed to the wall or left free-standing. It features an on/off switch and red "on" indicator light. The unit can be left on continuously, if wanted.

The amplifier has three coaxial sockets. The antenna lead plugs into one and the TV sets' leads into the other two sockets. The 1.8m mains cable should be fitted with a plug equipped with a 3A fuse.

Bandwidth: 470 – 860MHz
Typical Gain: 7dB
Maximum Output: 96dBμV
Input/Output Impedance: 75Ω
Cost £11.95

For more details on the antenna amplifier, contact:

Maplin Electronics
PO Box 3
Rayleigh
Essex SS6 8LR

Computers Make Toddlers Anxious

Ramat Gan, Israel: A researcher at Bar Ilan University has conducted studies of three-year-olds implying that attempts to use computers may be raising their anxiety levels.

Prof. Pnina Klein of the university's school of education, who specialises in the study of mental development of young children, concluded that the computer can be threatening to youngsters under age four. "They are unfamiliar with it," the Professor says, "unlike a television, which they can operate with the press of one button."

Among four, five and six-year-olds, the anxiety disappeared and their attitudes to computer were reflected in the degree of success they had in using them. "parents shouldn't worry about young children coming into contact with the home computer," says Prof. Klein. "I'm simply saying they shouldn't force the issue."

Reprinted from Amateur Radio Action Vol. 11 No. 1.

WHAT'S NEW

Lincoln Century Award

This award is available to licensed amateurs and s.w.l.s. A list showing full details of the contacts made/heard should be certified by two other licensed amateurs.

All the contacts must be made from the same location, but contacts via satellites or repeaters don't count. The award can be claimed for any permitted mode and all bands may be used. Any claims for above 50MHz should be single band.

There are four classes of award E to A and contact must be made with Lincoln Cities and Counties throughout the world.
Lincoln Short Wave Club stations G5FZ or G6COL count as 30 points.
Any station in the City of Lincoln, England or any other town or city in the world with the name of Lincoln counts as 20 points.
Any station in the County of Lincolnshire, England or in any Lincoln County in the USA counts as 10 points.

The five stages of award require the following points value:
E = 100 points
D = 200 points
C = 300 points
B = 400 points
A = 500 points

The award costs £1.00 sterling or five IRCs and is available from:

The Secretary
Lincoln Short Wave Club
Pinchbeck Farmhouse
Mill Lane
Sturton by Stow
Lincoln LN1 2AS

Shielded Coil Forms

Cirkit Distribution have introduced a comprehensive range of shielded coil forms manufactured by Micrometals of California. The assemblies include both an adjustable threaded core and a fixed cup to close the magnetic path.

Iron powder cores are offered as standard, with ferrite cores available for applications requiring higher inductance at lower frequencies. Winding forms may vary from series to series, with impregnated paper tube, polyester tube and nylon bobbins available. Shielding cans for electromagnetic shielding are made of copper with tin plating to ensure performance.

A thermosetting plastics that will not deform at elevated temperatures is used for the plastics moulded bases and all pins are copper tin plated.

For further information, contact:

Cirkit Distribution Ltd
Park Lane
Broxbourne
Herts EN10 7NQ
Tel: 0992 444111

Liniplex from Phase Track

Short wave broadcast listeners will soon enjoy the quality of reception which has hitherto been enjoyed only by serious BBC World Service listeners overseas using the Liniplex crystal controlled h.f. receivers.

The Liniplex receiver system is based on receivers supplied for "off air" broadcast relays to, amongst others, BFBS in the Falklands, Belize, Gibraltar, Cyprus, Hong Kong and Nepal.

The principal feature of these receivers is the linear phase locked synchronous demodulator which is unique and patented in the UK. In addition, an active tracking filter allows sideband modulation to be selected at will with no deterioration in audio quality from the double sideband case. No fine tuning is required during the reception of normal a.m. broadcasts.

Phase Track Ltd
16 Britten Road
The Robert Cort Industrial Estate
Elgar Road
Reading RG2 0AU

Radio Nederland Media Network Plans

This programme is transmitted by Radio Nederland on Thursdays. It is a weekly survey of communication developments compiled with the assistance of over 170 monitors spread across the globe. This audio magazine runs on enthusiasm, building on more than 26 years of experience in this field of programming.

Thursday September 1: "FIRATO-88". On location at the huge Firato Audio and Video Fair in Amsterdam, Media Network reports on the trends in consumer electronics. Will compact disc video finally appear, what is so great about Super-VHS and they report on the race to make an electronic stills camera.

Thursday September 8: "Masters of the Medium". Following on from Firato, they reflect on the days when recorded broadcasts were a nightmare . . . far worse than engineering a live one. A collection of curious stories from the early days of Radio Netherlands, back in 1947/48.

Thursday September 15: "Masters of the Medium Part II". Has modern technology improved radio programme production?

Thursday September 22: "News Roundup". Jonathan Marks reports on the East Coast Hamfest in Virginia and what 10 000 DXers manage to hear over the previous weekend.

Thursday September 29: "Newcomer Notes". As the peak period of the short wave listening season opens, Media Network goes back to basics. But even experience short wave listeners will find tips to improve their success in the hobby.

Radio Netherland
English Section
Postbus 222
1200 JG Hilversum
The Netherlands

Radio Stations in the UK

The 7th edition of the booklet *Radio Stations in the United Kingdom* is available from the British DX Club. It's a 24-page A5 booklet and it lists all national, local and regional long wave, medium wave and v.h.f./f.m. transmitters in the UK.

As well as station name, transmitter power and locations, each entry is cross-referenced to help with identification and to show any other channels that may be operating in parallel.

The list also includes a complete list of postal addresses and telephone numbers for each station listed together with background information on the broadcasters and advice on writing reception reports.

The cost of this booklet is £1, $3 or 4 IRCs and this includes postage worldwide.

British DX Club
54 Birkhall Road
Catford
London SE6 1TE

ASTUR

Do you own an Atari ST computer that you use for the hobby, or would like to use. If so then ASTUR may be the group for you.

The ASTUR group is a self-help users group dedicated to the use of the Atari ST computers in amateur radio — particularly with digital communications techniques.

The group was created to form a link between all amateur radio hobbyists throughout the world, regardless of affiliation or special interest. The idea is to foster a free exchange of ideas, techniques and general information between it's members concerning the use of the Atari ST.

For more information on joining the group, send 2IRCs to:

ASTUR
W. Elsschotlaan 21
B-8460 Koksijde
Belgium

CRUG Goes Public!

A few months ago the Commodore Radio Users Group started up, little did the originator envisage what was ahead. Around 130 or so people registered initially and it has been the general consensus of opinion that the group should produce their own magazine and be run along the lines of most other computer/radio user groups.

As from June 1, the CRUG became a "real" user group. A magazine will be produced four times a year and will be known as *Connections*. Subscriptions have been fixed at £8 for the first year's and will be reviewed next year.

For further information on the group, contact:

Commodore Radio Users
Group
Simon Lewis GM4PLM
69 Irvine Drive
North Clippens
Linwood
Paisley
Renfrewshire PA3 3TB

GRASSROOTS

Lorna Mower

Cheltenham ARA meet 1st & 3rd Fridays in the Stanton Room, Charlton Kings Library. September 2 is G4VXE on the ZB Expedition. Dave Abbott G4RFU at Holmbury, Thorncliffe Drive, Cheltenham.

Yeovil ARC meet Thursdays, 7.30pm in The Recreation Centre, Chilton Grove. September 8 is Netting by G3GC, the 15th is Frequency Changing G3MYM and the 22nd is Circular Polarisation G3MYM. David Bailey G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.

Chelmsford ARS have BBC Essex, a description of the station on September 6. 1st Tuesdays, 7.30pm at Marconi College, Arbour Lane. Roy Martyr G3PMX on Chelmsford 353221 Ext. 3815.

Wirral ARS meet 1st & 3rd Wednesdays at Ivy Farm, Arrore Park Road. A low cost construction contest on September 7, an Equipment Sale on the 21st. R. E. Bridson G3VEB on Wallasey 1346.

Thornbury & District ARC have a Junk Sale on September 13. For their meeting place and time contact H. T. H. Cromack G0FGI on Thornbury 411062.

Acton, Brentford & Chiswick ARC have demo of a Homebrew 2-band Transceiver by G4HMC on September 20. Alternate Tuesdays, 7.30pm at the Chiswick Town Hall, High Road. W. G. Dyer G3GEH on Acton 3778

Wakefield & District RS meet Tuesdays, 8pm in Ossett Community Centre, Prospect Road. August 30 is a video Film Night (& final prep for Trophy Contest), September 3/4 is the 144MHz Trophy Contest, the 6th is a Practical Evening, the 13th a Novice/Student licence debate and the 20th On the Air G1WRS/G3WRS. John Roberts G1XYT at 1 Pomfret Place, Garforth, W. Yorks LS25 2NL.

Dunstable Downs RC have a Natter Night on August 26, Organising Shuttleworth on September 2, National Car Boot Sale on the 4th, Natter Night on the 9th, Club Barbecue (QTH G3VZV) on the 10th and Wolfsburg Video on the 16th. Fridays, 8pm in Room 3, Chews House, High Street South. Tony Kelsey-Stead G0COQ on Luton 508259.

Worksop ARS have an Official Club Meeting on August 30 and a Natter Night on September 6. Details of their meeting place and time from Mrs C. S. Gee G4ZUN on Worksop 486614.

Lincoln SW Club have On Air/Activities/Hamfest Programme Colating on August 31. Meet Wednesdays at the City Engineers Club, Central Depot, Waterside. Pam Rose G4STO at address shown above.

Stevenage & District ARS meet 1st & 3rd Tuesdays, 8pm at SITEC Ltd, Ridgemond Park, Telford Avenue. September 6 is HF Night on the Air, the 11th is Lincoln Hamfest. Peter G0GTE on Stevenage 724991.

Rugby ATS meet Tuesdays, 7.30pm at the Cricket Pavilion, outside Rugby Radio Station. September 6 is a 144MHz d.f. Hunt, the 13th is prep for 3rd Annual Auction & Barbecue, the 20th is the 3rd Annual Auction & Barbecue, details G8TWH QTHR. Kevin Marriott G8TWH on Rugby 77986.

Keighley ARS have a visit to Fire Service HQ, Birkenshaw on August 30 and an Informal on September 13. 2nd & 4th Tuesdays, 8pm in the Club Room, rear of Victoria Hall. Kathy G1IGH on Bradford 496222.

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121 St. Nicholas Street, Radford. August 26 is a Canal Trip, September 2 & 16 are Nights on the Air/Morse Tuition, the 11th is a Treasure Hunt/Barbecue. Jonathan Ward G4HHT on Coventry 610408.

Exeter ARS have Digital Radio by G6FTV on September 12. 2nd Mondays, 7.30pm at the Community Centre, St Davids Hill. Ray Donno G3YBK on Exeter 78710.

Cheshunt & District ARC meet Wednesdays, 8pm in the Church Room, Church Lane, Wormley. August 31 is a Natter Night, September 7 is Portable on Baas Hill, the 14th a Natter Night and 21st is Aerial Basics G3TIK. Peter Davies G1KQA on Lea Valley 764930.

Mid-Warwickshire ARS have a DF Foxhunt & Barbecue on September 14. 2nd & 4th Tuesdays, 8pm in St. Johns Ambulance HQ, 61 Emscote Road. P. A. Brown G0HIH on Marton 632370.

Wimbledon & District ARS have a General Activity Evening on August 26 and a Surplus Equipment Sale on September 9. 2nd & last Fridays, 7.30pm in St Andrews Church Hall, Herbert Road. David Love G4RBQ on 07373 51559.

Horndean & District ARC meet 1st Thursdays, 7.30pm at Merchistoun Hall. September 1 is "Brains Trust". Dan Bernard G4RLE on Portsmouth 755274.

Felixstowe & District ARS have a Quiz versus Leiston Radio Club at Leiston on September 6 and a Social on the 19th. Meet alternate Mondays, 8pm in the Scout Hut, Bath Road, all Socials in the Grosvenor Hotel. Paul Whiting G4YQC on Ipswich 642595 (daytime).

Midland ARS have a Surplus Sale on September 20. Tuesdays, 7.30pm with classes from 7pm in Unit 16, 60 Regent Place, Birmingham. Wednesdays is Morse, Thursdays a Night on the Air. Tom Brady G8GAZ on 021-357 1924.

Todmorden & District ARS meet 1st & 3rd Mondays, 8pm at the Queen Hotel. September 5 is Antennas G8PG, the 19th is a Natter Night. Val Mitchell G1GZB on Todmorden 7572.

Wyre ARS have a Barbecue on August 31 and a Morse Class on September 14. 2nd & 4th Wednesdays, 8pm in Breck Sports & Social Club. Dave Westby G4UHI on Lancashire 854745.

Pontefract & District ARS meet Thursdays, 8pm in the Carleton Community Centre, Carleton Road. September 1 is finals on SSB Field Day, the 8th is a Committee Meeting, the 15th On the Air and the 22nd QRP by Rev. George Dobbs. Eddie Grayson G6OJX on Knottingley 83792.

Braintree & District ARS have a Construction Evening on September 5 and PMR & VHF Repeaters by G3XVV on the 19th. 1st & 3rd Mondays, 7.30pm at The Braintree Community Association Centre, Victoria Street. Norma Willicombe G0FPW on Braintree 45058.

South Manchester RC meet Fridays, 8pm in Sale Moor Community Centre, Norris Road, Sale. August 26 is a Mini Lecture Contest and September 16 is Active Filters by G0HAL. David Holland G3WFT on Sale 1837.

South East Kent (YMCA) ARC meet Wednesdays, with Morse or RAE Coaching on Mondays & Tuesdays. August 31 is a Top Band Fox Hunt and September 7 a Natter Night. John H. Dobson on Dover 211638.

Sutton & Cheam RS have SSB Field Day on September 3/4, visit to Bush House on the 7th and Antennas for Landed Gentlemen by G4XMK on the 16th. 3rd Fridays, 7.30pm at Downs Lawn Tennis Club, Holland Avenue, Cheam and Natter Nights are 1st Mondays in the Downs Bar. John Puttock G0BWV on Sutton & Cheam 9945.

Maltby ARS meet Fridays, 7.30pm at the Community Hall, Clifford Road, Hellaby. August 26 is HF Activity Night. Keith G1PQW on Rotherham 814135.

Wolverhampton ARS meet Tuesdays, 8pm at The Wolverhampton Electricity Sports & Social Club, St. Marks Road, Chapel Ash. August 30 is a Natter Night, September 6 a Committee Meeting, the 13th G4CVU talks about his visit to the USSR and the 20th a Night on the Air. Keith Jenkinson G1OIA on Wolverhampton 24870.

Torbay ARS meet Fridays 7.30pm at the ECC Social Club, Ringslade Road, Highweek. August 28 is the TARS Mobile Rally. Bob McCreadie G0FGX on Haytor 6233.

Verulam ARC have an Activity Evening on September 13. 2nd & 4th Tuesdays, 7.30pm at the RAF Association HQ, New Kent Road, St. Albans. Hilary G4JKS on St. Albans 59318.

Farnborough & District RS have Beer & Skittles — Floresters Arms Bagshot on September 9 and a pre-AGM discussion on the 14th. Meetings in the Railway Enthusiast's Club, Hawley Lane at 7.30pm. Tim Fitzgerald G4UQE on Camberley 29321.

On August 27, **World DX Club** have a representative from Phase Truck Ltd showing some of their equipment. They meet roughly every six weeks on a Saturday in St. Marys Centre, Chain Street, Reading from 2.30-5.30pm. Ron Blair on Reading 428895.

We have been informed that Mr A. G. Brimming, Secretary of the **DX Asscociation of GB**, has resigned. All correspondence should now be sent to DX.A.GB, c/o Flat 13, 63 Eton Avenue, Hampstead, London NW3 3ET.

LISTEN OUT FOR

GB75TV: The Rugby TV Repeater Group is planning a special event station over the August Bank Holiday weekend (August 27/28). The station will be operating ATV on at least 430 and 1296MHz from Sheenington, near Banbury in Oxfordshire. The times will be from 12 noon to 8pm on the Saturday and from 7am to 12 noon on the Sunday.

G6IQM QTHR

GB2WVR: This station will be on the air for the World Veteran Rowing Championships in Strathclyde Country Park, Motherwell. The dates for this event are September 5 to 11. For more details contact:

Brian GM0EGI QTHR or
Paddy GM3MTH QTHR

Have you Got a Special Event Station we should know about? If so, write and tell us

GB8AER: This Special Event Station will be operational from the Winter Gardens, Blackpool to commemorate the British 8th Army at El Alamein. The dates to look out for this station are October 29 and 30. GB8AER is organised on behalf of the Royal Signals Amateur Radio Society who would like to work other RSARS/RAFARS and RNARS members.

G2DHV QTHR

GB8EAR: This station will be on the air on October 22 from Hove and is part of the El Alamein Reunion being held at the Great Hove Town Hall, Hove. The station will be using 144MHz f.m.

G2DHV QTHR

GB1RLD: Two members of Radio Link — Derby Hospital Broadcasting will be operating the special event station from the outside broadcast caravan at the City Hospital, Derby. They will be using 144MHz v.h.f. on September 17 and 18 from 1000 to 1600.

John Huddlestone G1UJX
Tel: Derby 676822

RALLIES

*SWM in attendance

September 4: The 21st Preston ARS Annual Mobile Rally will be held at the University of Lancaster. There will be trade stands, a large Bring & Buy, licensed bar, snack bar and restaurant. Talk-in on S22. Doors open at 11am (10.30 for the disabled). Admission by programme (50p includes free draw for colour TV). Ample free parking. More details from:

Godfrey G3DWQ
Tel: 0772 53810

***September 4**: The Telford Radio Rally and Exhibition will be held at the Telford Racquet Centre, Telford. All the usual facilities and stands will be there. Talk-in on S22. Morse tests available through RSGB. Doors open 10.30 for the disabled, 11am for everyone else. More details from:

John G8ARS
Tel: 0952 727719

September 4: The National Amateur Radio Car Boot Sale will be held at the Shuttleworth Collection, Old Warden Aerodrome, near Biggleswade, Beds. Gates open from 10am to 5pm, admission 50p, parking free. The Shuttleworth Collecton is a famous aircraft and motor museum. Also there is a restaurant, bar and children's playground. More details from:

Wendy
Tel: 0582 451057

***September 11**: The Lincoln Hamfest will be held at the Exhibition Centre on the Lincolnshire Show Ground site. Admission is by lucky programme. All the usual attractions will be there.

September 20: The annual Amateur Radio Auction and Barbecue will again take place at the Cricket pavilion "B" Building Entrance, BTI Radio Station, A5 Trunk Road, Hillmorton Rugby. It's organised by the Rugby ATS. The admission charge is only 20p per person and the large car park is free. Anyone may place an item in the auction, with or without a reserve price, free of charge. However, the Rugby ATS will retain 10% (£10 maximum) on all items sold.

September 24/25: The first EI Hamfest will take place at the Grand Hotel, Malahide. Co. Dublin. There will be a dinner on the 24th, with the rally starting at 5.15pm sharp on the 25th. The weekend will consist of sessions on all aspects of amateur radio together with lectures by Louis Varney G5RV and it is rumoured that Hugh Turnbull, the Director Atlantic Division of the ARRL will be giving a lecture too. Talk-in will be on S22. More details on all the events and available accommodation at the hotel can be obtained from:

Christopher Yeates EI7AAB
Tel: Dublin 215145

***October 2**: The Great Lumley ARES are holding their rally at The Community Centre, Great Lumley, Co. Durham. Doors open 11am. Talk-in on S22, RB0 and GB3NT.

G1OKA
46 Donelaw
Great Lumley
Chesterlle-Street
Co. Durham

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

B. Davies GW3KYA
Tel: 0495 225825

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

J. A. Murphy
Tel: Armagh 522153

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

The AR2002 is without doubt the best known and best performing VHF/UHF monitor receiver on the market. Encompassing every frequency of interest, whether it be VHF airband, UHF airband, radio amateur, mobile radio, FM broadcasts, TV sound, the AR2002 also gives the user top performance. Frequency selection can be by direct keyboard entry, but there is a good old tuning knob as well, for whizzing up and down the bands. Properly styled and engineered for use in fixed station, mobile or portable, the AR2002 comes complete with a mains power supply and extended whip aerial. Covering 25-550 and 800-1300MHz, the AR2002 has high sensitivity and selectivity for professional performance. In use by government departments and Big Brother, as well as thousands of users everywhere.

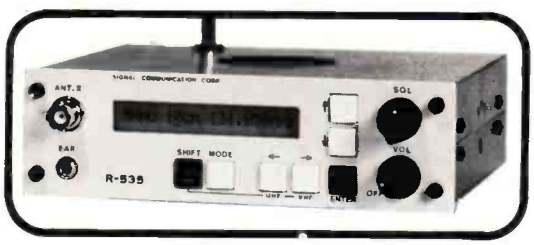
AR2002.....**£487** inc. vat. Carr. extra.

In the realms of hand held scanners, it would be hard to beat the new AR800E. This compact package (only 60 × 50 × 135mm) contains an AM/FM scanning monitor covering the frequency ranges 75-105, 118-174, 406-495, and that most requested band 830-950 MHz. Channel spacing can be programmed from the keyboard for 5, 10, 12.5, and 25 kHz according to band, so all frequencies are correctly selected. AM and FM modes are available, and there are 20 memory channels to store the most used frequencies. You can also tell the set to search automatically between frequency limits set by the user, and transfer any frequency of interest directly into an unused memory. To cap all this performance, the AR800E comes complete with rechargeable batteries and mains charger, and at an attractive price.

AR800E.....**£199** inc. vat. Carr. extra.

For the airband enthusiast, the WIN-108 is the answer to a maiden's prayer. This compact handheld airband receiver is fully synthesised and covers the entire VHF airband from 108 to 136 MHz. With direct keyboard frequency entry you can be on channel faster than a Concorde captain, and the clear frequency readout tells you where you are. 20 memory channels are included, and you can scan these automatically. Not only that, you can tell the WIN-108 to search any given frequency range within the air band so as to find new frequencies of interest. Forget the AIR-7, the WIN-108 does it all and more. The WIN-108 comes complete with a correctly matched helical aerial and is eager to go.

WIN-108.....**£175** inc. vat. Carr. extra.



For those who demand the best, the airband receivers from Signal Communications are a must. The company is totally dedicated to producing the best airband radios around, and the latest R-535 is in such demand that we are having to keep a waiting list of eager enthusiasts. Why? Simply because the R-535 gives ultimate performance not only on the VHF airband, but also on UHF as well. Designed for simple programming and high speed scanning and searching, the R-535 has no less than 60 memory channels to store your most used frequencies. VHF and UHF channels can be mixed in any order. A full list of accessories is available, including power supplies, aerials, rechargeable battery packs, and so on, making the R-535 the complete system for the advanced airband enthusiast.

R-535.....**£249** inc. vat. Carr. extra

The radio to end all radios. The new RZ-1 from Kenwood may look like a high quality in-car wireless, but in fact is a mobile monitoring receiver covering 500kHz to over 900MHz . . . Just read that again . . . 500kHz to over 900MHz. Modes available are AM, FM (communications), FM (broadcast and TV), and channel spacings are included to meet all requirements. Consider the fact that with this one package you can listen to almost everything, from Medium wave broadcast, Shortwave stations, high quality FM and TV broadcasts, all communications channels including VHF and UHF airband, right up beyond 900MHz. (Although the spec says 905MHz, all RZ-1 receivers supplied by us have the upper frequency extended to 950MHz at no charge). The excellence doesn't end there; the display can be programmed by you to show a readout of the station title e.g. "Radio 2" or "Lon. Twr.", in any of the 100 (yes, 100) memory channels, Kenwood engineering quality and ease of use are combined to make the RZ-1 a must.

RZ-1.....**£465** inc. vat. Carr. extra.

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

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DX LETTER FROM AMERICA

Gerry L. Dexter

Hello, and welcome to this new feature in the pages of *Short Wave Magazine.* Every three months we'll present a look at some of the things happening on the DXing scene in North America. The focus will be mainly on short wave broadcasting stations and DXing them, but, from time to time we'll also touch on clubs and the general listening hobby scene in North America.

WRNO Worldwide set off a chain reaction when it went on short wave back in 1982. Not a year has passed since then when at least one new short wave broadcaster hasn't gone on the air from one of the 50 US states or US possessions. The latest of this line is WWCR (World Wide Christian Radio) based in Nashville, Tennessee. WWCR plans to air a wide variety of religious programming produced by outside groups paying a price for the station's airtime. It may also broadcast programmes from various political groups as well.

Of those US short wave broadcasters now on the air only one or two met the original target date they had set and WWCR won't meet their's either. The station had originally hoped to be on the air by June 1 1988, but that has been pushed back until November 1, though it's hoped that test transmissions may begin by sometime in September. The schedule set was 0200 and 0600 on 7.520MHz and 1300 and 0000UTC on 15.690MHz. Those times may not hold for the tests but the frequencies are likely to be the ones used. The station will initially target audiences in Europe and Canada. Reports on reception may be sent to WWCR, 3314 West End Avenue, Nashville, TN 37203, USA.

Fire

A fire on June 12 damaged the studios and studio equipment of short wave station WHRI in South Bend, Indiana. Fortunately, WHRI's 100kW transmitters are at a separate site some two hour's drive to the south, at Nobelsville, and within an hour broadcasting had been transferred to an emergency set-up at the transmitter. The station was expecting that everything would be back to normal by the middle of July.

Voice of America

The Voice of America's transmitter site at Dixon, California began operating back in World War Two. A few years ago the VOA closed the site down but then, some years after that, re-opened it and began using it again. Now, Dixon has been closed once again. However, the property will remain "on the shelf" so to speak and it's possible that it might be brought back into use if needed at some point in the future.

Guatemala

Over the last year or so, two short wave broadcasters have come on the air from Guatemala. Radio Buenos Nuevas, at "Twi' Pic" near the village of San Sebastian Huehuetenango (often written as "Hue'tenango") came on the air using 4.800MHz. The station operates with 1kW and is owned by the Evangelical National Church of Mam (the Mam are one of the Guatemalan indian groups). The station, using the call letters TGMI, is located 276km north west of Guatemala City. All programmes are in the Mam language, except for Spanish language station identifications. Broadcasting runs from 1200 to 1330 and again at 2300 to 0100.

Another newish station is Radio Kekchi on 4.845MHz which started out with just 250W but may now have increased that to 5kW. The station, using the call letters TGVC, is a service of the Kekchi Baptist Association which is made up of some 135 Baptist Churches in Guatemala's north central region. Engineering set up for the station was done by Wayne Berger who is chief engineer at the well known Radio Cultural (TGNA) in Guatemala City. Radio Kekchi's address is: La Voz Evangelical de la Casas, Fray Bartolome de Las Casas, 16015 Alta Verapaz, Guatemala.

Libertad Cubana Returns

On the secret side of things an anti-Castro broadcaster that was active a few years ago and then went silent for four years has returned. Radio Libertad Cubana (then) has added the words "y Radio Felipe de la Cruz" to its name for the new version. The announcer identifies himself as "Commandante David" and appears to be the same person who ran things the first time, using the same name, until he was closed down and brought up on charges which were later dropped. At present the station is operating from approximately 0100 to 0130 on Tuesdays, Thursdays and Saturdays on a frequency varying between 7.045 and 7.075MHz. When this one is on, so is La Voz de Alpha 66 (run by the Alpha 66 organisation) on 6.666MHz. Both stations programme only in Spanish and are quite likely located somewhere in Southern Florida.

Mexico

At any one time there are perhaps only three or four stations active from Mexico (out of the more than one dozen officially listed). In addition to those few, currently active DXers are hearing an oddity. XEFAJ, Radio Consentida, a 10kW station licensed for 1560kHz m.w. has been showing up at various spots on the short wave dial. This transmission, which may be some kind of relay, is heard variously between 2300 and 0600 on such frequencies as 4.900, 6.753 and 11.480MHz (each one varies slightly). No response has been received to letters reporting reception to the station.

Listeners who still have unanswered reports for past reception of Radio Grenada when it was still active on its 15.045MHz short wave frequency, can still get QSLs. Station Manager, George Grant, is happy to help out DXers who didn't get replies from the previous administration, though he seeks rather detailed reports. A self-prepared QSL card and IRCs for return postage are sought, too. Reports to Mr Grant at Radio Grenada, Post Office Box 34, St. George's, Grenada, West Indies. Incidentally, there's a chance that Radio Grenada may return to short wave sometime in the future.

More tips on QSLing are now carried on HCJB's *DX Party Line* Saturday edition, based upon your scribe's book *Secrets of Successful QSL'ing* so tune in.

That uses up my space for this time. Please write in to *Short Wave Magazine* if you have suggestions about things you'd like me to cover. Best Wishes. □

Author Garry Dexter at his Wisconsin monitoring post, with NRD 525, NRD 515 and Drake R4B receivers.

INTRODUCTION TO DX-TV

Keith Hamer and Garry Smith

There is nothing quite like a gleaming set of antennas atop a mast to emphasise your devotion to the hobby. A d.i.y. mast for long-distance TV reception needn't be too obtrusive and can be relatively inexpensive to construct. The ideas presented in this article are based on tried and tested systems and range from the simple pole to a more ambitious lattice structure.

Although Sporadic-E reception is possible even with relatively simple indoor antennas, eventually there comes a time when the DX-TV enthusiast develops a craving for a more ambitious antenna system. Even a 3-element array for Band I occupies a minimum space of at least 3 x 2m – more if it is to be made rotatable. There can't be many lofts which will accept an antenna of such dimensions, so an outdoor location is usually necessary for a Band I array.

As a last resort it could be mounted on the chimney should there be insufficient garden space for a mast. An alternative solution is to use heavy-duty stand off brackets bolted to the gable-end wall of the house.

These days most of us are used to the familiar sight of a small 13-element u.h.f. array for local transmissions neatly lashed to the chimney. As a consequence the thought of much larger arrays, especially for Band I frequencies, mounted on the chimney stack might at first seem rather daunting. Don't forget, despite their size, vertically-mounted Band I antennas of even greater dimensions were sometimes seen on chimneys in the days before the v.h.f. 405-line system became redundant, especially in Channels 1 and 2 fringe reception areas. Receiving antennas for DX reception are usually orientated for horizontally polarised signals since the majority of European transmitters favour horizontal polarisation.

Fortunately an antenna mounted horizontally looks less conspicuous, but maybe that is a personal opinion. The addition of multi-element arrays for Band III and u.h.f. mounted above the Band I antenna may begin to present problems especially where high winds are concerned. The last thing you want is the chimney stack to come crashing through the bedroom ceiling at two o'clock in the morning at the height of a storm!

Up on the Roof

Professional installation services don't come cheap, especially if the system is a "one-off". The antenna rigger could spend several hours installing such a system. Another drawback of gable-end or chimney-mounted systems is their inaccessibility when maintenance is required. This means relying on an antenna rigger or venturing upon the roof yourself – something best avoided unless you have a head for heights.

The best solution is to have some form of a mast which can be raised and lowered reasonably quickly for routine maintenance and changing antennas for comparison tests, etc.

As anyone who is contemplating the purchase of a mast will know, professional structures can be prohibitively expensive. For most of us, with only a moderately sized wallet, and alternative approach must be found. Two types of mast will be described: the scaffold pole variety and the more professional looking lattice. Both these masts have been tried and tested over a number of years by each author, supporting a variety of multi-element arrays for DX-TV reception. Sections of lattice mast tend to be expensive, but they can occasionally be acquired second-hand. For instance, the authors and a couple of amateur radio enthusiasts obtained theirs when a television relay company decided to renew their antenna system and dismantled the old structure.

Size

The question is, what size of mast to have? The easy answer is the bigger the better, or more to the point, the biggest and most ambitious you are likely to get away with and at the same time preserving the peace with your neighbours. If your neighbours are the sort who complain as soon as the washing line goes up, then there's little chance you will be able to erect a mast without problems.

Planning Permission

Generally speaking, planning permission is required for any form of mast and it is best to make a few tactful enquiries initially. Different authorities seem to have their own rules and regulations. Sometimes local planning authorities frown upon any structure which is higher than a row of daffodils especially on some of the new open-plan housing estates. Also a lot depends on whether the structure will be classed as being fixed or portable, so bear this in mind when submitting any planning applications. In the case of the authors, obtaining written planning permission was just a formality.

If you do decide to approach the planning authorities, it will be worth stressing that the structure with its antennas will be used solely for receiving, rather than transmitting, purposes and it will therefore not cause any interference to neighbours' TV or radio reception. In the case of a professional tilt-over lattice tower, which may be raised and lowered to various heights, you should stress that it will only be raised to its maximum during periods of reception. You should show a little courtesy with your immediate neighbours by informing them of your intentions and stressing that your hobby will not interfere with them at all.

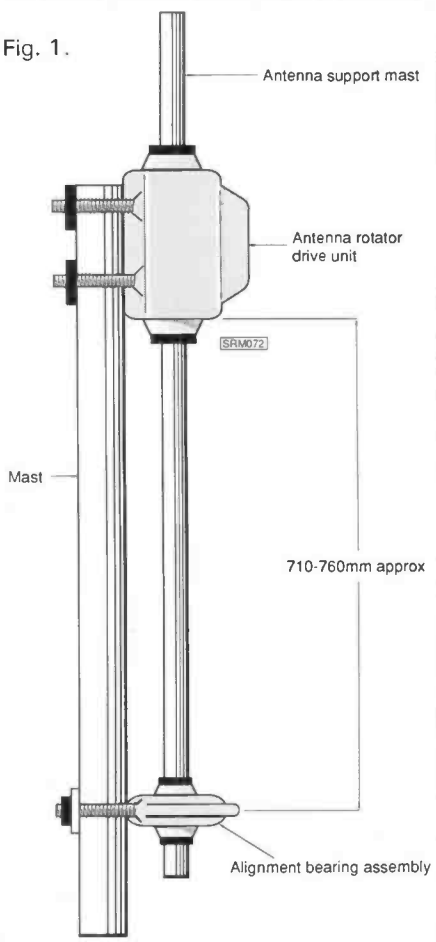
Safety

This should be uppermost in your mind at all times and in your initial plans certain safety aspects should be considered before ploughing ahead. Try to imagine the worst things that can possibly happen once the mast is erected. For instance, **if** the whole structure toppled (which it shouldn't if guyed properly) would it cause structural damage to the house? Perhaps of even greater concern, would it affect neighbouring properties? The latter aspect is extremely important. Questions like this should influence the final location of the mast. Obviously, if the total height of the mast is 11m and your garden happens to be 30 x 30m, there would be very little danger to neighbouring properties if you sited it in the middle. Of course it would look conspicuous, but it would be safe.

Use of Guy Lines

The use of guy lines will provide a safe mast structure up to the height of the lowest antenna. For obvious reasons, the remainder of the mast above the antenna

Fig. 1.



INTRODUCTION TO DX-TV

Part 12

cannot be guyed since this would impede antenna rotation. Therefore, the weakest part of the structure will be immediately above the upper guy clamps. In many systems, this is usually where the antenna support pole enters the rotator.

Leverage

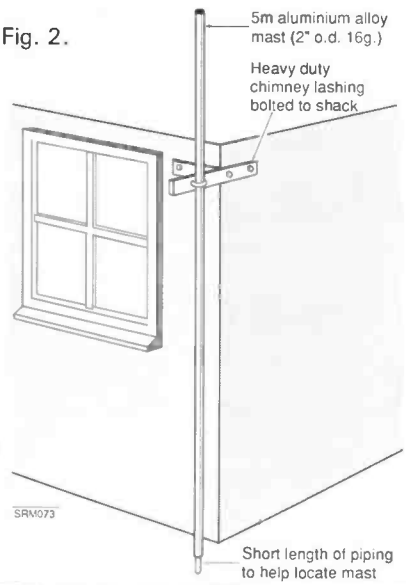
There are several factors which will influence the amount of stress at this weak point. The height of the support pole carrying the antennas above the rotator should not be excessively long. Its lever action will become magnified, especially if a large array is clamped to the top. It goes without saying that the heavier antennas should be mounted lower down if possible to reduce the effects of leverage during high winds. In most systems for DX-TV, the Band I array (which is usually the heaviest) is located at the lowest point with the one for u.h.f. at the top and Band III in the centre.

The lever action could be reduced by using the shortest pole possible to carry the antennas, but arrays have to be mounted a certain minimum distance apart to avoid mutual coupling effects which might degrade their performance. The minimum spacing used by many enthusiasts is 1m between the arrays.

Shared Boom

Some saving in pole length can be made by constructing antennas for different bands on the same boom. For instance, each author has a Band II array mounted in front of the final Band I director, therefore utilising the same boom. The arrays are quite separate and individual coaxial downleads are used. Arrays for Band I and III can be obtained using the same boom, but ensure that individual downleads can be used so that any necessary filtering can be incorporated. Some designs have a combined output but interference problems can arise, if using a mast-head amplifier, because individual band filtering cannot easily be incorporated to remove, for instance, breakthrough from the f.m. radio band.

Fig. 2.



Antenna Support Pole

The outside diameter and wall thickness of the antenna-carrying pole should also be taken into account. Aluminium alloy tubing with a wall thickness of 16 s.w.g. is usually adequate.

Many of the popular, inexpensive, rotators currently available will accept a pole up to a maximum of 38mm in diameter. Provided that the pole above the rotator does not exceed 2 metres in length it should be sufficient to carry a multi-element Band I array of 4- or 5-elements, a 12-element Band III and a u.h.f. array.

Alignment Bearing

The use of an alignment bearing is recommended for systems where anything but a single lightweight array is to be turned, see Fig. 1. The aim of the alignment bearing is to relieve the rotator of downward weight. For heavier loads, or support poles in excess of 2 metres, a second bearing is recommended positioned a similar distance above the rotator. Unfortunately, a protruding lip at the top of some rotators prevent its positioning anywhere other than the top of the mast.

To summarise the previous points, too many heavy arrays atop and excessively long antenna support pole should be avoided. Mast erection should also be given some consideration. If a mast consisting of two or more poles joined together is to be used to attain an upper guyed height in excess of nine metres, then you may find yourself with a structure resembling a hump-back bridge while attempting to lift it off the ground.

Simple Mast for Sporadic-E Antennas

As we have emphasised in previous parts of this series, the height of the antennas for Sporadic-E reception is not of great importance. This is because signals arrive at a slight angle in the same way as satellite TV transmissions.

A minimum height of about five metres is recommended to enable a clear take-off. So, a mast to carry a Band I array of three or more elements can be very simple to arrange. Most metal stockists can supply 50mm diameter aluminium alloy tubing in five or six metre lengths – which is ideal for the job. Tubing with a wall thickness of 16 s.w.g. isn't expensive, but the thicker gauge scaffold type tubing can be. Steel poles can be obtained, but these tend to be extremely heavy and are easily prone to rusting. One of the biggest headaches is getting the pole back home!

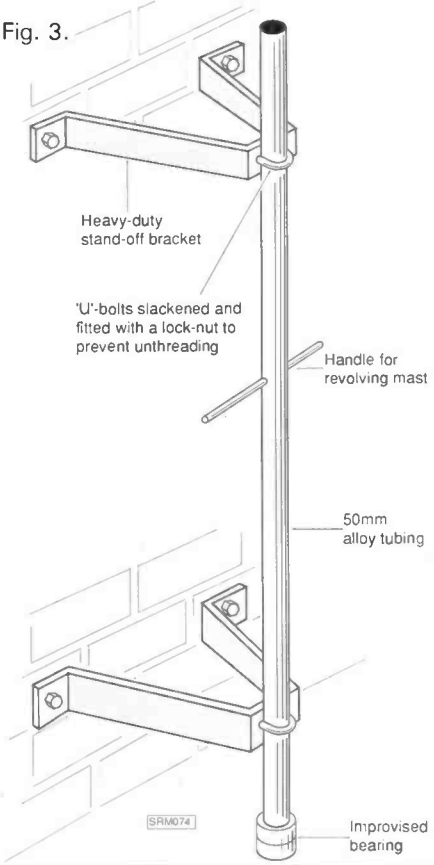
The pole can be attached to the side of a shack or garden shed, as shown in Fig. 2. A mast based on this principle is used by one of the authors to support a 6-element Band I array with a boom length of five metres! The mast is secured to the corner of a shed using a fixing bracket from part of a chimney-lashing kit. No guy lines are required and the system has survived severe gales over the years. In this particular example, the U-bolt is tightened to prevent rotation on the wind and the antenna is beamed in a southerly direction. This allows for monitoring of Spanish and Portuguese stations while freeing the main mast-mounted array for reception from other direction. There is no reason why the clamp on such a design should not be left sufficiently slack to enable manual rotation to be achieved.

Once the antenna is attached to the end of the pole and the coaxial cable carefully taped, erection is simple if there are two people. With this particular mast, no pivot assembly is used as such, although a short piece of smaller diameter tubing should be hammered into the ground to help locate the mast in its chosen position.

Such a mast is ideal for testing antenna performance where quick and easy access is required. The fact that it can be classed as "portable" may persuade awkward neighbours into accepting its presence. Convince them of its portablility by erecting it and taking it down several times!

We would recommend this type of simple unguyed mast for a single antenna plus rotator arrangement only since the addition of a support mast carrying extra antennas considerably contributes to the

Fig. 3.



weight and leverage.

If you feel that this type of mast is the only one which will keep the peace, you could always compromise. The five or six metre mast could be used to support a Band I antenna, or a combined Band I/III system, with the u.h.f. array located elsewhere (perhaps on the chimney stack). For tropospheric DX reception, an antenna height of around nine to ten metres is usually considered the absolute minimum. However, the authors have experimented with Band III arrays of only 5-elements at a height of only six metres and results have been surprising. Even under flat conditions, reception has been evident from transmitters in France, Eire and Belgium which were initially considered impossible to receive at such a height.

Distant u.h.f. transmitters have also been received at similar heights. During a tropospheric lift some years ago, several Continental stations, including East Germany, were resolved using a single u.h.f. grid antenna at a height of 5m.

A variation on this mast arrangement consists of bolting heavy duty stand-off brackets to the side of the house at sufficient intervals to safely support the mast, see Fig. 3. To enable manual rotation of the mast, the U-bolts can be left sufficiently loose but lock-nutted to prevent unthreading. A dollop of grease applied to the U-bolt and its immediate surroundings should prevent seizure.

Some form of handle could be attached to the lower end of the pole to act as a lever to enable easy manual rotation. If some form of bearing at the lower end of the pole can be arranged, so much the better. No doubt a visit to the local car breakers yard could provide some inspiration.

Mast Base

Of course, neither of the two systems described utilise any form of pivot arrangement at the base of the mast, mainly on the grounds of cost and simplicity. Base tilt systems are commercially available to accept masts of 50mm diameter and these are relatively inexpensive. A concrete foundation is not always required. Some systems can be anchored to the ground with stakes to provide a temporary location, for field events, etc. Special tilt-over wall brackets are available too. These are designed to enable the mast to swing parallel to the wall providing easy access to the antennas. Pulley systems are available to facilitate this.

Another d.i.y. system makes use of two large wooden posts set in concrete, see Fig. 4. These act in a similar manner to flag pole supports and consist of a pair of three metre beams with holes drilled at the top and bottom. These accept two short lengths of 32mm diameter alloy tubing to which the mast pole is clamped. The supports must be thoroughly treated with wood preservative in order to minimise the possibility of decay.

The beams should be positioned about 300mm apart. Ensure that the two sets of 32mm diameter holes are carefully drilled and are directly opposite each other. It is essential that correct alignment is observed otherwise it will be difficult to obtain true vertical pole positioning.

Before the hole is filled with concrete and broken bricks, check with a plumb line and spirit level to ensure that the wooden uprights will be perfectly vertical once the concrete has set. This procedure must not be overlooked because the clamps cannot be adjusted for any such errors. If the beams are not truly vertical, or if the 32mm diameter holes are not correctly aligned, the whole mast will lean at an angle. Remember, the higher the mast, the more apparent this will be.

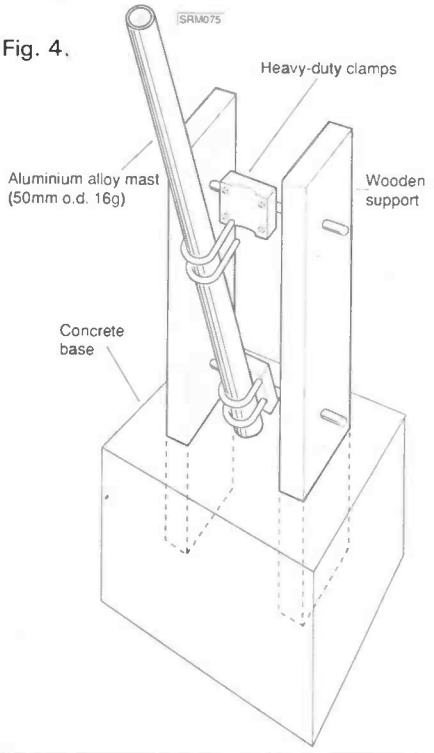
The concrete should be left for a few days to allow it to set really hard before you proceed to attach the bracket supports. To prevent movement of the beams whilst the concrete is setting, they can be shored up with props. It is worthwhile checking occasionally to ensure that the wooden supports have not moved from their vertical state.

Antenna Rotation

To make full use of a mast installation, particularly if it is to be used for DXing, it is strongly recommended that some method of rotating the antenna is adopted. This can be achieved by either employing a commercially available electronic rotator system or by turning the mast pole manually (often called the Armstrong method!). If the pole is steel and several arrays are fitted it may require a rather energetic person.

The manual method does have its advantages, such as cheapness, its muscle building properties and the chance for a breath of fresh air while venturing into the great outdoors to turn the antenna,

Fig. 4.



(not to mention the acquisition of a gentle suntan during the summer months throughout the Sporadic-E season!). However, it can be a dreadful bind having to leave the comfort and warmth of the house to turn the antennas a few degrees during heavy rain or snow.

If a system is used in which heavy duty stand-off brackets are used to support a rotatable pole against the house or shack, it may be possible to site the mast near a window of the house so that easy access is obtained from indoors and only the finger-tips will suffer from frost bite.

Needless to say, a proper rotator is invaluable for DX reception where constant repositioning of the antenna may be necessary. Being able to view the screen and rotate the antennas simultaneously is a great advantage as this avoids rotating the antennas beyond the required direction. Inexpensive rotator units are readily available from antenna suppliers and advertisers in *Short Wave Magazine*.

The drive system for turning the support pole carrying the antennas consists of a low-voltage motor assembly which is mounted atop the mast. An indoor control unit provides clockwise and anti-clockwise drive and also indicates the direction in which the antennas are beamed.

There are several different types of rotator on the market with a wide range of price tags. The cheaper and most popular rotators are generally of the offset variety in which the mast carrying the antennas passes completely through the rotator asssembly. Most rotators of this type will accept a mast pole of up to about 32mm diameter. These have proved sufficiently robust for driving a typical DX-TV antenna system comprising a multi-element Band I array, Band III and a u.h.f. antenna at the top of the support mast.

One problem encountered by several enthusiasts using the cheaper type of rotator available is the variation in alignment over a very short period of time. The authors have not had first hand experience of this particular problem and their original rotators, manufactured in West Germany by Stolle, are still going strong after 16 years of hard work (famous last words!).

Tips

When installing antennas don't forget to leave an adequate loop of cable just above the rotator to enable the arrays to move the full 360 degrees without the cabling becoming taught. One tip worth remembering is to position the rotator to allow it to move from the south-west through 360 degrees rather than from the traditional south. This will avoid having to rotate the arrays by almost full circle in order to receive transmissions in Spain and Portugal which are slightly further round that true south. Of course, it will mean that the dial markings on the control unit panel will be a few degrees out, but you can always apply your own calibration marks if necessary. □

AIRBAND

Godfrey Manning G4GLM

One reader to whom I talked at the Cranfield rally was **Peter Willmin** (Haslemere, Surrey) who wants to connect an external loudspeaker to his hand-held scanner. Certainly the small speaker in these sets is a compromise due to lack of space; a properly enclosed external type would give improved sound quality for home use, and many of the usual component suppliers sell something suitable. In most cases you should be able to get away with connecting the speaker to the earphone socket of your receiver. You must find out the load impedance of the earphone socket and then make sure that the speaker's impedance is at least the same, if not more, than this (but a grossly excessive value would be inefficient). Never connect a speaker that has too small an impedance: the audio output stage of the receiver could become damaged.

What if the set's instructions don't state the impedance? Typical earphones have 8Ω impedance when measured with a 1kHz signal; but this would be an impractical way to test the earphone that was supplied with your set. I took a sample of 6 different earphones (all nominally 8Ω) and tested their resistance at d.c. using a digital multimeter; results were in the range 4.7-7.7Ω. If the earphone supplied with your set falls in this range it would be a fair bet to assume that it is 8Ω; but if you would like a little safety margin, why not go for a 16Ω speaker?

Follow-Ups

A verdict of amusing was given by **Brendan McCartney G4DYO** (Wokingham, Berkshire) on hearing the tape *What Goes Up Might Come Down* (David Gunson, Big Ben Tapes BBMC12) that I mentioned last month. Also, the Speedbird 1000 (July "Airband") is a Beech King Air used (no play on words intended) by British Airways' Chairman, Lord King.

A request for "a day in the life of an airline pilot" comes from **Chris Durkin** (Ormskirk, Lancashire). I hope that the article by Malcolm Wayland in the last *SWM* satisfied your curiosity with regard to short-haul work. Would any pilot out there like to tell us what it's like doing the long-haul routes?

May 1987 seems a long way off now, but the "Aeronautical Radio" series that started in that issue of *SWM* referred to the standard NATO 4-pole jack plugs found on most airliner and many other headsets. These sometimes appear on the surplus market; the tip of the jack plug and the pole next to it are connected to the microphone, the remaining two poles being for the earphones.

Receiving single sideband (s.s.b.) came up in July's "Airband" and I now see that **Corrigan Radiowatch** (Building 109, Prestwick Airport KA9 2RT) supply an external beat frequency oscillator (b.f.o.) kit. You should check that your receiver's intermediate frequency (i.f.) is suitable for use with any particular b.f.o. otherwise the s.s.b. signals still won't be resolved. If anyone tries out this device, please share your results with the rest of us.

So, soon the air display season draws to a close. Did you get to see anything of interest? At a couple of shows I met a few readers in person: this was a great pleasure.

Steepletone SAB9 receiver.

There have been many requests for a source of three-pointer aneroid altimeters. **Barry Parkhouse** (Parkhouse Aviation, 9 Green Lane, Blackwater, Camberley, Surrey GU17 9DG, Tel: (0276) 33067 day or evening) is prepared to sell these "with minor defects" to readers for £5 plus £1 postage; but do **not** attempt to use these out-of-specification units for actually flying an aircraft!

Information Sources

There is no simple way to relate the 4-letter selective calling (selcal) code to aircraft registration other than to look it up in a reference book. To **R. J. Smith** (Plymouth, Devon) I recommend *High in the Sky* by Ken Barker of The Aviation Society, 44 Laburnum Park, Bradshaw, Bolton BL2 3BU. The Midland Counties Aviation Society sometimes publishes updates to this book in their *Air-Strip* monthly newsletter; contact R. Queenborough, 17 Leylan Croft, Birmingham B13 0DB.

Michel Geeraert (Koksijde, Belgium) recommends *The Radio Book Catalogue* (L.J.D. Derenette, Postbus 37, B-8460 Koksijde, Belgium) and asks that an international reply coupon (IRC, available at larger post offices) accompanies enquiries. Michel would like to know of any groups working with radio-related public domain software; answers via the editorial address please. Also, Michel has had difficulty in locating some n.d.b.s when only the ident and frequency are known. The LYX on 397.5kHz is at Lydd, Kent, England, but where are the others? They are (with the frequency in kHz) AUT 295.5; BE 356.5; BTE 389.5; BU 473; CC 388; KCE 320; OO 375; OZ 312; SD 305; UU 354. Can anyone with a computer database locate these? *Tot ziens.*

Retired DC-9-41 pilot **Capt. Leslie Greville-Smith G4SUJ** (Wolverhampton) sends his picture in the form of an amateur radio QSL card. Apparently he is seen doing his "On Approach – Roof Panel" checks, and appears to be making sure that the generators are re-set or haven't tripped. Leslie would like to know the precise geographical location of navigational beacons and I suggest three possibilities. Firstly, look in any of the usual sources (*Aerad Supplement*, RAF *En Route Supplement,* or any radio navigation chart) and find the latitude/longitude for the beacon in question. This can be plotted on Ordnance Survey maps such as the 1:50000 *Landranger* series. This grid on the chart is to be ignored; use the lat/long scale on the chart's edges, joining corresponding points on opposite edges with something long and straight such as folded newspaper. Second idea is to look on the quarter-million *Topographical Chart* used for visual navigation. The more recent editions tend to show the location of n.d.b. and v.o.r. facilities. Lastly, those aerodrome charts published by the Civil Aviation Authority will indicate the precise location of beacons on the airfield itself, such as i.l.s. or terminal v.o.r. (t.v.o.r.). These latter beacons are intended for finding the aerodrome rather than for *en route* use and hence differ from other v.o.r.s only in respect of having a lower transmitted power for shorter-range use. Leslie points out why aeronautical mobile operation is not permitted by radio amateurs; the interference aspects could be a danger. He also wonders if transmission from a hot-air balloon would be safer but a current project, the High Altitude Radio Transponder (HART), has been prohibited. The idea is to test out an amateur satellite transponder by sending it aloft in a balloon that will be making a ladies' altitude record attempt; it appears that permission was denied on airworthiness grounds.

Experiences Shared

Talking of hot-air balloons, Cameron N77 G-BMLJ landed in the field outside the "Airband" photographer **Chris Mlynek's** house (Aylesbury, Buckinghamshire) but it was getting to near dusk to take a picture. Its pilot had just completed an instructional flight with her trainee crew (the more usual method of travelling from Tring is faster but less interesting). On this occasion no radio was carried, but it is possible to use a v.h.f. transceiver when penetrating controlled airspace. The balloon's primary radar echo is indistinguishable from that produced by a flock of birds (the only sizable metal on board being the twin gas cylinders) and the controller must allow for the balloon having no directional control. If clearance is refused, the only option is to land short of controlled airspace since you can't turn round and go back again! It is even possible to carry a secondary radar transponder.

Geoffrey Powell (Tamworth, Staffordshire) has sent me a photo showing himself operating various bits of radio gear, and, unless I'm mistaken, with an *En Route Supplement* in his hand. Geoffrey gained flying experience in both the RAF and as a private pilot. Although many beacons are v.o.r./d.m.e. combinations, it is only the v.o.r. part that can be tuned on the v.h.f. band. As far as n.d.b.s go, some frequencies are close or even co-channel. Try using the directional null of a ferrite rod or loop antenna to distinguish these; the frequencies are close to or even inside the medium wave broadcast band. I like Geoffrey's philosophy: "Ham radio makes friends everywhere, politics don't." I couldn't think of a better thought to leave you with till next month.

Don't forget that you can also come along to my Museum (make a prior arrangement by 'phoning 01-958 5113 weekdays 1800-2300 hours local). □

Abbreviations:	
Ω	ohms
b.f.o.	beat frequency oscillator
d.c.	direct current
d.m.e.	distance measuring equipment
HART	High Altitude Radio Transponder
i.f.	intermediate frequency
i.l.s.	instrument landing system
IRC	International Reply Coupon
NATO	North Atlantic Treaty Organisation
n.d.b.	non-directional beacon
RAF	Royal Air Force
selcal	selective calling
s.s.b.	single sideband
t.v.o.r.	terminal very high frequency omni-directional radio range
v.h.f.	very high frequency
v.o.r.	very high frequency omni-directional radio range

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IC-R71E HF Receiver £825.00

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IC-R7000 VHF/UHF £957.00

Continuous coverage receiver. 25MHz-2000MHz. FM/AM/SSB modes. Direct frequency entry. 99 memories. Scanning, remote control option.

AR2002 £487.30

The frequency range is from 25 to 550 and from 800 to 1300MHz. Modes of operation are wide band FM, narrow band FM and AM. The receiver has 20 memories, memory scan and a search mode which checks frequencies between user designated limits and a push button keypad for easy frequency entry and operation. A front panel knob allows the listener to quickly step up or down in either 5, 12.5 or 25kHz steps from the frequency initially chosen. 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 30MHz 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.

BLACK JAGUAR Pocket Scanner — £225.00

The Black Jaguar Pocket 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

SPECIFICATION: Frequency Range: Band A: HF: 26-29.995 MHz in 5kHz step. Band B: VHF Low: 60-80 MHz in 5kHz step. Band C: Air & VHF Mid: 115-178 MHz in 5kHz step. Band D: VHF high: 210-260 MHz in 10kHz or 12.5 kHz step. Band E: UHF: 410-520 MHz in 10kHz or 12.5 kHz step.

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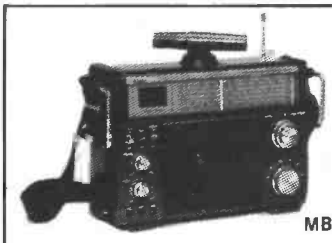

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UNIDEN BEARCAT 70XLT 20 Channel Hand Held Scanner.	£199.95
BLACK JAGUAR MKII Hand Held Scanner with Air Band.	£225.00
SONY ICF700DS PLL Synthesized Receiver.	£169.95
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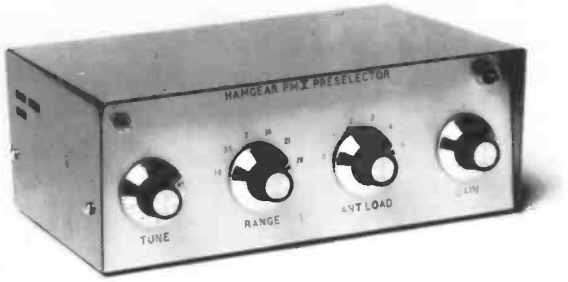
THE HAMGEAR PMX PRESELECTOR



The PMX is an antenna tuning unit combined with an RF amplifier, covering from 1.7 to 34MHz. The ATU section will match into your receiver all those odd lengths of wire whether indoors or out, making the most effective use of the antenna. The amplifier section takes the ATU signal and boosts it to the amount necessary to give you a better readable signal. Some receivers, normally used with no ATU and the odd wire ant, are literally transformed by the PMX; with others the improvement is more subtle but still quite definite. All in all the net result is better copy of the DX.

The PMX is an investment in better reception; you may eventually change your receiver, but you will always keep your PMX.

Some outstanding results have been reported by customers and some of our early units are still in use after 24 years.

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SONY ICF-2001D REVIEW

Jack Aldridge

I'm more than happy with my short wave listening set-up at home, but never turn down the chance of playing with a different receiver, especially one like the ICF-2001D. As well as the normal a.m. and f.m. broadcast band coverage the ICF-2001D features air-band and continuous short wave coverage between 150kHz and 29.999MHz with s.s.b. demodulation thrown-in! All my listening interests in one radio – great.

The Sony ICF-2001D is a fully synthesised portable receiver with loads of features. It fills the gap between a conventional portable receiver and a table-top communications receiver.

First Steps

Perhaps one of the most important points when getting started is to read the manual, which in this case is well up to Sony's normal high standard. I'm the world's worst at reading instructions, usually it's "when all else fails, read the manufacturer's data!". With this radio it is wise to read first as it will save a lot of operating time. It's not that the radio is complex, but it can do so much. You'll find the manual contains instructions in three languages, English, French and Italian with each section being about 21 pages long.

I found the fold out section at the front with all the controls numbered on one side and details of how to connect-up all the accessories on the other really useful (mainly as my memory is useless). It came into its own when I was experimenting with more unusual modes and the various features on the radio.

The presentation used in the manual was excellent with very good use made of diagrams to illustrate points. One section I thought particularly good was the description of synchronous detection, not the easiest thing to explain, but they managed it very well. It was much easier to understand than a lot of text books I have seen.

The final page of the manual was a trouble shooting guide which is really quite important with modern microprocessor based receivers. This guide can certainly save a red face when returning a set which you thought was faulty, but turns out to be mis-operation!

Now to the practicalities of getting going! The first thing to do is lay your hands on two AA batteries as these must be fitted before the receiver will operate. These batteries are required even if you are using an external power source as they are used to power the clock and provide back-up power for the microprocessor. On the review model, there was a large yellow notice wrapped around the antenna to warn the operator to fit these batteries before operating the receiver.

You can drive the ICF-2001D in any one of three ways: internal batteries, external d.c. or mains power. The battery requirement is quite moderate as only three D cells are required, that is in addition to the two AA batteries mentioned previously. Sony reckon that if you use "Sony New Super" batteries and use the radio for four hours a day, the batteries should last for between 32 and 45 hours depending on the type of listening. I can't verify this as I tend to use mains power when at home and only resort to batteries when out portable. I don't think I managed to come even close to 32 hours portable – the summer has not been good enough!

For powering the receiver from an external d.c. supply a 4.5V source will be required. Although 4.5V may seem a bit of an odd value, Sony do produce an optional accessory lead (DCC-127A) which allows the ICF-2001D to be powered from a standard 12V source. The final power supply option is to use the supplied mains power unit which plugs into the external power socket on the radio. Rather than being fitted with the standard, and often inconvenient, two-pin mains plug, this unit is left with a blank cable end so you can fit the correct type of plug. Another useful point is that the mains power unit is switchable between 110V and 240V a.c. so it should be useful for the traveller – no more searching shops in foreign lands for batteries!

The final decision to make when setting up is the antenna. The easiest solution is to use the built-in telescopic antenna which is simplicity itself as you only have to extend it! If you are looking for improved performance then an external antenna is to be recommended. I use a long wire or discone antenna for most of my listening. The connection of external antennas has been catered for with two 3.5mm jack sockets on the side panel, one marked AIR/FM and the other AM. One very good point is that the telescopic antenna is automatically disconnected when a plug is inserted in the external antenna jack. This is really effective in eliminating local interference from say a home computer or television, but is often overlooked on portable radios.

Now we've sorted out the connections let's move on to the controls.

The Buttons & Switches

First impressions of the Sony ICF-2001D are of a staggering array of push-buttons, some 68 in all! Fortunately Sony are used to sorting out the ergonomics of this many controls and the practical operation is nowhere near as complicated as the front panel or my description might suggest. The buttons are neatly grouped according to function and frequency of use. The most commonly used buttons, i.e., band selection, frequency entry and scanning are coloured white so they stand out well, whilst the memory and mode buttons are black. The remaining buttons are used to control the timer and shift functions and are coloured grey and blue respectively.

As well as the push buttons there are two switches which control the power and the tuning rate. The volume control is the normal slider type with the knob mounted so that it is just slightly proud of the surface.

There is only one rotary control on the whole radio and that is the main tuning knob. This is mounted on the right-hand side panel, but remains accessible from the front panel for fine tuning with your thumb. To allow fast tuning, this knob has an indent which allows rapid movement of the knob without your finger slipping. Although the knob is well placed for right-handed users, it's not so good if you happen to be left-handed.

Moving on to the side panels, in addition to the tuning control the right-handed side has a slider control for the r.f. gain when using a.m. and a switch for the tone control. The left-hand side panel contains all the external connections to the radio, this is where the external power and the antenna sockets are mounted. Additionally there are audio output sockets, one for feeding to a tape recorder or amplifier and the other for an ear-piece or headphones. There are two small switches on the left-hand panel, the first controls an attenuator, which can be inserted to reduce the level of overly strong short wave signals. The other switch controls the main power of the radio. It is particularly useful for the traveller as it is quite easy to accidently turn the set on using the front panel power switch. Then you're faced with buying batteries abroad, not easy. By using this switch the front panel control is disabled.

Using the ICF-2001D

The first thing I do, once the set is powered up, is to select my favourite frequency. This can be done in one of two ways: either direct frequency entry using the keypad or by using the manual tuning knob. Both have their uses and it's not all that usual to have both included on the same radio. If you want to roam around a band at will, then the rotary tuning dial is most useful. Whereas if you only have one particular frequency you want to listen to, then direct entry is much faster.

The direct entry of a frequency has been made extremely easy on this radio as only the frequency need be entered then the EXECUTIVE button. Mind you, once you've used the keypad to select your frequency you can then use the rotary control to move around from there if you want. The speed at which the dial moves when using a.m. can be changed. SLOW means 100kHz "steps" and FAST is 1kHz "steps", you can even lock the dial once you've found a station you like.

These days, things like RTTY and AMTOR seem to be growing in popularity, so I thought I'd see how this radio took to those types of signals. I first of all tried amateur RTTY signals, which use a shift of 170Hz, but these proved difficult to resolve. I think this is due to the fact that the ICF-2001D has minimum "tuning steps" of 100Hz, which was a bit too coarse for accurate tuning. Having said that, I did have better results when listening to stations that use much wider shifts. I successfully listened to TASS news broadcasts sent at 50 baud and 425Hz shift.

Amateur AMTOR signals suffered from the same problems as amateur RTTY signals. So if your interest lies mainly with amateur signals, I think you'll be disappointed. If you enjoy listening to the "more interesting" utility stations then you'll have better results.

When trying to listen to my preferred type of signals, i.e. broadcast stations, I got on very well. Starting with the short wave bands, the radio is well equipped for a wide range of signals. There are two modes of a.m. reception, conventional detection and synchronous detection – sounds awful doesn't it!

Synchronous detection is useful for getting rid of "splatter" from stations close to the one you want to listen to. When you normally receive a.m. signals, you listen to both sidebands and the carrier in the middle. With synchronous detection you can choose which of the two sidebands you want to listen to. So, if the offending station is higher in frequency, listen to the l.s.b. part of the a.m. signal, if it's lower, do the opposite. It's not really as complicated as it sounds, you should look the words up in a technical dictionary if you want to see complication! Actually, Sony make a good effort at describing the function in the handbook with the ICF-2001D, complete with a diagram to make it easier to understand.

If you can find a signal with little or no interference (some chance!) then there is another facility at your disposal. The WIDE/NARROW control can make a real difference to the quality of the signal you are receiving. I spent most of the time with the switch in the narrow position, but once or twice things quietened down enough to use the wide position. This made a real difference to the audio quality, especially music which was much brighter. Unfortunately that situation never lasts

Sony seem to have designed this radio for the short wave DX enthusiast as it's packed with gadgets to help winkle out those awkward signals. There's an r.f. gain control that only operates on a.m. which helps to reduce overloading problems. Then there is an attenuator switch which can be used to reduce signals even further. Both of these are most useful when you connect an external antenna.

Sony have added yet another function to help the DXer! If you are trying to listen to a news broadcast or sports programme under really bad conditions, there is a little switch marked HIGH/LOW/NEWS. This is basically just a switched tone control, but was very useful.

I found the secondary function of the memory buttons an ideal aid to DXing. There are thirteen buttons marked to correspond to thirteen short wave broadcast bands. So, when I wanted to listen to 49m, it was just a case of pressing the SHIFT button and the appropriately marked memory button together and the radio went straight to the low frequency end of the 49m band. Once there, you can tune up the band with the manual tuning control. I found this certainly saved a lot of time when I was using the radio as I tend to move around the bands looking for my favourite programmes quite a lot.

My other favourite band is the aircraft band and the ICF-2001D had plenty of features to play with. The first, and most important point, is that it sounded really good, which made a change as many manufacturers dismiss the aircraft band all too quickly. With local signals, I could almost believe I was in the cockpit with the crew, it was so clear! I listened to a lot of aircraft transmissions using both the internal telescopic antenna and a discone. I was lucky that, with the summer holidays around (delays included!), there was no shortage of traffic around to listen to. Luckily, I live quite close to an airport and could try out the performance on both strong local signals as well as the more distant stations.

I did try the radio out using both s.s.b., and f.m. The best place to check s.s.b. I have found are the amateur bands, with 14MHz being about the busiest and hardest work. The 100Hz "tuning steps" weren't a problem on amateur s.s.b. unlike my findings on amateur RTTY. The signal quality on f.m. was rather pleasant and I used it quite a bit as background entertainment whilst writing this review!

SPECIFICATION

Frequency Coverage:	f.m. 76-108MHz a.m. 150kHz-29.999MHz Air 116-136MHz
Sensivity:	a.m. 999kHz 32μV a.m.10MHz 0.8μV (0.2μV) a.m. 125MHz (2.2μV) f.m. 100MHz 3μV (1μV)
Selectivity:	s.s.b. ±5kHz (±4.8kHz) a.m. ±9kHz
Image Rejection:	74dB
IF Rejection:	50dB
IF Frequencies:	55.845MHz and 455kHz
Audio Output:	380mW
Power Consumption:	(200mA, 4.5V @ 380mW output)

Figures in brackets give the measured results.

The radio has 32 memories, which are arranged in four groups of eight. Once you've decided what to fill these with, they can be scanned at will. I must mention here the memo sheets that Sony provide, these are hidden in a vertical drawer on the right hand side of the set. They are so you can record what you've put in which memory, saving the dozens of scraps of paper that usually litter the bench (well mine's littered anyway). There was a total of five sheets in the review model, so if you write in pencil they should last forever.

There are so many options available for scanning the memories, I'd need the rest of the magazine to do them justice, so I'll briefly mention some. You can lock out and skip any memories you don't want to monitor. Each memory holds the mode programmed so you can listen to a mixture of aircraft, s.s.b. and a.m. DXing all one after another. You can also decide whether you want to stop on a memory that's active or move on after a second or so.

You can also search between two frequencies that you have decided or up through any of the thirteen stored broadcast bands. Again you decide whether or not to stop when you find an interesting signal.

Accessories & Oddments

The ICF-2001D also has a built-in clock, sleep timer and a programmable timer. The latter was my favourite. I could set it up to switch on and back off again up to four times a day, and these could be four different stations if I wanted. I could choose between listening for 15, 30 or 60 minutes. What was fun was waking up to the local radio, and then having my two other favourite programmes turning on without me having to remember them as well as the local airport at its busiest.

The accessories that came with the radio were impressive and useful. There were two little junction boxes in with the radio, these were so you could connect an external antenna easily to the 3.5mm socket. This saved me the time and effort of rushing out to buy 3.5mm jacks for my antenna leads — something I don't normally use. I didn't even have to heat up the soldering iron as screw terminals were used in the boxes. You get a strong webbing shoulder strap, which was useful when wandering around airport perimeters.

One feature which I think was put in for the traveller was 7m of wire complete with a clip for use when off on your holidays. The ear piece also is useful whilst on holiday, that way you don't keep everyone else awake with your programmes — not everyone appreciates them. As the socket was a 3.5mm one, I used my usual headphones whilst at home.

Also included is the *Sony Wave Handbook*. That's a 120-page guide to international a.m. and f.m. broadcast stations including schedules. Again I think this is aimed at the traveller as there's not enough room in amongst the luggage for all the frequency guides I usually use. I found the *Aviation Guide* interesting as it gave an outline of the uses of voice communications in aviation. It even included an example of what you might expect to hear and a glossary of terms.

Before the radio went back to Sony, the *SWM* staff put it through it's paces in the lab. The results they sent me make interesting reading as I enjoyed having the radio to play with. When compared with other radios in the "What Receiver" feature, I thought it came out quite well. The measurements confirmed my own impressions that the ICF-2001D is a very sensitive and well engineered receiver which will serve the enthusiast well.

The ICF-2001D is available from any Sony distributor priced around £350. My thanks to *Sony (UK) Ltd.*, for the loan of the radio. □

Abbreviations:	
a.c.	alternating current
a.m.	amplitude modulation
AMTOR	AMateur Teleprinter Over Radio
dB	decibel
d.c.	direct current
DX	"long distance"
f.m.	frequency modulation
Hz	hertz
kHz	kilohertz
l.s.b.	lower sideband
m	metre
mA	milliampere
MHz	megahertz
mm	millimetre
mW	milliwatt
r.f.	radio frequency
RTTY	Radio TeleTYpe
s.s.b.	single sideband
V	volt

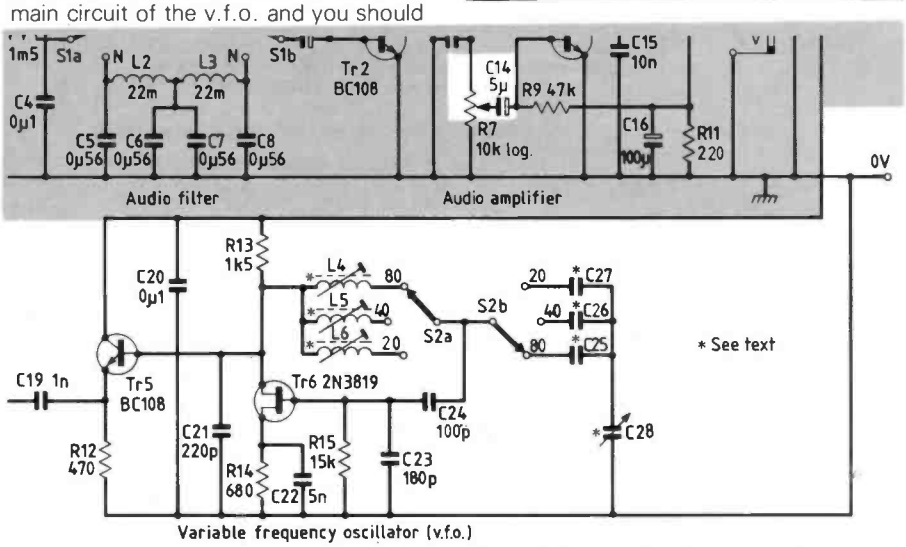
THREE-BAND SSB RECEIVER

C. M. Lindars

This part describes the construction of the variable frequency oscillator which will give you some more practice in soldering components to tags and teach you how to wind simple coils.

The first section of the receiver, the audio amplifier built on a tag board, was described in Part 2. Logically the v.f.o. is the next stage to build as it uses similar constructional techniques to the audio amplifier with the interesting addition of the now almost forgotten art of coil winding.

The rest of the tag board left over from the audio amplifier is used to build the main circuit of the v.f.o. and you should follow the layout of the components shown in Fig. 3.2. Remember how you fitted them onto the board last month? If not refer back to Part 2 to refresh your memory.



Variable frequency oscillator (v.f.o.)

Fig. 3.1: Circuit diagram of the v.f.o. Please note that in the audio amplifier section described in Part 2 the 5µF electrolytic capacitor C14 was shown the wrong way round in the circuit diagram (Fig. 2.1). It was shown correctly in Fig. 2.2 and has been corrected in this version.

YOU WILL NEED

Variable Frequency Oscillator

Resistors

¼ W 5% Carbon film

470Ω	1	R12
680Ω	1	R14
1.5kΩ	1	R13
15kΩ	2	R15

Capacitors

Polystyrene

100pF	1	C24
220pF	1	C21
1nF	1	C19

Silvered mica

180pF	1	C23

Polyester

5nF	1	C22

Disc Ceramic

0.1µF	1	C20

Sub-min. plate ceramic

6.8pF	1	C26
12pF	1	C27
100pF	1	C25

Variable air spaced

5 – 28pF	1	C28 (see text)

Semiconductors

Transistors

BC108	1	Tr5
2N3819	1	Tr6

Miscellaneous

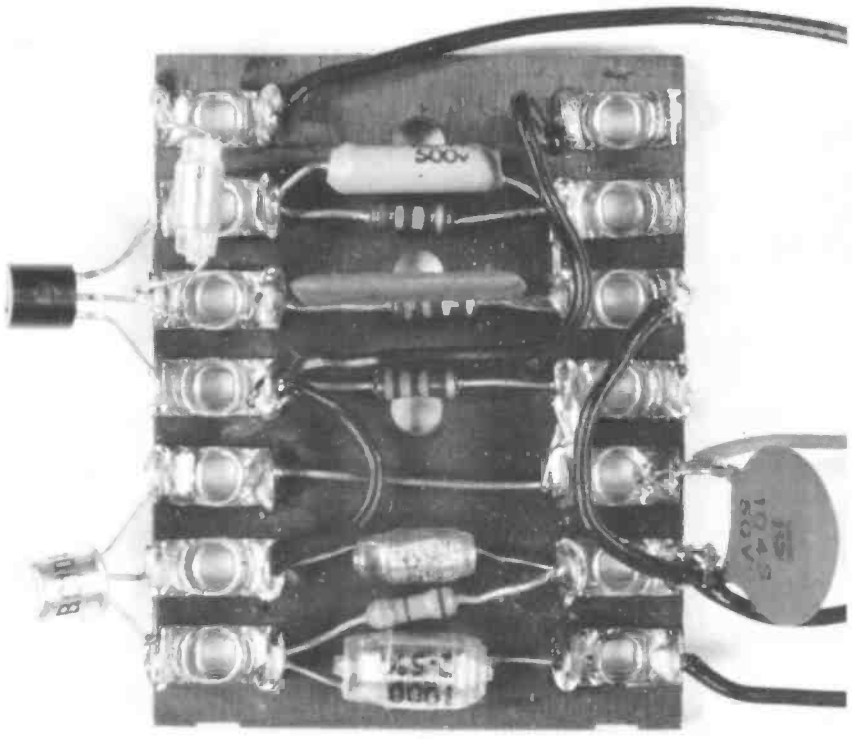
Miniature group panel (tag board); 10mm dia. coil formers with dust iron cores (4); Rotary switch 4p3w; 30s.w.g. enamelled copper wire.

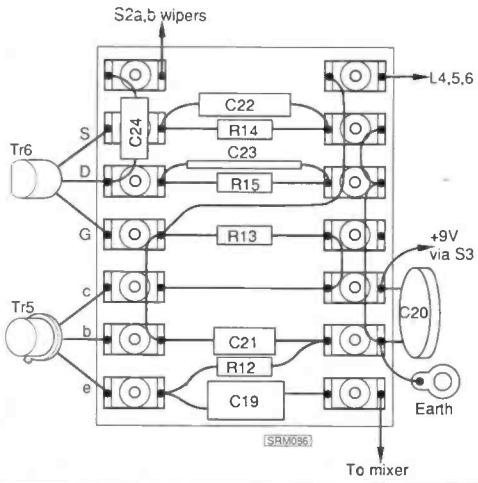
Coils

Now we come to the interesting bit – winding the coils. In the past the enthusiastic constructor would spend hours winding different coils to "improve" various aspects of the performance of his receiver. Now things are very different and coil winding is almost a forgotten art! Fig. 3.3 shows the basic coil assembly and for the v.f.o. you will need three of these coils – with different numbers of turns of course.

Take one of the coil formers and a length of 30s.w.g. enammelled copper wire about 1m long. Pass one end of the

Fig. 3.2. Completed v.f.o. board.





THREE-BAND SSB RECEIVER

Part 3

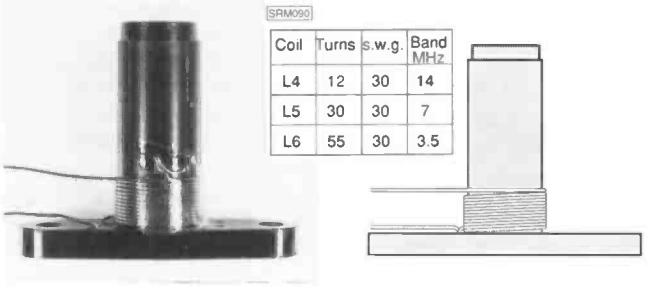


Fig. 3.3: Coil winding details.

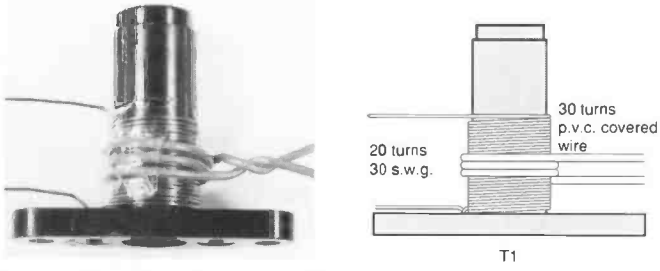


Fig. 3.4: Winding details for T1.

wire down through one of the two small holes in the base and then back up through the adjacent hole to lock the end in place, leaving about 100m free for connecting to the rest of the circuit. Now carefully wind the required number of turns around the coil former pushing the turns close together to the bottom of the former. When you have the required number of turns wound onto the former, secure the top end of the wire with a small piece of adhesive tape and then run a "strip" of "15 minute" epoxy adhesive (e.g. Araldite) down the windings to permanently fix them in place. Repeat this for the other two coils.

Winding T1

While you are coil winding you might as well wind T1. This consists of 20 turns of 30s.w.g. enammelled copper wire wound in exactly the same way as L4, 5 and 6. When the adhesive has set, carefully wind three turns of pvc covered "hook-up" wire over the top of the 20 turn coil and secure in place with some more "15 minute" epoxy adhesive.

You should now check your work carefully just as you did with the audio amplifier module. It is not really practical, however, to test the v.f.o. before it is properly installed in the case.

In Part 4 we will cover the remaining parts of the circuit before dealing with the case and final wiring in Part 5. □

Abbreviations	
s.w.g.	standard wire gauge
v.f.o.	variable frequency oscillator
4p3w	4 pole-3 way (switch)

SCANNING

Alan Gardner

There's exciting news for AOR fans. A demonstration of a pre-production version of their proposed new scanner, the AOR 3000 was available at the NEC Amateur Radio Exhibition. You may remember I mentioned in the April issue that AOR had run into difficulties with this new model. However, it now seems that most of the major design problems have been overcome and production should by now be well underway.

The major features include: coverage from 500kHz to 2075MHz, tuning in various step sizes from 50Hz to 100kHz, detection of a.m., w.b.f.m., n.b.f.m., u.s.b. and l.s.b., 400 memories, built-in computer interface, lockout of individual frequencies within search limits, tuning dial, S-meter, size the same as 2001/2002.

What more can I add? This looks like setting the trend for other manufacturers as with the initial introduction of the 2001. AOR seem to have done some good design work, with a GaAs-f.e.t. in the r.f. stages and 15 separate switched filter banks being used to give good signal handling performance across the very wide frequency range. The price is expected to be around £800 with the first models arriving anytime now.

For more details you should contact Lowe Electronics Ltd., Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: 0629 580800.

With modern scanning receivers covering such large frequency bands the choice of antenna becomes limited. Waters & Stanton may have the solution to this problem with two new active antennas. These have a claimed frequency coverage of 500kHz to 1500MHz and feature an adjustable r.f. gain control mounted on the power supply interface unit. The base station version consists of a 1.5m long glass fibre rod, with the active circuit encapsulated at the bottom of the tube. The retail price is expected to be around £90. The other version is intended for mobile use and has a 1.2m whip section with the active components again mounted at the base. The price of this model is likely to be £60.

For further details contact: Waters & Stanton, 18–20 Main Road, Hockley, Essex RM11 1QX. Tel: 0702 206835.

Cordless Telephones

BT has, for several years, been carrying out research into various forms of cordless telephone systems. Most of the recent trials have been centred at around 900MHz, with many experiments aimed at assessing the propagation of these frequencies within typical office buildings. Much of this research is aimed at providing an office orientated cordless telephone exchange. With the current generation of cordless telephones this is not possible, mainly due to the limited number of channels available.

This month's column begins with a look at two new products of interest to scanning enthusiasts.

Most current cordless telephones are adaptations of the older (illegal) designs, with different transmit and receive frequencies, improved r.f. filtering to reduce spuriously transmitted frequencies, increased electrical safety and in some, but not all cases, the addition of a security code to prevent illegal outside usage.

The operation of current generation cordless telephones is very simple. An incoming call is transmitted by the base unit to the handset using n.b.f.m. at approximately 1.7MHz. The handset receives this signal on an internal ferrite rod antenna and, after detection, causes an alarm signal to sound. On hearing this signal the user raises the telescopic antenna on the handset and switches it to "talk". This causes the handset to transmit back to the base station again using n.b.f.m., but this time at around 47MHz. The handset also transmits an additional signal in the form of a high frequency tone, usually around 6kHz, superimposed on top of the speech signals. This tone is filtered out at the base station and is used to switch the speech circuits to line, thus connecting the call. Part of the speech signal from the handset is routed back via the base station to the handset in order that the user can hear himself speak, as with a normal telephone.

In order to make an outgoing call, the user again switches the handset to talk, the base station detects the 6kHz tone and connects the system to line. When the user starts to dial, the 6kHz tone is interrupted by the dialling circuitry in the handset – this causes the line to disconnect momentarily on each dialling pulse, thus providing the loop disconnect dialling associated with a normal telephone.

This is a very simple system which under normal circumstances works very well. However, for business use it has several drawbacks, the main ones being very limited re-use of the channels available, short range, lack of security and no provision for interfacing with private switchboards. BT's research has led to the development of a specification for the next generation of cordless telephones, termed CT2. The idea behind this system is that as well as being able to use the handset as a normal cordless telephone at home, you can take it with you to the office, or make calls from selected public places where a "Phonezone" has been established. The unit's telephone number is electronically built into the handset, so you carry your phone number around with you. Nicknamed "the poor man's cellphone" and at around £150-200, CT2 is likely to be one of the fastest selling electronic consumer goods during the next few years with a major launch scheduled for later this year. Three main companies – BT, Ferranti and Shaye Communications (connected with Clive Sinclair) are expected to offer systems, so expect to see public base stations appearing from now on, with some of the first installations expected in service stations on the M25.

One of the most interesting features of the new system is its method of transmission. This is going to be digital, using forty 100kHz wide channels between 864 – 868MHz. Dynamic channel allocation will be used with the system automatically finding a clear channel from the forty available. Speech will be encoded at 32Kbit per second using an adaptive differential pulse code modulation algorithm, this is then framed into 1ms bursts and transmitted at 72Kbit per second using f.s.k. That's not all, transmissions are interleaved to give time division duplex operation on a single radio channel. This provides increased security against casual eavesdropping and also doubles the number of channels available. As only one channel is now needed for a two-way conversation, as opposed to the present requirement for two, transmitter power will be in the region of 10mW giving a range of around 100m from the base station.

These features permit a much higher degree of channel re-use, with experts predicting up to 5000 users per square kilometre, as opposed to the current figure of around 100 or so. Keep your eyes peeled as high street chains such as Dixons expect to stock some models towards the end of the year.

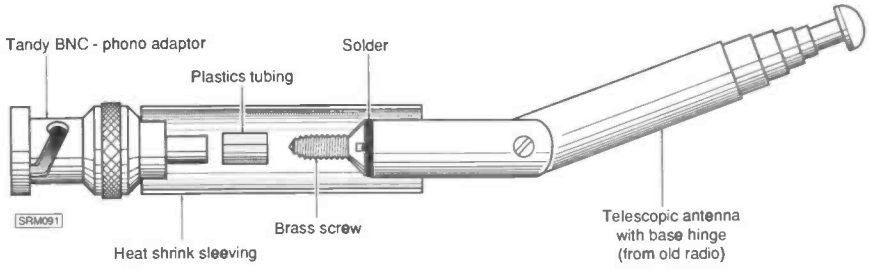
AOR AR-800E Antennas

Ian Smith of Paisley has just caught the scanning bug after purchasing an AR-880E handheld scanner. He finds that the receiver works well, but can be improved by substituting a telescopic antenna in place of the supplied helically wound antennas. This permits adjustment of the length of antenna to 1/4 wavelength at the frequencies of interest. The approximate length of antenna section in centimetres being given by the formula: 7500 divided by frequency in MHz.

Ian has made his own telescopic antenna from readily available parts, see Fig. 1. The most difficult aspect of construction is soldering a screw to the base of the antenna as you may have to use a blow lamp or gas ring to get the parts hot enough for the solder to melt.

Place a short length of suitable plastic tubing over the screw up to its bevel in order to form an insulator. This is then screwed into the centre of the phono socket, taking care that no part of the antenna touches the metal outer of the adaptor. Finally, a length of heat shrink sleeving placed over the lower section of the antenna and the top of the BNC adaptor helps to hold the parts together and creates a neater looking finish. Ian concludes his letter by saying, "I'll bet there is an easier way to do this but I always like to be difficult!" That may be true Ian, but at least you have found a method that works, which is a good starting point for anyone else who wants to make one, so many thanks for your notes.

Fig. 1



SMC 8400A

John Bidgood of Southampton has just obtained a SMC 8400A scanner and finds that he can enter and search frequencies between 26 – 55MHz which is outside the specified range of the receiver. He asks if the scanner is actually working on these frequencies or is it just the display fooling him?

I must admit that I don't have any experience of this particular scanner John, but I am sure that at least one of the readers of this column will have some information, perhaps even a few modifications they may like to share – how about it? In the meantime John, you should be able to tell if it is working on this particular band, especially at the moment as conditions are very good with many different types of stations being heard at very strong signal levels, even with very simple antennas. Why not have a listen for a few days, try initially around 26 – 27MHz you should at the very least hear a few local CB stations. Let me know your findings.

Converter Update

D. L. Prince writes from Dyfyd to correct me for saying that one of the first uses of convertors was for TV reception. He can remember convertors being offered as long ago as 1933, when they were produced to give short wave reception between 15 – 80m on normal domestic receivers, with only long and medium wavebands.

Well I guess that the next postbag will bring me a letter recalling an even earlier example – as Mr Prince says in his letter, "there is nothing new in Wireless".

Neil Buchanan of Lisburn, Co. Antrim has been experimenting with his Tandy PRO-2004 and finds that it is possible to extract a 10.7MHz i.f. signal from the "Tape Out" socket. Although theoretically this should not happen, he finds that there is enough leakage from the i.f. stages to make it possible to feed a short wave receiver from the socket.

He uses this method to receive s.s.b. signals by tuning the scanner to the frequency of interest and then after selecting w.b.f.m., tunes the short wave receiver around 10.7MHz, with s.s.b. selected until he can resolve the signal. One other tip that he mentions is that the level of signal leakage seems to increase if the squelch is fully closed, so it is a good idea to put frequencies – such as s.s.b. calling channels into the memories for rapid recall.

Note that w.b.f.m. has to be selected for this to work, as it is only in this mode that the receiver uses 10.7MHz as one of its i.f.s. Neil says that the great advantage of using this method of extracting an i.f. signal is that no modifications have to be performed to the scanner, which could involve problems with equipment warranties.

He has also tried feeding a TV set from the socket to see if there was sufficient leakage from the first i.f. to allow it to be used as a converter for long distance TV reception – as I outlined in the July column. However he has found that there is not enough leakage at the u.h.f. frequencies involved to give discernable pictures, but this could be a good starting point for further experimentation.

TV Frequencies

Along the same lines, **Peter Turner** of Ipswich has tried the R7000/TV modification mentioned previously, and is very pleased with the results. He now wonders what the best frequencies are to monitor. Well Peter, I have found that the best method is to let the scanner find them for you, get it to search over the TV Band I (41 – 68MHz), Band III (174 – 225MHz), Band IV (471 – 585MHz) and Band V (610 – 890MHz). You will often be surprised by what you can find even during the most disappointing of conditions. Band I is the favourite with many strong Eastern European being detectable at the moment. However you may find that you have to tune slightly away from the main vision carrier frequency to obtain the best results by avoiding interfering signals on adjacent channels. I have included a short list of the most common Band I/III TV channels for your guidance, but as I say, in many cases it is easier to just tune around and save any good frequencies in memory channels for future reference.

If you are interested in Long Distance Television Reception then I can recommend the book *A TV-DXers Handbook BP176* by R. Bunney. Published by Bernard Babini Publishing Ltd and – yes, you guessed it – available through the *SWM* book service (Do I get a bonus for this?). This is an invaluable reference book and contains details of international channel numbers and frequencies, antenna designs, receiver circuits as well as many hints and tips on the subject.

As a final note Peter has offered free of charge (but please enclose an s.a.e.) short lengths of the sub-miniature coaxial cable used in the modification. If you would like some of this cable send your letter to me and I will pass it on to him.

As usual all mail to PO BOX 1000, Eastleigh, Hants SO5 5HB. If you require items returning please enclose an s.a.e. Until next month – Good listening □

Abbreviations	
a.m.	amplitude modulation
BNC	type of coaxial connector
BT	British Telecom
f.m.	frequency modulation
f.s.k.	frequency shift keying
GaAs-f.e.t.	Gallium Arsenide field effect transistor
Hz	hertz
i.f.	intermediate frequency
kHz	kilohertz
l.s.b.	lower sideband
m	metre
MHz	megahertz
ms	millisecond
mW	milliwatt
n.b.f.m.	narrow band frequency modulation
NEC	National Exhibition Centre, Birmingham
r.f.	radio frequency
s.a.e.	stamped addressed envelope
s.s.b.	single sideband
TV	television
u.h.f.	ultra high frequency
u.s.b.	upper sideband
w.b.f.m.	wideband frequency modulation

REMINISCENCES

George Hewlett

The first wireless set I had ever seen belonged to an uncle and on one occasion I was allowed to turn the two large knobs under his watchful eyes. At that time, in 1924 and then aged 13, I viewed the set as a really magnificent piece of equipment. Measuring about 15 x 12in with a sloping panel, at the top were four valves of the pinched nipple type. "Dull emitters", I was told.

Below each valve was a small knob which turned the arm of a rheostat to control the brightness of the valves. To the left of this assembly were several large coils, one of which could be moved from a horizontal position to the vertical.

At the bottom were two large dials, each marked 0 to 100 which I was allowed to turn.

Eccentric Uncle

My uncle, however, was a bit of an eccentric for soon afterwards, much to my dismay, the wireless was relegated to a position on the first floor landing, covered in a dust sheet, never to be used again as far as I know. Yet it was complete with its loudspeaker, l.t. and h.t. batteries, and even had an aerial attached!

Although my uncle appeared to take no further interest in tuning-in the long and medium waves, he nevertheless continued to purchase a wireless magazine which I, in due course, was allowed to read and digest, much to my later advantage.

And so the idea of owning my own receiver became my aim.

The following year, 1925 and aged 14, I obtained a job as errand boy at a local electrical and wireless shop, one of my daily duties being to empty the waste-paper baskets and rubbish bins, not only in the offices and shop, but also on the workshop floor where wireless sets were assembled from kits.

Out of a Job

Six months later I was out of a job, the firm having gone into liquidation, but not before I had "scrounged" almost all the parts I required to build a simple set of my own; a couple of tuning condensers (capacitors), a valve holder, an h.f. choke or two, fixed capacitors and resistances, plus all the terminals and other bits and pieces.

By that time I had read in wireless magazines of correspondents who had tuned into Australia using one-valve sets and the idea appealed to me immensely, so much so that I was determined to do the same.

My first attempt was to be a one-valve set, 0-1-0, the valve probably a Mullard PM2DX. The only thing I now needed, apart from batteries, were a couple of coils for short wave listening.

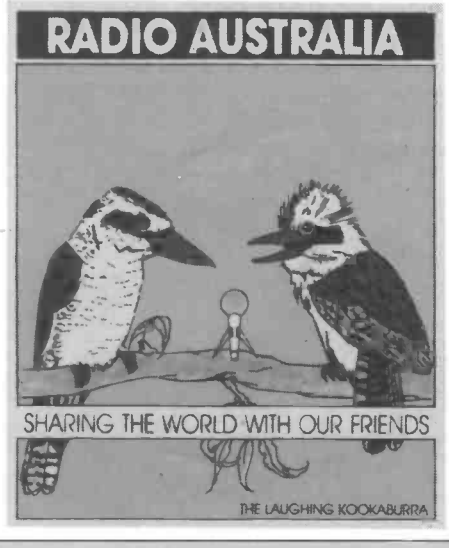
Tune into any frequency on which there is a broadcast station and the chances are that it will be heard, provided that the transmission is beamed to the listener's area at a suitable time of the day or night. That is thanks to the sophistication of modern transmitters and receivers. But it was not always so simple as that for in the 20s both receivers and transmitters were often very crude.

Eventually I found a suitable pair at another local shop, costing 2s 6d each (today's price 25p the pair!). With a diameter of about 3in they would have done justice to any transmitter. Marked 25 metres I knew they would do very nicely to start with. "Use in conjunction with a 0.0003μF tuning condenser", said the instructions.

My tuners were both 0.0005μF, too large for satisfactory use on the short waves, but that was no problem, for tuners of 60 years ago were so manufactured that each could be stripped and then re-assembled with fewer vanes, using the spare spacing washers to double-space the remaining vanes.

Assembled

Once assembled, having acquired batteries, the set was coupled to two wires stretching down the sloping stairway ceiling and then across the kitchen ceiling to a corner. The set worked, but was far from satisfactory. For one thing hand capacitance was rife, making it difficult not only to hear anything but also to retain reception long enough to identify the station.



The set had no front panel, the only controls being the variable coil-holder, its secondary coil of 3 turns providing the necessary reaction required, and a single tuner which tuned the other 5 turn coil.

Once again a wireless magazine came to my aid: it showed not only how to get rid of some, if not all, of the hand capacitance howling, but also how I could obtain a better control over reaction by placing my second tuner (until then spare) in series with the secondary coil.

This was a major step forward and although at that time I was restricted to 25 metres, I could now retain any transmission long enough to identify it. My target, however, was Australia and so far I had failed night after night, only to discover that I had been tuning-in at the wrong time of the day and that I should try early mornings.

A Bit of Luck!

Then a bit of luck! A neighbour gave me an old 4-valve set used for long and medium wave reception, together with its coils. No use for short waves, of course, but with the set came an h.t. eliminator (a mains rectifier which yielded d.c. voltages from 50 to 90 volts in 10-volt stages. There was also a trickle charger for my one and only accumulator.

From articles in the wireless magazine I also discovered that my one-valve receiver could be tuned into a one-valve converter, taking the four leads into the base of a broken valve and then plugging into the detector valve socket of the domestic receiver, giving me a two-valve amplifier to boost the converter.

Came the following Saturday and, before going to bed, I set up my rig ready for an early rise on the following day. Getting up just before 5am I tuned into some music and waited. Just on the hour came the call of the kookaburro. Success at last!

Six Months Waiting

After more than six months of waiting there came my first-ever QSL card, one which confirmed reception of VK3AR at Lyndhurst, Australia, and issued by the Australian Post Office. The card was buff-coloured, small and with 3AR typed in, not very impressive perhaps, but to me a major step forward in being a short wave listener.

The world of short wave listening was, however, changing almost dramatically, Strattons (Eddystone) had brought out a huge range of short wave equipment; plug-in coils (4-pin and 6-pin, the first having two windings for use in the h.f. antenna input stage, and the latter in the detector stage of the receiver). There were

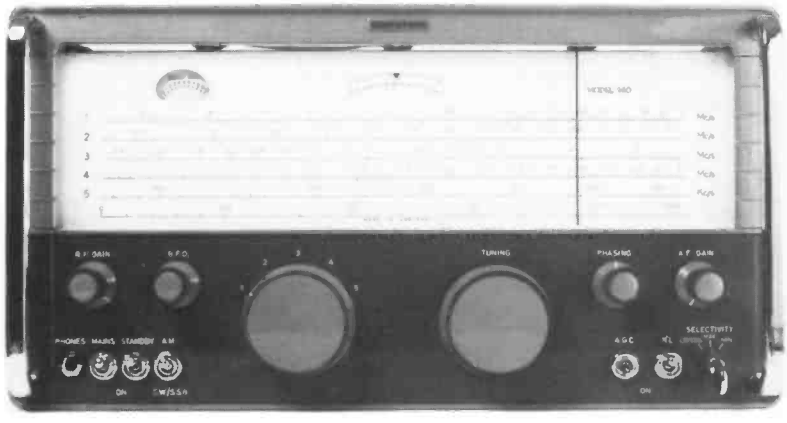
50 ▷

RESTORING AN EDDYSTONE 940 RECEIVER

Part 2

T. J. Wright G1BCR/G9BZW

This part covers modifications to improve the selectivity and thus enable effective use on today's crowded bands.



With the covers in place, connect up the receiver and run it for an hour or so with a towel covering the air vents. Keep an eye on it as the temperature will rise dramatically! If any component is likely to fail it will do so under these conditions. Switch off and allow to cool for a couple of hours, repeat the cycle and correct any faults that may have shown up.

Noise

Next, remove the casing and coil pack cover and replace the carbon resistors in the first r.f. stage, l.o. and first i.f. stage with metal film resistors to lower the noise. This may be necessary in the first audio amplifier also. Fit R20 from V3 grid (pin 2) to chassis and not to the a.g.c. line as variations in mixer current will "pull" the l.o. Replace the a.g.c. bias resistors, polyester capacitors with polycarbonate types, polystyrene capacitors with mica or ceramic types, and completely re-align the receiver. At this point I carried out noise figure tests and tried a different ECC189 r.f. valve V1 and ECH81 mixer valve V3 and got some improvement.

Bandwidth

My next step was to reduce the bandwidth, giving a better "minimum usable sensitivity" for a given noise figure as a bonus to improved adjacent channel selectivity.

Extract all i.f. transformers and remove the cans. The tertiary windings can cause stray leakage coupling across the transformer and degrade the skirt selectivity curve; carefully remove them and link the pins. Refit the i.f. transformers. Completely re-align to the centre frequency of the crystal filter, as described in the manual. Check out the receiver and note the difference!

BFO Swing

The b.f.o. tuning capacity or swing, on early production sets, is reduced by carefully bending outwards the fixed-vanes at the front and rear. On later sets simply remove the rear fixed vane altogether. Set to mid-way position and zero beat by adjusting the coil core, then check that ±3kHz is obtained. The original was over 6kHz and too coarse.

The front wafer of the selectivity switch – S2a,b in Fig. 2.2 – is re-wired as shown in Fig. 2.3. You should use the Eddystone circuit diagram (Fig. 2. 2), to help you identify the various components connected to the switch. Having located S2a connect all three contacts of the switch together and remove the wire connecting the MAX and MIN contacts to the bottom of the tertiary windings of T1. Remove the link wire connecting the MAX and MIN contacts of S2b.

Further Modifications

The contacts on the rear wafer, S2c, freed by removing the tertiary windings on T3, will be used for the "stenode" modification to be described in Part 3. Other modifications to come include a squelch circuit, tape monitor, i.f. output and a l.o. output to drive a digital frequency display. □

Abbreviations	
a.f.	audio frequency
a.g.c.	automatic gain control
b.f.o.	beat frequency oscillator
i.f.	intermediate frequency
l.o.	local oscillator

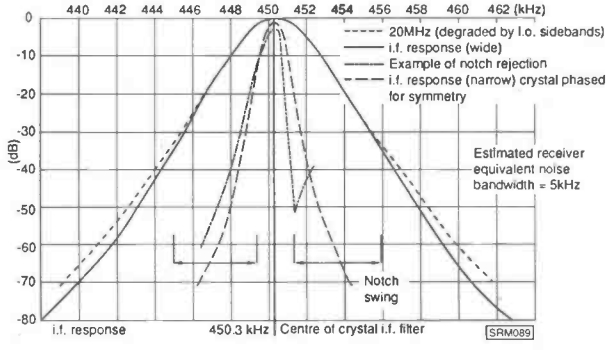


Fig. 2.1:

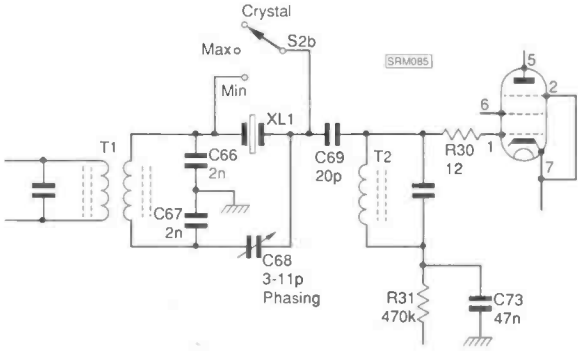
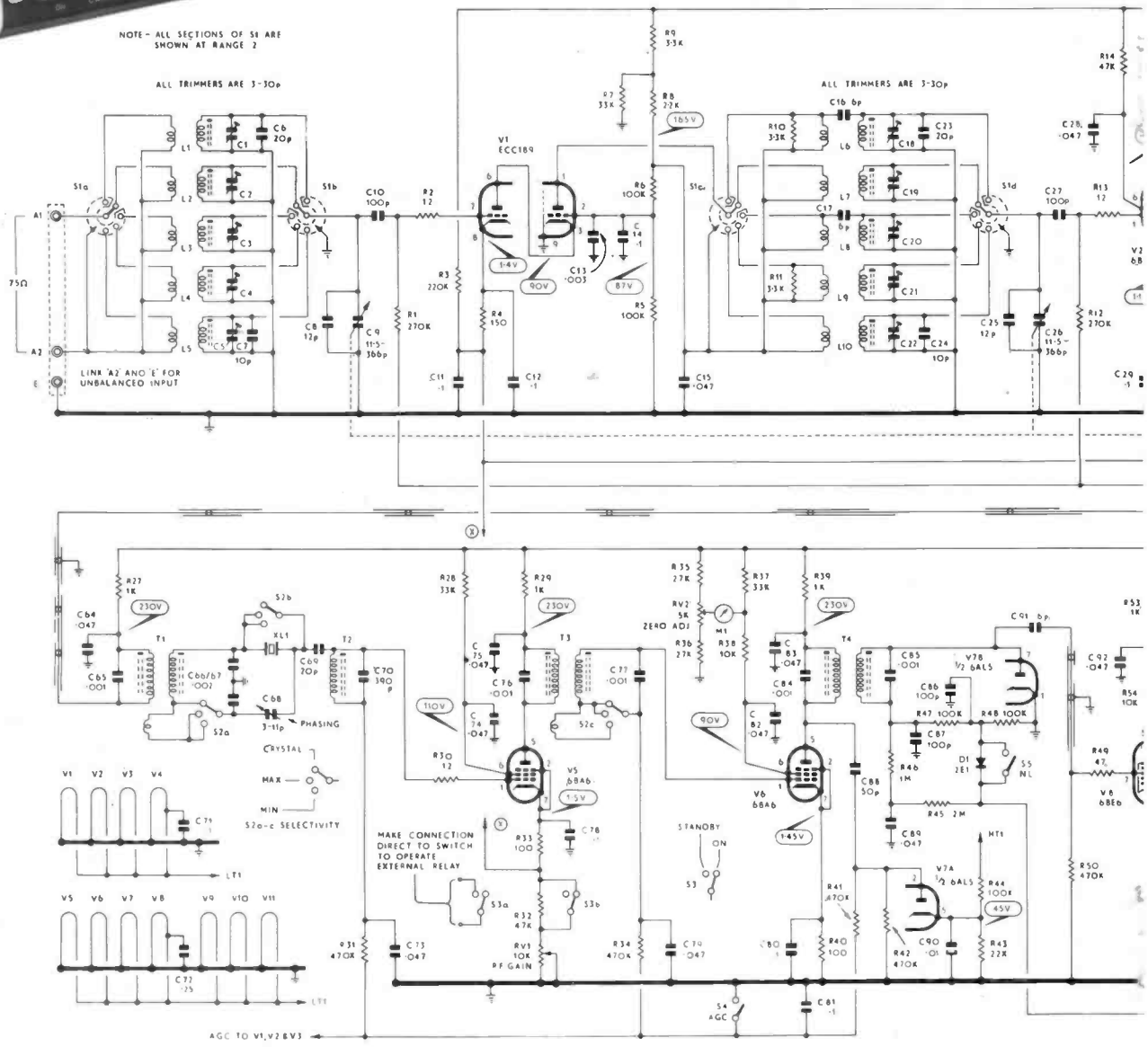


Fig. 2.3: Modifications to T1 and S2a, b.



CAPACITORS

C1–5, 18–22, 33–37, 49–53 : 3–30 pf Air Trimmer.
C6, 23, 38, 58, 60, 69 : 20 pf Silvered Mica±10% 350V DC.
C7, 24, 39, 56 : 10 pf Silvered Mica±10% 350V DC.
C8, 25, 40 : 12 pf Tubular Ceramic±10% 350V DC.
C9, 26, 41, 63 : 4–gang Air Spaced Variable.
C10, 27, 42, 48 : 100 pf Polystyrene±5% 350V DC.
C11, 12, 14, 29, 44, 71, 78, 80, 81 : 0·1 uF Plate Ceramic + 80—20% 200V DC.
C13 : 0·003 uF Metallised Paper±20% 350V DC.
C15, 28, 30, 43, 46, 64, 73–75, 79, 82, 83, 89, 92 : 0·047 uF * Polyester±10% 400V DC.
C16, 17, 31, 32, 91 : 6 pf Tubular Ceramic±10% 350V DC.
C45, 88, 93 : 50 pf Tubular Ceramic±10% 350V DC.
C47, 86, 87 : 100 pf Tubular Ceramic±10% 350V DC.
C54 : 0·004 uF Silvered Mica±1% 350V DC.
C55 : 3625 pf Silvered Mica±1% 350V DC.
C57 : 1625 pf Silvered Mica±1% 350V DC.
C59 : 1200 pf Silvered Mica±1% 350V DC.
C61 : 400 pf Silvered Mica±1% 350V DC.

*0·05 uF may be fitted as alternative.

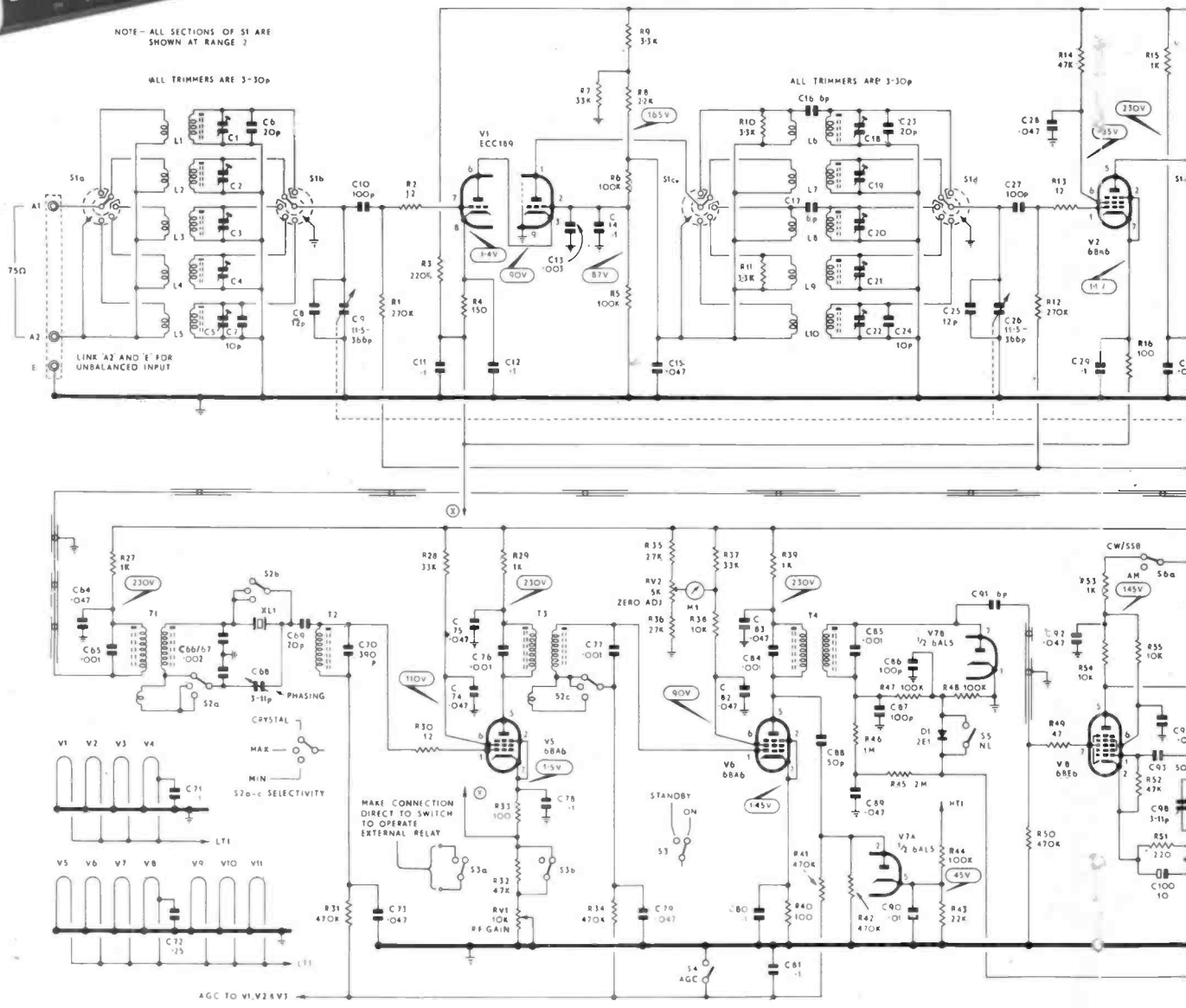
C62 : 15 pf Tubular Ceramic±10% 350V DC.
C65, 76, 77, 84, 85 : 0·001 uF Polystyrene±5% 125V DC.
C66, 67 : 0·002 uF Polystyrene±5% 125V DC.
C68, 98 : 3–11 pf Air Spaced Variable.
C70 : 390 pf Polystyrene±5% 125V DC.
C72 : 0·25 uF Metallised Paper±20% 150V DC.
C90, 101, 103–105, 107 : 0·01 uF Tubular Ceramic±20% 350V DC.
C94 : 0·01 uF Metallised Paper±20% 150V DC.
C95, 96 : 500 pf Metallised Paper±20% 350V DC.
C97 : 0·005 uF Tubular Ceramic±20% 350V DC.
C99 : 200 pf Silvered Mica±5% 350V DC.
C100 : 10 uF Tubular Electrolytic 16V DC.
C102, 106 : 25 uF Tubular Electrolytic 25V DC.
C108 : 32 - 32 uF Tubular Electrolytic 350V DC.
C109 : 50 uF Tubular Electrolytic 450V DC.

RESISTORS

R1, 12, 57 : 0·27 MΩ±10% ½ watt.

Fig. 2.2: Complete circuit diagram of the Eddystone 940 receiver reproduced by

RESTORING AN EDDYSTO



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C10, 27, 42, 48 : 100 pf Polystyrene±5% 350V DC.
C11, 12, 14, 29, 44, 71, 78, 80, 81 : 0·1 uF Plate Ceramic – 80 —20% 200V DC.
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C108 : 32 – 32 uF Tubular Electrolytic 350V DC.
C109 : 50 uF Tubular Electrolytic 450V DC.

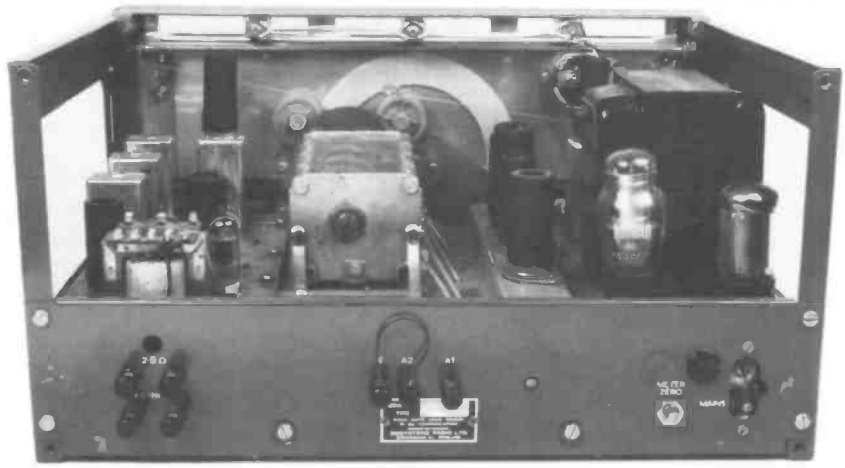
RESISTORS

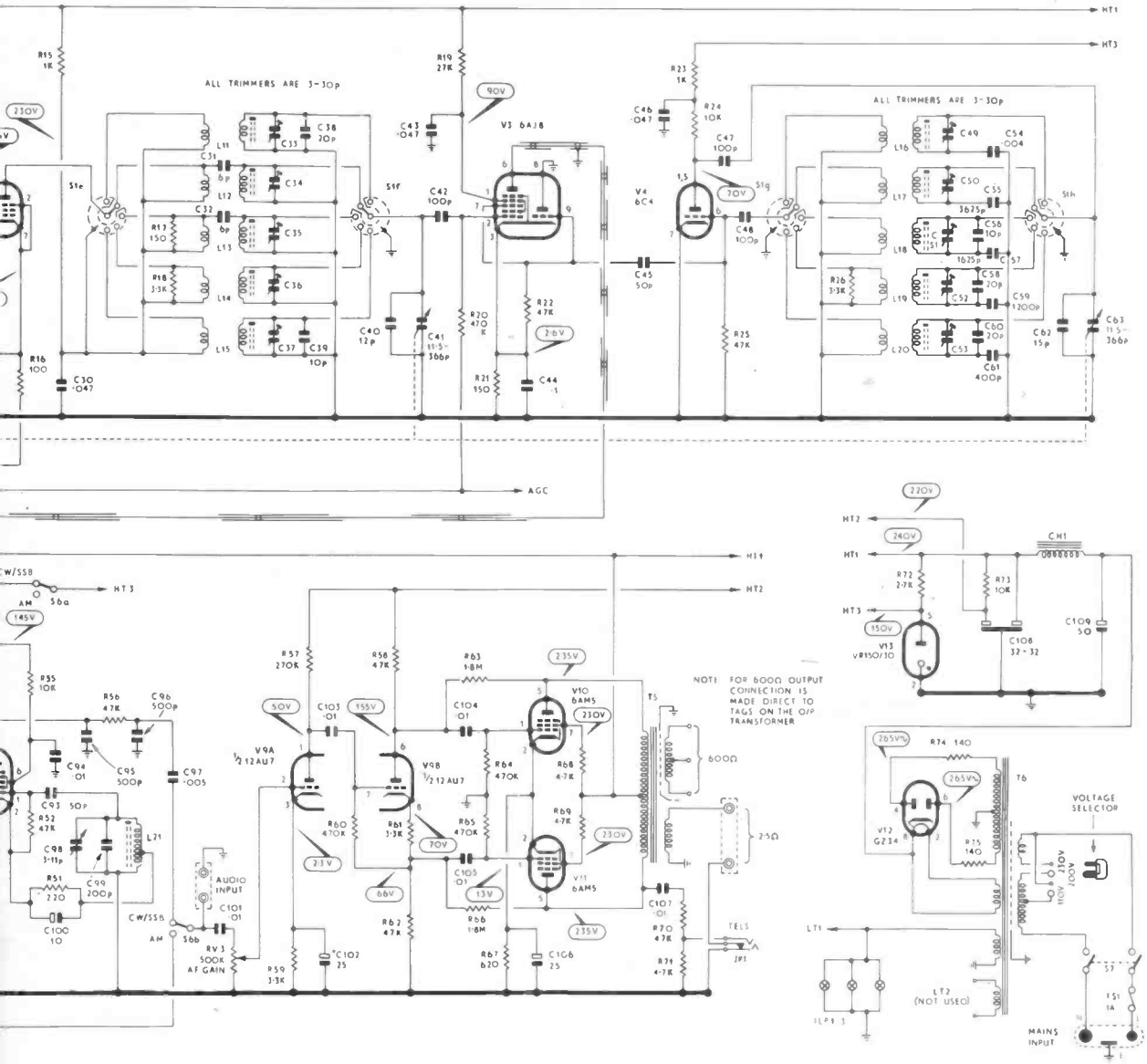
R1, 12, 57 : 0·27 MΩ±10% ½ watt.

R2,
R3 :
R4, 1
R5, 6
R7, 2
R8 :
R9 :
R10, 1
R14 :
R15, 2
R16, 3
R19, 3
R20, 3
R22, 2
R24, 5
R38, 7
R43 :
R45 :
R46 :
R49 :

Fig. 2.2: Complete circuit diagram of the Eddystone 940 receiver reproduced by kind perm

STONE 940 RECEIVER





R2, 13, 30 : 12Ω ±10% ½ watt.
R3 : 0·22MΩ ±10% ½ watt.
R4, 17, 21 : 150Ω ±10% ½ watt.
R5, 6, 44, 47, 48 : 0·1MΩ ±10% ½ watt.
R7, 28, 37 : 33,000Ω ±10% 1 watt.
R8 : 2,200Ω ±10% ½ watt.
R9 : 3,300Ω ±10% 1 watt.
R10, 11, 18, 26, 59, 61 : 3,300Ω ±10% ½ watt.
R14 : 47,000Ω ±10% 1 watt.
R15, 23, 27, 29, 39, 53 : 1,000Ω ±10% ½ watt.
R16, 33, 40 : 100Ω ±10% ½ watt.
R19, 35, 36 : 27,000Ω ±10% 1 watt.
R20, 31, 34, 41, 42, 50, 60, 64, 65 : 0·47MΩ ±10% ½ watt.
R22, 25, 32, 52, 56, 58, 62, 70 : 47,000Ω ±10% ½ watt.
R24, 54, 55 : 10,000Ω ±10% ½ watt.
R38, 73 : 10,000Ω ±10% 1 watt.
R43 : 22,000Ω ±10% ½ watt.
R45 : 2MΩ ±10% ½ watt.
R46 : 1MΩ ±10% ½ watt.
R49 : 47Ω ±10% ½ watt.
R51 : 220Ω ±10% ½ watt.
R63, 66 : 1·8MΩ ±10% ½ watt.
R67 : 620Ω ±10% ½ watt.
R68, 69 : 4,700Ω ±10% 1 watt.
R71 : 4,700Ω ±10% ½ watt.
R72 : 2,700Ω ±5% 6 watt wire-wound.
R74, 75 : 140Ω ±5% 6 watt wire-wound.

VOLTAGES

All voltages indicated on the circuit above were taken using a meter of 20,000Ω/V sensitivity and an applied mains voltage of 240V. A variation of ±5% should be allowed and readings should be taken between the point indicated and chassis. Range switch should be at '5.' Gain controls at maximum, Mode switch to CW/SSB, Standby switch to ON and AGC OFF.

kind permission of Chris Pettitt G0EYO, Managing Director, Eddystone Radio Ltd.

BEHIND THE SCENES AT RADIO AUSTRALIA

Peter Shore

Part 1

In the two hundred years since the first whites settle into the newly discovered continent of Australia, progress has been rapid. In particular, the telecommunications infrastructure of this fledgling nation, in which some 15750000 people live in an area of 7682000 square kilometres and whose climate ranges from the alpine to the tropical, has developed dramatically. There are around 270 national and 150 commercial television stations in operation, with the Australian Broadcasting Corporation operating 144 radio stations and 137 commercial, privately owned, stations in operation.

There can be few people who have not realised that this is Australia's bi-centennial year, so to start this new occasional series, we go behind the scenes at Radio Australia.

Test Match

Radio Australia can trace its history back to 1927 when, on September 5, the first world broadcast from the country was made from VK2ME with a 10kW transmitter. In November of that year, there was an attempt by VK3ME in Melbourne to broadcast a weekly programme for overseas listeners which failed. It was not until the inauguration in 1936 of special news services for New Caledonia and the New Hebrides that short wave transmissions for abroad re-started. This time they were from 3LR Melbourne, later to become known as VLR Lyndhurst.

The Australia vs England test match of 1936/7 proved to be another failure. The Australian Broadcasting Corporation attempted, unsuccessfully, to transmit ball-by-ball cricket description using 2kW transmitters.

Australia Calling

The beginning of World War Two marked the start of Radio Australia as we know it. In December 1939, the Department of Information requested the ABC to begin international short wave services. The Australian Wireless Authority stations VLR, VLW, VLQ and VK2ME, all of 2kW, were used. On December 20, a service in English began under the name "Australia Calling" using three low-powered transmitters and opened by the Prime Minister, R. G. Menzies.

In January 1940, French broadcasts in Indo-China and New Caledonia began, followed shortly thereafter by German, Spanish, Dutch and Italian. Some of these services were short-lived however. Both Italian and German were dropped in October 1940, followed in June 1941 by the cessation of programmes in Spanish. At the same time, a policy was adopted to concentrate programming more on Asia target areas. May 1942 saw transmissions in Japanese begin, and in June, the Department of Information which had taken control on international short wave broadcasting, handed back control to the ABC.

Psychological Warfare

In July, a political warfare committee was established in Canberra to co-ordinate Allied policy and psychological warfare transmission began from Radio Australia.

In August 1942, Malay, Siamese (nowadays known as Thai) and Chinese (Mandarin) transmission began. May 1944 saw the inauguration of a 50kW transmitter, VLC, at Shepparton for Radio Australia, the control of which had been assumed by the Department of Information again the previous month.

When the end of World War Two came in August 1945, there were 12 international transmission from Australia. Four of these were broadcasts of psychological warfare, comprising nine individual programmes for Asia, five general international transmissions, two Allied Forces transmissions and on British Fleet programme.

Peace

In that same month, a 100kW transmitter at Shepparton (VLA) began operations, by November, the name of Radio Australia was officially introduced to mark the change from the war-time role which the station had played.

In January 1946, a peace-time programme schedule for international listeners was introduced and in August, another 100kW transmitter (VLB) at Shepparton.

Between 1947 and 1974, Radio Australia consolidated its position, changing the language services to meet the needs of its audience. In June 1947, the Chinese and Japanese services were discontinued, by March 1948, a programme in German re-started, only to close, along with the Dutch service in April 1950. This was the month in which control of Radio Australia was returned to the ABC from the Department of Information. In 1956, the Mandarin Service commenced and the Thai Service started broadcasting daily. During the 1960s, the Japanese, Vietnamese and Cantonese Services began work.

On 20 December 1968, three 250kW transmitters at the Cox Peninsula, Darwin, site began operations. In 1973, the Papua New Guinea Service started with Neo-Melanesian, or Pidgin, introduced the following year.

A devastating cyclone hit Darwin in 1974, destroying the antenna system. Yet, the following year, one 100kW and one 250kW transmitters came into service at the Carnarvon site in Western Australia. Today, Radio Australia has fourteen transmitters:

Shepparton – 6 x 100kW & 2 x 250kW
Darwin – 3 x 250kW
Carnarvon – 1 x 300kW, 1 x 250kW & 1 x 100kW

In Part 2 we'll look at Australia in the 1980s. □

Radio Australia Centre, Melbourne.

Control Room at Cox Peninsular Transmitting Station, Darwin.

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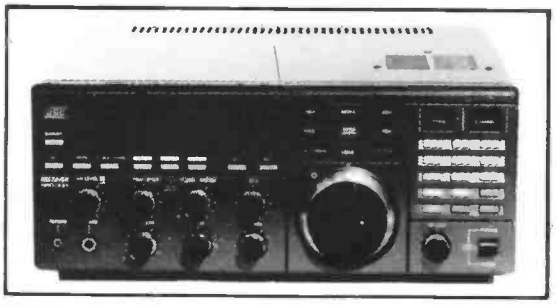

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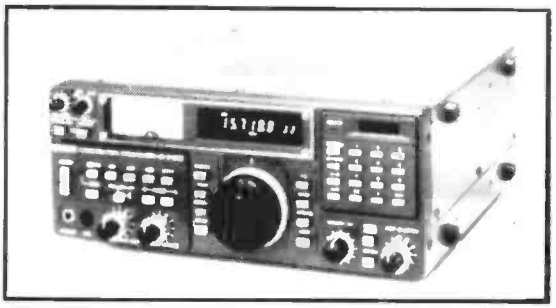

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BANDSCAN

Peter Laughton

Balloon Broadcasting

In Washington recently, the US Senate Appropriations Committee earmarked US $7.5 million for the establishment of a complementary TV Marti Service. The plan is backed by US Senators Hawlings and Warren Rudman. In order to obtain the line of sight path needed to get TV signals into the Cuban capital of Havana. US Engineers are thinking of using an industrial tethered balloon to support the antenna. The last station to try industrial balloons was a pop music ship in the North Sea. But then the weather in Florida is a lot less severe than the North Sea, with the exception of the occasional hurricane! Vice President George Bush seems to favour the project. Speaking to Cuban-American National Foundation, Bush said it was time to go one step better than the existing Radio Marti. "It has been said that a picture is worth a thousand words. In this case thousands of pictures are worth a single word . . . namely freedom".

US $7.5 million is not enough to run such a TV station though, only set it up. The US National Association of Broadcasters in Washington has expressed reservations that the project may provoke the Cubans into trying to jam the signal, with possible consequences for TV stations operating in Florida areas. Also the v.h.f. signal from the balloon will be omni-directional, and that means the chosen channel will be useless for US TV stations in the Southern part of the United States. Some radio stations in the same area received financial compensation when Cuba retaliated soon after Radio Marti started transmission in 1985.

Cool Reception

In the last few months, several European stations (notably RCI Montreal and SRI Berne) have been discussing their listeners. They claim there is a growing difference of interests between pure technical listeners, DXers and the international broadcasters. To use the bottle analogy, DXers are interested in the outside of the bottle, the broadcasters are more concerned with the contents. Both hope the container doesn't break.

Some broadcasters complain they are not getting the quality of response they desire. Technically orientated DXers retorted at conferences in Antwerp, Belgium and Irvine, California recently, saying that if a station doesn't get quality response, maybe it is not making quality programmes. Signal strength is also important, since if it is too weak in the target area, all the creative effort is in vain.

Audience research shows that pure DXers are a small but vocal minority of the audience. Nevertheless, there is a much larger group of people interested in occasional DXing and also programme listening. Other stations concentrate on cultivating this larger group of casual short wave listeners. Radio Budapest has run a short wave club since the start of 1965, and despite budget cuts, has maintained a service aimed at enthusiastic newcomers to short wave listening. Whatever you may think of Hungarian politics, Radio Budapest has managed to keep its short wave club free from political bias. In return for sending in reception reports, members of the club get a bi-monthly newsletter. The logging section covers all kinds of stations, although it can't compete with some of the Western DX clubs when it comes to speed in bringing the DX news. There is no doubt that Radio Budapest has done more than most stations to help beginners understand the short wave jargon. More information from Radio Budapest, Budapest 18, Hungary.

Radio Marti, the US government radio programme launched on May 20 1985, is in the news again. It is beamed towards Cuba on medium and short wave from Voice of America facilities in Florida, Ohio, and North Carolina.

Hungary has just upgraded one of its short wave transmitters. 6025kHz is now used to relay one of the domestic programmes, and it is no coincidence that this service was inaugurated at a time when Hungarians in neighbouring Romania, seemed to be under pressure.

Canaries Cease

A programme produced by the Spanish National Radio's regional studios on the Canary Islands, is recently being widely reported in DX circles. It goes out daily on 15360kHz between 2206-2300UTC. The programme is beamed to South America, which is why reception is only fair in Europe. In fact, the transmission has been around for years, but a change in transmitter site may explain why some people have just noticed it again. The programme used to be broadcast via two 50kW transmitters owned by Spanish Foreign Radio on the Canary Islands. Although official sources won't confirm it, it seems that the two ancient transmitters there have recently been retired from service. The programme is now fed back to Madrid and broadcast from transmitters at Nobeljas, near Toledo right in the heart of the country. There has been an increase in the transmitter power.

If you are interested in Spanish speaking stations, there is an 18-page useful and comprehensive free guide available. Jaime Bagena, a producer of the Radio Enlace programme on Radio Netherlands Spanish service, compiles a regular list of Spanish language broadcasts from international short wave broadcasters.

The next edition is due out at the start of October, just after the European winter time starts. You can avoid delays by writing directly to the Spanish service of Radio Netherlands, P.O. Box 222, Hilversum, Holland.

Receiver Update

Bob Grove of Brasstown, North Carolina, USA has released further news on the SR-1000 communications receiver he'll be marketing a little later this year. There will be options to extend the coverage up to 2000MHz if desired, as well as additional bandwidth filters to suit the listeners individual requirements, says the press release. We'll have to see what happens next. Several competitors are sceptical that all these features can be incorporated at the price of just under US $2000.

In the last few months we have had several reactions from readers complaining about receiver manufacturer's instruction booklets. Whilst the English language manuals of many Japanese made products have improved over the last 10 years, other language versions are often very confusing. They are obviously translated by a bureau with no real understanding of what they are doing.

With the exception of Lowe electronics in Britain and Grundig in North America, no manufacturer seems to offer a concise introduction as to what to do with your new short wave radio, despite having dug deep in your pocket to buy it. Back in the late fifties the Hallicrafters company of

Chicago gave away a promotional record to promote short wave. Grundig North America gives away a free VHS cassette with a 30 minute show explaining the radio. Maybe there are other ideas that we haven't spotted . . . if so drop a line to BANDSCAN.

Clandestine Shifts

The UNITA radio station, supporting the UNITA forces in Southern Angola has made some rather dramatic changes to its output. It calls itself "The Voice of the Black Cockerel Resistance". A transmitter said to be at Jamba runs a programme A using two transmitters, one of which must be in excess of 100kW. Between 0500 and 0900UTC they are on 9700kHz and 7130kHz, between 1100 and 1400UTC on 9650kHz and 11820kHz, 1800-2200UTC on 7130kHz and 7145kHz. English is heard at 0600UTC Mondays to Thursdays, and at 1310 on Sundays.

A second B programme operates independently from a transmitter site believed to be in South Africa. Between 0330 and 0600UTC and again 1730 -2000UTC they use 4975kHz, while from 0800-1030 and 12-1430UTC they use 9600 and 11980kHz. The audio quality of the B programme is terrible, as though it is being fed from a long way over the telephone line.

Continental Local Radio

With the recent decision to put UK community radio on the back burner again, it is interesting to watch developments in other parts of Europe. In Italy and France, attempts are being made at regulation, though there are still plenty of pirates around.

Until recently the many dozens of media groups in the Netherlands were dependent on existing cable systems to broadcast their local radio and television programmes. They could not legally use a transmitter to broadcast over the air, although the lack of legislation didn't stop some of them. Holland still has several thousand active pirate radio stations. Back on January 20 1988, twenty local groups were granted permission by the National Media Board to broadcast their radio programmes over the airwaves. In the course of this year it is expected that most of the other hundred or so local groups which have applied will also be granted permission.

However, this is not the green light for giant pirates to go legal. The power of the transmitter is limited to 25W, transmissions are only in mono and there is a strict rule against advertising. The pirate radio stations have proved that the many single family businesses are happy to use radio to advertise. But very heavy political lobbying by the newspaper industry in the Netherlands has succeeded in stopping the introduction of legal local commercial radio. Instead, the local radio station in Amersfoort, for instance, gets a grant from the council. They in turn collect some £75000 from a TV newspaper project run on the city's cable system. The situation is far from ideal, but it is a start in the right direction.

Radio Heating Experiment

The use of high-power electro-magnetic radiation in the upper atmosphere is raising concerns over its potential environmental impact. Louis Slesin of Microwave News in the US advises us of a weird invention. In August 1987, Dr. Bernard Eastlund of Spring in the state of Texas was granted a patent for a way of heating charged particles in the earth's atmosphere with radiation. This operated in the 20-1800kHz frequency range. This, the inventor claims, could result in the total disruption of communications over a large portion of the earth. Alternatively, the system could be used to modify weather. Dr Eastlund points out that his system would have significant military implications, particularly as a barrier to, or confusing factor for, hostile missiles or airplanes. The patent has been assigned to a company called APTI, a subsidiary of the Atlantic Richfield group.

Dr. Richard Williams, a Physicist based in Princeton, NJ, recently published a paper in which he warns that Eastlund's invention might become a serious threat to the earth's atmosphere. However, it is not known how Eastlund's ideas might be applied as two other patents concerning this same invention have been classified as secret. In his unclassified patent, Eastlund notes that a phased array antenna would be ideal for generating the desired signal and that the North Slope of Alaska would be a good place to test the weapon. Although a lot of energy would be needed (in the order of 1000mW), the capability is within the state-of-the-art. Indeed, Eastlund told Williams that a secret project is already underway to study and implement the invention.

More Culture!

Another European cultural television channel is ready to go on the air at the beginning of next year. That is assuming there are no further delays in the launch of France's TDF-1 direct broadcasting satellite. The French government actively supported the creation of the new European channel as La Sept, or Channel Seven, two years ago. However, George Duby, Chairman of the new channel, has admitted that La Sept's future hinges on the successful October launch of the French direct broadcasting satellite.

The TDF-1 satellite programme has been bedevilled by delays. Confidence was shaken when the German TV-SAT of exactly the same design failed soon after launch last November. Assuming all goes well though, the new French government-owned channel will aim to provide a pan-European service, and not just concentrate on what's happening around the French speaking parts of this continent.

La Sept has already negotiated a large number of joint productions with major European television networks and is about to reach a similar deal with Channel Four in the UK. The project was originally set up two years ago with a capital of £5.7 million. Apart from films, theatre, opera, documentaries and other cultural programmes, the new channel is also adapting the Open University concept on a European scale, putting out courses in the afternoon. The channel has already built up a stock of more than 2000 hours of programmes, which should keep it going for a while.

Religious Broadcasters Bulletin Board

Another short wave radio station has started a computer bulletin board. This is run by a religious station WYFR in Okeechobee, Florida. According to the board, WYFR has just inaugurated its 13th transmitter, and a 14th will be commissioned shortly. This station has certainly come a long way since it purchased the old "Radio New York Worldwide" site at Scituate Massaschussetts. If you have a computer modem capable of the 8-N-1 format and using the BELL tones you can try this number: 010 1 813 763 1034. No password is needed, and it seems to work quite well at 1200 Baud.

Yes, Another Relay!

The latest relay to be announced is from Switzerland. Swiss Radio International has decided to hire airtime from the Brazil external service broadcaster, Radio Bras. If you check 17730kHz at 0200UTC you may hear the SRI programme in English. In fact, it is being beamed to Central America(!). The slight delay behind parallel frequencies operating at that time indicates a satellite feed. Radio Bras has not asked Switzerland for reciprocal airtime. Who's next? □

KLINGENFUSS

The man behind the books

Roger Hall G4TNT

Joerg Klingenfuss is a well-known name amongst many short wave listening enthusiasts. His various frequency guides are respected publications. Roger Hall met Joerg recently whilst in Friedrichshafen.

The *Guide to Utility Stations* by Joerg Klingenfuss is currently Europe's best selling frequency guide. It's not cheap at £19, but it is very comprehensive with more than 15000 entries. It is also very accurate. Joerg told me that this accuracy is the result of many years of personal listening.

He is a radio enthusiast who has been listening around the bands for more than twenty years. When I asked him why he concentrates on the h.f. bands and virtually ignores v.h.f. and u.h.f., he explained that the law in Germany prohibits listening to transmissions other than those from authorised broadcasting stations, radio amateurs, time signals and, with a special licence, utility stations.

The situation is almost the same here in Britain, but in Germany the law is enforced – in a way that I don't think would be very popular here. The authorities regularly ask radio dealers for the names and addresses of their customers and life can be made very difficult for anyone who has bought a scanner. There is also a reward system where people are paid to inform on any of their friends and neighbours who they think may be operating a scanner or unlicensed television.

The ethics of this system may be questionable, but it has proved to be very effective and now only a few German radio dealers bother to sell scanners. It also explains why Joerg prefers to listen on h.f.

When I say that Joerg is an enthusiastic listener, this could qualify as the understatement of the year. Not for him the occasional twiddles round the dial – he spends many hours compiling lists and verifying signals; cross-referencing the ones he has heard with published information and bandplans. This he does throughout the summer from his home in Tuebingen, which is just south of Stuttgart. This isn't because he stops working for the winter, but because he doesn't like to stay in Germany when the winter turns cold, preferring to be somewhere warm such as tropical Africa or South America. So, where a radio amateur would take himself off on a DXpedition in order to make contact from some obscure square, Joerg goes on listening expeditions.

He's been to the Azores, the Yemen, Madagascar, Mauritius, Reunion Island, Zaire, Algeria, Morocco, Borneo, Brunei, Malaysia, Indonesia, India, Sri Lanka, Senegal, Martinique, Guadeloupe and many other places. When I asked why it was necessary to carry heavy radios to such exotic places just to listen, he explained that, in much the same way as a serious astronomer will site his telescope well away from artificial light in order to get a better view of the sky, he prefers to listen where there is no man-made electrical noise to interfere with the signals. He also added that he likes laying on the beach!

Receivers

Naturally, I was keen to find out which receiver Joerg uses and, surprisingly, it's not the latest Japanese all-singing, all-dancing digital black box, but an old trusty Drake R7. Admittedly, it has been modified to give improved frequency stability and Joerg paid Drake an enormous amount of money to persuade them to design some special RTTY filters for him, but apart from that, he considers this to be the best receiver available. It has stood up to the rigours of travelling, heat and humidity remarkably well, but just in case, Joerg carries an NRD-525 as a spare. This is a necessary precaution, especially when you consider the chances of picking up radio spares in the middle of a Borneo jungle.

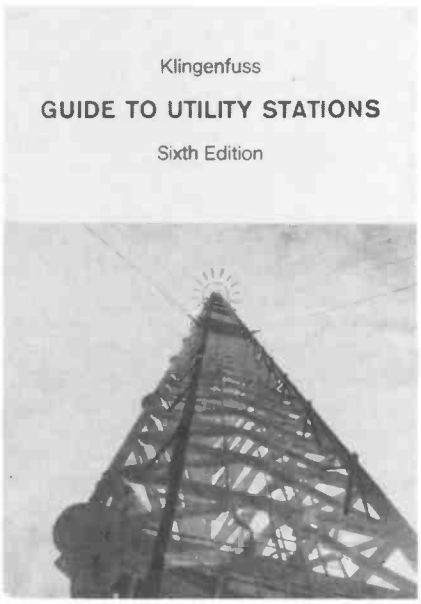
Fortunately, listeners can survive without the complicated (and heavy) antennas that amateurs need. I was surprised to find that Joerg uses a trick that I have used for years to hide my long wires. He carries with him several old transformers and when he wants to run out a long wire antenna, he just uncoils one of the windings. This provides an extremely long piece of very thin wire that is almost invisible. This, he explained, stops people asking awkward questions and, as the wire is so cheap, it doesn't matter if it breaks – he just runs out another length.

Unfortunately, Joerg and I didn't have time for a long chat, but he did tell me a few amusing stories about his expeditions. Like the time he was arrested for knocking on the front door of a top secret American listening station, located on a tiny tropical island so remote, that they hadn't bothered to post any guards!

I have asked Joerg if he would like to write an account of one of his trips and he has given me a definite maybe! It seems that finding the time is a problem, but perhaps we'll be lucky.

I was pleased to have met the man behind the books, and was left with the impression of someone who is dedicated to listening, while at the same time enjoying a very pleasant lifestyle. I was also left with a strong emotion – envy! □

Abbreviations	
h.f.	high frequency
u.h.f.	ultra high frequency
v.h.f.	very high frequency



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STARTING OUT

Brian Oddy G3FEX

The generation of double sideband (d.s.b.), single sideband (s.s.b.) and independent sideband (i.s.b.t.) suppressed carrier signals was detailed last month in this series. In any of these transmission systems the radiated sideband information is devoid of its original reference carrier, so it cannot be demodulated at a receiving point unless a locally generated reference signal is used to simulate the missing carrier.

The degree of accuracy with which the reference signal has to be applied to the sideband information in the receiver is dependent upon the type of transmission and the nature of the modulating waveform. In the case of d.s.b. and i.s.b. transmissions it is essential that both the frequency and phase of the reference be correct, otherwise severe distortion in the demodulated signal(s) will be evident.

This requirement also has to be met when s.s.b. transmissions are used to convey music or data information, but for voice communication purposes the requirement is a good deal less stringent. Provided the reference is within 10 or 20Hz of the original carrier frequency, the speech will sound fairly natural, but it will become unnatural sounding, although still intelligible, if the error in the reference is greater than 50Hz.

The amplitude of the reference is also important. If the ratio of sideband energy to reference signal is too high the effect will be similar to overmodulation in an a.m. system and distortion will arise. If the amplitude of the reference signal is much greater than the sideband information then an effect similar to undermodulation results; however in practice this has been found to be advantageous and a reference amplitude of up to 100 times the sideband information is often employed.

Carrier Insertion

One method of simulating the original carrier at the receiving point is to generate a low level reference signal on the same frequency as the missing carrier with a highly stable variable frequency oscillator (v.f.o.) and then very loosely couple it into the receiver via the antenna terminal. This method, known as **front end injection,** has the advantage that it may be used with any a.m. receiver and involves no modifications to the set whatsoever – however it does suffer from a number of limitations.

The desired s.s.b. signal is tuned in initially so that it is roughly centred within the i.f. passband of the receiver – this will be indicated by the unintelligible sounds reaching maximum volume or by the signal strength meter (if fitted) kicking upwards to a peak value. The v.f.o. is then set to a point either above or below the sideband signal and then very carefully tuned through the signal. At some point the signal will start to become intelligible, although the pitch may well be wrong so that a male voice will sound more like a female or *vice versa!* Further careful adjustment of the v.f.o. should result in the pitch of the voice becoming normal.

A completely unintelligible sound is produced when an a.m. receiver is tuned into a single sideband (s.s.b.) transmission carrying speech, but contrary to popular belief, an s.s.b. signal can be demodulated with any a.m. receiver without resorting to modifications – it is simply a matter of knowing how to insert a locally generated reference signal!

Where a transmission is known to be using the lower sideband (l.s.b.), the v.f.o. should be set to the high side of the signal initially and its frequency should then be gradually reduced until the signal is resolved – the reverse applies for an upper sideband (u.s.b.) transmission. As a general rule, amateur radio operators use l.s.b. below 10MHz and u.s.b. above that frequency, but that rule is not always applicable to commercial transmissions.

Once the v.f.o. tuning is correctly set, the receiver main tuning should be adjusted slightly for the best reception – this will not affect the pitch of the demodulated signal. The coupling between the v.f.o. output and the receiver antenna terminal should then be adjusted so as to ensure that an adequate level of reference signal is present, thereby avoiding effective overmodulation and distortion. Exactly how long the s.s.b. signal will remain intelligible will be determined by the stability of the v.f.o. – the stability of the basic receiver is relatively unimportant with front end injection methods.

In practice this method of inserting the reference signal may prove to be cumbersome, since it will be necessary to tune the v.f.o. to a frequency corresponding to the original suppressed carrier of each transmission received – the main receiver tuning and the coupling from the v.f.o. may then need to be adjusted for optimum results. Since the selectivity of the intermediate frequency (i.f.) stages of a typical a.m. superhet receiver will have been designed to accommodate a signal at least twice as wide as a typical s.s.b. signal, it may be difficult to avoid the splatter from stations operating close to a wanted signal in a busy band.

An alternative approach to front-end injection may be employed with a superhet receiver which has been designed for the reception of c.w. as well as a.m. signals. Since the i.f. signal resulting from the frequency changing process will have identical characteristics to a selected incoming s.s.b. signal, the local reference signal can be generated at i.f. and injected into, or just ahead of the detector stage to simulate the missing carrier. This method offers a distinct advantage in that a choice of only two injection frequencies will be required – one will be needed for use with u.s.b. and the other for l.s.b. signals!

The **beat frequency oscillator (b.f.o.)** provided for the reception of c.w. signals, can be used to supply the required reference frequency at i.f. so that the signal can be demodulated with an **envelope detector** – see "Starting Out" *SWM* July '88. The frequency of the b.f.o. will need to be set to about 1.5kHz above the nominal i.f. for the reception of l.s.b. signals, or to about 1.5kHz below it for u.s.b. signals – unlike the front end injection system where the v.f.o. frequency had to be changed for each incoming s.s.b. signal, only one or other of these two settings will be required for all incoming s.s.b. signals.

In order to ascertain these b.f.o. settings the receiver should be set to the a.m. mode initially with the b.f.o. turned off. Select either the 80 or 40m amateur band and centre an amateur l.s.b. signal within the i.f. passband by adjusting the receiver main tuning so that the unintelligible sounds reach maximum volume and the "S" meter kicks to a peak value. Next, reduce the r.f. gain, turn off the automatic gain control (a.g.c.), advance the a.f. gain (volume) and turn on the b.f.o. Do not alter the main tuning. Adjust the b.f.o. control to a point where the speech is resolved and note its position – this setting will be required for all l.s.b. signals. To establish the setting for u.s.b. signals the process should be repeated using an amateur u.s.b. signal in the 20 or 15m amateur bands.

Having set the b.f.o. to the appropriate frequency for the sideband involved, it should not be altered while searching for other s.s.b. signals – they can be selected by simply adjusting the receiver main tuning control, but it is important to note that the tuning has to be done very slowly and carefully until the speech is clearly resolved. How long the chosen signal will remain intelligible will depend upon the stability of the receiver, local oscillator(s) and the b.f.o.

The fast acting a.g.c. system employed in most a.m. receivers cannot be used to control the gain because bursts of noise would arise when the a.g.c. suddenly increased the gain to compensate for the lack of signal during the pauses in a s.s.b. voice transmission – it should therefore be turned off. The r.f. gain control should be adjusted to ensure that the level of sideband energy does not effectively overmodulate the inserted carrier.

For optimum performance an envelope detector requires quite different levels of reference injection from the b.f.o. with c.w. and s.s.b. signals – a very small b.f.o. signal is needed for c.w. reception

STARTING OUT

so as to avoid an excessive amount of hiss which would mask the weaker signals, whereas a large signal is required for s.s.b. detection so as to avoid the over-modulation effects already mentioned. Because of this problem, another form of detector has been devised which is equally effective with either transmission mode, so it is now used in the majority of modern communication receivers.

Product Detectors

There are several versions of this type of detector, but they are all known as **product detectors** because the a.f. output is a mathematical product of two separate r.f. inputs – see Fig. 1. Product detectors fall into two main categories, namely **active** and **passive.** The active type employ transistors, integrated circuits or valves, all of which depend upon an external power supply for their operation, whereas the passive type use diodes which act as high speed switches – they are controlled by the signal voltages and require no external power. A **conversion gain** can be obtained with active detectors, but the passive type introduce a **conversion loss** of 5dB or more – however, their simple circuits offer a number of advantages, including low noise performance, low cost and good isolation between the input and output ports. It is worth noting here that there should be no audio output from either type of detector if the reference signal is removed.

The circuit of one type of active product detector is shown in Fig.2. The principle of operation is essentially that of a mixer – the output from the i.f. amplifier chain is coupled into the gate of the f.e.t. transistor and the reference signal is applied to the source via C2. The external supply reaches the drain via the load resistor R2, which is decoupled by C1/R1. The output at the drain consists of sum

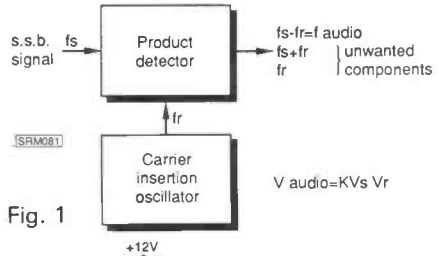


Fig. 1

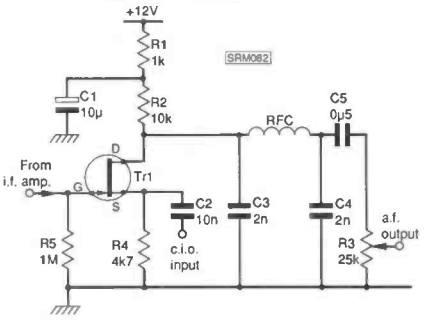


Fig. 2

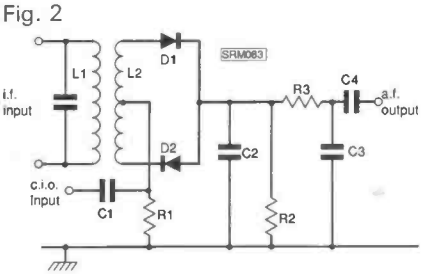


Fig. 3

and difference products – the difference signal being the wanted audio, which is coupled to the a.f. amplifier via C5 and the gain control R3. The unwanted sum product and the reference signal are prevented from entering the audio amplifier by the r.f. choke and by-pass capacitors C3/C4 – by choosing suitable values for these capacitors, unwanted high frequency components in the audio signal can also be attenuated.

The circuit of a passive detector which uses two closely-matched, high-speed, switching diodes is shown is Fig. 3. The reference signal is applied to a centre tap on the secondary winding (L2) of the last i.f. transformer via C1. R1/R2 provide a d.c. return path. During a positive half cycle of the reference signal the diode D1 will conduct and a charge will be placed on C2, but the following negative half cycle will cause the diode D2 to conduct and the charge on C2 will be removed. This process will be repeated during each cycle of the reference, so the average voltage across C2 will be zero. When an i.f. signal is applied to the transformer primary (L1) the diodes will conduct slightly sooner (or later) than hitherto and an unbalance in the nett current flowing into C2 results. The waveform at C2 is filtered by R3/C3 to remove the r.f. components and is then applied to the a.f. amplifier via the coupling capacitor C4, so that the variations in voltage are transmitted to its input as an a.c. signal – this will be a replica of the original modulating signal at the transmitter.

Modern communication receivers usually employ an envelope detector for a.m. signals and a product detector for s.s.b. and c.w. transmissions. A highly stable quartz crystal controlled **carrier insertion oscillator (c.i.o.)** is used to generate the reference signal – separate crystals 1.5kHz above and below the nominal i.f. are selected by a front panel switch for the reception of l.s.b. and u.s.b. transmissions. A third crystal is often provided for c.w. reception – this may operate 800Hz away from the nominal i.f. so that an incoming c.w. signal (at i.f.) results in an audible beat note of 800Hz.

Although a c.i.o. of this type will enable s.s.b. voice transmissions to be resolved with comparative ease, it will prove to be quite unsuitable for d.s.b. and i.s.b. transmissions as the locally injected reference for these systems needs to be not only identical in frequency, but also in phase with the original carrier – how this can be achieved will be revealed next month! □

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.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole (0202) 678558. An answering machine will accept your order out of office hours.

SEEN & HEARD

AMATEUR BANDS ROUND-UP

Paul Essery GW3KFE

PO Box 4, Newtown SY16 1ZZ

As this is our first meeting, let me introduce myself: Paul Essery GW3KFE, late Editor of this magazine in its earlier incarnation, currently DX columnist in *Practical Wireless* and author about amateur radio for the past twenty-odd years. In professional terms, an Electronics Development Engineer for more years than I care to remember; and a member of RNARS, G-QRP Club and RAOTA, not to mention the local club in Montgomery. J. C. and yours truly have been buddies and near neighbours for many years. So, the Box Number which used to reach him will now reach me.

Disaster!

As this is being written I have been severely stricken by disaster. First, I lost the side-tone on my TS-830S yesterday and then, an hour or so later, the v.h.f. rig's p.s.u. "fell over". Fortunately the p.s.u. was OK. It's a Trio PS6, originally sold for and used with a 7500. When the 7500 ceased to be used at home, I kept the PS6 and it now drives QRP rigs on v.h.f. and u.h.f. to talk to the repeater on a nearby mountain-top, plus a counter and a couple of other items. What had actually occurred was that in the 13A mains plug, the screw holding the live wire had worked loose and was open-circuit; tightening it down solved the problem.

Now, what MIGHT have happened is this: it could have got hot by arcing and consequent burning/corrosion effects, then smells, followed by a fire in the house. The only preventative is regular inspection of all such plugs on the one hand, PLUS pulling the plug out at the wall socket after switching off. Most of us have either a multi-way adapter (not preferred) or a distribution board feeding mains to all the various bits of gear. Pulling out the plug at the wall isolates the whole shooting match. Most switches are only single-pole, so merely switching off the mains outlet isn't really enough.

Why the screws come loose, heaven only knows! What matters is that they almost all do, at regular intervals. Routine checking, say, once a year, is the answer.

The TS-830S's lost sidetone turned out to be more difficult, mainly because my trusty testmeter died on me. Alas, it was reading about forty per cent low on all ranges, arguing a defect in the meter movement itself. So — I'm off the air until I repair (or replace) an item which isn't even a part of the operating station! That'll teach me to check its calibration from time to time.

The next three deadlines for your letters are: September 20, October 19 & November 15

Earthing

This topic has cropped up again in your letters. The are two angles to this subject, the first is safety and the second is improving the performance of the antenna in use.

In most houses the safety earth travels from every socket by various routes to come together somewhere in a big fat wire which may be clamped to a rising water pipe, or an earth running down into ground as part of the mains input cable. That's why re-wiring should never be attempted unless you know what you are doing, if it's not done properly the results can be severe.

Turning to the r.f. earth, it is preferable to separate it from the mains earth both on safety grounds and more importantly because the mains earth is usually very noisy. However, we need to ask ourselves, do we in fact need an earth! If we have a centre-fed antenna (dipole, G5RV, G8KW trap dipole or such) we don't have any desperate need for an r.f. earth. If we have an end-fed piece of wire, whether fed through an a.t.u. or not, then we have an antenna aloft, which depends on the presence of an earth to work properly. If the length of wire aloft is a quarterwave, or less, or ODD multiples thereof (e.g. 3λ/4) the need is very great. However, if the wire is a half-wave or multiples long, then the need for an earth is not so evident.

To create a signal earth, we must be sure it is a low-resistance connection to ground. Driving a four-foot spike into the ground and wiring with thin wire is just so much wasted effort — and if you remove the mains earth wire from the power plug as well, downright dangerous! A longer spike is often recommended but is only marginally better. Try ground radials instead. No special length, any old wire, buried a mere few inches into the ground. The aim is to get down as much wire as you can. It all comes together at one point, where all the radials are joined together and to the earth lead running up to the shack, and for this you use the outer braid of some old coaxial cable, or even just join braid and inner at both ends. Be sure the soldered joint bringing all together is a good one.

An alternative is to run the radials above ground and insulated from it. This gives you the chance to bring in the wire mesh fences around the house into the system as extra non-resonant radials. The more the merrier sums it up. You might even try both systems together.

If you have a large lawn, a good trick is to give it a close cut, then lay out wire netting all over it, soldering each piece to it's next alongside, till you have a mat of wire netting; join to the station earth with braid as before. Be sure it is pegged out flat enough so that the grass grows through and the mower blades will pass over the wire. In sum, whatever method you adopt, you spend far more time on earthing than on the antenna side. Improvements to your earth won't harm the results from a dipole, while on a short Marconi arrangement or a trap vertical the improvement will be spectacular.

Your Letters

The bit about earthing was prompted by a letter from **P. Townsend** (London E17). He, like many others, has good wishes for Justin Cooper. Suffice it to say, J. C. has read all the letters and thanks you all. Phil has been investigating the worth of his earth because he finds the present arrangement doesn't do much for signals at all! Perhaps one of the previous hints may help.

B. Woodcock (Leeds LS17) heard some good signals this time, the best being VR8YL, FK8KDB/P, ZL5BA, BT0ZML, BY5RA and 4J1FS. The first one of these is almost certainly either a mis-hearing or a typing error — there hasn't been a VR8 prefix as far as I can recall. The 4J1 station, of course, was the historic first joint Russian/Finnish joint DXpedition to Malyj Visotskij island. At the time of writing I am waiting to hear whether or not it's a "new country" for DXCC. As for BT0ZML, this was the first activity from Tibet since the forties.

K. Fletcher (Hayes) offers a list of twenty stations heard on 14 and 21MHz, of which the pick seem to have been KD8GB/MM, W3FM, K4SGQ, 4N4CX, PY7PZ, UZ9OWE and VU2KFR.

J. Mowat (Luton) finds he does best in the late evening, after say 2200Z, and early in the morning, from around 0600. Certainly the morning sessions are valuable, as much as anything because the Europeans are all rushing about the place getting ready for work, so the QRM is that much lower! For the rest, it is always worth while changing one's listening times just as soon as they have settled into a pattern. On a different tack, Jim started out to see if he could make the 500 prefixes in a year, on an indoor antenna. It actually took about five months and provided valuable learning in the way of "where" and "when" as well as in winkling them out.

Turning to **D. Pleat** (Mansfield). David tried 28MHz and for his pains all he heard was a chap working cross-band to 50MHz. Unfortunately, 28MHz is very much a band of opportunity; have a regular sniff round it concentrating, if it sounds "dead", on the beacons. Often you will hear a distant beacon, proving a path is present, when no activity is to be noted — the time for a licensed op to try a CQ call.

B. F. Hughes (Worcester) found a few more stations this month, of which perhaps the best were TYOLC and 4KODF.

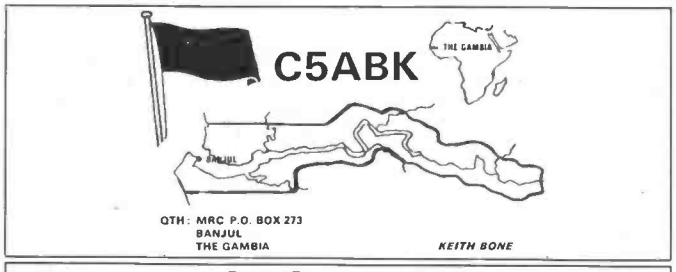
Steven Myers (Liverpool 9) has his doubts about the "ET9CCD" heard claiming to be from Ethiopia . . . so have I! Still, someone out there may know different.

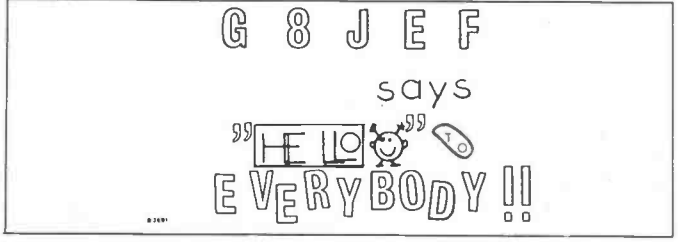
R. Shilvock (Halesowen) has sent in his loggings for the past month or so. It contains the usual small fry, plus a filling-in of US prefixes, rarer Russians and 4J1FS.

What about J88AQ? asks **B. Dawson** (Chester-le-Street). He heard the chap using a Realistic DX302, used, with an a.t.u., a vertical antenna and a 7MHz dipole in the loft. There is certainly a J88AQ in the *1988 North American Callbook*, QSL via W2MIG. J8 is the prefix for St. Vincent and Windward Islands. He's not a "new" country, but there aren't that many amateurs operating from there. Perhaps Brian heard the chap at the OTHER end of the QSO saying J88AQ was a new country for him, as part of a plea for a QSL! It's hard for s.w.l.s. to sort out what's what in a QSO if the amateurs don't keep to procedure, i.e. the other stations callsign first, theirs last.

R. E. Webb (Ashford, Kent) has underlined TG9KM as his catch of the month; all the other continents are represented save Oceania, so maybe some early rising is called for!

A. Pomfret (Lytham) has returned to the hobby as a result of early retirement. Alex has nine metres of wire in the loft space of a bungalow, at sea level, working to an FRG-7700 and the FRT-7700 a.t.u. On this he heard YC8VFB, Wan in the Ambon Islands of Indonesia, calling CQ USA on 21 MHz and getting several takers; he wonders





These two QSL cards show the different types people send. The humorous to the plain but exotic location. If you have any interesting cards, we may be able to publish them if we can borrow them.

if this is unusual for a situation like his own? My answer would be that the time is about right for him to be audible in this country. A location close by the sea should be worth quite a bit too.

Now to **N. Melville** (London N18). Neil notes that conditions have been pretty good of late, so he has been in there knocking off the "specials". One was GB75RS, just up the road at Potters Bar. Although this one was a local, he didn't sound like a typical local signal for some reason. One would guess that in fact Neil probably wasn't hearing the groundwave signal by itself, but mixed with an element of skywave, so it ceases to sound at all like a local.

A New Challenge

To "Celebrate" my new job as columnist for *SWM*, we have designed a new challenge for readers. To make it "fair" we're starting from scratch too, so no scouring back through old log books to see if you qualify!

The new start date is 1 September 1988 and you need to keep a track of the different DXCC prefixes you hear. If you're not sure of what these are, then an s.a.e. to Geoff Watts [1] will bring details of price and availability of his listing — the best I know of. There will be three stages to the challenge, Bronze, Silver and Gold, dependant on the number of prefixes logged.

We'll print the full rules next month, but briefly you need 75 to get the Bronze award 150 for the Silver and over 300 for the Gold. QSLs may be asked for, so chase them up. As I said, full details next month.

In the mean time, send me details of your loggings on the amateur bands. Don't worry if you don't think you've done very well, all letters and logs are appreciated. I'd like to hear details of your station and how well you think it performs too, other readers are always interested.

Until next month, happy DXing.

DECODE

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

Readers Letters

My first letter comes from **Henrik Bo Carlsen** who moved to the UK from Denmark about a year ago. Despite being comparatively new to RTTY, he has been very active and has written all his own software for his Amstrad 464. His first receiver was the trusty Matsui 4001 but this has since been replaced by a Yaesu FRG-7700 which he is very pleased with. His home-brew software has been written in compiled Pascal and is obviously quite sophisticated as he is able to receive 96 baud TDM. In addition to home-brew software Henrik has designed and built his own modem which is of the filter type and sounds very interesting.

The antenna system in use comprises a 16m dipole feeding into a Yaesu FRT-770 a.t.u. Henrik has kindly offered to give me a full description of his station and software which should prove interesting.

Another reader who sent me details of their station is **Allan Santos G4PMJ**. He uses an AEA PK-232, the BBC-B, an FRG-7, an IC-730 for his amateur work and the Epson FX-80 printer. Apparently he has various types of antennas available, although the main one is an h.f. beam for 14, 21 and 28MHz.

One of the charts this month was supplied by Allan. It was received at 1115UTC on July 17, the frequency being 14.4149MHz. Unfortunately, Allan's not sure who it was transmitting, so any ideas anyone?

Now to a plea for help. Terence Craig **VK6PQ** is looking for AMTOR software for the Amstrad 464. He's got both RTTY and Morse, so is anyone out there using an Amstrad 464 for AMTOR? If so, I'd like to hear about the software so I can help Terence.

Help for Newcomers

Ian Brothwell, the Secretary and Publicity Officer for BARTG, has recently sent me a copy of a new booklet called *Amateur Radio Data Comms & BARTG*. The booklet is available free-of-charge, provided you enclose an A5 or larger s.a.e., from BARTG[1].

The object of the publication is to provide some basic information for newcomers to the data modes. Although it is intended mainly for the radio amateur, there is a lot of information for all those interested in the data modes. It starts with some quite interesting historical facts covering the origins of RTTY. This is followed by a brief description of TOR, Packet and FAX. The next section gives some background behind the actual operating techniques in use today.

There is obviously a fair degree of "trumpet blowing", but this is only to be expected in a free publication.

The MM2001

Having mentioned the MM2001 RTTY decoder in past months, I have had several enquiries as to what it does, how much it costs, where can I buy one, etc. So, whilst at the RSGB Exhibition at the NEC in July, I approached the manufacturers[2] to find out the current situation. Apparently they have stopped production and only have a few units left. They would consider producing the unit again though, if the demand were great enough.

I have been offered a unit for review which could prove interesting, so watch this space for more details!

For those of you who have not heard of this unit, it's a stand-alone device which accepts an audio input from your receiver, decodes any RTTY signals within its capabilities and displays the output on a standard TV. This sort of unit is ideal for anyone who is interested in RTTY but doesn't want to get involved with computers. The modes catered for are: RTTY-45.5, 50, 75 and 100 baud; ASCII-110, 300, 600 and 1200 baud, with high or low tones.

Frequency List

Regular readers will recall that in last month's Decode I mentioned the imminent availability of a frequency list. This list is simply a compilation of reports received from readers, sorted into frequency order. Although there is space each month to put some of these in the column, I get sent details of many more than I can find the space to print.

The details included in the list are: Frequency, Mode, Speed, Shift, Callsign, Time Logged and a few notes on the station location and message type. The list is currently about 75-100 stations in size, but this will no doubt grow provided, of course, readers continue to send in contributions.

The important point about the list is that all the stations listed have actually been heard by someone in Europe in the recent past. To obtain a copy of the list, send an 220 x 110mm s.a.e. to the address at the head of this column. Don't send your requests to the *SWM* office, they won't have copies of the list.

I would hope to be able to reply by return of post, but if I am inundated with requests, there may be some delay — the printer only works so fast. In order to speed the process, please include a separate s.a.e. if you want any advice — preferably enclosing some loggings of your own too.

Public Domain Software Library

I have recently received a copy of the new, and much improved, catalogue from this library. For those of you not familiar with the PDSL, it is a collection of software which is either uncopyrighted or has been put in the public domain by its author. The library then catalogues the software and makes it available to the general public. The running costs of the library are covered by the copying fee which is charged for each distributed copy.

If you are likely to make extensive use of the library, then it is worth becoming a member as the copying fee is reduced by about 10 to 20 per cent.

The reason I mention the library again is that it has been completely re-organised recently. Your next question will no doubt be, "Which computers are supported?". Well, it's operating systems rather than specific computers that are supported. The two main systems covered are CP/M and MSDOS. This means that any computer running either of these operating systems can use the library. These include IBM PC clones and the Amstrad PCW series. For more details contact Rod Smith [3].

Beginners Frequency

I have received many requests from newcomers to the hobby who want to know where to find specific modes so they can get used to their equipment. In response to this I have hit upon the idea of a "beginners frequency". In this section I will choose a particular mode, this month it's RTTY news, and describe how to receive a particular station. As mentioned earlier this month's mode is RTTY news broadcasts and we are going to discover how to receive one of the TASS broadcasts from Moscow.

First, let's describe the mode used which is standard RTTY. This is the ITA No. 2 (International Telegraph Alphabet No. 2) which is sometimes incorrectly called baudot. You'll find that ITA No. 2 is normally called simply RTTY in most programs and terminal units. The transmission speed used by TASS is 50 bauds, which again is a very common standard.

Now to the shift, which in this case is 425Hz. The shift is the difference between the two frequencies used for the mark and space. Some stations send the mark and space freqeuncy in a different order from standard and this is called reverse shift.

The TASS broadcast we are going to monitor uses 425Hz reverse shift. The selection of the wrong shift sense is probably one of the most common mistakes that newcomers make. Next, the final detail, i.e. the frequency. This is 12.285MHz. Incidentally, the callsign of the station is RKU-74.

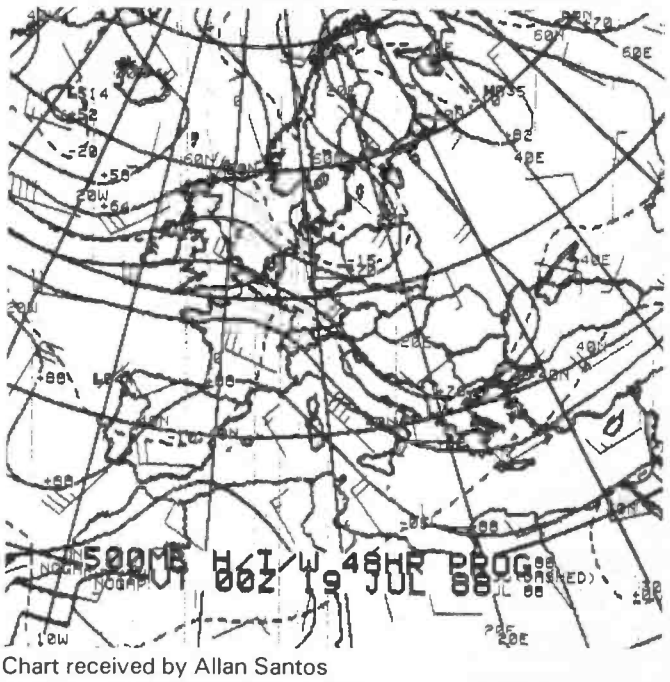


Chart received by Allan Santos

Before attempting to actually receive this station, read the instructions for your decoding software and set-up for 50 baud, 425Hz shift RTTY. Then tune to 12.285 MHz with your receiver set to the mode, i.e. u.s.b. or l.s.b., suggested by your decoding software. If you're very lucky, you will now be receiving the news broadcast. If not, don't worry as the solutions are very simple, providing a methodical approach is taken. First, can you hear what sounds like a RTTY station, i.e. a fast "warbling" sound. If not, try tuning up to 5kHz either side of 12.285MHz. If you have a tuning indicator, adjust the receiver tuning to get a correct indication.

If you are still not receiving good text, try switching to the opposite shift. Some of you may not have the luxury of a switch to reverse the shift. If this is the case, then all is not lost as you can achieve the same effect by switching to the other sideband if you have the option of l.s.b. or u.s.b. If you're using a radio with a b.f.o., simply move it past the null point to the next position that gives a correct tuning indication.

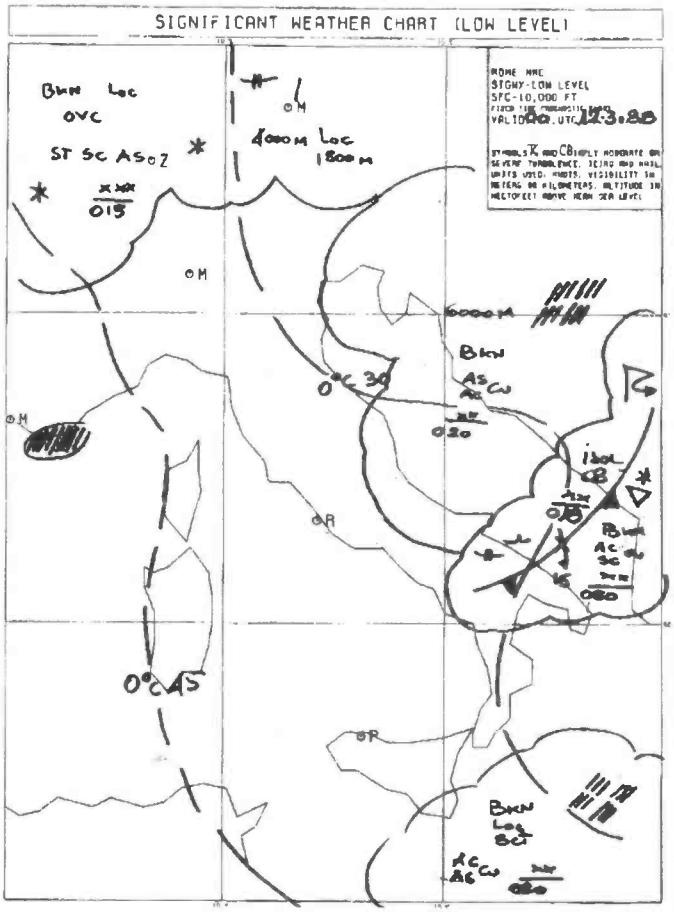
Once you are receiving good copy, make a note of all your settings. That way you can make use of them in the future to receive any other station sending 50 baud, 425Hz reverse shift. Another important point to note is that the frequency readout on your receiver will probably be different to the frequency I have quoted. This difference is the off-set for your receiver and should be noted as you can use this to ease the tuning of stations when using commercial frequency lists. Here is a simple example of the use of off-set. If, in the above example, your receiver indicated 12.2865MHz your off-set would be the difference between the published frequency and the frequency indicated by the receiver, i.e., +1.5kHz. If you now wanted to tune to another station using 50 baud and 425Hz reverse shift and a frequency of 10.270MHz you simply add the off-set to the published frequency and set the receiver to the resultant frequency and you will be in perfect tune! If your off-set is negative, i.e. your receiver indicates a frequency lower than the published frequency, you simply subtract the off-set from the published frequency. By the way, both the frequencies listed here are working TASS frequencies. One important point is that these stations don't transmit continuously but are usually active in the evenings.

If you have any modes that you would like me to cover in this way, please drop me a line and I will see what I can do.

What to listen For

As usual, here's a small part of the information received from readers this past month or so. The usual format of frequency, mode, speed, shift and callsign has been used.

4.23MHz RTTY 75/R GYA
6.397 MHz FAX 120/576 CFH Halifax Meteo
6.4185MHz FEC 100/170 DGF41
9.353MHz RTTY 50/N OLX5 Prague
10.543MHz RTTY 50/N Y2U/54 ADN Berlin
10.966MHz FAX 120/576 NPO US Navy Subic Bay
12.285 MHz RTTY 50/425R RKU74 Tass English News
12.984MHz RTTY 50/N CA17E Easiter Isle Air
16.1341MHz RTTY 50/R u.s.b. Map Rabat
17.024MHz ARQ 100/170 SAB83 Goteborg Radio
18.065MHz RTTY 75/R Tanjug Belgrade



Received on 13.5974MHz at 1630 on 11 March 1988.

INFO IN ORBIT

Pat Gowen G3IOR
17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6XD

Space For Thought

Readers may remember reading in the popular press that in 1978 the Soviet Cosmos-954 satellite carrying a nuclear payload fell back to earth, spreading its pay load of heavy alpha emitting isotopes over Northern Canada. The clean-up cost involved was quite heavy too! Previous to this, the American Spacelab spread its debris over a wide area of Northern Australia as it only partly burned out on its uncontrolled re-entry. Now we have another one about to re-enter, quite probably within the next eight weeks, but exactly where and when is not yet known.

The latest satellite concerned is Cosmos-1900, one of the "Rorsat" (Radar Observation Reconaissance SATellite) series. For Radar, high power is needed. To generate this with the number of solar cell panels required would give an enormous drag, taking the satellite out of its low earth orbit rapidly. So, some 50kg of enriched Uranium fuel is carried to provide the power required by a small nuclear reactor.

Normally, when the useful lifetime of the satellite is over, the nuclear power plant is detached and boosted into a 1000km+ high orbit, to go through several half lives of the multi-isotope decay before it eventually descends after many hundreds of years. Alas, the technology is not perfect and things can go wrong.

With luck, Cosmos-1900 may burn out spreading its vapour over a wide area.

Satellite enthusiasts are tracking the incoming satellite, which is still stable, though down to some 242km altitude now in mid-July and falling. We shall be able to compute the approximate re-entry time and place some days ahead.

For those who might wish to join the tracking, here follows the Keplerian element set to put into your computers:

Epoch Year:	88
Epoch Day:	192.81066986
Drag/Decay:	4.822E-4 (see note)
Inclination:	64.9741 degrees
Right Ascension of Ascending Node:	144.9551
Eccentricity:	0.0013537
Argument of Perigee:	283.3547
Mean Anomaly:	76.5630
Mean Motion:	16.12465279
Orbit/Revolution:	3397

Note: The decay is that current in mid-July. With further solar flux escalation and the consequent atmospheric expansion, it is likely that the drag will increase to at least 6.0E-4 by the end of September.

At the moment of writing the satellite is still stable, thus apparently with enough fuel to maintain the attitude, but in its last few days of life, the spacecraft may well start to tumble, and lose altitude rapidly as it meets the upper atmosphere immediately prior to burn-out.

For those who track their satellites by plotters or mathematics, the current period of Cosmos-1900 is 89.3 minutes, and the orbital increment is 22.6 degrees west, both shrinking. A reference orbit for September 15 is the first ascending equator crossing at 0108UTC at 112 degrees west longitude. Each successive day the satellite will cross the equator 78.1 minutes later and 24 degrees further west. The table in Fig. 1 gives the times, azimuths and elevations, plus the sub-satellite points of latitude and longitude for two close UK passes on 30 August 1988, when those with scanning receivers might wish to listen around to see if they hear any signals emanating from it. The satellite will not be visible at these times given, but later when close to overhead passes occur one to two hours before dawn or after dusk, it can be clearly seen as a bright object.

Fig. 1 ▼

COSMOS 1900 * 30/8/88

UTC	AZ	EL	LAT	LON
0027	199	0	38	5
0029	184	12	44	359
0031	108	26	50	352
0033	59	7	56	343
0035	49	-2	61	330

COSMOS 1900 * 30/8/88

UTC	AZ	EL	LAT	LON
0808	314	0	61	23
0810	310	11	57	10
0812	241	57	51	0
0814	150	12	45	353
0816	145	0	39	347

Weathersats

Chris Kaley, of West Drayton in Middlesex is one of our keen readers, and sends in some interesting news on the GOES satellite that is sponsored by NOAA, which is new to our column. He points out that this satellite, which was in geostationary orbit at 75 degrees west (and therefore out of range to the United Kingdom) has since been manoeuvred at a rate of one degree per day to its current position of 65 degrees west, and thus well over our horizon.

The Wefax APT signal is transmitted on 1691MHz, the same frequency as Meteosat Channel 2, so all one needs to do is to point ones dish in the correct direction, which for Chris, in Southern England, is 246 degrees azimuth and with an elevation of 5 degrees. As the signal from Meteosat is relatively

strong, Chris recommends a pre-amplifier at the dish, and suggests that as the source is close to the horizon, an elevated dish with a clear line of sight for a few hundred metres is required. Despite the fact that his dish is but 2m high, and a local church tower is in the path, he still gets good results!

Despite the fact that for some obscure reason the signals are never at their best in the mornings, Chris is highly delighted with the quality. He finds that they send a considerable quantity of meteorological maps via the satellite, similar to those transmitted on FAX, but the photo-mosaics assembled from NOAA-9 and 10 passes more than compensate. Copies of the GEOS.E. dissemination schedule are available from Weatherwatch at RAE Lasham, in return for a large self-addressed stamped envelope.

"For anyone interested in the weather in the States or the Pacific," says Chris, "turn the dish, or, as I did, invest in a second dish and convertor". Chris is always keen to exchange information, and kindly offers to demonstrate his system, all set up in a Portakabin in his back garden, to any enthusiast who comes his way, at 128 Station Road, West Drayton, Middlexsex UB7 7JS. Telephone: (0895) 446096.

Lawrence Harris of Plymouth reports to our column again, with the news that he too has been getting good pictures from GEOS.E, which he receives at 4 degrees elevation. He finds that if he rotates his dipole from the horizontal used for Meteosat to nearly vertical, he has an excellent signal. Pictures of North and South America have been observed in visible and infra-red, plus pictures from three other satellites, i.e. NOAA-9, NOAA-10 and GEOS.W. These include store and forward pictures of both polar regions and the tropics, also in visible and infra-red, which has enabled Lawrence to perform some interesting scientific research projects on the measurements of changes in the polar regions, an important subject with the threat imposed by the melting ice-caps to our future.

Lawrence has been busy monitoring the entire spectrum of satellite transmissions, and had discovered further developments since his last treatise. Both MET 2/16 and 2/17 have now started to demonstrate the aperture sticking problems evidenced by all the earlier Meteors. He says, "It suprises me that the Russians have continued to launch this series of weather satellites without any obvious attempt to correct this problem".

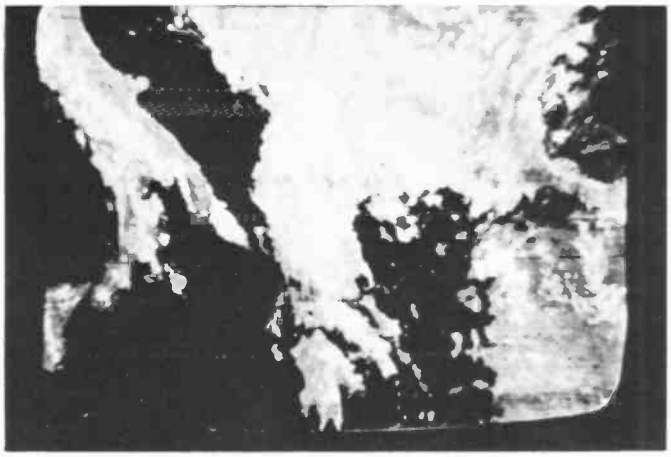
He found that Cosmos-1602 was transmitting pictures of indifferent quality until June 16, when he received the last signals on the 1612UTC pass, showing a number of faults including "banding". Despite regularly listening on 137.33MHz since then, nothing has been heard, so it must be assumed to be commanded off.

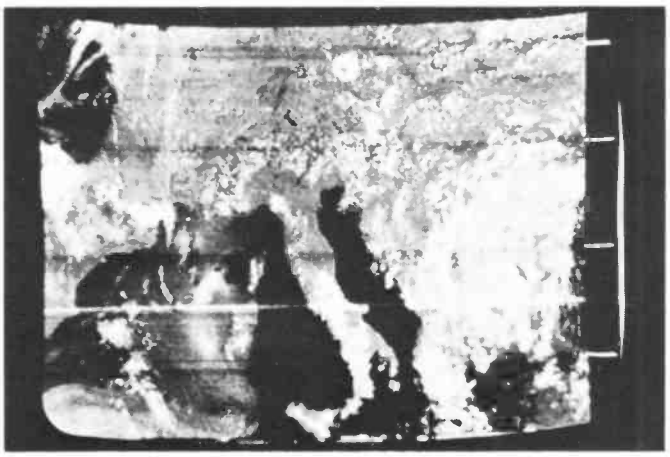
MET-30 was also finally switched off. Lawrence recorded both the early and late passes on June 11, but found it off the following day, and not heard since. This is a source of great regret to Lawrence, as he found it to produce some of the finest APT pictures ever provided, but he is still analysing many of the winter transmissions from his tape recordings that show icebergs in the Gulf of Bothnia in great detail.

During the summer months of the year the NOAA-9 overnight pass (which is around 4a.m. local time) is in sunlight. Lawrence discovered this whilst making an automatic recording for his routine archive purposes, and found that similarly, the evening pass of NOAA-10 (around 7p.m. local time) enters sunlight shortly after the commencement of the pass. These two APT weathersats, on 137.62MHz and 137.50MHz respectively still transmit continuously, visible (water vapour in darkness) and infra-red.

MET 2/15 on 137.85MHz, MET 2/16 on 137.40MHz, and MET 2/17 on 137.30MHz are all still active, but are subject to unpublicised switching, and may therefore not always be on and active when expected.

If the Keplerian elements are needed for your computer predicted pass calculations, these appear for all satellites of general interest, both weather and amateur, every second month in the "Amateur Satellites" column in *Practical Wireless*.





Figs. 2 and 3 from David Bird

Space Programmes

General information on the international space programme is often requested by our readers who would wish to learn more of the progress and plans of the various international launch agencies. These main operators have public relations departments, who will provide information free of charge to those requesting it. The addresses follow:

For the French national organisation, write to:

CNES, Public Relations,
18, Avenue Edourd Berlin,
31055 Tolouse Cedex,
FRANCE.

The European Space Agency, who launch the ARIANE missions from Korou, French Guiana, are based at:

ESA, Public Relations,
8-10, Rue Marie Nikis,
75738 Paris Cedex 15,
FRANCE.

The newly formed commercial launch agency of the USSR is at:

Glavkosmos,
9, Krasnoproletarskaya Street,
103030 MOSCOW,
USSR.

For the space program and information from the USA, you should write to:

NASA,
Public Relations Department,
Washington DC, 20456,
USA.

The next three deadlines are: September 20, October 19 and November 15

Satpix

Finally this month, for our picture spot, Figs. 2 and 3 have been supplied by **David Bird/G8XOC**, of Stoke Ferry, near Kings Lynn, Norfolk. They show NOAA views of the Mediterranean and Black Sea areas, with Italy and Greece well defined, unusually with lots of cloud. Your photos and/or computer produced prints would be very welcome in our column too!

BAND II DX

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

Portable DXing

While on holiday in an Aberdeenshire glen and although surrounded by mountains, **David Glenday** (Arbroath) lost count of the number of Italian stations he heard in Band II during the Sporadic-E opening on June 28. He was using a Binatone-Worldstar receiver with its own telescopic antenna.

When I left home for Bodiam Castle on July 20, the atmospheric pressure was slightly falling from 30.05in (1015mb). So, at each stop on low and high ground, in both directions, I checked Band II with my Plustron TVR5D using its own rod antenna. I found French stations at varying strengths between 98 and 101MHz.

Below Band II

Readers with scanners and/or v.h.f. communications receivers will know that when Sporadic-E is present, broadcast stations from eastern Europe are usually heard between 66 and 73MHz. According to my hurried research, Bulgaria has 31 transmitters within this range, Czechoslovakia 41, Hungary 38, Poland 70 and Romania 28. The graph in Fig. 1 shows the number of transmitters, from those countries, that share the space between each megahertz. The actual frequency of each station, like Poland's Gdansk on 66.29, 67.85 and 70.31MHz, can be found in the *World Radio TV Handbook*, available from the *SWM* Book Service (see page 55).

In Datchet, **Mike Bennett**, using a Realistic PRO-2021 scanner and Revcone antenna, identified broadcast f.m. from stations in Czechoslovakia, Hungary and Poland between 68 and 73MHz, during the Sporadic-E openings on May 26 and June 3. Mike identified programmes from BRNO, Hradec Kralove and Jihlava in Czechoslovakia; Budapest in Hungary and Gdansk in Poland just after 1100 on June 24, Hradec Kralove on the 25th and Budapest on July 10.

Like Mike, I use a Revcone, Fig 2, to feed my R216 receiver and I counted 30 of these stations at exceptional strength from 66 to 73MHz around 1445 on June 21 and again at 1230 on the 24th. There were about 16 at 0915 on the 25th and over 40 at 1730 on the 27th. The buzz of sync-pulses was

audible on both the television channels R4 (85.25MHz) and R5 (93.25MHz), but it was difficult to lock a picture. Around 0900 on July 20 and 21, about 20 stations could be heard in addition to pictures and sound on Ch. R3. (77.25/83.75MHz).

Reports

The high atmospheric pressure (1027mb) was falling, giving improved tropospheric conditions. This, accompanied by Sporadic-E during the evening of June 27 was good news for **Ken Lancaster** in Rotherham. Between 1900 and 2000 Ken made 3 scans of Band II and found 40 foreign stations. "Most of the stations were very strong and languages included Belgian, Dutch, French, German, Italian and Spanish", said Ken.

"The barometric pressure was high around 1020mb for almost two weeks, although it fluctuated a little, but not below 1018mb and not above 1027mb. It has also been very dry here and at times the fog rolled in from the sea, usually at night and enhancing v.h.f. reception", wrote **David Edwardson** (Wallsend) on July 2.

Between 1700 and 1900 on June 10, David, using a Toshiba RPF11-L with its own rod antenna, logged Dutch and German stations above 99MHz. He also heard football and popular music from Holland at the lower end of the band in parallel with m.w. transmissions on 747 and 675kHz respectively. This is a good way of identifying stations.

During the evening of the 13th, fog rolled in after a hot and very clear day, David heard BBC Radio Leeds on 92.4MHz at a distance of 160km in addition to 10, mainly German stations above 98MHz. Among those he identified were DLF in Koln and Hessicher Rundfunk. He pointed out that night-time stations are difficult to identify because in West Germany, local and various networks amalgamate.

John Parry (Northwich) logged a number of Spanish stations in Band II during the Sporadic-E opening at 2030 on July 6. He also heard the AFRTS, with an American lady announcer, from Madrid.

David Glenday received French, German and Italian signals, in stereo, between 93 and 105MHz around 1730 on July 10. I heard about 10 Italian stations between 87 and 102MHz at 0930 on the 12th.

While the band was under the influence of Sporadic-E toward the end of June, **Simon Hamer** (New Radnor) received Programmes 1 and 2 from Iceland (RUV) and Norway (NRK) on the 25th; various Scandinavian channels on the 27th and Austria, Czechoslovakia, West Germany including AFN, Hungary (Radio Danubus) and Italy on the 28th. During much improved tropospheric conditions he also heard BBC Radios Guernsey and Jersey, ILRs Clyde and Metro, some West Germans including BFBS, Manx Radio and RTE-FM-1/2/3, Cork local radio and RTE — Millenium 88 on June 16 and stations in Belgium, France, Holland and Luxembourg on July 9.

The next three deadlines are: September 20, October 19 and November 15

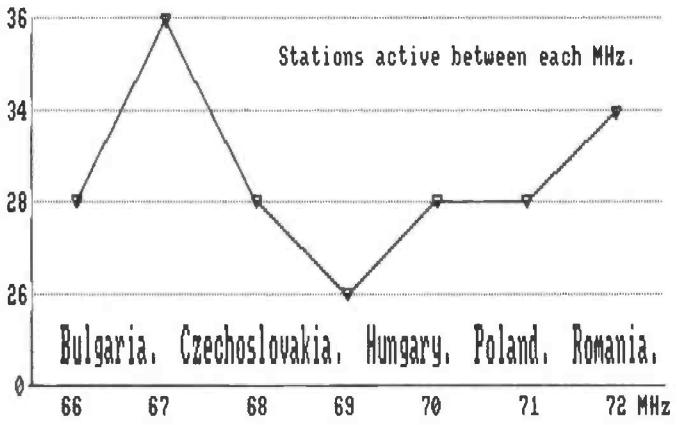
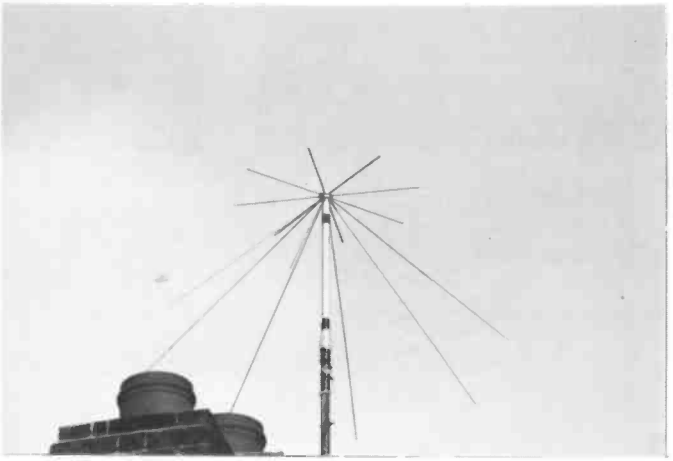


Fig. 1▲

Fig. 2▼



TELEVISION

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

Television networks throughout the world transmit their terrestrial signals on shared channels within the v.h.f. and u.h.f. regions of the radio frequency spectrum. These regions are generally known, with some international frequency variations, as Band I (45-68MHz), Band III (175-230MHz), Band IV (471-608MHz) and Band V (615-855MHz). New readers sometimes find all this confusing so, as a working example, I have prepared a chart, Fig. 1, which covers the main part of Band I and a little of Band II.

This area of the spectrum can be a DXer's dream during the annual Sporadic-E season (May-September), when pictures from a variety of stations in the countries listed are often received in the UK. The relationship between the country of origin, their channel numbers and the shared vision and sound frequencies are shown at the top and bottom of the chart. Details of individual stations can be found in the television section of the *World Radio TV Handbook*.

Band I

During the variety of Sporadic-E openings which occurred between May 24 and July 10, **Mike Bennett** (Slough) received test-cards and/or programmes from stations in Austria (ORF-FS1); Belgium (RTBF-1); Czechoslovakia (CST-Bratislava, DDK-2 and RS-KH); Denmark (DR); Finland (YLE-TV1); East Germany (DDR); West Germany (ARD); Holland (PTT-NED-1); Hungary (MTV-1 Budapest); Iceland (RUV-Island); Italy (RAI); Norwegian regionals (Bagn, Bremanger, Gamlen, Gulen, Hemnes, Kongsberg, Melhus and Steigen); Poland (TVP and TP); Portugal (RTP-Lisb1 and Porto); Spain (TVE); Sweden (Kanal-1 Sverige); Switzerland (PTT-SRG1); the USSR and Yugoslavia (JRT-BGRD, ZRGB-1 and RTU-LJNA). He also reports seeing a new style clock, square in shape with hands only, from Spain on July 8.

"Conditions have been super this last month", remarked **Dave Coggins** (Knutsford) on June 18. This was after seeing cartoons from Czechoslovakia on June 5; test cards from Denmark, Finland, Norway, Portugal and Sweden between June 4 and 9 and a quiz-game from Spain on days 16 and 17.

On the 17th, **Maurice Peall** (High Wycombe) watched a football match between England and the USSR on Russian TV, with a cartoon shown at half-time. He added Poland (TVP NTD-1) on June 24 and Portugal (RTP) on July 7 to his new country score, and received pages of Teletext from Italy (RAI) on July 9 and 12. "Reception good all day (June 24) with test-cards from USSR, Finland (YLE TV1) and Czechoslovakia (RS-KH), etc.", said Maurice.

On the 25th, **Simon Hamer** (New Radnor) logged pictures from Iceland; North America (525-line, Chs. A2/3/4); Scandinavia and the USSR. During the 12 events between June 18 and July 14, he logged 19 countries and saw Wimbledon tennis from Czechoslovakia; *UVTISET* (news) from Finland; an Alfred Hitchcock film from Spain on June 27 and Arabic script, on Ch. E3, from an unidentified source on July 8.

While some of these openings were in progress, **Stephen Moore** (Newquay) added Czechoslovakia, Germany, Holland, Iceland, Norway, Portugal, Spain, Sweden and Switzerland to his DXTV countries score.

In Belper, husband and wife team **Tony and Edwina Mancini** logged 14 countries and saw adverts from Germany, Hungary and Spain; cartoons from Czechoslovakia, Hungary, Italy and Portugal; dancing from the USSR; a variety of films from Italy, Norway (NRK-2), Portugal, Spain and Sweden; music from Austria; news from Germany (Tagesschau), Italy (TGI), Portugal, Spain (TVE-1) and the USSR (BPEMR and HOBOCTN) and various sporting events from Czechoslovakia (CST-1), Germany, Spain (TVE-2), the USSR and Yugoslavia (JRT-1). Among the idents seen were Germany's ARD-1 Grunten, SWF/BADN and RBG; Italy's

Fig. 1 ▼

Ch.E2	Ch.R1	Ch.Ia	Ch.E3	Ch.R2	Ch.E4	Ch.R3	Ch.R4	Ch.R5	Vis.
48.25	49.75	53.75	55.25	59.25	62.25	77.25	85.25	93.25	MHz.
Belgium Germany Norway Portugl Spain Sweden Switzld	Czechsl Hungary Poland USSR	Italy	Belgium Denmark Finland Germany Iceland Norway Portugl Spain Sweden Switzld Yugoslv	Czechsl Hungary Poland Romania USSR	Austria Denmark Finland Germany Holland Iceland Norway Spain Sweden Switzld Yugoslv	Poland Romania USSR	Czechsl Hungary Romania USSR	Bulgaria Czechsl Poland Romania USSR	
	Austria Ch.E2a 55.25s	Ch.Ib 62.25v 67.75s Ch.Ic 82.25v 87.75s					Band II		
53.75	56.25	59.25	60.75	65.75	67.75	83.75	91.75	99.75	Snd.

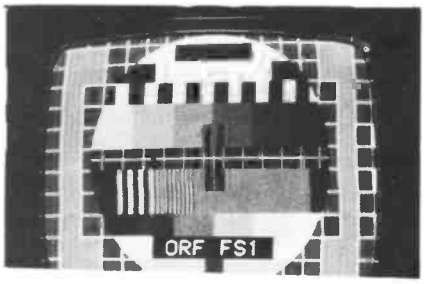


Fig. 2: Austria

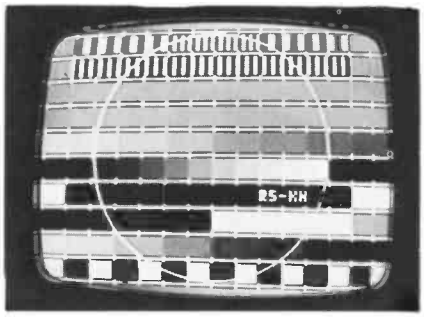


Fig. 3: Czechoslovakia

Fig. 4: Hungary

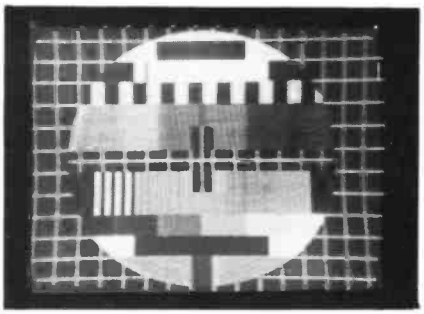


Fig. 5: Poland

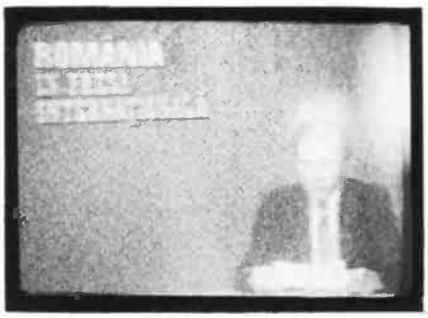


Fig. 6: Romania

Fig. 7: Spain

Fig. 8: USSR

Fig. 9: USSR

Fig. 10: USSR

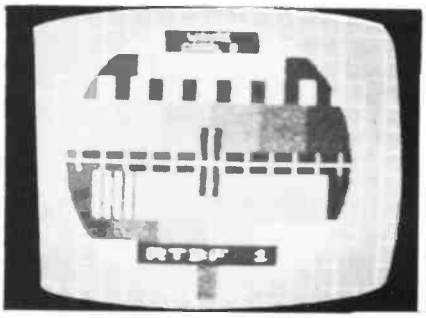


Fig. 11: Belgium

Fig. 12: W. Germany

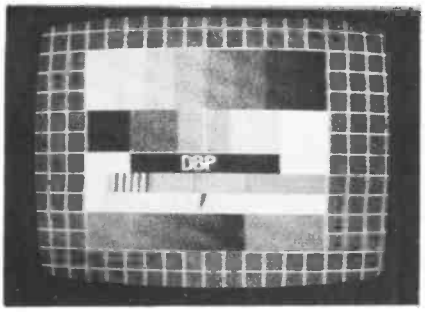


Fig. 13: W. Germany

RAI Televideo; Portugal's RTP-1 Porto; Spain's TVE-1 Porla Manana and Telediario and Switzerland's (+PTT-SRG-1) KEDD followed by a programme schedule. While on high ground in Derbyshire the Mancinis tried their Philips portable with a roof-rack dipole and logged signals from Portugal and Spain.

A tune around for me with a D-100 converter into a Panasonic VCR at 1435 on June 21 and 0840 and 1230 on the 24th revealed test cards from Austria, Czechoslovakia, Finland in colour, Norway, Poland and the USSR. Pictures and sound on Ch. R3 were received at 1706 on June 24 and around 1800 on the 27th. I use an ex-military R216 v.h.f communications receiver in conjunction with the television sets to find the sound channels which are several megaHertz away from the vision frequency.

Readers photographs of DXTV pictures are always welcome and this time the test cards from Austria and Czechoslovakia and the Hungarian presenter, Figs. 1, 2 and 3 came from David Glenday (Arbroath). The test card from Poland and the announcer from Romania, Figs. 5 and 6, were received by Noel Smythe in Caerphilly. The programme from Spain, Fig. 7, was recorded in July 1986 by the late Len Eastman in Bristol and, Fig. 8, the familiar Russian news presenter with TACC caption, came from the archives of Bob Brooks.

When Sporadic-E is about, Band I pictures from the USSR like Figs. 9 and 10, are often seen in Meerut, India, by Lt. Col. Rana Roy.

While on holiday in an Aberdeenshire glen surrounded by mountains, David Glenday, used his Yoko F6 receiver and set top antenna. He logged pictures from Germany on Chs. E2 and 3 during the Sporadic-E opening on June 28. From the home station he saw test cards from Czechoslovakia and the USSR fighting for predominance on the 24th; news, weather and the "TD" logo from Spain on July 7; logo and clock captions from both Germany and Hungary; programmes from Czechoslovakia and the USSR (TSS — Televidenie Sovietskovo Soyuza) on the 8th; test card and news from both Switzerland and Spain on the 9th; sport, film and news from Germany, Spain and the USSR respectively on the 10th and a wildlife feature and test cards from Italy and the USSR on the 12th.

In Great Sutton, Bob Brooks identified signals from 15 countries and logged the captions "Hello Vienna" from Austria, "Monitor" from Poland and "Austurias" and "Castille la Mancha" from Spain. He also saw Videotext from Italy and the idents with clocks from Hungary (MTV-Budapest), Poland (TVP with Eagle logo), Romania (TVR Bucharest) and the USSR. Bob noted that the TVP, TVR and TSS clocks were showing 1, 2 and 3 hours respectively ahead of our time.

Sporadic-E ebbed and flowed in the early mornings of July 12 and 13, when I received test cards from Sweden (Ch. E2) and the USSR (Ch. R2) on the 12th and Norge Melhus (Ch. E2) and Hemnes (Ch. E3) on the 13th. I also saw test cards from the USSR on Chs. R1/2 and programmes on Ch. R3 around 0900 on July 20 and 21. While using my Plustron, with its rod antenna, in Bodiam Castle car park between 1400 and 1530 on the 20th, I found rapidly fluctuating pictures on Chs. R1 and 2 and a strong western film around Ch. E3.

"RAI has been dominating the screen this year", remarked Owen Jones (Blurton) having frequently logged their captions, clocks, programmes and test-cards. Owen also received idents scribed with Barcelona, Bratislava, Budapest, Magyar Televizio, Porto, TACC, Televerket, Televini Novini and

Valencia, which all adds up to a good bit of DXing.

Tropospheric

During a tropospheric opening, pictures from the Belgian French service RTBF-1, Fig. 11, West Germany's ARD, Fig. 12, and the Deutsches Bundepost test card, Fig. 13, are often seen in the UK in Bands III, IV and V. The photographs in Figs. 12 and 13 were received by Bob Brooks and David Glenday respectively.

As the atmospheric pressure ebbed and flowed throughout the month prior to July 11, the Mancinis received pictures in Band III from Belgium (BRT TV-1 and RTBF1-Wavre Canal 8); Denmark (DR) France (Canal+); Germany (ARD-1 WDR-1 and NDR-1 and DFF DDR-F1); Holland (AVVC-HVS and PTT-NED-1) and Ireland (RTE-1 and 2 and RTE-2 Teletext).

Bob Brooks watched adverts from Canal+ at 1918 on July 7 and cartoons at 1743 on the 9th.

Simon Hamer logged Luxembourg (RTL) and West Germany (ARD-WDR-1) in Band III; France (TDF), East Germany (DFF-1/2) and Ireland (RTE-1/2) on the v.h.f. (Band III) and u.h.f. bands on June 15 and 16 and Belgium (BRT-1 and RTBF-1) and Luxembourg in Band III and France and Holland (NED-2/3) in the u.h.f. band on July 11.

LONG MEDIUM & SHORT

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

Long Wave DX

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

From time to time, listeners write and say that they find the l.w. band of little interest (even boring) because the same stations can be heard day after day. This may well be the case if the band is checked during daylight, because the signals arrive via ground wave paths and can be expected to be fairly consistent. As these signals follow the contours of the ground, they lose energy or become attenuated due to the resistivity of the surface. This varies with the nature of the path and is one of the factors which determines whether or not a signal may be received at a particular location.

The nature of the band changes after dark and a number of additional signals may then be heard via sky wave paths. These signals are not consistent and this makes the band of special interest to the DXer.

A careful study of the broadcasts which may be regularly received at a particular location during daylight can be used as a comparison against those received at night. Identifying the broadcasts may be a problem since a number of languages are involved and station idents are seldom given, but the l.w. chart herein may be of some help.

Using a Matsui MR 4099 portable in Surbiton, **Jon Baker** logged nine broadcasts via ground wave paths at 1700. At 2200 he checked the band again and to his surprise he found that Kalundborg, Denmark 245 and Burg, E. Germany 263 were no longer audible, but Kaliningrad, USSR 171; Nador, Morocco 171; Motala, Sweden 189, Konstantinow, Poland 225 and Tipaza, Algeria 254 were all audible via sky wave paths.

A Turin car radio was used by **Phil Townsend** to make his checks in London. He compiled an initial log around dusk — similar to Jon's but included Topolna, Czechoslovakia 272 and Tipaza, Algeria 254. Phil checked the band again at 2200 and he observed that Kalundborg and Burg were no longer audible. Although the broadcasts from Kaliningrad, USSR 171 and Konstantinow, Poland 225 were logged at that time, there was no mention of Motala, Sweden 189 or Kiev, Ukraine 207 in his report.

The performance of some receivers leaves a lot to be desired on the l.w. band. **David Edwardson** encountered this problem with his Trio R600 receiver and now uses an *PW* l.f. convertor ahead of the set to improve its performance. He has been checking the band in Wallsend and rated the broadcasts from Kishinev, USSR as 33433 at 2250. It seems that their broadcasts have been reaching **Ciaron Fitzsimons** in Co. Laios, S. Ireland around dusk, but their signal rated as only 15211. He also heard several other signals from the USSR at that time, Ufa 153, rated as 24242; Baku 216 at 15211 and Moscow at 35232.

Reporting from Moraira, Spain **Jurgen Thiel** says that high levels of static have existed recently, but despite that he has been receiving the BBC Radio 4 broadcasts via Droitwich, UK 198 at 44544 most days peaking at 44545 sometimes. He says it is unlikely that the broadcasts which he mentioned last month from Bechar 153 and Ouargla 198 in Algeria will be logged in the UK unless Donebach, W. Germany 153 and Droitwich 198 are off the air for maintenance.

MW Transatlantic DX

At this time of year, most of the transatlantic signals which reach our shores cannot be heard until well after midnight and that seems to deter many listeners. The hours of darkness are steadily increasing and already there is plenty to interest any DXer who is prepared to burn the midnight oil.

The latest report from **Jim Willett** includes the callsigns of some fourteen stations in Canada and the USA. Their signals have been reaching Grimsby at some time between 0100 and 0430. The broadcasts from a further seven stations in Central and South America were also logged by Jim between 0030 and 0400.

The signals from the Carribean Beacon, Anguilla 1610 have bridged the Atlantic just before midnight on one or two occasions recently, but listening for them from 0030 may prove to be more worthwhile just now. The Atlantic Beacon, Turks and Caicos Islands 1570 was mentioned in the report from **Tim Shirley** in Bristol. He says that 0030 seems to be the best time to listen for their signals. Earlier in the year Tim logged KAAY in Little Rock, Arkansas 1090 and he has now received their QSL card and sticker (Fig. 1).

Simon Hamer in New Radnor included eleven broadcasts in his log from Canada and the USA, several of which were not mentioned in the reports from other DXers.

The broadcasts from two Canadian stations, CKLM Lavel, PQ 1570 and CBJ Chicoutimi, PQ 1580, have been reaching **Leo Gieske** in Randburg, S. Africa around 0330. Both signals rated as 23333. Leo also heard WCKY in Cincinatti, Ohio 1530, rated as 23333. The only broadcast he received from S. America stemmed from Radio Mulher in Sao Paulo, Brazil 1260 also rated as 23333.

Other MW DX

During the night, Leo Gieske has also been hearing some interesting DX from several continents. His log included two stations in Australia: 6WF in Perth 720 and ABC 4QD in Emerald, Queensland 1548 — both signals rated as 23333. He also logged AIR via Nagpur, India 1566 as 43333. He was especially pleased to hear Deutsche Welle via Sri Lanka 1548 at 23332, as he has only heard their broadcast once before — that was in May 1986. The BBC relay on Misirah Island, Oman 1413 was logged as 33333. Three European stations were also heard: Vatican Radio Rome, Italy 1530 (150/450kW); DLF Mainflingen, W. Germany (700kW) 1539; WDR via Langenberg, W. Germany 1593 (400/800kW) — all three rated as 33333.

While driving near Perpignan, close to the Spanish border, **Jean-Yves Camus** picked up Duba, Saudi Arabia 1521 (2000kW) at 1900 rated 34443 on his car radio.

Using a Vega 206 portable with a home made loop antenna in Morden, **Sheila Hughes** received a number of interesting broadcasts during the evening: Radio Prague, Czechoslovakia 1287 via Litomysl (300kW); Liblice (200kW) rated as 43443 at 2200; Radio Sweden via Solvesborg 1179 (600kW) 44444 at 2100; BBC Radio Ulster, via Lisnagarvey, N. Ireland 1341 (100kW) 44444 at 2145; Radio Moscow via Kaunas, USSR 1386 (1000kW) 54444 at 2205; Radio Tirana via Lushnje, Albania 1395 (1000kW) 43343 at 2130; TWR Monte Carlo, Monaco 1467 (1000/400kW) 54554 at 2200; Radio Polonia via Stargard, Poland 1503 (300kW) 43333 at 2230 and BRT via Wolvertem, Belgium 1512 (600kW) 55454 at 2100.

The broadcasts from Radio Prague on 1287 have also been attracting the attention of Leo Barr in Sunderland at 2213. He picked up Radio Moscow, USSR via Kaliningrad 1143 (150kW) and via Kaunas 1368 (1000kW) at 2227. Leo uses a Steepletone MBR-7 portable with its built-in rotatable antenna, but he is planning to build a "Sooper Loop" in the near future.

Several of the BBC low power relays were logged by **Jonathan Creaser** in London between 1900 and 2000: Radio 4 via Newcastle 603 (2kW) rated as 22332; Radio 4 via Lots Road, London 720 (0.5kW) 55555; BBC Radio 4 via Plymouth 774 (1kW) 32333, Radio Ulster via Enniskillen 873 (1kW) 33444; Radio Wales via Llandrindod Wells 1125 (1kW) 12332; Radio 3 via Enniskillen 1197 (1kW) 43443.

The 0.5kW BBC Radio 1 relay in

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

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

DXers:
A: Jon Baker, Surbiton.
B: Colin Diffell, Corsham.
C: David Edwardson, Wallsend.
D: Ciaran Fitzsimons, Co. Laois.
E: Tim Shirley, Bristol.
F: Jurgen Thiel, Moraira, Spain.
G: Phil Townsend, London.
H: Neil Wheatley, in Lytham St. Annes.
I: Martyn Williams, Sunningdale.
J: David Wratten, Cambridge

SEEN & HEARD

Wallasey, Merseyside 1107 was logged by **Neil Wheatley** during a visit to Lytham St Annes. The transmitter was about 36km away and the signal was 55555 at any time of the day or night. The clear sea path to the Isle of Man ensured good reception from Manx Radio via Foxdale 1368 (20kW) throughout the day.

Phil Townsend (London) heard Belgium's BRT2 via Wavre 540 (150/50kW); RTBF1 via Wavre 621 (300kW); BRT2 via Kuurne 1188 (5kW) and BRT2/Inter via Wolvertem 1512 (600kW). From Holland: Hilversum 3 via Lopik 675 (120kW); Hilversum 2 via Flevoland 747 (400kW) and Hilversum 5 via Flevoland 1008 (400kW), all during daylight. Phil also noted quite good reception during daylight from DLF via Bayreuth, W. Germany 549 (200kW); RTE-1 via Tullamore, S. Ireland 567 (500kW); France Inter via Lille, France 1071 (200kW) and the BBC World Service via Orfordness 1296 (500kW).

MW Local Radio DX

A Racal RA17 receiver and a random wire antenna enabled **George Millmore** to hear ninteen stations in Wootton, Isle of Wight. He says, "I have not heard Radio Solway 585 since receiving it on May 26th – since then it has been obliterated by Paris (8kW). It is also interesting that Paris is obliterated at times by Madrid (200kW). Maybe the reception of Radio Solway was a one off occasion".

Radio Solway was mentioned in the latest report from Tim Shirley. He logged their signal at 0830. Their signals were also logged at night by **Christian Pritchard** in Cambridge. He used a Trio R2000 receiver with a random wire antenna and a.t.u.

It is always nice to hear a station for the first time, especially after repeated attempts in the past. **Stewart Russell** (Forfar) tuned to 1305 one evening and logged both ILR Radio Hallam via Ardsley (0.15kW) and ILR Red Dragon Radio via Newport (0.2kW) for the first time. Attempts since have failed.

Writing from Sunderland, Leo Barr says, "Imagine my surprise when I tuned into BBC Radio Devon on 801kHz during daylight. I listened for about 30 minutes and then sent off a detailed reception report including stamps, in the hope of receiving a QSL card – no joy yet!" Two stations: ILR LBC via Saffron Green 1152 (23.5kW) and BBC Radio Shropshire via Woofferton 1584 (0.30kW) were added to the growing list of DX heard by **David Wratten** in Cambridge. Three stations which he logged in May eluded him: BBC Radio Cumbria 756 (1kW); ILR Radio Tay 1161 (0.70kW) and ILR Radio Hallam 1548 (0.74kW).

Neil Wheatley used his Sangean ATS-803 portable to check the local radio scene during his visit to Lytham St. Annes and compiled a bumper log for the chart.

Having constructed a "Sooper Loop", Jonathan Creaser put it to the test with his Sony ICF-7600D portable and compiled an extensive log. He says, "The loop certainly makes a lot of difference to the reception of m.w. signals, as it should! The only problem that I find when using the loop with my ICF-7600D is that sometimes it gets overloaded – mostly by BBC Radio 1 and LBC! The gain control doesn't always eliminate this breakthrough".

Jonathan raised another interesting point too. He says, "One problem when DXing local radio stations in the evening is that they carry National networks, such as R2 on BBC local stations. ILR stations also share services – such as stations in Yorkshire/ Lancashire and also in Beds/Cambridge".

Short Wave DX

The sunspots are increasing at such a rate just now that some experts are of the opinion that the peak figure for this solar cycle will be an all time record. That has to be good news for broadcasters and DXers alike, since reception conditions can be expected to improve dramatically too! Of course there may well be periods when bursts of solar activity (flares) cause sudden ionospheric disturbances which may result in fade outs lasting a few minutes, hours or even days. Solar flares have been causing problems during some days recently and conditions have been disturbed, but generally there is a marked improvement in the propagation on the higher frequency bands.

There is no trace of broadcast activity in the **25MHz (11m)** band just now, but advance schedules for September indicate that Radio Norway International intend to broadcast to listeners in Africa via Fredrikstad, Norway on 25.730 from 1200 until 1245 – their programmes will be in Norwegian. The other good news is that Denmark will also be using this band to reach their listeners in S. Asia and Australia in September – their transmission from Copenhagen on 25.850 will be in Danish from 1200 and 1250. Perhaps some of the other broadcasters will decide to join them.

Solar flares have disturbed the reception conditions prevailing on the **21MHz (13m)** band from time to time during the month, but in general the reception from many areas has been good here.

A number of broadcasters beam their programmes in a variety of languages to Europe during the day. They include Radio Japan via Moyabi, Gabon 21.695 (Eng, Jap 0700-0830) rated as 33333 at 0715 by **Alan Curry** in Stockton-on-Tees; UAE Radio Dubai 21.605 (Ar, Eng 0615-1400) logged by **Kenneth Buck** in Edinburgh as SIO333 at 1035 and 444 at 1330; The Voice of Israel, Jerusalem 21.675/21.760 (Eng, Fr, Heb 1000-1530) **Philip Rambaut** (Macclesfield) rated 21.760 as SIO 222 at 1236 and 21.675 as SIO 444 at 1434; Radio RSA Johannesburg, S. Africa 21.590 (Eng 1400-1600) noted as 43343 at 1400 by Christian Pritchard; Radio Japan via Moyabi Gabon 21.700 (Eng. Jap) rated as 45444 at 1530 by **Andy Keddie** in Lincoln; WHRI in South Bend, USA 21.655 (Eng 1500-1700) logged as 433 by Philip Rambaut at 1636; he also heard WYFR via Okeechobee, Florida 21.615 (Eng, Ger, Fr 1600-1945) 333 at 1755.

Some other broadcasts heard by DXers during the morning were: David Wratten logged Radio Finland via Pori 21.550 (Fin, Sw, Eng to Australia) as 25333 at 0800; Radio Nederlands via Madagascar 21.485 (Eng to Asia) as 24333 at 0841; RBI Berlin via Nauen, GDR 21.540 (Eng, Ger to S. Asia) as 55444 at 0933; BBC via Woofferton, UK 21.470 (Eng to E. Africa) as 35343 at 0936. **Ken Whayman** (Bexleyheath) logged SRI via Schwarzenburg, Switzerland 21.695 (It, Eng, Ger, Fr to S. Asia) as 54555 at 1000. Between 1130 and 1145 Philip Rambaut heard BRT via Wavre, Belgium 21.810 (Du to C. Africa) SIO 211; Radio Moscow via Starobelsk, Ukraine 21.630 (Eng to Africa, Middle East) 211; RFI via Moyabi, Gabon 21.520 (Ar to E. Africa, Middle East)) 322; BSKSA Riyadh, Saudi Arabia 21.495 (Ind to SE. Asia) 322.

Many more were heard during the afternoon. An s.s.b. (u.s.b.) transmission from Radio Sweden via Varberg 21.555 (Sw to Africa 1100-1600) was monitored by **Kenneth Reece** in Prenton, he rated it as 23343 at 1215. At 1237 Philip Rambaut logged RNI via Fredrikstad, Norway 21.700 (Norw to Africa) as 222 and Radio DW Cologne via Sines,

Freq MHz	Station	Location	Time (UTC)	DXer
		USA		
650	WSM	Nashville, TN	0300	C,D
660	WNBC	New York, NY	0230	D
770	WABC	New York, NY	0140	D
860	WOAY	Oak Hill, W, VA	2200	C
1010	WINS	New York, NY	0315	B,C,D
1030	WBZ	Boston, MA	0330	B
1050	WFAN	New York, NY	0330	B
1110	WMBI	Chicago, IL	0150	D
1130	WNEW	New York, NY	0330	B
1210	WCAU	Philadelphia, PA	0330	B,D
1260	WWDC	Washington, D.C	0310	D
1530	WCKY	Cincinatti, OH	????	A
		Canada		
540	CBT	Grandfalls, NF	0300	C
580	CFRA	Ottawa, ON	0700	C
580	CJFX	Antigonish, NS	0200	D
590	VOCM	St. John's, NF	0230	B,D
610	CKYQ	Grand Bank, NF	0400	D
730	CKAC	Montreal, PQ	0600	C
920	CJCH	Halifax, NS	0330	B,D
930	CFBC	St. John, NB	0300	B
930	CJYQ	St. John's, NF	0100	B,D
1070	CBA	Moncton, NB	0230	B
1220	CKCW	Moncton, NB	0120	B,D
1570	CKLM	Lavel, PQ	0140	A,D
1580	CBJ	Chicoutimi, PQ	????	A
		C. American & Caribbean		
750	XEKOK	Las Cruces, Mexico	0215	D
1470	XEBBC	Tijuana, Mexico	0250	D
1570	Atlantic Beacon	Turks & Caicos Ils	0030	C
1610	Caribbean Beacon	Anguilla	0300	D
		South America		
570	R.Rumbos	Venezuela	0340	D
750	R.Vision	Caracus, Venezuela	0400	C,B
980	R.Nacional	Brazil	0250	C,D
1100	R.Globo	Sao Paulo, Brazil	0230	C
1220	R.Globo	Rio, Brazil	0315	D
1260	R.Muhler	Sao Paulo, Brazil	????	A

DXers
A: Leo Gieske, Randburg, S. Africa.
B: Simon Harner, New Radnor.
C: Tim Shirley, Bristol.
D: Jim Willett, Grimsby.

Fig. 1

Fig. 2

SEEN & HEARD

Portugal 21.680 (Ger to S. Asia, Australia) as 333. Kenneth Buck noted the BBC World Service transmission to E. Africa via Daventry, UK 21.470 as SIO 454 at 1335 and to N. and W. Africa via Rampisham, UK 21.710 as 55555 at 1400. At 1500, Tim Shirley picked up a broadcast in English to E. Africa and the Middle East from Radio RSA Jonannesburg, S. Africa 21.535, noting their signal as SIO 454.

Later, David Wratten heard Radio Prague, Czechoslovakia 21.505 (Eng, Cz, Ar, to Africa) 33443 at 1540; Radio DW via Wertachtal, W. Germany 21.600 (Eng, Swa, Fr to E. Africa) 55555 at 1540; WYFR via Okeechobee, Florida 21.525 (Eng, Ar, Fr, Port to W. Africa) 25333 at 1606; REE via Noblejas, Spain 21.575 (Sp to Middle East) 45444 at 1700. A broadcast to S. Africa from WCSN via Scotts Corner, Maine 21.640 (Eng, Fr, Ger) attracted the attention of Leo Barr at 1700, he rated their signal as 33222. At 1716 Philip Rambaut logged a broadcast in Italian from RAI Rome, Italy 21.690 to Africa and S. America as SIO 222. In Newcastle-upon-Tyne, **Glen Glen-Davison** heard REE via Noblejas, Spain 21.575 (Sp to Middle East) and rated their signal as a remarkable 55555 at 1720.

Sudden ionospheric disturbances have disrupted reception in the **17MHz** (16m) band recently, but fortunately these effects have been relatively shortlived and during most days many potent signals from several continents have been evident.

The 16m broadcasts from Radio Australia to Asia and the Pacific areas are being heard quite well in Europe just now. Andy Keddie rated their broadcast to the Central Pacific and Western N. America via Shepparton 17.795 (Eng 2200-0630) as 24333 at 2300. David Wratten also logged at as 24333 at 0218. At 0335, David Edwardson picked up their transmission to S. Asia via Carnarvon 17.715 (Eng 0100-0915) and noted it as 24432.

The latest report from **George Hewlett** (Torquay), details their transmissions as follows: 17.750 via Darwin (Eng, Chin to E. Australia, C. Asia 0000-0900) as SIO 433, it becomes inaudible at 0600 due to a jammer; 17.795 via Shepparton as 433; 17.715 via Carnarvon as 433, the reception of this broadcast varies a great deal, but it can usually be heard until close down at 0910. Alan Curry rated 17.715 as 22222 at 0700 and Philip Rambaut noted it as 322 at 0802.

The broadcasts to SE. Asia from Radio Japan via Yamata, Japan 17.810 (Eng, Jap 0100-1100) have also been reaching the UK. Using a Sony ICF-2002 with an AN-1 active antenna, **Bill Griffith** rated their signal in London as 23333 at 0545. Bill has also been hearing the broadcasts to E. Asia from KYOI in Saipan, N. Mariana Islands 17.780 (Eng 0200-0800) rated 44444 at 0550.

Broadcasts which may be heard later in the morning stem from Abu Dhabi 17.820 (Ar to Europe, N. America 0630-1015) rated as 333 at 0756 by Philip Rambaut; Radio Afghanistan via Tula, USSR 17.655 (Pashto, Eng, Tu to SE. Asia 0430-1230) logged at 0912 by **Ron Pearce** using a 1 valve (955) receiver in Bungay; UAE Radio Dubai 17.865 (Ar, Eng to Europe 0615-1645 rated as 344 at 1000 by Kenneth Buck; Radio Pakistan, Islamabad 17.660 (Ur, Eng to Europe 0715-1120) logged at 1100 to Ron Pearce with his one valver; Radio RSA Johannesburg, S. Africa 17.860 (Eng to Europe, W. Africa 1100-1200) rated as 232 at 1105 by Kenneth Buck; All India Radio via Aligarh, N. India 17.785 (Bur to SE. Asia 1115-1215) logged as 444 at 1154 by Philip Rambaut.

Many more may be heard during the afternoon, including Radio RSA Johannesburg, S. Africa 17.755 (Eng to Europe 1400-1600) rated as 34333 at 1400 by Andy Keddie; Radio Nederlands via Madagascar 17.575 (Ind, Du to SE. Asia 1230-1425) logged as 333 at 1425 by Philip Rambaut; Tanger, Morocco 17.815 (Eng, Fr to Middle East, N.Africa 1700-1900) noted as 433 at 1700 by Cyril Kellam in Sheffield.

During the evening Kenneth Buck logged VOA via Greenville, USA 17.785 and via Bethany, USA 17.800 (Eng to W. Africa 1600-2200) as 333 at 1800; RCI via Sackville, E. Canada 17.875 (Eng, Fr to Europe 1830-2100) as 454 at 1830 and on 17.820 (Eng, Fr to Africa 1800-2000) as 454 at 1900; Voice of Israel, Jerusalem 17.685 (Heb, Russ, Eng, Fr to Europe 1730-1955) as 444 at 1905; Radio Nederlands via Bonaire, Ned.Antilles 17.605 (Eng, Fr, Du to Africa 1830-2225) as 444 at 1919.

Later, Radio HCJB, Quito, Ecuador 17.790 (Fr, Ger, Eng, Sp to Europe 2030-2230) was logged as 44444 at 2130 by David Wratten; the Voice of Turkey, Ankara 17.760 (Eng, Tur to S. Asia, Australia 2200-0350) was rated as 33443 at 2201 by Leo Barr; the Voice of Free China, Taipei via Okeechobee, Florida 17.845 was noted as 54454 at 2230 by Bill Griffith; KVOH Los Angeles, USA 17.775 (Eng to C.America 2030-0100) was logged as 44333 at 0046 by David Wratten.

There is much to interest the listener and the dedicated DXer throughout the day and night in the **15MHz (19m)** band. Broadcasts from several continents have been reaching the UK at remarkable strength most days, but solar events (flares) have resulted in high noise levels and fade-outs which have disrupted reception from time to time.

The broadcasts from Radio Australia have been attracting attention in Europe although they are beamed to other areas. At 0030, Tim Shirley heard one of their transmissions from Shepparton: 15.240 (Eng to S. Pacific 2100-0730). This broadcast has been particularly well received here around 0400, the 44444 rating noted by Kenneth Reece being typical. In contrast, David Edwardson logged it at 0250 as 34423 and David Wratten noted it in his log as 43443 at 0725.

Several other 19m broadcasts from Radio Australia also stem from Shepparton including 15.160 (Eng, Fr to C. Pacific area 2100-0700) rated as 44333 at 0040 by Sheila Hughes and 32422 at 0352 by Kenneth Reece; 15.315 (Fr, Eng to C. Pacific 0500-0700) rated as SIO 433 by George Hewlett; 15.320 (Eng, Fr to C. Pacific, W. USA 2200-0500) which George noted as variable, 322 to 433.

A number of broadcasts from other countries were heard during the early morning by Kenneth Reece: BBC via Limassol, Cyprus 15.420 (Eng, Swa to E. Africa 0400-1800) rated as 44433 at 0452; BBC via Masirah Island, Oman 15.310 (Eng to S. Asia, Middle East 0600-1515) 24222 at 0557; Radio Japan via Moyabi, Gabon 15.235 (Russ, Sw, It, Jap, Ger, Fr to Europe, Middle East 0500-0700) 34443 at 0549; SRI via Schwarzenburg, Switzerland 15.430 (Ger, Fr, Eng, It to Africa 0545-0730) 54443 at 0634. At 0700, **Robert Cowell** (Blackpool) heard the Voice of Israel, Jerusalem 15.615 (Heb to Europe 0515-2000) at 44333. He uses a Hammarlund HQ180 XE receiver plus 32m wire antenna.

Later in the morning, Philip Rambaut logged Africa No.1 Gabon 15.200 (Fr, Eng to W. Africa 0800-1655) as SIO 333 at 0927 and BBC via Kranji, Singapore 15.360 (Eng to E. Asia 0800-1130) as 222 at 0935. Using his one valver, Ron Pearce heard AFRTS via Munich, W. Germany 15.265 (Eng to Middle East 0700-1300) at 0939. Bill Griffith logged Radio Pakistan, Islamabad 15.605 (Ur, Eng to Europe 0715-1120) as 54444 at 1000. In Worcester, **Edward Broadsmith** heard

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

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

DXers:
A: Jon Baker, Surbiton.
B: Leo Barr, Sunderland.
C: Edward Broadsmith, Worcester
D: Jonathan Creaser, London.
E: Alan Curry, Stockton-on-Tees.
F: Sheila Hughes, Morden.
G: George Millmore, Wootton, I.O.W.
H: Christian Pritchard, Cambridge.
I: Stewart Russell, Forfar.
J: Tim Shirley, Bristol.
K: Phil Townsend, London.
L: Neil Wheatley, in Lytham St. Annes.
M: Martyn Williams, Sunningdale.
N: David Wratten, Cambridge.

SEEN & HEARD

RNI via Fredrikstad, Norway 15.235 at 1000 (Norw, Eng, Sp to Middle East 1000-1045). Kenneth Buck listened to UAE Radio Dubai 15.435 at 1035 (Ar, Eng to Europe 0615-1645) their signal was SIO 333.

Listening during the afternoon, George Markwick (Thornaby) logged Radio Bucharest, Romania 15.270 (Eng to Europe 1300-1355) as SIO 433 at 1300. At 1410 Ciaron Fitzsimons heard Radio Sweden, Stockholm 15.345 (Eng, Sw, Fr to USA 1400-1530) at 44334. In George, S. Africa, Dick Moon, logged Radio Ulan Bator 15.305 at 1445 (Eng to Asia 1445-1520). At 1600, George Markwick heard the Voice of Vietnam, Hanoi, 15.010 (Eng, Russ, Viet, Fr, Sp to Europe, N. Africa 1600-2130) at SIO 444.

During the evening, Peter Vlietinck (London) listened to RCI via Sackville, E. Canada 15.325 (Ger, Hung, Cz, Pol, Eng, Fr to Europe 1630-2200). Cyril Kellam logged RNB Brasillia, Brazil 15.265 (Eng, Ger to Europe 1800-1950) as 433 at 1900. Christian Pritchard heard REE via Noblejas, Spain 15.375 (Eng, Fr to Africa 1900-2000) 54434 at 1930. At 2000, Bill Griffith logged Tangier, Morocco 15.335 (Ar to Europe, W. Africa 1000-0100) as 55555 and Kenneth Buck heard Radio Baghdad Iraq 15.230 (Fr, Ger, Eng to Europe 1800-2155) at SIO 444. At 2045, David Wratten rated WRNO New Orleans, USA 15.420 (Eng to Europe 1700-2100) as 44333 and at 2130 Ciaron Fitzsimons noted Radio HCJB Quito, Ecuador 15.270 (Cz, Ger, Eng, Fr to Europe 1800-2200) as 21333.

At 2200, Christian Pritchard logged Radio Damascus, Syria 15.095 (Eng to USA 2110-2210) as 33343 and RNI Oslo 15.180 (Norw, Eng, Sp to S. America 2200-2245) as 44334, Glen Glen-Davison heard KYOI Saipan, N. mariana Islands 15.405 (Eng to E. Asia 2200-0200) 35443. At 2230, Alan Curry logged Radio Korea Seoul, S. Korea 15.575 (Eng, Kor, Port, Sp to USA 2230-0300) as 33333 and David Wratten heard VOA via Tinang, Philippines 15.290 (Eng to E. Asia 2200-0100) 34333.

WCSN Scotts Corner, Maine 15.300 (Eng, Fr, Ger to W. Africa 2200-2355) heard by Leo Barr at 2321 as 44333; Voice of Chile, Santiago 15.140 (Sp to S. America 2200-0100) logged by David Wratten as 34333 at 2340; WINB Red Lion, PA 15.145 (Eng to S. America 2348-0330) heard by Sheila Hughes at 0105 as 34433; UAE Radio Dubai 15.435 (Ar, Eng to USA 0230-0400) logged by David Edwardson as 44444 at 0330; VOA via Kavala, Greece 15.205 (Eng to Middle East 0400-0600) was heard by Ken Whayman at 0445 as 43333.

The 13MHz (22m) band has attracted another broadcaster: Radio For Peace International. Their transmission via Santa Ana, Costa Rica 13.660 (Eng, Sp to C. America 1800-0000) was logged as 34333 at 2335 by David Wratten.

Using a JRC NRD 525 receiver, Kenneth Reece logged some of the early morning broadcasts including RBI via Leipzig, GDR 13.610 (Pol, Ger, Eng to E. Africa 0345-0545) 25333 at 0518; Radio Moscow, USSR 13.625 (Chin to C. Asia 0200-1000) 35444 at 0557; Radio Moscow, USSR 13.775 (Chin, Kor to C. Asia 0000-0930) 33443 at 0617; Radio DW via Julich, W. Germany 13.790 (Ha, Eng, Fr to Africa 0600-0750) 34443 at 0628.

During the afternoon many broadcasts may be heard: Radio Moscow 13.710 (Eng, Ger to Europe 0600-1500) 55455 at 1315 by Ciaran Fitzsimons; WCSN Scots Corner, Maine 13.760 (Eng, Fr, Ger to Europe 1400-1555) SIO 422 at 1400 by Phil Townsend; Radio DW via Julich 13.780 (Ger to E. Africa, Middle East 1200-1755) SIO 222 at 1411 by Philip Rambaut.

At 1815, Julian Wood heard Radio DW via Wertachtal, W. Germany 13.790 (Eng to E. Africa 1800-1900) at SIO 222. He uses a Trio R1000 receiver in Buckie. Later, two stations in the USA were heard: WYFR via Okeechobee, Florida 13.695 (Eng, Fr to E. USA 1200-2245) 34344 at 2005 by Ciaran Fitzsimons; WRNO New Orleans, LA 13.760 (Eng to E. USA 2100-0000) 33333 at 2230 by Alan Curry.

Although the propagation conditions prevailing in the 11MHz (25m) band have also been disturbed from time to time by solar events, reception has been generally more reliable than on the higher frequencies. Good long distance reception has been noted recently on this band and the paths from Australia have been open during the early hours of the morning and later in the day.

George Hewlett indicates that Radio Australia's broadcast to the S. Pacific and Europe via Shepparton 11.910 (0400-0630) is generally well received here, but sometimes there is jamming at first. Their transmission reaches Europe via the long path and was rated as 45544 at 0540 by David Edwardson. In contrast, their transmission from Shepparton on 11.945 (Eng, Fr to S. and E. Africa 0300-0700) suffers from adjacent channel interference from Radio Moscow on 11.940 and 11.950 and co-channel interference from the BBC via Skelton, UK (0415-0455) and via Limassol, Cyprus (0500-0645).

Some of the early morning broadcasts from other areas were noted in the reports. David Wratten logged AFRTS via Bethany, USA 11.790 (Eng to W. Africa 2200-0700) as 54444 at 0530; VOA via Monrovia, Liberia 11.915 (Eng to W. Africa 0600-0700) as 34333 at 0600; Radio HCJB Quito, Ecuador 11.775 (Eng to USA 0035-0700) as 34343 at 0620. Kenneth Reece rated Radio Sophia, Bulgaria 11.750 (Tur, Yu, Gr to SE. Europe 0400-1025) as 54544 at 0530 and SRI via Schwarzenburg, Switzerland 12.030 (Ger, Fr, Eng, It to W. Africa 0545-0730) as 33433 at 0636.

Later, Bill Griffith heard WYFR via Okeechobee, Florida 11.580 (Eng to W. Africa 0700-0900) 44554 at 0700. Kenneth Reece rated the BBC via Limassol, Cyprus 11.760 (Eng to Europe 0600-0730) as 32422 at 0713. Philip Rambaut logged Radio HCJB Quito, Ecuador 11.835 (Russ, Sp, Ger, Fr, Eng to Europe 0200-0830) as SIO 322 at 0820 and Radio Damascus, Syria 12.085 (Ar to Middle East 0400-1500) as 322 at 0840. At 1040 Kenneth Buck listened to a broadcast in English from UAE Radio Dubai 11.955 (AT, Eng to N. Africa 0615-2050) SIO 233.

During the afternoon, Philip Rambaut heard Radio Beijing, China 11.600 (Eng to S. Asia 1400-1555) SIO 222 at 1440 and the BBC World Service to S. Asia via Kranji, Singapore 11.750 (1030-1615) as 333 at 1445. At 1500, David Wratten logged KYOI Saipan, N. Mariana Islands 11.900 (Eng to E. Asia 0800-1600) as 32442. Later, Kenneth Buck heard Radio Pakistan Islamabad 11.615 (Ur, Eng to N. Africa 1315-1630) SIO 333 at 1629; UAE Radio Dubai 11.730 (Ar, Eng to Europe 1405-2050) 433 at 1757.

During the evening, Julian Wood heard AIR via Aligarh, N. India 11.620 (Eng to Europe 1845-2230) SIO 222 at 1908 and REE via Arganda, Spain 11.790 (Fr, Eng to Europe 1800-2200) 222 at 1915. Ian Bond (Wirral) rated Radio Bucharest, Roumania 11.940 (Ger, Fr, Eng to Europe 1800-2100) as very good at 1930. Sheila Hughes listened to Radio Kuwait, State of Kuwait 11.665 (Eng to Europe 1800-2100) 44444 at 1945. Ciaran Fitzsimons logged Radio Beijing, China 11.515 (Far, Tur, Ar, Eng to Middle East) as 54455 at 2021.

Later, Christian Pritchard rated Radio Finland, Helsinki 11.755 (Eng, Finn,

DXers:
A: Leo Barr, Sunderland.
B: Alan Curry, Stockton-on-Tees.
C: David Edwardson, Wallsend.
D: Bill Griffith, London.
E: Dick Moon, George, S. Africa.
F: Fred Pallant, Storrington.
G: Christian Pritchard, Cambridge
H: Kenneth Reece, Prenton.
I: Tim Shirley, Bristol.
J: Phil Townsend, London.
K: Keith Wakelin, Hull.
L: Jim Willett, Grimsby.
M: David Wratten, Cambridge

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2200	G
2.560	Xinjiang	China	2300	I
3.000	RRI Surabaya	Java	1630	E
3.200	TWR	Swaziland	0324	H
3.205	RRI Bandung	Java	1550	E
3.210	R. Mozambique	Mozambique	0345	I,L
3.215	R. Orange	S. Africa	0500	I
3.230	ELWA Monrovia	Liberia	2128	M
3.230	R. RSA	S. Africa	2055	F,H
3.270	SWABC 1, Namibia	S.W.Africa	2045	M
3.300	R.Cultural	Guatemala	0340	C,H,L
3.320	R.Orion	S.Africa	0245	I
3.330	R. Kigali	Rwanda	1954	M
3.365	GBC Radio 2	Ghana	2100	F,M
3.395	R. Zaracay	Ecuador	0350	C
3.777	VOIRI Tehran	Iran	1930	L
3.915	BBC Kranji	Singapore	2218	M
3.930	R. Capital	Transkei	2015	M
3.955	BBC Daventry	England	2000	G
3.955	R. Orion	S. Africa	2200	L
3.965	RFI Paris	France	2015	G
3.976	RRI Surabaya	Indonesia	1525	E
3.985	R. Beijing, China	via SRI Berne	2100	B
3.995	DW Cologne	W. Germany	1945	G
4.000	RRI Kendari	Indonesia	2115	E
4.005	R. Difusora Grau	Peru	0230	I
4.005	RRI Padang	Sumatra	1545	E
4.050	R. Moscow	USSR	2000	G
4.080	R. Ulan Bator	Mongolia	2200	I,L
4.220	PBS Xinjiang	China	2220	M
4.680	R. Nac. Espejo	Ecuador	0300	I
4.735	Xinjiang	China	2223	M
4.750	PBS Xizang, Lhasa	China	????	I
4.755	Sani Radio	Honduras	0430	K,L
4.760	ELWA Monrovia	Liberia	2105	D,F,H,M
4.770	FRCN Kaduna	Nigeria	2105	F,G,L,M
4.770	R. Mundial, Bolivar	Venezuela	0100	G
4.780	RTD	Djibouti	0255	L
4.780	V. Carabobo	Venezuela	0130	L
4.785	RTM Bamako	Mali	2135	G
4.790	R. Atlantida	Peru	0330	C,H,L
4.795	R. Douala	Cameroon	2105	F
4.800	R. Popular Cuenca	Ecuador	0545	L
4.800	LNBS Lesotho	Maseru	1915	G,L,M
4.805	R. Nac. Amazonas	Brazil	0150	H,L
4.810	R. Yerevan	USSR	0132	H
4.820	R. Botswana	Botswana	2010	G
4.820	La Voz Evangelica	Honduras	0300	H,I
4.825	V of Selva	Peru	0030	I,L
4.830	Africa No. 1	Gabon	2030	A,C,F,G,H,J,M

Freq MHz	Station	Country	UTC	DXer
4.830	R. Reloj	Costa Rica	0408	C,H,K,L
4.830	R. Tachira	Venezuela	0115	C,G,H,L,M
4.832	Gaborone	Botswana	0350	H
4.835	RTM Bamako	Mali	2110	F,M
4.840	R. Andahuaylas	Peru	0045	L
4.845	R. Nacional, Manus	Brazil	0125	C,M
4.845	ORTM Nouakchott	Mauritania	2106	F,H,L,M
4.850	R. Yaounde	Cameroon	2130	G,M
4.850	R. Capital, Caracus	Venezuela	0436	H,K
4.855	R. Sana Yemem	Yemen	0315	E
4.865	PBS Lanzhou	China	2200	L
4.870	R. Cotonou	Benin	2105	F,H,L,M
4.875	R. Nac. Boa Vista	Brazil	0030	L
4.875	Uraisk	USSR	0139	H
4.880	SABC Radio 5	S. Africa	2100	F,G,H,M
4.885	Voice of Kenya	Kenya	2010	C
4.890	ORTS Dhaka	Senegal	2214	H,M
4.895	R. Ashkabad	USSR	2115	F
4.905	R. Nat. N'djamena	Chad	2115	F
4.915	R. Ghana Accra	Ghana	2115	F,M
4.915	R. Anhanguera	Brazil	0400	C
4.920	R. Quito	Ecuador	0443	H
4.930	R. Moscow, Tbilisi	USSR	2115	F,H
4.940	R. Kiev	USSR	2130	F,G
4.945	Caracol, Neiva	Columbia	0430	L
4.950	R. Nac. Luanda	Angola	2220	M
4.955	R. Marajoara Belem	Brazil	0130	M
4.958	R. Baku	USSR	0415	H
4.975	R. Uganda, Kampala	Uganda	2048	M
4.985	R. Brazil Central	Brazil	0506	H
4.990	R. Animas, Chocaya	Bolivia	0521	H
4.990	R. Baha'I, Otavalo	Ecuador	0510	H
4.990	R. Barquisimeto	Venezuela	0450	K
4.990	FRCN Lagos	Nigeria	2230	B,G,H,M
4.995	R. Andina, Huancayo	Peru	0415	C,H
5.005	R. Nacional, Bata	Eq. Guinea	2030	D,F,M
5.010	R. Garoua	Cameroon	2045	F,H
5.020	R. Nacional, Caracas	Venzuela	0010	L
5.030	R. Impacto	Costa Rica	0420	H,K
5.035	R. Bangui	C. Africa	2115	F
5.040	Vos del Upano, Macas	Ecuador	2320	L
5.045	R. Cultura do Para	Brazil	0320	C,H
5.045	R. Togo, Lome	Togo	2015	F
5.045	RRI Yogyakarta, Java	Indonesia	1535	E
5.050	SBC Singapore	Singapore	1445	E
5.055	Faro del Caribe	Costa Rica	0502	H
5.057	R. Tirana Gjirokaster	Albania	2051	H
5.065	R. Candip, Bunia	Zaire	2045	F
5.095	R. Sutatenza, Bogata	Columbia	0015	L

SEEN & HEARD

Sw. SW. Europe, S. America 2100-2205) as a remarkable 55555 at 2100. Kenneth Reece heard Radio Australia via Darwin 11.730 (Chin to Australia 2100-2200) as 44444 at 2118. At 2130, Ian Curry (Stockton-on-Tees) logged the Voice of Israel, Jerusalem 11.605 (Eng, Fr, Heb, Sp to Europe 2100-2253) as 54444 their transmission to Europe and Canada on 12.080 was rated as SIO 444 by George Markwick. David Wratten heard RCI via Sackville, E. Canada 11.945 (Pol, Russ, Eng, Fr to Europe 1800-2200) 53443 at 2135; Radio Japan via Moyabi, Gabon 11.800 (Jap, Eng to Europe, Africa 2200-0000) 43443 at 2300; KUSW Salt Lake City, USA 11.695 (Eng to E. USA 0100-0300) 34333 at 0113.

The **9MHz** (31m) band is still the best one to choose if you intend to listen to the early morning broadcasts from Radio Australia via Shepparton 9.655 (Eng to Europe, S. Pacific 0700-1000). Keith Wakelin often listens to their programmes in Hull and he has found reception to be generally good. The report from Ken Whayman quoted 44444 at 0800, which is probably a typical rating in the UK, but Jurgen Thiel noted their signal in Spain as 35523 at that time. Surprising as it may seem, Ron Pearce has been hearing their broadcasts clearly while using his one valve (955) receiver in Bungay.

There are many 31m broadcasts to Europe during the day and night. Noted during the evening, were Radio Finland, Helsinki 9.550 (Eng, Ger, Fin, Sw, Fr 1830-2045) 53333 at 1845 by Robert Cowell; VOIRI Tehran, Iran 9.020 (Fr, Eng, Sp 1845-2230) 34433 at 1930 by Leo Barr; Radio Baghdad, Iraq 9.770 (Fr, Ger, Eng 1800-2155) 44334 at 2000 by Christian Pritchard; Voice of Turkey, Ankara 9.825, (Ger, Eng, Fr 1900-2150) 55445 at 2000 by Andy Keddie; Radio Cairo, Egypt 9.900 (Ger, Fr, Eng 1900-2245) 43222 at 2132 by Ian Curry.

A station which is seldom mentioned: WMLK in Bethal, USA 9.465 (Eng to Europe, E. USA 0400-0700) was logged at 0400 by Andy Keddie as 54444 and at 0630 by David Wratten as 34433.

Due to overcrowding, co-channel and adjacent channel interference is rife in the 7MHz (41m) band, so a good receiver may be needed! Some of the early morning broadcasts include the BBC via Ascension Island 7.105 (Fr, Eng, Ha to Africa 0430-0700) rated as 33443 by Kenneth Reece at 0518; WHRI South Bend, USA 7.400 (Eng to Europe 0000-0600); Voz del Cid, Costa Rica 7.380 (Sp to C. America 2300-1050), both were logged at 0550 by Philip Rambaut; Radio Thailand, Bangkok 7.115 (Thai to Thailand 2245-1600), heard by Dick Moon at 0617; WYFR via Okeechobee, Florida 7.355 (Russ, Ger, Eng to Europe 0400-0745) 54555 at 0700 by Bill Griffiths. WHRI occupy 7.355 at 0800 (Eng, Sp to Europe 0800-1100) 44444.

During the evening, Leo Barr heard RBI via Nauen, GDR 7.260 (Dan, It, Eng, Sw, Fr, Sp to Europe 1545-2145) 44334 at 1736. Philip Rambaut logged the BBC via Masirah Island, Oman 7.160 (Far, Eng to Middle East 1600-1900) as 322 at 1734. Phil Townsend listened to Radio Australia via Carnarvon 7.205 (Eng to S. Asia, Europe 1430-2030) 322 at 1745. David Wratten logged Radio Bangladesh, Dhaka 7.505 (Eng, Beng to Europe, Middle East 1800-2000) as 33333 at 1815; Ciaron Fitsimons heard AIR via New Delhi, N. India 7.410 (Eng to Europe 1845-2230) 35433 at 1948; Sheila Hughes listened to IBRA Radio via Cyclops, Malta 7.110 (Pol, Ger, Eng to Europe 2000-2115) 44343 at 2045.

From time to time solar events have resulted in high noise levels in the **6MHz** (49m) band, but the broadcasts from the high power stations in Europe and Scandinavia have been generally well received here. Broadcasts from more distant areas have also been heard: VOA via Greenville, USA 5.995 (Eng to Europe 0400-0700) 333 at 0530 by Philip Rambaut; Radio Australia via Carnarvon, W. Australia 6.035 (Eng to S. Asia, Europe 1530-2300) 43343 at 1800 by Andy Keddie, King of Hope, S. Lebanon 6.280 (Fr, Eng to Middle East, S. Europe 1945-2300) 23232 at 2145 by David Wratten. Putting his one valver to the ultimate test, Ron Pearce heard Radio Australia on 6.035 at 2234.

Station Addresses

BBC Radio Leeds, Broadcasting House, Woodhouse Lane, Leeds LS2 9PN.
ILR Swansea Sound, Victoria Road, Gowerton, Swansea SA4 3AB.
Radio Japan, NHK Overseas Service, Jinnan, Shibuya-ku, Tokyo 150, Japan.
KYOI, PO Box 1387, Saipan, CM 96950, North Mariana Islands.
Radio Malawi, International Service, PO Box 30133, Blantyre, Malawi.
Voix du Sahel, Radiodiffusion TV du Niger, Boite Postale 361, Niamey, Niger.

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
Hung	Hungarian
Ind	Indonesian
It	Italian
Jap	Japanese
Kor	Korean
Norw	Norwegian
Pa	Pashto
Pol	Polish
Port	Portuguese
Russ	Russian
Sp	Spanish
Sw	Swedish
Swa	Swahili
Tu	Turkman
Tur	Turkish
Ur	Urdu
Viet	Vietnamese
Yu	Yugoslavian

REMINISCENCES

▷ 26

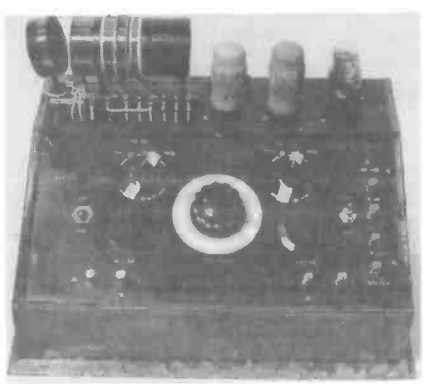
ceramic valve and coil holders, as well as insulated posts, and terminals.

Second-hand chassis

My one-valve set was also changing for now it had its own chassis, second hand, and an output stage. An h.f. stage had been added, with separate tuning for both h.f. and detector, together with band-spreading and a small tuner in the antenna input stage. A variable resistance also replaced the former coil reaction tuner, giving greater control over volume.

Changing Valves

Valves, too, were changing. First a screened grid went into the h.f. stage, then changed to an h.f. pentrode. And even the output stage boosted a QPP valve!



An old type radio receiver

To get some of the parts, often second-hand, I had to go not to a wireless shop, but to a small jeweller's business, the owner's son having an interest in radio.

Spin-wheel Tuning

The super-het came into being, mains powered of course, and I obtained a 5-valve Ekco table receiver for domestic use, the choice of set being made because of its fine spin-wheel tuning and the fact that it had two short wave bands together covering 50 to 16 metres. Its end-on tuning and volume controls were about 4in diameter. A flick of the thumb would send the pointer from one end of the scale to the other, the tuning so fine that no bandspread was needed.

No Longer Confined

No longer was I confined to 25 metres, but now ranged from 200 metres to even 10 metres, a second battery set having been built for 10 metres. □

ADVERTISERS INDEX

SPECIAL NOTICE TO READERS

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WHAT SCANNER

AOR AR800E
Hand-held Scanner

- *COVERAGE:* 75-105, 118-136, 140-174, 406-495, 830-950MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* For 12dB SINAD: 75-105MHz, 118-136MHz & 140-174MHz = 0.4μV; 406-495MHz = 0.5μV; 830-950MHz = 1μV; 118-136MHz a.m. (10dB S/N) = 0.8μV
- *SELECTIVITY:* – 23dB at ± 12.5kHz, – 45dB at ±25kHz
- *RESOLUTION:* 5, 10, 12.5kHz (v.h.f.) 12.5kHz (u.h.f.), 25kHz (offset by 12.5kHz) on 830-950MHz
- *IMAGE REJECTION:* – 24dB at 145MHz
- *IF STAGE:* 21.4MHz, 455kHz
- *AUDIO OUTPUT:* 140mW at 10% t.h.d.
- *SCAN RATE:* 13 channels per second
- *SEARCH RATE:* 7.5 seconds per MHz at 12.5kHz steps
- *MEMORIES:* 20
- *FEATURES:* NiCad battery pack and charger supplied, two helical antennas, illuminated liquid crystal display and delay/hold function
- *REVIEWED:*
- *PRICE:* £199.00

Black Jaguar BJ200 Mark III
Hand-held Scanner

- *COVERAGE:* 26-30MHz, 60-80MHz, 115-178MHz, 210-260 MHz 410-520 MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* 0.5μV (for 12dB SINAD) v.h.f. f.m. 0.7μV (for 12dB SINAD) u.h.f. f.m. 1.0μV (10 dB SINAD) a.m.
- *IF SELECTIVITY:* 60dB ± 20kHz
- *RESOLUTION:* 5, 10, 12.5kHz
- *IMAGE RESOLUTION:* More than 40dB
- *IF STAGE:*
- *AUDIO OUTPUT:* 250mW, 8 Ohms
- *SCAN RATE:* 10 Channels per second
- *SEARCH RATE:*
- *MEMORIES:* 16
- *FEATURES:* Priority and memory lock out on Scan. Selectable a.m./f.m.
- *REVIEWED:*
- *PRICE:* £235.00

WIN 108
Hand-held Airband Scanner

- *COVERAGE:* 108-135.975MHz
- *MODES:* a.m.
- *SENSITIVITY:* 0.5μV for 12dB SINAD
- *SELECTIVITY:* – 59dB at 25kHz
- *RESOLUTION:* 25 or 50kHz
- *IMAGE REJECTION:* – 55dB
- *IF STAGE:* 10.7MHz, 455kHz
- *AUDIO OUTPUT:* 320mW at 10% t.h.d.
- *SCAN RATE:* 10 channels per second
- *SEARCH RATE:* 5 seconds per MHz at 25kHz steps
- *MEMORIES:* 20
- *FEATURES:* Priority channel, display/hold, channel lockout, keyboard lock, external power and speaker jacks and display lighting
- *REVIEWED:*
- *PRICE:* £175

Sony ICF PRO-80
Hand-held Scanner

- *COVERAGE:* 150kHz-108MHz (115.15kHz-223MHz using FRG-80 converter)
- *MODES:* w.b.a.m., n.b.a.m., f.m., n.b.f.m., s.s.b.
- *SENSITIVITY:* 42dBμV on 1.w./m.w.; 2dBμV (ext a.m.) – 4dBμV (ext n.b.f.m.) on s.w./v.h.f.; 9dBμV on f.m. 6dB S/N on a.m., 30dB S/N for f.m.
- *SELECTIVITY:* ±3.8kHz/±6kHz (50dB); 58dB (±400kHz) on f.m.
- *RESOLUTION:* 3, 5, 10 or 50kHz plus fine tune control
- *IMAGE REJECTION:* 77dB (l.w./m.w./s.w./v.h.f.), 40dB (f.m.)
- *IF STAGE:* 55.845 MHz & 455kHz, 10.7MHz (f.m.)
- *AUDIO OUTPUT:* 400mW at 10% t.h.d.
- *SCAN RATE:*
- *SEARCH RATE:*
- *MEMORIES:* 40
- *FEATURES:* Converter supplied, soft case, shoulder belt, frequency handbook, key protect facility and fine tune control
- *REVIEWED:* Short Wave Magazine March 1988 (£1.45)
- *PRICE:* around £350

Sony AIR-7
Airband Scanner

- *COVERAGE:* 150kHz-2.19MHz, 76-136MHz, 144-174MHz
- *MODES:* a.m.,w.b.f.m., n.b.f.m.
- *SENSITIVITY:* 2μV for 20dB S/N (f.m.), 1.25μV for 12dB SINAD (airband), 0.5μV for 12dB SINAD (144-174MHz)
- *SELECTIVITY:*
- *RESOLUTION:* 5, 9, 10, 25 or 50kHz
- *IMAGE REJECTION:*
- *IF STAGE:*
- *AUDIO OUTPUT:* 400mW into 8Ω
- *SCAN RATE:*
- *SEARCH RATE:*
- *MEMORIES:* 10
- *FEATURES:* Key protect, backlit l.c.d. readout and priority channel
- *REVIEWED:* Practical Wireless Nov 1986 (£1.30)
- *PRICE:* £247

Uniden Bearcat 100XLT Hand Held
Scanning Receiver

- *COVERAGE:* 29-54MHz, 118-174MHz, 406-512MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* 0.4μV (Nominal) h.f. 0.8μV (12dB SINAD) v.h.f. 0.5μV u.h.f.
- *IF SELECTIVITY:* – 55dB ± 25kHz
- *RESOLUTION:* 5, 10, 12.5kHz
- *IMAGE RESOLUTION:*
- *IF STAGE:*
- *AUDIO OUTPUT:* 480
- *SCAN RATE:* 15 Channels per second
- *SEARCH RATE:* 25 Freq. per second
- *MEMORIES:* 100 Channels
- *FEATURES:* Antenna, Earphone, a.c. adaptor.
- *REVIEWED:*
- *PRICE:* £225.00

Uniden Bearcat 580XLT
Mobile/Base Scanner

- *COVERAGE:* 29-54MHz, 118-174MHz, 406-512MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* 0.4μV (12dB SINAD) h.f./v.h.f. 0.5μV (12dB SINAD) u.h.f.
- *IF SELECTIVITY:* – 55dB at 25MHz
- *RESOLUTION:* 5, 10, 12.5kHz
- *IMAGE REJECTION:*
- *IF STAGE:*
- *AUDIO OUTPUT:* 2.5W at 10% t.h.d.
- *SCAN RATE:* 15 Channels per second
- *SEARCH RATE:*
- *MEMORIES:* 100
- *FEATURES:* 2 second delay, lockout, priority scan.
- *REVIEWED:*
- *PRICE:* £199.00

WHAT SCANNER

Signal R-535
VHF/UHF Airband Scanner

- *COVERAGE:* 108-142.995MHz, 220-379.995MHz
- *MODES:* a.m.
- *SENSITIVITY:* For 12dB SINAD: 0.32μV (v.h.f.), 0.46μV (u.h.f.)
- *SELECTIVITY:* – 55dB at ±25kHz
- *RESOLUTION:* 5, 10, 25, 50 or 100kHz (v.h.f); 25, 50, 100, 500kHz or 1MHz (u.h.f.)
- *IMAGE REJECTION:* better than – 55dB (v.h.f.), better than – 25dB (u.h.f.)
- *IF STAGE:* 21.4MHz, 455kHz
- *AUDIO OUTPUT:* 360mW into 8Ω
- *SCAN RATE:* 12 channels per second (memory)
- *SEARCH RATE:* 2.5 seconds per MHz at 25kHz steps
- *MEMORIES:* 60
- *FEATURES:* Connection of RS232 interface possible and portable operation available
- *REVIEWED:*
- *PRICE:* £249

Revco RS-3000
Compact Monitor Scanner

- *COVERAGE:* 26-32MHz, 60-90MHz, 118-180MHz, 380-512MHz
- *MODES:* a.m., n.b.f.m.
- *SENSITIVITY:* 0.5μV (v.h.f. & h.f.), 1μV (airband) and u.h.f. Both 10dB S/N
- *SELECTIVITY:*
- *RESOLUTION:* 5, 12.5 or 25kHz
- *IMAGE REJECTION:*
- *IF STAGE:* 21.4MHz, 455kHz
- *AUDIO OUTPUT:* 1.5W at 10% t.h.d.
- *SCAN RATE:*
- *SEARCH RATE:*
- *MEMORIES:* 50
- *FEATURES:* Compact size, liquid crystal display and priority memory channel
- *REVIEWED:* Short Wave Magazine June 1988 (£1.45)
- *PRICE:* £199

Kenwood RZ-1
Scanning Receiver

- *COVERAGE:* 500kHz-905MHz
- *MODES:* a.m., n.b.f.m, w.b.f.m.
- *SENSITIVITY:* 5μV on a.m. (10dB S/N), <6μV on n.b.f.m. (12dB SINAD), <3μV on 60-905MHz, <1μV on w.b.f.m.
- *SELECTIVITY:*
- *RESOLUTION:* 5, 12.5 20 or 25kHz
- *IMAGE REJECTION:*
- *IF STAGE:* 45.75MHz, 10.7MHz
- *AUDIO OUTPUT:* 2W across 8Ω at 5% t.h.d. (speaker). Lineout 150mV
- *SCAN RATE:*
- *SEARCH RATE:*
- *MEMORIES:* 100
- *FEATURES:* Text store, feature, picture symbols available on display
- *REVIEWED:* Short Wave Magazine April 1988 (£.145)
- *PRICE:* £465

Bearcat 800XLT
Base Scanner

- *COVERAGE:* 29 – 54MHz, 118 – 174MHz, 406 – 512MHz, 806 – 912MHz
- *MODES:* f.m.
- *SENSITIVITY:* 29 – 54MHz & 136 – 174MHz = 0.3μV, 118 – 136MHz = 0.8μV, 406 – 512MHz = 0.5μV, 840 – 912MHz = 0.7μV
- *SELECTIVITY:* – 59dB @ 25kHz
- *RESOLUTION:* 5kHz
- *IMAGE REJECTION:*
- *IF STAGE:*
- *AUDIO OUTPUT:* 1.5W at 10% t.h.d.
- *SCAN RATE:*
- *SEARCH RATE:*
- *MEMORIES:* 40 (2 × 20 channel banks)
- *FEATURES:* Priority channel, scan delay, direct channel access and channel lockout
- *REVIEWED:*
- PRICE: £257

Bearcat 210XW
Scanning Radio

- *COVERAGE:* 30 – 50MHz, 136 – 174MHz, 406 – 512MHz
- *MODES:* f.m.
- *SENSITIVITY:* 30 – 50MHz & 136 – 174MHz = 0.3μV, 406 – 512MHz = 0.5μV
- *SELECTIVITY:* – 55dB @ ±25kHz
- *RESOLUTION:* 5kHz
- *IMAGE REJECTION:*
- *IF STAGE:*
- *AUDIO OUTPUT:* 1.5W r.m.s. into 8Ω at 10% t.h.d.
- *SCAN RATE:*
- *SEARCH RATE:*
- *MEMORIES:* 20
- *FEATURES:* Lockout facility, delay function and telescopic antenna supplied
- *REVIEWED:*
- *PRICE:*

Short Wave Magazine

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Keith Hamer and Garry Smith
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Philip Darrington
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GUIDE TO FACSIMILE STATIONS
8th Edition
Joerg Klingenfuss
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Joerg Klingenfuss
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6th Edition
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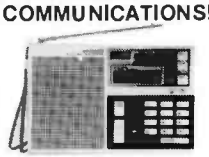

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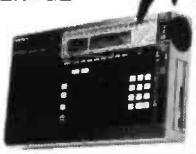

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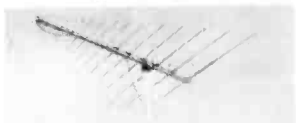

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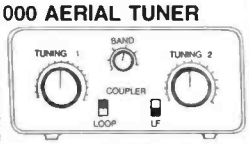

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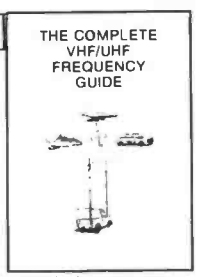

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