Short Wave Magazine

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JANUARY 1989

SWM SWM SWM SWM SWM SWM

NEW SERIES STARTS INSIDE

ANTENNAS by F.C. Judd G2BCX

For The Radio Listene

Grundig Yacht Boy 215 Reviewed

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.
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VOL 47 ISSUE 1 JANUARY 1989
ON SALE DECEMBER 22nd

FEBRUARY ISSUE ON SALE
JANUARY 26

|24| **Antennas**

Cover F. C. Judd G2BCX is well known for his work on antennas. He starts an important new series this month which sets out to explain, in easily understood terms, just exactly how antennas of all shapes and sizes work. The impressive antenna array on the front cover is one of many used by G4RFR/G6SFR, the Flight Refuelling Amateur Radio Society's station. The system consists of four stacked and bayed Jaybeam 14-element 144MHz Parabeams giving a combined gain of around 20dBd, while the beam mounted down the centre is a home-brewed 12-element Yagi for 70MHz built to NBS data published in *Wires and Waves*.

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CONTENTS

Short Wave Magazine

REGULARS

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 SWM SERVICE.

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

Sir

With reference to G. Hewlett's article "Tuning In the 1930s" in the October issue of Short Wave Magazine, *I too have the same reference book -* The ABC of Wireless. *In it the Dutch station, PCJ, at Eindhoven is listed as 9.586kHz - 31.27 metres with an output power of 2kW. At the start of the wireless section, the book gives information on all broadcasting stations operating in the 1930s.*

I have to say that Short Wave Magazine *is good value for money and the variety of items in it is excellent. "Airband" and the "Long, Medium and Short" DX reports have a lot of information in them.*

Overall, an excellent magazine for the short wave listener and I look forward to each issue.

R. RAEBURN
MORAYSHIRE
SCOTLAND

Sir

G. E. W. Hewlett's article "Tuning In the 1930s", In the October 1988 issue of Short Wave Magazine, *revived a flood of memories for me, although I did not commence listening on the short waves until early In 1937.*

It was my acquisition of a Mullard AW 5-valve receiver late In 1936, and hearing a broadcast on the short wave bands from PCJ (Peace, Cheer and Joy) Radio Nederland, of the Happy Station *programme, with its world-famous announcer Eddie Startz, that first aroused my interest in short wave listening and it is an interest that I still retain In my 80th year.*

To obtain more information on short wave broadcast stations that were operating in the late 1930s, I purchased a weekly publication known as World Radio. *I enclose, for your information, a sheet from the issue of the 9 December 1938 and another from that of the 16 December 1938, which, between them, list the short wave broadcasting stations in the world operating between 13 metres and 62 metres at that time.*

I still have cards and letters from stations acknowledging or confirming my reception of their transmissions during the years 1937-39, some of these being:

HBF Radio Nations, Geneva;
HVJ Vatican City;
HS8PJ Bangkok;
JVM Atagoyama, Tokyo;
KZRM Radio Manila;
OLR Czechoslovakia;
VK2ME Sydney, Australia;
3LR Lyndhurst, Australia;
VP3MR Georgetown, British Guiana;
CJCX Sydney, Nova Scotia;
W1XK Boston, Mass, USA;
W2XAF Schenectady, USA;
W9XF Chicago, USA.

With regard to G. E. W. Hewlett's joke about his old list of stations giving Eindhoven as being in Portugal (CT1AA), I have a card from the station CT1AA, Radio Colonial, Lisboa, Portugal, operating on a frequency of 9.650kHz using 2kW, and with an interval signal of "3 cookoo calls". This card was for my reception of the station on 31 July 1937.

My receivers have improved somewhat since those early days and after a spell with an Eddystone S740 and an 840c, I have operated a 940 model for the past 20 years and I can endorse the appreciative comments about this receiver that have been made recently In your magazine.

Another article which has interested me recently has been "Behind the Scenes at Radio Australia", which gives readers an up-to-date account of the activities of the station In the 1980s.

I was fortunate enough in 1964 and again In 1969 to receive from the station on the occasion of its 25th and 30th anniversary, copies of The Constant Voice, *a publication giving most interesting information on the history and activities of the station, up to those years, and furnished with plenty of very fine photographs. I wonder if an up-to-date issue of this publication will be produced next year to mark the 50th anniversary of this station?*

HAROLD EGLON
BRIDPORT
DORSET

Tokyo Studio of the Broadcasting Corporation of Japan, situated atop of Atago Hill, Tokyo, where the daily overseas broadcast programs originate.

Sir

The article by G. E. W. Hewlett, on page 26 of the October SWM *brought back many memories of a bygone era.*

My favourite stations were also W3XAL and W2XAF. The latter station also broadcast on 15.330kHz, where it was known as W2XAD. Close runners up were two other Americans, Pittsburgh (W8XK) 11.870kHz and Chicago (W9XF) 6100kHz.

Maybe Mr Hewlett was unlucky with the response he got from Kemilawoa-Cho-Chiba-Ken in Tokyo.

In 1937, this station did send out a form of QSL card. Although it gave no technical details of the station, it was written in English and Japanese on one side. On the other side was a photograph of the studio and antenna masts. The station was situated on Atago Hill, Tokyo.

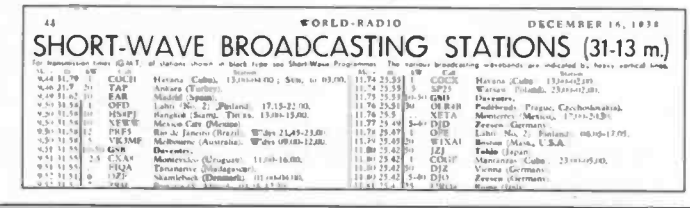
Also enclosed with the card was a questionnaire to be used for future reception reports.

Mr Hewlett also mentions VK2ME, Sydney. This station was known as The Voice of Australia and opened and closed its transmission with the laughing notes of the Kookaburra.

Although most reference books of the time listed this station with a power of 12kW, their QSL card of 10 November 1935 gives the power as 20kW.

The pages from the old reference book were probably taken from the Newnes Wireless Constructors Encyclopaedia, *by F. J. Camm, who at that time was the Editor of* Practical Wireless.

GEORGE MILLMORE
RYDE
ISLE OF WIGHT


44 WORLD-RADIO DECEMBER 16, 1938

SHORT-WAVE BROADCASTING STATIONS (31-13 m.)

A WORD IN EDGEWAYS

Sir

I am writing to you with regard to an article in the October 88 issue of Short Wave Magazine *entitled "The Role of the Short Wave Receiver", by G. D. Rawnsley.*

I notice several mis-statements about the short wave broadcasting activities of The Christian Science Monitor, *and I appreciate this opportunity to correct them.*

In a section of his article dealing with religious ideologies, Mr Rawnsley infers that The World Service of The Christian Science Monitor *is a broadcast promoting the Christian Science religion. In fact, the intent of this broadcast is to provide independent, truthful, accurate news and information programming.*

The Christian Science Monitor *began as a newspaper in 1908. It was intended to provide readers with factual, unbiased news reporting that would allow them to be well-informed citizens. This is the same goal of the* Monitor *today in all of its global news activities - radio, newspaper, magazine and television. As such, these are not religious publications.*

The Christian Science Church does indeed have a short wave religious broadcast, The Herald of Christian Science. *It is designed to provide answers to world problems in the context of Christian Science. It is certainly intended to be much more than what Mr Rawnsley calls a "harmless message of hope", and never to be what he calls "propaganda of a kind". The purpose of* The Herald *is to share with the audience, but never to impose beliefs on listeners or to proselytise.*

I hope this information is helpful, and wonder if you might consider passing it on to your readers.

DONALD E. FELDHEIM
ASSISTANT DIRECTOR, PUBLIC AFFAIRS OFFICE
THE CHRISTIAN SCIENCE PUBLISHING SOCIETY
ONE NORWAY STREET
BOSTON
MASSACHUSETTS
USA 02115

Sir

G. Hewlett, in his article "Tuning in the 1930s" asks the question "who or what was G5SW?". Perhaps I can answer his question. G5SW was a short wave transmitter that the Marconi Company was commissioned to build by the BBC. It was situated at their works in Chelmsford, and opened on the 5 November 1927.

This transmitter remained in service until 17 December 1932, after the Empire Broadcasting Station had opened on December 9 at Daventry.

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

NORMAN E. PILGRIM
LEICESTER

WHAT'S NEW

Medium Wave News Restyled

Medium Wave News is published by the Medium Wave Circle, which is a specialist club for all medium wave enthusiasts world wide. Now, in its 33rd year, *Medium Wave News* has been re-styled.

Each edition of *Medium Wave News* contains up-to-the-minute DX News, DX Logs and the QSL Corner. It also carries feature articles on a wide range of topics including antennas, receivers, DXpedition reports and station profiles. The main frequencies of interest are 150 - 290kHz and 500-1650kHz. A sample copy of *Medium Wave News* is available, together with full subscription details, free of charge (please enclose an IRC to help cover postage costs for distribution outside Great Britain) from: **Harold Emblem, 137A Hampton Road, Southport, Merseyside PR8 5DY.**

Glasnost Clears the Airwaves

Our correspondent, Peter Shore, reports that life became more pleasant for short wave listeners on November 30 when large amounts of jamming suddenly disappeared from the short wave bands as Soviet-led interference to Deutsche Welle, Kol Israel and Radio Free Europe/Radio Liberty broadcasts almost completely ceased.

All services of the CIA-backed Radio Free Europe/Radio Liberty from Munich, with the exception of Bulgarian and Czech language transmissions, were heard clearly for the first time, whilst Russian language programmes from West German state broadcaster Deutsche Welle, which have been almost continuously jammed since 1962, were similarly freed from deliberate, harmful interference, although DW's Pashto and Dari services remain jammed.

Meanwhile, Jerusalem-based Kol Israel, who's broadcasts include Russian, Yiddish and Hebrew directed to the Soviet Union, and which was generally affected after the ident "Goverit Jerusalem", was again heard without problems.

This new policy may perhaps be attributed to president Gorbachev's drive for openness in, and the democratisation of, Soviet society and perhaps may also be an attempt by the Kremlin to pave the way for a trouble-free lead-in to the forthcoming Human Rights Conference planned by Moscow.

Jamming of the BBC World Service Russian language programmes stopped in January 87 and VOA Russian programmes became clear in May of that year.

This opens up new opportunities for s.w.l.s as splatter, etc from the jammers will be reduced and it is to be hoped that this will be the last we will hear of jamming on the scale previously practised.

Low Cost DMM

The PM2525 digital multimeter has 18 different measuring functions provided as standard. These include a voltage function offering five ranges of up to 1000V, plus eight current ranges starting from 1µA and extending up to 10A. A current compensation system is provided for measurements of up to 1mA, eliminating voltage drop across the meter input. Also, seven resistance ranges are available. Extra functions include time, temperature, capacitance and frequency. The rotating bargraph indicator on the liquid crystal display "steps" in proportion to the

trend in the voltage. The high resolution, 10mV per step, allows voltage peaks, troughs or nulls to be identified. The bargraph can also function as a sensitive plus and minus indicator as well as be used for frequency measurements and continuity testing.

Overload protection is also provided. Voltage ranges handle peak transients of up to 2.5V. For current measurements, protection is electronic for ranges up to 1mA and by fuse for the 10mA and 100mA ranges. A simple interface command structure allows full programming capabilities via the GPIB, RS232 and analogue interfaces. Recalibration can be carried out without opening the instrument's case.

For more details, contact:

Instrumex (UK), Dorcan House, Meadfield Road, Langley, Slough SL3 8AL.

WHAT'S NEW

Catalogues

West Hyde have recently published their 96-page catalogue. There's a quick reference section which allows the user to rapidly select the cabinet or enclosure required for a particular job. All new products are illustrated together at the front for easy reference. The customising service is also fully described. The catalogue is available from: **West Hyde Developments Ltd. Tel: (0296) 20441.**

Five Star Connectors have produced a new 446-page catalogue covering a comprehensive range of connectors from 16 of the world's leading manufacturers. It's fully illustrated and features many new products, also highlighted in the catalogue is Five Star Connectors' range of customer services including Customer Care, "Helpline" and Assembly.

Copies are available, free of charge, from: **Five Star Connectors, Edinburgh Way, Harlow, Essex CM20 2DF. Tel: (0279) 442851.**

STC Instrument Services have produced their first full-colour catalogue which features a vast selection of products from over 65 leading manufacturers. The 320-page publication highlights several new products, such as the Marconi 893B a.f. power meter, the Keithley 197 autoranging, microvolt, digital multimeter and the Hitachi VC6265 digital storage oscilloscope. Copies are available, free-of-charge, from: **STC Instrument Services, Dewar House, Central Road, Harlow, Essex CM20 2DF. Tel: (0279) 641641.**

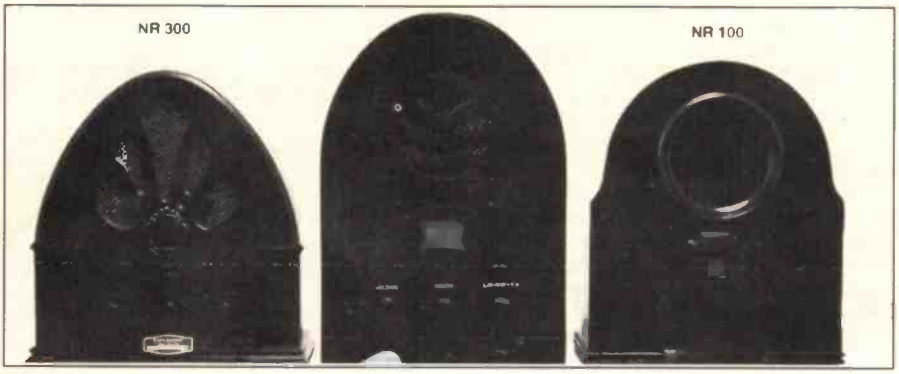
The 106-page **Electrovalue** catalogue (Oct 88 - Sept 89) is now out and it's full of components, soldering irons, tools, multimeters and lots more. **Electrovalue Ltd., 28 St Judes Road, Englefield Green, Egham, Surrey TW20 0HB. Tel: (0784) 33603.**

Cirkit have their latest catalogue out now. The 184-page catalogue not only contains details of their products but discount vouchers, a feature project (a programmable frequency generator) and a competition. **Cirkit, Park Lane, Broxbourne, Herts EN10 7NQ. Tel: (0992) 444111 (sales) 441306 (enquiries).**

Old Fashioned Wireless Sets

If you're looking for a wireless to fit in with today's fashionable "nostalgia" decor, then a range stocked by Johnsons Sound Service may be of interest. The five reproduction models from "Bygone Days" receive m.w., l.w. and f.m. broadcasts, but despite the old-fashioned look the insides of the radio are modern, solid-state technology. The cases are finished in real wood veneers and have illuminated dial scales. There are rotary controls for on/off, volume and station tuning and the sets are powered from 240V a.c. mains.

If you would like to know more about these beautiful looking radios, contact: **Johnsons Shortwave Radio, 43 Friar Street, Worcester WR1 2NA. Tel: (0905) 25740.**



DX-TV Converter

HS Publications of Derby are now distributing a de-luxe version of the D-100 DX-TV Converter System.

The D-100 system enables v.h.f. and u.h.f. reception of foreign TV signals on a standard u.h.f. television receiver at full or reduced l.f. bandwidth. The de-luxe version covers v.h.f. and u.h.f. channels and will also tune into specially assigned channels in Band II. This allows the reception of extra Eastern-bloc transmitters and countries such as Albania. The tuning range in Band III extends well below Channel E5 so Moroccan channels M4 at 163.25 and M5 at 171.25MHz can also be received. The de-luxe version also has the u.h.f. range extended to cover the amateur television band at 435MHz.

By a simple connection to the rod antenna of an f.m. radio, the de-luxe version is capable of providing multi-system sound reception of any of the four f.m. intercarrier systems. It may also be used to monitor the Eastern-bloc f.m. band and Italian radio station links in Band I.

Each unit comes complete with full operating instructions and a map of TV systems across Europe. The basic D-100 costs £77.99 and the de-luxe version £89.99 - both prices include mail order costs.

For further details, send two first class stamps (two IRCs if overseas) to: **HS Publications, 7 Epping Close, Derby DE3 4HR. Tel: (0332) 381699.**

CQ-TV Award

This award is available to both transmitting and receiving enthusiasts, in any part of the world, whether they are members of the British Amateur Television Club or not. The award is for contacts made using fast-scan high definition television systems only.

Transmitting Award: For pictures transmitted which have been successfully identified by another station, claim 2-points per kilometre. If the contact becomes a successful two-way exchange of pictures, then 10 bonus points may be claimed by each station regardless of distance. For contacts on the 1.3GHz band, or above, points are doubled.

Receiving Award: For any picture positively identified, claim for a one-way contact. Otherwise rules are as for transmitting.

Points: The award is divided into different grades. For the Bronze - 1000 points, for the Silver - 5000 points, for the Gold - 10 000 points, for the Diamond - 100 000 points. Points already gained for an existing award may be added in when applying for a higher grade.

Contacts: A station may be worked only once per day for the purpose of this award. It is quite possible for it to be gained by working the same station many times. Contacts through TV repeaters do not count.

The Award: Upon qualification for the Bronze Award, a certificate will be issued together with a Bronze Seal; the certificate may be up-graded later with Silver and Gold Seals. The Diamond Award is in the form of a specially made trophy.

Applications: Applications should include log details consisting of callsign, date of QSO, band, location of the station worked and points claimed. Contacts made from other than the home station should be clearly marked. QSL cards are not required, but the application should be checked and signed by either a licensed amateur of BATC member.

Certificate applications should include a large (12 x 8in) s.a.e. For upgrade seals an ordinary s.a.e. should be enclosed. applications should be made to: **Bob Webb G8VBA, 78 Station Road, Rolleston-on-Dove, Burton-on-Trent, Staffs DE13 9AB.**

Scottish Expedition Group

The Scottish Tourist Board (Radio Amateur) Expedition Group has now been formed and will be active in 1989. The aim of the group is to activate amateur radio stations from locations in Scotland that are unusual, historic or pertaining to Scotland in any aspect. To make the public more aware of the hobby of amateur radio all the stations will be open to the public.

Members of the group will be drawn from all over Scotland and they hope to activate two Malt Whisky Distilleries, an island, a World Heritage site, a Robert Burns Station and a very rare castle. A full list of events will be available later.

WHAT'S NEW

Gold Star Multimeter

Alpha Electronics now have two new 3 digit multimeters available, one auto-ranging, the other manual. Both instruments, from Gold Star, provide performance, low-cost and easy operation. Full overload protection, memory mode for relative measurements and measured value hold function are just a few of their features. There are large, clear, liquid crystal displays on both models. They are capable of d.c. voltage measurements to 1000V, a.c. voltage to 750V, alternating and direct current to 10A as well as visual and audible continuity and diode checks. Low battery and over-range are automatically indicated and the input impedance of both models is greater than 10MΩ

The auto-ranging model, DM6335, has a basic d.c. voltage accuracy of 0.5 per cent and measures resistance up to 2M. It is just 148 x 66 x 23mm and weighs 180g. The manually operated DM6133 has a basic d.c. voltage accuracy of 0.3 per cent and measures resistance to 20MΩ. This unit measures 170 x 84 x 30mm and weighs 285g.

The DM6335 costs £45.90 and the DM6133 £39.00, both prices are exclusive

of VAT. For more details, contact: **Alpha Electronics Ltd.,Unit 5, Linstock Trading Estate, Wigan Road, Atherton, Manchester M29 0QA. Tel: (0942) 873434.**

Wideband Antennas & Pre-amps

Many scanning receivers are in use now and one of the requirements seems to be a good wideband amplifier. Waters & Stanton have introduced the Kuranishi model WAZ-1, capable of operating up to 1300MHz and priced at £59.95.

Diamond have introduced two new wideband antennas for the s.w.l. Both antennas cover the range 1.5 - 1300MHz and are suitable for many of the current range of scanners.

The D707 is a glass fibre encapsulated, base station antenna which comes complete with hardware and a termination box fitted with an r.f. gain control to avoid the risk of overloading the receiver front end.

For mobile use, the D505 provides an answer for the listener who wants to use the scanner in the car. The basic unit comprises a high-quality, sprung whip with base assembly that incorporates the amplifier. The base assembly is terminated with a PL259 plug for use with most mobile antenna mounts. A termination box is also included together with cigar lighter plug and r.f. gain control.

The base station version costs £99 and the mobile version £69. For more details, contact: **Waters & Stanton, 18-20 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835.**

Radio Japan

The weekly *DX Programme* presented by Kat Matsuda can now be heard four times a week and lasts for 19 minutes. Sunday at 0925UTC to SE Asia and Asian Continent and 1525UTC to SE Asia, Asian Continent, North America, Middle East, Europe and North Africa via Gabon. Monday at 0125UTC to South Asia, SE Asia, Asian Continent and North America via Canada, 0325UTC to SE Asia and Asian Continent.

Mast-head Amplifiers

The TV-2 is a new mast-head amplifier for TV reception produced by DX-Tele-Labs in the USA and being distributed in this country by MFT Co. Ltd. Basically it is a mast-head amplifier that can be remotely tuned across the whole of the TV band (Ch. 21 - 69). A second r.f. cable is used to supply power to Varicap tuned filters ahead of the broadband u.h.f. amplifier.

The advantages of this are that local, strong transmissions on different channels are not amplified and so don't overload the pre-amp. The output power of the pre-amp is concentrated on one channel instead of being spread across the whole band. The noise floor of the system remains at its lowest figure because the impedance is matched on each channel.

A version for Bands I and II will be available shortly, but being a limited production, specialist item the distributors expect the price to be around £150 plus VAT. If you would like more information on these products, contact: **MFT Company Ltd., 164 Station Road, Lower Stondon, Henlow, Beds SG16 6JH. Tel: 046 272 536.**

English Lessons from RCI

Starting in the autumn of 1988, radio stations in Beijing, Shanghai, Guangzhou and Xian will broadcast *Everyday English* - a 40-week course produced by RCI at its headquarters in Montreal.

RCI - the short wave service of the Canadian Broadcasting Corporation - is not the first international broadcaster to offer English lessons by radio, but it is, however, the first to design a course for listeners in a specific country. Another major difference is that it will be carried by local radio stations, rather than broadcast by short wave. The stations being used have a combined audience of 100 million people.

The lessons feature three Chinese teachers on a study tour of Canada and open with their arrival in Montreal. Subsequent lessons follow them as they cross the country, learning about Canada's geography, resources, industries, political and social systems and culture. There will be a total of 120 lessons, three per week, each repeated four times.

Data Comms Decoder & Analyser

The W-4010 is a professional grade, high performance, data communications decoder/analyser. It can decode Morse code, standard baudot, bit inversion, ARQ, FEC, ASCII, packet radio and variable speed baudot and ASCII. Fourteen additional commercial data communications modes are included.

Measuring 200 x 250 x 80mm and weighing 1.5kg, the 4010 has an impressive range of capabilities. Operation is apparently simple with a continuous menu display of the entry keys f1 through f4 and a video status line of the operational parameters. It has direct module switching via individual entry keys, change of letters/numbers without signal interruption and termination of remote printer output. There is 160K of memory and the fast processor operation is due to a high clock frequency. The list could go on. The unit costs £895 plus £7 registered post; **Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands DY8 1TG. Tel: (0384) 390063.**

DX Association of Great Britain

The latest copy of the DX Association of Great Britain's newsletter arrived in my hands recently. It seems that their membership may be increasing following mentions by the EDXC and *SWM!*

This issue contained several interesting features. There was a station profile on Radio Austria which made interesting reading and the bit on m.w. DXing was certainly helped by the map provided to illustrate what the author had to say. As usual the various logs in the newsletter were enough to make me green with envy and left me with the thought that "I must try harder". It's always interesting to see how your own listening compares with others.If you would like more details on the DXAGB, then send an s.a.e. to: **E.A. Rickett, Flat 13, 63 Eton Avenue, Hampstead, London NW3 3ET.**

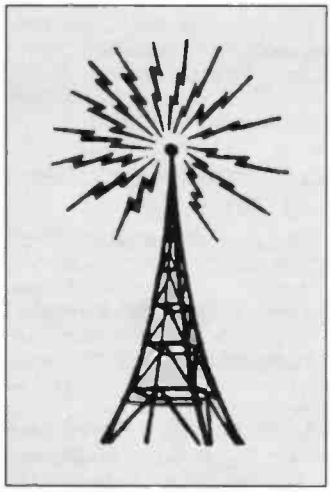
GRASSROOTS

Lorna Mower

Verulam ARC meet 2nd & 4th Tuesdays, 7.30pm in the RAF Association HQ New Kent Road. January 10 is an Activity Evening and the 24th is New Licence Question Time G3YGF. Hilary G4JKS on St. Albans 59318.

High Wycombe ARC meet 2nd Thursdays, 7.30-9.30pm in Unit 2, Fryers Works, Abercromby Avenue. Francis Rose G2DRT on Penn 814240.

Wimbledon & District ARS have a Meet the Committee evening on January 13. 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Road. Nick Lawlor G6AJY on 01-330 2703.



Biggin Hill ARC have their AGM on January 17. 3rd Tuesdays, 7.30pm at The Victory Social Club, Kechill Gardens, Hayes. Geoff Milne G3UMI on 01-462 2689.

Worksop ARS have Natter Nights on January 10, 17 and 24th. Meet Tuesdays, time and place from Carole Gee G4ZUN on Worksop 486614.

Chesham & District ARS meet Wednesdays, 8pm at The Stable Loft, Bury Farm, Pendor Road. December 28 is a Festive Season Natter Night. Liz Cabban G0ETU on 09278 3911.

Hasting Electronics & RC have a "This time last Year" lecture on January 18. 3rd Wednesdays, 7.45pm at West Hill Community Centre, Croft Road and Fridays, 8pm in the Club Room, Ashdown Farm Community Centre, Downey Close. Tim Anderson G0GTF on Hastings 437513.

Halifax & District ARS meet 1st & 3rd Tuesdays, 7.30pm in the Running Man, Pellon Lane. On January 17 they have a Visit to Richmond Road Police HQ. David Moss G0DLM on Halifax 202306.

Farnborough & District RS meet 2nd & 4th Wednesdays, 8pm at the Railway Enthusiasts Clubroom, 103 Hawley Lane. Tim FitzGerald G4UQE on Camberley 29231.

Rugby ATS have their annual Christmas Dinner on December 23. Tuesdays, 7.30pm at the Cricket Pavillion outside Rugby Radio Station. Kevin Marriott G8TWH on Rugby 77986.

Wyre ARS meet 2nd & 4th Mondays at Fleetwood Sea Cadet Corps, T S Conqueror, Princes Way, Fleetwood. January 2 is a Social with butties and beer, the 16th is Club Stn on air. Dave Westby G4UHI on Lancashire 854745.

Edgware & District RS have their AGM on January 12 and an Informal on the 26th. 2nd & 4th Thursdays, 8pm in the Watling Community Centre, 145 Orange Hill Road, Burnt Oak. Ian Cope G4IUZ on Hatfield 65707.

Yeovil ARC have an Operating & Natter Night on December 29, Receivers G8AWB on January 5, Transposing Formulas G3MYM on the 12th, Kilve Review G3MYM on the 19th and a Natter Night on the 26th. Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. David Bailey G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.

Felixstowe & District ARS meet in the Scout Hut, Bath Road at 8pm. All Socials in the Grosvenor Hotel. They have a Social on January 9 and Chinese Cuisine G4YQC on the 23rd. Paul Whiting G4YQC on Ipswich 642595 (daytime).

Todmorden & District ARS have a Construction Competition on January 2 and a Natter Night on the 16th. 1st & 3rd Mondays, 8pm at the Queen Hotel. Val Mitchell G1GZB on Todmorden 7572.

Reading & District ARC have Packet Radio by G3WGV on January 3. Alternate Tuesdays, 8pm at the White Horse PH, Emmer Green. Mike Anthony G4THN on Reading 774042.

Sutton & Cheam RS meet 3rd Fridays, 7.30pm in Downs Lawn Tennis Club, Holland Avenue and Natter Nights are 1st Mondays in the Downs Bar. December 28 is a Committee Meeting at 153 Boundary Road, Wallington, January 2 is a Natter Night, the 8th is a 3.5MHz Fixed/AFS Contest and the 20th is G4XMK on Antennas for Landed Gentry (tentative). John Puttock G0BWV on 01-644 9945.

Derby & District ARS meet Wednesdays, 7.30pm at 119 Green Lane. They have a Junk Sale on January 4, The Year in Retrospect on the 11th, a Video Show on the 18th and First Aid in the Shack by G8SSL on the 25th. Kevin Jones G4FPY on Derby 669157.

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121, St. Nicholas Street, Radford. January 6 and 20th are Nights on the Air with Morse Tuition, the 13th is a Computer Night - bring your own if you can! Jonathan Ward G4HHT on Coventry 610408.

Chelmsford ARS meet 1st Tuesdays, 7.30pm at the Marconi College, Arbour Lane. January 3 is their annual Video Show. Roy Martyr G3PMX on Chelmsford 353221 Ext. 3815.

Hornsea RC have a Natter Night on December 28, Military Equipment G4IGY on January 4, UHF Techniques G3ZTR on the 11th, Gems G4ODP on the 18th and their annual Dinner on the 25th. All meetings on Wednesdays, 8pm at The Mill, Atwick Road. Geoff G4IGY on 0964 533331.

Norfolk ARC meet Wednesdays, 7.30pm in The Norfolk Dumpling, the Livestock Market, Harford. January 4 is Magnetic loop antennas & demo G3PDH, the 8th is an AFS contest (Saturday), the 11th is a debate on "CQ for a Copy", an Informal follows on the 18th and the 25th is Homebrew spectrum analyser, Mike Lemin G4UUB, bring your h.f. rig along for checking. Craig Joly G0BGD on Norwich 485784.

Southgate ARC meet 2nd & 4th Thursdays, 7.45pm at Holy Trinity Church Hall (Upper), Winchmore Hill. January 12 is Award Hunting G4OUL and the 26th is Homebrew Amnesty, help for problem projects. Brian Shelton on Winchmore Hill 2453.

Stourbridge & District ARS meet twice monthly at the Robin Woods Centre, Beauty Bank. January 9 is a Natter/On air Night. C. Brunn G1WAI on Hagley 885602

Basingstoke ARC meet the 1st Mondays of each month, 7.30pm in The Forest Ring Community Centre, Sycamore Way, Winklebury. David Deane G3ZOI on Wokingham 787930 (office).

Isle of Man ARS meet Mondays, 8pm at the Howstrake Hotel, Harbour Road, Onchan, Isle of Man. Anthea Matthewman GD4GWQ on Douglas 22295.

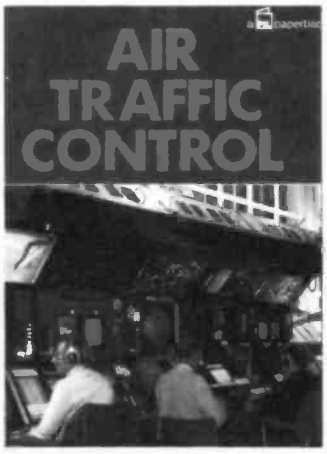
BOOKCASE

1934 OFFICIAL SHORT WAVE RADIO MANUAL
Edited by Hugo Gernsbach
Reprinted by Lindsay Publications Inc
Available from Short Wave Magazine Book Service
280 x 216mm, 262 pages. Price £7.85 plus 75p P&P
ISBN 0 917914 64 3

Sub-titled "Complete Experimenter's Set-Building and Servicing guide" this is a reprint of the first volume of the *Official Short Wave Radio Manual* which originally saw the light of day in 1934. If you are into nostalgia, or if you just want an interesting read, then this is the book for you. Packed with designs for a wide variety of receivers, transmitters and accessories for the home constructor, this book also contains articles on such diverse radio topics as "Short Wave Signals from Interstellar Space", "Can We Radio the Planets" (moonbounce in 1934!), "How ARE Short Waves Propagated" as well as circuit diagrams and servicing details for "practically every short wave commercial set which has been manufactured since the inception of the art" - well, up to 1934 obviously! The book is rounded off with a chapter on "Building Old-Time Radios" by T.J.Lindsay which gives you the information needed on how to set about constructing vintage designs in this modern world.

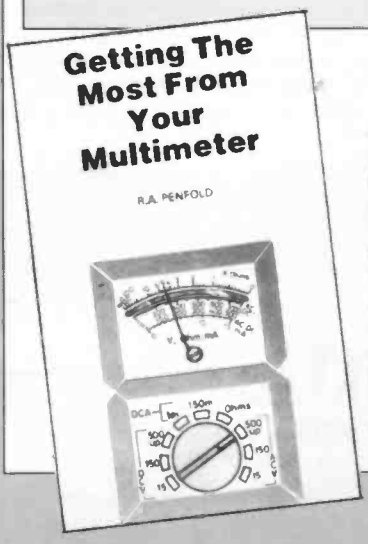
ELECTRONICS SIMPLIFIED - CRYSTAL SET CONSTRUCTION
by F.A. Wilson
Published by Bernard Babani (Publishing) Ltd
Available from Short Wave Magazine Book Service
110 x 178mm, 72 pages. Price £1.75 plus 75p P&P
ISBN 0 85934 067 8

If a novice asks anyone in radio or electronics for their advice on the simplest project to build, the chances are they'll be told to start with a crystal set. This book has been written for anyone who wants to start in the world of radio and electronics construction by building a simple crystal set.
As there are so many crystal set circuits in existence, the ones in this book don't claim to be either new or revolutionary. They are, though, completely modified to use modern and inexpensive components and home-wound coils.



AIR TRAFFIC CONTROL
by David Adair
Published by Patrick Stephens Ltd
Available from Short Wave Magazine Book Service
216 x 159mm, 176 pages. Price £6.99 plus 75p P&P
ISBN 0 85059 694 7

Many readers will have either sat in an airport terminal or on an aircraft wondering how the whole system of flying works. What do the people in the control tower do? Who decides who flies where? What happens if...? All these types of questions are answered in this book and after reading it you will realise just how professional the aviation business is.
The author takes you on an imaginary flight between Bournemouth and Edinburgh to show how the air traffic control system works, explaining the jargon they use as well as the training involved. This book is not intended to be a text book. If it fires your interest you should go on to other reading. This book was written with the layman in mind and so isn't full of technicalities from cover to cover, which makes it easy reading.



GETTING THE MOST FROM YOUR MULTIMETER
by R.A. Penfold
Published by Bernard Babani (Publishing) Ltd
Available from Short Wave Magazine Book Service
178 x 110mm, 102 pages. Price £2.95 plus 75p P&P
ISBN 0 85934 184 4

The first piece of electronic test equipment that most electronic hobbyists buy is a multimeter. This is probably because it is one of the least expensive items and, if you know how to use it properly, one of the most useful.
Aimed at beginners, this book assumes no previous knowledge or experience on the part of the reader. But, using the simple component and circuit testing techniques described, even the rawest of beginners should be able to tackle fault finding after studying the book. It covers the differences and basics of both analogue and digital meters as well as how to check components and circuits correctly.

When you are ready to graduate to real listening Look to Lowe

The R-2000 from Kenwood
150kHz-30MHz. SSB/AM/CW/FM
VC-10 converter 118-174 MHz
R-2000 . . . . £595
VC-10 . . . . £162

The R-5000 from Kenwood
100kHz-30MHz. SSB/AM/CW/FM/FSK
VC-10 converter 118-174 MHz
R-5000 . . . . £875
VC-20 . . . . £167

The NRD-525 from JRC
Simply the best receiver you could buy . . . **£1095**

What do I mean by "When you are ready to graduate"? Well, like all hobbies or pastimes, short wave listening is a progressive hobby, and many people come to it almost by accident when they hear an unusual broadcast station on their ordinary domestic radio, particularly if the radio has a short wave band. Interest is aroused, and before long the listener begins to wonder why there are some signals he cannot resolve. He may well turn to the pages of Short Wave Magazine for advice, and become familiar with terms such as SSB, RTTY, selectivity, propagation, and so on.

It is at this point that our worthy listener takes his first step in upgrading his equipment, and comes out of primary education into more advanced listening. Many people at this same point rush along to their nearest High Street multiple retail store and buy what they are told is a "Short Wave Radio", bristling with push buttons and coloured knobs. Sadly, the so-called "Short Wave Radio" is often no more than a domestic portable with a fancy front panel, and the performance when used for anything other than casual listening is no better than the old radio with which he started — in fact it's often worse.

So — these push button portables are excellent for taking on holiday, or carrying to the river bank during a fishing trip, but for real listening — no, no, no.

Our listener is about to graduate from the University of Short Wave Listening, and armed with the knowledge of what he really needs for his hobby will proceed to find a suitable receiver for his purposes. Now it is true that the cost of a properly designed short wave receiver will be higher than the domestic portables; but not so much higher as to be prohibitive, and by going to a specialist (and I mean a true specialist, not someone who talks about "Tranny Radios"), the listener will get good advice based on years of experience in the field, and access to not only new receivers but usually a range of guaranteed second hand units as well. The specialist will also stock and sell a full range of necessary accessories, ranging from simple aerial insulators to complex morse and RTTY decoders for more advanced enthusiasts.

You may get the impression that I am referring to Lowe Electronics when I talk about a specialist dealer, and of course I am. After 25 years of specialising, it is generally accepted that we are without equal, and this is re-inforced by the fact that we have been appointed by so many leading manufacturers to represent their products. As a final point, how many other companies in the UK have designed, built, and sold a real short wave receiver to 17 countries around the world. WE HAVE.

The receivers shown on this page are representative of the best in the world, and are on show at all our branches and at selected dealers throughout the UK. For full information on how to choose your short wave radio, just send off for our "Listeners Guide" (details below), or call and ask. We are happy to help, and we know what we are talking about.

FREE

Send £1 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.

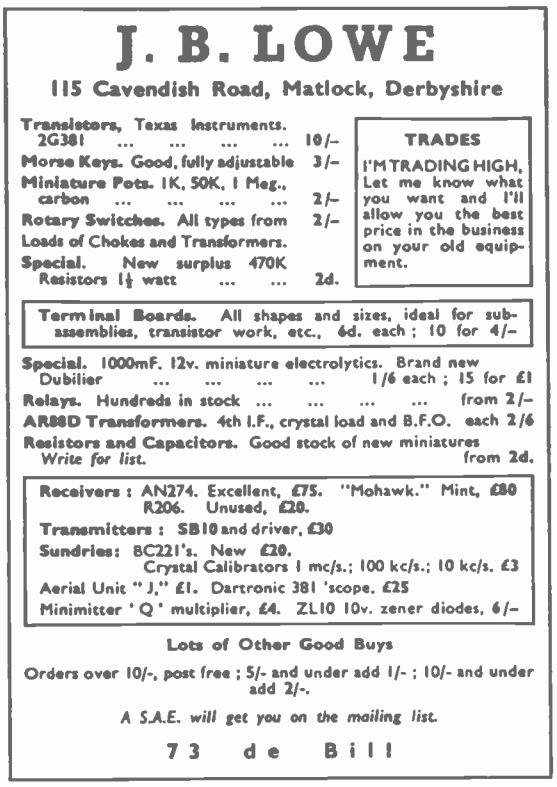
LOWE ELECTRONICS LIMITED

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines) Fax 580020 Telex 377482

25 YEARS IN SHORTWAVE

Did he say 25 years in Short Wave?

That's absolutely right; the company was registered in 1964 and the first advertisements for J.B. Lowe were soon in the magazines. As you can see from the early effort below, the business was built on selling small components — oh, all right if you insist — junk; but only the best quality junk.



J. B. LOWE

115 Cavendish Road, Matlock, Derbyshire

Transistors, Texas Instruments. 2G381 ... ... 10/-
Morse Keys. Good, fully adjustable 3/-
Miniature Pots. 1K, 50K, 1 Meg., carbon 2/-
Rotary Switches. All types from 2/-
Loads of Chokes and Transformers.
Special. New surplus 470K Resistors 1/2 watt ... ... 2d.

TRADES
I'M TRADING HIGH, Let me know what you want and I'll allow you the best price in the business on your old equipment.

Terminal Boards. All shapes and sizes, ideal for sub-assemblies, transistor work, etc., 6d. each; 10 for 4/-

Special. 1000mF. 12v. miniature electrolytics. Brand new Dubilier ... ... 1/6 each; 15 for £1
Relays. Hundreds in stock ... ... from 2/-
AR88D Transformers. 4th I.F., crystal load and B.F.O. each 2/6
Resistors and Capacitors. Good stock of new miniatures *Write for list.* from 2d.

Receivers: AN274. Excellent, £75. "Mohawk." Mint, £80
R206. Unused, £20.
Transmitters: SB10 and driver, £30
Sundries: BC221's. New £20.
Crystal Calibrators 1 mc/s.; 100 kc/s.; 10 kc/s. £3
Aerial Unit "J," £1. Dartronic 381 'scope. £25
Minimitter 'Q' multiplier, £4. ZL10 10v. zener diodes, 6/-

Lots of Other Good Buys

Orders over 10/-, post free; 5/- and under add 1/-; 10/- and under add 2/-.

A S.A.E. will get you on the mailing list.

73 de Bill

Bill Lowe laid down some basic rules of business behaviour which we still follow today, and the most important of these was the idea of service to the customer. The concept of "Flog it and forget it" was not allowed in Lowe Electronics, and those who know us will agree that as far as we are concerned, service is not just an idle promise, it's a fact. Unlike many companies, we employ more people to look after our customers than people to sell the goods, and although this may be unfashionable in today's "Forty quid off, John" environment, it does keep the customers coming back to us — and they are always welcomed.

The history of the last 25 years is clearly too long to cover in detail, but we must have done something right, because we are still here when many of those who started down the road at the same time are gone and forgotten. Do you remember "Ad Auriema", "Peter Seymour", "Brian J. Ayres", "Short Wave (Hull)", "Stern-Clyne", "G.W. Smith", all of whom appeared in those 1964 Short Wave Magazine pages with us.

Not only are we here, we have been chosen as the UK distributors by several major manufacturing companies, including **Kenwood, Daiwa, JRC, Signal, AOR, Kantronics, Bencher,** and many others. Their continuing confidence in us is matched by the confidence of our customers, past, present, and we hope, future.

Obviously we are pleased to be 25 years old in 1989, and to celebrate the event we shall be holding a monthly prize draw for all our customers. Each month throughout 1989, all the names of those customers who have made a purchase of more than £5 will be put into the hat at the end of the month and one name drawn out. The winner will then receive a fairly substantial piece of amateur equipment completely free, and so as not to limit his or her choice, we will publish a list of items from which to choose. It's one way we can say "thank you for your support over the years."

The January list will contain the following:—

Kenwood TM-221E, TH-25E, TH-405E, Lowe HF-125, Signal R-535; which should give a reasonable spread of interests.

For purchases made in any of our branches, the branch manager will give you a card to complete, and all the cards will be returned to Matlock at the end of each month for the draw to take place. The winner for each month will be informed right away, and his or her name given in a later magazine — just to prove that the draw HAS taken place.

Having mentioned some of the companies we represent, it is perhaps opportune to give you an idea of what they produce.

Kenwood amateur radio is too well known to need listing here, and I would refer you to our advertising for the last 13 years or so, but particularly the range of receivers including the **R-2000, R-500,** and the **RZ-1. Daiwa** are noted for their leadership in RF power measurement and high quality power supplies; **JRC** are renowned for their communications equipment, and the recently introduced **JST-135** HF transceiver, following on from the world wide success of the **NRD-525** receiver speaks for itself. **Signal** are specialists in design and manufacture of air band receivers, and **AOR** are quite simply the world leaders in wide range monitor and scanning receivers. Their soon to arrive **AR-3000,** which covers 100kHz to over 2000 MHz, will set the market on end, and will render everything else completely obsolete.

Aerials and accessories have not been forgotten in our range, and we have stocked and sold the **J-Beam** and **Hokushin** ranges since the beginning — and very happily, because their aerials are well made; perform properly; and give satisfaction to the user.

From the U.S.A. we are pleased to represent **Kantronics,** world leaders in packet radio terminals and systems, and of course **Bencher** keys, which have to be seen and handled to really appreciate how near perfection a key can be. The Rolls Royce (or should I say Cadillac) of the keyer market.

Too much to cover in a small space, so why not send off for a complete product listing, enclosing £1 to cover postage. You will find lots of useful reading including both our Listeners Guide and Airband Guide, together with details on everything we stock and sell. If you have a particular interest in one receiver or transceiver, just mention this and we will include extended information.

Good luck in the prize draw.
John Wilson
G3PCY/5N2AAC

Shops in **GLASGOW** Telephone 041-945 2626, **DARLINGTON** Telephone 0325 486121, **CAMBRIDGE** Telephone 0223 311230, **CARDIFF** Telephone 0222 464154, **LONDON** Telephone 01-429 3256, **BOURNEMOUTH** Telephone 0202 577760
All branches are closed all day Monday.

AIRBAND

Godfrey Manning G4GLM

The High Frequency Band

This month Godfrey looks at some of the aeronautical uses of the h.f.bands and invites you to round off your aeronautical activities for this year by having a go at his Christmas Quiz.

In Harare, **Nigel Tucker** is researching for a book to be titled *Civil Aircraft High Frequency Communication* and wishes to list the company frequencies of International Air Transport Association (IATA) members. Distances between stations are so large in Nigel's part of the world that v.h.f. is ineffective, as to some extent are navigational beacons. British Airways operate the London Airline Companies Air/Ground Worldwide network from Heathrow on 3.497, 5.535, 8.921, 10.072, 13.333, 17.922 and 21.946MHz u.s.b. Various airlines subscribe to this service through which their messages are relayed. Further messages can go via Portishead Radio (British Telecom) on 4.807, 4.810, 6.854, 8.170, 8.185, 12.133, 12.168, 16.370, 17.405, 18.210, 19.510 and 21.765MHz. Stockholm Radio is on 5.541, 8.930, 11.345, 13.342, 17.916 and 23.210MHz and is run by the Swedish p.t.t. The International Civil Aviation Organisation (ICAO) have sent Nigel a list which explains how frequencies are allocated on a geographical basis and airlines must share them; there is also a re-use factor across the globe, e.g. South African Airways and KLM (Royal Dutch) both use 8.933MHz.

Staying on h.f., International Short Wave League member **Anthony Barrett** (Newton Abbot) has provided some of the above information and also draws attention to Jeddah Control on 13.339 and 21.994MHz. On 5.680MHz the Plymouth and Edinburgh rescue centres co-ordinate helicopters and mountain rescue teams and the frequency is also used by fishery protection aircraft with the call-sign Watchdog. This information is prompted by a question from **Norman Hartford** (Telford) on emergency procedures (October 1988 "Airband").

Anthony's interest in aviation drives his wife **Jeanette** mad! Well, Jeanette, I'm sure that you are likely to fly (or have done so already), perhaps on a package holiday. Do you ever wonder about the different events that seem to go on during a flight? Once you begin to take note of (and understand a little about) the flight you're on, it relieves the boredom and makes it a worthwhile part of your holiday or journey.

You Write

Now we turn to the company frequencies on v.h.f. These tend to get blocked with heavy traffic, and this is despite pilots only having time to make two company operational calls on most flights. One suggestion is to send certain messages as digital data; some events can even trigger an automatic message (such as time off blocks, when the aircraft's wheels start to turn). **Roger Syratt** (Winslow, Bucks) who I believe is himself a private pilot, tells me that British Airways are trying such a scheme for aircraft communicating with their ground operations staff on 131.55 and 131.725MHz. One unresolved problem is how the aircraft can signal to its base that it is "almost there" so that ground staff can promptly meet the flight at the parking stand. Most approaches are flown auto-coupled until quite near the decision height, and there is also the progress from outer to middle markers plus, quite often, a d.m.e. associated with the l.l.s. A combination of these signals should do the trick - and if anyone from British Airways is reading this, I won't charge for giving them the idea!

Roger has something to ask. He's interested in the HP-82 handheld receiver and wonders what experiences other readers might have had with it. I'll pass your letter on to Roger if you send it to me via the editorial office, and will try also to print a selection of any comments so received. I would remark that the frequency coverage starts at 118MHz, missing the v.o.r./l.l.s. band which is a shame. It can be useful to listen to these nav aids to check for their serviceability, and some v.o.r.s carry the useful a.t.i.s. weather and runway reports (e.g. Heathrow Arrival Information can be heard on the Bovingdon v.o.r.). However, the HP-82 covers up to 174MHz and so will not be obsolete if the v.h.f. band is extended.

Radar changes are afoot, according to **Alan Oldfield** (Spendon, Derby). Border Radar (Civil) is transferring to Manchester; Eastern Radar is moving to London. Alan would like to know the locations of the new Pennine Radar (133.4MHz) and Anglian Radar. Send your answers to me and I'll print them here.

The well-equipped shack of **Anne Reed** (Cheltenham) has pictures of a Dan-Air BAC One-Eleven and Boeing 737 adorning its walls. Anne has a Signal R.535 and finds that "putting the memories in is a bit different from most scanners." Her favourite is the Sony 2001D. Her proximity to the London Air Traffic Control Centre v.h.f. relay at Birdlip Hill is noted. How do pilots keep up with changing from one frequency to the next throughout the route? The published information is the starting point, e.g. a call to Delivery or Ground Movement Control is necessary even before engines are started. North Atlantic h.f. frequencies are in the usual charts and publications. However, whilst airborne, the only sure way for the pilot to select the right frequency is to do what the controller tells him at each handover! To avoid errors, the pilot will read the frequency back to the controller before actually changing to it. I've just come back from sitting in a DC-9 cockpit for two flights within the UK and was impressed by the frequent handovers on v.h.f. on passing from one control sector to the next. Getting from the stand to the runway at Heathrow alone requires three frequencies, and you haven't even flown anywhere yet at this stage! On h.f. it's different, there being so few frequencies in use. Where are the reporting points on the north Atlantic track system? En route they are simply latitude and longitude intersections, usually falling on "easy" multiples. At each end of the system, though, are fixed reporting points which, on the American side, have 5-letter names like PRAWN, OYSTR, CARPE, etc. Your best bet is to buy an *Atlantic Orientation Chart* or similar from one of the aviation information suppliers so often mentioned in this column. Remember also that Shanwick handles traffic on our side of 30°W and Gander on the other side. Hope all this helps.

Please note that I regret being unable to reply directly to individual readers. I will, however, endeavour to answer each enquiry as fully as possible for all to share in this column but it can take a couple of issues before you see your name in print.

Godfrey presents some VC-10 instruments from his museum to Stan Stewart, a 1st Officer on British Airways 747s and well-known author. Stan flew on VC-10s several years ago.
Photo Christine Mlynek

Military Happenings

A Gazelle crewman, whose name I have witheld for security reasons, has written about his experiences at the turn of the decade whilst stationed at Voss, southern Norway. The helicopter was equipped with an ARC44 homing direction finder using a nose-mounted H-shaped antenna. Cockpit indication is a left/right deflection on a pointer and the frequencies used are 38-41MHz. Some mornings, there was strong but intermittent reception of private mobile radio emanating from Texas. Was this phenomenon sporadic-E, or one of the weirder modes of propagation that is just becoming apparent now that amateurs have 50MHz? Any ideas?

Terry Ford (Sheffield) complains that I don't say enough about the military side but is "well aware of the sensitivity of the subject." In fact, I don't have a "civil only" policy; the aim of this column is to inform, educate, provide an exchange of ideas and also to show that flying can be enjoyable. By chance, few people write in about the military side but I'd be happy to hear your views as long as you remain within the limits of public domain information. There is no intention to cause embarrassment through any lack of sensitivity. For example, remember the enormous interest in Eureka ("Airband," April 1988)? Most people experience flying as passengers, particularly on inclusive tours; a lucky few become private pilots (this is still but a dream for me, too!). Military and civil flying share a common basis, of course. If you can contribute, Terry, then please write again.

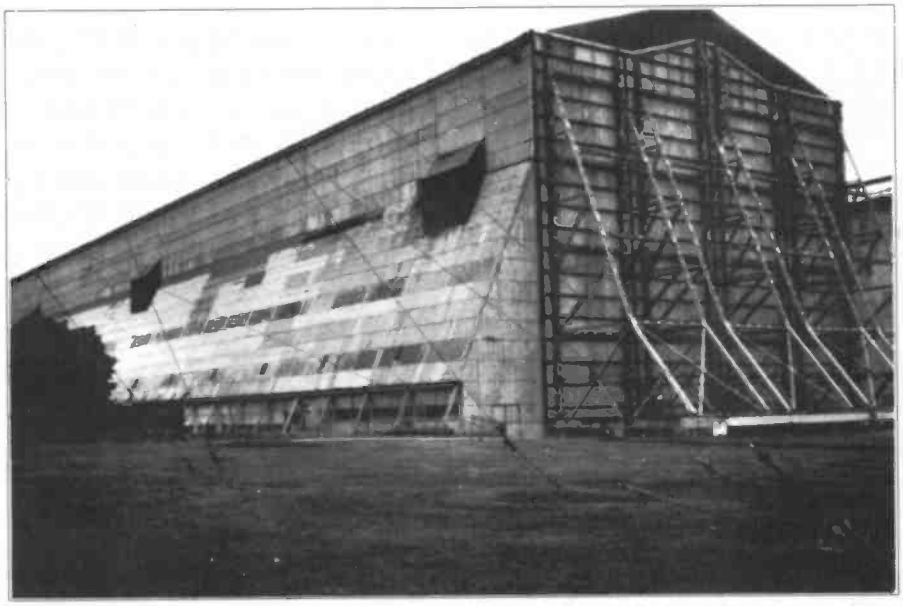
Terry would like to obtain the RAF's *Low Flying Handbook* and *Low Level Charts*. If you can help, send me a stamped envelope and I'll put you in touch. Terry also adds a bit of local knowledge: the Sheffield civil airport project is planned for Tinsley, near Junction 34 of the M1 and low passes have already been made by a BAe 146 and others.

Follow-Ups

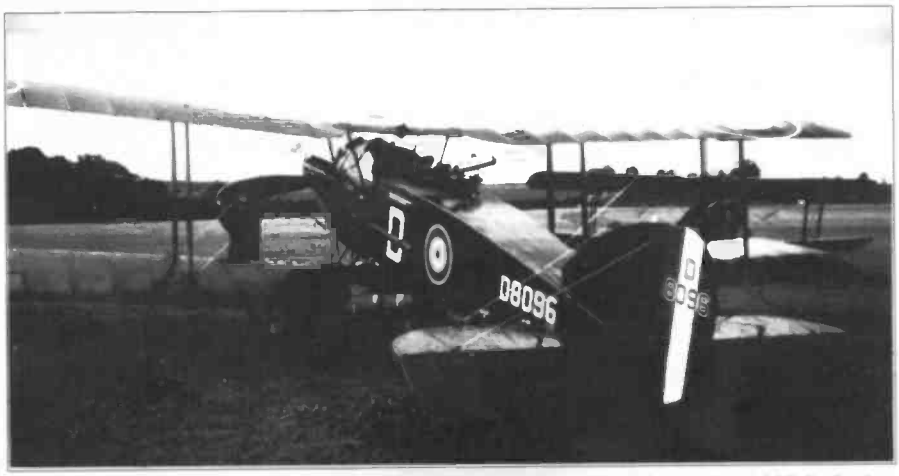
Alan Jarvis (Cardiff) obtained a couple of "minor defects" altimeters from **Parkhouse Aviation** (Camberley, Surrey - see September 88 "Airband"). Whereas the defects are minor in the sense that they are limited in number, they do seem to require a degree of instrument-maker's skill for their correction. If you buy one then please be advised that this type of defect is a possibility. I have just obtained a three-pointer "killer" altimeter for my own collection, from a different source. Its spindle was off its bearings - although roughly functioning now, it's not clear how the manufacturer expects the spindle to stay put in the first place!

Alan further comments on the Bristol (Luisgate) approach frequency change to 132.4MHz (see December 88 "Airband"). He would like to know the reason for the change; any answers?

Temperature and dew point were discussed in the October 88 "Airband" Now **John Walker** (Upper Langford, near Bristol) adds the importance of not exceeding the maximum take-off weight allowed under hot conditions. John flew the Comet 1 and the Argonaut (quite some time ago, no doubt). Also the likelihood of fog formation increases as temperature approaches dew point, which is another way of saying that relative humidity tends to 100%. I'm still not too sure why the ground movements controller will quote temperature to the pilot on start-up, when most aircraft have their own outside air temperature thermometers.



A landmark of importance in aviation history. Where is it and what was it built to contain? Photo Christine Mlynek.



Swinging the prop - the right way. Bristol Fighter at the "Hendon in the 1930s" display at Old Warden, 29 May 1988. Photo Godfrey Manning.

News

The British Women's Altitude record was broken by **Diane Maimoe** when she reached 19300ft in *Thunder* AX7-77 G-LYTE, lifting off from Woollaton Park, Nottingham on 17 August 1988 (see: *Air-Strip*, 9/88, from the Midland Counties Aviation Society). Is this the same balloon flight mentioned in the September 88 "Airband" that was denied permission to carry the amateur High Altitude Radio Transponder?

Frequency Changes

Just one new change in the Civil Aviation Authority General Aviation Safety Information Leaflet 10/88 since last month: the Clacton n.d.b. (CLN: dah-di-dah-dit, di-dah-di-dit, dah-dit, 669.5kHz) now only operates when the corresponding v.o.r. on 114.55MHz is unserviceable.

The Christmas Quiz

This month's photo by **Christine Mlynek** shows an aeronautical landmark of historical importance. Where is it, and what was it originally used for? When did this original use take place? The most complete answer will win a piece of aeronautical radio equipment (courtesy of The Godfrey Manning Aircraft Museum) and the winner's name will appear in this column. In the event of a tie, the winning answer will be the first correct one drawn at random. My decision is final. Answers to the editorial office to arrive by the end of January please.

With that, I wish the compliments of the season to one and all until we take to the air again next year. □

THREE-BAND SSB RECEIVER

C. M. Lindars Part 6

As promised last month, the complete inter-connection drawing is reproduced here, enabling the beginner to complete the 3-band s.s.b. receiver. The series finishes with some hints on restoring old slow-motion drives.

The complete wiring diagram for the receiver is shown in Fig. 6.1. Note that this is drawn with the front and back panels laid out flat so as to show clearly the disposition of the various modules and cables.

Slow-motion drives

At the beginning of this series the slow-motion drive, so essential for smooth accurate tuning, was discussed. The Muirhead dial shown in the photographs was picked up by the Editor at a recent rally for the princely sum of £1.50. It is well worth going to your local rally and scouring the stands selling components and other used goodies.

Of course, it didn't look as clean as it does here and it is missing the cursor. It was cleaned up, after removing the cover and dial, using the wife's kitchen cleaner (Ajax Lemon) rubbed on with an editorial finger and washed off under the hot tap. The plastics parts, such as the cover, were smartened up using black shoe cleaner! Unless you are very patient and mechanically minded do not be tempted to completely dismantle the works - it takes four hands to get it back together again! This one was dismantled to clean off some rust but it was probably not really worth the bother as, when the cover is replaced, the works are completely hidden - as long as the drive is smooth and doesn't feel full of grit, leave well alone. The missing cursor will have to be made up from a scrap of Perspex cut to shape with a fine line cut into the underside. A couple of 6BA screws and spacers to postion the cursor over the dial markings should complete the restoration.

Well, you should now have a working receiver capable of giving you hours of fun. I hope that you enjoyed building it. □

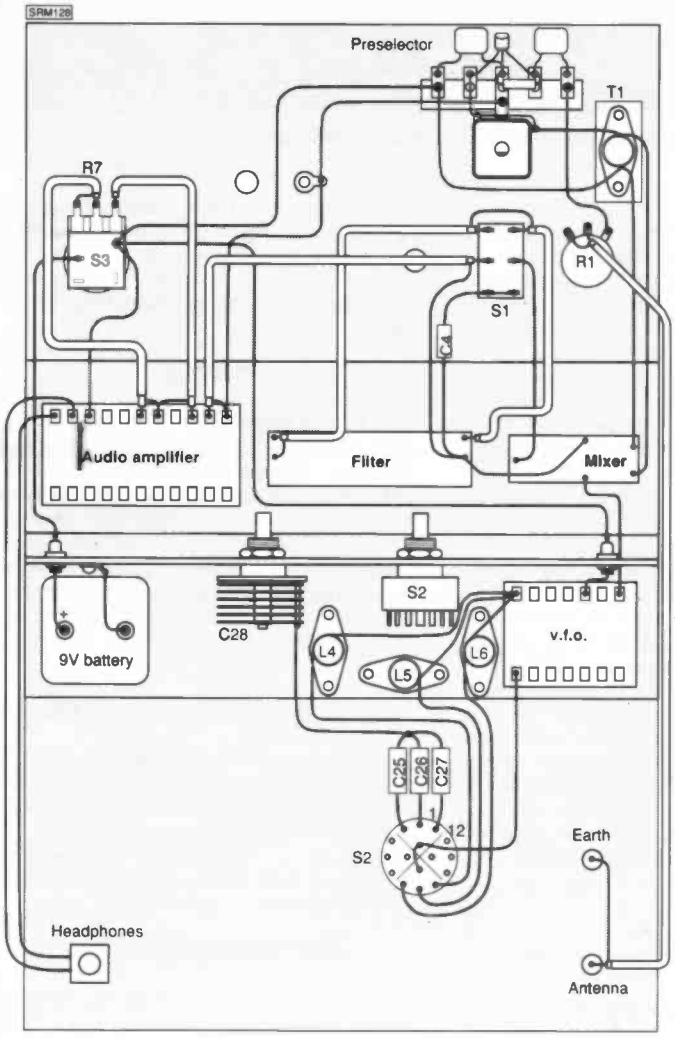
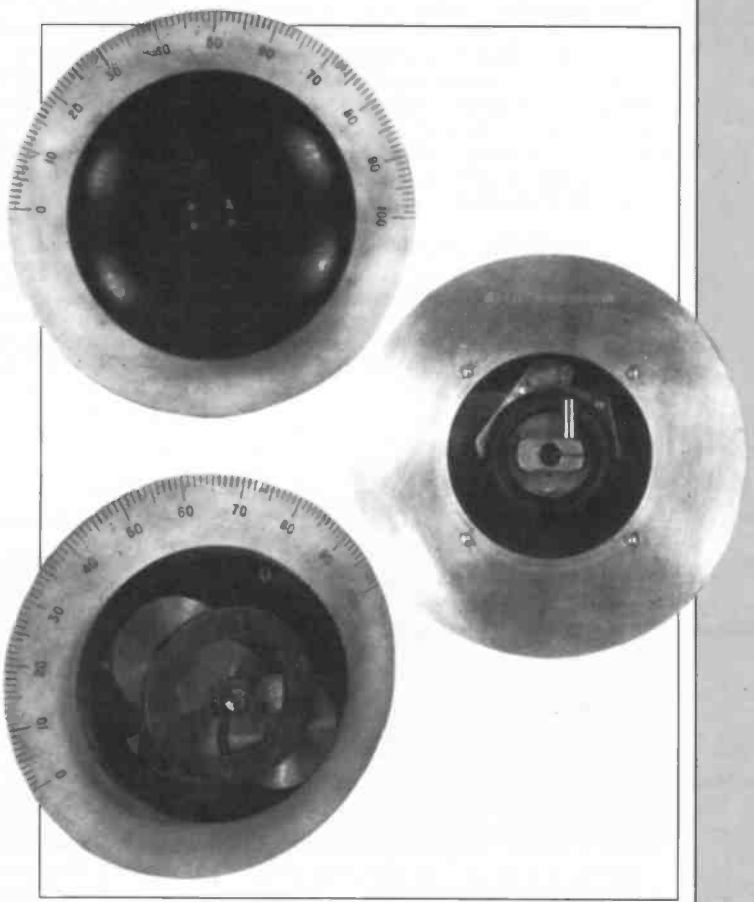


Fig. 6.1: The complete wiring diagram of the 3-Band s.s.b. Receiver. Note that the front and back panels are shown laid flat for clarity. The band selector switch, S2, has been shown removed from its correct position on the intermediate panel so that the connections to it can be shown correctly. In Fig. 5.1 the coils L4, 5 & 6 and T1 were shown incorrectly as L2, 3 & 4 and L1 respectively. These have been corrected in this drawing.



A Muirhead slow-motion drive picked up at a local rally and restored by the Editor.

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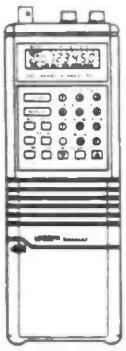

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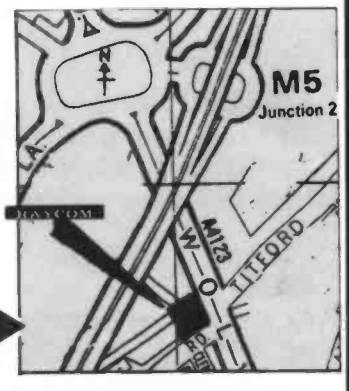

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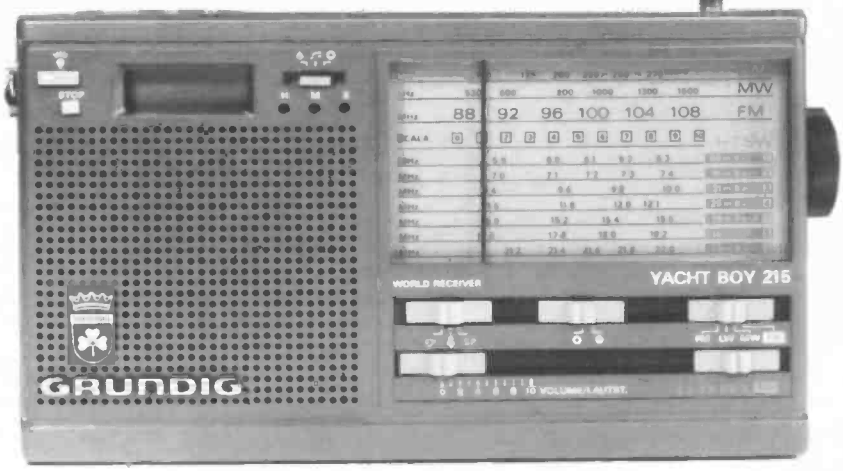
GRUNDIG YACHT BOY 215

Jack Aldridge

The Yacht Boy 215 from Grundig is a simple and very compact a.m./f.m. portable radio featuring seven-band short wave coverage.



One of the first things I noticed about the radio was the handy size and styling. It was only about 185 × 105 × 35mm, dark grey in colour with light grey controls. I think it's likely to appeal most to the traveller, though the newcomer to short wave listening may well be interested too.

The operating instructions were in a 24-page multi-lingual booklet covering German, English, French, Dutch and Swedish (I think). The English language section amounted to about three pages with a flip-out numbered photograph of the controls available on the front page. That flip-out photograph was one of the most useful bits as I was able to identify the various controls quickly. Surprisingly, for a radio that looked very simple, it wasn't immediately obvious how to drive it (more of that later). Fortunately, despite the fact that the instructions were quite short, they were fine for a radio of this type and I soon got the hang of it.

For any newcomers to short wave listening there was a very useful little booklet included which contained a list of frequencies and bands for some of the more common short wave broadcast stations. There was even a list of addresses at the back where you could send off for station schedules, which was quite handy.

Getting Started

The first decision facing anyone with a new radio is, "how am I going to power this?". As far as the Yacht Boy 215 is concerned, there are a couple of options. The most obvious is to use internal batteries and the Yacht Boy needs four AA (IEC R6) size batteries which are fitted in a small compartment at the back right-hand corner of the radio.

If you're likely to be using the radio a lot then an external power supply is probably a more practical solution. The NR-60 power unit, available as an accessory, is connected to the radio via a flying lead and a connector on the left-hand side. This mains power unit can only accept 220-240V at 50Hz, so the traveller may need to buy another unit to cope with different mains supplies.

In addition to the main power sources, a small mercury cell is needed to power the internal clock. Fortunately this was supplied with the radio and fits quite neatly in the compartment provided just underneath the antenna on the back of the radio. To get to this compartment you have to lift the telescopic antenna out of the way. Incidentally, this battery is required for the clock regardless of the main power source. This fact fooled me for a while, mainly as I hadn't read the instructions first! You don't need to have the clock battery in before the radio will operate though. Once the power supplies have been sorted out, the Yacht Boy is ready for testing.

Controls

The main radio controls are grouped on the right-hand side of the front panel. The whole panel is dominated by the main tuning dial, it's about 93 × 46mm and contains all the tuning scales for the ten bands. Most of the controls take the form of sliders which are slightly recessed so that only the centre of each of the controls stick out above the front panel. They're all grey, but the short wave band selection slider has both red markings beneath the slider and a red line on it. Unfortunately, I did find this a little difficult to see in some lighting conditions, but it wasn't that big a problem (probably just old age!).

The main on/off switch is in the centre of the slider controls and hasn't been combined with any other controls like volume, which is quite unusual for a small radio. To select the band you want to listen to, you need to operate two switches. The first selects either f.m., l.w., m.w. or s.w., whilst the second switch gives access to the seven short wave bands.

One thing you have to do before the radio will work is make sure the alarm control is switched to off (and not the bell or musical note symbols). If you don't, it doesn't matter how many times you switch the main on/off switch – nothing happens. Again that fooled me for a while, until I read the instructions.

The tuning control is a straight-forward 25mm knob mounted on the side panel close to the tuning dial, ideally placed for the right-handed user. I'm not really sure how left-handed people get on, I suppose they get so used to things being designed for right-handed people. No-one's left-handed in this household so I couldn't check this out.

The tuning rate seemed to be just about right as I found it quite easy to tune-in to stations, even on the crowded short wave bands. In fact, the pointer seemed to be very closely coupled to the tuning dial. There isn't a fine tune control of any sort though, mind you, quite where it could have been put I don't know.

The short wave broadcast bands included are 49, 41, 31, 25, 19, 16 and 13m, which is quite a good selection on such a small radio. Each band is spread over the full width of the dial, so there's about 400 – 600kHz coverage in each instance. This makes a change from some receivers which, although giving the same frequency coverage, leave only about 5mm of dial movement for each broadcast band! At least with this radio I could "guesstimate" the frequency I was tuned to. It's probably a sign of old age, but it never ceases to amaze me how much they seem to be able to cram into these portable radios today.

In addition to the main dial markings, which incidentally are in kHz and MHz, there's a logging scale included which is marked 0 to 10. This came in very handy if I found a station I thought I would like to return to at a later stage. Why not use the frequency scale on the dial? The answer's simple. On each of the short wave bands there are only four or five frequencies printed and, as with all analogue scales of this type, they are not really very accurate. So you can see, with ten markings on the logging scale, why I found this an easier scale to use. It wasn't only useful on the short wave bands either. Other members of the household found it useful when trying to find their favourite local stations too!

Once you've found the station you want, the sound quality can be adjusted by using a three position switched tone control on the front panel. The actual

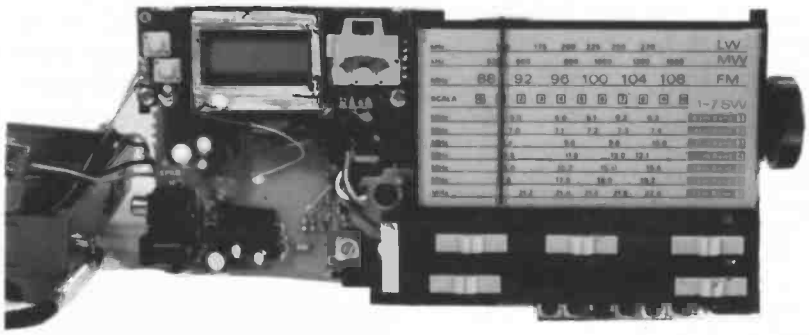
GRUNDIG YACHT BOY 215

markings comprise a musical bass and treble clef symbol followed by the letters SP. The normal position for the switch is in the centre (treble) position which gave quite a well-balanced sound. If, however, you prefer a slightly fuller sound, moving the switch to the bass symbol reduces the treble and gives the required effect. The position marked SP is also very useful as it reduces both the bass and treble response giving a sound quality which is ideal for speech. The main use of this lot is to help reduce some of the interference when listening on the busy short wave bands, and I found them to be quite effective. Obviously, separate controls would be nicer, but again, where would you put them?

Digital Clock

As mentioned earlier, the Yacht Boy 215 is equipped with a digital clock and, of course, this means that one or two other facilities are also available. The first thing I tried to do was to set the time. I found this was quite simply achieved via three small holes to the right of the clock display marked H, M and S. This was even self explanatory to me!

As expected each press of the H or M button incremented the hour or minute reading by one, the S button, however, had no visible effect on the display but it did internally reset the seconds counter to zero. I found this out from the instructions. So, to set the time precisely, you set the hours and minutes to a point in the future, listen to the time signal and then press the S button at the appropriate moment. It was quite handy for log keeping to have a clock on the radio as I set this to UTC and didn't need to do the usual mental arithmetic on my watch readings. I'm sure this is where a lot of new s.w.l.s get muddled with their log keeping.



Alarm setting is achieved in a similar way, except that the S button has absolutely no effect whatsoever. You also have to keep the ALARM TIME button on the top panel pressed down whilst you alter the time. If you want to check what time you set the alarm for, you need to press this button, otherwise you just get the clock time displayed.

To use the alarm facility, the small switch to the right of the clock has to be moved to one of two positions which are indicated by a bell or musical note. Fairly obviously, the bell symbol means that the radio will emit an alarm signal whilst the musical symbol means it will simply turn on the radio at the designated time (much more civilised!).

The alarm signal from the Grundig consisted of a burst of about eight "beeps", followed by a pause and then more beeps. This could only be stopped by pressing the STOP button on the front panel which being only 3 × 4mm meant you had to be reasonably awake to find it! If you have a sadistic streak and want to snooze for a few minutes before being woken-up again you can press the snooze button, this stops the alarm for four minutes whereupon it will start all over again. Once the alarm has been set an additional symbol appears in the top right hand corner of the clock display. I must admit I only played around with the various alarm functions in the "shack". Having new alarm clocks/radios going off in the mornings and not being very sure of how to turn them off is not popular here.

If you like to go to sleep with some music playing there's a button marked SLEEP which turns the radio on for 60 minutes. One thing I did discover was that once the radio had been turned on with this button the only way to turn it off, other than wait an hour, was to press the STOP button.

The Verdict

Despite its small size the Yacht Boy 215 proved itself to be a very capable receiver which was ideally suited to the traveller or newcomer to short wave broadcast listening.

The Yacht Boy 215 is available from any Grundig retail outlet price £49.95.

My thanks to **Grundig UK** for the loan of the review model. □

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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 £28.00 (UK) and £32.00 (overseas). Three year subscriptions are also available for *SWM* at £45.00 (UK), £50.00 (overseas).

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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.

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UHF DISCONE MODIFICATIONS

Peter Rouse GU1DKD

I decided to put some of his advice into practice and have been very pleased with the results. Alec, quite rightly, made two criticisms of commercial discones: they are bigger than they need to be and u.h.f. performance falls off where an SO239 socket is used. The latter is by far the biggest problem and certainly no professional engineer would consider using an SO239 for applications above 200MHz.

Having recently acquired an Icom R-7000, I decided my cherished beast deserved a better antenna than the corroded old dipole that has suffered a few too many blasts of the salty sea air that regularly whistles across the island of Guernsey during the winter months. I purchased a brand new Revco discone.

My choice was governed by the fact that it really is exceptional value for money. All the elements are solid rods and the whole assembly is very well engineered. The only let-down is the ubiquitous SO239 socket. The good news is that it is easy to change it to an N-socket. Before doing so you will have to ensure that the replacement socket is a single hole fixing type, (a suitable socket is available from Cirkit, part number 10-01301) as no other type will fit.

Words of Caution

Do not, under any circumstances, attempt to de-solder the top element connector lug. Aluminium is a wonderful heat dissipator, and by the time you get the solder molten you will damage the Neoprene insulator ring. Simply undo the two screws in the top element connector block and then, holding the upper and lower blocks in each hand, just keep twisting them in opposite directions until the wire inside the unit breaks. With the two halves separate, de-solder the top element connector. Using long nose pliers, unscrew the nut on the back of the existing socket. Solder a few inches of stiff wire to the new socket and install it. Put the two blocks back together with the insulator ring and solder the wire to the top element connector lug, (you do not need as much heat to solder as you do to de-solder, so you should not damage the insulator ring).

The entire assembly must be re-varnished (as it was in the first place), but I would personally suggest you wait until you have fitted the elements to the unit and varnish them at the same time. Use good quality outdoor grade varnish, and apply at least two coatings, allowing a good 24 hours for the first coat to dry.

The big question is, is it worth the bother? The answer is a definite yes. Assuming good quality coaxial cable is used, the performance above 400MHz is markedly improved.

In the August 1987 *SWM*, Alec Wood G8WHR gave some excellent advice on antennas for scanners. We had been corresponding on the subject for some time before his article appeared and I learned a lot from him.

The antenna was tested before modification and notes made on received strength of a range of signals below 100MHz, the quoted coverage of the Revco discone is 50-500MHz and I decided that I wished to increase the upper range. I was prepared to sacrifice low-end performance, but having re-cut the elements for a theoretical lower limit of 100MHz, I noticed that reception of signals as low as 75MHz was barely affected by the modification. On the other hand, there was not a theoretical upper range to 1000MHz. If, like me, your interest lies in the u.h.f. ranges, then this is a very useful modification and bears out the comments made by Alec Wood.

Referring to Fig. 2. You will see that we must first determine the dimensions of elements "A" whilst making some allowance for the dimensions of the discone's connector block. We determine the starting point for "A" by first increasing our minimum frequency by 25 per cent. In my own example, this gives us 125MHz. If we divide 75000 by this figure we get 600mm, which is the length of "A". The diameter of the disk (D) will therefore be 419mm. Compare these with the original dimensions and you will find the modified discone is almost exactly half the size. We now have a far more compact antenna with an extra 500MHz coverage at the upper end for a loss of only 75MHz bandwidth at the lower end. That is not a mistake on my calculator, it is the plain mathematics of the matter and all comes down to the 10:1 bandwidth ratio available on this type of antenna.

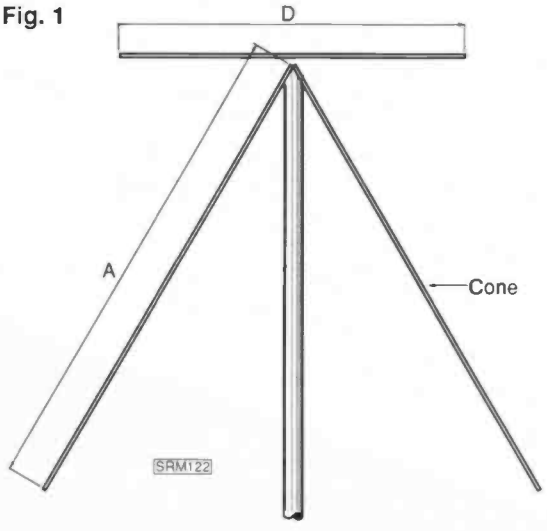
To summarise both modifications, I would say that for the cost of one socket, a drop of varnish and less than an hour's labour, the increased performance is a good investment. In practice, the discone's dimensions appear to be far less critical below 125MHz and so very little is lost despite all the advantages.

Mounting

My last tip concerns mounting. Most scanner owners appear to use chimney lashing kits with a 2 or 2.5m mounting pole. The normal method of attachment is to use a mounting bracket to hold the discone pole to the mounting pole. However, a far neater and cheaper job can be done with two Jubilee clips. These can be bought from most garages at a fraction of the cost of a mounting bracket. Use a 2in mounting pole and cut four "V"s at the top, as in Fig. 3. Feed the coaxial cable down the mounting pole, insert about 125mm of the discone pole and tighten the two clips. There is no need to tape-up the joint, any rainwater that gets in will simply run out at the bottom.

I do not recommend this method of mounting for any pole longer than 2.4m. The cable is self-supporting and so quite a strain is put on the connection in the plug if there is a long cable drop. □

Fig. 1



A=1/4 wave at lowest design frequency
D=70% of A

FIG. 2

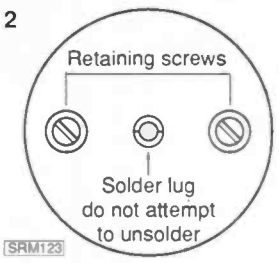
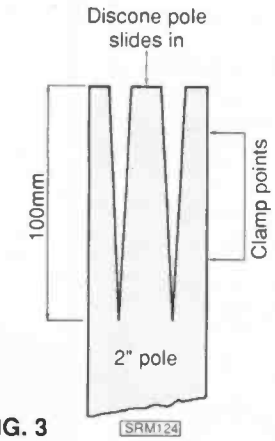


FIG. 3



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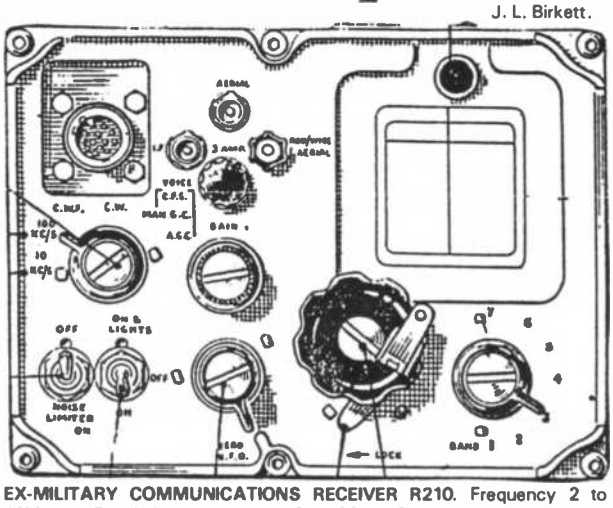

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BANDSCAN

Peter Laughton

Welcome to the first column for 1989, and with the sunspot maximum possible later in the year, things are getting better and better for the international short wave broadcast listener.

IRRS Emerges

After a short period of testing, the Italian Radio Relay Service has come on the air as planned. The 10kW Siemens transmitter was first noted on Saturday 19 November 1988 with a reasonable signal in Northern Europe. So far the station has got some American religious organisations and Radio Earth as clients. IRRS has an f.m. station in Milan which has been active since 1982, but the short wave venture is new for them.

The station is one of the few international broadcasters to use a reduced carrier a.m., and is best listened to on one of the sidebands. The frequency of 9.810MHz was active at the time we went to press, but other channels may now be used. For current details you can phone the station's answering machine in Milan. The number from the UK is 010 39-2-266 69 71 or write to: IRRS, PO BOX 10 9 8,0, 20110 Milan, Italy.

Relay Corner

I think that 1988 will go down as the year of the relay agreements. In fact, 1989 will probably be just as busy. In April, RCI Montreal and Radio Beijing should start swapping, and we may see further relay expansions on m.w. from Radio Antilles in the Caribbean.

One of the more curious relays of taped KGEI programmes by Radio Nacional de Chile on 15.140MHz may resume this year. A three month experiment by the religious US short wave broadcaster took place in late 1988. Tapes of Spanish language programmes were broadcast from Chile to other stations in the southern part of South America between 2330-0330UTC.

KGEI told us they booked a three month experimental relay back in July, and after some tests on 9MHz (31m), the transmission was moved to 15.140MHz. Because of the Chilean elections, the tests were suspended, but resumed in October as there were some compensation days to make up for. Now KGEI wants to evaluate the relay experiment, but hopes to resume the agreement in the near future.

Expansion Down South

The use of the 25MHz (11m) band by South Africa is usually a sign that sunspot numbers are on the way up. Radio RSA, the Voice of South Africa, has started announcing several last minute changes to its winter schedule. It started an English service to India, Pakistan and the Far East at 1300UTC on 21.590 and 17.755MHz. A 25MHz (11m) band frequency to North America started too between 1400-1600UTC, namely 25.790MHz. There is only a very poor propagation path from South Africa to Australasia so it is not expected that RSA will try to resume broadcasts down under. The recent resumption in the station's glossy programme schedule is a sign that they are stepping up their public relations campaigns abroad.

Phone-Ins

Following the increasing use of the phone for international broadcasting, there is now a monthly "phone-bridge" programme on Radio Moscow called Calling Moscow. The next programme will air on the last Friday of each month at 0300UTC. Callers in the US get onto the programme by dialling radio station KPBS in San Diego, California.

VOA Modernisation Criticised

Back in the 1970s, VOA identified transmitter sites at the beginning and end of a transmission period. Now all we hear is that programmes "come from Washington". VOA will QSL transmitter sites if you ask politely and are willing to be patient.

One of the influencial broadcasting magazines in Washington recently published a rather damning report about the modernisation programme of the Voice of America. The US Information Agency's Inspector General says that the whole process is going too slowly, and money has been wasted. The original programme a few years back approved 1.3 billion dollars to upgrade Voice of America's audibility, but so far only 365 million dollars has been appropriated, and most of the investment is in short wave.

Dr Robert Frese, Director of the office of engineering and technical operations at the Voice of America says results of modernisation will begin to bear fruit in two years. At the end of 1988 they completed a satellite system that will enable programmes from Washington intended for VOA relay stations in Thailand and Botswana to be fed by satellite, not short wave.

Out of the Out-of-Band

Sadly, the Radio Frequency Service in New Zealand has withdrawn the out-of-band use by Radio New Zealand International of 12.045MHz. Between 1730 - 2015 and 0900 - 1115UTC they're now using 11.780MHz instead. This is a great pity as the small 7.5kW transmitters from the land of the Kiwi have now been buried under the noise.

Meanwhile, the BBC has started using an out-of-band channel for the European service which hasn't been widely publicised. Few people would look for them on 5.875MHz between 1715 and 2000UTC. That really is a way-out-of-bander.

Radio Netherlands Asian Relay?

There have been further developments in the plans to improve the Dutch coverage of the Asian continent. In the middle of 1988, Radio Netherlands completed a £60 000 study which went into quite a lot of detail as to the options available, including recommending possible countries for a relay station. The report was then presented to the Dutch Minister for Culture, Elco Brinkman. It seems the Minister feels the station must seek a partner to build a relay station in Asia. Some sites have been evaluated but not announced. Radio Canada International

has also said that Asia is on its priority list. Maybe the two will work as partners?

Back in November, BBC Monitoring filtered this item out from news agency copy. The story has since gone quiet, though subsequent checking indicates it may well go ahead. It seems that the former Director of Radio France International and the first TV channel in France TF1 says that he's just signed an agreement with the authorities of the Cape Verde Islands off the West African coast. Herve Bourget told reporters of the French news agency AFP that the plan called for three high-powered, short wave transmitters which will be capable of beaming programmes to Latin America and Africa.

It seems the operation will be similar in style to Africa's Number One station in Gabon. It puts out its own programmes, as well as relaying satellite fed material from Radio France International, Radio Japan and Swiss Radio International. The report quotes him as saying that the relay time will go to the highest bidder, whoever it is. Even Radio Moscow would be welcome it seems!

No Room for Local Short Wave

The British government White Paper entitled *Broadcasting in the Nineties, Competition, Choice and Quality* received a lot of media attention when it came out a few months back.. Most of the discussion focussed heavily on what the government plans to do with television. Radio wasn't given much of a mention, and short wave was left out altogether.

A British group have just finished hiring airtime on an Irish transmitter to broadcast programmes to those interested in technology in Europe. It was called Radio Fax, and only existed because the Irish did not crack down on the pirates until the start of this year. Trevor Brook, the head of Radio Fax says he is disappointed that, despite several letters, the new White Paper doesn't seem to have considered his idea for legal low power short wave broadcasting at all.

Middle East Mystery

At the time of going to press, Jordan's high-power, short wave facility still has not materialised, but after years of a stop-start situation, Abu Dhabi has restarted its English service. Note that this is not the same station as the popular UAE Radio in Dubai, also in the Emirates.

English test transmissions to North America are noted at 2200UTC on 6.170 and 9.595MHz, though they suffer co-channel jamming because these frequencies are used by Radio Liberty and Radio Free Europe.

During the day, the channel on 25.900MHz is excellent at 1030UTC, but then you need an active knowledge of Arabic!

Norwegian Helping Hand

Radio Norway International has offered airtime to their Danish colleagues. By eliminating the 15 minute gap between each Radio Norway International broadcast, and re-organising the schedule to maybe 30 minutes of Norwegian transmissions, a lot of spare capacity is available.

Denmark Radio feels the short wave service for Danes abroad should be funded by the Danish government, so the officials in Copenhagen now have to decide if a relay of Radio Denmark via Norway is a good idea. Denmark's short wave service is currently enjoying some success with a 25MHz (11m) band broadcast on 25.850MHz between 1200-1252UTC.

It seems that the relay exchange between Radio Beijing and Radio France International has now started up, although the promised new English programme to India from Radio France is still in the planning stages. Radio France's next priority is programming in Vietnamese, Laotion and Chinese. Radio Bejing on the other hand has got airtime from French transmitters in French Guiana for North and South America. Programmes for Radio Beijing in East European languages are also going out from transmitters in France.

Audience Researchers Meet

A meeting of audience researchers recently took place at the headquarters of Radio Deutsche Welle. The radio building is on the southern side of Cologne, and from the top 31st floor there's a commanding view of the historic city and the river Rhine. The BBC, Radio France International, VOA, Radio Netherlands, Radio Deutsche Welle (which no longer calls itself the Voice of Germany), Radio Canada, and Radio Free Europe were seated round the table.

Letters - A Problem

One of the most interesting points of the meeting was that many stations now regard listener mail as a problem. It is great for programme producers looking for praise, but because it tends to be more positive rather than negative, researchers think they should no longer draw too many conclusions. It is important to stress though, that we are talking about the audience researchers attitude to listener mail.

There are other methods that are used. Research organisations like Gallup are often commissioned to do quantative studies, in other words tell the station how many listeners they have in a particular country. They can be fiendishly expensive, and apart from a number, tell the station little or nothing about what people want to hear.

When it comes to judging programme reactions, some stations still rely on a panel of selected listeners. They're chosen on the basis of education, age and sex to be representative. Whilst it works for a one-off survey, people move and change interests, so long term panels such as those the BBC used to run have been discontinued.

For qualitative analysis one of the most popular methods is a focus group. You arrange for a cross-section of the audience to be invited to a radio studio or a hotel in the target area, and ask them in depth questions about their listening habits.

The conclusions? If you write to a radio station, the more specific your request, the more chance it has of being answered. Letters that react to programme content get priority over requests for stickers and souvenirs. Postage costs and manpower cutbacks mean that many stations are being very selective as to who they reply to. If you can't write, as many as 14 international broadcasters now have a listener answerline. Try ringing 010 43 222 82 913636 outside office hours for the latest addition...Radio Austria International.

At the Cologne meeting in Cologne, both the BBC and Radio Free Europe reported a growing number of calls from Eastern Europe. Bulgaria tops the list, with the BBC reporting some 5000 phone calls from that country in the last 6 months. In Czechoslovakia, many of the calls to Radio Free Europe in Munich seem to get cut off, but some 2000 calls still made it and were analysed by researchers. Of that, 3 per cent had negative comments about the station, 11 per cent were pro, 6.6 per cent had music requests, and 3 per cent rang up with political jokes.

In general, radio stations are taking audience research more seriously, but, at the same time, there's a growing divide between those who can and cannot afford to do it scientifically. □

Abbreviations

a.m.	amplitude modulation
BBC	British Broadcasting Corporation
f.m.	frequency modulation
IRRS	Italian Radio Relay Service
kW	kilowatt
m	metre
MHz	megahertz
m.w.	medium wave
TV	television
UTC	Universal Co-ordinated Time (=GMT)

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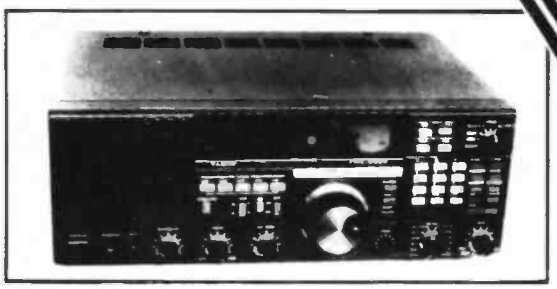

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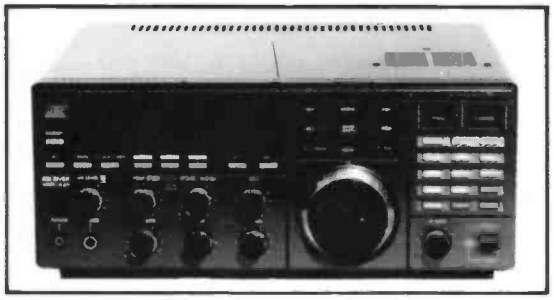

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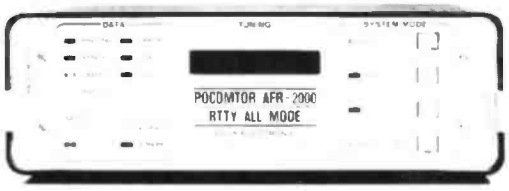

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ANTENNAS

F. C. Judd G2BCX

The first part of an important new series in which this well-known author describes fundamental principles, types and performance of that most important item — the antenna. This month the author looks at radiation and radiation patterns.

Regardless of whether they are used for transmitting or receiving, or both, virtually all antennas must be *resonant*, i.e. tuned to the frequency of operation, in order to function with greatest efficiency. If a single antenna is used for both transmitting and receiving (which demands, of course, that the performance parameters are the same in each case), the function of the antenna is said to be *reciprocal*.

Most s.w.l.s. are well aware of the foregoing and many employ antennas originally designed for transmitting (and receiving) on the amateur h.f. and v.h.f/u.h.f. bands. But what about all the other frequency bands — for example h.f. broadcast and the multiplicity of v.h.f. and u.h.f. bands and individual channels on frequencies extending to 1000MHz and higher? One would need a pretty sizeable "antenna farm" to accommodate enough resonant antennas to cover a frequency range in the region of 1 to 1000MHz! Fortunately there are alternatives: for instance, the so-called "doublet" antenna (not suitable for transmitting) has a reasonably good performance for receiving over the whole h.f. spectrum up to at least 30MHz. There are also v.h.f. and u.h.f. antennas that function quite well over very wide frequency bands.

Some knowledge of the fundamental principles and performance parameters of different types of antenna will assist readers to choose and use one (or more) best suited to their particular needs; knowledge that should also prove useful to those intending to obtain an amateur radio licence at some future date.

The Antenna as a Tuned Circuit

The most basic form of antenna is the "half-wave" since its length is half the wavelength relative to the frequency of operation. It is often referred to as a "dipole" but is, in effect, a tuned circuit, consisting therefore of inductance and capacitance (perhaps more accurately described as "distributed inductance and capacitance"). A tuned circuit of small dimensions but employing the same elements and used in an oscillator, for example, produces an electrostatic and magnetic field both of which radiate, hence the need for such circuits to be completely screened. If the screening were removed the radiation would travel a short distance, but would otherwise be of little consequence — except perhaps to produce interference in nearby receivers.

If the inductive element of a tuned circuit was "pulled out" so as to become a straight conductor, i.e. a finite length of wire, it would still be inductive and have an element of distributed capacity. Supplied with an oscillating current the wire would radiate this, with a high degree of efficiency, as an electromagnetic wave propogating over very long distances before being absorbed in one way or another.

The strength of a radiated electromagnetic wave depends on the length of the wire, the r.f. current flowing along it and the voltage associated with it. However, as the strength of the field of radiation is directly proportional to the current, it is desirable that this be as large as possible so any loss of r.f. power between the transmitter and the antenna is minimised.

Resonance of Linear Antennas

The shortest length of conductor capable of being "resonant" must be long enough to allow an electric charge to travel from one end to the other, and back again, in the time of one cycle of a given frequency. If the speed at which this charge travels is taken as the speed of light (300000000 m.p.s.), the wavelength of one complete cycle will be equal to this speed divided by the frequency (f) in Hertz (Hz); note that, originally, frequency was expressed in cycles per second (c/s). The speed is usually referred to as velocity (V). The wavelength (λ), in metres, can be obtained from:

Wavelength (λ) = V/f (metres)

If f is in Hz then V is 300 000 000
if f is in kHz then V is 300 000
if f is in MHz then V is 300

Examples. If f is 200kHz then

λ = 300 000/200 = 1500m

If f is 30MHz then

λ = 300/30 = 10m

For an electromagnetic wave propagated in free space at a frequency of, for example, 30MHz, the half-wavelength would be 5m. The half-wavelength, usually expressed as $\lambda/2$, can easily be directly obtained from the above equation: $\lambda/2$ metres = 150/f (MHz); or by changing the units, $\lambda/2$ feet = 492/f(MHz).

However, the speed at which an electromagnetic wave travels along a conductor (antenna) is slower. This means that the physical length of a $\lambda/2$ antenna is shorter than the free-space half-wavelength. To determine the correct physical length a modifying factor known as the *velocity factor* is used, which will be dealt with shortly. First it is important to consider the current and voltage distribution on a half-wave antenna.

Half-Wave Antenna Current and Voltage Distribution

The diagram, Fig. 1.1, illustrates the current and voltage distribution on a $\lambda/2$ antenna — the shortest conductor length that can be fully resonant, and what might be regarded as the basis of all other antennas. Even quarter-wave ($\lambda/4$) antennas with an artificial ground (groundplane), or operated against real ground, are derivations of the half-wave or dipole. It has been explained that in order to be resonant, an antenna which we may call a linear conductor, must accommodate an electric charge having a time duration of one complete cycle of the frequency of operation. This is shown in Fig. 1.1(a) where the current rises from zero on the left, reaches maximum (positive polarity) at the centre, and becomes zero again on the right (solid line). It must then change polarity (negative) and return along the conductor (dash-dot line) in order to complete the full cycle. The next and following cycles simply perform repetitions of this and so create a continuous electromagnetic field. It will also be noticed that the voltage follows the same movement, along the conductor and back, but always with a 90 degree phase difference between it and the associated current.

The current cycle is illustrated again in Fig. 1.1(b) except that this time there is another half-wave conductor added to the first, so the whole system becomes a "full-wavelength" long which permits the charge to complete the full cycle. Following cycles repeat this process, so producing a "full-wave" linear conductor. No doubt it will be appreciated that a number of half-waves can be joined together to form a long, linear conductor, i.e. an antenna which may also be used for operation on fundamental frequency and frequencies harmonically related to it.

Resonance and Wave Velocity

The propagation velocity of an electromagnetic wave in free space is constant (300 × 10 m.p.s.) but a little slower along a metal conductor. To make a $\lambda/2$ antenna resonant at some specific frequency it must be slightly shorter than the half-wavelength of a radio wave in free space. The actual length is obtained by multiplying the free space half-wavelength by what is known as the *velocity factor*, which is defined as the *ratio of the free space half-wavelength to the antenna conductor diameter*. The velocity factor "K" for different ratios of the above may be found from the graph shown in Fig. 1.2. For antennas made from 16 to 12 s.w.g. (or similar diameter stranded wire) Fig. 1.2 shows that the ratio is in the region of 750:1, but for copper or aluminium tube it

Part 1

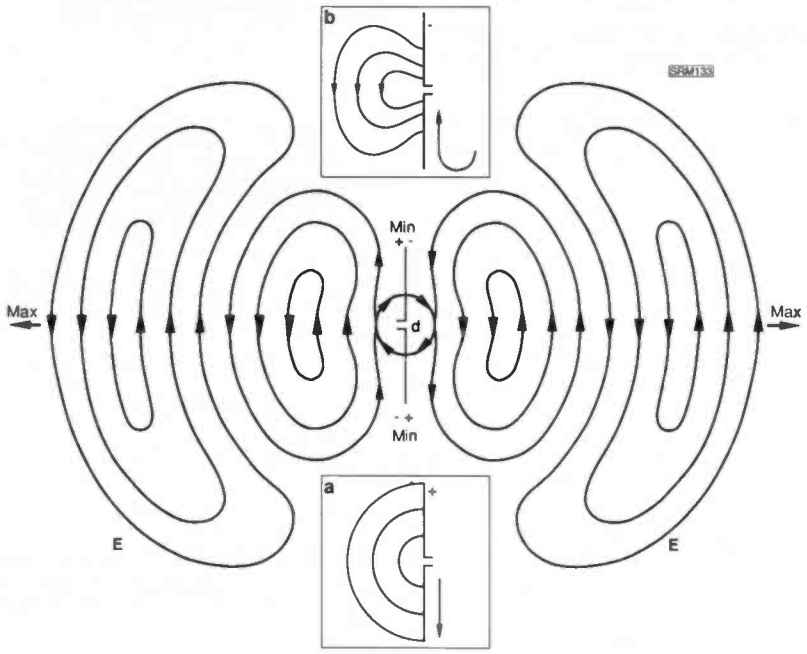


Fig. 1.3. Simplification of how radiation occurs from a λ/2 antenna; it can be seen that a distinct pattern is emerging (see Fig. 1.4).

may be as low as 50:1. The physical length of a resonant half-wave antenna will be:
Length in metres = 150 x K/f MHz.
Length in feet = 492 x K/f MHz.
Length in inches = 5905 x K/f MHz.
On average the physical length is about 5 per cent shorter than the electrical length; the "K" factor for this is 0.95. For a λ/2 antenna for v.h.f. and possibly u.h.f. — made from aluminium tube of about 12 mm dia. and requiring no end support — the "K" factor would be about 0.95. As an example, a λ/2 dipole for the 2m band (centre frequency 145MHz) would be 5905 x 0.95/145 = 38.68in, or 150 x 0.95/145 = 0.98m (98cm) in length. There is another factor called "end effect": this makes it necessary to further reduce the physical length of antennas which are long enough to require support at each end with insulators.

Wavefronts

In simple terms, how does radiation from a half-wave antenna occur? Fig. 1.3 illustrates the process, in stages, with the initial development from *a* and *b* of electric fields due to the current flowing in a λ/2 radiator, *d*. As soon as they are generated, these fields "E" and "E", continue to expand since they cannot return to the radiator owing to the presence of the magnetic fields also generated by the current flowing in *d*. So what becomes the "wavefronts" of the electric fields moves outwards from the radiator, expanding all the time but with the maximum of the field always in the same direction, i.e. at right-angles to the axis of the radiator. Near the ends, however, the field lines are not so close together so there is little or no radiation in those directions. It can now be seen that a "pattern" of radiation is beginning to emerge. All antennas, including half-waves, have distinctive radiation patterns covering both horizontal and vertical directions. It is from these patterns that what is called the radiation "directivity" as well as the directivity "gain" can be determined for horizontal directions (plane parallel to ground), as well as for vertical or inclined directions. Both have considerable bearing on the overall directive performance of an antenna *regardless of whether it is used for transmitting or receiving*. It is important to remember that the pattern of radiation activity also depends on whether the antenna itself is horizontal or vertical — which, incidently determines the "polarisation" of a radiated wave.

Radiation Patterns

Radiation patterns can also be regarded as graphs that show the magnitude of the horizontal or vertical radiation at different angles around an antenna and relative to the angle (or angles) at which radiation is maximum. The horizontal and vertical radiation patterns of a λ/2 antenna in a free space environment, i.e. located many wavelengths above ground, are shown in Fig. 1.4. (*Note:* the vertical radiation pattern for many antennas is determined by their height above ground in terms of some fraction of a wavelength, or a small number of complete wavelengths at the frequency of operation. The patterns in Fig. 1.4 were computer produced, as are others that will appear in this series.)

Pattern "A" is that obtained when a

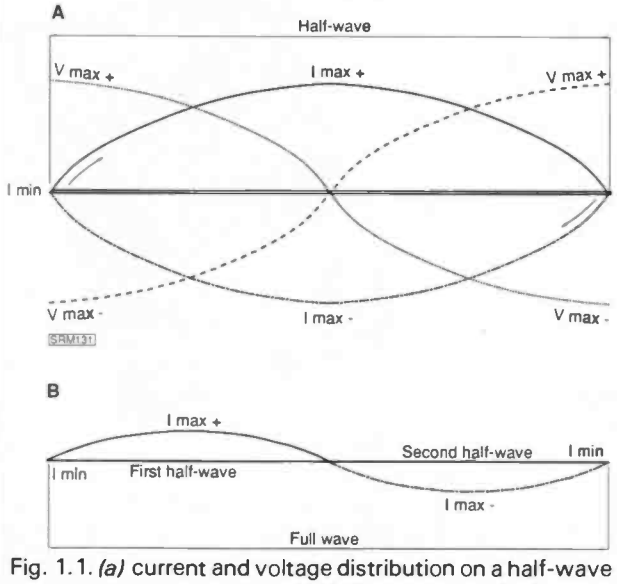


Fig. 1.1. *(a)* current and voltage distribution on a half-wave antenna; *(b)* current distribution on two half-wave antennas, i.e. full-wave antenna (see text).

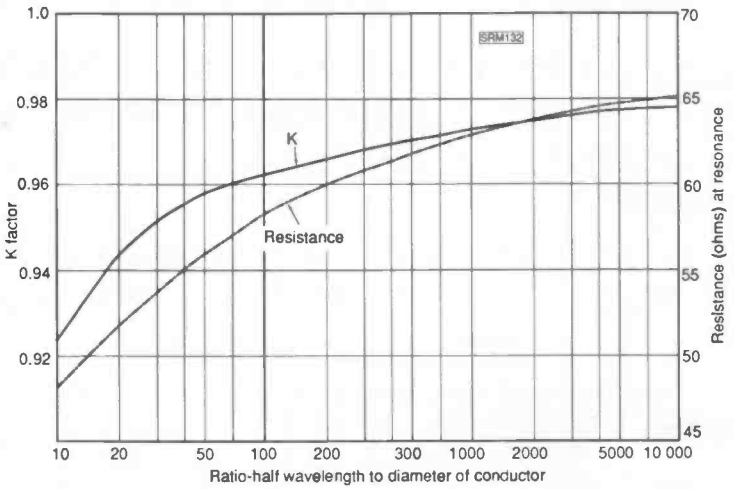


Fig. 1.2. Graph to obtain the "K" factor from the ratio of a half-wavelength to conductor-diameter; the average "K" factor is 0.95.

dipole antenna is horizontal, as "H", and therefore represents the horizontally polarised radiation field in a plane that would otherwise be parallel to ground. The pattern shows that the antenna is bi-directional with maximum radiation at right-angles to its axis and no radiation from either end.

With the antenna operated vertically as "V", radiation is of course vertically polarised but maximum in all directions around the antenna. The horizontal radiation pattern "C" is therefore circular, so the antenna is said to be omni-directional; however, it is still bi-directional in the vertical plane and maintains the familiar cosine, or figure-of-eight, pattern "B". If the total radiation from a vertical half wave in free space could be made visible in three dimensions, it would resemble a doughnut with the antenna as a stick through the middle.

Visualisation of a "solid" radiation pattern may be easier by referring to Fig. 1.5 (also computer produced) which shows the imaginary 3-D, or doughnut, shape cut through the middle; this is for a vertical dipole. With most other types, particularly harmonically operated long wires, the horizontal and vertical radiation patterns become quite complex.

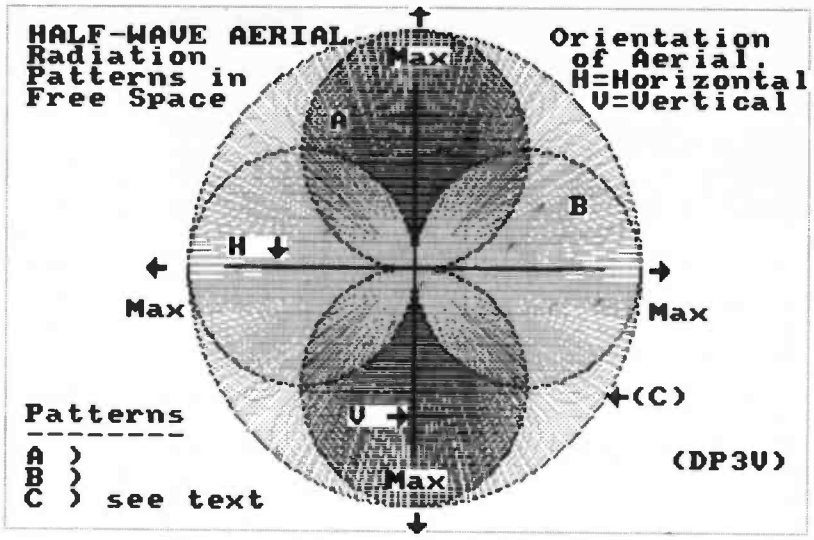
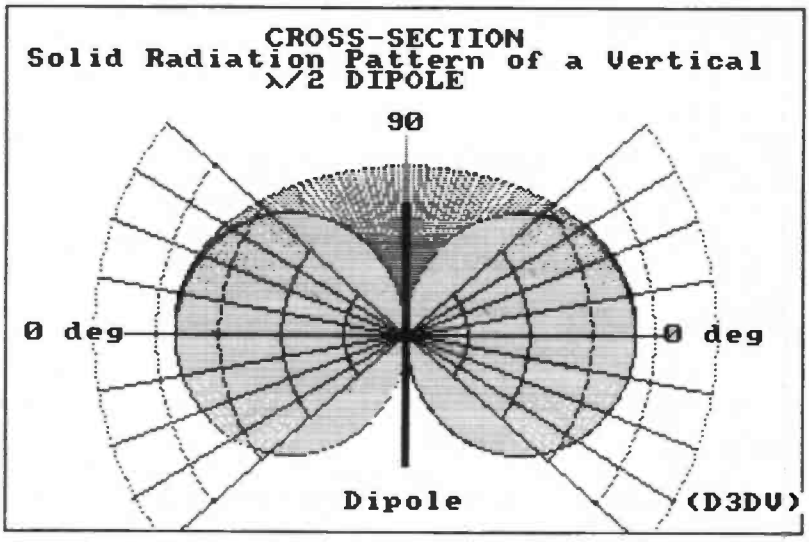


Fig. 1.4. (Above) Radiation patterns from a λ/2 (dipole) antenna (see text).

Fig. 1.5. (Below) Cross-section of the "solid" radiation pattern of a vertical half-wave antenna. Compare with patterns shown in Fig. 1.4.



Reception

But how do these patterns relate to reception? Primarily, they serve to indicate the directivity of an antenna – *which will be the same for receiving as for transmitting*. Directive antennas may be classified as follows:

Omni-Directional: radiation equal in all directions around the antenna, e.g. vertical dipole, quarter-wave groundplane, vertical collinear antennas.

Bi-Directional: maximum radiation in two directions, e.g. horizontal dipole, horizontal collinear antennas, endfire and broadside arrays (types of beam antenna).

Uni-Directional: antennas with maximum radiation in one direction, e.g. Yagi type beams, corner reflector, plane reflector and parabolic reflector antennas. There are of course many other types of antenna that have one or the other of these directive properties.

Omni-directional antennas have a disadvantage in that they are prone to receiving unwanted signals on the same or very adjacent frequencies, but coming from two different directions. A beam antenna has the advantage of losing unwanted signals from some other direction, as well as the provision of some gain over the angles embracing maximum directivity. Uni-directional beam antennas do, of course, have to be rotated for optimum performance.

Part 2 will deal with the effect on vertical radiation when an antenna is in close proximity to the ground, and with harmonically operated, long, linear antennas for h.f. use. □

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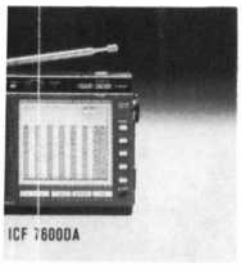
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WHAT'S NEW

Narrow Band TeleVision Association

The Narrow Band TeleVision Association was founded in 1975 and exists to promote the development, study and widespread use of low-definition and mechanical television. Membership is open world-wide to anyone interested at a current subscription of £3 (students qualify for concessionary rates). There is an annual exhibition and conference held in April/May and members receive quarterly newsletters (about 12 pages) containing technical articles, details of constructional projects, etc. The association also offers a number of special services to its members. Activities include the building of experimental cameras, monitors, etc., with closed circuit demonstrations, tape correspondence (using audio recorders) as well as transmissions on the amateur radio bands - 28 and 144MHz being favoured.

Enquiries regarding membership should be addressed to: **N. Reynolds G8YXL, 6A Collingbourne Road, London W12 0JQ.** For information on Amateur Band NBTV, write to: **D.J. Sumner G3PVH, 20 Woodlands Way, Southwater, Horsham RH13 7HZ.**

Radio Budapest

The *Calling DXers and Radio Amateurs* programme can now be heard in Europe on Mondays at 1515UTC, Thursdays at 1515UTC, Saturdays at 1030UTC and Sundays at 0945UTC; in North America on Tuesdays, Wednesdays, Fridays and Saturdays at 0130UTC.

Airband Antennas

The GP-125 is a base station antenna for airband reception. It provides 4dB of gain and comes complete with stainless steel hardware. The height is approximately 1.8m with three radials providing the ground plane. The base connector is an SO230 socket equipped with a weather protector. The antenna costs £49.00 from: **Waters & Stanton, 18-20 Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835.**

Two New AMSAT Books

AMSAT-UK have two books written especially for the newcomer to amateur and weather satellites. *The Sheffield Project* deals with the very first principles of listening and taking data from UoSAT. The book starts by explaining what an antenna and a 2metre receiver are, and follows on to the use of a simple computer and the programming needed. The second book, *The SEUK, A Guide for Teachers* explains in layman's terms the use of all kinds of equipment that a school may acquire to teach pupils the basics of satellite watching, listening and data gathering.

The books were written for the Education & School Establishments, so the contents could well assist others not in the teacher/pupil situation too.

Both books are available from AMSAT-UK and all funds go to help them fund future satellites. *The Sheffield Project* costs £2.20 and *The SEUK Teachers Guide* costs £2.60, both post and packing free in the UK - overseas £1.75 extra each book. If a club orders ten or more, then discounts are available. **AMSAT-UK, 94 Herongate Road, Wanstead Park, London E12 5EQ.**

SCANNING

Alan Gardener

Out with the Old and in with the New

Judging by the letters I receive one of the most popular subjects featured in the column is that of modifications to equipment. The response to the PRO-2004 memory expansion and the R7000 TV output was very encouraging, and I hope to include more modifications in future columns. The first one of wil probably be a mod for the Uniden-Bearcat BC200 handheld scanner to provide the facility to manually select a.m. However, I am still collecting the details at the moment. Another item I try to feature regularly is information relating to new receivers and accessories. At times this can be difficult as the column has to be written well in advance of the magazine publication date. This means that I either take a risk and mention new products for which I only have the briefest details, or wait until I have better information and then discover that the advertisers have featured the product a month before the column is published. Of course, this is not always true and I can think of at least two items which I have been given estimated delivery dates for and which are still not yet available. Take a look through some back issues of *SWM* and see if you can guess which ones I am referring to (no, it's not a Christmas quiz!). Even now news reaches me of several new models from Tandy, amongst which is the PRO-2005. This is anticipated to have all the features of the popular PRO-2004 but in a smaller package. Incidentally, Tandy are now offering the PRO-2004 at a much lower price so keep an eye open when you go past one of their stores.

Uniden-Bearcat also have an interesting new model in the pipeline - the BC1000. This is intended to rival the Icom R7000 so it may be an added incentive to Icom to hurry up with their new model.

I have also tried to feature some topics in greater depth. These are usually as a result of questions asked by readers which I believe may be of general interest. Good examples of this were the items on convertors, receiver image rejection, speech scrambling and pre-amplifiers. I intend to continue with topics such as these in the New Year so it's up to you to keep on asking me questions. Of course not all of the letters I receive are suitable for publication, but I do try and help where I can. Many people ask for their name not to be mentioned in the column, particularly when they live in one of the European countries where even the ownership of a scanning receiver is illegal. In cases such as these I usually include the points they have raised in general terms. Let us hope that legislation such as this, which would affect the sale of scanners, is not one of the topics I have to feature in 1989!

Cassette Recorders

Reader **Mark Steyning** of Trowbridge has written asking for my advice on the use of a cassette recorder with his scanner. He wants to record the audio output each time a signal is received.

The advantage of doing this is that a whole day's worth of monitoring can be "time compressed" into just a few tens of minutes by stopping the recorder when no signals are present. The scanner and recorder can be left monitoring whilst you are out and the results replayed on your return.

January is upon us again and, with the start of another new year, I thought it would be a good idea to take a quick look at the topics covered in the column during the last year and to try and make some predictions about what we may expect in 1989.

Perhaps the more difficult part of the exercise with most receivers is obtaining an output which is switched by the receiver's squelch line. Mark is fortunate in this respect as the scanner he owns already has this facility provided as an option on the rear panel. However he ran into problems when he tried to use it with his cassette recorder, because one side of the switched output socket (a 3.5mm audio jack) was connected to the chassis of the scanner, and the remote control socket on his cassette recorder was connected in the positive d.c. supply rail to the recorder circuits. When he connected the two units together the fuse in the cassette recorder power supply blew! This was due to the supply being shorted out via the earth circuit between the scanner and cassette recorder mains supplies. He got around this problem by running the cassette machine on batteries and recording the audio with the built-in microphone. However, this is only a temporary solution as the audio quality is rather poor and the recorder tends to use batteries faster than he would like.

This is fairly typical of the trouble you can run into when trying to use a cassette recorder for this particular application. I have used several recorder/scanner combinations over the years and as well as the problem outlined by Mark, I have have had distorted audio, the first words of transmissions not being recorded, whole chunks of speech missing, cassettes being chewed up or whole tapes being recorded with nothing on them. The majority of these problems are due to the way in which the tape recorder is switched. As Mark discovered, most cassette machines stop and start remotely by switching the d.c. supply to both the recording circuits and the motor. This can cause several problems, the first of which is the current taken by the recorder when the supply is first switched - usually due to the initial charging of the large electrolytic smoothing capacitor in the recording circuit. This can cause the first few seconds of each recording to be lost. In some cases, the contacts of the switching relay in the

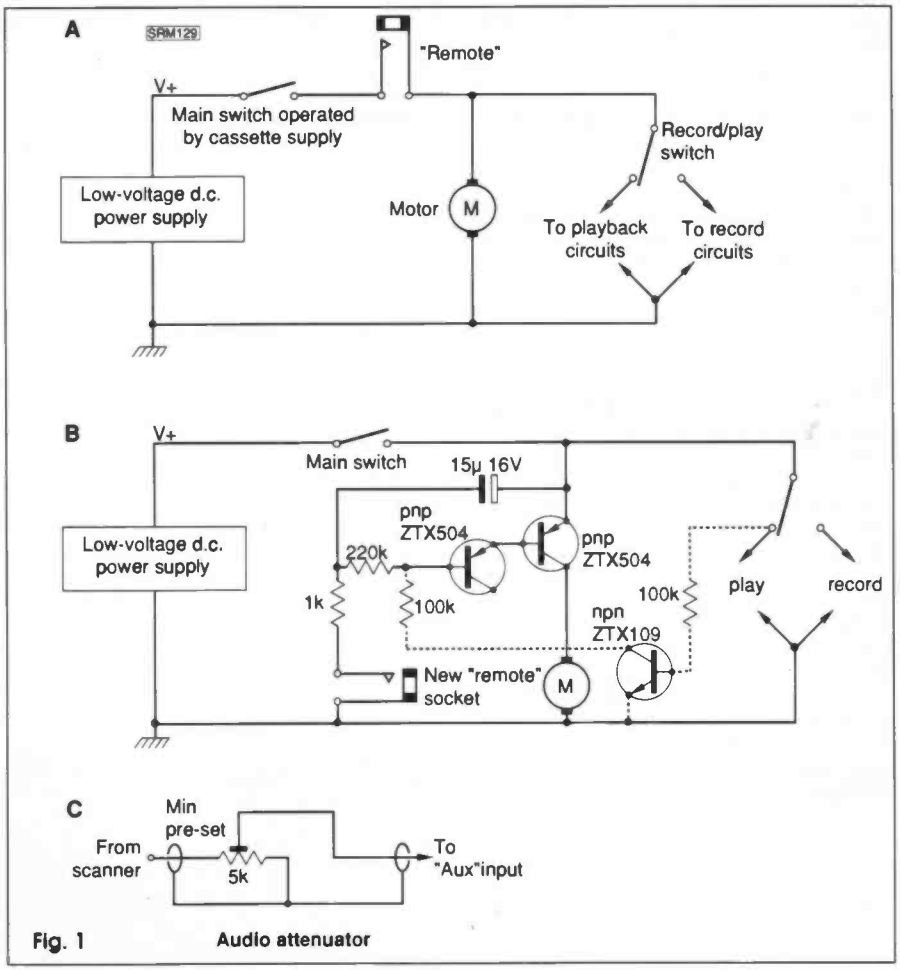

Fig. 1 **Audio attenuator**

scanner can "weld" together letting the recorder run continuously to the end of the tape.

I solved many of these problems by modifying the recorder so that the electronic circuits were powered continuously and the switched circuit just fed the motor. This dramatically improved the starting characteristics of the recorder and also reduced the switching current (Fig. 1).

The next stage was to build a simple switching circuit into the recorder serving two purposes. The first was to make the recorder operate by earthing the input to the remote socket rather than by switching the d.c. supply and the second was to provide a run on delay of a few seconds after a signal had ceased. This prevents rapid stopping and starting of the recorder on weak signals which only just open the squelch on the receiver. By stopping the tape from progressively unspooling and being "chewed" up by the recorder more reliable recordings are produced. I have also arranged for the external switching signal to only operate during record, thus saving me from having to unplug the scanner each time I want to play or rewind the tape.

Most of the problems with distortion were due to the input circuits of the recorder being overdriven. This is particularly a problem with automatic level control circuits as it is often not possible to tell how much of an input signal is required for satisfactory recordings. The way I normally feed a recorder is by tapping across the volume control in the scanner, this has the advantage of being at a fixed level so you don't have to remember volume control settings and is usually suitable to directly feed the "AUX" input of the recorder. Some scanners already have a tape socket fitted of course, but for those of you without such a facility and who don't want to modify the scanner then the best solution may be a resistive attenuator placed in a lead between the loudspeaker output of the scanner and the recorder input. A quick way of providing this is to fit a miniature 5kohm potentiometer inside one of the audio jack plugs, which once set to give the correct level can be forgotten.

If you want to avoid modifying equipment then consider buying a recorder with a built in voice operated switch or "VOX" circuit. This automatically performs the switching and delay functions and only requires a feed from the receiver audio output. I use this type of recorder to good effect with my h.f. receiver which hasn't got a built in squelch circuit. However this still has the disadvantage of not recording the first few syllables of speech so look out for a new type of recorder soon to be available which records and stores the audio signal in an electronic memory before transferring it to the magnetic tape. This means that it is possible to record a signal which was present before the tape mechanism started moving! If you want to construct a similar circuit complete with built in sound operated switch then try and get hold of a copy of *Practical Electronics* April 86. This featured a design by R.A. Penfold which is a good basis for experimentation.

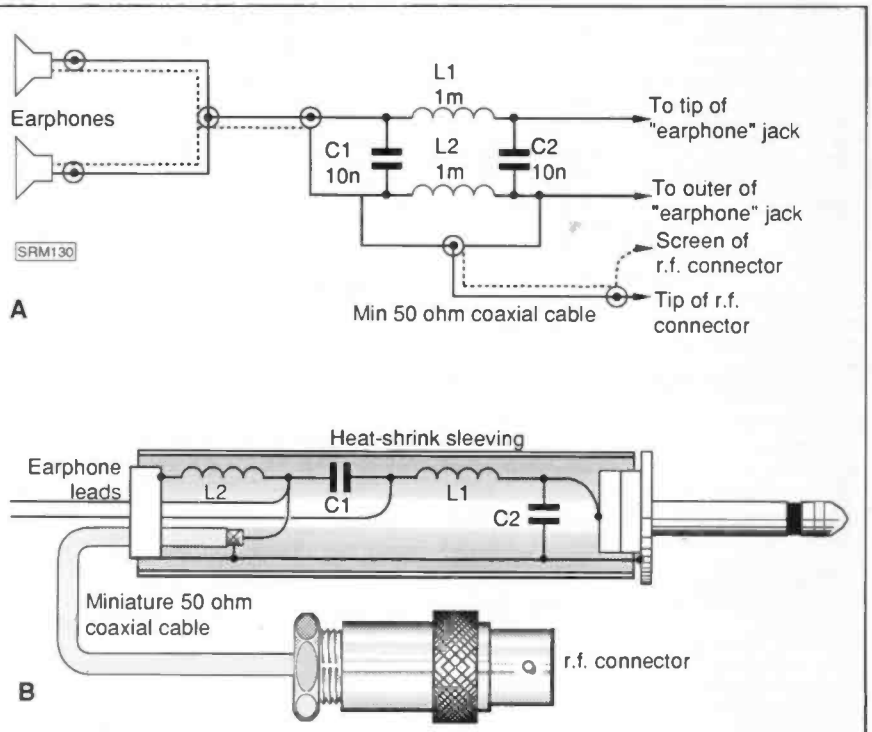

Fig. 2

Hand-held Antennas

On the subject of experimentation, I have been continuing my tests with alternative antennas for hand-held scanners and have now tried a system normally used in personal hi-fi sets. I got the idea when I started using a cheap set of earphones, intended for use with a personal hi-fi, with my hand-held scanner.

I found that, although they made a vast improvement to audibility when used for outdoor listening, the actual reception of signals tended to be poorer. This was not due to a problem with the receiver as such but was because I now tended to put the receiver in my pocket whilst walking around whereas before I would carry it in my hand, where the antenna was in a much better position. What was required was an antenna which would not be quite so screened by my body, which led me to the idea of using the ear-phone lead as the antenna. This is quite easy to achieve, all that is required is a filter network fitted in the earphone lead which is designed to isolate the receiver at r.f. but still allow a.f. signals to pass. A separate feed is then taken to the antenna socket of the scanner. After a little experimentation I arrived at the circuit shown in Fig. 2.

This uses two capacitors and two subminiature chokes to provide the required isolation. I mounted the components inside the body of the earphone connector - the type with a metal body is the best as it allows more room inside for the components and in addition is much more robust than the plastic types. Use subminiature coaxial cable to connect to the antenna socket and cover the circuit with heat-shrink sleeving before re-fitting the metal connector cover. The earphones I used were the in-ear type which I found to be more comfortable and more compact than the type with a metal band. Don't pay too much for them as the more expensive types tend to have an extended low frequency range which tends to worsen intelligibility when listening to speech. As a guide the pair I use cost £1.50 so the whole circuit shouldn't cost much more than £5 to construct. In use the circuit works well, particularly on the low v.h.f. ranges where the supplied helical antenna is not so effective. As an added bonus the scanner looks less conspicuous without the normal antenna and hardly attracts a second glance when new entries are made via the keypad.

Well that's the end of the first column of 1989. I hope that you have a great Christmas and are looking forward to an even better New Year. Don't forget, if you want any queries answering or just advice on a particular aspect of the hobby, then write to me at the usual address - PO Box 1000, Eastleigh, Hants, SO5 5HB and please enclose an s.a.e. if you require items returning.

Until next month - Good listening - and a Happy New Year. □

Abbreviations	
a.f.	audio frequency
d.c.	direct current
h.f.	high frequency
mm	millimetres
r.f.	radio frequency
s.a.e	stamped addressed envelope
v.h.f.	very high frequency
VOX	voice operated switch

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STARTING OUT

Brian Oddy G3FEX

Most of the man-made r.f.i. in built-up areas results in two distinct types of noise from the receiver, namely a "hiss" and an annoying "pistol shot" or "machine gun" effect. Hiss cannot be dealt with successfully by any noise-limiting device in the receiver; however, when c.w. signals are being received the noise can often be minimised by reducing the receiver bandwidth to a few hundred hertz. This approach cannot be used successfully with a.m. signals because the higher frequency components of the signal will also be attenuated.

The action of breaking an electrical circuit produces a spark discharge which results in the pistol-shot - or if the breaks are rapid the machine-gun - effect. Each discharge produces a pulse of electromagnetic energy. The pulses are of extremely short duration, but their instantaneous amplitude is often high, and when the pulse amplitude exceeds that of the desired incoming signal the effect is very objectionable.

Although the effect of the pulses can be limited to some extent by installing one of the simple noise limiter circuits, described last month, between the detector and the audio stages of a receiver, such devices are not particularly effective because the highly selective tuned circuits employed in the receiver i.f stages tend to broaden the pulses. Any attempt to reduce the effect of this type of interference by decreasing the receiver bandwidth makes matters worse; in fact, the more selectivity there is ahead of the noise reducing device the more difficult it becomes to secure good noise suppression! In view of these difficulties, a more complex approach is adopted in many of the more advanced receiver designs.

Some of the natural and man-made forms of radio frequency interference (r.f.i.) were detailed last month in this series. The best place to eliminate man-made r.f.i. is at the source, but in many cases the origin of the interference may be unknown to the listener. An alternative approach is to incorporate additional circuits in the receiver which are capable of limiting or even rejecting the noise resulting from certain types of r.f.i.

Noise Silencers

One popular approach is to use the incoming interference pulses to momentarily decrease the gain of a controlled i.f. amplifier stage, thus silencing the receiver for the duration of each pulse. Ideally the controlled i.f. stage, known as a noise silencer, should be the first one in the i.f. chain, so as to avoid the duration of the pulses being increased from a few microseconds to as much as several milliseconds by the highly selective crystal filter(s) used in the i.f. stages to limit the receiver bandwidth.

The basic constituents of a typical noise silencer are shown in Fig. 1. The i.f. signal from the mixer (Tr1) is applied to the input of the controlled first i.f. amplifier (noise silencer, Tr2) and also to a side-chain consisting of a noise amplifier (Tr3) and a noise rectifier. The output of the noise amplifier is broadly tuned to the i.f. by the primary of transformer (T1), but the close coupled, centre-tapped, secondary is untuned. The output from the secondary is rectified by two diodes (D1, D2) in a full-wave circuit. The d.c. output is taken from the centre tap, thus reducing the possibility of r.f. feedback into the noise silencer stage (Tr2). A bias is applied to the noise amplifier and to the rectifier via a "threshold" control, so that rectification cannot occur until the noise voltage exceeds the amplitude of the desired incoming signal. When an interference pulse is present on the signal it will be amplified and rectified in the side-chain and applied as a bias pulse to the noise silencer (Tr2). Depending upon the amplitude of the interfering pulse, the noise silencer will be rendered partly or wholly inoperative for the duration of the pulse. To prevent the bias pulse from disabling the noise silencer stage for a longer period than the duration of the noise pulse, the time constant of the noise rectifier load circuit consisting of resistor (R1), capacitor (C1) and capacitor (C2) must be made small.

In practice this system works relatively well and an improvement in the signal-to-noise ratio of some 30dB may be achieved during periods of heavy car ignition type interference. However, because the controlling d.c. bias pulse for the noise silencer is derived directly from the incoming interference pulse, the turn-off properties are not very effective when the amplitude of the interference pulse is small.

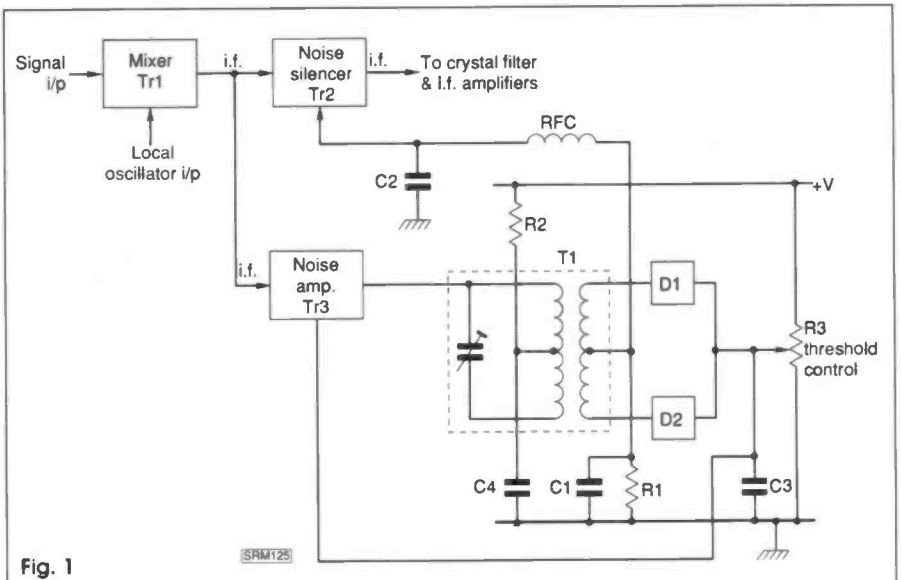

Fig. 1

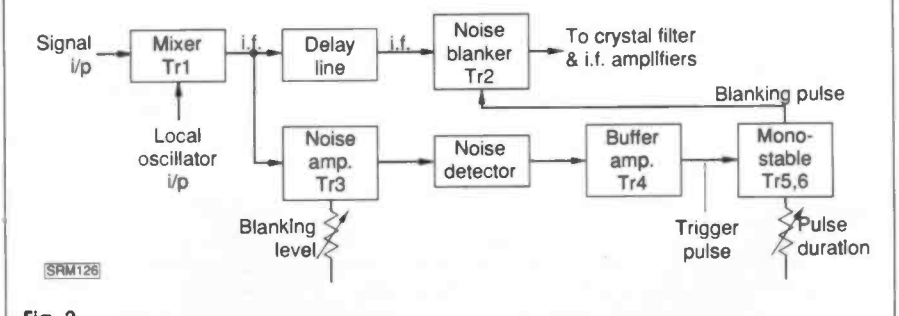

Fig. 2

Noise Blankers

A considerable improvement in the turn-off characteristics would be obtained if the applied bias pulse amplitude remained constant despite widely differing interference pulse levels. This could be achieved by using the incoming interference pulses to trigger a pulse generator which then provides a signal of correct amplitude and polarity for the duration of the incoming noise pulse.

Several varieties of this type of circuit, generally referred to as noise blankers, have been developed. The basic constituents of one type are shown in Fig.2. The I.f. signal from the mixer (Tr1) passes through a blanking gate (Tr2) before reaching the main I.f. amplifier

STARTING OUT

chain. A sample of the mixer output is also applied to a noise amplifier (Tr3) in a side chain, where the signal and interference pulses are amplified. A gain control is applied to this stage so that the blanking level may be set.

The output from the noise amplifier is rectified by a noise detector. The rectified noise pulses pass through a buffer stage (Tr4) and are then applied as triggers to the pulse generator (Tr5, Tr6).

Each time a trigger pulse appears at the output of the buffer (Tr4) it fires the monostable multivibrator used as the pulse generator and a single output pulse is produced - see Appendix. Irrespective of the amplitude and duration of the trigger pulses, the output pulses will be of constant amplitude and duration. By using pre-set controls in the multivibrator circuit, the amplitude and duration of the blanking pulses can be adjusted so that they are just adequate to operate the blanking gate - a typical pulse duration being 10 microseconds.

Timing Errors

Unfortunately the addition of a separate pulse generator introduces timing delays which would allow the noise pulse to pass through the blanking gate before the blanking pulse arrived! To overcome this problem a time delay has to be introduced in the main i.f. chain between the point at which the noise pulse is sampled by (Tr3)and the input to the blanking gate (Tr2). The delay required may be as much as 400 nanoseconds, so a linear delay line consisting of a network of resistors, capacitors and inductors has to be employed. The duration of the blanking pulses may need to be changed when other types of man-made r.f.i. are encountered. One of the most annoying problems in recent years stems from over-the-horizon radar installations which operate in the h.f. spectrum.

The interference consists of a series of extremely powerful pulses which occupy a considerable bandwidth. Because of their repetition rate, DXers world-wide refer to this radar as the "Woodpecker"! The operating frequency of the radar does not remain constant, but seems to change in a random manner and without regard for other s.w. transmissions which are usually instantly obliterated. The effect of these radar pulses can be reduced to some extent by employing a noise blanker in the receiver and increasing the duration of the pulses from the blanking pulse generator.

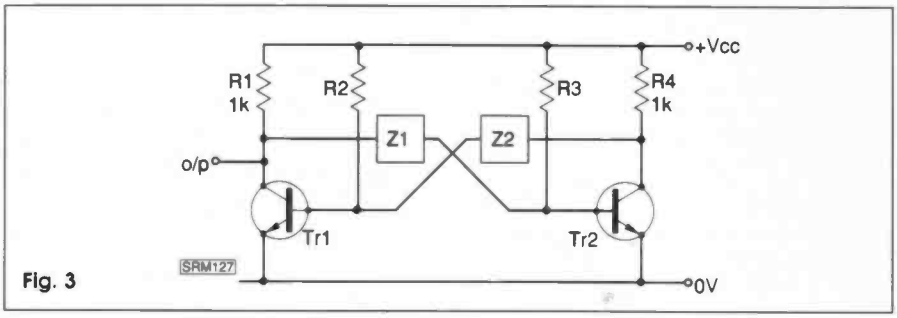

Fig. 3

Appendix

The term multivibrator refers to a two-stage amplifier with positive feedback. The basic circuit is shown in Fig.3. The nature of the cross-couplings (Z1, Z2) between the two transistors (Tr1, Tr2) determines the characteristics of the circuit. If Z1 and Z2 are both capacitors the circuit becomes a free running oscillator known as an astable multivibrator. If Z1 and Z2 are both resistors and R2, R3 are deleted, one of two stable states exists - namely Tr1 conducting and Tr2 off or Tr2 conducting and Tr1 off. The circuit, known as a bistable multivibrator or "flip-flop", can be triggered from one state to the other by either grounding or applying a negative pulse to the base of whichever transistor is conducting.

In contrast, if Z1 is a resistor, Z2 is a capacitor and R3 is deleted, the circuit adopts a single stable state, namely Tr1 conducting and Tr2 off. However, it can be triggered into a temporary unstable state, whereby Tr1 is turned off and Tr2 conducts for a short period before the circuit returns to its original stable state. This circuit, known as a monostable multivibrator or "one shot", is often employed as the pulse generator in noise blankers, so let us consider the basic principles of its operation. Refer to Fig.3, but note that R3 is not used.

Assume that Tr1 and Tr2 are silicon transistors, the supply (Vcc) is 5 volts, the coupling component in Z1 is a resistor (R) and the coupling component in Z2 is a capacitor (C). Also assume that when a transistor is conducting (i.e. turned on) its collector - emitter voltage will be zero. Upon switching on the supply, Tr1 will be turned hard on by the bias applied to its base via R2. Due to the lack of bias on the base of Tr2 it will be turned off. The coupling capacitor (C) will be charged up via R4 to the supply voltage (Vcc) minus the base - emitter voltage of Tr1, namely (5 - 0.6) = 4.4V. The charging time constant will be CR4, and the circuit will then remain in this stable condition.

The application of a negative pulse to the base of Tr1 will turn it off. The rising collector voltage of Tr1 will then be applied to the base of Tr2 via coupling resistor (R), turning Tr2 hard on. The positive end of the coupling capacitor (C) will be effectively grounded via Tr2, so that -4.4V will be applied to the base of Tr1. The capacitor (C) will discharge with a time constant CR2 - the voltage across R2 being (5 + 4.4) = 9.4V. When the base voltage of Tr1 reaches 0.6V it will conduct and Tr2 will be turned off. The original stable state will then exist until another negative trigger pulse is applied to the base of Tr1. Irrespective of the duration and amplitude of the negative trigger pulses, the output pulses will be of constant duration and amplitude; in fact the duration of the output pulse will be approximately 0.7 CR2. □

Abbreviations	
a.m.	amplitude modulation
c.w.	continuous wave (Morse)
h.f.	high frequency
i.f.	intermediate frequency
r.f.	radio frequency
r.f.i.	radio frequency interference
s.w.	short wave
V	volts

RALLIES

* SWM in attendance

March 4: The Blue Star Radio Rally, organised by the Tyneside Amateur Radio Society, will be held at High Gosforth Park, otherwise known as Newcastle Racecourse. All the usual attractions as well as talk-in. To find out starting time and other details contact Terry G6VEG. Tel: (091) 2648196.

May 7: The Southend & District Mobile Rally will be held at Roach Way Youth Centre, Rochford, Essex. Doors open at 10am. More details from: Ted G4TUO. Tel: (0702) 202129.

* **June 11:** The Royal Naval Amateur Radio Society's Annual Rally is scheduled to be held at HMS Mercury again this year. More details nearer the date.

* **January 29:** The NARSA Norbreck Radio and Electronics Exhibition (formerly held at Belle Vue in Manchester) will be held in 1989 at the Norbreck Castle Exhibition Centre, Blackpool. Details can be obtained from: Peter Denton G6CGF. Tel: 051-630 5790.

February 26: The 2nd Taw and Torridge Rally will be held in the BAAC Halls, The Pill, Bideford in North Devon. These premises are larger than last year. The doors open at 10.30am with talk-in available on S22. There will be trade stands, a bring & buy, refreshments and a bar as well as ample parking. More details are available from: G0AYM. Tel: (0805) 23776.

If you are organising a rally and would like it mentioned in *Short Wave Magazine*, then drop us a line, preferably as soon as you have fixed the date but no latter than 6 weeks in advance (marking your envelope "SWM Rally Calendar") and we'll do the rest. Please make sure that you include all the details including such essential information as the venue, starting time, special features and a contact for further information.

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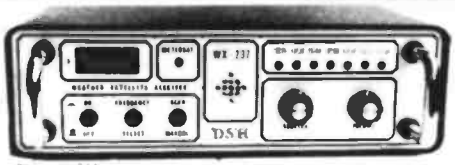

WX-237
WX-337

Receiving weather satellites is a very interesting affair. Every evening you can see the weatherman presenting an overview of the weather conditions using pictures which have been sent to earth by means of weather satellites.

These pictures supply extensive information to professional weather bureaus, weather amateurs or others who are interested in the weather. Receiving these pictures at home is relatively simple!

All you need is a weather satellite receiver and a special converter which is needed to transform the received signals into a picture that can be shown on a video monitor.

Photo Acoustics Ltd supplies both types of equipment. Below you will find the specifications of the WX-237 (or WX-337) weather satelite receiver which has exceptionally good qualifications. It is capable of receiving all polar orbiting weather satellites and can also receive the geostationary weather satellite "Meteosat 2" if an appropriate converter from 1.7GHz to 137MHz is used. For this purpose the **WX-237 (or WX-337)** has a separate antenna connector.

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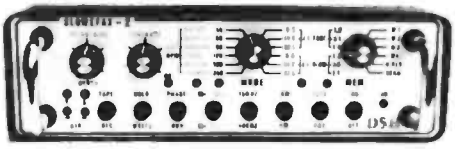

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At present the reception of *weather satellite* pictures is very popular. Many weather satellites orbit around the earth or are located in a fixed position above the earth in the geostationary belt. At regular intervals they send fascinating weather photographs to earth.

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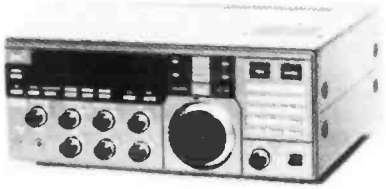

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If you have anyone near enough who is an avid DX operator, there is much to be said for "following him around". Then, if your own listening turns up something new or rare, passing the word to him on the landline won't come amiss. In the fullness of time, he may well pass the word to you of something interesting.

Another way onto the grapevine is to subscribe to one of the weekly DX sheets. In this country, RSGB's *DX News Sheet* is the ticket, you can enquire about *DXNS* rates and so forth to RSGB HQ, Lambda House, Cranbourne Road, Potters Bar, Herts EN6 3JN. *The DX Bulletin*, PO Box 50, Fulton, CA 95439, USA is another weekly. Then there are the major contests, they will bring out the rare ones. So — for contests, there is no possible improvement on a regular read each month of Frank Anzalone's W1WY Contest Calendar in *CQ Magazine*. This is an American publication, the subscription address is *CQ Magazine*, 76 North Broadway, Hicksville NY 11801, USA. However, to receive this airmail is an expensive proposition, while surface mail usually is too slow.

Then, of course, there are the DX columns in the UK magazines, particularly *Practical Wireless* and *Radio Communication*. In some parts of the country there are local DX nets operational in the 144MHz band (often 144.525MHz) from which you can glean the very latest details.

Of course, knowing what band to listen on, at what time of day is useful too. If you want, say, to log a ZL, then you are at the receiver around 0800UTC on the h.f. bands; but for a ZL on Top Band you need to know the grey-line path between you and the ZL area in question, his precise frequency, AND the right time of year!

Don't restrict yourself to just s.s.b., c.w. is often used on DXpeditions, and at times when propagation is at its best between the DX station and you. If you have three elements for each band atop a 36m tower, then you can stick to sideband, but if you have the proverbial bit of wet string over a weedy window-box you will only find the pile-up, except at times of peak propagation.

Letters

Let's start by saying that since old J.C. retired — he sends his best wishes to all old friends, by the way — the change of emphasis of the column has meant that most of his regulars have also retired. So, I do need lots more input to make things as interesting as I can.

S. Price (Loughor) offers his loggings since October 1 to the date of his letter (October 22) as evidence for a Gold Award. Nothing obviously wrong, save that the AXCTT was almost certainly AX3TT, the EO7DHK more probably EA7DHK and 1AQKM a mis-copying. However — and it is a general point — with the times for which Steve logs as having been maintained on each one, I would doubt whether there would be time to make a CERTAIN identification, at least where the DX stations are concerned. It is not unusual for me to sit in front of a pile-up for many minutes before I have satisfied myself that I have in fact logged the DX station, and not one of the callers.

My own routine goes something like this: Hear something interesting, or a pile-up. Look carefully for what is underneath, put his frequency in a memory or write it down. Establish where he is listening, listen there. When you can hear your DX "go over", hit the memory button (if you have one) and hear the other guy respond. If your receiver hasn't any memory facilities, you can get away with careful logging of both frequencies and fast tuning. If you have two receivers, better still. But it is important to be sure you have got your man. If and when you come to hold your own ticket and chase your own DX you will realise how important it is to "know the form" BEFORE you add to the QRM. After all, if as a transmitter you call someone on a different frequency to the one on which he is listening, you can't expect him to reply! But, for a newcomer to the game a good log, and I have passed the log on to the proper quarter. Don't forget though, I may be calling for some QSL cards before the award is issued.

D. H. Travis (Guiseley) runs a Lowe HF-125 into a ten-section telescopic antenna connected to the input of the receiver by a short wire. Dennis, who has been a s.w.l. for the better end of fifty years, seems to operate in the mornings for preference. Among his best were ZL2APW, FK7AZ, VK7EK, VK3AAO/M, 8P6QT, 4S7VK, 4F1JZ, JT1BG, JA8ESA, JA0URR, BY9GA, W6BXE and smaller fry. An idle tune around the CB band one day yielded LG55 in Western Australia.

Barry Smith (Stocksfield, Northumberland) recently picked up his first copy of *Short Wave Magazine* for twenty-five years, and as a result has returned to the fold. Some of the prefixes puzzling Barry would certainly not worry him had he an up-to-date copy of Geoff Watts' Prefix List — Geoff is at 62 Belmore Road, Norwich and his list is always bang up-to-date. All the queries are quite valid and the AX2VA is an Aussie special; between HK7KKF, YV5DWV, ZL3JF, JY5DL, CX4CB, J87CD, TI2KD, 4N7AX, C30CAN, CM2VZ, ZL2APW, LU4L, TM7EM, AX2VA, JP4IFT, YA6ABC, KP2A, 6W7OG, HJ0OEP, AP2MB and ZD8RP, we can find all continents represented.

Last month (October), Andrew McClelland (Salisbury) had a holiday in Malta. A couple of days before he set off he phoned the Maltese authorities and was told to bring with him a copy of the G licence plus a copy of the validation document. On arrival in Malta, the licence for 9H3JJ was issued within ten minutes. Operating as 9H3JJ, Andrew made various contacts including AL7FQ, C30DSA, LU5DL, N5AU, ON4RIP, P4ONG, RO5OC, VK3AG and ZL2JL. The antenna was a dipole for 14MHz, all were solid s.s.b. copy giving 9H3JJ reports of S7 or better. The rig was a "suitcase special" comprising the FT-290R driving the Howes 2 – 20 transverter, putting ten watts into the dipole which was up at about 20m.

C. Partington (Wineswold, Leics) is a c.w. addict and, on October 16, during the contest he collected up all JA prefixes, all USA call areas including some twenty-odd West Coast signals, all Canadian prefixes, plus VK8AV, VK6LW, UL7CW, UM8MAD, UJ8JA, 5NOB/G3IGQ, VS6UO, NY6M/KH2, ZC4NC, lots of PY, LU and smaller fry. P4OTL was also picked up.

Next we come to Gordon J. Hudson from Stirling, who is in the process of changing from a rotatable dipole to a home-brew monoband two-element beam. Gordon reckons that it is likely that he may lose contacts through choosing antenna direction and wondering where to have the nulls; my own experience says that apart from the Antipodean stations where there is the choice of long or short path, one won't go far wrong by aiming at the direction shown on a great circle projection based on your own home (one based on London is good enough in general for all UK); and for those antipodean signals to choose between long or short path on the basis of time-of-day. Aim at the wanted signal, not to null the QRM away unless there is a very good reason for doing it differently. The latter implies that the wanted signal is quite strong enough to raise off the side and the there is no reason to expect a fade-out in the next few minutes. In any case, the two-element array doesn't have the front-to-back ratio obtained by three or more elements and the problem hardly arises; for example I have been given fine reports from 4X stations while the two-element beam faced west for VK and ZL; but with three elements I might not have been strong enough to have raised them without turning the beam.

D. Wright (Hastings) has got hold of one of the Hallicrafters S38D receivers; this was a simple, valve, s.w.l. receiver from the early post-war period covering 1.8 to 28MHz in four bands. He has lots of questions and very clearly needs to be introduced to the Hastings club! He lives at 26 Laton Road, Hastings, so perhaps someone will do the needful.

D. Pleat (Mansfield) has another long log, printed out from a computer. David found an odd set of conditions in the first week of November; at one stage Radio Moscow was audible on 14.230, 14.250, 14.265, 14.286, 14.300 and 14.330MHz! However, on November 13, all was back to normal. Earlier on October 22 a long "bash" on 28MHz yielded good signals although the only new one for the band was the first JA logging.

AL43D Gloria & Roy Hills

G8STO
G8ZYL

51 Charter St, Gillingham, Kent.

24MHz

It is rare for any s.w.l. to mention the WARC Bands at all, so the letter from Ian Hatton (Derby) is doubly welcome. Ian has a G5RV antenna up and the Racal RA17 receiver. He mentions that in the one day he heard ON4ABB, PY2CDS, ND1T, YU2WM, CU2AF, 4X6RN, KV4AD, IS0EP, W9WPV, EA9TP, CT2HB, J37AJ, W5CNE, K4VHV, W4QO, EA4DW, T77T, 5B4OK, I0AMU, Y25WJ, VU2NR, W0CM, TK5BF, VE3VX, K6STI, YT1V, PY3NZ, plus a load of Stateside stations on upper sideband between 24.880 – 24.890 trying for a P29ZL who was not audible to Ian.

The position on these bands is that they are basically c.w. bands, simply because of the narrow slot allocated to us: on the other hand, there are many amateurs in many countries who flagrantly disregard their licence and use s.s.b. No country, as far as I know, has a licence that permits telephony on 10, 18 or 24MHz.

Special

GM0EXN wrote — alas to late to get in print early enough — to mention that GB75DH would be on from Dunnet Head, Caithness, which is further north than John O'Groats, and is the furthest north you can get on the mainland of Scotland. The exact site is Dunnet Head Tea-Room, Brough, Dunnet Head, Caithness. An interesting catch between December 4 – 31. QSLs will be sent to all stations worked and presumably to good s.w.l. reports. Sponsorship has come from Caithness Development Office and Caithness Tourist Board.

The next three deadlines for letters are: January 16, February 13 & March 13

Both Justin & I would like to wish all SWM readers a Merry Christmas & Good DX in the New Year

DECODE

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

I'll start this month by offering my thanks to all who have taken the trouble to write. It's very gratifying to know that the column is providing the information that you need. So thanks again and keep those letters coming.

The study of natural phenomena is the subject that aroused **Chris Moss's** interest in utility stations. One of the best ways of studying this topic is by receiving the FAX weather charts which are transmitted by meteo stations world wide. Chris has recently bought himself the FAX program from J & P Elecronics, which he reports to be extremely good value for money. In fact, Chris has given me a ticking off for implying that the J & P program is just a cheap and cheerful way of getting started. In order to prove the capabilities of the program Chris has sent me a stack of examples, one of which should appear in this column!

The equipment currently in use is a Kenwood R-1000 receiver fed with a 12m indoor antenna. For receiving v.h.f. he uses a Yaesu FRV-7700 convertor. The computer equipment comprises a Spectrum 48K with an Alphacom printer running J & P Electronics software for FAX, RTTY and c.w.

One final point made by Chris is the dearth of amateur FAX information. This is done purposely as this column concentrates on Utility stations with amateur transmissions only being mentioned if there is something of significant interest occuring. Anyone with a desire for more amateur coverage might like to see my RTTY column in our sister magazine *Practical Wireless*.

Chris Swann asks if anyone can help with a couple of problems. The first concerns dumping FAX pictures from his Spectrum 48K to a Brother M1009 printer, the FAX software being from J&P. The second problem concerns the reception of FEC and ARQ modes using the Spectrum 48K. If anyone can help please drop me a line and I will forward the information to Chris.

Now for an international flavour with a letter from **Francisco Jimenez** who lives in Malaga, Spain. Francisco actually wrote asking for a frequency list but thought to include his station details. He uses a Kenwood R-2000 receiver with a Commodore 64 computer, the two being connected via a home-made decoder, for FAX, c.w. RTTY, SSTV and ARQ. I must say that decoder sounds rather interesting, so I've replied to Francisco asking for more details.

I have had several queries regarding the use of the Yaesu FRG-9600 scanning receiver for Utility station listening. The FRG-9600 is a very popular receiver which many people seem to use quite successfully, one example being **Neil Mogford**. He uses a FRG-9600 with an AKD h.f. convertor which apparently gives coverage down to 30kHz. On the decoding front he uses a CD-600 multi-mode decoder with which he reports great success on RTTY, c.w. and ARQ.

My only comments would be to make you aware that the tuning steps are rather coarse on the FRG-9600 (100Hz minimum I think) and this can make it very difficult to tune in stations using narrow shifts, i.e. 170Hz. I would recommend that you spend some time with the receiver and your own decoder before parting with your money!

You may remember that some months ago I mentioned the Admiralty List of Radio Signals often shortened to ALRS. One of my regular contributors has informed me of another supplier that you may like to note. The company Dubois Phillips and McCallum Ltd., of Oriel Chambers, Covent Garden, Liverpool L2 8UD have been reliably supplying this publication for over 20 years so this is quite some recommendation. An added bonus is that they will accept standing orders for new editions of whatever volumes you want which sounds very useful.

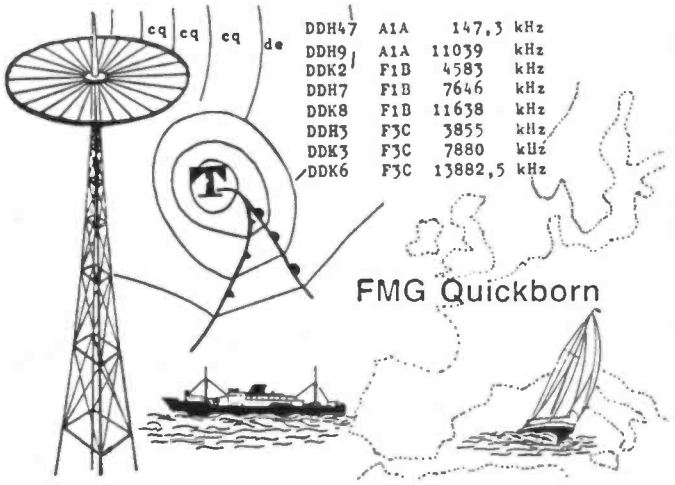
Colin Bates has written to say that he has solved his problems with reception of FAX signals from Offenbach Meteo on 134.2kHz. The solution was very simple, lengthen the antenna from 17m to 54m! One other point raised by Colin is the fact that satellite pictures are available on l.f. It seems that many people think that the only way to receive satellite pictures is to listen on v.h.f. or u.h.f. I think it is quite common for people to misread 134.2kHz as 134.2MHz which is close to the v.h.f. satellite band. I must say that I have suprised many v.h.f. satellite fans when after seeing my pictures they discover they were received on long wave!

DX Meteo Listening

I have received a useful tip for anyone interested in receiving DX meteo reports from ships. The transmissions are normally made in SITOR using the synoptic code. This of course may be the first stumbling block for some of you but if you would like to know more then the Air and Meteo Code Manual by Klingenfuss Publications gives all the conversion data. Assuming that you can cope with the synoptic code then the frequencies to watch are 16.6725MHz and 16.693MHz during the 30 minutes past each Met reporting hour (every six hours from 0001UTC). By using the position groups for the ships synoptic code you can see just where the ship is located. A particularly interesting time is 1800 to 1830UTC when you will often find reports from ships close to the Equator in the Atlantic. One point to watch is that some stations lump together the five letter groups and actually send ten letter groups!

Packet and the SWL

The subject of packet radio reception has cropped up on several occasions so I will take this opportunity to point out the pit falls. The first point I want to make is that packet radio is essentially an amateur mode of communications and as such I will not be covering it on a regular basis in this magazine. One of the main features of Packet radio is that the system is fully error correcting. This is achieved by splitting the message up into convenient sized packets and automatically checking that a packet has been received before sending the next packet. This is rather similar to SITOR and AMTOR except that the packets are much longer and do not have to be a fixed length. One of the problems with monitoring any error correcting system is that the monitoring station does not get the benefit of error correction. This results in parts of the message either being lost or repeated, both of which can be equally frustrating. To add to these problems, the answer is no, as you have to be able designed to allow frequency sharing by many stations. This means that in addition to the stations you are attempting to monitor, you will also be copying a variety of other signals. This can at times make it almost impossible to follow a conversation! I think most experienced listeners would agree with me that it is not really worth attempting to monitor amateur packet, especially on the crowded h.f. bands. One final point concerns mailboxes, several readers have asked if they as s.w.l.s. can make use of these. Unfortunately, the answer is no as you have to be able to transmit commands to the mailbox. having said that you can gain some useful information by monitoring mailboxes whilst amateurs are using them, but of course you only see information requested by the amateur.



QSL card received by Jan Nieuwenhuis

Schedules

This month, the schedule has been sent in by **Jan Nieuwenhuis** from The Netherlands. He received the Dakar Meteo schedule from the station's own QSL card.

The RTTY frequencies are: 7.585, 13.665 and 19.7475MHz.

The transmission times are: 0015 – 0130, 0315 – 0430, 0615 – 0730, 0915 – 1030, 1215 – 1330, 1515 – 1630, 1815 – 1830 and 2115 – 2230.

The address of the station is: Dakar Meteo, Asecna, Representation de l'Asecna au Senegal, PO Box 8132, Aeroport de Dakar-Yoff, Senegal.

Name Change

At the recent AGM, BARTG (formerly British Amateur Radio Teleprinter Group) voted for a name change. Nothing dramatic though, the letters remain the same, but they have changed the word Teleprinter to Teledata. The name change does not mean that BARTG is dropping its interest in the mechanical teleprinter,

Fax picture received by Chris Moss

SEEN & HEARD

but rather that they want to make it clear that BARTG does also cater for AMTOR, Packet (i.e. AX.25) and FAX.

BARTG's aim is to encourage and promote amateur radio activity in all these modes. If you are interested in joining BARTG then the current subscription rate is £10 for UK members. Membership details from: Mrs Pat Beedle GW6MOJ, 'Ffynnonlas'', Salem, Llandeilo, Dyfed SA19 7NP.

What to Listen For

Don't forget, an up-to-date list of all the stations heard by readers over the last three months is available from me for a stamped addressed envelope. The list now is over 500 stations and so should give listeners a good idea of what they can expect to hear.

This month, I have included the time of logging for the frequencies here as that will give a better chance of hearing any of the stations mentioned. The format is: frequency, mode, speed, callsign, station name and time of logging in UTC.

7.460MHz RTTY 50N LZB Sofia Press 1757
7.778MHz RTTY 75N UNID Air Meteo Pacific 2139
8.067MHz RTTY 50 Y2V7 Berlin Press 2127
13.4002MHz RTTY 50N ? Cuban News 2145
15.575MHz RTTY 50R ? TASS 0915
18.255MHz RTTY 50N ATB68 Delhi Press 0930
18.307MHz RTTY 50R 9KT349 Kuwait Press 1510
19.4578MHz RTTY 75N ? UNID 1532
20.327MHz RTTY 50R 6VK Dakar Press 1510
23.370MHz RTTY 100N HZN50 Jeddah Meteo 1503
9.114MHz RTTY 50 H9931 MTI Budapest 1735
10.1075 FAX 120 576 ATE60 Delhi Meteo 2035
13.5974MHz FAX 120 576 IHB56 Rome Meteo 1931
16.135MHz FAX 120 576 KVM70 Honolulu Meteo 0632
18.94MHz FAX 120 576 BDF Shanghai Meteo 1942

Finally may I wish you all a very Happy Christmas and rewarding New Year from Elaine, Ruth and myself. And don't forget the next three deadlines are: January 16, February 13 & March 13

INFO IN ORBIT

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

New Satellites

Readers will recall last months column when, due to shortage of space, we had to omit both the Keplerian element set and some actual pass times for the new Russian Met 3/2 weather satellite. They now follow:

Satellite:	METEOR 3/2
International Designation:	88-064A
Catalogue Number:	19336
Element Set:	59
Epoch Year:	1988
Epoch Day:	305.070-40891
Inclination:	82.5523
Right Ascension of Asc. Node:	337.7495
Eccentricity:	0.0016854
Argument of Perigee:	38.5642
Mean Anomaly:	321.6641
Mean Motion:	13.16845036
Decay or Drag Factor:	3.91E-06
Rev. No. or Orbit No:	1275

This is the latest set available, and is seen to be giving good accuracy in pass times, some of which for the UK appear in Fig. 1. From left to right, the columns read the date, the AS (aquisition of signal) time, the LOS (loss of signal) time, the MAX time when the satellite is at maximum elevation over the horizon, and finally that actual elevation in degrees.

For those who need EQX, i.e. those who use built-in system timings, plotters and calculators, a known first ascending equator reference crossing for 4 November 1988 at 0130.69UTC was at 76.19 degrees west, when the orbit number was 1327. The anomalistic period at that time was 109.409911 minutes, and the increment 27.481071 degrees west per orbit.

Lawrence Harris of Plymouth has been keeping a close eye on MET 3/2, and reports the following observations:

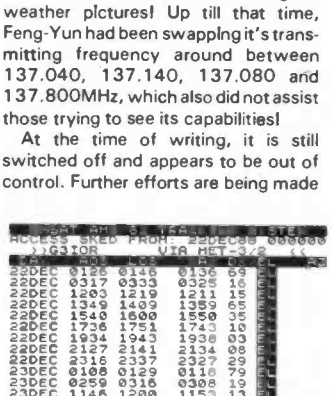
"This satellite holds the promise of occasional infra-red pictures but has been switched on and off several times during the autumn."

Lawrence promises us some photographs of this for a coming issue. He arose early on October 26 and at 0718UTC was able to see the change-over from infra-red to visible when MET 3/2 came over the north pole transmitting infra-red pictures of excessive cloud cover for the first eight minutes until it entered sunlight, when at 0726UTC an immediate change to the visible picture format came about. "The change occurred at about 75 per cent illumination," says Lawrence, "and the dynamic range of the signal (black and white levels) was significantly increased, resulting in the need to turn down the white level. The telemetry format changed from just a few phasing bars plus picture to the usual 15 bars, grey scale and picture." The next day, MET 3/2 was off again, and by November 9 had not been seen again. Lawrence advises potential users to scan all frequencies given when it is due, as it may well have changed again.

Feng-Yun-1

Had we but known when selecting which of the new satellites to prefer for inclusion, it would have been better to have given the passes for MET 3/2 rather than those of the new Chinese weather satellite. Alas, we had barely gone to press with the details of Feng-Yun-1, when Murphy's Law struck. Presumably due to a command malfunction, the satellite started to rotate at a rate of twice per second, which did not exactly aid the production of good weather pictures! Up till that time, Feng-Yun had been swapping it's transmitting frequency around between 137.040, 137.140, 137.080 and 137.800MHz, which also did not assist those trying to see its capabilities!

At the time of writing, it is still switched off and appears to be out of control. Further efforts are being made to regain attitude command, so it will pay to keep watching for this satellite for a while longer yet.



ACCESS SKED FROM: 22DEC88 000000
>>G3IOR VIA MET-3/2 <<

DAY	AOS	LOS	MAX	EL
22DEC	0125	0140	0132	69
22DEC	0317	0333	0325	16
22DEC	1203	1219	1211	15
22DEC	1349	1409	1359	65
22DEC	1540	1600	1550	35
22DEC	1736	1751	1743	10
22DEC	1934	1943	1938	03
22DEC	2127	2141	2134	08
22DEC	2316	2337	2327	29
23DEC	0108	0129	0118	79
23DEC	0259	0316	0308	19
23DEC	1146	1200	1153	13
23DEC	1332	1352	1342	56
23DEC	1522	1542	1532	39
23DEC	1718	1733	1725	11
23DEC	1915	1925	1920	03
23DEC	2109	2122	2116	07
23DEC	2300	2318	2309	25
24DEC	0050	0111	0101	88
24DEC	0241	0259	0250	22

Fig. 1.

Mystery Satellite

Listeners in Finland have given details of an unknown satellite that has suddenly appeared in the amateur 430MHz band. It is to be found centred on 433.400MHz, showing typical doppler drift and sending what appears to be data by phase shift keying modulation. It seems to be in a high inclination polar orbit with a period of about 90 minutes, as listeners in Finland report hearing the satellite "every one and a half hours". Perhaps some of those who listen to the amateur radio simplex f.m. often used on this frequency have heard the signals, or know the source?

MIR

All attention this month is on the Soviet manned space station MIR, as a number of exciting events are happening on this front. As mentioned last month, the amateur radio activity experiment should now be operational, with regular activity from both the commander Vladimir Titov using the call sign U1MIR and fellow cosmonaut Musa Manarov using U2MIR. Full details of this mission are to be found in the current *Practical Wireless* Amateur Satellites column.

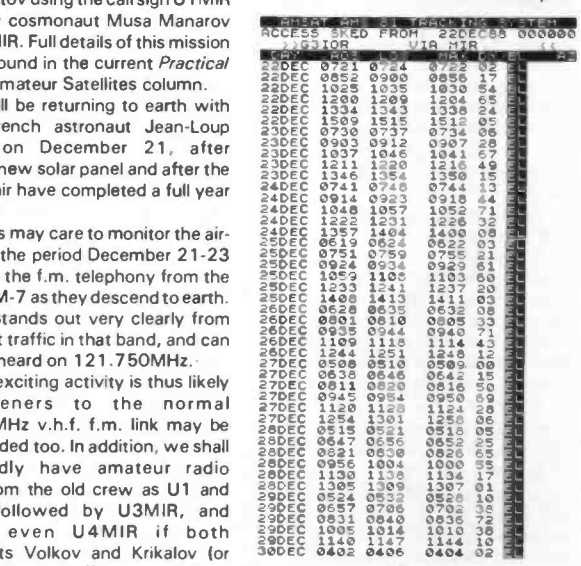
They will be returning to earth with visiting French astronaut Jean-Loup Chretian on December 21, after erecting a new solar panel and after the Russian pair have completed a full year in space.

Listeners may care to monitor the air-band over the period December 21-23 to listen to the f.m. telephony from the SOYUZ-TM-7 as they descend to earth. The f.m. stands out very clearly from the aircraft traffic in that band, and can be clearly heard on 121.750MHz.

Lots of exciting activity is thus likely and listeners to the normal 143.625MHz v.h.f. f.m. link may be well rewarded too. In addition, we shall undoubtedly have amateur radio activity from the old crew as U1 and U2MIR, followed by U3MIR, and perhaps even U4MIR if both cosmonauts Volkov and Krikalov (or Serebrov) have a sufficiency of spare time to effect their presence on 145.550MHz f.m.

For this reason, we have provided sets of all of the probable pass times for MIR for the central eastern UK over the Christmas holiday period, based upon the current Keplerian element set. There is little point in publishing this Keplerian data itself, as it will undoubtedly be out by the time that this column is read.

The set, given as Fig. 2, reads in the same order as Fig. 1 for MET 3/2. The precise pass times, whilst accurate to the second at the time of writing, will undoubtedly have drifted, possibly by up to as much as 12 to 15 minutes by the time they are seen. The reason is that MIR is not in a free fall orbit, but is constantly being changed by thrusts of its on-board motors to compensate for frictional drag, atmospheric expansion, attitude changes, rendezvous, and to adjust for the numerous on-board and outboard experiments being conducted. These changes cannot be determined or even assessed ahead, so the times given whilst correct in the day periods of pass times, cannot be said to permit precise minute or positional tracking. With the proviso that listening continues from some 15 minutes prior



ACCESS SKED FROM: 22DEC88 000000
>>G3IOR VIA MIR <<

DAY	AOS	LOS	MAX	EL
22DEC	0721	0724	0722	02
22DEC	0852	0900	0856	17
22DEC	1025	1035	1030	54
22DEC	1200	1209	1204	65
22DEC	1334	1343	1338	24
22DEC	1509	1515	1512	05
23DEC	0730	0737	0734	08
23DEC	0903	0912	0907	28
23DEC	1037	1046	1041	67
23DEC	1211	1220	1216	49
23DEC	1346	1354	1350	15
24DEC	0741	0748	0744	13
24DEC	0914	0923	0918	44
24DEC	1048	1057	1052	71
24DEC	1222	1231	1226	32
24DEC	1357	1404	1400	08
25DEC	0619	0624	0622	03
25DEC	0751	0759	0755	21
25DEC	0924	0934	0929	61
25DEC	1059	1108	1103	60
25DEC	1233	1241	1237	20
25DEC	1408	1413	1411	03
26DEC	0628	0635	0632	08
26DEC	0801	0810	0805	33
26DEC	0935	0944	0940	71
26DEC	1109	1118	1114	43
26DEC	1244	1251	1248	12
27DEC	0508	0510	0509	00
27DEC	0638	0646	0642	15
27DEC	0811	0820	0816	50
27DEC	0945	0954	0950	69
27DEC	1120	1128	1124	28
27DEC	1254	1301	1258	06
28DEC	0515	0521	0518	05
28DEC	0647	0656	0652	25
28DEC	0821	0830	0826	65
28DEC	0956	1004	1000	55
28DEC	1130	1138	1134	17
28DEC	1305	1309	1307	01
29DEC	0524	0532	0528	10
29DEC	0657	0706	0702	38
29DEC	0831	0840	0836	72
29DEC	1005	1014	1010	38
29DEC	1140	1147	1144	10
30DEC	0402	0406	0404	02

Fig. 2

to the acquisition of signal time, and continues to up to fifteen minutes after loss of signal time, the spacecraft should be heard, and any changes of times noted. This differential, added to or subtracted from those supplied for the next pass, should keep you within good time for active passes.

It is more likely that the signals will arrive earlier, as normally the spacecraft will lower its altitude giving a shorter orbital period (i.e. more orbits per day in the mean motion) to facilitate docking with the SOYUZ. When the transfers are complete, we may expect powering into a higher longer period orbit, when the spacecraft signals will start arriving later than predicted for each pass.

Note that whilst signals at 143.625MHz are regular, as they often both leave the carrier on for tracking as well as communicate with the various strategically placed ships even when out of range of the USSR during normal working hours (weekdays 0600 to 2000UTC), the two metre amateur activity will mainly occur at week ends only during free time. They are then unlikely to operate in unsocial hours, as adequate rest is essential for spacemen.

BURAN

This is the Russian word meaning "snowstorm", the name for the new large space-shuttle first launched at 0300UTC launch from Baikonur via the powerful *Energia* rocket. This first actual space flight, on grounds of safety, was for two unmanned orbits only and was entirely sensor computer controlled. Next year, some four manned missions will probably result, with a link-up to MIR highly likely. Alexander Danyov, the head of the Soviet Glavkosmos Launch Agency said that despite the fact that the Energia launch vehicle was recoverable and re-useable, the cost of the Buran launch worked out at around ten times that of the conventional lift-offs. For this main reason, the shuttle would only be used for special activities and for recovery missions. No frequencies are known for the communications channels as yet, so listeners may care to scan the usual frequencies during future flights in the hope of finding them. Plus or minus 143.625MHz would probably prove to be a good search area.

RS-10/11 Experiment

Ron Mikkenie PE1ISP is conducting an interesting and informative experiment with the USSR amateur radio spacecraft, in an effort to evidence the high sensitivity of its transponders. The information gained should assist in persuading those who perpetually employ excessively high levels of uplink power that it is both unethical and unnecessary. (These users have gained the name of "alligators", these being creatures possessing a very large mouth and apparently devoid of ears!)

Ron will be transmitting powers ranging from 10 watts at extreme horizon range down to 100 milliwatts at close range to the satellite, and is anxious to have reports from any who would care to follow the experiments. They will take place on the ascending close to overhead passes each week-end until the end of February. The equatorial pass times of those orbits to be employed follow:

Date	Equator crossing time	Equator crossing longitude
24/12/88	1730:57UTC	349°
25/12/88	1801:16	359
31/12/88	1733:08	2
01/01/89	1618:25	345
01/01/89	1803:27	11
07/01/89	1550:17	348
07/01/89	1735:18	15
08/01/89	1620:36	358
14/01/89	1552:27	1
15/01/89	1437:45	344
15/01/89	1622:46	10
21/10/89	1409:36	347
21/01/89	1554:37	14
22/01/89	1439:55	357
28/01/89	1411:46	360
29/01/89	1257:04	343
29/01/89	1442:05	9

All of these passes for the UK will have acquisitions of signal generally southerly between nine and eleven minutes after the equator crossing time supplied, will be at the highest elevation and nearest point a further eight minutes later and will go below our northern horizon eight more minutes later, e.g. some twenty-six minutes after the given equator crossing time.

The transmission will take place on a two metre uplink to give a downlink from the satellite on or very close to 29.445MHz u.s.b. on RS-11, or, should it come into use, on RS-10 on 29.395MHz. The power in use followed by a varying two letter code will be transmitted throughout the pass, e.g. "1 watt, Romeo Sierra" or "100 milliwatts, Bravo Oscar", etc., changing about every quarter of a minute.

The report should include the date, time in UTC, frequency, the satellite in use, the maximum and minimum signal, the received letter code and the power stated. Add to this the information on your receiver, pre-amplifier if used, antenna, and QTH locator if known. The report should be sent to Ron at Burg. Loysonstraat 51, 6373 PB LANDGRAAF, The Netherlands. All reports will be replied to individually.

The weather satellite photograph this month (Fig. 3) was sent by **Greg Roberts ZS1BI** and is of a picture taken by Les Currington of Welwyn Garden City. The photograph in Fig. 3 shows Greg's excellent reproduction by METEOR 3/1 of the April Ice break-up in the Gulf of Bothnia and was made using a drum and base of a Muirhead 901 FAX machine and his home-made equipment.

A March 1988 MET-30 picture of the icebergs in the Gulf of Norway and Sweden by **Lawrence Harris** is shown in Fig. 4, whilst Fig. 5 shows a whole disc by Lawrence from METEOSAT–2 in July, in visible light and with artificial colour added. It is unfortunate that you will only see this in monochrome, as the original is very beautiful to behold.

Merry Christmas and a Happy, Satellite Filled, New Year to all SWM Readers. Don't forget to keep writing in with your reports.

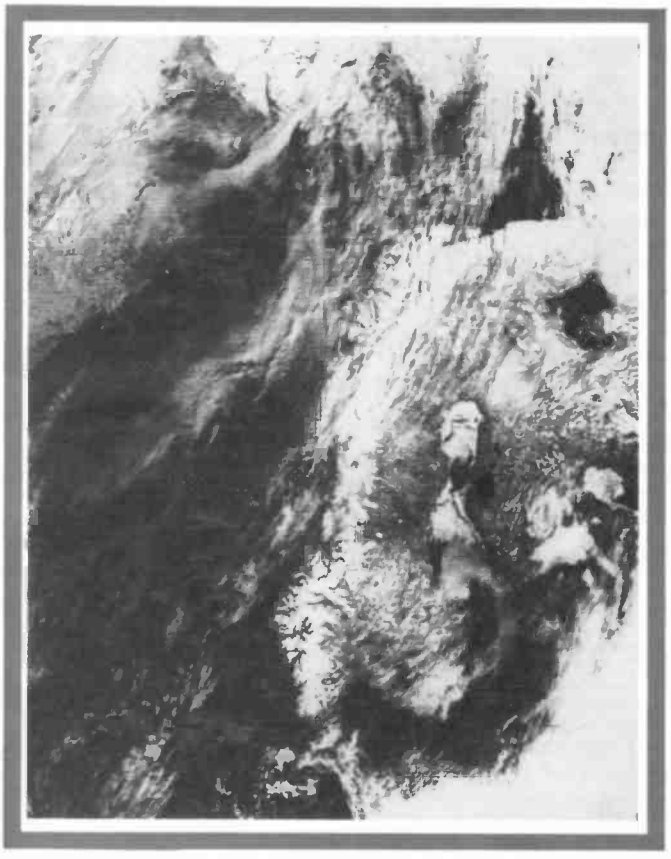


Fig. 3

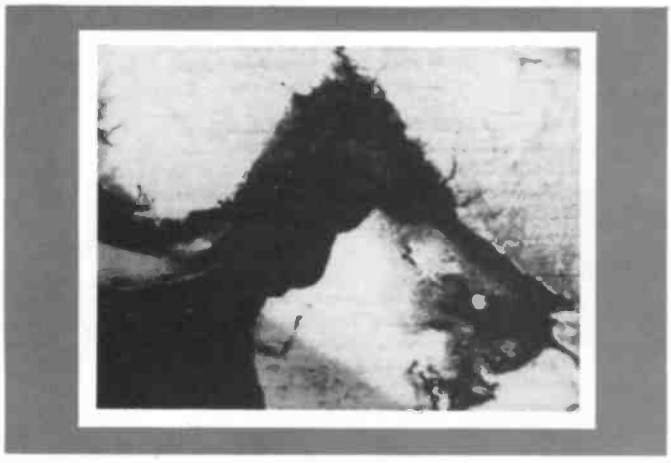


Fig. 4

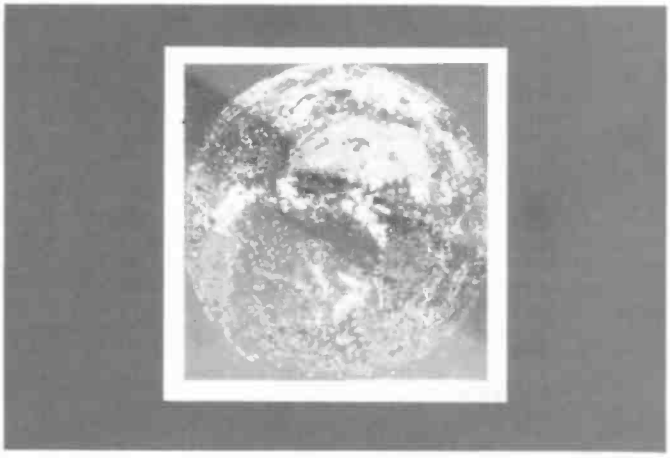


Fig. 5

SEEN & HEARD

BAND II DX

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

In October, I had the pleasure of showing **Eve and Ron Lucking (East Molesey)** around the radio exhibition at The Chalk Pits Museum, Amberley, Sussex. In addition to his interest in amateur radio Ron, seen in Fig. 1 with his prototype Mark II barograph, has recorded weather conditions for over 30 years. With a little help from me, hi, local and national weather conditions are beginning to play a larger part in this column, so, with this in mind, I have included the monthly rainfall figures, recorded at my home in Sussex, for the past 3 years from November 1985 to October 1988, Fig. 2. The peak of 9.31in, October 1987, was the month of the hurricane which hit the south of England and I hope it will remain an abnormal amount for a long time.

For computer buffs, Fig. 2 was produced using the graphics section of the Mini-Office Professional programme on my Amstrad PCW.

P.R. Guruprasad (Molepolole, Botswana) has added a German aneroid barometer to his station and reports that between October 8 and 27, he listened to a variety of programmes in Band II in Afrikaans and English and he identified signals from Radio Mabatho, Radio Oranje and a transmission from Radio South Africa on his Philips D1835 receiver.

From his home in Meerut, India, **Lt. Col. Rana Roy** using a 10-element antenna can sometimes hear the f.m. TV sound from Bangkok on 103.75, 105.5 and 107MHz.

Reports

During the good tropospheric conditions on October 16, **George Garden (Edinburgh)** was in an upstairs room in Laurencekirk using a Sony receiver, horizontally polarised dipole antenna and a preamplifier. At 2043, he received a fading, but strong and clearing, signal from the Black Hill transmitter of ILR Radio Clyde. "Next day no signal was obtained," said George and when he checked the prevailing weather conditions with a friend in Glasgow, he learnt that the Black Hill area was submerged in fog at the time. He had a further surprise when he received ILR Radio Tay on 96.4MHz from the very low power transmitter at Perth.

Fig. 1

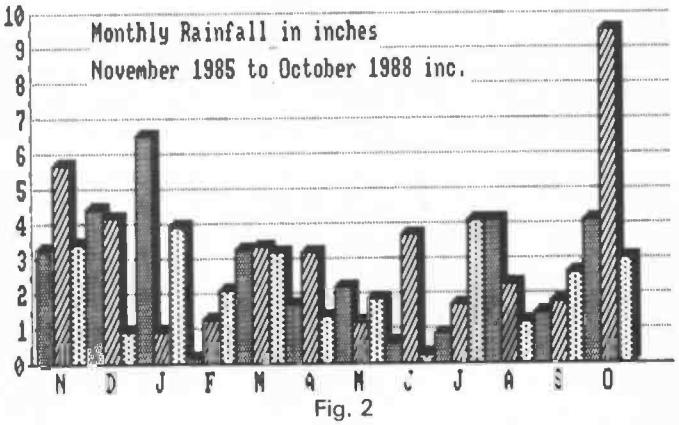


Fig. 2

The following day, **Andrew Jackson (Birkenhead)** logged Beacon Radio on 103.1MHz, Pennine Radio on 102.5MHz and Viking Radio on 96.9MHz using an indoor antenna to feed his receiver. Andrew plans to install an Antiference FM1087, 7-element array, for Band II.

The high pressure was again declining on November 6 and from the top of Cairn O' Mounth, near Laurencekirk, George Garden, using his Sharp car-radio and normal extended car-antenna, found Band II "jammed with transmitters" and says that he was lucky to hear the Ident Marcher Sound on 103.4MHz at midday broadcasting adverts for the Wrexham area.

David Glenday heard BBC Radio York on 103.7MHz from his home in Arbroath on November 3. From Wales (New Radnor), **Simon Hamer** received signals from the Benelux countries, France, East and West Germany Ireland and Scandinavia on the 16th and Belgium (BRT and RTBF), France (TDF), Holland (NOS) and Ireland (RTE) on November 4.

Early on November 4 the prevailing high pressure of 30.5in (1032mb) was beginning to fall and many inter-station "warbles" were apparent throughout Band II. Briefly, a low, coming in over Ireland, was forecast and in addition to receiving strong signals from Radios Cymru, Gloucester and Stoke, I heard *Morning Ireland* at 0900 from RTE on 89.7MHz. During the afternoon I logged French stations from a portable set in my car and back home, at 1805, I found RTE and Radio Cymru on several spots in the band and heard *Ireland Sport* at 1810 followed by *Farm News* at 1815. A variety of French stations were also present between 87.6 and 100MHz at 0845 on the 5th.

In Basingstoke, **John Woodcock** found Band II "very lively" on the 5th "with plenty of Europeans coming in strong and the French roaring in up the higher end." These were heard indoors on John's Grundig Portable with a telescopic antenna.

While the prevailing high pressure, of just over 30.5in, was falling on November 15 and 16, I again received programmes from France and Ireland while using a Plustron TVR5D from my car in East and West Sussex and from home with my ex-military R216 v.h.f. communications receiver and discone antenna. On the 17th, conditions were back to normal, the pressure was down to 30.1in (1019mb) and the fine weather had turned to rain.

TELEVISION

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

The first time I saw the effect of Sporadic-E on a television picture was back in the summer of 1948. It was on a Philips televisor with a Band I "H" antenna installed well above the chimney tops. I have been fascinated by this and other types of propagation ever since. The televisor was designed for family entertainment because, in addition to a 9in picture tube, it has a 3 wave-band (long, medium and short) a.m. radio built in. The glass dial, pointer and "magic eye" tuning indicator for the radio protrude from the top of the heavy and highly polished wooden cabinet. One of these models, Fig. 1, is now displayed with many other vintage television receivers in the radio exhibition at the Chalk Pits Museum (Amberley, Sussex).

From the old to the new and **Kevin Phillips (Bexhill-on-Sea)** recently purchased, from an Argus outlet for £190, a Bush 2114T 14in colour portable with remote control and teletext. "It has a v.h.f./u.h.f. tuner which appears to be very sensitive and a massive 55 station memory which can be assigned to any band in any order," said Kevin. On arriving home at 1600 on October 22, he coupled the new receiver to his home-brew Band I antenna. He tuned through Band III and logged Luxembourg (RTL) on Ch. E7. A good start Kevin.

Band I

Readers of my Propagation column in our sister magazine *Practical Wireless* will know about the rising sunspot activity and the large number of low power beacons that have been heard in the UK on the 28MHz band. This means that the time has arrived to look for DX in Band I via the F2 region of the ionosphere. However, don't expect to see the sharp crisp pictures that appear in this band when Sporadic-E is present.

At 1230 on October 31, **Simon Hamer (New Radnor)** received two strong signals, via F2. The first, on Ch. E2 (48.25MHz), was a multiburst test pattern and the second, on Ch. R1 (49.75MHz), was a smeary picture which looked like a documentry. **Bob Brooks (Great Sutton)** saw "lots of F2 activity" around this time but could not decipher the captions or the pictures. "We have been receiving some good pics at E2/R1 but ID is poor due to the hazyness of them. However they are not from 'usual' sources, it definately is F2," wrote **Edwina and Tony Mancini** from Belper.

"I have been getting a propagation which is similar to F2 from the 23rd of September," wrote **Lt. Col. Rana Roy (Meerut, India)** on November 10. He continued, "the channel is E2 and at times E3 and the TV stations coming in appear to be SE. Asian. The script is similar to Malay. At times I have seen Chinese script also some of the script is exactly like the Malayalam script used in South India. The signals usually come in at 1500 or 1700 and are present till 2230. At times I have seen it at 0730 also. The ID is a '3' coming in at times, I think it is Malaysia because some of the programmes I could see when the pictures were a bit clearer were the same as the ones given in the programme schedule of Malaysian TV." Thanks for these interesting reports folks, let's hope there is even more next time.

Sporadic-E

During brief Sporadic-E openings **Bob Brooks** identified pictures from Spain (TVE) on Ch. E2 at 1853 on October 18, on Ch. E3/4 around 1035 on November 3 and Switzerland (PTT-SRG1) at 1037 on November 2. On various days between October 18 and 30, Edwina and Tony received test cards from Czechoslovakia (CST RS-KH), Denmark (DR), Finland (YLE TV1), West Germany (ARD-NDR1), Holland (PTT NED1), Norway (NRK Televerket), Poland (TVP1) and Sweden (SVT Kanal1).

Picture Archives

Bob Brooks sent photographs of the logos he received from Poland (Szczecin) Fig. 2, Spain (TVE) Fig. 3 and the USSR (Estonian TV) during the peak

SEEN & HEARD

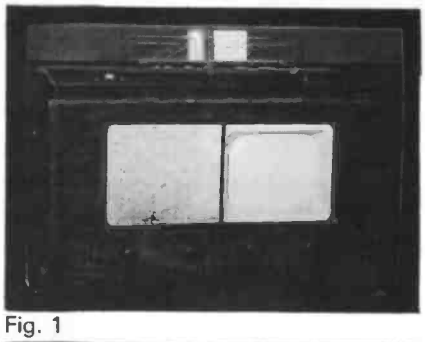


Fig. 1

Fig. 2: Poland

Fig. 3: Spain

Fig. 4: USSR

Fig. 5: Spain

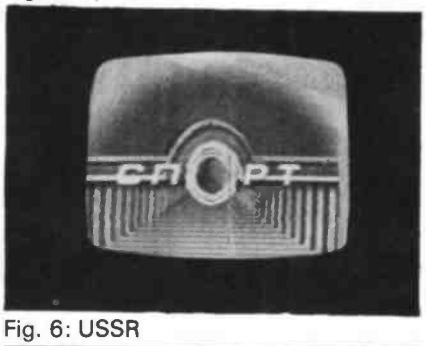


Fig. 6: USSR

Fig. 7: Hungary

Fig. 8: Unidentified

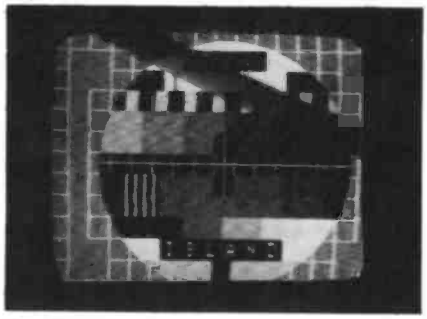


Fig. 9: Iceland

Fig. 10: UK

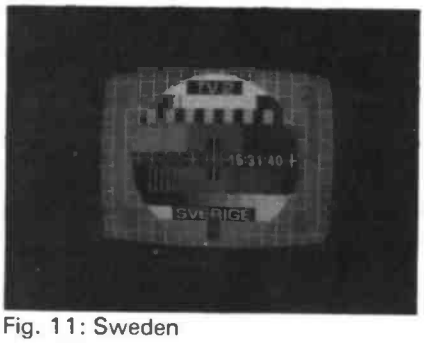


Fig. 11: Sweden

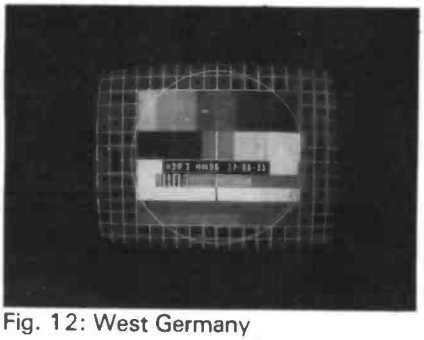


Fig. 12: West Germany

of the 1988 Sporadic-E season. David Glenday (Arbroath), using a Yoko receiver, watched a childrens programme from Spain, Fig. 5, at 1805 on June 4, caught the Sport ident from the USSR, Fig. 6, at 1840 and a results list form the Hungarian *Telesport* programme, Fig. 7, at 2050 on the 5th. On 14 June 1987 Noel Smythe (Caerphilly) saw a motor-sport caption, Fig. 8, from an unidentified source in Band I. At 1118 on 7 August 1988, Paul Hegarty (Co Dublin) logged the Icelandic test card (RUV Island), Fig. 9, on Ch. E4 (62.25MHz) via Sporadic-E and a programme, at 2119 on the 6th, which he thinks came from HTV, Fig. 10, on the u.h.f. channel 25, via improved tropospheric conditions. Such conditions also enabled David Glenday to receive test cards from Sweden, Fig. 11, on Ch. 30 and a West German regional, Fig. 12, on Ch. 48, on June 12 and 13 respectively.

Tropospheric

After seeing a slight fall in the high atmospheric pressure on October 16 and a veil of thin cloud appearing, **George Garden** (Edinburgh) decided to take his JVC610GB receiver and amplifier loop antenna to the top of Cairn O'Mounth and was amply rewarded for his efforts. By 1600 the landscape at the southern horizon could not be seen for thickening fog, however, on went the set and in came a strong colour picture from the 2kW transmitter at Eyemouth on Ch. 23. George also searched for, and found, Tyne Tees from Chatton as good as a local and further up the band, on Ch. 61, he received a fading picture, with flaky colour, appearing in regular bursts from the Tyne Tees transmitter at Pontop Pike. At midday on November 6, he was back with his gear on Cairn O'Mounth and received a good picture, for over an hour, from the Eyemouth transmitter of Border TV. This was confirmed when he saw a programme list with the Border captlon and an advert concerning Dumfries.

Between October 14 and 17, **Andrew Jackson** (Birkenhead), using a chimney mounted rotatable Trlax Unix 92, wide-band u.h.f. antenna, watched programmes from Anglia TV on Ch. 24, BBC1 East and BBC1 Northern Ireland on Ch. 31, BBC1 North East on Ch. 33, Central East Midlands on Ch. 61, Tyne Tees on Ch. 29 and Ulster on Ch. 24. Using this Triax antenna, means that Andrew can receive perfect pictures from all four Central TV Channels from the Wrekin and HTV from Moel-y-Parc.

On October 16, Kevin Phillips, using a D100 converter received pictures from France in Bands III, IV and V and Luxembourg on Ch. E7. The latter was often in colour despite the use of a temporary antenna.

I received two transmissions from RTE on Band III at 1805 on November 4, noted co-channel interference on some stations in the u.h.f. band during the evenings of the 4th, 6th and 7th and logged negative pictures from France in Band III at 0415 on the 5th.

The opening on October 16 meant a big haul for Simon Hamer. He logged pictures from Belgium (BRT 1/2 and RTBF 1/2), Denmark (DR), France (TDF), East and West Germany (DFF1/2) and (ARD, BR1, HR1/3, NDR1, NDR3 HMBG, SWF1, WDR1, WDR3 with "WEST 3" and ZDF), Holland (NED1/2/3) Ireland (RTE1/2), Luxembourg (RTL PLUS) and Sweden (SVT1/2) generally on many spots in Band III and the u.h.f. band. Among the idents he saw were test cards "DR Danmark" and "Kanal 1 Sverige" and the news programme *Akuelle Kamera* from East Germany in Band III and *TELE 21* from Belgium's RTBF2, *TV2 Sverige* and *Heute* (news) from West Germany in the u.h.f. band. Simon also logged pictures on similar channels from Belgium, France, West Germany, Holland and Luxembourg during another tropo-opening on November 4.

In Band III, Bob Brooks watched Ice Hockey from Belgium and cartoons from France and identified test cards and logos from Belgium and West Germany on October 16 and a film and programmes from France (Canal+) on

November 4 and 8.

David Glenday concentrated his efforts with a Philips receiver in the u.h.f. band and among the signals he logged on October 15 were the ARD/ZDF teletext service and SW3 BADN from West Germany, Anglia TV (Sudbury and Tacolneston), BBC1 (England and Scotland), BRT TV1 (Egem), Channel 4 (Crystal Palace), PTT-NED2 (Wieringermeer) and 3 (Goes, Lopik and Roermond), RTL Plus Koln (Luxembourg), TVS (Dover), TV2-Danmark (Vejle) and Yorkshire TV (Emley Moor). "I logged my most distant u.h.f. DX when the test card of Switzerland's Italian Service, +PTT TSI 1, appeared for a few minutes on Ch. 34, probably from La Dole. That's a distance of some 800 miles," said David. On the 17th and 18th he added BBC 2 and Central TV from Sutton Coldfield, BRT TV2 (Egem, Genk and Schoten), Channel 4 local adverts (Emley Moor), NED2/3 (Smilde) and 3 (Arnhem), West Germany's SW3 Badn (Ahrweiler), WEST 3 (Monschau) and WDR NH30 (Nordhelle) and TDF FR3/RES.3 (France). At 1835 on the 31st, David saw BBC1's *Northwest Tonight* from Caldbeck on Ch. 30 and on November 3 and 4 he received strong colour pictures from Bilsdale, a test card from BRT TV1 on Ch. 43 and programmes from BBC1 and Nederland 3 on Ch. 30. On the 5th, both David and I heard the TV weatherman comment about the prevailing co-channel interference.

Among the programmes seen by the Mancinis between October 16 and 30 were ice hockey and news (Tageschau) from West Germany, football from France (Antenne 2) and test cards from Belgium, France and Ireland. They also logged a variety of signals from Belgium (RTBF1) on November 7, France (Canal+) on days 1, 2, 4, 5, 7, and 9 and Ireland (RTE1) on the 1st and 7th.

The atmospheric pressure was just above 30.5in (1032mb) on November 14 and with little surprise I found weak signals from France, in Band III, on my Plustron TVR5D with its own telescopic antenna while parked in Chichester. This very high pressure began to decline around 1600 on the 15th and during the 16th I received pictures from France and Ireland.

Joan & I would like to wish all readers a Merry Christmas & Happy New Year. We'd be pleased to see you at the Chalk Pits Museum too

The next three deadlines are: January 16, February 13 & March 13

LONG MEDIUM & SHORT

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

The New Year looks like being an interesting and exciting one for all listeners as many new stations are being introduced both at home and abroad and a number of changes in existing services are planned too. The reception conditions prevailing in the higher frequency short wave bands can be expected to continue to improve during the year and listeners who are new to this hobby will be able to experience, for the first time, the exceptional conditions which exist during the peak years of a solar sunspot cycle. Happy New Year.

Long Wave DX

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

During a visit to Poland, Alex Mackow checked the band in a number of different locations. His interesting log was compiled with a Sony ICF-7600D portable, using just the built in ferrite rod antenna. While in Zakopane in the extreme south of Poland, Alex picked up the BBC Radio 4 broadcasts around 2100 — the combined signal on 198 from Burghead (50kW), Droitwich (400kW) and Westerglen (50kW) rated SINPO 33333.

Encouraged by his initial success last month, John Evans has been searching the band again in Shawforth. Using a 500mm diameter G2VFI.w./m.w. type loop ahead of a Sharp ST 1122 tuner, John logged for the first time Bechar, Algeria 153 (2000kW) rated SIO 333 at 1600; Lahti, Finland 254 (200kW) 433 at 1945 and Moscow, USSR 263 (2000kW) 444 at 2000. He says, "I was quite amazed at the quality of the transmissions".

The broadcasts from Medi 1 Nador, Morocco 171 (1200kW) were logged by Tim Shirley in Bristol at 0300. This station was not mentioned in any other report this time. At 0330 he picked up two of the broadcasts from the USSR: from Leningrad 198 (150kW) and Kishinev 234 (1000kW). The relatively weak signals from Kishinev reach some areas of the UK via sky wave paths as early as 1800, but those from Leningrad may not become audible until much later as the BBC transmissions on 198 via Burghead, Droitwich and Westerglen mask their presence — a point worth remembering if you have not yet added this station to your list of DX. On several occasions, Tim has noted co-channel interference between Leningrad and Droitwich around midnight.

In Storrington, Fred Pallant used a Trio R2000 receiver with a random wire antenna in the loft to check the band during daylight and establish which broadcasts reach him via ground wave paths — ten were identified. After dark he re-checked the band and logged five additional broadcasts via sky-wave paths. They stemmed from Motala, Sweden 189 (300kW) SIO 233; DLF Munich, W. Germany 207 (500kW) 133; Azilal, Morocco 209 (500kW) 233; also Topolna, Czechoslovakia (1500kW) 343. Fred also observed that the strength of the signals from Roumoules 216; Konstantinow 225; Junglinster 234 and Moscow 263 increased after dark.

Similar checks were made by Philip Rambaut in Macclesfield at 1600 and 1800UTC. Eighteen stations were logged during daylight and three additional stations were noted after dark: Azilal, Morocco 209 (300kW); Oslo, Norway 216 (200kW) and Kishinev, USSR 234 (1000kW). An increase in the strength of the signals from Kaliningrad 171; Oranienburg 177; Konstantinow 225; Kalundborg 245; Topolna 272 and Minsk 281 was observed after dark, but the signals from Donebach 153 and Burg 263 deteriorated. During daylight, the ground wave signal from Brasov, Romania 153 (1200kW) rated as only S1 and after dark it simply disappeared!

MW Transatlantic DX

Although the shortest day has passed the long dark nights just now are providing DXers with a good opportunity to add a few more stations to their DX list. Many listeners are reluctant to embark upon this aspect of our hobby because they feel that it involves too much loss of sleep! At this time of the year some signals cross our shores around midnight and some are still audible at dawn, so the loss of sleep may not be too serious.

It is not essential to use elaborate receiving equipment to enjoy the pleasures of transatlantic DXing, but by using a good loop antenna ahead of the receiver the operator will be able to eliminate some of the interference from unwanted stations. The common mistake it to assume that the reception conditions are the same every night, so if at first you don't succeed . . . !

The earliest signals to cross the Atlantic on a fairly regular basis just now, stem from CJYQ in St. Johns, NF 930; WINS in NY, USA 1010 and Caribbean Beacon, Anguilla 1610. By dawn the signals from CJYQ may still be audible along with those from VOCM 590, also located in St. Johns, but some others have been heard recently too.

From time to time the broadcasts from VOCM 590 have also reached the UK soon after midnight. Using an RCA AR77 receiver in Grimsby, Jim Willett logged them as SIO 222 at 0040. In contrast the signals from CJYQ were peaking 322 by 0020. The VOCM station ident was heard by David Edwardson in Wallsend at 0110, by then their signal was a remarkable 34443. David uses a seven-turn loop antenna measuring 0.885 x 1.005m and a *PW* l.f. converter head of his Trio R600 receiver and he rated the signals from CJYQ 930 as 24442 at 0127 and those from CJCH in Halifax, Nova Scotia 920 as 24442 at 0150.

Enclosed with the report from Tim Shirley were several of the QSL letters he has received from stations in Canada and the USA, all confirm recent reception and the following extracts may be of interest: CHAM Hamilton, Ontario 820 a.m. stereo system, but no other station details; WLS Chicago, Illinois 890, 50kW transmitter located 42km south of Chicago, plus a 179m tall anti-fading non-directional mast radiator built in 1938; CHOK Sarnia, Ontario 1070 no station details; KSGO Portland, Oregon 1520 transmitter 50kW (day), 10kW (night), plus a three tower directional antenna system with major directivity to north west! His latest log includes several stations in the Caribbean and S. America.

DXers:

A:	John Evans, Shawforth.
B:	Ciaran Fitzsimons, Chertsey.
C:	Alex Mackow, while in Poland.
D:	Fred Pallant, Storrington.
E:	Philip Rambaut, Macclesfield.
F:	Tim Shirley, Bristol.
G:	Andrew Westmoreland, Wakefield.
H:	Neil Wheatley, Newcastle-on-Tyne.
I:	David Wratten, Cambridge.

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

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

SEEN & HEARD

Other MW DX

During the early hours of one morning recently, Jim Willett picked up the broadcasts from three stations in Saudi Arabia; Qurayyat 900 (1000kW) SIO 322 at 0030; Dammam 1440 (1600kW) 233 at 0230; also Duba 1521 (2000kW) 233 at 0100. It is easy to overlook the distance of these stations from Grimsby, but a quick check with a globe will reveal that it is much the same as that separating Grimsby from the east coast of Canada and the USA.

Listening in Newcastle-upon-Tyne **Neil Wheatley** logged three broadcasts from Algeria. They stemmed from Les Trembles 549 (600kW) SIO 243 at 2100; Algiers 891 (600/300kW) 344 at 2130; also Algiers 981 (600/300kW) 444 at 2130. While testing his new Matsui MR-4099 portable in Sunderland, Leo Barr also heard Algiers on 981, he rated their signal as 44454 at 1911. A Matsui MR-4099 portable enabled **John Nash** to hear their signal in Brighton, it was a remarkable 55555 at 1937.

Using a dismounted car radio in London, **Phil Townsend** picked up a broadcast in Italian on 1575, which proved to be from Genoa, Italy (50kW). Their signal was 433 at 1605, but it deteriorated to 222 later. After dark, he heard SER via their 2kW transmitter in Pamplona, Spain 1584; Vatican Radio, Rome 1530 (150/450kW); Kaliningrad, USSR 1143 (150kW) and Sarnan, Switzerland 1566 (300kW).

Despite the distance involved, Radio Tirana via Lushnje, Albania 1395 (1000kW) reaches many areas of the UK well at night via sky wave paths. They were rated as 43333 at 2130 by Ian Bond (Wirral); 43333 at 2230 by Sheila Hughes (Morden) and as 44444 at 2251 by Leo Barr.

While in Poland, Alex Mackow used his Sony ICF-7600D portable to receive several of the BBC broadcasts. BBC 648 via Orfordness 648 (500kW) 23333 at 2032 in Warsaw and as 22332 at 2109 in Zakopane, S. Poland. The BBC broadcasts in Polish via Orfordness 1296 (500kW) rated as 34444 at 2034 in Warsaw; 34444 at 2037 in Wroclaw, SW. Poland and as 44444 at 1941 in Zakopane. Alex could also hear two of the BBC UK domestic networks; Radio 1 on 1053, shared by Burghead (20kW), Droitwich (150kW), Stagshaw (50kW), Start Point (100kW) and lower power relays rated as 23322 at 2108 in Krakow, S. Poland. Radio 2 on 909, shared by Brookmans Park (140kW), Clevedon (50kW), Moorside Edge (200kW), Westerglen (50kW) and lower power relays rated as 22222 at 2100 in Krakow and as 22332 at 2023 in Zakopane.

Two programmes by Radio Polonia in Warsaw have been attracting Sheila Hughes. Using a Vega 206 portable with a home built loop antenna, she listened to *DX Club* via Stargard 1503 (300kW) at 2230 rated as 43443. At 2305 Sheila listened to a *Postbag* programme via Wroclaw 1206 (200kW) rated as 43333. Programmes of special interest to DXers are also broadcast by Radio Sweden via Solvesborg 1179 (600kW) and by BRT via Wolvertem, Belgium 1512 (600kW). The sky wave signals from both stations reach many areas of the UK well at night, the 44444 ratings quoted by Ian Bond being typical.

In Wakefield, **Andrew Westmoreland** has been trying out his new Kenwood R5000 receiver. At 1730 he listened to AFN via Frankfurt, W. Germany 873 (150kW), noting their signal as SIO 444. The broadcasts from Radio Bremen, W. Germany 936 (100kW) attracted him at 1815, rated as 544. At 1900 he picked up NDR/WDR via Hamburg, W. Germany 972 (300kW) 433.

No doubt the long sea paths enabled **David Middlemiss** (Eyemouth) to hear several of the broadcasts from W. Germany during daylight. Between 1500 and 1630 he logged AFN via Frankfurt 873 as 333; RAIS Berlin 855 (100kW) as 333, Radio Bremen 936 as 343; NDR/WDR Hamburg 972 as 444; Sudwestfunk Via Wolfsheim 1017 (600kW) as 333. From E. Germany he noted DDR1 via Burg 1044 (250kW) as 232.

The ground wave signals from BBC Radio Ulster via Lisnagarvey, N. Ireland 1341 (100kW) were logged by Leo Barr as 34434 at 0707. The sky wave signals from two of the low power relay transmitters in S. Ireland were noted in the reports: RTE-1 via Cork 729 (10kW) 423 at 1830 by Neil Wheatley; RTE-2 via Dublin/Cork 1278 (10kW) 44344 at 1750 by Leo Barr.

Four of the BBC Radio 4 low power relay stations were mentioned by Neil Wheatley. During daylight he logged Carlisle 1485 (1kW) SIO 233 at 1030 and Aberdeen 1449 (2kW) 333 at 1200. After dark he noted Lisnagarvey, N. Ireland 720 (10kW) 344 at 1745 and Lots Road, London 720 (0.5kW) 333 at 1900.

MW Local Radio DX

There are some changes taking place in the local radio scene just now. **Leslie Hollis** (Grantham) informs me that a new local radio station known as GEM-AM is now operational on 945, 999 and 1260kHz. It is a combined operation by ILR Radio Trent and ILR Leicester Sound. Reception is good and Leslie says that the programme content is quite interesting.

Jim Willett reports that ILR Viking Radio has split its v.h.f. and m.w. programming, the m.w. station on 1161kHz is now known as Viking Gold and has an "oldies" format. Sheila Hughes noted that ILR County Sound 1476kHz is now County Sound Gold in her report. **Francis Hearne** (Ilford) tells me that ILR Capital Radio 1548 will shortly become Capital Gold and operational for 24 hours a day, seven days a week. John Evans says that BBC Radio Manchester 1458kHz is now Greater Manchester Radio (GMR).

The BBC transmissions from Greater London Radio (GLR) 1458 and Radio Gloucestershire 603 are being well received in many areas. Both stations welcome reception reports and comments from listeners. If possible, try to include at least two listening periods in your report and quote SINPO ratings during daylight and after dark. Be sure to enclose an s.a.e. if you require a QSL, as most local radio stations operate on a limited budget.

Writing from Winscombe, **Hugh Tyson** says, "I never cease to be amazed at the Sooper Loop, I chase m.w. DX mainly in the winter, and it's enabled me to pull in things I've never heard on an ordinary antenna". The full constructional details of the Sooper Loop designed by Dave Mayhew (Yapton) appeared in the July '86 edition of *Practical Wireless* — back issues are still available from the Poole offices.

Merry Christmas and good DXing in the New Year

Freq MHz	Station	Location	Time (UTC)	DXer
		USA		
690	KHEY	El Paso, TX	0600	B
880	WCBS	New York, NY	0400	C
890	WLS	Chicago, IL	0100	B
1010	WINS	New York, NY	0220	B,C
1050	WFAN	New York, NY	0700	B
1210	WCAU	Philadelphia, PA	0210	B,C
1510	WSSH	Boston, MA	0230	C
1520	KSGO	Portland, OR	0330	B
		Canada		
580	CFRA	Ottawa, ON	0530	B
590	VOCM	St. John's NF	0040	A,C
610	CKYQ	Grand Bank, NF	0120	C
820	CHAM	Hamilton, ON	0630	B
920	CJCH	Halifax, NS	0100	A,C
930	CJYQ	St. John's, NF	0020	A,B,C
950	CHER	Sydney, NS	0400	B
1010	CFRB	Toronto, ON	0400	C
1070	CHOK	Sarnia, ON	0600	B
1570	CKLM	Laval, PQ	0300	B,C
		C. America & Caribbean		
1540	Radio Bahamas	Bahamas	0345	B
1570	Atlantic Beacon	Turks & Caicos Is	0230	B
1580	VOA	Antigua	0330	B
1610	Caribbean Beacon	Anguilla	0100	B,C
		S. America		
1220	R. Globo	Rio. Brazil	2300	B
1260	R. Muhler	Sao Paulo, Brazil	0500	B
1350	R. Buenos Aires	Argentina	0615	B

DXers:
A: David Edwardson, Wallsend.
B: Tim Shirley, Bristol.
C: Jim Willett, Grimsby.

Short Wave DX

As we climb the steep slope leading to the peak of the present sunspot cycle, the conditions on the higher frequency bands are now improving to such an extent that many interesting and unexpected signals are reaching DXers world-wide. Some days, solar events (flares) have caused ionospheric disturbances and reception conditions have been disappointing. Fortunately these effects have been relatively short-lived, but such occurances are likely to continue.

Seven broadcasters are now taking advantage of the excellent conditions prevailing in the **25MHz** (11m) band; Radio Liberty, Munich; Radio Norway International (RNI), Oslo; BBC London; Radio RSA Johannesburg; Radio France International (RFI), Paris; Radio Denmark, Copenhagen; also UAE Abu Dhabi. There is still no confirmation that Radio Moscow is using the 11m band, but it may be worth monitoring 25.930 as transmissions in Russian have been heard from time to time on that frequency.

The broadcasts from Radio Liberty via Gloria, Portugal 25.665 (Russ to N. Asia, E. Europe 0900–1600) are frequently jammed by the USSR. So far, no reports have reached me from listeners in the target areas and any report on this transmission from listeners outside the UK would be appreciated. Reception in the UK varies, as the jammer is less effective at certain times of the day. Using a Hammarlund HQ 180XE receiver, **Robert Cowell** rated their signal in Blackpool as 44333 at 1430.

The report from Dick Moon in George, S. Africa confirms that the broadcasts from RNI Oslo, Norway 25.730 (Eng*, Norw to Africa 1000–1045 and 1200–1250) are reaching their target at SINPO 55555 at 1200. (*Eng. Sundays only 1000–1030.) He logged RFI Paris, France 25.820 (Fr to Africa 0900–1545) as 44344 at 1000 and Radio Denmark, Copenhagen 25.850 (Dan to S. Europe), W. Africa 1000–1052; also** Dan to S. Asia, Australia 1200–1252) as 33232 at 1235. (**now discontinued.)

Using a Philips D 1835 portable with just the built-in whip antenna in Molepolole, Botswana, P. R. Guruprasad rated RNI Oslo 25.730 as 35544 at 1200. He has also been listening to RFI Paris 25.820 and noted 25533 in his log at 0900. The BBC World Service via Daventry, UK 25.750 (Eng to Africa, Asia 1100–1515) has also been reaching him quite well, rating as 25533 at 1145.

Reporting from Southport in Queensland, Australia **John Ratcliffe** confirms that the broadcasts from Radio Denmark to S. Asia and Australia 25.850 were reaching their target at 1200, but they have since been discontinued. Using a home built "Spontaflex" reflex receiver with a 2m long antenna, John picked up the BBC World Service via Daventry, UK 25.750 at 1300UTC. The signal was sufficiently strong to enable him to reduce the receiver gain considerably and there was only slight fading present. He listened for about 30 minutes hoping to get a frequency check, but no details were given.

The report from Alan Curry (Stockton-on-Tees) was the only one to mention the broadcasts from Radio RSA Johannesburg, S. Africa 25.790 (Eng to Europe, Canada, USA 1400–1556). He rated them as 22222 at 1527, but that must have been during poor conditions as their signal is very potent indeed here, peaking 55555 much of the time.

Although I had been monitoring the broadcasts in Arabic on 25.900 (0615–1603) for some days their origin was obscure until Kenneth Reece (Prenton) and Philip Rambaut identified them as UAE Abu Dhabi. The target area of these transmissions is unknown, but Kenneth heard "test transmission" mentioned at 0900, he rates their signal as 55544 at 1115. Philip has sent a reception report to

them, so perhaps the full details will be known in the near future.

The reception conditions prevailing In the **21MHz (13m)** band are generally good and many interesting broadcasts from several continents become audible at some time during the day.

In addition to English, a variety of other languages are used in the programmes intended for listeners in Europe. Some were noted In the reports: Radio Japan via Moyabi, Gabon 21.695 (Eng, Jap 0700–0830) 43323 at 0700 by **Christian Pritchard** (Cambridge); UAE Radio Dubai 21.605 (Ar, Eng 0615–1400) 54444 at 1015 by **Darran Taplin** (Tunbridge Wells) using an Eddystone 680X receiver plus 25m wire antenna; Voice of Israel, Jerusalem 21.660 (Eng, Fr, Russ 1100–1455) 42333 at 1114 by Leo Barr; also on 21.675 (Heb 1100–1630) 35543 at 1109 by David Edwardson; Radio Free Europe via Gloria, Portugal 21.665 (Pol 0700–1800) 44444 at 1151 by Alex Mackow while in Warsaw; Radio RSA Johannesburg, S. Africa 21.590 (Eng 1400–1600) SIO 455 at 1515 by **Kenneth Buck** (Edinburgh); Radio Japan via Moyabi Gabon 21.700 (Eng. Jap 1500–1700) heard at 1520 by John **Sadler** (Bishops Stortford) using a DX400 receiver plus indoor wire antenna; WYFR via Okeechobee, Florida 21.615 (Eng, Ger, It 1600–1900) 54444 at 1900 by **David Minter** (Portland) using a Toshiba RPF-11 portable with whip antenna.

Some of the broadcasts in a variety of languages to other areas were logged by DXers. During the morning, UAE Radio Dubai 21.700 (Ar, Eng to SE. Asia 0415–0600) was noted as 25323 at 0530 by Kenneth Reece; BRT Brussels, Belgium 21.815 (Du, Eng to Australia, SE. Asia 0730–0825) 34444 at 0800 by **David Wratten** (Cambridge); Radio Nederlands via Talata, Volon, Madagascar 21.485 (Du, Eng, Ind to SE. Asia 0700–1025) 55444 at 0830 by P. R. Guruprasad in Botswana; Radio Finland, Helsinki 21.550 (Fin, Sw, Eng to Australia, SE. Asia 0800–0925) SIO 434 at 0900 by **Cyril Kellam** (Sheffield); Radio Prague, Czechoslovakia 21.705 (Eng, Cz to SE. Asia 0730–0930) 44444 at 0911 by Leo Barr; Radio Sweden Stockholm 21.610 (Fr, Sw to SE. Asia, Australia 1000–1100) 34433 at 1028 by Darran Taplin; BBC via Rampisham, UK 21.710 (Eng to Africa 0900–1615) 44444 at 1025 by Dick Moon in S. Africa; Vatican Radio, Rome 21.485 (Fr, Eng, Port to Africa 1100–1220) 33323 at 1115 by John Nash.

Later, Radio RSA Johannesburg, S. Africa 21.535 (Eng to E. Africa, Middle East 1400–1600) was logged as SIO 344 at 1515 by David Middlemiss; Radio Austria Int, Vienna 21.490 (Ger, Fr to W. Africa 1500–1700) 55545 at 1540 by **Neil Dove** (Lockerbie); SRI Berne, Switzerland 21.630 (Eng, Fr, Ger to Middle East 1515–1700) 32232 at 1555 by Ian Bond; WCSN Scotts Corner, Maine 21.640 (Eng, Fr, Ger to Africa 1600–1755) SIO 534 at 1607 by **Alan Smith** (Northampton); Radio DW via Cyclops, Malta 21.680 (Ur, Hi, Eng to Asia 1430–1650) SIO 455 at 1646 by Kenneth Buck; WYFR via Okeechobee, Florida 21.525 (Eng, Ar, Fr, Port to Africa 1600–2000) SIO 222 at 1821 by Philip Rambaut; Radio Nederlands via Bonaire, Ned. Antilles 21.685 (Eng, Fr, Du to Africa 1830–2125) 35543 at 2025 by Neil Dove.

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

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

Generally good reception conditions have been evident in the **17MHz (16m)** band and the long distance paths from New Zealand, Australia and the Far East to the UK have often been open during the early morning.

Many listeners in the UK have experienced the thrill of hearing the broadcasts from Radio New Zealand, Wellington 17.705 (Eng to Pacific areas 2345–0145 and 0330–0730*) for the first time and some are now the proud owners of an RNZ QSL card! If you hear their broadcasts and require a QSL, it is important to note that RNZ request three IRCs with your reception report. (*2345–0730 Saturdays and Sundays.)

Most mornings, Kenneth Reece has been monitoring the RNZ transmissions from around 0400 until closedown at 0730 and the SINPO ratings in his log vary from 13211 to 45544. Using a Racal RA17L receiver with a multiband trap dipole, John Evans rated their signal as SIO 333 at 0530 and found their music easy listening. Their broadcasts have also been reaching S. Africa, a programme of Country and Western style music was clearly received by Dick Moon at 0430.

The 16m broadcasts from Radio Australia are monitored from 0400 on a daily basis by **George Hewlett** in Torquay. His latest report indicates that 17.715 via Carnarvon (Eng to S. Asia 0100–0915) is often jammed at 0700, but becomes audible around 0730**. 17.750 via Darwin (English, Chinese to E. Australia, C. Asia 0000–0900) is not heard very often and is usually jammed from 0600. 17.795 via Shepparton (Eng to Central Pacific, W. USA 2200–0630) is seldom heard. (**rated as 33333 at 0830 by David Wratten.)

Some of the broadcasts to Europe were noted: Radio Pakistan, Islamabad 17.660 (Ur, Eng 0715–1120) 44444 at 1100 by Sheila Hughes; Radio Surinam Int. Paramaribo via RNB Brasilia, Brazil 17.840 (Du, Eng 1700–1750) 42222 at 1740 by Alan Curry; Radio RSA Johannesburg, S. Africa 17.765 (Eng 1800–1900) SIO 344 at 1815 by Kenneth Buck; WYFR via Okeechobee, Florida 17.750 (Eng, Ger, Fr 1800–2045) SIO 434 by Philip Rambaut; VOFC via Okeechobee, Florida 17.845 (Chin, Fr 1900–2100) 55545 at 1908 by Neil Dove; Radio HCJB, Quito, Ecuador 17.790 (Cz, Ger, Eng, Fr 1800–2230) 33333 at 1929 by **Ciaran Fitzsimons** (Chertsey) using an SW-2000 receiver.

Numerous broadcasts in a variety of languages to other areas were logged. During the morning, Radio Japan via Yamata, Japan 17.810 (Eng, Jap to SE. Asia 0100–1100) was noted as 23323 at 0530 by Christian Pritchard;

DXers:
- A: Leo Barr, Sunderland.
- B: Alan Curry, Stockton-on-Tees.
- C: John Evans, Shawforth.
- D: Ciaran Fitzsimons, Chertsey.
- E: Francis Hearne, Ilford.
- F: Leslie Hollis, Grantham.
- G: Sheila Hughes, Morden.
- H: George Millmore, Wootton IOW.
- I: Christian Pritchard, Cambridge.
- J: Mark Selby, Aldershot.
- K: Tim Shirley, Bristol.
- L: Philip Townsend, London.
- M: Hugh Tyson, Winscombe.
- N: Neil Wheatley, Newcastle-upon-Tyne.
- O: Jim Willett, Grimsby.
- P: David Wratten, Cambridge.

KYOI Saipan, N. Marlana Islands 17.780 (Eng to E. Asia 0200–0800) SIO 333 at 0650 by Alan Smith; Radio DW via Wertachtal 17.845 (Ger to S. Asia 0600–1355) 44444 at 0748 by Alex Mackow while in Warsaw; SLBC Colombo, Srl Lanka 17.850 (Fr, Jap, Si to SE. Asia 1030–1130) 53344 at 1120 by P. R. Guruprasad in Botswana; Radio Moscow, USSR 17.590 (Eng to Middle East 0200–1200) SIO 434 at 1130 by

Sent in by Tim Shirley.

ADVERTISERS INDEX

SEEN & HEARD

Cyril Kellam; Vatican Radio, Rome 17.865 (Eng, Viet to SE. Asia 1200–1250) 43333 at 1200 by Sheila Hughes.

Later, SRI via Schwarzenburg, Switzerland 17.830 (Eng, Fr, It to E. Africa 1515–1700) was logged as SIO 555 at 1555 by Kenneth Buck; RTM Morocco 17.595 (Fr, Eng to N. Africa, Middle East 1400–1700) SIO 434 at 1600 by John Evans; RFI via Issoudun, France 17.620 (Fr, Eng to Africa 0600–1800) 44444 at 1611 by Leo Barr; RAI Rome, Italy 17.785 (So, It to E. Africa 1640–1745) heard by **Ron Pearce** using a one transistor receiver in Bungay; RTM Morocco 17.815 (Eng, Fr to N. Africa, Middle East 1700–1900) rated as 54544 at 1820 by John Nash; Radio Oman, Thumrait 17.735 (Ar to N. Africa, Middle East 0800–2130) 53333 at 1830 by Robert Cowell; VOA via Greenville, USA 17.640 (Port, Fr to W. Africa 1730–2230) SIO 444 at 1835 by Philip Rambaut; KVOH Van Nuys, California 17.775 (Sp, Eng to C. America 1530–0100) 24542 at 2045 by Neil Dove; REE Madrid, Spain 17.845 (Sp to S. America, Canada 1930–2245) 45554 at 2115 by **John Parry** (Northwich); RCI via Sackville, E. Canada 17.820 (Fr, Eng to Africa 2100–2200) 44444 at 2139 by David Wratten; VOA via Poro, Philippines 17.820 (Eng to E. Asia 2200–0100) 35444 at 2237 by **Richard Radford-Reynolds** using a Sangean ATS-803A portable in Southampton; Radio Nac. Columbia 17.835 (Sp to Columbia 1600–0600) 25444 at 0005 by David Wratten.

The **15MHz (19m)** broadcasts from Radio New Zealand and Radio Australia are not intended for listeners in the UK, but recently some of them have been reaching our shores at remarkable strength. Many other interesting signals from several continents have been logged on this band too.

The broadcasts from Radio New Zealand, Wellington 15.150 (Eng to Australia, Pacific Area 2345–0730) were logged at 0500 by Robert Cowell as 33333. Their transmissions have been monitored on a daily basis by Kenneth Reece and his ratings varied from 12422 to a remarkable 43443 around 0500.

Several frequencies are used by Radio Australia to reach their listeners via Shepparton, SE. Australia: 15.160 (Eng, Fr to C. Pacific Area 2100–0700) 24432 at 2103 by Neil Dove; 15.240 (Eng to S. Pacific Area 2100–0730) 44444 at 0725 by David Wratten; 15.315 (Fr, Eng to S. Africa 0500–0700) noted as poor by George Hewlett; 15.320 (Eng to Africa 0300–0500) seldom heard by George Hewlett; 15.395 (Eng to C. Pacific, W. USA 2100–0200) 33333 at 2230 by Robert Cowell.

Many broadcasts are beamed towards Europe at some time during the day. They include the Volce of Vietnam 15.010 (Eng, Russ, Viet, Fr, Sp 1600–2130) 54444 at 1600 by David Wratten; RNB Brasilia, Brazil 15.265 (Eng, Ger 1800–1950) noted as good by **Edward Broadsmith** (Worcester); Radio RSA Johannesburg, S. Africa 15.365 (Eng 1800–2100) SIO 433 at 1840 by Alan Smith; WRNO New Orleans, LA 15.420 (Eng 1700–2100) SIO 212 at 1853 by Philip Rambaut; UAE Radio Dubai 15.300 (Ar 1500–2050) SIO 454 at 1910 by Kenneth Buck; Radio Korea Seoul, S. Korea 15.575 (Ar, It, Eng, Sp, Port, Ger 1645–2300) 43333 at 1945 by David Minter; Radio HCJB Quito, Ecuador 15.270 (Fr, Ger, Eng 2000–2200) 44444 at 2146 by Darran Taplin; WINB Red Lion, PA 15.185 (Eng 2003–2245) 44444 at 2200 by David Wratten; RAE Buenos Aires, Argentina 15.345 (It, Sp, Ger, Eng 2015–2300) 22222 at 2205 by Alan Curry; Radio Kuwait, St. of Kuwait 15.505 (Ar 0700–0000) 45444 at 2227 by Richard Radford-Reynolds.

Some broadcasts to other areas were noted during the morning: UAE Radio Dubai 15.435 (Ar, Eng to N. America 0230–0400) 25333 at 0338 by Kenneth Reece; RCI Montreal, Canada 15.235 (FR, Eng to Middle East 0600–0700) SIO 232 at 0645 by David Middlemiss; Radio Japan Yamata, Japan 15.270 (Eng, Jap to Australia 0500–1000) SIO 533 at 0800 by Alan Smith; BBC via Kranji, Singapore 15.360 (Eng to SE. Asia 0400–1130) SIO 322 at 0835 by Philip Rambaut; Radio Finland, Helsinki 15.245 (Eng, Fin, Sw to Australia, SE. Asia 0930–1100) 43333 at 0930 by Sheila Hughes; Radio Portugal, Lisbon 15.265 (Port to Africa 0900–1900) noted as good at 1045 by Edward Broadsmith.

Later, Africa No. 1, Gabon 15.200 (Fr, Eng to W. Africa 0800–1655) was logged as 44333 at 1500 by Christian Pritchard; Radio Sweden, Stockholm 15.240 (Eng to Africa 1530–1600) 32222 at 1537 by Ian Bond; SRI via Schwarzenburg, Switzerland 15.430 (Eng, Fr, Ger to Middle East 1515–1700) 44354 at 1537 by Leo Barr; VOA via Colombo, Sri Lanka 15.395 (Eng to S. Asia 1400–1800) 22222 at 1700 by John Nash; Radio Sophia, Bulgaria 15.310 (Eng, Port, Fr to Africa 1530–2130) heard at 1830 by John Sadler; AIR via Bombay, India 15.360 (Eng to E. Africa 1800–2000) 44333 at 1920 by P. R. Guruprasad in Botswana; BBC via Ascension Island 15.400 (Eng to Africa 1500–2300) heard at 1952 by Ron Pearce using a one transistor receiver; KUSW Salt Lake City, Utah 15.650 (Eng to E. USA 1500–2200), heard at 2015 by John Sadler; VOA via Greenville, USA 15.410 (Eng to W. Africa 1600–2200) 34333 at 2021 by Ciaran Fitzsimons; Radio DW via Kigali, Rwanda 15.270 (Ger to W. Africa, N. America 2200–0250) 23432 at 2157 by Darran Taplin; Radio DW via Antigua, W. Indies 15.410 (Ger to S. America 2200–0150) 45554 at 2200 by John Parry.

Although many of the broadcasts in the **13MHz (22m)** band are beamed to other areas, they are often good signals here too. Noted in the logs were Radio DW via Julich, W. Germany 13.790 (Eng, Fr to Africa 0600–0750), rated as 33443 at 0610 by Kenneth Reece; SRI via Sottens, Switzerland 13.685 (It, Eng, Ger, Fr to Australia, Pacific Area 0745–1030) 44444 at 1000 by Sheila Hughes; WCSN Scotts Corner, MA 13.760 (Eng, Fr, Ger to Europe 1400–1555) 55444 at 1410 by David Wratten; Radio Austria Int, Vienna 13.730 (Ger, Fr, Eng, Sp to Europe 0700–1700) heard at 1450 by **Julian Wood** (Buckie) using a Trio R1000 receiver; RBI via Leipzig, GDR 13.610 (Swa, Eng to E. Africa 1745-1915) 45544 at 1815 by Neil Dove; WYFR via Okeechobee, Florida 13.680 (Fr, Eng to E. USA 1200–2245) SIO 243 at 2000 by Kenneth Buck; WHRI South Bend, IN 13.760 (Eng to E. USA, Europe 1500–2100) 53333 at 2000 by David Minter; WRNO New Orleans, LA 13.760 (Eng to E. USA, Europe 2100–0000) 33433 at 2130 by Christian Pritchard; Radio Vilnius, Lithuania 13.645 (Eng, Li to W. USA 2300–0130) 34333 at 2300 by David Wratten.

The conditions prevailing in the **11MHz (25m)** band have enabled DXers to log a number of broadcasts from distant locations during the day, but the early morning transmissions to Europe and the S. Pacific Area from Radio Australia via Shepparton 11.910 (Eng to ?????? 0400–0630) are being

Freq MHz	Station	Country	UTC	DXer
2.470	R. Cacique	Brazil	2300	N
2.485	ABC Katherine	Australia	2130	N
3.200	TWR	Swaziland	0115	N
3.215	R. Orange	S. Africa	0200	K,N,Q
3.230	ELWA Monrovia	Liberia	2200	Q
3.230	R. RSA	S. Africa	2055	K
3.260	ORTN Niamey	Niger	2200	Q
3.270	SWABC 1, Namibia	S.W. Africa	2145	K,N
3.310	PBS Jilin, Changchun	China	2200	Q
3.365	GBC Radio 2	Ghana	1835	L,Q
3.395	R. Zaracay	Ecuador	0315	Q
3.400	Reykjavik	Iceland	1856	L
3.905	AIR Delhi	India	1655	I,Q
3.915	BBC Kranji	Singapore	2040	F,H,L,Q
3.955	BBC Daventry	England	1945	B,D,E,P
3.955	R. Orion	S. Africa	2200	K
3.965	RFI Paris	France	2000	K
3.975	BBC Skelton	England	1950	H
3.980	VOA Munich	W. Germany	1845	A,E,P
3.985	R. Beijing, China	via SRI Berne	2200	B,E,P
3.985	SRI Berne	Switzerland	2040	H
3.990	RFE Munich	W. Germany	2330	P
3.995	DW Cologne	W. Germany	2040	B,H,K,P
4.050	R. Frunze	USSR	2300	Q
4.050	R. Moscow	USSR	2000	K
4.060	R. Moscow Kharkov	USSR	1945	H
4.080	R. Ulan Bator	Mongolia	2200	Q
4.650	R. Santa Ana	Bolivia	0200	Q
4.735	Xinjiang	China	2300	N,P
4.740	R. Afghanistan	via USSR	1915	E
4.750	R. Bertoura	Cameroon	1730	H
4.775	Caracol Neiva	Colombia	0320	M,Q
4.755	Sani Radio	Honduras	0130	N
4.760	ELWA Monrovia	Liberia	2105	K,M
4.760	R. Afghanistan	via USSR	1750	J,Q
4.765	R. Moscow	via Cuba	0604	M
4.770	FRCN Kaduna	Nigeria	2100	E,H,K,M,Q
4.775	R. Gabon, Libreville	Gabon	1940	H,Q
4.775	RRI Jakarta	Indonesia	1604	C
4.785	RTM Bamako	Mali	2200	H
4.790	R. Atlantida	Peru	0230	N
4.790	Azad Kashmir Pakistan		2000	Q
4.795	R. Moscow	USSR	2207	B,M
4.800	LNBS Lesotho	Maseru	1915	K
4.805	R. Nac. Amazonas	Brazil	0050	Q
4.810	R. Yerevan	USSR	2040	H
4.815	R. diff TV Burkina	Ouagadougou	2040	H,Q
4.820	R. Botswana	Botswana	1830	H,K,Q

Freq MHz	Station	Country	UTC	DXer
4.820	La Voz Evangelica	Honduras	0400	N
4.830	Africa No. 1	Gabon	2000	A,E,G,H,K,M,O,P,Q
4.830	R. Tachira	Venezuela	0200	K,Q
4.832	R. Reloj	Costa Rica	0100	N,Q
4.835	RTM Bamako	Mali	2200	A,E,H,M,P
4.845	R. Nacional, Manus	Brazil	0135	Q
4.845	ORTM Nouakchott	Mauritania	2145	H,Q
4.850	R. Capital, Caracus	Venezuela	0400	K,M
4.865	PBS Lanzhou	China	2200	B,H,Q
4.870	R. Cotonou	Benin	2145	E,H,M,Q
4.875	Uraisk	USSR	2130	H,M
4.880	SABC Radio 5	S. Africa	1840	G,K,N,Q
4.890	ORTS Dakar	Senegal	0615	M
4.895	R. Ashkabad	USSR	2040	B,H
4.895	R. Moscow, Kalinin	USSR	1900	E
4.905	R. Nat. N'djamena	Chad	2150	E,H,M,Q
4.910	Voz d. Mosquitia	Honduras	0230	Q
4.910	R. Zambia, Lusaka	Zambia	2100	Q
4.915	R. Ghana, Accra	Ghana	2130	H
4.920	AIR Madras	India	1648	C
4.920	ABC Brisbane	Australia	2145	N
4.920	R. Nat. N'djamena	Chad	2200	H
4.930	R. Moscow, Ashkhabad	USSR	2040	H
4.930	RRI Surakarta, Java	Indonesia	0015	Q
4.940	R. Kiev	USSR	2040	A,E,G,H,M
4.970	R. Rumbos, Caracas	Venezuela	0300	Q
4.975	R. Dushanbe	USSR	1610	C
4.980	Ecos del Torbes	Venezuela	0145	N,Q
4.990	R. Ancash, Huaraz	Peru	0320	Q
4.990	FRCN Lagos	Nigeria	2230	K,M
4.990	R. Yerevan	USSR	2100	E,H
4.995	R. Andina, Huancayo	Peru	0405	Q
5.005	R. Nacional, Bata	Eq. Guinea	2050	H
5.010	R. Garoua	Cameroon	2100	H,M
5.015	R. Lesotho	Maseru	1800	D
5.025	R. Parakou	Benin	0500	Q
5.030	R. Impacto	Costa Rica	0530	M,N
5.035	R. Alama Ata	USSR	0045	M,P
5.035	R. Bangui	C. Africa	2245	N
5.040	R. Tbilisi	USSR	1850	G,H
5.045	R. Cultura do Para	Brazil	0030	N,Q
5.045	R. Togo, Lome	Togo	0528	M
5.050	R. Tanzania	Tanzania	1654	C
5.057	R. Tirana Gjirokaster	Albania	2050	E,H,M,P
5.060	PBS Xinjiang	China	2300	Q
5.065	R. Candip, Bunia	Zaire	2120	Q
5.095	R. Sutatenza, Bogata	Colombia	0020	K,Q
5.570	R. Nueva Bida	Colombia	0120	Q

DXers:

A: Robert Cowell, Blackpool.
B: Alan Curry, Stockton-on-Tees.
C: David Edwardson, Wallesend.
D: P. R. Guruprasad, Botswana.
E: Sheila Hughes, Morden.
F: David Middlemiss, Eyemouth.
G: John Nash, Brighton.
H: Fred Pallant, Storrington.
I: John Parry, Northwich.
J: Roy Patrick, Derby.
K: Christian Pritchard, Cambridge.
L: Philip Rambaut, Macclesfield.
M: Kenneth Reece, Prenton.
N: Tim Shirley, Bristol.
O: Alan Smith, Northampton.
P: Neil Wheatley, Newcastle-upon-Tyne.
Q: Jim Willett, Grimsby.

SEEN & HEARD

badly hit by jamming. At best, George Hewlett rated their signal as SIO 433 around 0600.

The more distant broadcasts noted in the logs stemmed from FEBC Manila, Philippines 11.850 (Eng to China, SE. Asia 0400 – 0930) 33222 at 0830 by John Nash; KYOI Siapan, N. Mariana Islands 11.900 (Eng to E. Asia 0800 – 1600) SIO 222 at 1135 by Phllip Rambaut; VOA via Poro, Phllippines 11.715 (Eng, In to Australia, SE. Asia 1100 – 1430) 34333 at 1235 by John Nash; BBC via Kranji, Singapore 11.750 (Eng to S. Asia 1030 – 1615) SIO 322 at 1605 by Alan Smith; Radio Beijing, China 11.600 (Eng to S. Asia, Africa 1400 – 1755) noted as good at 1630 by Edward Broadsmith; KLNS Anchor Point, Alaska 11.650 (Eng to E. Asia, Pacific Area 1800 – 1900) SIO 322 at 1835 by Philip Rambaut; Voice of Vietnam, Hanoi 12.020 (Eng, Russ, Viet to Europe 1600 – 2130) 44333 at 1924 by Richard Radford-Reynolds; RHC Habana, Cuba 11.795 (Eng, Fr to Europe 1830 – 2140) SIO 333 at 2000 by Cyril Kellam; KFBS Saipan, N. Mariana Islands 12.025 (Chin to C. Asia 2200 – 0000) 15442 at 2200 by Richard Radford-Reynolds; AIR via Aligarth, India 11.620 (Eng to Europe 1845 – 2230) 55555 at 2216 by Darran Taplin; Radio Japan via Moyabi, Gabon 11.800 (Jap, Eng to Europe, Africa 2200 – 0000) 32323 at 2300 by Alan Curry.

The **9MHz (31m)** broadcasts from Radio Australia to Europe and the S. Pacific Area via Shepparton 9.655 (Eng 0700 – 1000) are now being received well in the UK. Last month, George Hewlett mentioned that Radio HCJB Quito, Ecuador had extended their co-channel broadcast until 0830, but they have now reverted to 0800. Radio Australia's transmission now rates as SIO 434 at 0800 and peaks 444 by 0830, but falls to 433 by 0945. George noted their transmission to C. Pacific and N. USA via Sheparton 9.580 (Eng 0800 – 2130) as 433 at 0800, but it generally fades out before 1000. In contrast their transmission to SE. Asia via Shepparton 9.770 (Eng 1000 – 1100) peaks 434 at 1000.

The broadcasts from Radio New Zealand, Wellington 9.850 (Eng to Australia 0900 – 1115) have also been reaching the UK during the morning. Kenneth Reece has been monitoring them on Saturdays and Sundays and he has observed wide variations in signal rating, ranging from 14433 to 35444. Their signals usually fade out by 1100.

Listening in Aldershot at 0835, **Mark Selby** picked up a broadcast to Australia, S. Pacific by Radio HCJB Quito, Ecuador 9.745 (Eng 0700 – 1030). A broadcast in Armenian from TWR Monte Carlo, Monaco 9.435 (Arm to Middle East 1930 – 1945) may be of interest if you make language identification recordings. **Graham Johnson** (Coventry) rated it as 33333 at 1930.

Some of the long distance signals noted in the **7MHz (41m)** band stem from WYFR via Okeechobee, Florida 7.355 (Eng to Europe 0400 – 0745) 444 at 0743 by Philip Rambaut; WCSN Scotts Corner, Maine 7.365 (Eng, Fr, Ger to Europe 0600 – 0755) SIO 544 at 0735 by Alan Smith; WHRI South Bend, Indiana 7.355 (Eng to Europe 0800 – 1100) 35444 at 0900 by David Wratten; Radio Australia via Carnarvon 7.205 (Eng to S. Asia, Europe 1430 – 2030) SIO 253 at 1430 by Kenneth Buck; Radio Beijing, China 7.800 (Chin, Fr to W. Europe, N. Africa 1730 – 2225) 44453 at 2100 by John Parry; Radio Bangladesh, Dacca 7.505 (Eng, Beng to Europe 1815 – 2000) 23222 at 1825 by John Nash; AIR via Delhi, India 7.410 (Eng to Europe 1845 – 2230) heard at 2006 by Ron Pearce using a one transistor (2N3819) receiver; Radio Korea, Seoul, S. Korea 7.550 (Ger, Eng, Fr, Sp, Port to E. Africa, Middle East 1945 – 2345) SIO 322 at 2000 by Alan Smith.

Many of the broadcasts to Europe in the **6MHz (49m)** band stem from stations in Europe and Scandinavia. They include Radio Austria Int, Vienna 6.155 (Ger, Eng, Fr, Sp 0400 – 2300) 53544 at 1843 by John Nash; RFI via Allouis, France 6.175 (Fr, Eng 0500 – 2200) 53545 at 1600 by **Ken Whayman** (Bexleyheath) using a Saisho SW 2000 receiver with built-in whip antenna; Radio Sweden via Karlsborg 6.065 (Sw, Sp, Pol, Russ, Fr, Ger, Eng 1600 – 2230) 43444 at 2108 by Ian Bond; Radio Prague, Czechoslovakia 6.055 (Ger, It, Fr, Cz 1700 – 2300) 54555 at 2200 by Ken Whayman; Radio Finland, Helsinki 6.120 (Eng, Fr, Ger, Fin 1930 – 2100) 34232 at 1946 by Ciaran Fitzsimons; Radio Polonia, Warsaw 6.135 (Ger, Fr, Eng 2100 – 2355) 54444 at 2230 by Sheila Hughes; SRI via Schwarzenburg, Switzerland 6.190 (Eng 2230 – 2300) 54444 at 2256 by David Wratten.

Abbreviations

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

WHAT SCANNER

Regency MX7000 Monitor Scanner

- *COVERAGE:* 25 to 550MHz continuous, 800MHz to 1.3GHz
- *MODES:* a.m., n.b.f.m., w.b.f.m.
- *SENSITIVITY:* n.b.f.m. = 0.4μV at 12dB SINAD; w.b.f.m. = 1.0μV at 12dB SINAD; a.m. = 0.8μV at 10dB s/n
- *SELECTIVITY:* n.b.f.m. ±7.5kHz at 6dB; w.b.f.m. = ±50kHz at 6dB; a.m. = ±5kHz at 6dB
- *RESOLUTION:* 5, 12.5 and 25kHz
- *IMAGE REJECTION:* – 50dB
- *IF STAGE:* 750 MHz, 45.03MHz, 5.5MHz, 455kHz
- *AUDIO OUTPUT:* 1W at 10% distortion
- *SCAN RATE:* 5 channels per second
- *SEARCH RATE:* 6 seconds per MHz
- *MEMORIES:* 20
- *FEATURES:* Tuning dial as well as keypad, priority channel, mains adaptor and mounting bracket available as extras
- *REVIEWED:*
- *PRICE:* £399

Bearcat 100FB Handheld Scanner

- *COVERAGE:* 66 – 88MHz, 138 – 174MHz, 406 – 512MHz
- *MODES:*
- *SENSITIVITY:* For 12dB SINAD. 66 – 88MHz = 0.6μV; 138 – 174MHz = 0.6μV; 406 – 512MHz = 1μV
- *SELECTIVITY:* 50dB @ ±25kHz
- *RESOLUTION:* 5, 12.5kHz
- *IMAGE REJECTION:*
- *IF STAGE:*
- *AUDIO OUTPUT:* 300mW
- *SCAN RATE:* 15 channels per second
- *SEARCH RATE:* 15 channels per second
- *MEMORIES:* 16
- *FEATURES:*
- *REVIEWED:* Practical Wireless September 1982 (£1.30)
- *PRICE:* Available second-hand

Regency HX850E Handheld Scanner

- *COVERAGE:* 75–106MHz or 60–90MHz, 118–136MHz, 136–175MHz, 406–496MHz
- *MODES:* a.m., n.b.f.m.
- *SENSITIVITY:* v.h.f. f.m. = 0.7μV at 12dB SINAD, u.h.f. f.m. = 1.0μV at 12dB SINAD; v.h.f. a.m. = 1.0μV at 10dB s/n
- *SELECTIVITY:* f.m./a.m. ±7.5kHz at 6dB
- *RESOLUTION:* 5, 10 and 12.5kHz
- *IMAGE REJECTION:*
- *IF STAGE:* 21.4MHz, 455kHz
- *AUDIO OUTPUT:* 10mW, 10% or less t.h.d.
- *SCAN RATE:* 12 channels per second
- *SEARCH RATE:* u.h.f. = 7 sec per MHz; v.h.f. 9 seconds per MHz
- *MEMORIES:* 20
- *FEATURES:* NiCads, flexible antennas and 240V charger supplied
- *REVIEWED:*
- *PRICE:* £280

Yaesu FRG-9600 VHF/UHF Scanner

- *COVERAGE:* 60-905MHz (up to 460MHz for s.s.b.)
- *MODES:* n.b.a.m., w.b.a.m., n.b.f.m., w.b.f.m., s.s.b.
- *SENSITIVITY:* At 435MHz 12dB SINAD n.b.f.m. 0.35μV. At 435MHz 10dB S+N/N n.b.f.m. 0.51μV. At 435MHz 15dB S+N/N s.s.b. 0.38μV
- *SELECTIVITY:*
- *RESOLUTION:* 100Hz, 1, 5, 10, 12.5, 25, 100kHz
- *IMAGE REJECTION:* At 145MHz – 39dBm
- *IF STAGE:*
- *AUDIO OUTPUT:* 1W into 8Ω
- *SCAN RATE:*
- *SEARCH RATE:*
- *MEMORIES:* 100
- *FEATURES:* 0.6m whip antenna, mobile mounting bracket, wire stand, 1.8m d.c. power cord.
- *REVIEWED:*
- *PRICE:* £525

Realistic PRO-32 Programmable Handheld Scanner

- *COVERAGE:* 68 to 88MHz, 108 to 136MHz (a.m.), 138 to 174MHz, 380 to 512MHz.
- *MODES:* a.m., f.m.
- *SENSITIVITY:* (a.m. 20dB signal-to-noise at 60% modulation). 108 – 136MHz = 2μV; (f.m. 20dB signal-to-noise at 3kHz deviation). 68 – 88MHz = 0.6μV; 138 – 174MHz = 1μV; 380 – 512MHz = 1μV
- *SELECTIVITY:* – 6dB @ ±9kHz, – 60dB @±15MHz
- *RESOLUTION:* 5, 12.5 or 25kHz
- *IMAGE REJECTION:*
- *IF STAGE:* 455kHz, 10.7MHz
- *AUDIO OUTPUT:* 300mW
- *SCAN RATE:* 4 and 8 channels per second
- *SEARCH RATE:* 4 and 8 channels per second
- *MEMORIES:* 200
- *FEATURES:*
- *REVIEWED:* Short Wave Magazine November 1987 (£1.45)
- *PRICE:* £239.95

Realistic PRO-38 Handheld Scanner

- *COVERAGE:* 68 – 88, 136 – 174, 406 – 512MHz
- *MODES:* f.m.
- *SENSITIVITY:* 68 – 88MHz = 0.5μV normal, 2μV limit; 136 – 174MHz = 0.7μV normal, 3μV limit; 406 – 512MHz = 0.7μV normal, 4μV limit
- *SELECTIVITY:* At 155MHz. – 6dB = ±10kHz, – 50dB = ±17kHz
- *RESOLUTION:*
- *IMAGE REJECTION:*
- *IF STAGE:*
- *AUDIO OUTPUT:* nominal 260mW
- *SCAN RATE:* 10 channels per second
- *SEARCH RATE:*
- *MEMORIES:* 10
- *FEATURES:* Keyboard lock switch, l.c.d. channel readout, jack for earphone, belt clip and flexible antenna supplied
- *REVIEWED:*
- *PRICE:* £129.95

Uniden Bearcat 70XL Handheld Scanner

- *COVERAGE:* 29 – 54, 135 – 174, 406 – 512MHz
- *MODES:* f.m.
- *SENSITIVITY:* 29 – 54MHz = 0.4μV, 136 – 174MHz = 0.5μV, 406 – 512MHz = 0.7μV
- *SELECTIVITY:* – 55dB @ ±25kHz
- *RESOLUTION:* 5kHz
- *IMAGE REJECTION:* – 50dB
- *IF STAGE:* 10.8MHz
- *AUDIO OUTPUT:* 140mW at 10% t.h.d. into 8Ω
- *SCAN RATE:* 15 channels per second
- *SEARCH RATE:* 15 channels per second
- *MEMORIES:* 20
- *FEATURES:*
- *REVIEWED:*
- *PRICE:* £199.99

Uniden Bearcat 50XL Handheld Scanner

- *COVERAGE:* 29 – 54, 136 – 174, 406 – 512MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* For 12dB SINAD. 29 – 54MHz = 0.4μV; 136 – 174MHz = 0.5μV; 406 – 512MHz = 0.7μV
- *SELECTIVITY:* – 55dB ±25kHz
- *RESOLUTION:* 5kHz
- *IMAGE REJECTION:* – 50dB
- *IF STAGE:* 10.8MHz
- *AUDIO OUTPUT:* 500mW at 10% t.h.d. in 8Ω
- *SCAN RATE:* 15 channels per second
- *SEARCH RATE:* 15 channels per second
- *MEMORIES:* 10
- *FEATURES:*
- *REVIEWED:*
- *PRICE:* £99.99

Uniden Bearcat 100XL Handheld Scanner

- *COVERAGE:* 66 – 88, 118 – 174, 406 – 512MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* For 12dB SINAD. 30 – 50MHz = 0.3μV; 118 – 136MHz = 0.8μV; 136 – 174MHz = 0.4μV; 406 – 512MHz = 0.5μV
- *SELECTIVITY:* 50dB at ±25kHz
- *RESOLUTION:* 5kHz
- *IMAGE REJECTION:* – 50dB
- *IF STAGE:* 10.8MHz
- *AUDIO OUTPUT:* 300mW at 10% t.h.d.
- *SCAN RATE:* 15 channels per second
- *SEARCH RATE:* 25 frequencies per second
- *MEMORIES:* 16
- *FEATURES:* Priority channel, keyboard lock, auto squelch and battery low indicator
- *REVIEWED:*
- *PRICE:* £189.99

WHAT SCANNER

JIL SX-200N Monitor Scanner

- *COVERAGE:* 26 to 88MHz, 108 to 180MHz, 380 to 514MHz
- *MODES:* a.m., n.b.f.m.
- *SENSITIVITY:* f.m. = >60dB at ±25kHz: a.m. = >60dB at ±10kHz
- *SELECTIVITY:* 26 — 180MHz f.m. = 0.4μV at 12dB s/n: 380 — 514MHz = 1.0μV at 12dB s/n: 26 — 180MHz a.m. = 1.0μV at 10dB s/n: 380 — 514MHz a.m. = 2.0μV
- *RESOLUTION:* 5, 12.5kHz
- *IMAGE REJECTION:*
- *IF STAGE:* 10.7MHz 455kHz
- *AUDIO OUTPUT:* 2 watts
- *SCAN RATE:* 4 and 8 channels per second
- *SEARCH RATE:* 5 and 10 channels per second
- *MEMORIES:* 16
- *FEATURES:*
- *REVIEWED:* Practical Wireless October 1981 (£1.30)
- *PRICE:* £325

AOR AR2002 Monitor Scanner

- *COVERAGE:* 25 to 550MHz, 800 to 1300MHz
- *MODES:* a.m., n.b.f.m., w.b.f.m.
- *SENSITIVITY:* n.b.f.m. = 0.3μV (12dB SINAD): w.b.f.m. = 1.0μV (12dB SINAD): a.m. = 0.5μV (10dB s/n)
- *SELECTIVITY:* n.b.f.m. = ±7.5kHz at 6dB: w.b.f.m. = ±250kHz at 60dB: a.m. = ±10kHz at 70dB
- *RESOLUTION:* 5, 12.5 or 25kHz steps
- *IMAGE REJECTION:* – 50dB
- *IF STAGE:* 750MHz, 45.03MHz (w.f.m.), 455kHz (n.f.m./a.m.)
- *AUDIO OUTPUT:* 1W at <10% distortion
- *SCAN RATE:* 5 channels per second
- *SEARCH RATE:* 6 seconds per MHz
- *MEMORIES:* 20
- *FEATURES:* Tuning knob in addition to key pad and computer control facilities
- *REVIEWED:* Practical Wireless December 1985 (75p)
- *PRICE:* £487

AOR AR2001 Communications Scanner

- *COVERAGE:* 25 — 550MHz
- *MODES:* a.m., n.b.f.m., w.b.f.m.
- *SENSITIVITY:* At 70MHz. Input signal for 12dB SINAD n.b.f.m. = 0.39μV; Input signal for 10dB S + N/N a.m. = 1.35μV.
- *SELECTIVITY:* n.b.f.m. = 13kHz @ 6dB, 21kHz @ 70dB; w.b.f.m. = 180kHz @ 6dB, 446kHz @ 70dB; a.m. = 13.5kHz at 6dB.
- *RESOLUTION:* 5, 12.5, 25kHz
- *IMAGE REJECTION:* – 50dB
- *IF STAGE:* 750MHz & 455kHz
- *AUDIO OUTPUT:* 1W at 10% distortion
- *SCAN RATE:* 5 channels per second
- *SEARCH RATE:* 6 seconds per MHz
- *MEMORIES:* 20
- *FEATURES:* Good coverage of v.h.f. and u.h.f. airband
- *REVIEWED:* Practical Wireless May 1984 (£1.30)
- *PRICE:* Available in limited quantities on special production runs. Apply Lowe Electronics.

Uniden Bearcat UBC-175XL Base Station Scanner

- *COVERAGE:* 66 — 88, 118 — 174, 406 — 512MHz
- *MODES:* a.m., f.m.
- *SENSITIVITY:* For 12dB SINAD. 29 — 54MHz = 0.3μV: 118 — 136MHz = 0.8μV: 136 — 174MHz = 0.3μV: 406 — 512 MHz = 0.5V
- *SELECTIVITY:* – 45dB at ±25kHz
- *RESOLUTION:* 5kHz
- *IMAGE REJECTION:* – 55dB
- *IF STAGE:* 10.85MHz & 450kHz
- *AUDIO OUTPUT:* 800mW at 10% t.h.d.
- *SCAN RATE:* 5 and 15 channels per second
- *SEARCH RATE:* 5 and 15 channels per second
- *MEMORIES:* 16
- *FEATURES:* Channel lockout, auto squelch, priority channel and short term memory back-up
- *REVIEWED:* Short Wave Magazine December 1987 (£1.45)
- *PRICE:* £179.99

Realistic PRO-2004 Programmable Scanner

- *COVERAGE:* Continuous 25 to 520MHz, 760 to 1300MHz
- *MODES:* a.m., w.b.f.m., n.b.f.m.
- *SENSITIVITY:* (w.b.f.m. 30dB signal to noise at 22.5kHz dev). 25 — 520MHz = 3μV; 760 — 1100MHz = 3μV; 1100 — 1300MHz = 10μV. (n.b.f.m. 20dB signal to noise at 3kHz dev). 25 — 520MHz = 0.5μV; 760 — 1100MHz = 0.3μV; 1100 — 1300MHz = 3μV. (a.m. 20dB signal to noise at 60% mod). 25 — 520MHz = 2μV; 760 — 1100MHz = 2μV; 1100 — 1300MHz = 3μV
- *SELECTIVITY:* (n.b.f.m & a.m.) ±9kHz @ – 6dB, ±15kHz @ – 50dB; (w.b.f.m.) ±150kHz @ – 6dB, ±300kHz @ – 50dB
- *RESOLUTION:* 5, 12.5 or 50kHz
- *IMAGE REJECTION:* – 60dB
- *IF STAGE:* 611.5 — 607.505MHz, 48.5MHz, 455kHz (a.m.)
- *AUDIO OUTPUT:* 1.8W @ 3% t.h.d.
- *SCAN RATE:* 8 and 16 steps per second
- *SEARCH RATE:* 8 and 16 steps per second
- *MEMORIES:* 300
- *FEATURES:* Lock-out key, squelch, priority function key and large l.c.d. readout.
- *REVIEWED:* Short Wave Magazine April 1987 (£1.45)
- *PRICE:* £329.95

Revco RS-2000E Monitor Scanner

- *COVERAGE:* 60 to 179MHz, 380 — 520MHz
- *MODES:* a.m., n.b.f.m.
- *SENSITIVITY:* 0.5μV v.h.f. f.m., 1.0μV u.h.f. f.m.
- *SELECTIVITY:* – 60dB at ±25kHz
- *RESOLUTION:* 5kHz
- *IMAGE REJECTION:*
- *IF STAGE:*
- *AUDIO OUTPUT:* 2W
- *SCAN RATE:* 5 or 10 channels per second
- *SEARCH RATE:* 5 or 10 channels per second
- *MEMORIES:* 70
- *FEATURES:* Auto search and store.
- *REVIEWED:*
- *PRICE:* £279

JIL SX-400 Monitor Scanner

- *COVERAGE:* 26 to 520MHz continuous (100kHz to 1.4GHz with converters)
- *MODES:* a.m., n.b.f.m., w.b.f.m.
- *SENSITIVITY:* v.h.f. f.m. = 0.5μV at 12dB s/n: v.h.f. a.m. = 1.0μV at 10dB s/n: u.h.f. f.m. = 0.5μV at 12dB s/n: u.h.f. a.m. = 2.0μV at 10dB s/n
- *SELECTIVITY:* 60dB at ±15kHz (f.m.), 60dB at ±10kHz (a.m.). s/n ratio: 45dB
- *RESOLUTION:* 5, 6.25, 10, 12.5kHz
- *IMAGE REJECTION:* 50dB (v.h.f.)
- *IF STAGE:* 10.7MHz, 455kHz
- *AUDIO OUTPUT:* 2W (4Ω load)
- *SCAN RATE:* 4 and 8 channels per second
- *SEARCH RATE:* 5 and 10 channels per second
- *MEMORIES:* 20
- *FEATURES:*
- *REVIEWED:*
- *PRICE:* £650

Saiko SC-1600 Mobile Monitor Scanner

- *COVERAGE:* 10MHz within 65 to 90MHz, 20MHz within 130 to 175MHz, 30MHz within 390 to 500MHz
- *MODES:* n.b.f.m.
- *SENSITIVITY:* 1.0μV for 10dB s/n
- *SELECTIVITY:* ±15kHz at 50dB, ±7kHz at – 6dB
- *RESOLUTION:* 5kHz
- *IMAGE REJECTION:* – 40dB
- *IF STAGE:* 10.7MHz, 455kHz
- *AUDIO OUTPUT:* 1.5W at 10% distortion
- *SCAN RATE:*
- *SEARCH RATE:*
- *MEMORIES:* 16
- *FEATURES:* Squelch, delay key, l.c.d. channel display, d.c. power cable and mounting bracket supplied
- *REVIEWED:*
- *PRICE:* £159.95

Realistic PRO-2021 Programmable Scanner

- *COVERAGE:* 68 to 88MHz, 108 to 136MHz, 138 to 174MHz, 380 to 512MHz.
- *MODES:* a.m., f.m.
- *SENSITIVITY:* 66 — 88MHz = 1μV; 108 — 136MHz = 2μV; 138 — 174MHz = 1μV; 380 — 512MHz = 1μV
- *SELECTIVITY:* – 6dB @±9kHz. – 50dB @15kHz
- *RESOLUTION:* 5, 12.5 and 25kHz
- *IMAGE REJECTION:*
- *IF STAGE:* 10.7MHz, 455kHz
- *AUDIO OUTPUT:* 300mW
- *SCAN RATE:* 4 and 8 channels per second
- *SEARCH RATE:*
- *MEMORIES:* 200
- *FEATURES:* Easy-to-read l.c.d. readout, squelch control, mobile mounting bracket included, sockets for external antenna, speaker and tape recorder
- *REVIEWED:*
- *PRICE:* £219.95

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