Short Wave Magazine

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MARCH 1989

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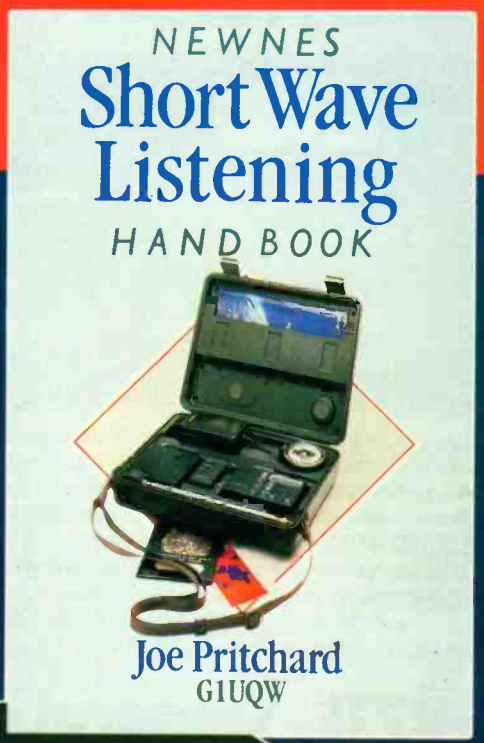

BEARCAT 800XLT BASE STATION SCANNER REVIEWED

For The Radio Listener

ICOM

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

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

IC-R71E, General coverage receiver.

The ICOM IC-R71E 100KHz to 30MHz general coverage receiver features keyboard freqency entry and infra-red remote controller (optional) with 32 programmable memory channels, SSB, AM, RTTY, CW and optional VFOs 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 3 MARCH 1989
ON SALE FEBRUARY 23rd

APRIL ISSUE ON SALE
MARCH 23

|20| **Uniden-Bearcat 800XLT scanning receiver reviewed.**

Cover Jack Aldridge puts this base station scanning receiver through its paces and was impressed with some of its qualities.

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CONTENTS

Short Wave Magazine

REGULARS

SEEN & HEARD

GOOD LISTENING

FIRST WORD

In the "Word in Edgeways" section this month I have taken the unusual step of publishing a letter from a dealer complaining about a review, published in *SWM*, of a piece of radio equipment which he sells. To balance out the complaint I have also included a reply from the reviewer.

Reviews of any piece of technical equipment, be it radio, photographic or cars, must be subject to the views and ideas of the reviewer. In an ideal world the reviewer would be totally impartial, but in practice this is not so - each reviewer has his own likes and dislikes as well as his own fingers, eyes, and ears. My brief to each reviewer is to be as fair and impartial as possible while trying to give readers a true summary of the important features and drawbacks of the equipment.

In many cases we put the subject of the review through our own well equipped laboratory to measure its performance. However, this can lead to a very "dry" and uninteresting review which is totally incomprehensible to most readers,and I try to strike a balance for *SWM* reviews.

However, one thing is common to all our reviews. No matter how simple or complex the item, the reviewer actually tries to use it under genuine operating conditions. If he finds problems with it, what am I supposed to do - ignore it in case it offends the supplier, or publish and be damned? If the findings are so bad that the equipment represents a complete waste of money, fails to do the job for which it is being sold or is dangerous, we would return it to the supplier explaining what, in our opinion, is wrong with it and scrap the review. From experience on our sister magazine, *Practical Wireless*, we know that where this policy has been implimented the equipment concerned has been modified, withdrawn from sale or sold off at a greatly reduced price.

In some instances when we have commented on certain features which detract from the use of the equipment, it would appear that the manufacturers have taken notice and modified the design to overcome the problems. Often this only comes to light when readers who have bought latter versions write to me complaining that the review was unfair to the unit as their model doesn't exhibit the same problems as our review sample.

As Editor I have to try to provide my readers with a balanced magazine. I have manufacturers and suppliers of radio equipment queueing up to get their latest pride and joy reviewed - a situation that I hope will not change in the future.

DICK GANDERTON

A WORD IN EDGEWAYS

Sir

I was very interested to read the article by Peter Rouse (SWM January 1989 page 18) on modifications to the Revco Discone ("Revcone").

In response to popular demand, the N-type socket option is now available.

I have no criticism of Peter's modification, but I must sound a note of caution: we use brass screws in the aluminium head. This mixture of metals can be bad news as regards electro-chemical corrosion, but we get away with it because we are careful with our waterproofing treatment.

Anyone carrying out the modification, and intending to use the antenna outdoors should adopt the following procedure: lightly coat the nylon washer on both sides with silicone grease or Vaseline (NOT motor grease) and re-assemble.

Clean all grease from the outside metal work with paint thinners or petrol, then finish with two coats of good quality,exterior grade, polyurethane varnish.

Before fitting the elements, apply a small amount of Vaseline to the threads to prevent seizing when they are screwed into the head.

P. E. LONGHURST
MANAGING DIRECTOR
REVCO ELECTRONICS LTD

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

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

Sir

I have recently retired and have again taken up short wave listening as a hobby. I have received my first copy of Short Wave Magazine *(January 1989) and it has been read from cover to cover.*

I was intrigued by the letter referring to G. Hewlett's article "Tuning in the 1930s". I wonder if any of your readers remember the Glasgow Herald *in the middle 1930s publishing drawings and instructions on how to build your own short wave radio..*

Each Saturday when I was paid I rushed to our local "ham" shop and bought one or two components - condensers, valves etc. Then the magic day arrived when my set was complete and I started to tune into stations around the globe such as HCJB, Quito, Ecuador; Havana, Cuba; Boston, MARS Schenectady (I think it was WRUL) and ABC Melbourne. Most nights when I tuned into Melbourne at 10pm I listened to the GPO clock in the centre of Melbourne strike 7am the following morning, introducing "Breakfast Hour". What a thrill it was.

I am at present using a set which cost me approx £60 and bears the trade name "Steepltone", made in Hong Kong. Although I am logging stations around the world I would like to have more room on the dial(s).

Have any of your readers any recommendations to make in regard to sets costing around £100 to £150? If so I would appreciate their comments.

J. H. WRIGHT, ESQ
BUXTON
DERBYSHIRE

Sir

I wonder if anybody or anyone of your readers could help me? A friend and I are reviving some old valved radios, and a recent rescue is a three-valve battery "Gecophone" of around 1930, exactly as we used to make 'em, in a nice walnut case, a row of screw nut terminals at the back, a clip for the 9 volt GB battery, and now I'm making up a battery set for the beastie.

Then we have a mains Capitol, an Emston and an old Ultra.

Unfortunately,during a house move I lost my copy of the Wireless World Valve Manual *which gives all the data for the older valves. The local library don't help,* Wireless World *say they haven't a file copy, so I wondered if any reader has a copy that I might borrow or sell if not required?*

JOHN D. BERRIDGE
WHITCHURCH
CARDIFF

Sir

Maybe someone can tell me where I can get a 465kHz i.f. double-tuned transformer for the Eddystone EC10 RX, or someone who is selling an EC10?

If you can help me in any way, I would be most grateful. Also, could you tell me where I can get a second-hand Rx list?

NORMAN BEADSWORTH
LONDONDERRY
NORTHERN IRELAND

A WORD IN EDGEWAYS

Sir

Re: SWM December 1988 Review of the WIN-108 Airband Receiver.

As a specialist retailer of Airband Monitors and a regular reader and advertiser in SWM, I read with interest Godfrey Mannings' article, as the WIN-108 is currently our best seller (approx 60 per cent of hand-held scanner sales). On completion of the review I felt duty bound to "put pen to paper" (not something I do lightly) to correct, what in my opinion are misleading and inaccurate statements about this set, which unfairly might deter prospective buyers of what has proved to be, since it's introduction into our range, the best hand-held scanning receiver for v.h.f. airband reception.

*1) **Battery Life** - At least double the 15-hours quoted, one customer who took his 108 on holiday to Spain with him, returned to tell us that after 14 days at 6 hours a day, his Mn1500s were still going.*

*2) **Inability to cancel the Delay/Hold** - In our experience this is only a minor point, to date no customer has ever commented back to us about it.*

*3) **Sensitivity** - Is one of the best we have found on any receiver with v.h.f. airband capability, the only models better in our experience are the Signal R532 and R535. Worth noting however is that any receiver using a "Rubber Duck" antenna has restricted performance and can be greatly improved with a tuned telescopic antenna. A point that a reviewer of Mr Manning's experience should have made.*

*4) **Audio Quality** - True, that its own speaker could be better, but bearing in mind the compact size, it's acceptable. It is greatly enhanced with an extension, giving better audio quality and output.*

*5) **6V Power Requirement** - As most hand-held scanning receivers need a voltage stabiliser to run from a vehicle battery I don't view this as a drawback.*

In his closing comments, Godfrey has seemed to have overlooked the fact that the likely end user of such a device is probably a newcomer to such receivers with a keen interest in plane spotting and not necessarily a qualified "ham with correspondingly higher requirements and expectations from his equipment. Also I feel his last remarks about the market position by Lowe Electronics of the WIN-108 has an air of condescension about it.

My comments and impressions of the WIN-108 are drawn on over 20 years experience in retailing of such specialist radios. All scanning receivers have drawbacks somewhere in either facilities or performance aspects irrespective of price. A good example - the SX400N Base/Mobile monitor at £650 being sensitive enough to detect the frequency offset widely used in Airways frequencies. Try to explain why that won't receive a ground station when a WIN-108 at £175 will, to a first time buyer!

It is up to those of us in the "know", dealers and magazines alike, to give the right impression and explain about this type of specialised receiving equipment.

D. FAIRBOTHAM
FLIGHTDECK - THE AIRBAND SHOP
STOCKPORT
CHESHIRE

Godfrey Manning G4GLM replies

I thank Mr Fairbotham for his interesting comments which I will address in turn.

1) Battery Life is a simple calculation (consumption measured as 100mA "with full volume in the speaker and backlight on", battery capacity 1500mAh, 1500/100 = 15h) and of course under conditions of low duty cycle, the squelch being closed most of the time, the consumption is far less.

2) Inability to cancel Delay/Hold is a matter of opinion; I know that this would cause me problems.

3) Sensitivity was only judged "subjectively" (not using a helical, in fact). I don't think there's any remarkable problem with the WIN-108's sensitivity, nor did I suggest that there was in the review.

4) In the article I mentioned that the "thin" audio quality did not improve despite using a large external speaker of known performance.

5) Mr Fairbotham agrees with me that a 6V receiver needs attention when running from a 12V vehicle battery.

I'm not too sure about the point concerning frequency offsets - it is the selectivity and not sensitivity which is the determining factor (see this month's "Airband", comments by M. J. Taylor). Of course the receiver will often be purchased by newcomers; the purpose of a review article is to provide "instant experience" to help in making a choice. I make no recommendations but simply point out the good and bad things about the equipment. I frequently remind readers that purchasing any equipment is a compromise - as a reviewer I need to clarify what features on the receiver reflect the price being paid (in this case, a low one). I don't think that Mr Fairbotham has shown me to be "misleading and inaccurate" in this respect.

WHAT'S NEW

Netherlands Media Network

March 2: Al look at time measurement. Dave Rosenthal visits the famous station WWV in Fort Collins Colorado. they also catch up on Pacific news with Arthur Cushen.

March 9: An examination of the growth of local radio in West Germany. Wolfgang Schulz in Hamburg traces the development of private radio in the Federal Republic. They also expect clandestine radio news from John Campbell.

March 6: An all news programme, and a look at recent short wave publications. Andy Sennitt from the *WRTH* will present his usual survey of media developments.

March 23: Expect a special programme originating from the Netherlands Antilles. Jonathan Marks reports from the Bonaire relay station as it celebrates 20 years on the air. He'll be examining the long term plans for the station and looking at the constant battle they face against erosion from the salty air.

March 30: This programme should originate from the Caribbean too. What is the influence of video in the Caribbean and is this part of the world still regarded as important by the international broadcasting community?

English Service, Radio Netherlands, PO Box 222, 1200 JG Hilversum, The Netherlands.

EUCW Straight Key Day

The Scandinavian CW Activity Group have re-designated their midsummer straight key day as "EUCW Straight Key Day". This event will be held on Saturday June 24 and will be open to all amateur c.w. operators who enjoy working on the hand key, whether regularly or just occasionally. Participants receiving at least two votes for "Best Fist" will receive a "Straight Key Award" free of charge.

If you would like more details on the event, send an s.a.e. to: **G4FAI, 1 Tash Place, London N11 1PA.**

Aircastle Products

We have been asked to point out to readers who have had trouble contacting this company during their recent change of premises that their new telephone number is **(0202) 632040.**

WHAT'S NEW

Catalogues

Kanga Products latest catalogue contains a few changes since the last edition. You can now buy either the p.c.b., instructions and components OR the p.c.b. and instructions only (at a reduced cost). They have some new kits too, a transmitter to match the dual band receiver, a Morse code practice oscillator and a simple transmit/receive control board.

If you would like to receive a copy of the catalogue, send an s.a.e. to: **Kanga Products, 3 Limes Road, Folkestone, Kent CT19 4AU.**

ITW Switches have just produced a new, short-form catalogue which provides a brief overview of some of the most popular switch products in the company's range. Full colour photographs illustrate the various switch types and they are accompanied by a brief description of their salient features in English, French, German, Italian and Spanish.

For a free copy of ITW's short-form catalogue send to: **ITW Switches, Norway Road, Portsmouth, Hants PO3 5HT.**

The Vintage Wireless Company Ltd has sent us their *Antique Wireless Newsheet No. 130*. This is issued every month and 12 issues will cost you £4 in the UK (overseas including Eire £5). The newsheet contained all kinds of things as well as the list of their standard stock items such as subscribers adverts, news snippets, forth coming events and special offers. Contact **The Vintage Wireless Company Ltd., Tudor House, Cossham Street, Mangotsfield, Bristol BS16 3EN. Tel: (0272) 565472** for more details.

Amiga SSTV

Following hot on the heels of the Amiga FAX software and interface package, ICS are now introducing AMIGA SSTV.

This has been written by the same author as AMIGA FAX and uses the same interface card. It implements all commonly used amateur slow-scan television protocols (colour and b/w) and permits images to be both sent and received. Transmitted images can be generated from PAINT files or by inputting images from a TV camera *via* a digitiser.

AMIGA SSTV costs £99.95 including VAT plus £2.50 post and packing. For those who already have AMIGA FAX, the upgrade to AMIGA SSTV is available at £59.95.

ICS Electronics Ltd, PO Box 2, Arundel, West Sussex BN18 0NX.

The Club of Friendship

To help the growing frindship between radio amateurs in the UK and USSR, a group of enthusiasts has formed the "Club of Friendship" with members in both countries.

Both s.w.l.s and licensed amateurs are welcome to join and further details can be obtained by sending an s.a.e. to **Ken Norvall G3IFN, Hon. secretary, CoF, 24 Ryedene, Vange, Basildon, Essex.**

New Scanning Receiver

Nevada have just sent details of a new scanner which they have recently introduced into the UK.

The Cobra SR-925 sells at £149 and covers 29 - 54, 118 - 174 and 406 - 512MHz. Other facilities include priority scan, scan delay, channel lockout, memory backup with 16 memory channels.

An 8-digit l.c.d. provides frequency, channel, lockout, delay, priority, weather search and memory loss information.

Power is provided by an internal a.c. adaptor and the memory backup is by means of a capacitor, eliminating the need for batteries. Overall size is 241 x 64 x 181mm and the weight is 740g.

Further details from **Nevada, 189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel (0705) 662145.**

Computer Programs

Harlech Electronics have recently completed two computer programs which readers may be interested in. The first is a p.c.b. drafting program for the Amstrad 8256 which is capable of drawing either a p.c.b. track layout or schematic diagram. It costs £29.95.

The second program is an electronic calculator for the Spectrum and is suitable for the RAE student or electronic enthusiast. It simulates inductors, capacitors and resistors in series and parallel, works out frequency to wavelength conversions, calculates coil turns inductance, transformers, tuned circuits and is a c.w. trainer too. This program costs £6.50. **Harlech Electronics. Noddfa, Lower Road, Harlech, Gwynedd LL46 2UB.**

Frequency Allocation Chart

The radio frequency bands allocated to commercial and industrial uses in the UK can be seen at a glance on a colour-coded bar chart prepared by the DTI's Radiocommunications Division.

Frequencies from 1kHz up to 60GHz are covered by the chart which is divided into primary and secondary uses.

The main uses shown are broadcasting, fixed services, mobile, amateur, meteorological, radio location, navigation, astronomy, space and the various maritime, aeronautical and satellite bands.

The chart is available from your local HMSO, priced £2.50, the ISBN number is 0 11 514637 7.

Radio Pirates

There will be no let-up in the Government's crackdown on pirate radio stations following a record year of raids against illegal broadcasters, Industry Minister Robert Atkins has said.

The Department's Radio Investigation Service (RIS) made nearly 450 raids last year. More than 100 people were prosecuted - a rise of over 50 per cent on 1987. The minister announced that the Government is to seek more powers to prosecute people who advertise on or support the pirate stations.

The interference from uncontrolled radio broadcasts can threaten vital communications for emergency services like fire and police; important radio links for businesses and legitimate radio and TV services.

"The RIS are not killjoys," said Mr Atkins. "I must warn pirates that there will be no let-up. The RIS will continue to keep up the pressure to make certain that interference is removed."

He outlined powers which the Government will be seeking, which would make it an offence: to supply goods and services for the operation of an unlicensed station; to advertise on an unlicensed station, or to solicit others to do so and to engage in the operation of an unlicensed station. The proposals would need legislation to put them into effect.

"The Government is using the carrot as well as the stick. There are positive incentives for those interested in community-based local radio to stay within the law, with 20 licences for community stations available to the most suitable applicants this year.

"But the rub for the pirates is that anyone with a conviction for a piracy committed from 1 January 1989 onwards will be barred for five years from applying for a community radio licence. So there is even less reason to risk fines of up to £2000 and 3 months in jail by staying on the wrong side of the law."

WHAT'S NEW

Weather Station

ICS have announced a new low cost, microprocessor-controlled, weather system from Magnaphase Industries Inc., Seattle, USA.

ICS claim that this battery-powered unit is cheaper that any other similar system and brings local weather monitoring of wind speed and direction, temperature and precipitation within the range of many boat owners and amateur radio enthusiasts. It can be installed on a boat, in the home, the office - in fact almost anywhere.

Also available from ICS is the matching PCW system for the IMB PC. This enables long-term monitoring and analysis of wind speed and direction, temperature, precipitation and air pressure. Support software operates in background mode and the price for this is £299.95.

The other prices are: £129.95 for the micro weather station with anemometer, £39.96 for the rain collector, £7.75 for the desk stand, £2.95 for the mounting template, £9.95 for the 12m extension cable and £3.95 for the 12 volt d.c. lighter power cable. These prices don't include P&P, contact ICS for details. **ICS Electronics Ltd., PO Box 2, Arundel, West Sussex BN18 0NX. Tel: (02436) 5655.**

The CW Novice Award

The CW Novice Award is administered by the G-QRP Club on behalf of the European CW Association and the World QRP Federation.

The objective is to encourage newly licensed radio amateurs to use the c.w. mode. To qualify you must, during the first 12 months of holding an amateur licence, work 50 different stations using the c.w. mode.

There are two classes of award; **A**: maximum power to be used when making the 50 contacts of 3 watts and **B**: any licensed power.

Applications must consist of a log extract giving details of the 50 contacts made and be certified as true by the applicant and one other licensed radio amateur.

Applications from outside the UK must enclose three IRCs with their application, UK applicants must enclose three first class postage stamps. **A.D. Taylor G8PG. 37 Pickerill Road, Greasby, Merseyside L49 3ND**

144/146MHz Contest

The 3rd Annual Derby & District Amateur Radio Society National 144/146MHz contest will take place on Sunday 12 March 1989.

Time: 1300-1700UTC

Mode: Any mode is permitted, but the band plan must be observed. Fixed, alternative and portable entries are permitted.

Exchange: Contestant will exchange callsign, RS(T), serial number starting and 001, as well as administrative county (Scottish contestants will send region). Metropolitan areas, e.g. Greater London, are still considered counties.

Scoring: Contacts with G3ERD count 10 points all other score 2 points. The final score is the total number of contact points, multiplied by the number of counties worked. Each country outside the UK is scored as a county.

Logs: Logs must be sent to **Derby & District ARS, 119 Green Lane, Derby DE11 1RZ** to arrive **by March 29**. RSGB log and cover sheets are preferred, but any neat alternative is acceptable. Logs must show: Time (UTC), station worked, RS(T), serial number sent, RS(T) and serial number received, county received. Please head each sheet with callsign of station entering and county. Check lists of stations and counties worked would be appreciated. Short wave listeners' entries must show: Time, station heard, station being worked, RS(T) sent and county sent.

Awards: There will be three sections: Full legal power limit, low power (30W max output), s.w.l. Please specify whether single or multi-operator. The winner in each section will receive a certificate.

Disputes: The ruling of the DADARS Contest Sub-committee shall be final and binding in all cases of dispute.

If you require a list of results, please send an s.a.e. to the contest address.

Snippets from Sweden

Venezuela: Radio Mundial in Caracas has returned to short wave 24 hours a day on 5.05MHz. Radio Continental in Barinas has been observed after 0050 on 4.94MHz. Radio Mondial Bolivar is active again and has been heard at 0210 on 4.77MHz.

Yemen: Arab Republic Radio Sanas has been heard at 2055 on the rather unusual frequency of 6.27MHz, in parallel with 9.58MHz.

Zaire: Radio Bukavu, which has been on the air irregularly for a long time, has been heard in French and a vernacular language at 0345 and apparently at sign-off at 1838 on 4.844MHz.

Jamming: Czechoslovakia ended its jamming of Radio Free Europe and Deutsche Welle on December 17.

Canary Islands: REE in Spanish to Latin America via Tenerife is now at 2205-2255 on the new frequency of 11.775MHz.

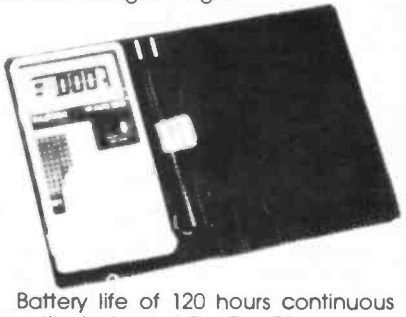
Seychelles: The BBC World Service has brought forward its sign-on time on some frequencies: 11.75 and 15.42MHz open now at 0300 and 17.885MHz at 0400. At 1800 a new frequency of 9.63MHz is used and runs to 2115. After 2115, the frequency changes to 9.6MHz.

Digital Pocket Multimeter

New from Electronic & Computer Workshop Ltd is the Pan 50. This is a digital multimeter with high resolution and handy compact size. The main features of this instrument include 3200 counts, auto power off, continuity test by buzzer and diode test.

The Pan 50 has a 3-digit l.c.d. numerical display with automatic indication of symbols and functions. Range selection is also automatic. Features include over-range indication, auto-polarity indication, battery warning indication and automatic switch off after one hour of non-use.

Readings can be taken in the following ranges: *Volts d.c.* - 320mV; 3.2V; 32V; 320V; 500V. *Volts a.c.* - 3.2V; 32V; 320V; 500V *Resistance* - 320Ω; 3.2kΩ; 32kΩ; 320kΩ; 3.2MΩ; 32MΩ, all to a basic accuracy of 0.3% of reading ± 4 digits.



Battery life of 120 hours continuous operation is claimed. The Pan 50 measures 108 x 54 x 11mm, weighs 90g, and comes supplied with a hard-cover case, two batteries and an instruction manual at a cost of £36.55 excluding VAT plus £3.50 P&P from: **Electronic & Computer Workshop Ltd., Unit 1, Cromwell Centre, Stepfield, Witham, Essex CM8 3TH. Tel: (0376) 517413.**

GRASSROOTS

Lorna Mower

Midland ARS meet Unit 16, 60 Regent Place in the Jewellery Quarter. Wednesdays are Morse 7pm, Thursdays Natter Nights 7.30pm. 1st Tuesdays are committee, 2nd Tuesdays and last Mondays BBC Computer Nights and 4th Tuesdays Birmingham RAYNET Group. All Tuesdays meet at 7.30pm. March 16 is Microwaves G0DJA, 7.30pm. Paul O'Connor G1ZCY on 021-443 5157.

Fylde ARS meet 2nd & 4th Thursdays, South Shore Tennis Club, Midgeland Lane, Blackpool. February 23 is QRP by Rev. Dobbs G3RJV, March 9 is Printed Circuits from DIY to Mass Production G3WGU and the 23rd is an Informal. F. Whitehead G4CSA on St. Annes 720867.

Lothians RS have a Junk Sale on March 8 and an outside broadcast live on the 22nd. 2nd & 4th Wednesdays, 7.30pm at the Orwell Lodge Hotel, Polwarth Terrace, Edinburgh. P. J. Dick GM4DTH at 21 West Maitland St., Edinburgh EH12 5EA.

Cheshunt & District ARC have Natter Nights on March 1/15 and the History of Communications 3 G0BTX on the 8th. Wednesdays, 8pm in the Church Room, Church Lane, Wormley, Hertfordshire. Roger Frisby G4OAA on Hoddesdon 464795.

Sevenoaks & District ARS meet 3rd Mondays, 8pm in the Emergency Control Centre, Sevenoaks District Council Offices. Barry Leggett G7CIC on Sevenoaks 741222 Ext. 245.

Thornbury & District ARC meet 1st & 3rd Wednesdays, 7.30pm in the United Reform Church, Chapel St. March 1 is Aerials Illuminate G3PGQ of the BBC Engineering Training Dept, Evesham and the 15th is HF Activity. Tom Cromack G0FGI at Rose Cottage, The Naite, Oldbury on Severn, Bristol BS12 1RU.

Stourbridge & District ARS have a Natter/On-air night on March 6 and their AGM on the 20th. Meetings held twice monthly at Robin Woods Centre, Beauty Bank. C. Brunn G1WAI on Hagley 885602.

Vale of Evesham RAC have Something in the Sky, talk by G4NIJ on March 2. Formal meetings on 1st Thursdays at The Meb Club, Worcester Rd, Evesham, 7.30pm. Mike G4UXC on Evesham 831508.

Basingstoke ARC meet 1st Mondays, 7.30pm at The Forest Ring Community Centre, Sycamore Way, Winklebury. March 6 is Visit by RSGB Regional Liason Officer, Trevor Emery G3KWU. Dave Deane G3ZOI on Mortimer 332777 (home).

Hastings Electronics & RC meet 3rd Wednesdays, 7.45pm at West Hill Community Centre, Croft Road and every Friday, 8pm in Club Room, Ashdown Farm Community Centre, Downey Close. March 15 is their AGM. Tim Anderson G0GTF on Hastings 437513.

Yeovil ARC meet Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. March 2 is Logarithms & DBW G3MYM, the 9th is deadline date for entries into Constructors Contest and also Home brew tobacco tin transceiver G3PCJ, the 16th is the Effect of Sunspot Maximum G3MYM and the 23rd is Constructors Contest G3GC. David Bailey G1MNM at 7 Thatchem Close, Yeovil BA21 3BS.

Colchester Radio Amateurs meet in Room 15, Ground Floor, "C" Block at The Gilberd School, Brinkley Lane, Highwoods, 7.30pm. March 2 is The Thames Barrier by R. W. Horner and the 16th is Very Early Days of Radio Valves by J. Stanley Wood. Mike Griggs G4YJN on Layer-de-la-Haye 348189.

South Manchester RC have Fault Finding on the TS820 Phase-locked loop G3SVW on February 24, Computers in Education by John Ashurst B.Sc. on March 10 and a Surplus Equipment Sale on the 17th. Sale Moor Community Centre, Norris Rd, Sale, 8pm. David Holland on 061-973 1837.

Bath & District ARC meet alternate Wednesdays, 8pm at Englishcombe Inn, Englishcombe Lane. March 1 is HF Night on the Air and the 15th is Preparation for AGM. Eric Otten G4GEV on Combe Down 832156

Loughton & District ARS have a 6m Night on the Air using club callsign G4ONP on February 25 and March 10 is G3OPA Top Band d.f. Set Construction Judging Night, Essex RSGB R.L.O Ted Whitworth G4TUO is the judge. Loughton Hall, Room 20, 7.45pm. John Ray G8DZH on 01-508 3434 (after 7pm).

Ipswich RC have a Constructional Contest - entries from club members only - on March 8. Red Lion, 284 Bramford Rd, 8pm. Jack Toothill G4IFF on Ipswich 464047.

Dragon ARC meet 1st & 3rd Mondays, 7.30pm at Four Crosses, Pentraeth Rd, Menai Bridge. March 6 is a Grand Debate - will the introduction of a student/novice licence be a good thing for the future of amateur radio? The 20th is Fifty Years of Amateur Radio GW2FLP. Tony Rees on Bethesda 600963.

Maidstone ARS have a Natter Night, RAE and c.w. on March 3. YMCA Sports Centre, Melrose Close. Paul G0BUW on Maidstone 43317.

South East Kent (YMCA) ARC have a Natter Night on March 1, Ten Minute talks on the 8th, Natter Night/Committee meeting/Morse test on the 16th and a Construction Contest on the 23rd. Dover YMCA, Godwynehurst, Leyburne Rd. Des Edwards at 12 East Cliff, Dover, Kent CT16 1LX.

Wirral ARS meet 1st & 3rd Wednesdays at Ivy Farm, Arrore Park Rd. March 1 is Ham Radio Maritime Mobile. A. Seed G3FOO at 31 Withert Ave, Bebington, Wirral L63 5NE.

Mansfield ARS meet 2nd & 4th Fridays, 7.30pm at Westfield Folk House, Westfield Lane. February 24 is Open Forum. Keith Lawson on Mansfield 642719.

Wimbledon & District ARS have Antenna Matching Units G6HC on February 24. 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Rd. Nick Lawlor G6AJY on 01-330 2703.

Worksop ARS have an Official club meeting on February 28, Video-W5LFL lecture on March 14 and Natter Nights on the 7/21. Meet Tuesdays, time and place from Carole Gee G4ZUN on Worksop 486614.

Halifax & District ARS have Birketts' Component Sale on March 21. 1st & 3rd Tuesdays, 7.30pm at the Running Man Public House, Pellon Lane. 1st Tuesdays are Informal "noggin and natter" nights. David Moss G0DLM on Halifax 202306.

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121 St. Nicholas St, Radford. February 24 is the Indoor Direction Finding Contest (Cup Qualifier), March 3/17 are Nights on the Air with Morse tuition and the 10th is a members slide/video show. Jonathan Ward G4HHT on Coventry 610408.

Hornsea RC meet Wednesdays, 8pm at the Mill, Atwick Rd. March 1 is SWR G3TEU, the 8th is a Committee Meeting, the 15th is Omega Entertains G4YTV and the 22nd is Computer Operating Systems by Simon SWL. Geoff G4IGY on 0964 533331.

Norfolk ARC meet Wednesdays, 7.30pm at The Norfolk Dumpling, The Livestock Market, Harford. March 1 is Any Questions? Ask the panel for answers! The 8th is a Surplus Equipment Auction/bring & buy (doors open 7pm), the 15th is Computer aided printed circuits G4ONF and the 22nd is The Shefford Club project 2m DC XCVR, G3WRJ. Craig Joly G0BGD on Norwich 485784.

Taunton & District ARC meet 1st & 3rd Fridays at County Hall, Emergency Planning HQ. March 3 is talk by G3GC and the 17th is RSGB Video. Peter Robinson G0EYR on Taunton 275973.

Derby & District ARS have a Junk Sale on March 1, TVI - its causes and cures - G2CV on the 8th, talk/demo by MUTEK Ltd on the 15th and their AGM on the 22nd. 119 Green Lane, Derby, 7.30pm. Kevin Jones G4FPY on Derby 669157.

Torbay ARS have Aerial Circus G6CJ - a film from the RSGB on February 25. Natter Nights are Fridays, 7.30pm at the ECC Social Club, Ringslade Rd, Highweek. Bob McCreadie on Haytor 6233.

Trowbridge & District ARC meet Wednesdays, 8pm at the TA Centre, Bythesea Rd. Packet Communications talk on March 1 and Natter Night on the 15th. Ian Carter G0GRI on Bratton 830383.

Maltby ARS meet Fridays, 7.30pm in Hellaby Community Hall, Hellaby, Nr Maltby. K. Johnson G1PQW on Rotherhan 814135.

Mexborough ARS meet Fridays, 7.30pm in Harrop Hall. D. Thomas G6FUM on Doncaster 859654.

Sheffield ARC meet Mondays, 7.30pm at Firth Park Pavilion, Firth Park. Alan Pemberton G0ILG on Sheffield 670866.

Barnsley ARC meet alternate Mondays, 7.30pm at Monk Bretton Training Centre, Burton Rd. Ernie Bailey G4LUE at 8 Hild Ave, Cudworth, Barnsley, S. Yorks S72 8RN.

Hoyland ARC meet Wednesdays, 7.30pm at West Bank House, West St. M. Wardle G0GDC at 11 Sokell Ave, Wombwell Ave, Barnsley.

Rotherham ARC meet alternate Wednesdays, 7.30pm in the Church Hall, opp the Pike and Heron, Bawty Rd, Tinsley. F. Moody G0FNR on Rotherham 552925.

Doncaster Radio ARC meet Mondays, 7.30pm at Corporation Brewery Taps, Cleveland St. K. McMahon G8JJR on Doncaster 852938.

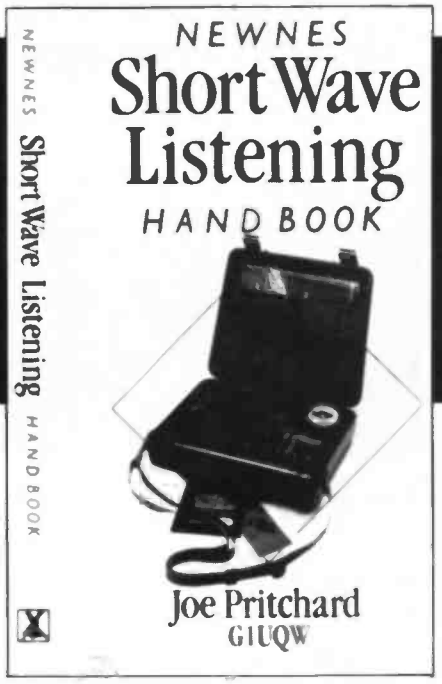
Sheffield Packet Group meet Tuesdays, 8.30pm in the Rugby Club, Stocksbridge. P. Green G4PHL at 6 Yews Close, Worrel.

UK FM Group Northern meet 1st Sundays, 7.30pm in the Dove Inn, Doncaster Rd, Barnsley. Mrs L. Laughton G4UNA at Claremont, Main St, East Ardsley, Wakefield WF3 2AP.

Southgate ARC have lecture on Effects of Weather Propagation G3YLA on March 9 and Portable HF Rig Evaluation night on the 23rd. 2nd & 4th Thursdays, 7.45pm at Holy Trinity Church Hall Upper, Winchmore Hill, London N21. Brian Shelton on Winchmore Hill 01-360 2453.

Acton, Brentford & Chiswick ARC meet 7.30pm, Chiswick Town Hall, High Rd. March 21 is Aeronautical Communications G4GD. W. G. Dyer G3GEH on Acton 3778.

Special Offer



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The second half of the book covers the "listening" side: the use of sets, what can be heard, the various bands, propagation, identification of stations, sources of information, QSLing of stations and listening to amateurs. Some computer techniques, such as computer Morse decoding and radioteletype decoding are also covered, along with computerised record keeping and other applications of the computer in the shack. Interference sources and cures are investigated.

Newnes Shortwave Listening Handbook is for all existing and potential short wave listeners who want a technical guide covering construction and for the listener who wants to explore the bands between 0 and 30MHz.

Joe Pritchard G1UQW, is the author of six computing books, numerous articles in the computing and electronics press and has been a radio amateur for more than ten years.

The *Newnes Shortwave Listening Handbook* (ISBN 0 434 91550 5) is in paperback, comprising 288 pages 216 x 138mm with 80 illustrations, and will be published by Heinemann Newnes. The special pre-publication offer price to *SWM* readers is £11.95 including post and packing. (Books are zero-rated for VAT).

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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.

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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.

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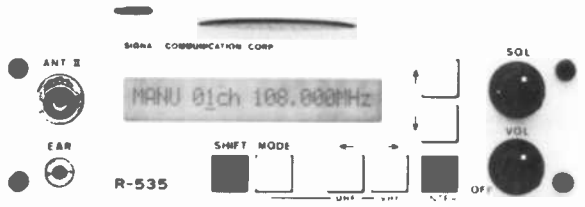

R-535..... **£249**

Signal also make the ideal starter receiver, the R-537S, which combines fully tunable operation for seaching around the VHF band and two channel crystal control for spot-on accuracy when you need it. A special version of the R-537S is in use by most parachute clubs where the instructor can talk directly to a falling pupil — helps to advise them that they should have opened the 'chute.

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ANTENNAS

F. C. Judd G2BCX
Part 3

At the end of Part 2 we dealt very briefly with full-length resonant vertical antennas tuned against ground. However, before continuing with the more practical aspects of antennas it would be as well to provide some understanding of how radiation patterns are formed.

Radiation patterns show the directivity performance, i.e. variations in the magnitude of the radiated field in both the horizontal and vertical planes and which has already been illustrated in Parts 1 and 2. Vertical radiation will be dealt with first.

Vertical Radiation and Ground Reflection

Whilst the ground beneath an antenna has considerable effect on its vertical radiation, regardless of whether the antenna itself is horizontal or vertical, this applies largely to antennas designed for operation in the h.f. spectrum. Note that height above ground is expressed in either a fraction of, or whole number of wavelengths related to, the frequency of operation and is applicable to either a horizontal or vertical antenna. As far as the latter is concerned, the height above ground is taken as the centre of the antenna irrespective of its resonant length; for a vertical antenna with its base at ground level the height is from the base to the top of the antenna.

For purely theoretical explanation we need to assume that the ground occupying a large area beneath an antenna is a flat plane and has perfect conductivity.

Waves reflected from ground combine with those radiated at angles above the horizontal plane, and do so in various ways - depending on the orientation of the antenna, its length and height above ground. Radiation from an antenna at angles lower than horizontal, that is parallel to ground and directly from the antenna to ground, is reflected upward again in the same way as light from a mirror. The angle of reflection is then the same as the angle of incidence, which means that a wave reaching ground at an angle of, say, 20 degrees would be reflected upward at the same angle.

At some "vertical" angles above the horizontal the direct and reflected waves may be exactly "in phase", in which case the resultant field will be equal to the sum of the magnitude of both fields. At other vertical angles the waves may be "out of phase", the resultant field magnitude being determined by the amount of phase difference. Complete phase opposition results in a zero-magnitude field.

The overall effect on antennas relatively close to ground in terms of wavelength is an increase of radiation at some angles and a decrease, or even no radiation at all, at others. The function of ground reflection is illustrated in Fig. 3.1(a). At a relatively long distance from the antenna the two waves, one direct and one reflected and meeting at a distant point "P", may be considered in parallel, but the reflected wave has to travel a greater distance, BC, to reach "P". It is this difference in path length that accounts for the phase effect as described.

What is generally known as the "image" antenna is used to illustrate reflection from ground: as in Fig. 3.1(a) the reflected wave would have the same path length (AD = BD) if it originated from an antenna, with the same electrical characteristics as the real antenna but otherwise located below ground at a depth equal to the height of the real antenna above it.

Like an image seen in a mirror, the reflected antenna is reversed as in Fig. 3.1(b), and if the real antenna is a half-wave dipole at an electrical height of 0.5 wavelength, then its instantaneous charge during one half-cycle is also reflected but in opposite polarity. On the other hand, if the real antenna is a vertical with one end very close to ground - see Fig. 3.1(c) - and with an instantaneous positive charge at that end, the polarity at the end of the image antenna nearest ground will be negative.

In the foregoing examples, the respective currents flowing in the real horizontal antenna and in the reflected counterpart are 180 degrees out of phase, but the currents in the real and reflected versions of the vertical antenna are in phase. The overall effect of ground reflection is that the resultant vertical radiation patterns from either a horizontal or vertical antenna are really modifications of the patterns that would otherwise be obtained in a free-space environment.

Ground Characteristics

Normal ground is far from being a perfect conductor and in this respect its effect depends largely on the frequency of operation. At low frequencies (e.g. medium and long-wave broadcast bands) ground conductivity is fairly good allowing radiation to penetrate to a considerable depth where it often finds a large sub-ground area of low resistance in which r.f. current flows freely. This condition can still prevail even at frequencies as high as 3 or 4MHz, but as the frequency is increased the ground starts to behave as a lossy dielectric, the penetration decreases and radiation becomes more and more absorbed.

Formation of Horizontal Radiation Patterns

Vertical and horizontal half-wave dipoles, horizontal linear radiators "N" wavelengths long, single ground-based vertical antennas, horizontal and vertical broadside or end-fire arrays, Yagi-type beam antennas, groundplane antennas - in fact every type of antenna one can think of: all have their own defined patterns of radiation in the horizontal plane. This is the case irrespective of whether they are operated in a free-space condition or are physically close to ground in terms of a fraction, or whole numbers, of a wavelength at operational frequency. It is the horizontal radiation pattern that indicates the overall directivity for 360 degrees around the antenna, and applies to reception as well as transmission.

In order to obtain a pattern of the

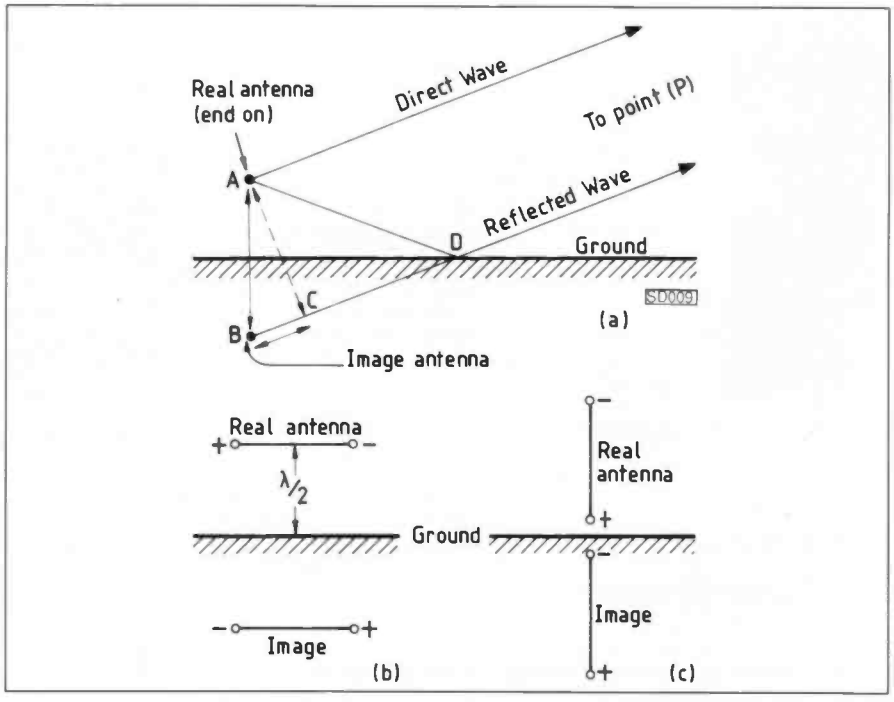

Fig. 3.1: (a) function of ground reflection; (b) the "image" antenna theory, (see text).

horizontal radiation the magnitude of the field strength can be either measured or calculated for every 5 or 10 degrees (minimum) over 360 degrees and the results plotted in polar, or Cartesian, co-ordinates. If measurement is employed, this must be carried out at a point sufficiently distant from the antenna and in a clear area to obviate the possibility of errors due to reflection. There are also other requirements too numerous and detailed to mention here, and in any case measurements of this nature can only be carried out on a practicable basis if the frequency of operation is relatively high - above at least 100MHz.

However, there is an alternative for otherwise very large antennas designed to operate at much lower frequencies. An antenna can be scaled down in physical size in order to operate as a "model" at some directly related but very high frequency, a system used by the writer for many years.(3, 4, 5)

Calculation of a horizontal radiation pattern can be illustrated, albeit in a simple way, by using a horizontal half-wave dipole as the example. This has what is often referred to as a "cosine" pattern because the basic equation for plotting the pattern is cos. The magnitude of the radiated field at any angle through 360 degrees is equal to the cosine of the angle. Starting at 0 degrees and using a scientific-type pocket calculator, the cosine of 0 degrees is 1: this is the first figure for magnitude. But this is rather low to work with when plotting in polar co-ordinates. The equation is therefore modified by introducing a multiplying factor to accommodate larger figures for magnitude: we can choose, say, "100" for maximum, which means multiplying cos by 100. The magnitude for 0 degrees now becomes 100 x cos(0) = 100. For 10 degrees it will be: 100 x cos(10) = 98.4, but accurate enough if rounded down to 98. By the time we work round to 90 degrees the magnitude will be 100 x cos(9) = 0. Still calculating for every 10 degrees, the next will be 100 degrees with the magnitude given as 100 x cos(100) = -17; however, for the purpose of plotting, this can be taken as a positive number, i.e. 17. Negative numbers will occur until we get to 280 degrees when the magnitude figures will become positive again, e.g. 100 x cos(300) = 50.

Degrees		Magnitude	Degrees		Magnitude
0		100	90		0
10		98	100		17
20		94	110		34
30		87	120		50
40	(1)	77	130	(2)	64
50		64	140		77
60		50	150		87
70		34	160		94
80		17	170		98
180		100	270		0
190		98	280		17
200		94	290		34
210		87	300		50
220	(3)	77	310	(4)	64
230		64	320		77
240		50	330		87
250		34	340		94
260		17	350		98

(cos)

Table 3.1. Cosine plots for horizontal radiation pattern of a half-wave dipole, to be used with polar co-ordinate graph

Plotting a Complete Pattern

To illustrate further, Table 3.1 gives the magnitudes for every 10 degrees from 0 to 350 degrees in rounded positive numbers; note that 360 degrees is the same as 0 degrees. The polar co-ordinate graph, Fig. 3.2, has the plots already made for 0 to 90 degrees. From Table 3.1 finish plotting to obtain the horizontal radiation pattern for a half-wave dipole, i.e. the familiar figure-of-eight, or cosine, pattern.

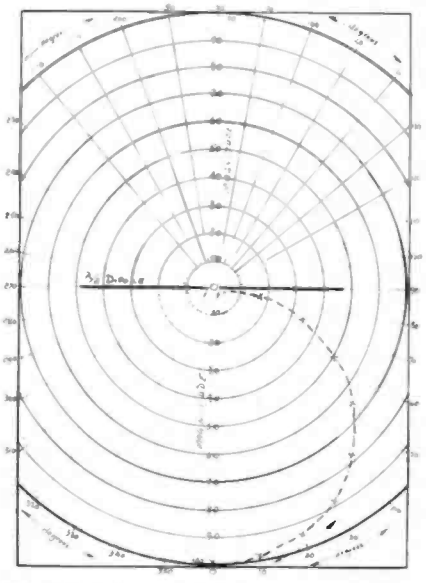

Fig. 3.2. Polar graph to be completed with the aid of Table 3.1.

In Part 4 we will briefly consider radiation patterns for vertical and multi-element antennas, and take a look at "directivity gain". □

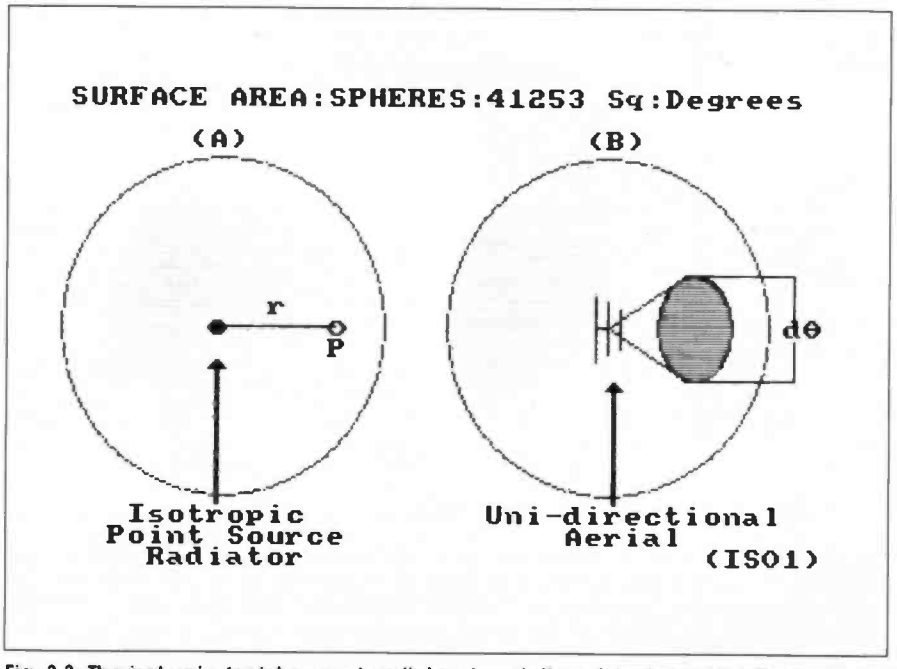

Fig. 3.3: The isotropic (point source) radiator. Annotations & text describe the theory.

References

(3) "Practical Aerial Measurements (Scale Models)", F.C.Judd, *Wireless World* Dec. 1960.

(4) "High Frequency Model Aerials", F. Charman BEM, *Proc. RSGB* Spring 1949.

(5) *Two Metre Antenna Handbook*, F.C. Judd, Newnes Technical Books. (Chapter on antenna performance measurement with high frequency scale models).

RALLIES

February 25: The 1989 Rainham Radio Rally will be held at Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham, Kent. This is near Junction 4 on the M2. Doors open at 10am, admission is 50p and there will be a licensed bar, snacks and hot drinks, free parking and talk-in on GB4RRR on 144 and 430MHz, as well as many traders and a bring & buy stall. Further details from G1LKE on (0634) 362154.

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.

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.

March 5: The Bury Radio Society Annual Hamfeast will be held at the Castle Leisure Centre, Bolton Street, Bury. It's only 3 minutes from the M66 and there will be talk-in on S22. Doors open at 11am and entrance is by programme costing 50p. Refreshments are available. Contact: C.D.W. Marcroft G4JAG, Mosses Centre, Cecil Street, Bury.

✱ **March 12:** The Trafford Rally, now also being called The Great Northern Rally, organised by the Trafford Amateur Radio Club, is moving to a new venue - G-MEX, the new Greater Manchester Exhibition & Event Centre. All the usual attractions including Free Draw, Bring & Buy, Licensed Bar, Hot & Cold Meals, lots of room on one floor and plenty of Parking. Talk-in on S22. All enquiries on 061-748 9804 or 061-881 3739.

March 12: The Pontefract & DARS are holding their 9th Components Fair at the Carleton Community Centre, Carleton, Pontefract. Admission is free and the doors will be open from 11am. to 4.30 pm. Traders, bookstall, QRP stand, refreshments, etc.

March 19: Bournemouth Amateur Radio Society are holding an Amateur Electronics (Radio, Electronic & Computer) Bring & Buy Sale at Kinson Community Centre, Pelhams, Milhams Road, Kinson, Bournemouth. Refreshments will be available along with a raffle and talk-in will be through the club station on S22. Advance information from Clive G6MYT (0202) 422441.

March 19: Wythall Radio Club will be holding their 4th Annual Radio Rally at Wythall Park, Silver Street, Wythall, Worcs. This is on the A345 south of Birmingham. Doors open at 11.30am. There will be three large halls, the usual trade stands, a flea market, a large bring & buy, snacks available and a bar. Talk-in on S22 with more free parking this year. Admission is 50p. For more details contact Chris G0EYO on 021-430 7267.

✱ SWM in attendance

March 26: The Cunningham & District ARC are starting a new rally at the Magnum Leisure Centre in Irvine to combat the shortage of rallies for Scottish amateurs. Doors open at 10.30am. More details from: Bob Low on (0563) 35738.

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

May 21: The "Hobbies Fair" is the first event in the Science Museum's Wroughton 1989 season. As well as radio, this event covers a wide range of interesting hobbies and also offers the rare opportunity to see some of the Science Museum's stock of aircraft and other transport items which are stored in the hangers. Wroughton Airfield.is south of Swindon, Wiltshire and easily reached by road.

May 21: The Parkanaur Rally, organised by the Mid-Ulster Amateur Radio Club will be held at the same venue as last year, the Silverwood Hotel, Lurgan, Co. Armagh. Doors open at 12 noon and the entrance fee is £1. The usual trade stands, bring & buy, bookstall, QSL Bureau will be there and talk-in will be on S22. Proceeds from this rally go to the Stanley Eakins Memorial Fund, Parkanaur, near Dungannon, so the club hope for a really good turnout of everyone interested in all aspects of radio and electronics.

May 28: The thirteenth annual East Suffolk Wireless Revival will take place at the usual venue of the Civil Service Sportsground, the Hollies, Straight Road, Ipswich - between Bucklesham Road and Felixstowe Road (now the A1156) and adjacent to the Suffolk Showground. There will be plenty of attractions to keep the rest of the family occupied whilst the radio enthusiasts take their time looking round the rally stands. Doors open at 10am Further information from Colin Ranson G8LBS, 100 Stone Lodge Lane West, Ipswich, Suffolk IP2 9HR.

May 28: Plymouth Radio Club are holding their Mobile Rally at Plymstock School, Church Road, Plymstock, Plymouth. Doors open at 10am. and there is a large, free car park, refreshments, raffle, trade stands, demonstrations and talk-in on S22. Full details from Joe G1RXR on (0752) 509855.

✱ **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.

June 11: Mid Lanark Amateur Radio Society are having their Open day at the Community Education Centre, Newarthill, by Motherwell. This is on the A723, 12km south of the Newhouse interchange on the M8. There will be trade stands, bring & buy stall, demonstrations of packet radio, RTTY and QRP together with lectures and the award of the Society's annual EHI Trophy. Talk-in on S22 and refreshments will be available.

✱ **June 25:** The 32nd Longleat Amateur Radio Rally will be held as usual in the grounds of Longleat House, Warminster, Wiltshire. This rally is always popular as it offers something for the whole family. More details from the Rally Manager, Shaun O'Sullivan G8VPG, 15 Witney Close, Saltford, Bristol BS18 3DX.

✱ **July 15:** The Cornish Radio Amateur Club are holding their 1989 rally at a new and larger venue - the Richard Lander School, Truro and is being held on a Saturday to coincide with the school's Summer Fair so there will be something for all the family. The usual trade stands, bring & buy, computer display and demo, refreshments and good, free parking. Details from Rolf Little, (0872) 72554.

✱ **July 30:** Scarborough ARS are holding their annual Rally at the Spa, on the South Shore Seafront, Scarborough. This is close to the beach and all the entertainment so that there will be something for all the family. Doors open at 11am. Trade stands, bring & buy, refreshments and bar with talk-in on S22. Details from Ian G4UQP (0723) 376847.

✱ **August 13:** Hamfest '89 will be held at the Flight Refuelling Sports Ground, Wimborne, Dorset. Gates open at 10am and there's free car parking as well as overnight camping facilities. The day will feature radio and electronics trade stands, field displays and a craft and gift fair. More details from: Bob G6DUN. Tel: (0202) 479038.

August 13: The annual Derby Radio Rally will be held once again at the Lower Bemrose School, Saint Albans Road, Derby with all the usual attractions including the famous Monster Junk Sale. Details from Martin G3SZJ (0332) 556875.

November 19: The Bridgend & District Amateur Radio club will be holding their 1989 Rally at the Bridgend Recreation Centre, Angel Street, Bridgend, Mid-Glamorgan. Doors open at 11am.

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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AIRBAND

Godfrey Manning G4GLM

I write this while still recovering from the shocking news of two recent air tragedies - at Lockerbie and East Midlands. Thinking about the former case must have prompted many readers to weigh up the disadvantages and benefits of our present security arrangements as compared with tighter measures. It may be that present airport security is pitched at an economic level that doesn't require excessive check-in intervals; but what will be the cost (even leaving out the unquantifiable human element) of loss of a large airliner and the compensation paid to relatives of those aboard? Personally I would like to see, as a minimum, passengers place their own baggage in the hold and then board; this way, a bomb in checked baggage would mean suicide for its perpetrator. You might not agree with these ideas - have you any thoughts on this?

A bumper crop of your letters gets us off the ground this month. Godfrey airs some views and answers some questions posed by readers, rounding off with some of your flying experiences.

You Write

Apologies to those whose letters have been outstanding since August. The hole in the editorial desk (through which they fell!) has now been patched up.

Tom Valentine GM1XHZ (Montrose, Scotland) went to Corfu for his holidays - a difficult approach including the risk of transgressing nearby Albanian airspace during go-arounds. What aircraft did you fly in, Tom?

Always pleased to hear from first-timers such as **John Periam** (Shoreham-by-Sea) whose living room appears to be filled with aircraft pictures. As a local life-boat team member John had a close encounter with a Red Arrows pilot - pulling him from the water after a crash! John's holiday began with flying Brize Norton - Ascension Island - Falklands and he would like to know about the route. Even the military aircraft will fly in the same controlled airspace as civil ones; the best bet is to write to the Officer Commanding, RAF Brize Norton, Carterton, Oxfordshire OX8 3LX, explaining why your request is genuine (enclose your ticket) and see if he'll release the nav log to you. Then use the standard information sources to plot the route. En-route charts, aerodrome let-down plates and various supplement books are available from at least three major suppliers as follows. Aerad Customer Services, Building 254, PO Box 10, London (Heathrow) Airport, Hounslow, Middlesex TW6 2JA (Tel: 01-562 0795). Jeppesen & Co. material is sold by The Airport Shop, Oxford Airport, Kidlington, Oxfordshire OX5 7RA (Tel: (08675) 4321). The RAF also sell to the public: 1 AIDU, RAF Northolt, West End Road, Ruislip, Middlesex HA4 6NG (Tel: 01-845 2300 X209). Here's an idea of John's - any interest? Readers (plus myself!) could meet at certain airshows by advance arrangement. Write with your possible venues and dates, enclosing a reply envelope please. Send all "Airband" correspondence via the editorial office.

Regular correspondent **Geoffrey Powell** (Tamworth) has photos of the vertical mast at the Lichfield n.d.b. and also the vertical v.h.f. array he has built and attached to his chimney. To answer your question, pilots acknowledge having received the current issue of the a.t.i.s. pre-recorded broadcast by giving its identifying letter as a phonetic, e.g. "Stansted, this is Shortwave 389, DC-9 with information Bravo." When the information tape is updated it will announce itself as "information Charlie", and so on. The automatic terminal information service includes actual weather and runway details.

The Avro Lancaster of the RAF Battle of Britain Memorial Flight gets a polish at Cranfield last July. Photographs Dick Ganderton.

Also a regular, **T.S. Christian** (North Walsham, Norfolk) laments the lack of atmosphere in the new terminal building at Norwich airport. A pity that spectators aren't catered for - they could bring revenue but, without facilities, they often unwittingly get in the way by parking and standing around perimeter fences and emergency access points (none of you would do this, of course!). Luton earn my praise as a model for spectator arrangements. The climbing sunspot number is noted; apparently, h.f. aircraft frequencies such as 11.175, 11.3, 13.2, 13.291 & 13.306MHz are more likely to find daytime use as a result.

Dave Lawrence G6HXR (Snodland, Kent) thinks that the West Malling Airshow may be cancelled - please keep us informed, Dave. He'll be doing a bit of flying within the UK soon. Apparently, busier airports are trying to save a bit of controller and pilot time by giving the next frequency whilst the aircraft is still holding for takeoff. The only problem would be if a pilot misunderstood and tuned the new frequency too soon.

Equipment Re-Visited

Various bits of gear have been mentioned in this column recently and **Peter Stonebridge G8ZQA** (Ipswich) provides his thoughts on the HP-82 receiver (see "Airband," January). It's easy to set memories and search limits but has poor audio and will not hold on frequency after a signal has gone off unless it had been a strong one. It runs for 5 hours on four AA rechargeables and doesn't lose its memory whilst changing batteries.

A Corrigan Radio Watch b.f.o. kit ("Airband," September 88) was built by **W.G. Roberts** (Wolverhampton) and used with a Prinzsound receiver. Easily built and economical (under £10) it allows s.s.b. including amateurs to be resolved. However, a careful touch is required and it is easily detuned by outside influences.

An annoyed **M.J. Taylor** (New Malden, Surrey) has copied his open letter to the editor of *Ham Radio Today* to me. He's found that many receivers are so "good" in terms of narrow selectivity that they can't receive offset transmissions! Many relay stations and also VOLMET transmit simultaneously from several sites; to prevent mutual interference, each site's transmitter is offset from the nominal centre frequency by up to about 7.5kHz. Airborne equipment resolves this perfectly (although some light aircraft receivers apparently have a problem with their squelch not opening when it should) but the Sony ICF-2001, Air-7 and Pro-80 and the FRG-8800 and the AOR-2001 may exclude the offset signal as being outside their passband. I have written to Sony but without a reply so far.

Alan Jarvis (Cardiff) continues the story of his rebuilt altimeter (which started in January's "Airband"). When the indication is below 10000ft a striped flag appears in a window. To explain this, I must refer back to the old "killer" altimeter which had three pointers - the smallest for the 10000s of feet, the slightly longer, wider one for the thousands and the thin,

AIRBAND

Typical of the aircraft to be seen at the PFA Cranfield Rally.

The RAF's Hawker Hurricane seen at the 1988 PFA Rally.

longest one for the hundreds. At 100ft the smallest pointer was obscured by the thousands pointer (both being almost at zero); and at 10100ft the smallest pointer was now obscured by the hundreds pointer - both pointing to 1. Otherwise, the indications were indistinguishable. In poor visibility and when disorientated the two readings could be confused - whilst actually at 100ft, the pilot behaved as though at 10100ft and struck the ground! The stripes on a modern instrument appear as a reminder of being at low altitude. Thanks to everyone who has written in with follow-ups on equipment.

Frequency Changes

Alan also points out that the Radnor n.d.b. (RNR: di-dah-dit, dah-dit, di-dah-dit) has changed from 404.5 to 375kHz. But, why?

NOTAM A879 describes the new VOLMET set-up as follows: London VOLMET (Main), 135.375MHz, covers Amsterdam, Brussels, Dublin, Glasgow, London (Gatwick), London (Heathrow), London (Stansted), Manchester and Paris (Charles de Gaulle). London VOLMET (South), 128.6MHz, covers Birmingham, Bournemouth, Bristol, Cardiff, Jersey, Luton, Norwich, Southampton and Southend. London VOLMET (North), 126.6MHz, covers Blackpool, East Midlands, Leeds and Bradford, Liverpool, London (Gatwick), Manchester, Newcastle, Ronaldsway and Teesside. Scottish Volmet, 125.725MHz, covers Aberdeen, Aldergrove, Edinburgh, Glasgow, Inverness, London (Heathrow), Prestwick, Stornoway and Sumburgh.

Some help with the radar changes (January "Airband") is given by **Chris Coates** (North Walsham, Norfolk). Border Radar no longer has civil control at RAF Boulmer; in its place is Pennine Radar (132.9 and 133.4MHz) based at the Scottish air traffic control centre (a.t.c.c.) and the Manchester sub-centre. Anglia Radar is at Stansted (125.275MHz primary, 128.92MHz secondary, and 306.4MHz) with heads at Cromer and Claxby; part of this service handles helicopters serving oil rigs.

It seems as though a band extension of 136-137MHz is proposed but I still don't have concrete details yet; I am asked about this by **A. Fairbairn** (Stanford-Le-Hope, Essex) - apologies if I've read your signature incorrectly.

Your Experiences

Chris Durkin (Ormskirk) had the privilege of being the first passenger when his friend passed his private pilot's licence. In good weather, they went in Cessna 172 'MI from RAF Woodvale, routing over their houses, to Liverpool. They returned later, learning from the experience that the professional approach by the pilot inspired confidence; that Air Traffic Control are helpful and co-operative; and that their wives were very understanding about the cost of the trip! Just as a reminder, if, and it can happen to anyone, you are unlucky on a flight then I hope that you'll continue in the professional manner and contact 121.5MHz soonest where you will find some more helpful and co-operative controllers.

An experienced flyer is **Gordon Partridge G3RJD** (Willenhall, West Midlands), having been on flying duties since 1943 (and being interested in radio from the mid-30s). As an RAF Wireless Mechanic (1940) he flew in a Dominie - the Rapide, not twin-jet, variety! He had a go at the controls of a Harrow under supervision, and eventually earned his wings (1943) and started on DC-3 supply drops. Gordon's first jet was a Meteor followed by the Jet Provost (1957) and Strikemaster. Quite a collection! Sorry I can't QSO on h.f., Gordon. Thanks to both who have shared their experiences here.

Agony Column

Many of your letters ask for advice and, although I can't reply individually, I try to deal with the main points in this column. If you do want to know something, have a look through the back issues - your point might have been raised previously by another reader.

Mike G1HGD and **Helen Newell** (Kenilworth, Warwickshire) are considering purchasing a portable receiver. The cheaper sets may lack scanning facilities thus limiting you to one frequency (major airports have several frequencies on the go at once) so as usual it's a matter of compromise and cost-effectiveness. Those with "string-driven pointer" tuning don't tend to be selective enough, either. I know your local airfields at Baginton, Coventry quite well (try a visit to the Midland Air Museum, Rowley Road, on the airfield perimeter - Chris asks you to say hello to the Vulcan for her!) and also Wellesbourne Mountford (see photo, "Airband," March 88). I don't know if they'll let you in the control tower, but don't turn up unannounced - write to the Watch Supervisor first and explain your interest. You never know your luck, but be prepared to accept a refusal with good grace.

Receivers also interest **R. Searesbrook** (Thurmaston, Leicester) who lives right under the main trunk of NW-SE airways such as A2, A20 and B4. On v.h.f., line-of-sight signals are easily received from aircraft at altitude, but listening to one ground station (e.g. an airport) from another is usually only possible if the transmitter is relatively local. Aircraft h.f. allocations don't tend to lie in the amateur bands, so it would not be possible to hear them on a 10-160m "amateur bands only" communications receiver even if it does have upper sideband. Sorry to hear that you're unable to get out and about to visit airports, but let me recommend a book that captures the atmosphere of civil airline operations: *Flying the Big Jets* by Stan Stewart, Airlife Publishing - my local library had a copy.

"Where's the London a.t.c.c. relay for the Strumble sector?" asks **Mike Bennett** (Slough). Clee Hill and Winstone seem to be the nearest. Mike also reveals the secret of the Boeing 757 h.f. antenna ("Airband," December 88): it's suppressed into the fuselage.

Don't miss your slot time for next month's "flight of fancy" - and thanks again for all your letters. □

Abbreviations

a.t.c.c.	air traffic control centre
a.t.i.s.	automatic terminal information srvice
b.f.o.	beat frequency oscillator
f.m.	frequency modulation
ft	feet
h.f.	high frequency
kHz	kilohertz
MHz	megahertz
n.d.b.	non-directional beacon
s.s.b.	single sideband
v.h.f.	very high frequency

SCANNING

Alan Gardener

Illegal Listening

An interesting court case ended just before Christmas - the outcome of which was the conviction of five people living in London for various offences under the Wireless Telegraphy Act. The main crime being "listening to stations they were not authorised to receive". Normally this would have been very difficult to prove, however in this case several members of the group had discussed very openly what they had heard.

The court imposed fines on the group totalling just under £8000 and in addition ordered the forfeiture of over £10000 worth of radio equipment.

A more detailed account of the circumstances relating to this case appeared in an article written by Duncan Campbell and Nigel Townson in the 16 December 88 issue of *New Statesman and Society*. Duncan Campbell is of course no stranger to breaking news of controversial subjects. You may remember all the media attention connected with his disclosure of the secret British "Zircon" spy satellite. Alternatively you may have read one of his books such as *War Plan UK* or *The Unsinkable Aircraft Carrier* in which he details many aspects of Britain's defence and communication systems.

The article is worth reading for details of the court case alone, but the authors go on to discuss the wider implications of the case, and describe how difficult it is to prevent people from listening to transmissions they are not authorised to receive simply by passing a law. As they point out the only effective way to do this is to scramble the signals before transmission.

Finally - and to me the most surprising part of the whole article, was the inclusion of several frequencies used by the Police and Ministry of Defence for various activities. For example MI5 and its "Watchers" operating from Euston Tower in central London on 142.5MHz, the US Embassy on 454.075, "Glassjar" and "Proton Control" Special Branch control stations operating on 147.5 and 147.85MHz or Regional Crime Squads on 155.7MHz, Customs & Excise on 86.71MHz and finally Cruise missile convoys on 73.65MHz.

Disclosures such as these are of course very damaging to the services operating on the frequencies, but, as the authors point out, most of the frequencies are already well known by groups with an interest in monitoring the user's activity. In particular they point out that the MI5 transmission is on a frequency very close to one used for down-links from the orbiting Soviet space station "MIR". As a result the transmissions are unlikely to have gone unnoticed.

New Products

It will be interesting to see how quickly the security services introduce new equipment and operating procedures in order to prevent further embarrassment and, more importantly perhaps, consider tightening the laws relating to listening.

Just one new item this month,a scanner from Uniden-Bearcat the 950XLT.

Alan starts his column this month with a look at recent events, which may have far reaching implications for users of scanning receivers over the next few months. He also continues with his review of what you can hear with your scanner.

Aimed at the mobile/base user the receiver measures 50 x 178 x 178mm and features 100 memories in five banks of 20. Frequency coverage includes the bands 29-54MHz, 118-174MHz, 406-512MHz and 806-952MHz, all of which can easily be checked with the programmable frequency search facility. Scan speed is fast at 15 channels per second. Memory lock-out and memory delay facilities are provided, as well as a back-lit display which should ease night-time operation.

Again, as with so many scanners originally intended for the American market, manual switching between a.m./f.m. does not seem possible, a.m. being automatically selected on the v.h.f. aircraft band. The price - around £269. Contact Nevada, 189, London Road, North End, Portsmouth, Hants PO2 9AE. Or ring (0705) 662145 for further details.

Oops!

A couple of small errors crept into the January 1989 column. In Fig. 1 the collectors of the two transistors should have been shown connected together - the circuit works a little better that way!

In Fig. 2 the value of the two inductors should have been 10µH instead of the 1mH marked on the drawing. The circuit would still work with 1mH inductors but it may be difficult to find types that are small enough to fit inside the jack plug casing.

I will have to draw the diagrams on the back of a larger cigarette packet the next time!

What Can I Hear? Part 2

In last month's column I featured the frequency range 25-54MHz this month I take a look at 54-88MHz.

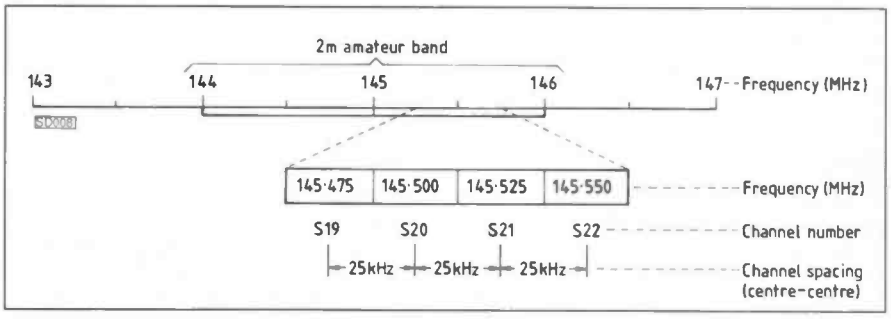
The band of frequencies from 54-68MHz formed the top end of the UK 405-line Band I TV allocation. This only ceased operation a short time ago and so is only just starting to be reallocated to other services in the UK, although it is still used for TV transmissions in many other countries. The band from 54MHz right up to 88MHz is internationally allocated for military use but operation has to be slotted between other allocations in individual countries. The first of these in the UK is the 4 metre amateur band which spans the frequency range 70.025-70.5MHz. This tends to be one of the least active amateur bands mainly due to the lack of commercial Japanese equipment capable of operation within the band, and partly due to the fact that the UK is one of the few countries which permit amateur operation on these frequencies resulting in few overseas contacts in comparison to the more popular 2 or 6 metre bands.

Most operation on 4 metres tends to be either c.w. or s.s.b. at the low frequency end of the band or a.m./n.b.f.m. operation towards the high frequency end, mainly using converted commercial radiotelephone equipment.

As we venture further up in frequency the effects of atmospheric conditions on the propagation of radio waves become less variable. This makes them much more suitable for services requiring reliable communication systems. This is one of the main reasons that little use is made of the frequencies below 70MHz by services in the UK, as foreign signals often can be received at strengths well above those of local stations during periods of enhanced propagation. Not much use if you are trying to operate a taxi or breakdown service when your base station is being masked by a Spanish delivery service or American Fire Department for example.

One of the most recent allocations in the UK is 70.5-71.5MHz and is being gradually occupied by the Fire Services. These are being moved from their old 100MHz allocations which were in the middle of the v.h.f. f.m. broadcast band. Many Fire Services have now moved to their new frequencies and the old systems are being run down as broadcast stations fill up the old channels.

Most Fire Services have to ensure communications over a very large area in order to do this they generally use more than one base station for the transmission of messages to and from the mobile fire appliances. This is achieved by linking together several base stations operating on the same channel. A small frequency difference in the order of 2-5Hz is maintained between the frequency each of the base stations operates on. This is termed Quasi-Synchronous operation and is in used in order to prevent dead



SCANNING

The new Uniden Bearcat 950XLT

spots occurring in an area where signals from two base stations arrive at about same signal strength. If the signals were on exactly the same frequency then the areas where the signals arrived in phase with each other would benefit from an increase in the received signal strength.

However in areas where the signals arrived out of phase with each other there would be an almost complete loss of signal. By maintaining the small frequency difference between transmitters the phase relationship between the two signals constantly changes and so the dead spots move at the same rate as the frequency difference between transmitters. You can usually detect a low frequency variation in the received signal level on systems using "quasi-sync" operation, particularly if you are outside the intended coverage area where the signal strengths are lower and a receivers a.g.c. or limiting circuits cannot mask the variations in signal strength.

The next small band extends from 71.5MHz up to 72.8MHz. This forms part of the private mobile radio (p.m.r.) "low" band. The allocation is divided into separate channels each one 12.5kHz away from its neighbour and is used by mobile stations transmitting to their base stations. The base stations transmit back to the mobiles 13.5MHz higher in frequency.

A gap exists between 72.8 and 76.95MHz. This is used by an odd mix of services including the military and Aeronautical navigation marker beacons at around 75MHz.

Frequencies in the band 76.95-78MHz are allocated to p.m.r. for mobile stations, in this case paired with base stations 10MHz higher in frequency. Another gap exists between 78 and 80MHz, again allocated internationally for military operations.

The 80-84MHz band was used by the Home Office for both the Police and Fire Services to transmit to their base stations from mobiles and was paired with the band centred on 100MHz. Now that the police and Fire service are being moved to different frequencies the band is being reorganised and is currently being reallocated to the fire service for mobile transmit paired with 70.5-71.5MHz. Another small gap exists between 84-85MHz which again is allocated internationally for military use.

Finally 85-88MHz, this band is use for the p.m.r. "low" band base station transmit frequencies. With the exception of a small band between 86.3 to 86.7MHz which is still used by p.m.r. services but for low power single frequency operation - usually hand-held transceivers. A mixture of a.m. and n.b.f.m. transmissions are used but the band is divided up into standard 12.5kHz channels.

The propagation characteristics of frequencies around 80MHz make it an ideal band for coverage of large areas without having to install base stations at many sites. It may be possible for example to provide radio coverage of a complete county with only two or three well sited stations. It is for this reason that many large organisations such as councils, water boards, car breakedown services and delivery companies have allocations in this part of the spectrum.

More next month as we venture higher still in frequency.

Bands, Frequencies and Channels

Dave Whitley of Ealing is a little confused with my usage of certain terms in the column, in particular the relationship between Bands, Frequencies and Channels. Well Dave I hope that I may be able to clear up this particular mystery for you.

Starting with *frequency* this is the actual spot in the radio spectrum that a signal can be found. Frequency used to be expressed in terms of wavelengths, however as radio developed over the years it became more common to define it as the number of variations or *cycles* the electromagnetic wave forming the radio signal alternates through in a second (c.p.s. or c/s). Recently the unit was renamed *hertz* after one of the pioneers of radio communication. Unfortunately this tends to lead to confusion as the term is rather less descriptive than its predecessor. The relationship between wavelength and frequency is fixed by the rate at which radio waves travel through the air. This is 300 million metres per second - which happens to be the same as the speed of light, another form of electromagnetic radiation. Wavelength is obtained by dividing 300 by the frequency in MHz.

Radio waves vary in frequency from around a few thousand hertz - kilohertz (kHz) to beyond several thousand million hertz - gigahertz (GHz). As a guide most scanning receivers cover the range 25MHz to 500MHz (One MHz or megahertz equals one million hertz), a relatively small portion of the overall radio spectrum, but one which tends to be the most used for local communications.

The term *band* is generally used to to refer to a group of consecutive frequencies used for a similar purpose. For example the "2 metre amateur band" extends from 144 to 146MHz and is so called because the frequency expressed in terms of wavelength approximates to - you guessed it - 2 Metres. Actually it's

Frequency Allocations 54-88MHz

Frequency (MHz)	Service
54.000	International military TV broadcasting
68.000	International military
70.025	UK 4 metre amateur band
70.500	Fire Service base transmit
71.500	85.000 p.m.r. "low" band mobile transmit paired with
72.800	86.300 International military Aeronautical marker beacons (75.000MHz)
77.000	87.000 p.m.r. "low" band mobile transmit paired with
78.000	88.000 International military
80.000	Fire Service mobile transmit
84.000	International military
85.000	71.500 p.m.r. "low" band base transmit paired with
86.300	72.800 p.m.r. "low" band single frequency operation
86.700	76.700 p.m.r. "low" band base transmit paired with
88.000	78.000

☞29

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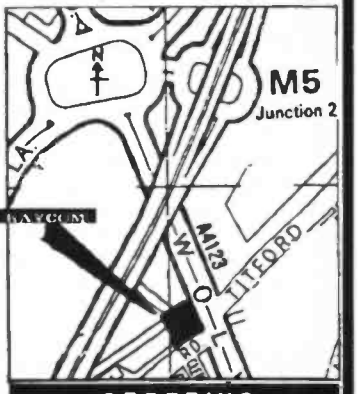

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BEARCAT 800XLT SCANNER

Jack Aldridge

The Bearcat 800XLT is a very attractive base station scanner featuring coverage between 29 and 912MHz in 12 bands. All the usual facilities of memory scanning and search are provided as well.

Getting Started

The 800XLT was very well packaged and came complete with two antennas - one for normal use and one for specialist use on frequencies above 800MHz. The first job, of course, was to read the manual. Well, if you're doing a review you ought to do things properly!. In this case it was an 18-page A5 booklet covering the main operational details well with plenty of illustrations to clarify the use of memories, etc. Ideal if this is the first scanner you've used. The only technical information supplied was a single sheet with the basic specification which I'm sure is more than enough for most users.

The power requirements were simple - 12V d.c. Unfortunately an external power unit is not supplied with the set which is rather unusual for a base station receiver. Despite this, it only required 12V at 750mA which is quite cheap and easy to provide whether you're buying a power unit or having a go at building your own. One advantage of a 12V supply, of course, is that the receiver can be used for "hill topping". You know, where you drive up to the top of your local hill and see what extra DX that brings in. The power socket used is the usual coaxial type which is mounted on the rear panel.

The only other power source to consider is the battery back-up for the memories. It's no use programming them full of interesting frequencies if, when you disconnect the set, they get lost and you have to start again. You need two AA cells which are mounted in a battery compartment again on the rear panel.

I was pleased to see that the instruction manual told you how to change these batteries without loosing the frequencies programmed in. It's quite simple really, you just had to remember to keep the set powered up whilst you swapped batteries.

Having sorted out the power, the next stage is to connect up the antenna. As I mentioned earlier, there are two antennas included. First, there's the 540mm telescopic antenna which screws into the main p.c.b. via a hole in the top panel. Although this antenna can be used for the entire coverage of the 800XLT, the manual does suggest that the second, shorter (90mm), fixed antenna is used for frequencies above 800MHz. This second antenna fits into a car radio type antenna socket on the rear panel. I must say, this seems to be a strange choice of socket for these frequencies as it is very lossy.

The final antenna choice could always be an external antenna of your choice, but once again you have to use the car radio type socket. For any newcomer who's not sure why I'm suggesting an external antenna, it's that for v.h.f/u.h.f. scanning that's really essential for good results. Unless, of course, you live near the top of a well located high-rise building or perched on top of a hill with no electrical interference around (which probably discounts many s.w.l.s). If you do get electrical interference, then even in a high-rise building an external antenna can help.

Operation

The front panel layout was very simple to operate with a bank of 23 push-buttons and two rotary controls. The two rotary controls were for volume/on-off and squelch, which seems to be fairly standard these days. The thing that went against convention was the squelch control, it worked clockwise (i,e, clockwise rotation opened the squelch). This is obviously not at all serious, in fact it turned out to be quite logical as the auto-squelch click stop was at the anti-clockwise end of the movement and when you move from auto squelch to manual you weren't faced with a rush of noise while you found the correct setting. Very "user friendly" as the modern phrase goes.

The frequency selection modes provided were memory scan and search. By far the most common frequency selection method used by v.h.f./u.h.f. listeners is memory searching as it is the fastest and easiest way of checking a wide range of frequencies for activity.

Before you can start scanning you obviously have to enter some frequencies into the memories. This has been made very simple on the 800XLT. All you do is select the required channel number by pressing that number on the keypad, and follow that by pressing the MANUAL key. All that's left to do then is enter the frequency using the 0-9 keypad. The 800XLT puts in all the trailing zeros for you after you've pressed the decimal point and ENTER.

Once you've got a selection of your favourite frequencies safely stored away, you can start scanning. This involves just a single press of the SCAN button (obvious really). You'll soon discover that a couple of additional features are necessary in order to make best use of this mode and they are LOCKOUT and DELAY. Veteran scanner users won't need any explanation of these functions, but just incase you're a newcomer: the lockout feature allows you to temporarily eliminate any individual channel from the scan. This is useful to stop the scan coming to rest on a channel which only has a carrier up or one that get's on your nerves after a while. The delay function makes the scanner wait for up to three seconds on a channel after the carrier had disappeared, this gives time for and answer to appear from the other half of the transmission. Both of these functions were activated by pressing the appropriately labelled button when the appropriate channel is selected.

One thing about the 800XLT that's a bit out of the ordinary is that the 40 memories can be split into two banks of 20. This can be very useful if, for example, you're interested in air band and the amateur band but don't want to listen to both at the same time. By using this split feature you could put all your favourite air band frequencies into one bank and the amateur ones in the other. Then you can choose which sets of frequencies to listen to.

The main frequency display is used to show which memory bank is enabled by putting decimal points (or dots!) in the memory numbers. The system used it quite simple (but difficult to explain), a left-hand dot indicates memories 1 to 20 and a right-hand dot indicates memories 21 to 40. If both dots are lit then all 40

BEARCAT 800XLT SCANNER

memories are enabled. I warned you it was difficult to explain!

One of the best and probably quickest ways of finding new stations is by using the search facility. This is especially true if you know that the type of transmissions you are interested in are between xxx and yyy. On the 800XLT it let's you search between any two frequencies as long as they are within the range of the set. To start a search going is very simple and quite logical.

The frequency steps used in the search mode weren't given in the manual but a bit of detective work with the review model revealed the following:

All frequencies below 174MHz were 5kHz steps except the air band (118 - 135.975MHz) which used 25kHz steps.

All frequencies above 174MHz used 12.5kHz steps.

This selection of step size was well chosen by the manufacturers as it fits in with the existing channel spacings.

As with the scanning modes, the DELAY function can be used to cause the 800XLT to pause for three seconds after the signal has disappeared. The only difference here it that you only have to press the DELAY button once to enable the delay function on all frequencies.

To stop the search and manually tune around for activity, you press the HOLD button which stops the search, while any further presses increase the frequency by the minimum step for that section of the band. to step lower in frequency you need to press the LIMIT button. This took a bit of getting used to as I normally press buttons marked > and < to go up and down in frequency.

If you want to keep half an ear on a particular frequency regardless of what other mode you are using, then the priority mode will suit you down to the ground. I often keep half an ear on either the local repeater or the local airport depending on my mood. The priority button is marked PRI and once you've chosen your frequency and pressed the button, the 800XLT checks for activity on that channel every three seconds. But, you must make sure you put your priority frequency in channel on of the memory, which I think is fairly standard with most scanning receivers.

The last operating mode to mention is marked as WX on the front panel, this stands for weather. No, it doesn't mean you get a weather forecast when you press the button (like someone in this house did!). Unfortunately, this is only of limited use in the UK as it scans the NOAA weather frequencies and automatically locks-on to any that are transmitting. Well, it's not easy to hear NOAA at the best of times and with the antennas provided with the 800XLT it is even harder. All the time I had the set on review I didn't hear anything. Mind you, I shall probably get rude letters from the satellite buffs telling me how easy it is.

Specifications

Frequency Range	29-54MHz 118-135.975MHz 136-174MHz 406-512MHz 806-912MHz
Sensitivity	29-54MHz 0.3µV 118-135.975MHz 0.8µV 136-174MHz 0.3µV 406-512MHz 0.5µV 806-912MHz 0.7µV
Selectivity	-55dB @25kHz
Audio Output	2W into 8Ω @ 10% t.h.d.
Power Supply	12V d.c. @ 75mA
Size	270 x 89 x 200mm
Weight	2.3kg

Performance

I must admit that I found the 800XLT to be simple and straightforward to use. The front panel layout was very clear and the push-buttons had a good positive feel, which reduced keying errors to a minimum. the buttons weren't too small or too close together either which helps when you're not quite as agile as you were.

The fluorescent display was also very easy to read, both during daylight and under indoor lighting conditions. It was also set at an ideal angle for table top use.

Initially I tried the receiver with the supplied telescopic antenna and was pleasantly surprised with the results. The home location is very much less than ideal for v.h.f./u.h.f. operation, but nevertheless the 800XLT performed very well.

The majority of the on-air testing was carried out in my shack (when I wasn't demonstrating it in the kitchen) where I use a discone mounted on a pole at about 10m. The performance under these conditions was very good and I managed some of the best DX for a long time. Despite all this, I was not very happy with the car radio type antenna sockets which must waste a fair amount of valuable signal - particularly at the top end of the 800XLT's coverage.

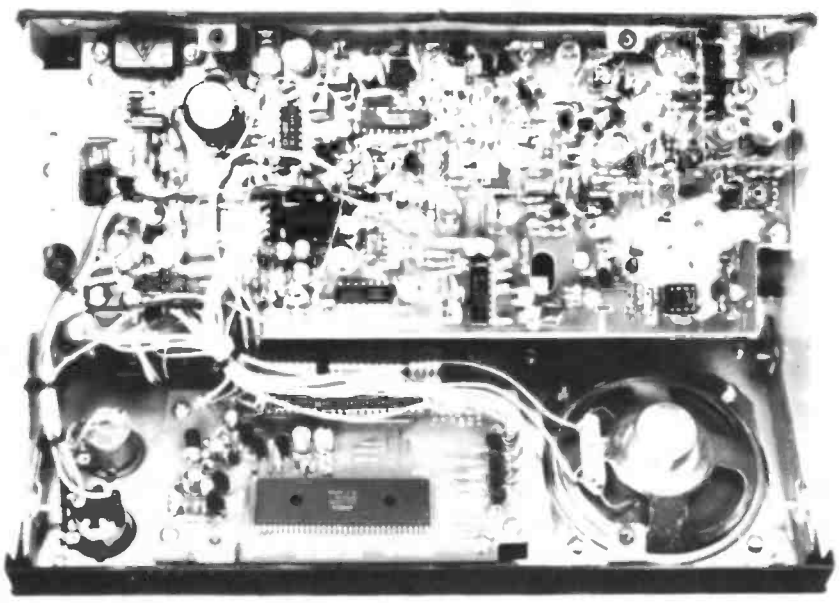
Although the facilities offered by the 800XLT are pretty basic by modern standards, everything worked extremely well. The squelch control, although operating in the opposite direction to normal, proved to be an improvement and the threshold of the auto position was ideal and effectively made the rotary control redundant.

Memory programming was very quick and easy with empty channels being indicated by the message "Error" on the frequency display. The memory scan rate was very fast at about 15 memories per second which meant that all forty memories could be scanned in just over two and a half seconds! I did find that the display blinked rather a lot while in search mode which I found a little irritating as it kept distracting me, but it wasn't a serious shortcoming. (The best solution I found was to take my glasses off!).

The delay feature, with its 3 second pause, seemed to be just about long enough to cope with the time between transmissions on most commercial stations, amateurs sometimes paused too long.

The search mode featured a similar stepping speed to the scan mode covering some 15 steps per second. I found the manual tuning by push-button to be quite effective but, being a bit old fashioned, I still prefer a rotary control. One area I did find lacking was transferring a frequency that had been found using the search facility into a memory. It would have been convenient to do this automatically, but with the 800XLT you had to make a note of the frequency and then enter it into a free memory. So treat yourself to a new notebook.

One area where the 800XLT really performed well was the audio quality which was very good indeed. It was enhanced by the sensible placing of the speaker - on the front panel. The air band is a particular favourite of mine and so I



BEARCAT 800XLT SCANNER

tend to use this as a check on the audio capabilities and it proved to be one of the best I have heard and made listening a real pleasure. The quality was equally as good on n.b.f.m. which, incidentally, was the only f.m. mode available. The lack of a wide band f.m. mode meant that you couldn't listen to u.h.f. TV sound channels.

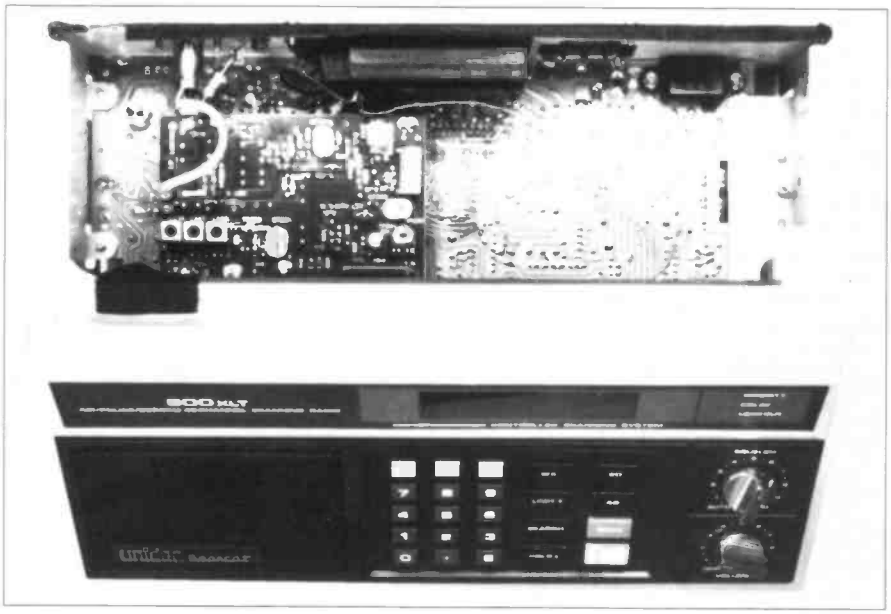
The inclusion of the 29 and 50MHz amateur bands was unusual and can reveal some interesting DX under favourable conditions. With the sunspot cycle still on the up, we should be alright for a little while yet.

Summary

The 800XLT, although only featuring fairly basic scanner facilities, was actually a pleasure to use as everything worked so well. The very wide frequency coverage was also very welcome, but I, at least, will remember it for its excellent audio quality particularly on the air band.

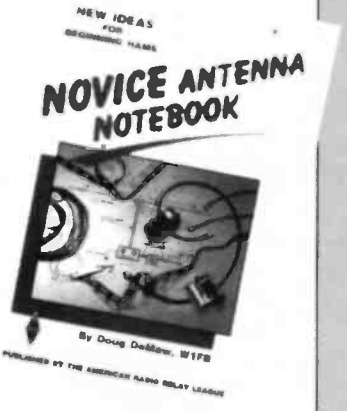
Overall, I think the 800XLT would be well worth considering for anyone new to v.h.f./u.h.f. scanning or someone not-so-new that gets bogged down with the "all-singing, all-dancing" versions that you see.

The Bearcat 800XLT costs £229 and is available from **Nevada Communications, 189 London Road, North End, Portsmouth PO2 9AE. Tel: (0705) 662145**, who kindly loaned the review set. □



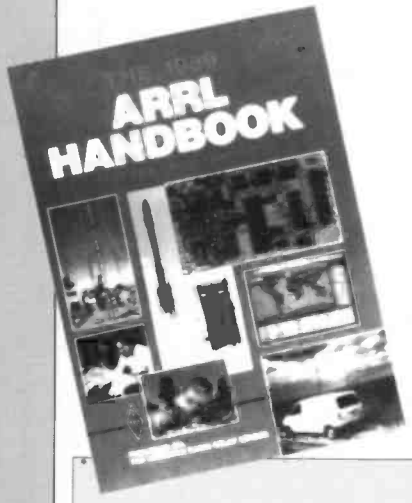
BOOKCASE

NOVICE ANTENNA NOTEBOOK
by Doug DeMaw W1FB
Published by the ARRL
Available from Short Wave Magazine Book Service
276 x 209mm, 124 pages. Price £5.95 plus 75p P&P
ISBN 0 87259 207 3



If you're a beginner in amateur radio then you need basic information written in a way that you can understand. This applies to antennas probably more than anything else as even expensive transceivers won't achieve anything without the right type of antenna. Your station will only be as effective as the antenna you are using allows it to be.

Drawings have been included with the necessary dimensions, so if you want that type of antenna for a different band it's not difficult to do the maths involved. You also don't need to be an engineer to build or erect the antennas described in this notebook. The author also explains how the antennas work and what governs their effectiveness for short and long distance communication. He also discusses the effects of antenna height above ground as well as the properties of earth ground and artificial ground systems.



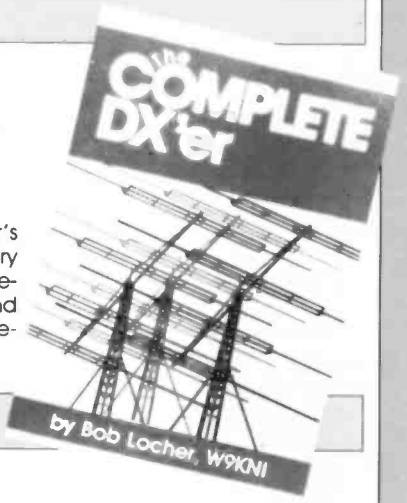
THE 1989 ARRL HANDBOOK FOR THE RADIO AMATEUR
Published by the ARRL
Available from Short Wave Magazine Book Service
283 x 214mm, hardback. Price £15.95 plus 75p P&P
ISBN 0 87259 166 2

This year's edition, the 66th, of this impressive book is, like last year's, available only in hardback form and just as thick! The weaker Dollar enables the UK price to be even lower than last year, making it one of the best bargains available for the radio enthusiast.

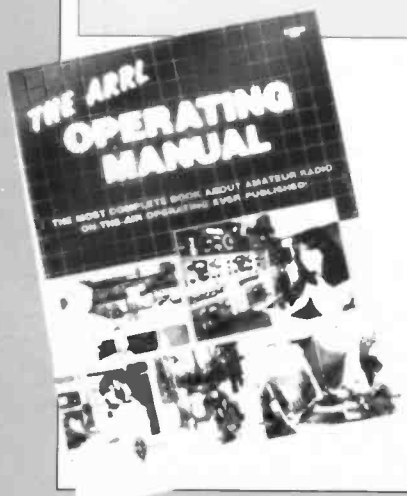
As always, the 1989 *Handbook* has been updated to keep pace with progress in electronics technology. Rather than a complete revision of a few chapters the Editors have made a number of more subtle changes to much of the content, adding new sections on oscilloscopes, spectrum analysers, digital frequency synthesis and phase-noise measurement. New constructional projects include a 50MHz frequency counter, a microprocessor-based memory keyer, a digital audio keyer and an inductance meter as well as a new 1.5kW amplifier design using the 3CX1200A7 triode valve.

Last year's edition sold very quickly and this one will be no exception. Can you afford to be without it on your reinforced bookshelf?

THE COMPLETE DXER
by Bob Locher W9KNI
Published by Idiom Press
Available from Short Wave Magazine Book Service
235 x 164mm, 187 pages. Price £7.95 plus 75p P&P



W9KNI has dominated the CW-DXCC Honor Roll since it started in 1975. Well known for the "DXer's Diary" and "The Far Horizons" series in American magazines Bob Locher's new book covers every significant aspet of DXing from how to really listen, how to sntch the rare ones from the midst of a pile-up to how to secure that elusive QSL. There is plenty of advice on siting, equipment selection and antennas but the book is full of excitement with "reports from the front" giving details of life in the pile-ups.



THE ARRL OPERATING MANUAL
Published by the ARRL
Available from Short Wave Magazine Book Service
273 x 209mm, 684 pages. Price £12.95 plus 75p P&P
ISBN 0 87259 032 1

The ARRL seem to have the knack of publishing books which not only provide up-to-date information which is indispensable to the radio enthusiast but are also unbelievable value for money.

This book carries the sub-title "The most complete book about amateur radio on-the-air operating ever published" and if the size is anything to go by they must be right!

Obviously the book is aimed at the American radio amateur but this does not detract from its usefulness to the UK amateur. There are chapters on short wave listening, the amateur radio spectrum, basic operating, antenna orientation, DXing, overseas DXing/DXpeditions, contests, operating awards, RTTY communications, packet radio, f.m. and repeaters, v.h.f./u.h.f. operating, satellites, emergency communications, traffic handling, image communications, ending with a very comprehensive reference section.

Altogether a book that is a must for every radio amateur.

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ICS ANT-1 ACTIVE ANTENNA

Mike Richards G4WNC

I'm sure that many of you with wide-range communication receivers have come across the problems associated with the reception of l.f. signals. For some it may be when trying to receive broadcast stations, while for others it may be utility stations (i.e. FAX and RTTY).

One of the main problems is that the general purpose, short wave antenna, although reasonably effective on the h.f. bands, often falls off rapidly in performance at the very low frequencies. There are several solutions to the problem, but the one offered by ICS Electronics is their ANT-1 active antenna system, designed for use between 100kHz and 25MHz.

Active antennas are basically quite simple devices in that a short whip antenna is used as the receiving element, coupled to the receiver via a pre-amplifier and matching unit. The clever bit is in the matching and pre-amplification, as a short whip (650mm in this case) requires a very high load impedance to work effectively. The practicalities of obtaining this high impedance over a wide frequency range usually means that the electronics need to be mounted as close to the antenna as possible. The matching unit and pre-amplifier for the ANT-1 is actually mounted within the insulated base of the whip. Mounting the electronics at the mast-head creates another problem in that a power feed arrangement is required. The problem is solved on the ANT-1 by using the supplied d.c. power adapter. This takes an incoming 12 volt supply and superimposes it onto the coaxial feeder to the antenna.

On The Air

The first task was to sort out the necessary leads and find a suitable location for the antenna. The leads required were quite simple with a SO-239 (u.h.f.) socket on the antenna and the power adaptor. My only criticism here was the use of this type of connector at the antenna. Because the antenna has to be exposed to the elements, I would have expected a waterproof connector, the SO-239 isn't. This means that additional waterproofing

There are many interesting signals to be found in the low frequency section of the radio spectrum, but what kind of antenna works best?

measures have to be taken. In my case this consisted of liberal use of self-amalgamating tape.

Another point to watch is that the antenna should be mounted well clear of any other metal objects as these will tend to reduce the performance. The ideal position is roof height, as this keeps the antenna as clear as possible from any sources of man-made interference. At l.f., these can be quite a problem.

The mounting of the ANT-1 is facilitated by a supplied right-angle bracket which fits under the SO-239 socket. Although this bracket was fine for fitting the antenna to a flat surface, additional hardware will be required if mounting the antenna on a stub mast.

The choice of cable between the antenna and the shack-mounted power adaptor is not critical provided it is of good quality and nominally 50Ω. I used 6.3mm diameter UR-43, which is not too unsightly and can be obtained at very reasonable prices - particularly from rallies.

The next stage was to connect up the power adaptor which comprised a small (70 x 45 x 35mm) plastics box with two SO-239 connectors on one side and one on the other. Power was supplied via a pair of black and red wires which were protected by a 200mA fuse, panel mounted on the power adaptor. The use of two SO-239 connectors on the adaptor meant that two receivers could be fed with the output of the active antenna. This would be ideal for, say, feeding an MSF clock in addition to the main receiver. The current consumption of the review model with a 13.2 volt supply was 13mA.

Abbreviations

d.c.	direct current
h.f.	high frequency
kHz	kilohertz
l.f.	low frequency
m	metre
mA	milliampere
MHz	megahertz
mm	millimetre
u.h.f.	ultra high frequency
Ω	ohm

The performance of the ANT-1 was really quite respectable, particularly at the l.f. end of the spectrum. My prime use for the antenna was to receive FAX pictures from Offenbach Meteo on my ICS FAX-1 and I found the combination to be very successful. When trying the higher frequencies, I found that the performance was maintained up to the 25MHz limit quoted, though its performance was easily exceeded by a simple wire antenna at the higher frequencies.

Summary

The overall performance was as I would expect from such an antenna, with the main advantages being at the l.f. end of the spectrum. This is where suitably dimensioned wire antennas are often difficult to accommodate. The ANT-1 would be an ideal choice for anyone with an interest in the lower frequencies, but with little space available for conventional antennas.

An additional use for the ANT-1 is in conjunction with a special version of the ICS FAX-1 decoder known as the FAX-1N. This version has its own 518kHz NAVTEX receiver built in and is capable of decoding FAX and NAVTEX simultaneously. In order to achieve this, the main receiver and antenna are used for the FAX frequency while the ANT-1 makes an ideal antenna to feed the internal 518kHz NAVTEX receiver.

The ANT-1 is available from **ICS Electronics Ltd., PO Box 2, Arundel, West Sussex BN18 0NX,** price £75 including VAT plus £2 post and packing. My thanks to them for the loan of the review model. □

BANDSCAN

Peter Laughton

Jamming - All Quiet on the Eastern Front

In the last few months, there have been several reports about the reduction in the jamming levels. Indeed, listening around to some of the higher frequencies it is sometimes unbelievable how quiet the bands are. For the first time it is possible to hear Radio Liberty and Radio Free Europe in the clear. In particular, broadcasts to target areas in Soviet Asia have rarely been heard in Europe in the past due to the interference.

The move started at the end of last November when the USSR cut back it's jamming levels. Then suddenly reports came from Prague that the government there was planning to stop both s.w. and m.w. deliberate interference against Radio Free Europe. This duely happened. On December 23, Bulgaria stopped jamming the Bulgarian broadcasts of Radio Free Europe.

But not all jamming has stopped. Here is a current survey of what is still continuing:

Jamming by **Bulgaria** of other Bulgarian language broadcasts from Radio Beijing, Voice of the Islamic Republic of Iran, RAI Rome, The Vatican, Voice of Greece and Voice of Turkey is stil going on.

Iraq jams broadcasts from Iran and Syria. This jamming sounds very different from the East European sound. It is believed these are French jamming transmitters purchased from France. They make a sort of "bubbling" sound. Try 6.035MHz in the European evenings to hear an example.

In **Asia**, broadcasts in Dari and Pashto put out by the Voice of America, Deutsche Welle, Radio Beijing, and the clandestine Voice of Unity are heavily jammed by Soviet transmitters close to the Afghan border.

Beijing, China continues to jam broadcasts beamed into the country from the Voice of Free China, Taiwan.

Some low power jamming continues in both **Koreas.**

New Christian Science Station Testing

Just before this issue of *Short Wave Magazine* went to press, we called the Christian Science Monitor organisation to find out more about their third short wave transmitter site at Cyprus Creek, South Carolina USA. Two 500kW transmitters are being installed, together with ten antennas, designed to serve Canada, the Caribbean, Central and South America. Ed Evans, the station manager for the new transmitter site, says they hope to start testing in the middle of February. Frequencies have not yet been decided. By the middle of March they should be running regular programming. The callsign of the new station will be WSHB. That stands for the World Service Herald Broadcasting.

You will already have heard about the enormous reductions in the levels of jamming of broadcast stations by the Eastern Bloc countries. Peter Laughton elaborates on this topic follows up the story of RNI and its problems and concludes with some interesting information about the Sony SW1-E.

ZOO 101.6 Worries Singapore

We switch to the tiny island of Batam in Indonesia. If your map is detailed enough you'll find it lies a few kilometres south of Singapore. An f.m. station, owned by the son-in-law of the Indonesian Vice President, has started beaming a diet of pop music towards Singapore. It is clearly trying to woo listeners away from the Singapore Broadcasting Corporation. Called ZOO 101.6, the station's disk jockeys have given themselves names of animals - Henry Kangaroo, Peter Snake and Joe Monkey to name a few. The diet of golden oldies and commercials seems to be working, especially amongst the Malay speaking sections of the population.

RNI Gives Up

Now a follow-up concerning the rusty freighter off the coast of Long Island. In October radio equipment on board the *Sarah* sprang to life as "Radio New York International". A boat with officials from the US Coastguard and Federal Communications Commission officials went alongside two days later and warned the broadcasters that unless they ceased immediately they would board. Subsequently, a restraining order was filed at a Federal court in Boston. Now the judge has announced his final decision, siding with the US government. He told the RNI operators that if they want access to the m.w. band they should apply for a license when the 1.610MHz part of the band is opened up. RNI's owner, Alan Weiner, believes that the court can't stop him. However, finances probably will - the project has run out of money.

Another RNI To Get a Boost

After years of indecision, the external affairs department of the New Zealand government has made an important announcement concerning the future of the short wave external service, Radio New Zealand International. For decades the short wave service has been limping along using two 7.5kW transmitters. It has been reduced to simply relaying programmes from the domestic service of Radio New Zealand. Its sign-on theme of the New Zealand bell-bird has been buried in the background noise.

Assistant secretary of External Affairs, Hugo Judd, told reporters in Wellington that a 100kW short wave transmitter is to be purchased and located south east of a place called Tarpo. Broadcasts will initially be made in the morning and evening hours, a total of 11 hours a day. Programmes will mainly be in English and concentrate heavily on news and sport. The domestic service of Radio New Zealand may be asked to provide the programmes, but the government may also decide to contract the service out to a private company. There will also be programmes in other Pacific island languages, made by ethnic groups living in New Zealand.

It will cost three million New Zealand dollars to start up the new short wave service, and an additional one million dollars a year to pay a total of ten staff. The lack of an external voice was first drawn to the attention of the New Zealand government during the coup in Fiji, and recent trouble in Vanuatu and New Calidonia has further persuaded them that a voice from Wellington needs to be heard. The transmitter should start testing in early 1990, to coincide with the country's 150th anniversary celebrations.

Umbrella News

The Association of North American Radio clubs has launched a drive to publicise its revamped Newsletter. Over the last eight months there's been a dramatic improvement in the quality of the publication, which complements very nicely the bulletins put out by the member clubs. ANARC is the umbrella organisation representing all radio clubs in North America.

The new ANARC Publicity manager, Tom McElvy, has persuaded another two national equipment dealers in the US to distribute club lists. Publicity for

international radio is being put on the largest computer network in the world called USENET, and ANARC info will also be in this year's *Radio Shack Police Call Frequency Directory*, which sells some 300 000 copies a year.

If you plan to be in Florida during July, the ANARC convention looks like something worth attending. This year, organiser Jeff White says the meeting will have a distinctly Caribbean flavour, and also look on how the North American's manage to hear all those Latin American stations (distance helps!). The conference is being held July 14-17 at the Dolphin Hotel in St Petersburg Beach. Even though it is **HOT** in Florida at that time of the year, it should be cooler by the coast. Further information from ANARC 1989, P.O. Box 272301, Tampa, Florida, 33688 USA. Tel 010 1 813 384 2354.

European Options

There are two options for radio listeners in Europe this year. From June 16-18 the Swedish DX Parliament will meet on the Norwegian-Swedish border. The exact location is Morokulien, and you can reach it via Oslo. The European DX Council recently announced that the Swedes have invited the EDXC to combine their conference with theirs. EDXC has accepted. No announcement has yet been made about the cost, or whether the agenda will be entirely in English. More information is available now from Stig Granfeldt, Signalhornsgatan 100, S-654 71, Karlstad, Sweden.

Meanwhile a little earlier, on May 26, West Berlin will be the host of a two-day radio convention. This is nothing to do with the European DX Council meeting, it is more geared to programme listeners than people who want to search for weak stations. The agenda calls for several presentations on the future of international broadcasting, which will be illustrated by working exhibits. David Monson is the man behind what's called "International Radio Days". To keep costs to a minumum, IRD offers a series of options. The basic price including everything except the hotel, banquet and flight works out at DM185. Hotels are in the region of DM100 a night if you choose the hotel booked by the organisers. Futher information from International Radio Days, World Trade Centre, Boulevard Emile Jacqmain 162, bte 12, B-1210 Brussels, Belgium. Bookings must be in by the end of April at the latest.

World News and Information Radio

A Washington based entrepeneur has come up with a scheme to put National Public Radio onto short wave. Robert Trobaugh argues that the Voice of America's charter forbids it to reach Americans abroad, and since the US Armed Forces Radio and TV Service stopped using short wave at the end of last year, a void has been created. He hopes to fill that gap with a service called World News and Information Radio. Plans for this station are in the early stages.

DX Newsline

Several experiments to maintain a news service for short wave listeners have failed across the world, partly because the novelty seems to wear off after a while. But there is one which is extremely sophisticated, and because the operator refreshes the news throughout the week, it's up to date. It's the DX Newsline, and you can reach it by dialling 010 1 for the USA, then the area code 301 953 0777. The basic service is free, you only pay for the call. If you call from Europe at off-peak rates it can be quite a cheap source of information.

AWR-ASIA Complete

Adventist World Radio is probably best known amongst short wave listeners in Europe for the topical DX programme on Sundays. This airs at 0915UTC in the winter, and 0815UTC during the summer period. The frequency of 9.670MHz is usually clear in Northen Europe. Two reporters from the Danish SW Clubs International - Finn Krone and Gordon Bennett - do an excellent job in providing fresh listening tips.

The AWR station in Asia says it has now completed construction. A second antenna system means the station has improved its coverage of Japan, Korea and China. Since AWR Asia started broadcasting from the island of Guam back in 1987 they claim no less than 11 000 people have written to them. Daily English programmes are broadcast at 0000UTC on 15.125, 1000UTC on 9.465MHz, and 1630UTC on 11.980MHz. The first two last 60 minutes, the third is only 30 minutes long. A full schedule, and a station newsletter is obtainable from AWR ASIA, P.O. Box 310, Hong Kong.

Jordan Appears

I got caught out in the last column. No sooner was my copy on the way to the printers than Radio Jordan's signal dramatically improved. It is great to hear them back with a listenable signal in this part of the world. They first tried 9.560MHz but in the morning hours they're using 11.955 for Arabic between 0500-0700UTC and from 0700-1000UTC the programmes are in English. It seems this is causing problems for the BBC who use the same channel for English out of their Singapore relay station. This may mean that they'll switch back to 9.560MHz. Reception reports should go to PO Box 909, Amman, Jordan. QSL cards verifying the new transmitter have already been received by several European DXers.

Abbreviations	
DX	long distance (**Distance eXtra**)
f.m.	frequency modulation
kW	kilowatt
MHz	megahertz
UTC	Co-ordinated Universal Time (=GMT)

Receiver Update

We're still waiting for further news on the new ATS-808 portable receiver from the Sangean company of Tawain. It will be another month at least before samples are available. Meanwhile, four projects to further the cause of international broadcasting have been given special credit

The editorial office of the *World Radio TV Handbook*, based in Amsterdam, recently released details of its new prestigious annual award scheme. It seems they hope that these will act as a stimulus to receiver manufacturers. This year awards were made in four categories:

The **Best Communications Receiver** was judged to be the Kenwood R-5000, combining "all the functions needed for effortless listening, together with good quality audio".

The **Best Portable Receiver** was the Sony ICF-7601. This is not a digital portable, and has been overshadowed in the publicity by more expensive receivers, like the SW1S. This analogue portable offers crisp reception, good performance for the price, and is ready for short wave broadcast band expansions taking place this year. There are definitely not enough budget analogue portables with good performance, hence the choice of this receiver.

The *WRTH* has also started testing computer related software. The **Most Innovative Software** was judged to be "Short wave Navigator". This is a Macintosh computer program developed by Jim Frimmel, who lives in Texas. It is a computer "card index" which gives the user access to the schedules of many international broadcasters and their programmes. But it was Frimmel's idea of recording some of the sounds heard on air into the computer program that earned him the award.

For those who use the IBM MS-DOS machine, or one of its thousand compatible clones, the **Best Computer Accessory** of the past 12 months was certainly "Short Wave Database". Tom Sundstrom of New Jersey deserves credit for his active promotion of the

BANDSCAN

international radio listening field. His database of monitored schedules, and the Pinelands Bulletin Board confirm his dedication to the medium.

Formal presentation of the awards will take place during International Radio Days in Berlin and the Association of North American Radio Clubs convention in Florida during July.

Grundig Launch New Set

The new set from this West German company is called the Grundig Satellit 500. The transportable set offers two bandwidth filters, the narrow one being about right for listening under difficult conditions, the wide position is rather wide so the signal has to be clear of side-channel interference if you select it. The radio offers standard a.m., Upper and lower sideband, and a.m. synchronised modes. Coverage is continuous from 148kHz right up to 26.100MHz on the European model, plus f.m. in stereo through headphones. But one of the clever points lies in the convenience of the memories. They store not only the frequency and mode, but up two four letters or numbers on the display. You might programme BBC1 alongside 6.175MHz for instance to remind you. But in addition to memory channels that you can programme yourself, the Satellit 500 Professional to be sold on the European market will come complete with a database of 156 frequencies already in the radio!

In the last three years, few European manufacturers have upgraded their short wave portable line. Radios are certainly being sold, especially to holiday makers, although most consumer electronic advertising campaigns concentrate on video recorders, hi-fi and TV.

The Grundig Satellit 500 is going to cost around £275 in Europe. That makes it quite competitive in Europe, but very expensive for the North American market when Japanese radios are up to 30 per cent cheaper than on this side of the Atlantic.

Radio Denmark Update

Back in the 60s Radio Denmark's English service had a wide appeal, especially in Europe for rather up-tempo programming. Twenty years ago foreign language services were dropped, and Radio Denmark continued as a Danish-only service for Danes abroad, especially at sea. The ageing transmitter facilites on the outskirts of Copenhagen prompted Radio Denmark to ask the government to take over the finance of the short wave service. They also wanted an investigation into the possibility of hiring airtime via Radio Norway's new short wave transmitters.

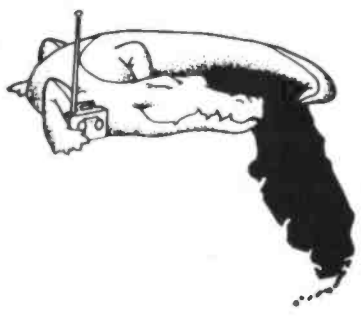
An ultimatium a few weeks ago seems to have had positive results. Jorgen T. Madsen, head of the short wave service of Denmarks Radio, told *SWM* that the government has decided the short wave service should continue. In theory, airtime on Radio Norway could be made available as from May 1989, but so far negotiations between Denmark and Norway make it unlikely that this target will be reached. There is an air of optimism though that one day a "Radio Scandinavia" might go on the air. This would combine resources of Sweden, Denmark and Norway, and might include foreign languages.

Soviet DXers Unite

Short wave listener organisations in the Soviet Union have been somewhat few and far between until now, and not formally organised. But Sigitas Zilionis who lives in Vilnius, Lithuania, tells us that the Lithuanian DX Club "Banga" has now been formed and included a bulletin to prove it. "Banga" means "Wave" in Lithuanian. The organisation has agreed with the English service of Radio Vilnius to produce a five minute media programme every two weeks on a trial basis. The LDXC is looking for contacts outside the country, and if you'd like to get in touch their address is LDXC, Box 985, Postal Code 232300 Vilnius, Lithuania.

Sony In Germany Launch SW1-E

You will have seen the *Short Wave Magazine* review of the Sony SW1-S. This sophisticated cigarette-pack sized radio appeared in April last year. But when you buy one you get the radio, a large power supply, plus an active antenna unit, all of which rather defeats the appeal of the radio's small size. In Western Europe for instance, the active antenna is certainly needed for good reception. Until now you've been forced to pay for all this stuff. Now Sony in the Federal Republic of Germany has introduced the SW1-E. It consists of an identical cigarette-pack sized short wave receiver, a set of stereo headphones, and a portable "washing-line" type of wire antenna. It costs £165, so the price is reduced by just over two-thirds. Sony outlets in USA, Canada and Britain though said they knew nothing about the SW1-E - at least not yet. □



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SCANNING

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nearer to 2.0689655 metres but what are a few decimal places between friends?

If we now sub-divide the band into reguarly spaced frequency slots we obtain *channels*. This makes it simpler for users of a particular band to change operating frequencies. Instead of saying "change to a frequency of one hundred and forty five point five two five mega-hertz" they can now say "goto channel S twenty two" which is much easier to remember, providing all the users agree on the same channel numbering system.

Abbreviations

CB	Citizens Band
f.m.	frequency modulation
GHz	gigahertz
h.f.	high frequency
kHz	kilohertz
l.c.d.	liquid crytal display
MHz	megahertz
n.b.f.m.	narrow band frequency modulation
s.s.b.	single sideband
TV	television
v.h.f.	very high frequency

This also makes life a lot easier for non-technical users of communication equipment for example v.h.f. marine radios, where an operator can simply turn a switch on the equipment to a pre-set channel without having to know the exact operating frequency.

I hope that clears up the confusion Dave! If any other readers have questions they would like to ask drop me a line at he usual address PO Box 1000, Eastleigh, Hants SO5 5HB. Until next month - Good listening. □

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This might give you the impression that they're fairly exclusive.

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With prices between £69.95 and £299.95, Sony shortwaves cater for everyone, from the everyday business traveller to the most demanding enthusiast.

At one extreme you'll find the ICF 5100.

It may look like the standard tranny found in most people's kitchen. It's as easy to use as your average tranny. But don't let that fool you.

A flick of a dial and Radio 1 is replaced by stations from every corner of the World (and the top, bottom and sides as well). To reduce interference it has a dual conversion circuit, a feature usually reserved for the most expensive models.

Speaking of which, at the other extreme is the ICF 2001D.

It does everything an enthusiast could want. And quite a few things he didn't know he wanted but will soon swear he couldn't do without. Like a synchronised detection system for instance, something you'd only expect in professional equipment.

You'll even find the World's smallest shortwave radio, the ICF SW1.

Slightly larger than a cassette box, it's just what you need when you wake up in a strange hotel room in Papua New Guinea, and feel a hankering for the news back home.

Whether it's a simple case of homesickness you want to cure, or an advanced case of 'enthusiast's fever', Sony shortwaves are the answer.

For a free trip around the World (well, its radio stations anyway), ask your nearest Sony Shortwave Centre for a free demonstration.

SONY.

London: SKB Limited, Video & Audio, 100 Ballards Lane, Finchley, London N3 2DN.

Edgware Electronics Centre, 194 Edgware Road, London W2.

Harrods Ltd., Radio & TV Dept., Brompton Road, Knightsbridge, London SW1X 7XL.

Knightsbridge Electronics, 155 Knightsbridge, London SW1 7PA.

LeSet Ltd., 115 Fulham Road, London SW3.

PNR Audio Vision, 28 Tottenham Court Road, London W1P 9RB.

Welbeck Video Ltd., 26 Tottenham Court Road, London W1.

Selfridges Ltd., Radio & TV Dept., 400 Oxford Street, London W1A 1AB.

Wallace Heaton Ltd., New Bond Street, London W1.

Berrys of Holborn, 37-39 High Holborn, London WC1.

Westminster Audio, 169 Piccadilly, London W1.

Galaxy, 230 Tottenham Court Road, London W1.

Spatial Audio & Video, 29 Tottenham Court Road, London W1P 9RE.

Massey Radio Ltd., 117 Chiswick High Road, Chiswick, London W4.

David Ingram (Hi-Fi Centre), 42-43 Lower Marsh, Waterloo, London SE1.

Alvabond, 70 Ballards Lane, Finchley, London N3.

Goodwins, 7 The Broadway, High Road, Wood Green, London N22.

Southern England: Suttons Limited, Bournemouth Sony Centre, The Quadrant, Bournemouth BA1 2AB.

Milton's Audio Visual Ltd., Southampton Sony Centre, 29 London Road, Southampton, Hants. SO1 2AD.

Brassky Limited, Colchester Sony Centre, 14-16 Culver Street West, Colchester, Essex CO1 1JG.

J. O. R. Gilbert, 35a High Street, Baldock, Herts.

Nicholls Bros., 82 High Street, Braintree, Essex.

Videovision, Camberley Sony Centre, 42 High Street, Camberley, Surrey GU15 3RS.

Videovision, Kingston Sony Centre, 40 Fife Road, Kingston upon Thames, Surrey.

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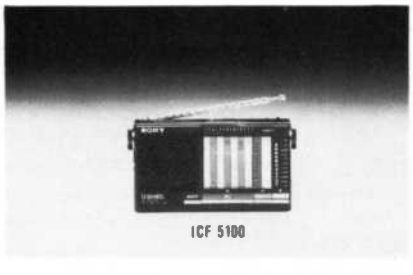
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73 from Dave G4KQH, Technical Manager

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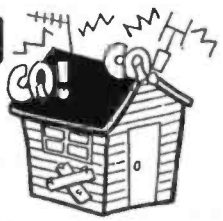

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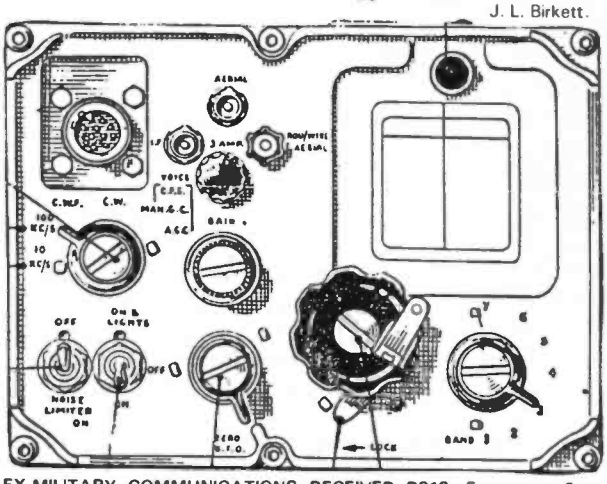

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HIGH SEAS & SHORT WAVES

Joan Ham

Joan Ham continues with the fascinating story of the early days of wireless. G6YL and G2YL are the subjects this month.

Another eavesdropper to that record-breaking contact had been Barbara Dunn in Stock, Essex, who recorded in her log, "G2SZ calling AQE Norwegian whaler *Sir James Clark Ross,* South Pole." Also in her log book, she put *The Times* news-cutting reporting the event. Barbara had been a broadcast listener for 4 years, enjoying 2LO broadcasts, but an over-whelming "YLish curiosity" as she described it, prompted her to investigate the meaning of the scratchy interference with 2LO's signals. Once she found out that they were spark signals from ships and coastal stations, 2LO lost a listener, and Barbara began to teach herself Morse. Her crystal receiver was tuned to 500kHz and 115kHz to receive f.l. time signals; after 5 intensive months of dedicated listening, Barbara could copy at 20 w.p.m.

Christmas 1925 brought what was probably the most exciting and momentous present she ever received, a short wave receiver. She listened, keeping very detailed logs, including weather conditions and tuning coil data among other things: reports signed "B. Dunn" began to appear at many gratified stations. Shipping and its signals remained a lifelong fascination for Barbara, and we have in the radio archives at the Chalk Pits Museum, some delightful early QSL cards with photographs of ships of all kinds with messages from amateurs and radio officers, not only pleased to have her fine reports, but also delighted to contact this first YL operator. One 1927 card shows the *SS Lituania,* a Dutch ship of the Baltic-America line in regular service between New York, Copenhagen and Danzig. The operators were OIK, working mostly on 8.8 or 14MHz. The radio station was clearly marked with a cross, and arrowed, halfway between the *Lituania's* two stacks. Barbara had heard their signals 2092km west of Essex, and the operators wrote that they would love to hear her some day, and they could not understand what thrill she could get from receiving alone – perhaps it was the QSL cards? Her report was particularly welcomed, as they had seen it published in *QST*, it was their first night on s.w. and their first QSO.

Other 1927 ships logged were *HMS Renown* at New Zealand carrying the Duke and Duchess of York, later King and Queen. The ship reported that "Neptune's Herald came aboard this evening, granted *Renown* formal permission to cross the line. Visit was not unexpected as Captain Sullivan had informed ship's company of receipt of a wireless message from Neptune." The relevant newscutting, as so often, backed up her log entry. She logged the *USS Memphis* of the American Navy, and American freighter, XLW, reporting, "worse explosives on board than going down. 20 tons of Navy powder and my mate. Hi!", the ice-patrol ship *Madoc,* NIVD and HMS Kellett, GFAR calling GLYK, *SS Adventuress.* This was a motor yatch which Col. Millard and Flt/Liet. Durrant, officer in charge AMWT and later council member of RSGB, had fitted out with short wave. Barbara had a letter of thanks and information from Flt/Lieut. Durrant, who told her that although he had not much time for amateur work, he was sometimes on the air as GFA, and would be on 7.6MHz every night to GDKB, the troopship *Dorsetshire* which he had fitted up for 7.2MHz. She was en route to India. That was enough for Barbara, and log entries, newscuttings and sailing movements began to appear regularly in her logbook. She followed the voyage and messages all round the world to the far east, including such enigmatic queries as, "Hw is the parrot?" "D not hr. Hw is our parrot? Pse QRS", to the reply, "Parrot's OK and set OK. In Suez now." Barbara was aware when the pilot was taken aboard at Basra, and that GFA, when told that a lady pilot was flying the Atlantic, told the Air Ministry in London, "senior op says he wishes he was there. It would be cool. What was the result of the Cesarwitch OM?" The frivolity of the occasional message obscures the serious scientific nature of Naval radio, which by 1927 was accepted as so reliable that official contact could give way to light conversation.

The greatest thrill of the exchange of messages surely came in mid-October, when Barbara must have felt accepted as a real part of the experiments. Her log entry read, "GFA Air Ministry London calling P3L. 'QSO GDKB *(Dorsetshire)* (calling 6YL *me!*) thanking me for my reports of reception of GDKB's sigs." One month later, GFA asked X263 to wait while he sent, "6YL de GFA GE *(me!* good evening)". The *Dorsetshire* had a very rough return voyage across the Bay of Biscay, and the final exchange of messages from Southampton Water requested boxes and lorries for the dismantled set, and referred to personnel.

Ships and operators in nearly every sea and ocean worked G6YL or were heard by her. The MacMillan Antartic expedition ship, the schooner *Bowdoin,* WNP, was logged in July, the *Canadian Seigneur's* operator J. Miller NC2BN, called CQ from lat. 21 degrees 25 degrees south, long. 121 degrees 16 degrees west; in the south Pacific and was entered in the log; FAMP, *Lamotte-Picquet,* a French battleship was heard transmitting, "Venons de quitter Tanger"; NX1XL. University of Michigan Greenland Expedition called NUWUBY. G6YL had among her QSL cards, a fine collection of ships of all nations and types – the *Monark,* a Swedish steamer, the *SS Djebel Dira,* sailing between Marseilles and Oran, the *SS Atreus* at Cebu in the Phillipines, the *SS Indauchu,* the J. W. Van Dyke, an oil tanker at Harbour Island, Texas and many others.

True to form, Barbara was always pleased to enter the exotic, the expeditions and the once-only stations in her log, such as "EEX28 Portable set of EAR28 on car going to Madrid calling CQ" or "XEK4AP, a German aeroplane between Leipsig-Berlin at about 1098km calling CQ" and A6L, and RAF station in Melbourne calling L80 at Calshot. In 1931, John R. Witty G5WQ, sailed from Las Palmas to Melbourne by way of Capetown on the *Ascanius.* He took with him his transmitting and receiving equipment for 7 and 14MHz, and Barbara kept an almost

G6YL was Babara Dunn's callsign and this was her QSL card.

Part 2

daily schedule with him during the 5-week voyage. He drew for her a fine map of the world with the ship's route plotted, and every contact that they had made.

G6YL had a fine grasp of languages, and apart from being a rare YL operator, this gained her coveted DX. Answering FE8CDA on 6.6MHz, she received the reply, "R OK. Bonsoir cher OM. TNX for QSO. QRK ur sigs. DC. QRA Bordeaus", she answered in French, telling EF8CDA that it was her first foreign QSO and she was the first YL station. Back came the response, "R. Now mes felicitations pour ce premiere QSO etranger. Pse votre QRA?" "R. OK. Je QSL via RSGB. Ce sera avec plaisir. Vous parlez tres bon le francais. Moi a vs aussi pr QSO. J'espere vous retrouver later. QRV" (A unique example of "Franglais plus Q code!"). A few months later, she heard L. Vydra EC2YD, Telc nr Prague calling test, and answered. The QSO ended with Barbara sending, "GB. Statsny Novy Rok! Dobrounoc" (Happy New Year, good-night). EC2YD responded with enthusiasm. "Rok Hi'! FB! Congrats FB YL Hi! Rok Hppi New Year YL fer all YL! Hi! Nazda. Hi! Hwsatl Nw Gud Luck es GB YL."

Barbara Dunn's high-speed Morse, accurate and meticulous log-keeping and no doubt her linguistic abilities were of value to her country when the Second World War broke out, but like so many other amateur activities this period remains an official secret.

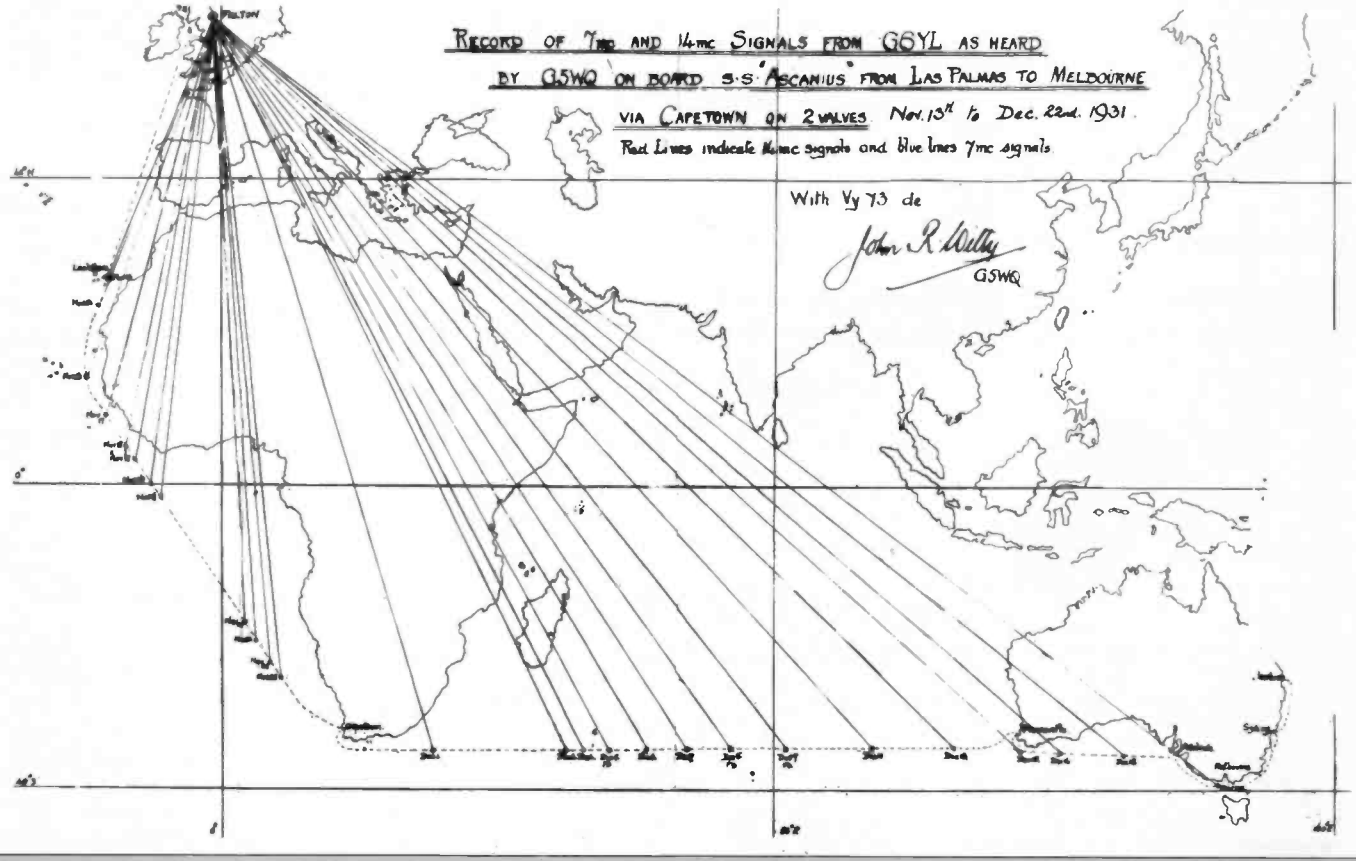
Shipping and its signals, always her first love, remained an over-riding attraction for Barbara. Checking through her *1928 RSGB Annual* and Log Book which we have in the archives at the Chalk Pits, of which Barbara had used the log section as a private call book, I found under the back flap a loose page torn from a note book. It was a list of ships, their callsigns, radio operators, positions and frequencies and also a "radio wagon" and train in Leningrad, several aeroplanes, one on a round-the-world flight, and the Byrd South Pole expedition, complete from base station, supply ships, planes and their makes, to the advance base. As late as 1959, she was made an Associate Member of the American Maritime Mobile Amateur Radio Club, in recognition of her work. "It is a real pleasure for me", wrote W3OB, "on behalf of the /MM gang to enclose your Associate Membership certificate. To my knowledge you are the first YL in England to receive it. Congratulations, I am very impressed with your accomplishment on low power and think I can understand what a real thrill you have gotten from your activity." He added that she was the first European YL to receive the certificate.

Enter Nell Corry G2YL

Barbara retained her first love of Morse signals, propagation and shipping to the end, and even when terminally ill, would mentally rehearse the Morse code so that she would never forget it.

A friend and colleague of Barbara was Nell Corry G2YL. One month after beginning her log book in 1932, she noted that the 3.5MHz tests had begun and entered the BRS listener's section. At the end of the tests covering two weekends, she had logged 38 G stations, 61 Continental stations and scored 83 points which won the tests. In June, she passed her Morse test at Croydon Post Office and was hard at work building a transmitter, winding coils on glass cigar tubes. Built on a floor board with a clean front panel mounting four condenser controls and meters, Nell's transmitter was a model of neatness, with the components beautifully laid out. On October 5 of that year, capital letters announced in her log book, "LICENCE ARRIVED!!!! CALLSIGN G2YL!!!! and in six months she was able to write in the book, "WAC" followed by a row of exclamation marks. The following month it was "WBE" with similar decorations, but her real world record was yet to come.

The amateurs had been hustled from 300kHz wavelengths down the short waves by official and professional bodies as they proved the value of the frequencies, and were finally told in 1928 that they could have the 28MHz waveband for their experiments as it was "commercially useless". One month after this permission was granted, the Atlantic was bridged on 28MHz by T. W. Matthews G6LL, who contacted W2JN. The



message received was, "Congratulations on first 28MHz between W and G."

In 1935, sunspot activity was inducing favourable conditions at these high frequencies. On Sunday 20 October, Nell was at her radio equipment early; at 0721, she heard VK6SA call her on 28MHz. Twenty minutes later, another Australian was heard calling CQ and Nell answered, but they did not connect. At 0813, VK4BB called CQ and one minute later, Nell went back to him. He replied, and the first Australian contact on 28MHz was established at 3:3:9, for both signals. The following Sunday, Nell's log recorded:

0901. VU2LJ Assam, India QSO no 1588

1038. VK4BB Maryborough, Australia QSO no 1589

1136. CX1CG Montevideo, Uruguay QSO no 1590

1245. G2MV London, England QSO no 1591

1412. FA8CR Algier QSO no 1592

1521. W4AGP West Palm Beach, Florida QSO no 1593

She had contacted the whole world, represented by 6 continents, on the "useless" 28MHz band, she had done it in consecutive calls and in only 6hrs 20mins. The world's press celebrated her great achievement and wireless experts forecast world-wide communication on wavelengths of 56MHz or less as a result of G2YL unlocking the door. She told the reporters, "I hope soon to build a set for experimenting on a 56MHz wavelength." John Clarricoats, secretary of the RSGB went even further and said, "Then will come yet another important line of investigation on waves of less than 1m, known as microwaves."

The world and its vast oceans was already becoming a small place for amateurs. Karl Jansky, an employee of Bell Telephone Laboratories in America had already recorded the ultimate in DX in 1931, when he announced that he had detected radio noise between 21.4-15MHz, coming from the area of the Milky Way. His antenna system was unlike anything seen before, a carousel arrangement of rods which revolved on a circular brick track. Bell Laboratories told him to get on with something else!

The first man to construct a recognisable 33.3MHz dish antenna and confirm Jansky's discovery was Grote Reber W9GFZ, His initial investigations in 1937 were at 3GHz, but receiver sensitivity at that time caused problems, and he found 1GHz a better working frequency. The large parabolic reflector which he eventually built worked in the 150MHz region, and with this he drew the first radio map of the sky, and identified Jansky's source in the Sagittarius area of the Milky Way.

In 1935 at Clacton-on-Sea, Denis Heighton G6DH, was a notable 28-56MHz callsign, particularly interested in propagation conditions. He observed that reception of the Berlin television transmitter on 42.8MHz meant good DX, and that a sudden fading of USA stations was usually associated with solar eruptions, visible sunspots and magnetic storms. One strange observation he made was a sudden surge of receiver noise which preceded the fading of DX signals. 6DH found that Nelly Corry G2YL, G5OJ and BRS25 had noticed the "hiss", and it was also observed by ZS1H in Capetown. In the following year, under the heading "Cosmic Notes", the *T & R Bulletin*, published a table of observations, recording sunspots, fade-outs, "hissing" and eruptive prominences on the sun, supplied by 26 amateurs and a Worthing astronomer, Mr Newbegin, 6DH wrote, "the phenomenon (the hissing noise) apparently originates on the sun, since it has only been heard during daylight."

Solar radio astronomy was born; the amateurs had broken the shackles of earth and reached out into space. They were poised to split the metre and experiment with tiny wavelengths.

In 1934, the 21st birthday of the RSGB was celebrated in the *T & R Bulletin* by many eminent people looking back on its history.

"1924, a greatly strengthened *T & R* section advanced to take part in the DX work with short waves, then triumphantly in full blast in America. These were exciting times, for during that winter signals were received by our members from hundreds of American amateurs and our transmitters began to shorten their inductance coils and their antennas. As everybody now knows, all this activity quickly led to every ocean being spanned by our members in the course of the year, perhaps the most remarkable year in the history of the RSGB."

"It was my privilege in my Presidential Address in January 1927, to call attention to the work done by members of the Society on the short wavebands, members who eventually distinguished themselves as pioneers and blazed the trail of long distance transmission with small power input, and made practical use of the Kennelly-Heaviside layer for this purpose."

Brigadier-General Sir Capel Holden, KCB FRS MIEE, Past President.

"Like my predecessors as Postmaster-General, I much appreciate the valuable work accomplished by amateurs in the field of wireless experiment and research."

Rt. Hon. Sir Kingsley Wood MP. His Majesty's Postmaster-General.

"(The Society's) experiments have been and are of great value to the country and to science."

Sir John Reith, Director of the BBC.

"As one who has been in constant touch with radio development since the time when the late Sir Williams Preece encouraged Marconi's early experiments in this country, I can say without fear of contradiction that the amateurs have contributed largely to the advancement of this particular branch of knowledge, especially in the direction of short wave transmission and reception and were, in fact, conducting regular transmission between places widely spaced on the earth's surface at a time when professional interests denied that such transmissions were commercially feasible."

L. F. Fogarty Esq. MTEE Hon Treas 1913-1922.

"A large portion of the history of radio development is written in your records."

F. J. Camm Esq. Editor *Practical Wireless.*

"I have been fully conversant with the early pioneering work so ably carried out and constantly maintained by the keen body of radio enthusiasts who form your members. Modern high quality transmission and reception is now an accepted fact, but it is doubtful whether it would ever have attained its present state without the invaluable aid of your Society."

A. Bulgin Esq. Director, A. E. Bulgin & Co

"I wish to congratulate the Radio Society of Great Britain for the rapid progress it has made, and for all it has done in promoting the development of radio science and practice."

Senatore Guglielmo Marconi GCVO, Honorary Member. □

G2YL and her station. Home-built transmitter on top of the bench to the left.

RADIO AUSTRALIA — 50 YEARS OF BROADCASTING

G. E. W. Hewlett

This year Radio Australia celebrates 50 years of international broadcasting, not only to the people of that vast continent and the surrounding areas of the Pacific and Indian Ocean, but also to the whole world.

Perhaps in some respects it is thanks to World War Two that Radio Australia exists today, although long before then the trend had already been set for as far back as 1920 Australian Post Office researchers had worked out a master plan.

As early as 1928 Post Office engineers had turned their attention to short wave broadcasting and in that year a low-power (2kW) experimental station was built at Lyndhurst, Victoria, the idea being to test the suitability of short waves for reception in the remote areas of the continent, particularly in the north.

Already a number of regional medium wave stations were operating: 2BL, 2FC, 3AR, 3LO, 4QG, 5CL, 6WF and 7ZL. These were the Class A stations and there were another 12 B stations before 1930, and from 1934 the Lyndhurst transmitters were carrying ABC (Australian Broadcasting Commission — now a Corporation) programmes to listeners in the outback areas of Australia who were not reached by its medium wave service.

The broadcasts were also directed to the Pacific Islands, sometimes being heard as far away as the British Isles.

It was now a matter of time before Australia went international, the service being first called "Australia Calling". Within weeks of the first transmissions, in 1939, the ABC was making daily transmissions in several languages.

Initially, transmissions came from existing low-power stations, at Lyndhurst and at Sydney. In 1940 the Post Office built a 10kW transmitter at Perth and, in the following year, another 10kW transmitter at its Lyndhurst site.

It was realised, however, that to do the job for which they were intended, transmitters of greater power would be required.

World War

Then came the Second World War and as the Battle for Britain increased in intensity, the Governments of Britain and Australia, fearful of the damage that could occur to the BBC's transmitters and spurred on by the war in the Pacific, realised that an alternative high-power station was an urgent necessity.

The site chosen was at Shepparton, about 192km north of Melbourne, in Victoria. Before the end of the war three transmitters were built, two of 100kW and one of 50kW. They were housed in a thick-walled, windowless, blast-proof building.

During the war and the immediate post-war period the control of programme alternated between the ABC and the Australian Department of Information. In 1950 it reverted to the ABC which has had the responsbility for programming ever since, the name being changed from Australia Calling to its present title, Radio Australia, in 1945.

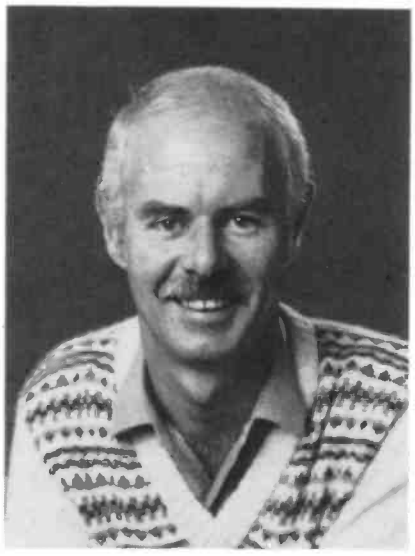
Higher Power

Throughout the following years the programme side of Radio Australia continued to develop. It was also realised that if Radio Australia was to retain its large listening public it would have to step up its power.

So the next stage was the construction of a high-powered station at Cox Peninsula, near Darwin, with three transmitters each of 250kW. Put out of action at Christmas a few years ago, they have since been rebuilt and put back into service.

In addition, other transmitters have been acquired at Carnarvon, Western Australia, where there are now three transmitters with output powers of 300kW, 250kW and 100kW, and additional transmitters at Shepparton. □

BRENDAN TELFER
Radio Australia



ROB HOSKIN
Radio Australia

MARY ADAMS
Radio Australia

PETER CAVANAGH
Radio Australia

Some of the broadcasters and presenters on Radio Australia.
Photos: Australian Post Office.

STARTING OUT

Brian Oddy G3FEX

Early experiments revealed that the arrival of a signal resulted in a change in the average value of anode current flowing in the demodulator stage of a receiver. It was observed that an increase in signal level caused a reduction in the current flowing in a grid leak type of detector, but in an anode bend detector the current increased. In both types of detector the maximum change in current occurred when the receiver was accurately tuned to the signal. A milliammeter was therefore installed in the anode circuit of the detector in some early amateur receivers, which provided not only an indication of the correct tuning point, but also some idea of the relative strength of the signal. Such indicators however were relatively insensitive.

The advent of the superhet receiver and the subsequent development of automatic gain control (a.g.c.) systems enabled a number of more sensitive **signal strength ("S")** meter circuits to be devised. The changes in current which occur in an a.g.c. controlled stage during the presence of an incoming signal are exploited in some of the designs, but in others the a.g.c. potential is applied directly to a specially designed meter circuit.

A simple approach, which was used in some valved receivers, was to connect a milliammeter in series with the supply to the anode of one or more of the variable-mu valves used in the a.g.c. controlled stages. An incoming signal resulted in a negative a.g.c. potential being applied to their control grids, thereby reducing both gain and anode current. Because an increase in incoming signal level resulted in a decrease in meter reading, the meter presented a confusing display: to overcome this problem a special right-hand zero-set meter was used in some sets, but in others a normal meter was

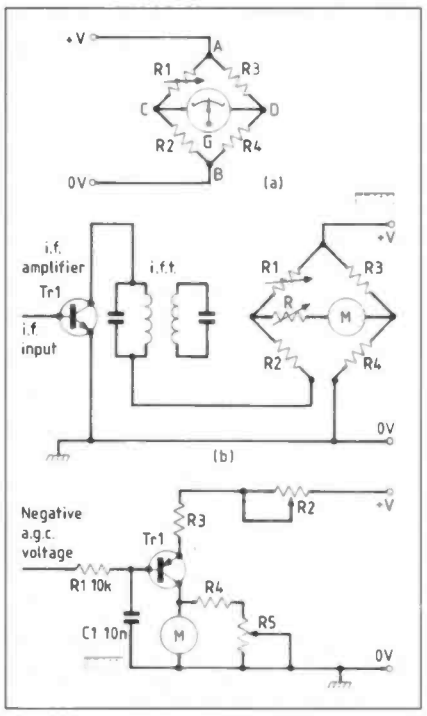


Fig 1.

Some of the simple tuning indicators which have been devised over the years were detailed last month in this series. Many of the more expensive portable receivers and most communications receivers employ a sensitive, moving coil meter to display not only the correct tuning point, but also the relative strength of an incoming signal.

simply mounted upside down! The meter calibration tended to be cramped at the lower end of the scale because the a.g.c. system was almost inoperative at low incoming signal levels.

Bridge Circuits

It was found that a much more sensitive indication could be obtained by connecting a microammeter across a bridge circuit installed in either the screen grid or anode circuit of one of the a.g.c. controlled stages - usually the last i.f. stage. The **Wheatstone bridge** circuit was frequently used and still forms the basis of many of the S-meter circuits in modern receivers.

The basic circuit of a Wheatstone bridge is shown in Fig. 1a. Two fixed resistors (R3, R4) form the so-called "ratio arms" of the bridge. A variable resistor (R1) and an "unknown" resistor (R2) form the opposite arms of the bridge. An external d.c. supply is connected to the bridge at points "A" and "B". A sensitive centre-zero **galvanometer** ("G"), connected across points "C" and "D", is used to indicate when the bridge is balanced. The bridge may be balanced by adjusting R1 until the potentials at "C" and "D" are the same - this will be indicated by a null on the galvanometer since the potential difference between points "C" and "D" will then be zero. So, at balance: R1/R2 = R3/R4, or R2/R1 = R4/R3. A number of other important applications for the bridge are based on these relationships.

In a typical, modern, bridge-type S-meter circuit, the "unknown" resistor consists of a fixed resistor (R2) in series with the collector resistance of the i.f. amplifier transistor (Tr1) - see Fig.1b. Two fixed resistors (R3, R4) form the ratio arms and the pre-set resistor (R1) enables the bridge to be balanced so that the S-meter ("M") reads zero in the absence of an incoming signal. Before making this adjustment the antenna and earth terminals are usually shorted together.

An incoming signal results in an a.g.c. potential being applied to the base of Tr1, thereby causing the collector current (Ic) to rise (forward a.g.c.) and the voltage drop across R2 to increase. This unbalances the bridge and causes the needle of the S-meter to deflect. A rise in incoming signal level will result in a higher collector current and an increased voltage drop across R2, thereby further unbalancing the bridge. The pre-set resistor (R5) in series with the microammeter ("M") enables the meter sensitivity to be adjusted to the pre-determined value laid down in the specifications by the receiver manufacturer, e.g. so that the meter reads S9 when 50 microvolts are applied to the antenna terminals at 14.300MHz.

Other Circuits

In some modern receivers. Instead of using the changes in current flowing through an a.g.c. controlled i.f. stage to activate the meter, the a.g.c. potential is measured with a transistor voltmeter, the scale of which is calibrated in "S" units. The circuit of a simple *pnp* transistor voltmeter is shown in Fig.2. The S- meter movement in the collector circuit of the meter amplifier (Tr1) is shunted by a pre-set resistor (R5) so that the meter sensitivity may be adjusted. The pre-set emitter resistor (R2) enables the meter to be set to zero.

When the negative a.g.c. potential resulting from an incoming signal is applied as a forward bias to the base of Tr1 it causes an increase in the collector current flowing through the meter, thereby deflecting the meter needle upwards. An increase in signal level will result in a greater meter deflection. By using a more

Readability (R)

1 Unreadable.
2 Barely readable, some words distinguishable.
3 Readable with considerable difficulty.
4 Readable with practically no difficulty.
5 Perfectly readable.

Signal strength (S)

1 Faint signals, barely perceptible.
2 Very weak signals.
3 Weak signals.
4 Fair signals.
5 Fairly good signals.
6 Good signals.
7 Moderately strong signals.
8 Strong signals.
9 Extremely strong signals.

Tone (T)

1 Extremely rough hissing note.
2 Very rough a.c. note, no trace of musicality.
3 Rough low pitched a.c. note, slightly musical.
4 Rather rough a.c. note, moderately musical.
5 Musically modulated note.
6 Modulated note, slight trace of whistle.
7 Near d.c. note, smooth ripple.
8 Good d.c. note, just a trace of ripple.
9 Purest d.c. note.

Table 1.

STARTING OUT

complex circuit for the voltmeter the characteristics of the meter response may be easily changed, for example the scale calibration beyond S9 could be compressed. Integrated circuit operational amplifiers provide a convenient basis for such designs.

Calibration

The majority of S-meters are calibrated in signal strength "S" units from 0 to 9 and dB over S9 in accordance with the **RST code**, or from 1 to 5 in **SINPO code "S"** units - see Appendix. Unfortunately S-meter calibrations are not standardised, so the "S" value indicated for a particular incoming signal on one receiver may well differ from that shown by the meter on another receiver when either set is connected to the same antenna. It is both difficult and expensive to design a metering circuit which is accurate, because the sensitivity of most receivers varies from band to band. An interesting comparison of S-meter performance was published in the July '85 *Practical Wireless* - back issues are available from PW Publishing Ltd., Poole, price £1.40 inc. P&P.

Provided that S-meter readings are treated as relative indications and not absolute values they can provide a lot of valuable information about signal conditions. For instance, when the reception conditions are unstable the meter needle will swing intermittently downward each time the signal fades - even shallow fades will be indicated on the meter, although their effect may not be audible since the action of the receiver a.g.c. system will hold the demodulated audio output reasonably constant. Both man-made and atmospheric noise will register on the meter, so the strength of a signal may be compared with the noise level on an unoccupied channel.

Signal strength

1	Barely audible.
2	Poor.
3	Fair.
4	Good.
5	Excellent.

Table.2

In addition to indicating the point of maximum signal when adjusting the receiver main tuning control, the S-meter can also be used as an aid in setting up the receiver for optimum performance. In some receivers an **antenna trimmer** is provided so that a match between the antenna and the first tuned circuit in the set can be achieved. In operation, it is rotated until the highest meter reading is obtained on a chosen incoming signal in a particular band - re-adjustment will be necessary when changing to another band. The separate pre-selector tuning employed in some receivers can also be peaked up while observing the meter.

Abbreviations

a.c.	alternating current
a.g.c.	automatic gain control
a.m.	amplitude modulation
c.w.	continuous wave (Morse)
dB	decibel
d.c.	direct current
i.f.	intermediate frequency
S	signal strength
s.s.b.	single sideband

Appendix

The internationally understood RST code has been used by amateurs for many years to describe the readability ("R"), strength ("S") and tone ("T") of an incoming c.w. signal. An incoming signal is assessed at the receiving point and then specified to the sender in terms of three simple numerical ratings. The readability ("R") ratings extend from 1 to 5, but there are nine ratings associated with the strength ("S") and tone ("T") - see Table 1. The ratings for a perfectly readable (R5), extremely strong c.w. signal (S9) of pure tone (T9) would be sent as RST 599. In the case of an a.m. or s.s.b. telephony signal only the "R" and "S" ratings are applicable. In practice, the strength of many signals is often greater than S9, so the scale on some S-meters is calibrated in dB above S9. Although a potent telephony signal might rate as "5 and 9 plus 10dB", the dB ratings are not quoted when giving c.w. signal reports.

Some signal strength meters are calibrated with the "S" ratings of the generally recognised SINPO code, which is used by short wave listeners to send concise reception reports to broadcasters - see Table 2. In this code, each letter specifies a particular aspect of reception and the ratings only extend from 1 to 5. For a detailed description of how to assess a broadcast signal in terms of the other ratings in this code, see pages 31 and 32, *SWM* October '87 - back issues are available from *Short Wave Magazine* in Poole price £1.50 inc. P&P. □

SERVICES

Subscriptions

Subscriptions are available at £17 per annum to UK addresses and £19 overseas. Subscription copies are despatched by Accelerated Surface Post outside Europe. For further details see the announcement elsewhere in 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 (UK) and £32 (overseas). Three year subscriptions are also available for SWM at £45 (UK), £50 (overseas).

Components for SWM Projects

In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

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

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SEEN & HEARD

AMATEUR BANDS ROUND-UP

Paul Essery GW3KFE

PO Box 4, Newtown, Powys SY16 1ZZ

Why do amateurs take longer than listeners to reach the one hundred countries, and yet both s.w.l.s and amateurs are about level-pegging when it comes to scoring a maximum? This question was thrown at me recently and took a bit of thinking about.

Basically, only about half of the countries on the current DXCC list (and both the European WAE and the Russian equivalents are for all practical purposes in agreement with DXCC) are in fact real countries, or even colonies. Most of the rest are only "countries" in the amateur radio sense, having few if any residents. Thus they are only activated when someone organises a DXpedition to that spot. Some are only visible at low tide! Others are claimed by several countries (Spratly Is for example) who glare at each other like dogs arguing over a bone; so anyone DXpeditioning there is liable to be shot dead or at least injured. Therefore, since the transmitter must first identify his man and only then start to try and raise him, while the s.w.l. can shift off and listen for his second one. That being said, a good contest station or indeed a good DXpedition should, if conditions are right, be able to work 100 countries in a 48-hour weekend bash. For the s.w.l. given the same conditions, the 100 countries target is rather easier.

However, that's all a question of populated countries, with a resident active amateur population. However, no-one with less than twenty years experience can possibly have heard a genuine ZA station, let alone worked one. I have seen a ZA QSL card, with a Tirana postmark, but the doubts linger that ANY ZA station since WWII have ever been genuine! However, giving it the benefit of the doubt, it remains the case that whether transmitter or listener, you have to have been around for twenty years to have had even a chance. Minami Torishima, Spratly, Willis and other places have been put on the radio map once or twice only since WWII; others mainly in Africa which once were easy, are now almost or even totally silent and hence not hearable.

If we consider the longer view, from WWII, we find that there are many countries which in effect appear twice; Ghana was previously in the list as the Gold Coast, for example. Usually there was a change of name, but not always. Again, countries amalgamated, so for example present-day Tanzania is made out of what were once Tanganyika as a colony then 5H3 and Zanzibar which was VQ1. In all these cases, those who have cards from the earlier days, and another card — maybe from the same station — from the current regime, have therefore counted two countries rather than one. This accounts for the fact that while the current DXCC list contains some 320 countries, the All-Time Post WWII listing shows about 360! It follows that the chaps with 100 per cent scores — there are one or two — have been around and on the air since amateur radio first opened up after WWII.

What about the influence of antennas? Again, it favours the s.w.l. to some extent. Most receivers can be persuaded to hear all the continents — Europe, Asia, N. America, S. America, Africa, Oceania in a normal weekend around the Equinoxes, even on a built-in whip, provided the user chooses his bands and times to suit. However, the transmitter then has to raise his man or even to crack his pile-up which takes time, while the inexperienced or unscrupulous s.w.l. may well enter the DX station in his log when in fact he has only heard somebody in the pile-up calling the DX!

Don't forget the SWM Awards for s.w.l.s — the Rules are repeated elsewhere in this issue.

Letters

Many of you will have heard GB75DH; this, says **GM0EXN**, was on from Dunnet Head throughout December, mainly on 14MHz. It finished up with nearly 1000 stations worked, in 43 countries, even though the triband beam was not erected due to a crack observed in the rotator housing; they made do with a multi-band dipole.

OH9SCL was a special from Santa Claus Land, with Santa at the mic(!) from Finland's most northerly village; a mixture of auroral note and T9 made the effect complete.

Events were wound up in a fine way by an Aurora manifestation; 8P9EM was heard in Barbados with a T9X signal, while the horde of JAs calling him were all showing the characteristic Auroral rasp — this one on 14MHz. I was also amused by the VE8RCS station up in Alert; his phonetics for RCS varied between Real Cool Site and Real Chilly Situation; fair enough for the nearest station to the North Pole!

Many of the knowledgeable ones will have wondered about the Laos activity that should have completed the Vietnam operation. The word that reached me is that the ticket did in fact arrive before the Vietnam operation was closed, but the boys were so physically exhausted, not to mention financially broke, that they had to abandon the attempt. However, they have said they will go there soon. Talking of the 3W effort, it just has to be one of, if not the, best DXpeditions mounted since my licence was first taken out back in the fifties.

Gary Sanders (Leicester) is 14 and uses a Lowe HF125 receiver plus wire antenna. Gary uses 2.5, 14, 21 and 28MHz. On 28MHz (10m) he mentions KW1JDL, IK7LCU, N4UH, W2KA, W4ST, while on 21MHz (15m) DL4WOZ was noted working G4WBE. On 14MHz (20m) there was VE8RCS at 59 working into G, 12BBJ in contact with K6HRT, DK3OP, OZ1LLP working VE8RCS, UA1BX in contact with A1, G3FXB, DJ2LS working into G and EA4RZR working SP5JBO. As for 3.5MHz (80m), G0FLA was noted working G0EUQ.

Turning to **Steve Price**, at Loughor, Swansea. He threw me well and truly by asking what I know about the HL5, heard on November 5, on a frequency outside the amateur band, of 3.477, lower sideband. Heaven only knows! The band 1.605-3.8MHz is allocated to, among others, ship-shore m.f. radio communications, but frankly we believe this was some piratical type offering his crooked wares without even knowing what the frequency was used for. After all, a CQ call as such is a pretty uncommon thing outside of the amateur bands. Onto Steve's other loggings, he certainly "gets around" with HZ1AB, KH6FKG, VU2FCX, 4KOÖ (Soviet Arctic station), FH4EE, 6W1NQ, JX1UG up on Jan Mayen, K2KTT/PJ7 in a rather warmer spot, 3W8DX, DK5EZ/VP9, FR4FA/J for Juan de Nova, 6Y5DA, V47NXX, ZF1HJ, C6ARC, DU1ELT, XQ6CFX in Chile, S83H Transkei, C6ANX, ZK2RY, VP8BUO, FP5HL, HH2JR, TV6YEU on Yeu Is, VR6TC (Tom Christian, on Pitcairn Is), FO5BI in Tahiti, SU1ER, HR5MAH, CV0Z from Uruguay, VS6DO, YC0DB, 8P6JB, 9K2RA, AP2UR, A92BE, BY4OM, FM5DN, YI2ARB who gave QSL address as to PO Box 335, Seghez Kurdktan, Iran — sounds a bit far-fetched as a QSL address, does that! — YL2VZ (QSL to UQ2GKL for this USSR special) XE1ND and VE8RCS.

A letter from **Bob O'Hara ZD8BOB**, Box 2, Ascension Island says that so far he has made some 1800 contacts since he started up on December 8; most were c.w., but at least some were on s.s.b. That makes up a fair-sized QSL chore and so Bob asks that everyone be patient and he will deal with them as expeditiously as possible. This is not a high rate for a DX location, so just think; if Bob keeps up the present rate he will have shifted nearly 22 000 QSL cards in one year — quite an expenditure on cards, let alone the postage for them from such a spot — and Bob says he expects to be at Ascension for three years! Now, just think of the time involved in writing out 22 000 QSL cards, and you'll get some idea of the magnitude of the DX station's QSL problems. No wonder they ask for an s.a.e. or IRCs!

Perry Stevens (Bridgwater) has been restoring an old Swan 260 to life; it was tried out on 14MHz with an inverted-Vee, but then a 21MHz ground-plane went up and he hasn't looked back! For example KA2QWZ, K7PSQ, WK0S, VE3OCP, WA3ZRO, W1SBM, W1EMH, VE3CRG, NE9O, JH3KEA, JR3BOT, not to mention stacks of Europeans. However, and this is a good point, Perry then said to himself "What about c.w.?" Not having been much taken with c.w. in the abstract, he was surprised to find how much pleasure was obtained from decoding KB2ELY, VE3JJP, UC3CF, UV3QGS, KA1QPJ, UB5EPQ and PY7MY. The FY5BO Perry was wondering about was probably from French Guiana.

QSLs and all that

This one arises from Gary Sanders letter already mentioned. Gary wants to know how to get hold of the addresses of overseas amateurs he wants to QSL and what should go on the QSL. First, the standard (and cheapest) way of getting a station's QSL address is to stick around on the frequency until he gives it to a station he is working. He might give his own address in which case you know enough; but he might say "QSL via the bureau" or he might say QSL via some callsign or other. Now, the bureau system is operated in most countries, so you either send your card direct to that country's bureau address, or more usefully, belong to a Society that operate a QSL Bureau. In this country that means either ISWL or RSGB. Taking RSGB for example, you join RSGB (Lambda House, Cranborne Road, Potters Bar) and when you are accepted as a member you are entitled to use their bureau. Then you get some envelopes of a suitable size, stamp them up and address them to yourself, mark the outside of the last one suitably so you know when to renew the envelope supply — no envelopes correctly stamped, no incoming cards, as yours truly knows to his cost! These are sent to your QSL manager. Your outgoing QSLs must go to the outgoing bureau address which is c/o E. Allen, G3DRN. Put them in alpha-numeric order to make life easier for Ted to sort; remember, the bureau chore now covers millions of cards.

Now, as to what to put on a report. An s.w.l. report must be USEFUL, or it won't be answered. If you can say to the chap that he was, for example, not as strong as others from the same part of the world on the band with him, or that his modulation sounded a mite breathy, or you can plot his signal strength variations over several days and operating sessions, or something like that, you are in there with a chance. Most direct QSLers enclose something to cover the cost of the return card and include an s.a.e. — but of course its no use sending an s.a.e. with a British stamp on it to a Russian; you have to go to a stamp shop and buy mint Russian stamps of the right value! Hence the value of the IRC or International Reply Coupon; one IRC equals the value of surface mail post from any country in the Postal Union. So, three IRCs should cover the cost of air mail postage back. Don't forget, though, that in many Third World countries, local people will have rumbled that envelopes with a callsign written on them contain money or IRCs, so a proportion (or even the lot) may be stolen.

Now, as to names and addresses. For UK stations, the RSGB Call Book is the standard, of course (see the advertisement for *SWM* Book Department) and is pretty reliable, as it is prepared from the DTI listings. For the rest of the world, you place your faith in the Call Book Inc's two volumes — one volume covers USA, one volume the rest of the world. Sometimes, this one is by way of a very expensive joke — for example it still shows me at my old address even though I moved three years or more ago, and have notified them several times! However, access to a current copy is often about the only way to get at a QSL Manager's full address. Incidentally, at this stage I ought to explain the QSL Manager. Many DX stations have a QSL Manager; every so often they pass their logs to their Manager, either over the air or by post; the QSL Manager has agreed to keep the logs and he receives the DX station's incoming QSLs, checks for the relevant entry in the log, fills in the QSL card if the details tally, puts it into the s.a.e., and mails it off. Usually all the cards lacking a return envelope, or IRCs, are sent off into the QSL Bureau system. Some, alas, just refuse to handle anything not sent direct with s.a.e. and a "donation" as well; thankfully, these are few and far between. However, as I have already said, the cost of QSLing for a DX station, or an active QSL Manager is very high, so the problem does have more than one dimension.

DECODE

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

Reader's Letters

John Plowman has recently set himself up with a very good station comprising an Icom R-71E and the popular ERA Microreader and is very pleased with the results. The only problem he has is with his location which is at the top of a twenty storey block of flats. Of course, this is excellent for v.h.f./u.h.f. monitoring, but imposes some limitations when it comes to h.f. monitoring due to the lack of space for antennas. My advice to John is to try the longest piece of wire you can manage and remember it doesn't have to be in a straight line. If you have a friendly local dealer or perhaps a friend who is prepared to let you try out an active antenna you may find this is a more practical solution. Although I have not tried it, I hear that C.M. Howes produce an active antenna kit at a very reasonable price.

Another newcomer to this side of the hobby is **Ken Whayman** who has a Panasonic RF2200 receiver covering 3.9MHz to 28MHz which is fed by a 10m sloping dipole. Ken's interest has been aroused partly by this column and partly because his sons have just bought a Sinclair Spectrum +2 which lies idle for most of the day. Obviously Ken would like to use this computer to check on the utility stations. I would recommend that he contacts Technical Software[1], J&P Electronics[2] or Pearson Computing[3] for a range of decoding software.

John Dimond (South Africa) has been a keen utility station listener for some time now and has been very active with his QSLs. As a result he has been able to send me a vast range of QSLs which I will reproduce in this column from time to time. John's station comprises a Kenwood R2000 receiver with a Tono 350 decoder, though lately he has been using the RX4 computer programme in conjunction with his BBC-B computer with great success. For FAX reception he uses David Bird's decoder again with his BBC-B. The other accessories in use include a Datong FL3 audio filter and a Toni Tuner tuning indicator. The antennas are a 30m long wire and a 5m vertical.

My thanks to all readers for their valuable contributions.

New Equipment

Richard Wilmot of Technical Software[1] has just sent me details of his latest multimode decoding system aimed at the short wave listener.

The system, which is only suitable for use with the BBC computer, utilises a hardware interface and software on a 16K ROM. This represents a slight change in direction for this company which has previously specialised in software interfaces with some external filtering. From the description supplied, the interface seems to be very well thought out with 4-pole filtering for the narrow shift modes and a unique keyboard tuning system. This allows the operator to compensate for coarse tuning steps on the receiver by fine tuning the filters in the interface from the keyboard of the computer.

Care has also been taken to minimise interference with all computer and radio connections isolated.

There is also full printer support which enables all modes except SSTV to be printed as received. To print SSTV signals you have to dump the screen once the complete picture has been received.

Now to the modes available which are: FAX — weather and press most standards and includes a tuning indicator picture inversion; Packet — v.h.f. and h.f. at 1200 and 300 baud; SSTV — colour and mono amateur transmissions with many picture controls; RTTY — 45-300 baud high or low tones, shift invert and unshift-on-space; Morse — automatic speed tracking 4-250 w.p.m.; AMTOR/SITOR — all standard ARQ and FEC plus special mode for NAVTEX; UoSAT — copies UoSAT 1 and 2 1200 baud transmission; ASCII — many baud rates.

The package is available for £259 and comes complete with all connecting leads, manual and a demo tape showing some of the modes the RX-89 can handle. If you already own either an RX-4 system or a TIF1 interface, contact Technical Software for details of the discounts available.

J&P Electronics

I have recently published several letters from readers who want to dump images received using the J&P FAX program to their printer. Last month we heard a few brief details about a program J&P[2] produce that can help. It's called "Decode" and if you drop them a line with a £1 cheque or postal order to cover duplication and postage they'll send one to you. Thanks to J&P for the details.

AMTOR — SITOR

I have received one or two queries over the past few months asking what is the difference between these two very similar modes.

The simple answer is that as far as the listener is concerned there is very little difference and the same software can be used to decode both modes. The essential part of the name is TOR which stands for Teleprinter Over Radio. The name SITOR is used for a particular commercial communication system while AMTOR means Amateur Teleprinter Over Radio. Another common term used to describe this mode is ARQ or Mode A, both of these imply the use of automatic repeat request for any received errors.

In order to look a little deeper we need to gain an outline understanding of how the system works. The essential difference between these two modes and normal RTTY is that the system is fully error correcting. This is obviously an important commercial advantage as errors in the received information waste operators time and can even produce misleading information.

The basics of error correction is that we need to send information and then check that it has been received accurately. The only real way of achieving this would be for the receiving station to retransmit the information back to the source for comparison with the original. This would slow the exchange of information dramatically and would result in a lot of redundant information being sent.

Another technique is to encode the transmitted information in some way so that a simple analysis of the received pattern would indicate if the received information has been corrupted. This latter technique is used for error detection in TOR systems. The actual technique involves using a seven unit code as opposed to the normal five unit code used for RTTY. The way this seven unit code is used is unusual in that not all the combinations are used. Only those which have a combination of four marks and three spaces are relevant. By using this pattern it is simple for the receiving software to reject any character which does not contain this particular combination of marks and spaces.

Having devised a process for identifying the errors, the next stage is to request a repeat of the corrupt information. At this point a decision needs to be made regarding how much information should be received before a repeat is requested. In the case of TOR systems the information is sent in groups of three characters. So, once three characters have been sent the originating station reverts to receive and waits for an acknowledgement from the receiving station. If the acknowledgement is successful then the originating station continues with the message. If, on the other hand, an error had been received or the acknowledgement is not received, the last group of three characters is sent again.

As the normal speed for TOR is 100 baud, the transmit-receive switching takes place quite quickly and gives this mode its characteristic "chirp-chirp" sound. Additionally the ARQ process means that the effective transmission rate is 50 baud which ties in well with the standard commercial teleprinter speed of 50 baud.

I expect you have already noted that the system is not fool proof. If, for example, a signal was corrupted by interference but the received characters still comprised four marks and three spaces, the system would not detect the error. Fortunately, in practice, the error rate with TOR systems is very low and in fact they are used extensively for commercial Telex links.

One other feature of the TOR system is the use of Selcalls. These are four letter callsigns which can be stored in the TOR software and allow fully automatic operation. Let's take an example of a shore station wanting to send a message to a ship. Without TOR the radio operator would need to manually monitor a selection of frequencies to check for any traffic for his ship which can be very time consuming. By using TOR, the shore station can send out a message containing the ship's Selcall on standard calling frequencies. If the ship's TOR systems detects this signal it will automatically burst into life and print the message. The great advantage being that many ships can monitor the same frequency but will only be able to receive messages intended for them. The final advantage is the shore station has confirmation that the message has been received by the ship.

One other facility provided by TOR systems is the broadcast facility. This is known as FEC (Forward Error Correcting). This mode uses the same seven unit code but is intended for reception by many stations. In this case it is impractical for each station to ask for repeats when an error is received, so a slightly different technique is used. The process involves sending the message in groups of three characters as before but each group of three characters is repeated. If the software detects an error in a character in the first group it will automatically select that character from the second group so eliminating the error. The transmission rate is again normally 100 baud, but as each character is sent twice the effective rate is half that, i.e. 50 baud.

I hope I have made the operation of this mode a bit simpler and if you have any modes you would like me to try and explain please drop me a line.

Frequency List

I have to apologise to anyone who received a frequency list around the Christmas/New Year period. As you have probably guessed we sent the lists out in a bit of a hurry and there were quite a few duplicated stations (50 to be exact). Anyway, these have now been sorted out and I hope that I can weed out the extra entries before the list is printed next time!

If you would like a copy of the list, send three first or second class stamps to the address at the start of this column

Fig. 1: QSL received by John Dimond.

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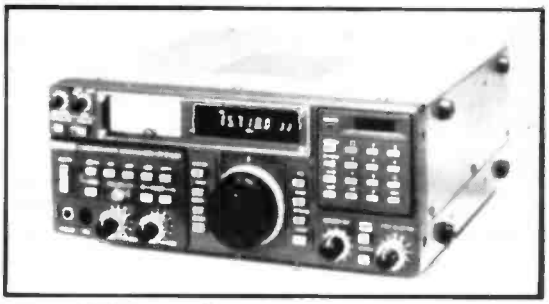

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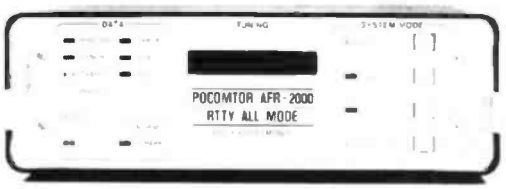

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What to Listen For

The format is as usual, i.e., frequency, mode, speed, shift, callsign, station name and time of logging in UTC.

5.9MHz, RTTY, 50/?, 5AF, Tripoli Air, 2232
6.803MHz, RTTY, 100/170, Y7A29, MFA Berlin ?
7.911MHz, RTTY, 50/?, 9KT26, KUNA Safat, 2012
8.085MHz, RTTY, 50/?, RAW71, Khabarovsk Meteo, 2138
8.622MHz, CW, ?/?, PCH41, Schevevingen radio, 1750
8.648MHz, CW, ?/?, DHJ59, Wilhelmshaven German Navy, 1755
10.96MHz, RTTY, 50/170, 3MA22/26/3, CNA Taiwan, 1425
12.265MHz, RTTY, 75/?, BZR62, XINHUA Beijing, 1550
15.95MHz, FAX, ?/?, ?, Moscow Meteo, 1130
16.517MHz, ARQ, 100/170, ?, MFA Cairo, 1135
20.56MHz, RTTY, 50/?, ?, Jamahirya News Tripoli
20.735MHz, CW, ?/?, DAM, Norddeitch TS, 1110

[1]Technical Software, Fron, Upper Llandwrog, Caernarfon, Gwynedd LL54 7RF.
[2]J & P Electronics Ltd., Unit 45, Meadowmill Est., Dixon St., Kidderminster DY10 1HH.
[3]Pearson Computing, 42 Chesterfield Road, Barlborough, Chesterfield, Derbys S43 4TT.

Your next three deadlines are: March 13, April 17, May 15.

GKR

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Fig. 2: QSL received by John Dimond.

INFO IN ORBIT

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

MIR Operations

Whilst the 143.625MHz f.m. voice communication channel has been active as ever, the same is not true for the amateur radio communications experiment on 145.550MHz. The burst of weekend activity that preceded the return to earth of Cosmonauts Vladimir Titov U1MIR and Musa Nanarov U2MIR, has not been sustained by the remaining medical doctor Valery Polyakov U3MIR. He did come on for a few passes over the USA in early January, but no-one in Europe has heard a signal from him or the new crew now aboard.

The plan was for the new 10 watt transceiver to go aboard for use by the new crew, but so far this has not resulted. It is hoped that the new Progress going up toward the end of January will take this in the supply and that further activity will result. Leo Labutin UA3CR, in a telephone conversation on New Years Day, was exploring the future operations from MIR, the information from which is awaited. The new Progress will mean that the lowering orbit will now be boosted up higher again with the remaining fuel from the old Progress before it is discarded, so it is not possible to forecast passes for five weeks ahead at this time. The AMSAT-UK nets each Monday and Wednesday at 7.00pm local time and Sundays at 10.15am, all on 3.777MHz will provide updated pass times. The AMSAT-Europe net each Saturday at 1000UTC on 14.280MHz and the AMSAT International net each Sunday at 1900UTC on 14.280MHz are further sources of this and additional topical satellite data.

UoSAT

In response to the needs of active user interest, a slight change in schedule has been announced by the University of Surrey UoSAT Command Centre. They advise that, until further notice, the Whole Orbit Data telemetry emanating from UoSAT-2/OSCAR-11 will be as follows:

Sundays: Channels 2 and 61.
Mondays: Channels 1, 2, 3 and 61.
Tuesdays: Channel 19.
Wednesdays: Channels 17, 18, 19 and 21.
Thursdays: Channels 1, 2, 3 and 61.
Fridays: Channels 0, 10, 20 and 30.
Saturdays: Channels 10, 11, 19 and 29.

For those who have yet to follow this fascinating scientific satellite, the telemetry equations are given in Fig. 1. As it is rather an elongated task to separately decode the data and calculate it to the real levels and units required, it may be preferred to use the latest technology by direct "number crunching" or to tape the 145.825MHz downlink to feed into a suitable programmed computer.

A suitable modem is available through the offices of AMSAT-UK. This is a unit into which the audio via the speaker or headphone socket from the receiver set to the 145.825MHz downlink frequency is placed, the audio output from which goes to your chosen computer. This will do all the work for you and your video display will give a direct screen listing of all the downloading information. For information on the modem, the p.c.b., full details and prices, send a stamped self-addressed envelope plus your computer type to the secretary of AMSAT-UK, Ron Broadbent G3AAJ, 94 Herongate Road, Wanstead Park, London E12 5EQ. Alternatively you may telephone him on 01-989-6741 during reasonable hours. Ron will send you on request a bumper bundle from AMSAT-UK, including a list of all hardware and computer software available, plus the latest copy of the AMSAT-UK bi-monthly *Oscar News*.

For those in possession of a Spectrum (48K) computer, a number of programs to decipher both OSCAR-9 and OSCAR-11 (UoSAT-1 and UoSAT-2) are available from two known sources. If the 145.825MHz telemetry is recorded, and then played back into the Spectrum loaded with the correct computer program, the results will appear on your monitor screen.

"WOD" enables you to see the results of the whole orbit telemetry storage from the channel(s) under

UoSAT-2 Analogue Channel Equations

Channel	Parameter	Cal.Equation
00	Solar array current -Y	I=1.9(516-N) ma
01	Nav mag X axis	H=(0.1485N-68) uT
02	Nav Mag Z axis	H=(0.1523N-69.3) uT
03	Nav mag Y axis	H=(0.1507N-69) uT
04	Sun sensor 1	N uncalibrated
05	Sun sensor 2	N uncalibrated
06	Sun sensor 3	N uncalibrated
07	Sun sensor 4	N uncalibrated
08	Sun sensor 5	N uncalibrated
09	Sun sensor 6	N uncalibrated
10	Solar array current +Y	I=1.9(516-N) mA
11	Nav mag (Wing) temp	T=(330-N)/3.45 C
12	Horizon sensor	N uncalibrated
13	435MHz Beacon VCO control	V=N/200 V
14	DCE RAMUNIT current	I=(N-70.4)/6.7 mA
15	DCE CPU current	I=(N-187.1)/2.0 mA
16	DCE GMEM current	I=(N-121.3)/2.1 mA
17	Facet temp +X	T=(480-N)/5 C
18	Facet temp +Y	T=(480-N)/5 C
19	Facet temp +Z	T=(480-N)/5 C
20	Solar array current -X	I=1.9(516-N) mA
21	+10V line current	I=0.97N mA
22	PCM voltage +10V	V=0.015N V
23	P/W logic current (+5V)	I=0.1N mA (N<=500)
24	P/W Geiger current (+14V)	I=0.21N mA
25	P/W Elec sp.curr (+10V)	I=0.096N mA
26	P/W Elec sp.curr (-10V)	I=0.093 mA
27	Facet temp -X	T=(480-N)/5 C
28	Facet temp -Y	T=(480-N)/5 C
29	Facet temp -Z	T=(480-N)/5 C
30	Solar array current +X	I=1.9(516-N) mA
31	-10V line current	I=0.48N mA
32	PCM voltage -10V	V=-0.036N V
33	1802 comp curr (+10V)	I=0.21N mA
34	Digitalker current (+5V)	I=0.13N mA (N<=500)
35	145MHz beacon power O/P	P=(2.5N - 275) mW (N>200)
36	145MHz beacon current	I=0.22N mA
37	145MHz beacon temp	T=(480-N)/5 C
38	Command decoder temp (+Y)	T=(480-N)/5 C
39	Telemetry temp (+X)	T=(480-N)/5 C
40	Solar array voltage (+30V)	V=(0.1N-51.6) V
41	+5V line current	I=0.97N mA
42	PCM voltage +5V	V=0.0084N V
43	DSR current (+5V)	I=0.21N mA (N<=500)
44	Command RX current	I=0.92N mA
45	435MHz beacon power O/P	P=(2.5N-200) mW N>175
46	435MHz beacon current	I=0.44N mA
47	435MHz beacon temp	T=(480-N)/5 C
48	P/W temp (-X)	T=(480-N)/5 C
49	BCR temp (-Y)	T=(480-N)/5 C
50	Battery charge/dischg curr	I=8.8(N-513) mA
51	+14V line current	I=5N mA
52	Battery voltage (+14V)	V=0.021N V
53	Battery cell volts (MAX)	7+N uncalibrated
54	Telemetry current (+10V)	I=0.02N mA
55	2.4GHz beacon power O/P	P=((N-50)**2)/480 mW
56	2.4GHz beacon current	I=0.45N mA
57	Battery temp	T=(480-N)/5 C
58	2.4GHz beacon temp	T=(480-N)/5 C
59	CCD imager temp	T=(480-N)/5 C

Fig. 1.

SEEN & HEARD

Investigation as a tabular graphed display, so allowing you to see the findings of the listed sensors when the satellite is out of your radio range. For details and price, send a s.a.s.e. to Roger Barker G4IDE of Micro Systems, 79 South Parade, Boston, Lincs PE21 7PN, or telephone him on Boston 63454.

If you wish to see the stored pictures taken from space by the onboard CCCD camera, then "SPIX" is the program needed. For seeing the telemetry decoded values, plus the status, the weekly updated space news bulletin, the latest sets of Keplerian elements, the DCE message, the satellite schedule, etc., then "sudd" is the program you need. These are available from G4HLX, and a s.a.s.e. to him as N. P. Taylor, 87 Hunters Field, Stanford in the Vale, Faringdon, Oxon SN7 8ND will get you the full information on programs and prices.

OSCAR-9, alias UoSAT-1 is now three quarters of a decade old, but continues to give excellent service. As stated last month, it is descending rather rapidly now with the expanding atmosphere due to the peak of the solar cycle, but is expected to last out a further two years before it enters earths atmosphere to burn up.

A fascinating new development has been the good audibility of three of the phase coherent h.f. beacons on OSCAR-9. When the satellite was commanded to extend it's gravity gradient boom soon after post-launch stability achievement, it was thought that the extending boom snagged in the wiring, as despite numerous attempts, no emergence resulted. This long boom also served as the antenna for the h.f. beacons and it was not surprising that they were not audible. Suddenly, without apparent reason, the 21MHz beacon started to be heard some year ago, followed by the 14MHz beacon some six months later. In early January, up popped the 29MHz beacon, radiating an excellent signal!

A number of possibilities can be conjectured, such as an unexpected boom emergence, the decay lowering of the satellites orbital height to below the densest part of the F2 attenuating ionised layers, the closer proximity effect upon the inverse square law dependent signal strength, although none of which theories are thought really likely. Whatever the cause, the result is quite fascinating, as the propagation of these beacons gives an excellent opportunity to observe the effects of changing solar flux upon the paths of signals emanating from above and in the refracting and reflecting layers. Whilst with the rapidly changing drag factor in this time of maximum solar activity does not permit us to predict orbits precisely, Fig. 2 will give reasonable pass times for the United Kingdom within some few minutes of accuracy. The appearance and disappearance of the 145.825MHz will supply the difference of aquisition and loss of signal times, whilst the time of greatest doppler shift will give the time of closest approach.

Listen for a plain carrier, which then keys at some 8 words per minute in Morse code with the telemetry of the first ten frames, with the first two numbers indicating the channel number, e.g. 0028, 0187, 0265, and so on, ending with the call "AMSAT" before it returns to plain carrier. The doppler shift, which also varies considerably as a result of multi-path, will be apparent. The frequencies to monitor are 14.0013, 21.0018 and 29.510MHz with slight doppler offsets. The QRM can be quite fierce when the bands are open, but the signal is very evident, peaking some 6 to 10dB over the noise according to path attenuation. Listeners may wish to study 7.0015MHz also, as a further beacon is listed here, though as yet not positively identified.

When the satellite is southbound in the morning passes, signals will often be heard well below horizon, with the first sign being the 14MHz beacon often up to thirty minutes before official "AOS". The 21MHz beacon can usually be heard some 8-10 minutes before horizon, and the 29MHz beacon some 3-4 minutes before the time the 145.825MHz beacon is heard at the northerly horizon. The evening northbound passes give very early hearings to the south, often even more extended than the morning northerly arriving passes. As the satellite nears the north westerly auroral zone, the beacons frequently become very rough and multi-path distorted, first the 14MHz, then the 21, and finally the 29MHz beacon, eventually disappearing by merging into the noise. No evidence of such effects appear at 145.825MHz unless a radio aurora is being experienced.

For those who would like to track, and thus determine the actual signal source path (which often is not in line with the satellite itself) two complete passes are supplied. Those in Fig. 3 track the overhead morning pass of February 24, whilst Fig. 4 is that of the evening pass of February 26. The print-out reads UTC time in hours, minutes and seconds, then satellite azimuth and elevation, the range, and finally the doppler offset to 145.825MHz in kHz.

Reports on reception, findings, experimentation and utilisation of the current UoSAT satellites are always welcome, particularly when they are being used for scientific and educational projects. Please send them to UoSAT, Department of Electrical and Electronic Engineering, University of Surrey, Guildford, Surrey GU2 5XH. You will receive acknowledgement both as a QSL and via the news bulletin of the satellite itself.

Available from the same address, also from AMSAT-UK, is the UOSAT-DATA Booklet, which tells you all you ever wanted to know about the pair of UoSAT spacecraft, including their history, the sub-systems, modulation, data formats, decoding algorithms, telemetry equations, and a whole lot more. Write for details to one of the addresses given.

Much work is now in progress at the university on the thermal design of the new "microsats" under development. Whereas UoSAT 1 and 2 operate in relatively benign near-polar sun-syncronous low earth orbit, gravity gradient stabilised with a slow spin, giving low thermal gradients, the new batch are very different. They have to operate in a variety of orbits using spin stabilisation and three axis stabilisation, and require active thermal control to adapt to the changeable conditions, otherwise adverse effects on battery life and power production can reduce the optimum longevity of such a satellite.

ZRO QRP Tests

In memory of Kaz Deskur K2ZRO, an early AMSAT satellite pioneer, AMSAT are transmitting via OSCAR-13 a signal on 145.840MHz c.w. that decreases it's uplink power with time, so as to run an educational competition to find those who have a real receive capability. Commencing on Saturday February 25 at 1500UTC, at the same initial given downlink level referenced to that of the 145.812MHz beacon, the uplink power will serially decrease until it reaches that giving a downlink strength of down to −24dB of that of the beacon. This is the level of uplink power that would be achieved if one used a 5 watt hand-held with a quarter wave whip for an antenna, and yet was heard well by several participants, hopefully to be noted by some of our "alligator" operators!

Certificates for prowess in receive capability are issued by AMSAT for each level of achievement and can be obtained by sending your report and a copy of the data received throughout the audibility of the test to Andy MacAlister WA5ZIB, 14714 Knightsway, Houston, Texas 77083, USA. Enclose a self addressed envelope and two IRCs to cover the postage of your certificate. The next ZRO test will be scheduled for 4 March 1989 at 0700UTC on the same downlink frequency.

Space Education Net

The AMSAT-OSCAR-13 satellite transmits on a Mode B downlink frequency of 145.960MHz a regular Saturday information net on space activities. It commences with SSTV for the first ten minutes, which then goes to the SSTV net on 14.965MHz, leaving the Space Education Net to continue on 145.960MHz. The only net times and dates currently available will have passed by the time you read this item, so please listen to the AMSAT nets to get the coming times for this interesting and informative broadcast containing many items of common interest to space fans, both amateur and professional.

Weather Satellites

Our regular and reliable weathersat correspondent **Lawrence Harris** keeps us informed again of what is happening with this side of our hobby. He reports the bad news that NOAA-9 has "gone bust" and although (surprisingly!) still transmitting on 137.62MHz, pictures are impossible to synchronise. "I first logged problems with NOAA-9 on November 3 last year, and things have rapidly got worse," writes Lawrence. "NOAA-10 and 11 continue normally, on 137.50 and 137.62MHz respectively. Although NOAA's 9 and 11 share a common frequency, NOAA-11 transmits on passes earlier in the day, so there is no mutual interference problem". Lawrence reports that the ailing NOAA-9 can be heard by ear to be faulty.

He reports that Meteor-2/16 on 137.40MHz and Meteor-2/17 on 137.30 are on when they are over ground that is in nearly full solar illumination, but that he has not heard the Chinese Fen Yung-1 satellite on now for several weeks, and has to assume it is now switched off.

Lawrence finds that the oceanographic research satellites Okean-1 and Cosmos-1766 have been both transmitting on 137.4MHz (the same frequency as Meteor-2/16) almost daily pictures as they cross Norway and Sweden passing southbound. "One can use a tape recorder to save the data and play it back at a later time with perfect synchronisation," he writes, "Unlike the Meteors, both satellites use a clock signal on the subcarrier."He continues, "During December Okean started a series of daily transmissions using different equipment formats from it's onboard microwave sounder, sideways looking radar and visible light imager. I have been getting very good results from this series of tests. On December 22 I recorded two series of images which I later identified as being from both Okean and then Cosmos-1766. Late at night Okean transmitted a picture containing half a screen width of radar image and the remainder a microwave radar image. The quality was outstanding, and continues to be so. I have been able to feed the data into my computer and perform contrast enhancement and also artificial colour to emphasise features. I am undoubtedly producing pictures to the same resolution and clarity as the Russian satellite controllers."

Lawrence found that he could pull out much detail from the radar images of the gulfs from the live pictures over Norway and Sweden, with one track even including as far west as Scotland. His pictures include piano-key telemetry plus the radar and sounder images, with very clear details, and are, naturally cloud-free. His best picture to date was such a live picture giving images of Norway, across Leningrad, and down to the Black Sea. He finds that the transmissions always cease a few minutes, presumably due to the power constraints of the demanding radar system.

Photographs and print-outs of weather satellite pictures, general satellite information and details of enthusiasts stations are always welcome in this column for publication, as well as hints and tips on the hobby.

AMSAT AMSAT-II TRACKING SYSTEM
ACCESS TABLE FROM 24FEB89 000000
G3IOR UIA OSCAR9

DATE	AOS	LOS	MAX EL	PASS
24FEB	0718	0724	0721	05
24FEB	0849	0859	0854	11
24FEB	1022	1031	1026	14
24FEB	1753	1800	1756	06
24FEB	1923	1933	1928	48
24FEB	2058	2105	2100	15
25FEB	0808	0818	0813	18
25FEB	0940	0950	0945	34
25FEB	1113	1119	1116	04
25FEB	1714	1716	1715	00
25FEB	1852	1851	1847	13
25FEB	2013	2024	2017	40
25FEB	2149	2154	2152	03
26FEB	0727	0734	0731	07
26FEB	0855	0909	0903	73
26FEB	1031	1040	1035	12
26FEB	1802	1809	1805	07
26FEB	1932	1942	1937	61
26FEB	2105	2114	2110	12
27FEB	0817	0827	0822	24
27FEB	0949	0959	0954	28
27FEB	1123	1128	1125	03
27FEB	1723	1726	1725	01
27FEB	1851	1900	1856	22
27FEB	2022	2033	2025	32
27FEB	2159	2203	2201	01
28FEB	0735	0744	0740	09
28FEB	0907	0918	0912	85

Fig. 2.

AMSAT AMSAT-II TRACKING SYSTEM
TRACKING FROM 24FEB89 000000
G3IOR UIA OSCAR9

AOS	AZ	EL	RANGE	PHS	DOPPLER
0849 29	017	00	2422	---	145.825
0851 13	020	00	1881	---	3.5
0852 15	024	16	1249	---	3.4
0853 00	030	24	957	---	3.2
0853 31	037	32	772	---	2.9
0853 56	046	41	646	---	2.6
0854 15	059	49	573	---	2.3
0854 30	074	54	536	---	1.9
0854 41	091	57	520	---	1.7
0854 53	109	57	519	---	0.1
0855 04	126	55	531	---	-0.5
0855 16	139	51	557	---	-1.1
0855 31	152	45	606	---	-1.6
0855 52	162	36	703	---	-2.2
0856 20	170	28	856	---	-2.7
0856 58	177	19	1098	---	-3.1
0857 57	181	11	1493	---	-3.4
0859 46	186	01	2268	---	-3.4
0900 04	189	00	2397	---	-3.5

Fig. 3.

AMSAT AMSAT-II TRACKING SYSTEM
TRACKING FROM 26FEB89 193100
G3IOR UIA OSCAR9

UTC	AZ	EL	RANGE	PHS	DOPPLER
1932 14	155	00	2403	---	145.825
1933 56	151	08	1677	---	3.5
1934 57	151	15	1245	---	3.4
1935 41	146	24	957	---	3.2
1936 11	141	32	774	---	3.0
1936 34	133	41	650	---	2.6
1936 58	119	51	555	---	2.0
1937 12	103	57	518	---	1.3
1937 23	085	60	502	---	0.7
1937 35	064	61	501	---	0.0
1937 46	045	58	515	---	-0.6
1937 58	031	53	542	---	-1.1
1938 14	018	46	597	---	-1.7
1938 35	009	37	695	---	-2.3
1939 01	002	29	844	---	-2.7
1939 38	357	20	1078	---	-3.1
1940 34	353	12	1459	---	-3.4
1942 20	350	02	2216	---	-3.5
1942 49	348	00	2424	---	-3.5

Fig. 4.

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Kenwood	R5000	875.00	(—)
Lowe	HF125	375.00	(—)
Yaesu	FRG 8800	649.00	(—)
Yaesu	FRV 8800 V.H.F. Converter	100.00	(2.50)

STATION ACCESSORIES			
Drae	V.H.F. wavemeter	30.25	(1.50)
A.K.D.	V.H.F. wavemeter	24.95	(1.50)
Kenwood	LF30A low pass filter 30MHz 1kW	32.26	(2.50)
Adonis	AM303G desk mic with pre-amp	53.00	(2.50)
Adonis	AM503G desk mic with compression	69.00	(2.50)
S.M.C.	Polar-phaser II 2 metre	49.00	(2.50)
KPC2	Kantronics Packet communicator	159.00	(2.50)
AEA	PK 232 6 mode Terminal Unit	269.95	(2.50)
AEA	PK88 Packet Controller	109.95	(2.50)

V.H.F. SCANNING RECEIVERS			
Icom	ICR7000	989.00	(—)
Yaesu	FRG9600M	509.00	(—)
WIN	108 Airband Receiver	175.00	(2.50)
A.O.R.	AR 2002	487.30	(—)
Signal	R535 "Airband"	249.00	(—)
Sony	Air 7	249.00	(—)
Kenwood	RZ1 Wide Band Receiver	465.00	(—)

V.H.F. SCANNER ACCESSORIES			
A.K.D.	HFC1 HF Converter	49.00	(1.50)
Revone	Discone Antenna 30-500 MHz	32.26	(3.00)
Icom	AH7000 Antenna 25-1300MHz	82.50	(3.00)

CABLES ETC.			
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UR76	50ohm coax dia. 5mm. per metre	0.30	(0.10)
UR70	70ohm coax per metre	0.35	(0.10)
UR95	50ohm coax dia. 2.3mm per metre	0.40	(0.10)
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Bricomm	Balun 4:1 1kW	13.80	(1.50)
Bricomm	7.1MHz Epoxy Traps (pair)	10.95	(1.50)
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T-piece Polyprop Dipole centre		1.60	(0.25)
Small Ceramic egg insulators		0.65	(0.20)
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Yaesu	FRT 7700 Short wave listening	59.00	(2.50)
Yaesu	FC 757AT	349.00	(—)
Kenwood	AT130	140.56	(2.50)
Kenwood	AT230	208.67	(2.50)
Kenwood	AT250 auto	366.00	(—)
MFJ	941D Versa Tuner II	105.13	(2.50)

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DRAE	3 way SO239 skts	16.94	(1.50)
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Icom	IC 02E Handheld	279.00	(—)
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Icom	Micro II Handheld	249.00	(—)
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SEEN & HEARD

BAND II DX

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

We often carry reports and comments about changes in atmospheric pressure, local weather, Sporadic-E, tropospheric and F2 openings. So, I think the time has come to include another vital factor, the sun Fig. 1, which provides light, heat and natural energy. It is well known that the complex rays from this variable star has influence over the earth's weather and changes the condition of the ionosphere between sunrise and sunset.

We also know that dark patches, called sunspots, often appear on the sun's surface and the particles ejected from these active areas can cause an aurora to manifest in the earth's polar atmosphere. Given clear skies, a night-time aurora is a spectacular and colourful sight but, whenever it occurs, this area of temporary and random ionisation will scatter v.h.f. radio signals over a fantastically large area. It causes them to sound horrible and very distorted when they reach a receiver well in excess of their normal range and intended direction.

During the lifetimes of several auroral events I have heard a number of "burbling" f.m. radio signals from east European stations in their broadcast band between 66 and 73MHz. Depending upon the density, one would also expect to hear auroral reflected signals from the TV Ch. R4 television sound on 91.75MHz and the R5 vision pulses and sound on 93.25 and 99.75MHz respectively.

Apart from the usual outdoor weather recording instruments, such as anemometers, wind direction indicators, rain gauges and thermometers, I cannot resist a look at the variety of sundials, especially the one on Chichester Cathedral, Fig. 2. which I photographed on a glorious sunny afternoon last August.

Fig. 1

Fig. 2

Reports

What better way for a DXer to say "goodbye" to an old year and welcome in a new than with an opening? That's what happened as the very high pressure (around 30.5in — 1032mb) fluctuated between December 29 and January 4. "On Band II f.m. many stations were booming in on the Sony 2001 general coverage receiver, using only the whip antenna," wrote **Mike Bennett** from Slough. Mike logged stations from Belgium (BRT1), France and Holland (news) on the 31st and France, Holland and possibly many from Scandinavia on the 1st. He identified transmissions from Amsterdam Radio and Radio Antwerp.

While talking about Holland, **Ed Wieringa** (Zandvoort) has two 3-element antennas, one vertically and one horizontally polarised connected to his receiver. During the opening last October 16, Ed heard BBC and ILR stations from Bedfordshire, Devonshire, Reigate and York and writes, "More often I can hear BBC1 on 98.4 and 98.8MHz." With his horizontal antenna on the 23rd, he logged some of the transmitters in Paris and earlier in the year he listened to the French transmission of Radio Luxembourg on 93.0MHz and says that there is a fraction of a minute difference between this signal and the one on 234kHz in the long wave band.

Simon Hamer (New Radnor) logged stations from Belgium, France, West Germany and Holland on January 3 and Ireland's RTE FM1, 2 and 3 and Millenium 88, plus BBC Radios Cornwall, Lincoln, Norfolk and Northampton on the 8th. He tells me that BBC Radio Hereford and Worcester will start operating on February 14 from Ridge Hill on 94.7MHz and Malvern on 104.0MHz.

Kevin Phillips (Bexhill), tuned through the band daily from December 29 to January 2 and among the multitude of stations he heard were BBC Radio 1 from Black Hill, Oxford, Sutton Coldfield and Wenvoe; Radio Cymru; Radio 4 from Wenvoe and the BBC locals Bedfordshire, Bristol, Cambridge, Oxford and Solent. His ILR haul includes Radio Broadland, Chiltern R., Red Dragon R., R. 210, County Sound, Ocean Sound and Severn Sound.

"A further small opening happened on the 8th," reports Kevin, when he logged BBC Radios Bristol and Devon and ILR Radio 210. He noted that the signal from BBC Radio Solent, which I think should have been good, as poor and rapidly fluctuating.

While the high atmospheric pressure was falling during the evening of the 8th and early morning of the 9th, I heard several French voices among the many "warbles" caused by co-channel interference.

The next three deadlines are: March 13, April 17 and May 15.

TELEVISION

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

Readers who add other modes of transmission such as FAX, Packet Radio, RTTY and Slow Scan Television to their stations, simply purchase or build the appropriate equipment and the required signals are usually found soon after switch-on.

However, this is not the case with **DX** (long distance) **TV** (television). That's because a natural disturbance within the earth's complex atmosphere is necessary before such pictures appear on our screens. To the new enthusiast who has recently purchased a receiver, converter or video recorder, providing coverage of the v.h.f. bands I (48 – 68MHz — Chs. E2 – 4) and III (175 – 230MHz – Chs. E5 – 12) and the u.h.f. bands IV (471 – 608MHz — Chs. 21 – 38) and V (615 – 856MHz — Chs. 39 – 69), I say, "be patient", the DX will come, sooner or later, when conditions are right.

Some receivers, like the JVC610 and the D-100 converter includes Band II (88 – 108MHz) in their range. So while an extensive Sporadic-E disturbance is in progress it is possible to receive pictures from Bulgaria, Czechoslovakia, Romania and the USSR on Ch. R5 (93.25MHz). A good early warning for this is to tune a domestic f.m. broadcast receiver to 93.25MHz and listen for the television synchronising pulses (a low pitched "burr"). When these become strong, switch on the TV gear and carefully tune through Band I and you should see east European DX. Keep the domestic set going and you may hear the television sound for Chs. R4 and 5 on 91.75 and 99.75MHz, respectively.

Try and obtain a copy of the *World Radio TV Handbook* and familiarise yourselves with channel numbers and frequencies of the stations that you are most likely to receive when the bands are open. Stations in Continental Europe and Scandinavia are not the only users of Band I. For example, transmitters in Czechoslovakia, Hungary, Poland and the USSR use Chs. R1 and 2 (49.75MHz and 59.25MHz); Ireland's Ch. B is on 53.75MHz and Italy have their Chs. A and B on 53.75 and 62.25MHz respectively. Note that Ireland and Italy, by international agreement, share 53.75MHz. This is fine under normal conditions, but during a Sporadic-E opening these stations can interfere with each other.

Frequency sharing is a necessary fact of life in all TV bands as more terrestrial transmitters come on stream to serve the ever growing number of viewers. Television transmitters normally have a limited range and will not interfere with its co-channel inhabitant hundreds of kilometres away, but, with help from an atmospheric disturbance, signals can travel hundreds of kilometres further than originally intended.

Briefly, the cause rests with two types of atmospheric disorder. The most popular is an Ionospheric disturbance known as Sporadic-E which, depending on it's size, can suddenly open up Bands I and II for a few daylight hours, on any day, between May and September.

The paths of signals in the higher frequency bands are influenced by changes in the troposphere which often occurs when the atmospheric pressure is high and prevailing fine weather is on the change. Apart from the household barometer and the TV weather chart, a good indicator for DX is your domestic u.h.f. receiver, because, when lines and patterns appear on the picture you are being told that signals from a distant transmitter, using the same channel, have increased their range and the time could be right to check Bands III, IV and V for European and Scandinavian pictures.

During the mid-summer months it is possible for both events to manifest on the same day and then, believe me, you will become an experienced TV DXer in

The deadlines are: March 13, April 17 and May 15.

SEEN & HEARD

Fig. 1: Spain.

Fig. 2: Spain.

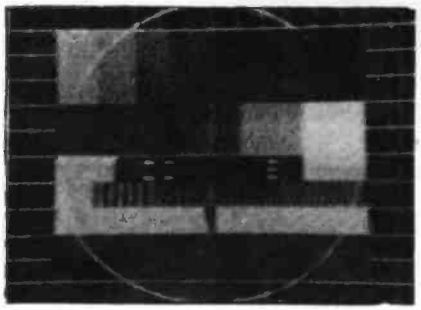

Fig. 3:

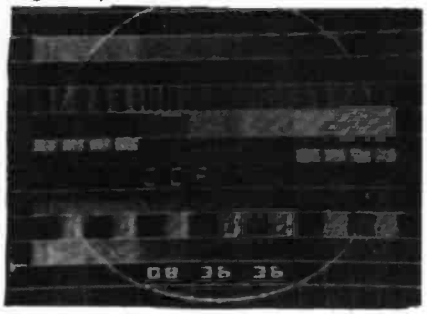

Fig. 4:

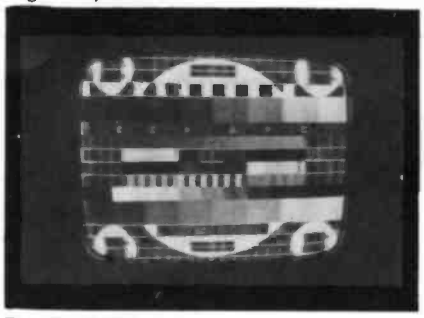

Fig. 5: USSR.

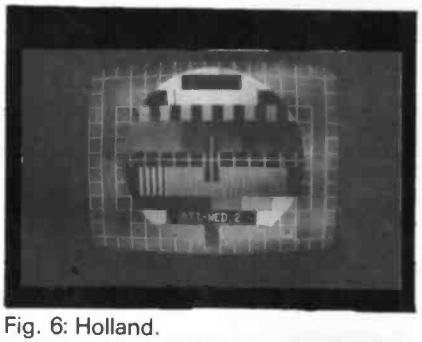

Fig. 6: Holland.

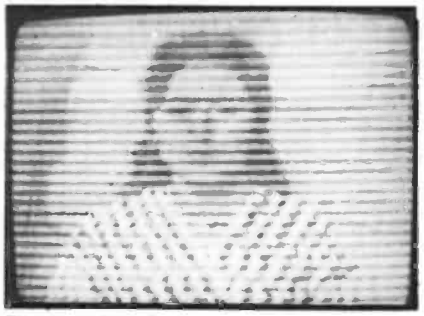

Fig. 7: Jalanhar.

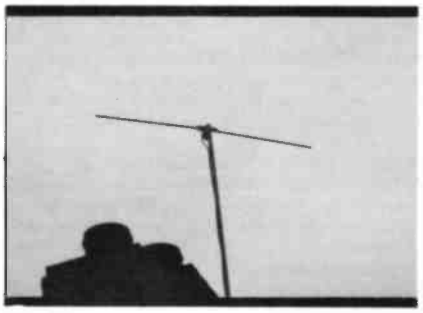

Fig. 8:

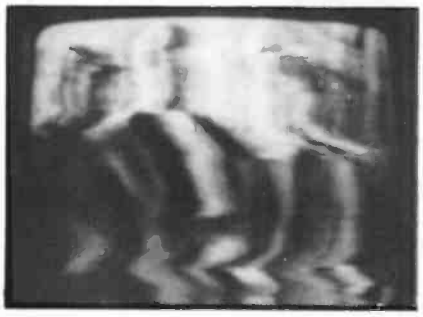

Fig. 9:

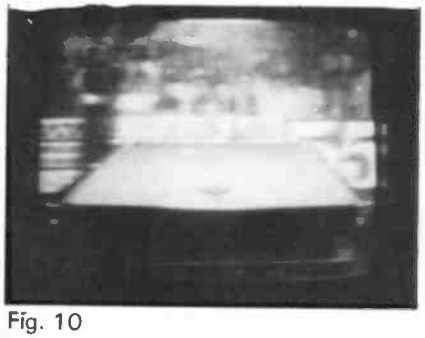

Fig. 10

Fig. 11:

Fig. 12:

a very short time. Although the TV bands are generally quiet during the winter period, keep an eye open early in the mornings around Chs. E2 and E5 and you should find a clue to any DX that is around.

Antennas

In Manchester, **Barry Bowman** has Grundig and Phillps receivers that cover the v.h.f. TV bands, but, in common with many other enthusiasts, he has a problem with regard to installing outside antennas. What about making a horizontal dipole, cut to 50MHz, and installing it in the loft or outside a convenient window. Face it south-east and see how you get on during the forthcoming Sporadic-E season. The dipole which I built recently from redundant Band I TV antenna parts can be seen in Fig. 8.

Picture Archives

Signals can be amazingly strong when enhanced by an opening. The late **Len Eastman** showed this when he received pictures from Spain's TVE, Figs. 1 and 2, at his home in Bristol during the peaks of the 1986 and 1987 Sporadic-E seasons. Before his death, Len recorded the DX pictures that he received and later, he replayed the video-tape, photographed some of the DX and frequently sent me a batch of pictures to use, when possible, for the benefit of newcomers. Testcards in Band I from Czechoslovakia Fig. 3 and East Germany Fig. 4, were captured by **Noel Smythe** (Caerphilly) in June and July 1987. On June 6 and 13 respectively **David Glenday** (Arbroath) received a testcard from the USSR Fig. 5, via Sporadic-E in Band I and from Holland Fig. 6, during a tropo-opening in the u.h.f. band. At 0825 on 12 October 1987, **Lt Col. Rana Roy** (Meerut) received pictures, in Band III, from Jalanhar TV Fig. 7 complete with lines caused by Co-channel interference.

My thanks to **John Coulter** (Winchester) for identifying my Fig. 8 in our January issue. "This picture is Yugoslav," said John and added that "Rijeka" is the Yugoslav port, also called Fiume and the smaller words "duljina stazo" means length of track.

Band I

Although Band I openings are few during the winter months, **Bob Brooks** (Great Sutton) found test-signals from Austria (ORF-FS1) on December 20; Czechoslovakia (RS-KH) on the 21st and (Prague) on the 29th; Norway (Televerket) and Sweden (SVT-Kanal1) on the 28th and 30th and the USSR on the 22nd. In addition he saw the Prague logo and a film and the news from Hungary (MTV) and the USSR on the 20th, children's and cookery programmes from Spain (TVE) and the TVR (Romania) logo and clock on the 22nd, the Portuguese logo (RTP) on the 30th and possibly programmes from Italy and the USSR on January 3 and 5. At 1759 on the 22nd, he logged TVE across the band on Chs. E2,3 and 4. Bob also noted some very blurred pictures via F2.

While tuning through the band at 1530 on December 23, **John Woodcock** (Basingstoke) heard strong voices of North American origin. "They seemed to be a base-station (or stations) talking to mobiles," said John. He added, "Listening to Radio Australia the following morning for the propagation forecasts, they spoke of high solar activity." That could well cause an F2 disturbance John.

In Slough, **Mike Bennett** received test-cards from Norway (Televerket) and Switzerland (PTT SSR1) around 0830 on December 16. From Arbroath, David Glenday wrote on January 13, "The past 4 weeks have been good for Band I activity — sort of mini-Sporadic-E season, but few signals were received for more than a few seconds." David found that not many were identifiable, for example, at 1300 on December 31, he saw a clock caption, possibly from Portugal or Spain and pictures probably from Italy around noon on January 10 and 11. During the evening of the 3rd, David noticed quite a bit of activity on Band I so he left his D100 tuned to Ch. R2 (59.25MHz) and

a number of pictures flashed in briefly. Most likely caused by the Quadrantids meteor shower David, so keep an eye open for similar activity during the Lyrids on April 22.

Simon Hamer (New Radnor) also received "pings" of pictures, via m.s., from Czechoslovakia, Poland and Sweden on December 14. He also saw Telediarlo (news) and *Upstairs Downstairs* from Spain (TVE-1), via Sporadic-E, on the 19th and 22nd respectively and signals from Czechoslovakia (CST) and Sweden (SVT) on the 21st and 31st. In January he logged testcards from Denmark (DR), Iceland (RUV), Norway (Greipstad and Gulen) and Sweden (SVT) on the 9th and saw the BPEMR (news) ident from the USSR on the 10th.

Edwina and Tony Mancini (Belper), found some Sporadic-E during the fortnight prior to January 15 and logged a film, with English sub-titles, from Austria; the West German logos ARD/ZDF and SWF/RBG; the Norwegian regionals Bremanger, Kongsberg and Melhus; cookery from Spain; ice hockey and skiing on Chs. R1/2 — most likely from the USSR and testcards from Finland (YLE-TV1) and, on December 30, Sweden (SVT-Kanal1) with a Radio Sweden overlay.

News from India

"I have had more F2 or t.e.p. pictures from South East Asia," wrote Lt. Col. Rana Roy, (Meerut) at the end of November. Rana received "multiple fluttering pictures" in Band I, predominantly Malaysian TV on Ch. E2, around 0730 on November 5 and 8, during the morning of the 10th and at midday on the 9th and 11th. For the period 13 to 28 he reports, "Between 1700 and 2230, Malaysian TV with F2 type pictures could be seen regularly. At times pictures were very clear."

During these "wobbly" transmissions Rana identified commercials, a variety of films, news and snooker. A typical example came at 2100 on the 7th when he watched a scene from a film, Fig. 9, while another station was coming up very strongly from SE. Asia with the figure "3" ident and showing snooker, Fig. 10. Rana saw this particular ident coming from Malaysian TV at 0800 on the 5th. Among the clearer pictures that appeared, sometimes in colour, was a commercial, Fig. 11, at 2050 on the 10th and a news reader, Fig. 12, at 1655 on the 28th.

In addition, he logged a few tropospheric openings between 1930 and 2330 from the 15th to 19th when he received pictures in Band III, sometimes weak and fading, from Lahore, Jallandhar and Bhatinda TVs on Chs. 5, 9 and 12 respectively.

Tropospheric

While the atmospheric pressure was very high, 30.6in (1036mb) over the new year weekend, I noted co-channel interference on several stations to the north of me during the evenings of December 31 and January 1. Co-channel interference occurred again while the high pressure was falling during the evening of the 8th and the early morning of the 9th. Ironically, I had lines and patterns across my screen while the TV weather reporter was showing the movement of this particular high.

Bob Brooks received pictures from France (Canal+) and Germany (ARD) in Band III on December 31 and January 3. Mike Bennett logged a testcard on Ch. E10 from Belgium (BRT1) at 1025 on December 29 and weather from France (Canal+) and a programme schedule from Luxembourg (RTL) around 1145 on January 3.

On the 6th, **George Garden** (Edinburgh) took his DX gear to the top of Cairn O'Mounth where the fog was so dense he had difficulty in finding the car-park. However, his efforts were rewarded when he received pictures in the u.h.f. band from Darvel (Ayrshire) and the Scottish Black Hill transmitter on Ch. 43. At this point George turned his antenna vertical and identified Grampian TV by their local adverts and station jingle. He found the same on Ch. 61, with the antenna horizontal, BBC2 was seen and when vertical the picture changed to ITV and the 1745 news. "I definitely had to wait to the end of this to see what local magazine or news round-up came next," said George and when *Scotland Today* appeared, he realised that the signal was coming from a satellite transmitter of Scottish ITV. His later research gave two possibilities, the 2kW transmitter at Penicuik near Edinburgh, or the 10kW station at Rosneath in the Glasgow area.

David Glenday noted strange happenings as the new year high pressure passed over Scotland. "The tropo-opening started at 2200 on January 1 when co-channel interference appeared on many channels in the u.h.f. Band. At 2319 "Jeudi FR" caption appeared imposed on Ch. 4 from Chatton (Ch. 42). Also co-channel beating on Chs. 21, 24, 39 and 45, all from France." said David. He also identified a host of French signals, some co-channelling, on the 2nd and an unidentified test-card on Chs. 42, 43 and 46, lots of French stations in the band and Nederland 3, on Ch. 30, on the 3rd.

At the other end of the UK, in Bexhill, **Kevin Phillips** received pictures daily, at moderate strength, from Anglia TV (Ch. 24 — Sandy Heath) and S4C from Wenvoe, between December 29 and January 2.

Simon Hamer's v.h.f. and u.h.f. haul on the 3rd included test-cards and programmes from Belgium (BRT and RTBF), France (TDF and Canal+), East and West Germany (DFF and ARD), Holland (Ned1/2), Ireland (RTE1 and 2, "the latter is now called Network 2" said Simon") and Luxembourg (RTL+).

Among the various programmes seen by the Mancini's on Canal+ were cartoons and the film *Psycho*.

LONG MEDIUM & SHORT

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Long Wave DX

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

Several of the l.w. stations in the more remote areas of the USSR were heard for the first time by **Tim Shirley** (Bristol) during the early hours of the morning. These stations have been added to the chart, but are subject to confirmation by QSL.

Two broadcasts from the USSR were also noted by **Fred Pallant** in Storrington. Using a Trio R2000 receiver with a random wire antenna in the loft, he rated Kaliningrad 171 (1000kW) as 142 during daylight and 243 after dark. In contrast, Moscow 263 (2000kW) fell from 244 during daylight to 132 after dark. Kaliningrad is about 1210km from Storrington and Moscow is about 2172km away so the effect was unexpected.

While visiting Lytham St. Annes, **Neil Wheatley** (Newcastle-upon-Tyne) checked the band during daylight and after dark. Eight stations were heard during daylight, the most distant being Kaliningrad, some 1320km away. Four additional stations were noted after dark, the most distant being Azilal, Morocco 209 (800kW), about 1680km away.

In London, **Phil Townsend** has been comparing his dismounted car radio plus a.t.u. and wire antenna with that of his Panasonic RF 1680L portable. Although many signal strengths received on the car radio were greater, the built-in directional antenna in the portable enabled him to null-out the signal from one station on a shared frequency to reveal another. So, after dark he nulled-out Monte Carlo via Roumoules 216 (1400kW) and heard Oslo, Norway 216 (200kW) for the first time. He also nulled-out the BBC via Droitwich 198 (400kW) and heard Motala, Sweden 198 (300kW).

MW Transatlantic DX

Up in Wakefield, **Mark Thompson** has been trying Transatlantic DXing and heard the broadcasts from CJYQ in St. Johns, Newfoundland 930 at 2320. He used a 0.85m loop with a Saisho SW 5000 receiver and rated them as SIO 222. Lower in the band he heard CIYQ in Grand Falls NF680, which often relays the programmes from CJYQ. Mark's main problem was adjacent channel interference from stations in Europe, but keeping awake also proved to be difficult!

Broadcasts from CJYQ also attracted **Roy Patrick** in Derby. He picked them up around 2330 during several nights and also heard WINS in New York, 1010. Roy uses a Lowe HF 125 receiver with an a.t.u. and a random wire antenna. Tim Shirley noted good signals from CJYQ 930 around 2300 on several occasions. Around dawn he added another station to his list: WVOK In Birmingham, AL 690.

Writing from Grimsby, **Jim Willet** found the conditions rather poor at times, but he did log three stations he's not heard for quite some time: WYNZ Portland, MA 970; WLIB New York, 1190; WENE Endicott, NY 1430. All logged between 0415 and 0435 and rated as 211.

The next three deadlines are: March 13, April 17 and May 15.

Freq kHz	Station	Country	Power (kW)	DXer
153	DLF Donebach	Germany (W)	500	A,C*
153	Khabarovsk	USSR	1000	B*
162	Allouis	France	2000	A,C*,D
162	Norilsk	USSR	?	B*
171	Kaliningrad	USSR	1000	A,C*,D
177	Oranienburg	Germany (E)	750	A,C*
180	Chita	USSR	150	B*
183	Saarlouis	Germany (W)	2000	A,C*,D
189	Motala	Sweden	300	A,C*
198	BBC Droitwich	UK	400	A,C*,D
198	Irkutsk	USSR	500	B*
207	DLF Munich	Germany (W)	500	C*
207	Nukus	USSR	50	B*
209	Azilal	Morocco	800	A*,D*
216	Roumoules	Monaco	1400	A*,C*,D
216	Oslo	Norway	200	C*
225	Konstantinow	Poland	2000	A,C*,D*
234	Junglinster	Luxembourg	2000	A,C*,D
245	Kalundborg	Denmark	300	A,C*,D
254	Tipaza	Algeria	1500	A,C*,D*
263	Burg	Germany (E)	200	C*,D
263	Moscow	USSR	2000	A
272	Topolna	Czechoslovakia	1500	A,C*,D*
281	Minsk	USSR	500	C*

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

DXers:
A: Fred Pallant, Storrington.
B: Tim Shirley, Bristol.
C: Phil Townsend, London.
D: Neil Wheatley, Newcastle-on-Tyne.

Other MW DX

A welcome first report from Switzerland was sent by **Martin Ferdy** in Cortaillod. Using a JRC NRD 525 receiver with a Datong AD370 active antenna, he has heard two of the BBC domestic services between 0700 and 1200: Radio 1 on 1053 (shared by Burghead 20kW, Droitwich 150kW, Postwick 10kW, Start Point 100kW and low power relays), rated as 34334; and Radio 1 on 1089 (shared by Brookmans Park 150kW, Lisnagarvey 10kW, Moorside Edge 150kW, Washford 50kW, Westerglen 50kW and low power relays), rated as 32322.

SEEN & HEARD

Freq kHz	Station	Country	Power (kW)	DXer
540	BRT-2 Wavre	Belgium	150/50	G*
540	Sidi Bennour	Morocco	600	C*
549	DLF Beyreuth	W. Germany	200	G*
567	RTE-1 Tullamore	S. Ireland	500	A*,G*,I
576	Stuttgart	W. Germany	300	G*
585	RNE-1 Madrid	Spain	200	G*
594	HRF Frankfurt	W. Germany	400	G*
603	BBC-R4 Newcastle	UK	2	I,M
612	RTE-2 Athlone	S. Ireland	100	A*,G*,I
621	RTBF-1 Wavre	Belgium	300	G*
639	Liblice	Czechoslovakia	1500	G*
648	BBC Orfordness	UK	500	I
648	Radio Lotus	?	?	A*
657	Burg	E. Germany	250	G*
675	Hilversum-3 Lopic	Holland	120	A*,G*
684	RIAS via Hof-Saale	E. Germany	100	A*
684	Beograd	Yugoslavia	2000	K
720	BBC Lisnagarvey	N.Ireland	10	M
720	BBC Lots Road	UK	0.5	A,I
729	RTE-1 Cork	S. Ireland	10	D
729	Oviedo	Spain	50	G*
738	Poznan	Poland	300	F*
738	RNE-1 Barcelona	Spain	250	G*
747	Hilversum-2 Flevo	Holland	400	G*
756	Brunswick	W. Germany	800/200	G*
765	Sottens	Switzerland	500	G*
774	RNE-1 San Sebastian	Spain	60	G*
783	Burg	E. Germany	1000	G*
792	Sevilla	Spain	20	G*
801	BRF via Munich	W. Germany	420	G*
810	BBC Westerglen	UK	100	G,I,L
837	R.Popular, Sevilla	Spain	10	G*
855	Murcia	Spain	125	G*
873	R.Ulster, Enniskillen	UK	1	M
873	AFN Frankfurt	W. Germany	150	A*
882	BBC Washford	UK	70	A*,I
891	Algiers	Algeria	600/300	A*
891	Vila Moura	Portugal	?	G*
900	Milan	Italy	600	A*,G*
927	BRT-1 Wolvertem	Belgium	300	G*
936	Pori	Finland	600	A*
972	NDR/WDR Hamburg	W. Germany	300	A*,G*
981	Algiers	Algeria	600/300	G*,H*
990	SER R.Bilbao	Spain	10	G*
1008	Hilversum-5 Flevo	Holland	400	G*
1017	Wolfsheim	W. Germany	600	G*
1035	Milan	Italy	50	G*
1062	Kalundborg	Denmark	250	G*
1071	Brest	France	20	G*
1080	Katowice	Poland	1500	G*
1098	Velke Kostolany	Czechoslovakia	400	G*
1107	RCE Madrid	Spain	20	G*
1107	AFN via Munich	W. Germany	40	A*
1107	BBC-R1 Wallasey	UK	0.5	M
1125	Zagreb	Yugoslavia	200	A*
1134	Zagreb	Yugoslavia	300	K
1143	AFN via Stuttgart	W. Germany	10	G*
1143	Kaliningrad	USSR	150	A*
1179	Solvesborg	Sweden	600	A*,B,C*,G*
1197	VOA via Munich	W. Germany	300	A*,L
1206	Wroclaw	Poland	200	C*,F*,G*
1224	COPE Madrid	Spain	20	G*
1233	Prague	Czechoslovakia	400	G*
1269	Neuminster	W. Germany	600	A*,G*
1278	RTE-2 Dublin/Cork	S. Ireland	10	A*,C,D
1287	Litomysl/Liblice	Czechoslovakia	300/200	A*,C*,G*
1314	Kvitsoy	Norway	1200	B*,G*
1323	R.Moscow via Leipzig	E. Germany	150	A*,C*
1332	Rome	Italy	300	G*
1341	BBC Lisnagarvey	N. Ireland	100	A*,G,L,E
1350	Nancy/Nice	France	100	A*,F*
1359	RBI Berlin	E. Germany	250/100	A*
1368	Manx Radio, Foxdale	I.O.M.	20	A*,D,J,M
1377	Lille	France	300	G*
1386	Kaunas	USSR	1000	G*
1395	R. Tirana via Lushnje	Albania	1000	A*,C*
1413	RCE Zaragoza	Spain	20	G*
1422	Heusweiler	W. Germany	600	A*,G*
1440	Marnach	Luxembourg	1200	A*,G*
1449	BBC-R4 Redmoss	UK	2	A*
1467	TWR Monte Carlo	Monaco	1000/400	A*,C*,F*,G*
1485	BBC-R1 Bournemouth	UK	2	M*
1503	Stargard	Poland	300	A*,F*
1503	RCE Pamploma	Spain	2	G*
1512	BRT Wolvertem	Belgium	600	A*,B*,C*,F*,G*
1530	Vatican Radio, Rome	Italy	150/450	A*
1566	Sarnen	Switzerland	300	G*
1593	Langenberg	W. Germany	400/800	G*

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

An oblong loop antenna measuring 760 x 490mm has been built by George **Millmore** in Wootton, IOW. The main winding is 8 turns of 26 s.w.g. enamelled wire. The coupling to an EF86 valve pre-amplifier is formed by winding a single turn on either side of the main winding and connecting them in series. Using the loop ahead of his Racal RA17 receiver, George noted good performance across the whole band and logged many interesting stations.

MW Local Radio DX

No doubt the new BBC Hereford and Worcester local radio station will welcome reports from listeners both inside and out of their planned service areas. Their transmission on 738kHz is intended to cover Worcester and the surrounding area, listeners in the Hereford area should tune to 819kHz. When sending along your report to the station engineer do make sure that it includes detailed information about reception during daylight and after dark. Mention the type of receiver and antenna in use. Local stations are run on a very limited budget, so be sure to include an s.a.e. if you request their QSL.

Both transmissions are being received in New Radnor by Simon **Hamer**, but **Edward Broadsmith** (Worcester) informs me that reception of 819kHz is poor there simply because the Malvern Hills obstruct the path.

Writing from Leeds, Chris **Nykiel** says he was interested to read about m.w. DX conditions around the Cat and Fiddle Inn near Buxton. When visiting the area in 1986 he also received a very wide selection of stations with his car radio. Chris says that similar conditions exist on the moorland near the BBC Holm Moss transmitter and above nearby Saddleworth.

The close down of the unlicenced stations in S. Ireland have enabled some DXers in the UK to log additional stations. During a visit to Lytham St. Annes, Neil Wheatley could hear several stations which were inaudible during a previous visit. Ian **Bond** (Wirral) added several stations to his list.

Mark Thompson says he especially enjoys local radio DXing. He concentrates on the faint signals underneath the more powerful ones and can spend several hours monitoring one frequency to get a positive ident. He uses a home built 0.85m loop with his Saisho SW5000 receiver.

A modified version of the "Sooper Loop" has been built by **Mike Evans** in Buckhurst Hill. He constructed a 305mm square frame. It worked well, but looked rather small, so he experimented with other shapes. His latest version is oblong, measuring 407 x 305 x 90mm and is pleased with the performance. Mike is willing to build similar loops for DXers, so if you would like to know more, please write to him via me initially, enclosing an s.a.e.

Short Wave DX

The generally excellent conditions in the **25MHz (11m)** band are being exploited daily by five broadcasters: RNI Oslo, Norway 25.730 (Eng Sundays only 1000-1030, Norw to Africa 1000-1045 & 1200-1250); BBC via Daventry 25.750 (Eng to Africa, Asia 1100-1515); Radio RSA, Johannesburg 25.790 (Eng to UK, S. Ireland 1400-1556); RFI Paris, France 25.825 (Fr to Africa 0900-1545) and Radio Denmark, Copenhagen 25.850 (Dan to Africa 1400-1455).

The transmissions for Radio RSA 25.790 were mentioned in many reports, but the SINPO 55444 rating noted at 1500 by John **Nash**, using a Kenwood R5000 receiver in Brighton, is typical.

The daily broadcasts from RFI, RNI, BBC and Radio Denmark are all potent signals in the target areas, but UK listeners should not expect to receive these transmissions clearly as they reach us via back scatter and other modes. Rapid flutter fading and echo effects were frequently mentioned in the reports from UK listeners.

Many very potent signals have been reaching the UK in the **21MHz (13m)** band and reception of broadcasts intended for Europe have been good. From time to time however, high levels of solar noise have been evident and solar flares have caused sudden ionospheric disturbances which have disrupted reception.

Some broadcasters who beam programmes to Europe were reported: Radio Japan via Moyabi 21.695 (Eng, Jap 0700-0830) 24443 at 0703 by **Kenneth Reece** using a JRC NRD525 receiver with a delta loop antenna in Prenton; Voice of UAE, Abu Dhabi 21.730 (Ar 0600-1600) 455 at 1100 by **Kenneth Buck** in Edinburgh; UAE Radio Dubai 21.605 (Ar, Eng 0615-1400) 44333 at 1030 by **Sheila Hughes** using a Sony ICF 7600DS portable in Morden; Voice of Israel, Jerusalem 21.625 (Russ, Eng 1000-1130) 45544 at 1122 by **David Edwardson** using a Trio R600 receiver plus 22m inverted Vee trap dipole in Wallsend; Radio RSA, Johannesburg 21.590 (Eng, Fr 1100-1600) 53333 at 1440 by **Mark Selby** in Aldershot; Radio Japan via Moyabi 21.700 (Eng, Jap 1500-1700) 45344 at 1505 by John Nash; WYFR via Okeechobee 21.615 (Eng, Ger, It 1600-1900) 55534 at 1700 by **Neil Dove** in Lockerbie.

Broadcasts to other areas logged were: Radio Moscow, USSR 21.680 (Eng to E. Africa 0600-1500) 53443 at 0803 by Leo **Barr** using a Matsui MR 4099 portable in Sunderland; Radio DW via Kigali 21.650 (Eng to S. Asia 0900-0950) 25333 at 0945 by **David Wratten** using a Trio R2000 receiver plus 30m wire antenna in Cambridge; Radio Sweden, Stockholm 21.610 (Fr, Sw to SE. Asia, Australia 1000-1100) 444 at 1014 by **Philip Rambaut** in Macclesfield; Radio Austria, Vienna 21.490 (Ger, Sp, Fr to W. Africa 1300-1700) 444 at 1500 by **Peter Hall** using an Eddystone 940 receiver with a dipole antenna in Chichester; WCSN Scotts Corner, Maine 21.640 (Eng, Fr, Ger to S. Africa 1600-1755) 44344 at 1600 by **Ken Whayman** using a Saisho SW 2000 portable with built-in whip antenna in Bexleyheath; Radio DW via Cyclops, Malta 21.680 (Ur, Hi, Eng to S. Asia 1430-1650) 44533 at 1615 by **Leslie Hollis** using a Yaesu FRG-7 receiver plus 26m Windom antenna in Grantham; Radio

DXers:

- A: Leo Barr, Sunderland.
- B: Ian Bond, Wirral.
- C: John Evans, Shawforth.
- D: Simon Hamer, New Radnor.
- E: Francis Hearne, Ilford.
- F: Sheila Hughes, Morden.
- G: George Millmore, Wootton I.O.W.
- H: John Nash, Brighton.
- I: Chris Myklel, Leeds.
- J: Mark Thompson, Wakefield.
- K: Phil Townsend, London.
- L: Andrew Westmoreland, Wakefield.
- M: Neil Wheatley, Lytham St. Anne.

SEEN & HEARD

Nederlands via Bonaire, Ned. Antilles 21.685 (Eng, Fr, Du to W. Africa 1830-2125) 25232 at 1834 by **Richard Radford-Reynolds** with a Sangean ATS-803A and 3m wire antenna in Southampton.

There is plenty to interest the DXer in the **17MHz (16m)** band just now. Many UK DXers have heard Radio New Zealand via Wellington 17.705 (Eng to Pacific area 2345-0730) for the first time, as their 7.5kW transmission has been audible here around 0530 some mornings. Considerable variations in the signal were noted by Kenneth Reece. At best, he rated them as 34333 at 0520, but it was completely inaudible other mornings. If you hear their broadcasts and decide to send them a reception report, please note that RNZ request three IRCs if you require one of their QSL cards.

The propagation conditions have also favoured Radio Australia via Carnarvon 17.715 (Eng to S. Asia 0100-0915). The report from Kenneth Reece quoted variations in the SINPO rating ranging from 22332 to 43433 around 0705, but unsuitable conditions prevented reception on a number of occasions.

Broadcasts beamed to target areas outside Europe were logged in the UK. They stemmed from KYOI Saipan, N. Mariana Islands 17.780 (Eng to E. Asia 0200-0800) 24343 at 0700 by David Wratten; Radio DW via Kigali 17.780 (Eng to E. Asia 0900-0950) 33333 at 0945 by **David Minter** in Portland; Vatican Radio, Rome 17.840 (Fr, Eng, Port to Africa 1100-1220) 33333 at 1120 by Sheila Hughes; BBC via Seychelles 17.885 (Eng to E. Africa 0900-1400) 23442 at 1245 by Leslie Hollis; RBI via Nauen 17.880 (Ger, Hi, Eng to S. Asia 1130-1500) 44444 at 1429 by Ian Bond; RTM Tangier, Morocco 17.595 (Eng, Fr to N. Africa 1400-1700) logged at 1430 by **John Sadler** in Bishops Stortford; RTM Tangier, Morocco 17.815 (Eng, Fr, to N. Africa 1700-1900) 533 at 1715 by **Alan Smith** in Northampton; VOA via Greenville 17.785 (Eng to W. Africa 1600-2200) 45444 at 1730 by Ken Whayman; Radio Nederland via Bonaire 17.805 (Eng, Fr, Du to W. Africa 1830-2125) 45444 at 1833 by Richard Radford-Reynolds; KVOH Los Angeles, USA 17.775 (Sp, Eng to C. America 1530-0100) 35443 at 1910 by Neil Dove; RCI via Sackville 17.820 (Fr, Eng to Africa 2100-2200) logged at 1827 by Leo Barr; Radio HCJB Quito, Ecuador 17.890 (Sp to S. America 1600-2145) 433 at 2130 by Peter Hall.

Reports also mentioned broadcasts beamed towards Europe during the day: UAE Radio Dubai 17.765 (Ar, Eng 0615-1500) 333 at 1030 by Kenneth Buck; Radio Moscow, USSR 17.810 (Eng 0700-1600) heard at 1100 by **Francis Hearne** in Ilford; Radio Pakistan, Islamabad 17.660 (Ur, Eng 0715-1120) 45344 at 1105 by John Nash; Voice of Israel, Jerusalem 17.575 (Eng, Fr 1100-1200) 44444 at 1110 by David Wratten; Radio RSA, Johannesburg 17.795 (Eng 1800-1900) 34433 at 1900 by **Darran Taplin**, using an Eddystone 680X plus 25m wire antenna in Tunbridge Wells.

Long distace paths have been open in the **15MHz (19m)** band and many interesting signals have been logged. Solar activity (flares) has disrupted reception from time to time during the month, but the effects have been relatively short-lived.

Radio Australia via Shepparton 15.160 (Eng, Fr to C. Pacific 2100-0700) has reached the UK quite well during the evening, the 24442 rating noted at 2112 by Neil Dove is typical. Their transmissions to S. Asia via Carnarvon 15.415 (Eng 0900-1100) have also been audible in the UK, rated as 23333 at 0952 by David Wratten.

Broadcasts from Radio New Zealand via Wellington are in parallel with their transmissions in the 16m band. Listening at 0525, Simon Hamer picked up their broadcast on 15.150 (Eng 2345-0730) with his Grundig Satellit 1400S portable. Kenneth Reece has monitored their frequency during the early mornings and noted considerable variations in reception conditions. There was no trace of their signal on some occasions, but at times it peaked 23422 around 0630.

Broadcasts directed to European listeners include Radio Japan via Yamata 15.325 (Russ, Sw, Ger, Fr, Eng, Jap 0500-0900) 35333 at 0750 by John Nash; UAE Radio Dubai 15.435 (Ar, Eng 0615-1645) 55344 at 1615 by Ken Whayman; RCI via Sackville 15.325 (Pol, Russ, Fr, Eng, Ger, Hung, Cz 1600-1900) "very clear" by Edward Broadsmith at 1600; WYFR via Okeechobee 15.565 (Sp, Ar, Fr, Eng 1600-2145) SIO 333 at 1800 by Kenneth Buck; RNB Brasilia, Brazil 15.265 (Eng, Ger 1800-1950) logged at 1832 by **Ron Pearce** using a home built two transistor receiver in Bungay; WRNO New Orleans, USA 15.420 (Eng 1700-2100) 33333 at 1845 by **Andrew Westmoreland** in Wakefield; Radio RSA, Johannesburg 15.365 (Eng 1800-2100) 45544 at 1900 by Darran Taplin; Radio HCJB, Quito 15.270 (Cz, Ger, Eng, Fr 1800-2200) 23323 at 1957 by Leo Barr; Radio Korea, Seoul 15.575 (Ar, It, Port, Eng, Eng, Ger, Sp 1645-2300) 35443 at 2045 by Leslie Hollls; also WINB Red Lion, USA 15.185 (Eng 2003-2245) 44444 at 2130 by Sheila Hughes.

Broadcasts to other areas were logged. They stemmed from Radio Japan via Yamata 15.270 (Eng, Jap to Australia 0500-1000 34333 at 0536 by Kenneth Reece; Radio Yugoslavia, Belgrade 15.325 (Eng to USA 130-1330) 44444 at 1315 by Ian Bond; VOA via Colombo 15.395 (Eng to S. Asia 1400-1800) 111 at 1623 by Philip Rambaut; KUSW Salt Lake City, USA 15.650 (Eng to E. USA 1500-2200) logged at 1640 by John Sadler; Africa No. 1, Gabon 15.475 (Eng, Fr to W. Africa 1700-2100) 44444 at 1708 by David Wratten;

Freq kHz	Station	ILR BBC	Power (kW)	DXer
585	R. Solway	B	2.00	G,F,J,M,P,Q
603	Invicta Sound	I	0.10	F*,H*,K,M, N,Q,R
603	R. Gloucester	B	?	B,F,M,R
630	R. Bedfordshire	B	0.30	F,H,J,K,M,N,Q,R
630	R. Cornwall	B	2.00	F,I
657	R. Clwyd	B	2.00	A,F,H,J,M,N, P,Q,R
657	R. Cornwall	B	0.50	F*,L
666	DevonAir R.	I	0.34	F,I,R
666	R. York	B	0.50	A*,D,F,J,M, N,P,Q*,R
729	BBC Essex	B	0.10	F,K,L,M,N,Q,R
738	Hereford/Worcester	B	?	C,F
756	R. Cumbria	B	1.00	A,F,M,P
756	R. Shropshire	B	1.00	F,I,M,P,R
765	BBC Essex	B	0.50	F,H,K,M,R
774	R. Kent	B	0.70	F*,I,K,R
774	R. Leeds	B	1.00	B,D,F,J,M,N,P,Q
774	Severn Sound	I	0.14	F,M,R
792	Chiltern R.	I	0.27	F,J,K,M,N,Q,R
792	R. Foyle	B	1.00	F
801	R. Devon	B	2.00	F,I,K,M,R
819	Hereford/Worcester	B	?	C,F
828	2CR	I	0.27	F,I
828	R. WM	B	0.20	F
828	R. Aire	I	0.12	A*,D,F,J,M,N,P
828	Chiltern R.	I	0.20	F*,H,K,M,Q,R
837	R. Cumbria	B	1.00	M
837	R. Furness	B	1.00	F,P
837	R. Leicester	B	0.70	F,K,M,N,R
855	R. Devon	B	1.00	F,I,L
855	R. Norfolk	B	1.00	F,H,M,N,Q,R
855	R. Lancashire	B	1.00	D,F,,J,M,P
873	R. Norfolk	B	0.25	F,J,K,M,R
936	Brunel R (GWR)	I	0.18	F,H,I,K,M,R
945	GEM-AM (R. Trent)	I	?	F,K,M,N,P,R*
954	DevonAir R.	I	0.32	F,H,I,K,M*
954	R. Wyvern	I	0.16	F,R
990	R. Aberdeen	B	1.00	F*
990	R. Devon	B	1.00	F,H,I
990	Beacon R.	I	0.09	F,M*,N,R
990	Hallam R.	I	0.25	F*,J,M,O,R
999	Red Rose R.	I	0.80	F,J,M,P,Q
999	R. Solent	B	1.00	F,H,I,J,K,M*,R
999	GEM-AR (R. Trent)	I	0.25	F,M,N,R
1026	R. Cambridgeshire	B	0.50	F,G,H,K,M,N,Q,R
1026	Downtown R	I	1.70	F*,N,P
1026	R. Jersey	B	1.00	F,I,K,L*
1035	R. Kent	B	1.00	F,H,I,K,M*,N,R
1035	Northsound R.	I	0.78	A*,D,F*,N,Q
1035	R. Sheffield	B	1.00	F,J,M,O
1035	West Sound	I	0.32	F*
1107	Moray Firth R	I	1.50	A*,F*
1107	R. Northampton	B	0.50	F,H,I,K,M*,N,R
1116	R. Derby	B	0.50	F,M,O,P,R
1116	R. Guernsey	B	0.50	F,G,H,I,R
1152	BRMB	I	3.00	F
1152	R. Broadland	I	0.83	F*,M*,N,Q,R
1152	R. Clyde	I	3.60	F*
1152	LBC	I	23.50	F,H*,I,K,N,R
1152	Metro R.	I	1.80	F*
1152	Piccadilly R	I	1.50	F,J,M,O,P
1152	Plymouth Sound	I	0.32	F*
1161	R. Bedfordshire	B	0.08	F*,K,N,R
1161	Brunel R. (GWR)	I	0.16	F
1161	R. Sussex	B	1.00	F,I,K
1161	R. Tay	I	0.70	F*,M*,P*
1161	Viking Gold	I	0.35	F*,J,M,N,O,R
1170	R. Orwell	I	0.28	F*,G*,N,Q,R
1170	Signal R.	I	0.58	F,M
1170	Swansea Sound	I	0.58	F,G
1170	R. Tees	I	0.32	F*,J,M,O
1170	Ocean Sound	I	0.12	F*,I,K
1242	Invicta Sound	I	0.32	F,H*,I,K,M,N,R
1251	Saxon R.	I	0.76	F,I,N,Q,R
1260	Brunel R (GWR)	I	1.60	F,I,Q
1260	Marcher Sound	I	0.64	F,P
1260	Leicester Sound	I	0.29	F,K,M,N,R
1260	R. York	B	0.50	A*,F*,J,M
1278	Pennine R	I	0.43	F*,J,K,M,O
1305	R. Hallam	I	0.15	F,J,K,M,O
1305	Red Dragon R.	I	0.20	F,I
1323	R. Bristol	B	1.00	F,P*
1323	Southern Sound	I	0.50	F,H,I,K,M*,R
1332	Hereward R.	I	0.60	F,G,I,M,N,R
1359	Essex R.	I	0.28	F*,R
1359	Mercia Sound	I	0.27	F,M,N,R
1359	Red Dragon R	I	0.20	F
1359	R. Solent	B	0.25	F,I
1368	R. Lincolnshire	B	2.00	F,J,M,N,R
1368	R. Sussex	B	0.50	F*,H,K
1431	Essex R.	I	0.35	F,M*,N,Q,R
1431	Radio 210	I	0.14	F,I,K,N,R
1449	R. Cambridgeshire	B	0.15	F,I,M,R
1458	R. Cumbria	B	1.00	F*,M
1458	R. Devon	B	1.00	F*
1458	GLR	B	50.00	F,H*,I,K,N,R
1458	R. Newcastle	B	2.00	D,F*,J,M,O,Q
1458	GMR	B	5.00	F,M,P
1458	Radio WM	B	5.00	F,G,R
1476	County Sound Gold	I	0.50	F,H,K,R
1485	R. Humberside	B	1.00	F*,J,L,M,N,O,R
1485	R. Merseyside	B	2.00	F,P
1485	R. Oxford	B	0.50	F,R
1485	R. Sussex	B	1.00	F*,H*,I,K
1503	R. Stoke-on-Trent	B	0.50	F,J,M*,O,Q,R
1521	Mercury	I	0.64	F,H*,I,K,M*,R
1521	R. Nottingham	B	0.50	F,M,N,R
1530	R. Essex	B	0.10	F*,I,R
1530	Pennine R	I	0.74	B,F,J,M,O,Q
1530	R. Wyvern	I	0.52	F
1548	R. Bristol	B	5.00	F,M*
1548	Capital (Gold)	I	97.50	E,F*,H*,I,K,N,R
1548	R. City	I	4.40	F,P
1548	R. Cleveland	B	1.00	F*,J,M
1548	R. Forth	I	2.20	F*,M*,Q
1548	R. Hallam	I	0.74	F*,M,O
1557	R. Lancashire	B	0.25	F,M
1557	Northants 96	I	0.76	F,M,N,R
1557	Ocean Sound	I	0.50	F,H,I,K,M*
1584	R. Nottingham	B	1.00	A,F*,J,M,O,R
1584	R. Shropshire	B	0.30	F
1584	R. Tay	I	0.21	F*
1602	R. Kent	B	0.25	F,H,I,K,Q,R

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

DXers:

- A: Leo Barr, Sunderland.
- B: Ian Bond, Wirral.
- C: Edward Broadsmith, Worcester.
- D: Alan Curry, Stockton-on-Tees.
- E: Martin Ferdy, Cortaillad, Swltzerland.
- F: Simon Hamer, New Radnor.
- G: Francis Hearne, Ilford.
- H: Shella Hughes, Morden.
- I: George Millmore, Wootton, IOW.
- J: Chris Nykiel, Leeds.
- K: Mark Selby, Aldershot.
- L: Tim Shirley, Bristol.
- M: Mark Thompson, Wakefield.
- N: Ted Walden-Vincent, Great Yarmouth.
- O: Andrew Westmoreland, Wakefield.
- P: Neil Wheatley, while in Lytham St. Anne.
- Q: Jim Willett, Grimsby.
- R: David Wratten, Cambridge.

SEEN & HEARD

Radio Denmark, Copenhagen 15.165 (Dan to N. USA 1730-1830) 44444 at 1730 by **Alan Curry**, using an Icom R-70 receiver in Stockton-on-Tees; Radio Nederlands via Talata Volon 15.175 (Eng to E. Africa 1830-1925) 45444 at 1830 by Richard Radford-Reynolds; VOA via Monrovia 15.445 (Eng to C. Africa 1600-2200) SIO 433 at 1855 by Alan Smith; BBC via Ascension Island 15.400 (Eng to S. Africa 1500-2300) logged at 2100 by Julian Wood using a Trio R1000 receiver in Buckie; also heard on 15.260 by Peter Hall at 2115 (Eng to S. America 2000-0330) 333.

Many broadcasts in the **13MHz (22m)** band are not intended for listeners in Europe, but those noted stemmed from RBI via Leipzig 13.610 (Port, Ger, Eng to E. Africa 0445-0645) 34433 at 0609 by Kenneth Reece; SRI in Berne 13.635 (Eng, Fr, Ger, It to E. Asia 1045-1300) SIO 444 at 1135 by Philip Rambaut; Radio Nederlands via Flevo 13.770 (Eng, Ar to S. Asia, Middle East 1430-1525) heard at 1500 by John Sadler; WYFR via Okeechobee 13695 (Fr, Eng to E. USA 1200-2245) 34333 at 1507 by David Wratten; Radio Prague, Czechoslovakia 13.715 (Eng, Cz, Ar, Fr to S. Asia, Middle East 1430-2125) 455 at 1610 by Kenneth Buck; Radio Vilnius via Komsomolsk 13.645 (Eng, Li to W. USA 2300-0130) 23322 at 2310 by Leo Barr.

Broadcasters that beam their programmes to Europe include Radio Korea, Seoul 13.670 (Kor, Eng, Port, Sp 0800-1100) heard at 0832 by Ron Pearce; Radio Austria, Vienna 13.730 (Ger, Fr, Eng, Sp 0700-1700) SIO 333 at 1245 by Peter Hall; WCSN Scotts Corner, Maine 13.760 (Eng, Fr, Ger 1400-1555) 55344 at 1401 by John Nash; also WHRI South Bend, USA 13.760 (Eng 1500-2100) 34333 at 1823 by Andrew Westmoreland.

The conditions in the **11MHz (25m)** band have not favoured long distance reception during the early morning, but interesting signals were logged later in the day. Solar events have caused high noise levels on this band some days.

The only mention of the 25m broadcasts from Radio Australia was in the report from Philip Rambaut, picked up their transmission via Carnarvon 11.765 (Chin to C. Asia 1100-1400) at 1201 rated as only SIO 111.

The broadcasts from Radio Jordan via their new 500kW transmitter at Al Karanah on 11.955 have been reaching the UK well. Listening at 0639, Kenneth Reece rated their transmission (Eng 0615-1415) as 44544. Many other broadcasts to Europe were noted in the reports, during the day were the Voice of Israel, Jerusalem 11.585 (Heb, Russ, Yid, Lad, Eng, Fr 1100-2300) SIO 433 at 1100 by **George Markwick** in Thornaby; RTV Tunis, Tunisia 11.550 (Ar 0600-1700) 45554 at 1200 by **John Coulter** in Winchester; Radio Moscow, USSR 11.900 (Eng 0800-1600) 44444 at 1215 by Ian Bond; UAE Abu Dhabi 11.965 (Ar 1600-2130) SIO 555 at 1800 by Kenneth Buck; Voice of Greece, Kavala 11.645 (Gr, Eng, Sw 1500-1550) 54444 at 1534 by David Wratten.

Alan Smith's Listening Post.

Later, VOA via Woofferton, UK 11.760 (Eng 1700-2200) was heard by **Colin Godwin** while in Scheffau, Austria 33333 at 1935; AIR via Aligarh, India 11.620 Austria 33333 at 1935; AIR via Aligarh, India 11.620 (Eng 1845-2230) 23323 at 1952 by Leo Barr; WCSN Scotts Corner, Maine 11.680 (Eng 54444 at 2000 by Ken Whayman; Radio Kuwait, State of Kuwait 11.665 (Eng 1800-2100) 44444 at 2015 by Sheila Hughes; RNB Brasilia, Brazil 11.765 (Fr 2000-2050) 34433 at 2031 by John Nash; Radio Damascus, Syria 12.085 (Ger, Fr, Eng 1835-2105) SIO 444 at 2045 by Peter Hall; Voice of Vietnam, Hanoi 12.020 (Eng, Russ, Viet, Fr, Sp 1600-2130) 43433 at 2139 by Alan Curry; Radio Japan via Moyabi, Gabon 11.800 (Jap, Eng 2200-0000) heard at 2345 by Francis Hearne.

Broadcasts to other areas stemmed from SLBC Colombo, Sri Lanka 11.800 (Hi, Nep, Ur, Kan, Te, Mal, Ta to S. Asia 0030-1630) heard at 0400 by **Peter Vlietinck** in London; RBI via Nauen 11.890 (Ger, Eng to E. USA 0930-1045) 33433 at 1035 by Darran Taplin; VOA via Poro 11.965 (Chin, Cant to C. Asia 1100-1600) 34543 at 1120 by David Edwardson; KTWR Agena, Guam 11.665 (Chin to

Freq MHz	Station	Country	UTC	DXer
2.325	ABC Tennant Creek	Australia	2035	F
2.340	Fuzhou	China	2105	K
2.470	R. Cacique	Brazil	0300	Q
2.485	ABC Katherine	Australia	2050	F,L,Q
2.490	Vos 1, Fuzhou	China	2105	K,S
2.560	Xinjiang	China	0033	E
3.200	TWR	Swaziland	?	Q
3.205	AIR Lucknow	India	2230	S
3.215	R. Orange	S. Africa	1740	J,O,Q
3.230	R. Nepal	Kathmandu	1855	E,O
3.230	ELWA Monrovia	Liberia	0600	S
3.235	AIR Gauhati	India	1619	J
3.300	V of Rev. Bujumb	Burundi	0120	S
3.350	KCBS Pyongsong	N. Korea	0210	S
3.355	R. Botswana	Gabarone	1728	J,O
3.365	AIR New Delhi	India	0053	E
3.365	GBC Radio 2	Ghana	2200	E,K,O,P,R
3.380	Austrian Army R	Austria	1725	O
3.400	Reykjavik	Iceland	1800	O,Q
3.777	VOIRI Tehran	Iran	1915	E
3.905	AIR Delhi	India	1716	E,O,P
3.915	BBC Kranji	Singapore	1858	E,J,K,N,O,S
3.925	AIR Delhi	India	0039	E
3.940	RSA Meyerton	S. Africa	0055	E
3.950	PBS Qinghai Xining	China	1535	E
3.955	BBC Daventry	England	1755	D,I,O
3.955	R. Orion	S. Africa	2200	Q,S
3.960	PBS Xinjiang, Urumqi	China	1550	E
3.965	RFI Paris	France	1712	K,O
3.975	BBC Skelton	England	1711	C,K,O
3.980	VOA Munich	W. Germany	1709	K,O
3.985	R. Beijing, China	via SRI Berne	2100	B,D,I,R
3.985	SRI Berne	Switzerland	1713	A,E,G,H,O
3.995	DW Cologne (Julich)	W. Germany	2115	K
4.005	RRI Padang	Indonesia	1538	E
4.010	R. Frunze	USSR	0031	E
4.050	R. Frunze	USSR	0031	E
4.060	R. Moscow Kharkov	USSR	2120	D,K
4.080	R. Ulan Bator	Mongolia	2215	Q
4.220	PBS Xinjiang	China	0012	E
4.460	R. Beijing	China	2050	J
4.500	Xinjiang	China	1603	E,J
4.610	R. Moscow, Khabarovsk	USSR	2120	K
4.725	BBS Rangoon	Burma	2120	S
4.735	Xinjiang	China	2308	A,D,E,M,O
4.740	R. Afghanistan	via USSR	1900	E,M,P
4.755	Caracol Neiva	Colombia	0725	E,F,P
4.755	RRI Ujungpadang	Indonesia	1544	E
4.760	ELWA Monrovia	Liberia	0635	E,I
4.760	R. Afghanistan	via USSR	1900	D,I,K,M,N,S
4.765	R. Moscow	via Cuba	0728	P
4.770	FRCN Kaduna	Nigeria	2120	E,J,N,P,S
4.770	R. Mundial, Bolivar	Venezuela	0042	E
4.775	R. Gabon, Libreville	Gabon	2137	J
4.780	V. Carabobo	Venezuela	0841	E
4.785	RTM Bamako	Mali	2130	E,K,P,S
4.785	R. Baku	USSR	1808	K,O,P
4.790	R. Atlantida	Peru	0830	E,P
4.795	R. Moscow	USSR	1730	I
4.795	R. Moscow, Ulan Ude	USSR	1755	K,O,P
4.800	AIR Hyderabad	India	0025	E
4.800	LN8S Lesotho	Maseru	1807	O,S
4.810	R. Yerevan	USSR	2100	C,O,P,Q
4.815	R. diff TV Burkina	Ouagadougou	1803	J,K,O,S
4.820	R. Botswana	Botswana	2130	S
4.820	Khanty-Mansiysk	USSR	1935	J,K
4.825	R. Moscow Yakutsk	USSR	1930	J,K
4.830	R. Grigota, Santa Cruz	Bolivia	0355	P
4.830	Africa No. 1	Gabon	2000	E,I,K,M,N O,R,S
4.830	R. Tachira	Venezuela	0255	E
4.835	RTM Bamako	Mali	2140	E,I,J,K,M, N,O,P
4.840	R. Valera, Trujillo	Venezuela	0806	E
4.845	ORTM Nouakchott	Mauritania	1810	A,J,K,O,P,S
4.850	R. Columbia Pt	Costa Rica	0448	P
4.860	AIR New Delhi	India	0024	E
4.860	Kalinin	USSR	1811	K,L,O
4.865	PBS Lanzhou	China	2152	I,J,O
4.865	V of Cinaruco	Colombia	0752	E,P
4.870	R. Cotonou	Benin	2106	E,I,J,O
4.870	R. Jornal Rio	Brazil	1645	J
4.875	R. Nac. Boa Vista	Brazil	2005	J
4.875	Uraisk	USSR	1813	C,O
4.880	SABC Radio 5	S. Africa	1835	H,J,K,O
4.885	R. Clube do Para	Brazil	D817	E
4.890	RFI Paris	via Gabon	0446	P
4.890	ORTS Dakar	Senegal	1720	C
4.895	R. Bare, Manaus	Brazil	0630	P
4.895	R. Ashkabad	USSR	2050	K
4.895	R. Moscow, Kalinin	USSR	1750	P,Q
4.898	La Voz de Rio, Arauca	Columbia	0500	F
4.900	SLBC Colombo	Sri Lanka	0048	E
4.905	R. Nat. N'djamena	Chad	1752	E,J,K,O,P
4.910	R. Zambia, Lusaka	Zambia	1817	O,P,S
4.915	R. Ghana, Accra	Ghana	1818	I,J,K,O,S
4.920	ABC Brisbane	Australia	1910	E,K
4.920	AIR Madras	India	1915	R
4.920	R. Moscow 8, Yakutsk	USSR	1044	E
4.930	R. Moscow, Tbilisi	USSR	1819	O
4.935	Voice of Kenya	Kenya	1928	E,P
4.940	R. Kiev	USSR	1820	E,K,O,P
4.945	Caracol, Neiva	Colombia	0725	E,J,P
4.950	R. Nac. Luanda	Angola	1915	C
4.955	R. Cultura, Campos	Brazil	0748	P
4.955	R. Marajoara, Belem	Brazil	0745	E
4.960	R. Baku	USSR	2120	J,P
4.970	R. Rumbos, Caracas	Venezuela	2303	J,P
4.975	R. Uganda, Kampala	Uganda	2030	I,K,N,P
4.975	R. Dushanbe	USSR	1556	E,P
4.980	PBS Zinjiang	China	0045	E
4.980	Ecos del Torbes	Venezuela	2312	J
4.990	AIR New Delhi	India	0004	A,E,M
4.990	FRCN Lagos	Nigeria	1845	E,K,P
5.005	R. Nacional, Bata	Eq. Guinea	2130	I,J,K,M,O
5.005	R. Nepal, Kathmandu	Nepal	1553	E
5.010	R. Garoua	Cameroon	2210	J,K,S
5.015	R. Moscow Arkhangelsk	USSR	1823	J,K,O,P
5.020	ORTN Niamey	Niger	1940	F,J,P
5.025	R. Rebelde, Habana	Cuba	2320	J
5.025	R. Uganda, Kampala	Uganda	2035	K
5.030	R. Impacto	Costa Rica	0310	E,P
5.035	Schulungssender	Austria	1830	O
5.035	R. Bangui	C. Africa	2236	J
5.035	R. Alma Ata	USSR	2329	E,J,P
5.040	R. Tbilisi	USSR	1825	E,J,K,O,P
5.045	R. Cultura do Para	Brazil	2122	J,P
5.045	R. Togo, Lome	Togo	1955	F,J,S
5.050	R. Mundial, Caracas	Venezuela	0905	F
5.055	TWR Manzizi	Swaziland	1826	O
5.057	R. Tirana Gjirokaster	Albania	2045	I,K,O,P
5.060	PBS Zinjiang	China	0035	E
5.065	R. Candip, Bunia	Zaire	2145	S
5.090	R. Beijing	China	2325	J
5.163	R. Beijing	China	2045	K
5.260	R. Alma Ata	USSR	0045	E
5.320	R. Beijing	China	2135	J
5.440	PBS Xinjiang	China	0055	E

DXers:

- A: Leo Barr, Sunderland.
- B: Ian Bond, Wirral.
- C: Robert Cowell, Blackpool.
- D: Alan Curry, Stockton-on-Tees.
- E: David Edwardson, Wallsend.
- F: Martin Ferdy, Cortaillad, Switzerland.
- G: Colin Godwin, Scheffau, Austria.
- H: Peter Hall, Chichester.
- I: Sheila Hughes, Morden.
- J: John Nash, Brighton.
- K: Fred Pallant, Storrington.
- L: John Parry, Northwich.
- M: Roy Patrick, Derby.
- N: Richard Radford-Reynolds, Southampton.
- O: Philip Rambaut, Macclesfield.
- P: Kenneth Reece, Prenton.
- Q: Tim Shirley, Bristol.
- R: Alan Smith, Northampton.
- S: Jim Willett, Grimsby.

SEEN & HEARD

C. Asia 0900-1500) 43333 at 1130 by Robert Cowell using a Hammarlund HQ 180XE receiver in Blackpool; VOA via Poro 11.715 (Eng, Ind to Australia, SE. Asia 1100-1430) 43532 at 1240 by Leslie Hollis; AWR Agat, Guam 11.980 (Chin to S. Asia 1600-1700) SIO 333 at 1645 by Alan Smith; Vatican Radio, Rome 11.700 (It, Eng, Fr, Sp, Port to Africa 1940-2100) heard at 1940 by John Sadler; RHC Havana, Cuba 11.950 (Ar, Sp, Fr to N. Africa 1630-2140) 35433 at 2040 by Neil Dove; AIR via Delhi 11.715 (Eng to Australia 2045-2230) 25333 at 2215 by Richard Radford-Reynolds.

Interesting DX signals may be heard in the 9MHz (31m) band day and night. Radio New Zealand, Wellington 9.850 (Eng to Australia 0900-1115) have been reaching the UK particularly well most mornings. The 22222 rating noted at 0900 by Alan Curry is fairly typical as a flutter fading effect is often present. Alan Smith has been monitoring their transmissions daily and noted variations in signal ranging from inaudible to SIO 433 at best. He has one of their attractive QSL cards.

Radio Australia broadcasts to a number of different target areas and some have been reaching the UK. Noted in the reports were 9.645 via Darwin (Ind, Eng to SE. Asia 0900-1200) 23322 at 0855 by Kenneth Reece; 9.655 via Shepparton (Eng to Europe, S. Pacific 0700-1000) 34443 at 0909 by David Edwardson; 9.770 via Shepparton (Eng to SE. Asia 1000-1100) 34333 at 1000 by David Wratten; 9.580 via Shepparton (Eng to C. Pacific, USA 0800-2130) SIO 211 at 1221 by Philip Rambaut; 9.770 via Carnarvon (Eng to SE. Asia 1100-1300) SIO 454 at 1200 by Tim Shirley; 9.620 via Shepparton (Eng to E. Asia, W. Pacific 2000-2130) 23432 at 2000 by Leslie Hollis. ABC Brisbane 9.660 (Eng to NE. Australia 24Hrs) was logged at 0900 by Simon Hamer.

Some broadcasts to Europe stem from Radio HCJB, Quito 9.610 (Cz, Sw, Norw, Ger, Eng 0500-0830) 55544 at 0730 by John Nash; AWR via Sines 9.670 (Pol, Ger, Eng 0700-0930) 54444 at 0930 by David Minter; Radio Jordan via Al Karanah 9.560 (Eng 1430-2200) heard by Ron Pearce at 1605 and noted as "good during the evening" by Roy Patrick; Voice of Israel, Jerusalem 9.435 (Eng, Fr, Russ 2000-2155) 44444 at 2011 by Ian Bond; Radio Pyongyang, N. Korea 9.345 (Sp, Ger, Fr 1800-2150) SIO 354 at 2110 by Fred Pallant; Radio Cairo, Egypt 9.900 (Alb, It, Ger, Fr, Eng 1730-2245) 55555 at 2135 by Darran Taplin; Radio Sophia, Bulgaria 9.700 (Ger, Fr, Eng, It 1930-2225) 43444 at 2141 by Leo Barr; Voice of Turkey, Ankara 9.825 (Ger, Eng, Fr 2000-2250) 44334 at 2143 by Richard Radford-Reynolds; VOA via Tangier 9.760 (Eng 1700-2200) 33333 at 2159 by Colin Godwin in Scheffau, Austria; VOFC Taipei, Taiwan 9.955 (Eng, Sp 2200-0000) 54444 at 2200 by Robert Cowell; Radio Baghdad, Iraq 9.770 (Fr, Ger, Eng 1900-2255) 534 at 2245 by Alan Smith.

Also logged were BBC via Antigua, W. Indies 9.640 (Eng to C. America 0600-0815) 43433 at 0629 by Kenneth Reece; Radio Nederlands via Bonaire Ned. Antilles 9.715 (Du, Eng to Australia, Pacific 0630-0825) 45444 at 0700 by David Wratten; TWR via Agana 9.820 (Chin to C. Asia 0900-1500) 211 at 1200 by Philip Rambaut; Radio Sweden via Horby 9.565 (Eng, Sw to Asia, Australia 1230-?) 45554 at 1235 by John Parry in Northwich; VOA via Tinang 9.660 (Chin. Ca to C. Asia 1100-1600) 44544 at 1520 by Neil Dove; FEBA Radio Mahe, Seychelles 9.770 (Swa, So to E. Africa 1615-1731) 35443 at 1615 by David Edwardson; AIR via Delhi 9.910 (Far, Ar to Middle East 1615-1945) 333 at 1815 by Peter Hall; Radio Tirana via Kurja 9.375 (Far, Ger to Middle East 2000-2030) 354 at 2030 by Kenneth Buck; KYOI Saipan, N. Mariana Islands 9.465 (Eng to E. Asia 2000-2200) 44433 at 2100 by Leslie Hollis; Voice of Turkey, Ankara 9.445 (Eng, Tur to USA 2300-0450) heard at 2300 by Francis Hearne; AIR via Aligarh 9.535 (Eng to SE. Asia 2245-0115) 33333 at 2315 by Alan Curry; Voice of UAE, Abu Dhabi 9.595 (Eng to USA 2200-0200) heard by Mal Tedds in Nottingham while relaying Capital Radio, London and rated as 54344 at 2330 by Mark Selby; WCSN Scotts Corner, Maine 9.850 (Eng, Fr, Ger to Africa 0000-0355) 44444 at 0000 by Sheila Hughes.

Despite the congestion in the 7MHz (41m) band, some broadcasts to Europe may be received quite well. The latest reports mentioned WCSN Scotts Corner, Maine 7.365 (Eng, Fr, Ger 0600–0755) 534 at 0730 by Alan Smith; WHRI South Bend, USA 7.355 (Eng 0800-1100) 33323 at 0900 by Sheila Hughes; Radio Australia via Carnarvon 7.205 (Eng 1430-2030) 43343 at 1540 by David Wratten; Radio Prague, Czechoslovakia 7.345 (Ar, Fr, Eng, Sp 1630-2125) 34444 at 1800 by Andrew Westmoreland; Voice of Greece, Athens 7.430 (Gr, Eng, Fr, Ger 1900-1950) 32223 at 1925 by Colin Godwin while in Scheffau, Austria; AIR via Delhi 7.410 (Eng 1845-2230) noted as "good" at 2000 by Edward Broadsmith; IBRA Radio via Cyclops 7.110 (Pol, Ger, Eng 2000-2115) 44444 at 2110 by Alan Curry; Radio Budapest, Hungary 7.220 (Tur, Eng, Hung, Ger, Sp 1730-2230) 33333 at 2118 by Leo Barr; Radio Sophia, Bulgaria 7.115 (Eng 2130-2200) SIO 433 at 2150 by Peter Hall; Radio Moscow, USSR 7.150 (Eng 1700-2300) 44344 at 2206 by Ian Bond.

Some broadcasts to other areas were also logged: Voice of Nigeria, Lagos 7.255 (Eng, Fr, Ha to W. Africa, C. Africa 0500-2200) 32422 at 0550 by Kenneth Reece; Radio Korea, Seoul 7.550 (It, Fr, Kor, Ar, Ger, Eng, Sp, Port to E. Africa, Middle East 1545-2345) 243 at 1947 by Fred Pallant; Radio Beijing, China 7.800 (Chin, Fr to W. Europe, N. Africa 1730-2225) 43553 at 2035 by John Parry.

A variety of broadcasts are beamed towards Europe in the 6MHz (49m) band. Those noted were: Radio Austria Int, Vienna 6.155 (Ger, Eng, Fr, Sp 0400-2300) heard at 0445 by Francis Hearne; TWR Monte Carlo, Monaco 6.230 (Ger 1430-1500) 433 at 1430 by George Markwick; RFI via Allouis 6.175 (Fr, Eng 0500-2200) 323 at 1628 by Ian Bond; Radio Afghanistan via USSR 6.020 (Pa, Ger, Eng 1730-1930) 32433 at 1831 by Richard Radford-Reynolds; Radio Pyongyang, N. Korea 6.576 (Russ, Fr, Kor, Sp, Ger, Eng 1500-2150) 243 at 2000 by Fred Pallant; BBC via Limassol 6.180 (Eng 1500-2315) 33444 at 2150 by Leo Barr; Radio Polonia, Warsaw 6.135 (Ger, Fr, Eng 2100-2355) 443 at 2250 by Peter Hall; Radio Prague, Czechoslovakia 6.055 (Ger, It, Fr, Cz 1700-0057) heard at 2313 by Simon Holland in Douglas, IOM; Vatican Radio, Rome 6.185 (It, Eng 2200-0100) 44444 at 0005 by Sheila Hughes.

A few of the transmissions to other areas were logged; Radio Nacional Malabo, Eq. Guinea 6.250 (Sp to Guinea 0500-2205) 34333 at 0543 by Kenneth Reece; WYFR via Okeechobee 6.105 (Sp to S. America 0800-1100) 222 at 0850 by Phillip Rambaut; Radio Sta. Maria Coyhaigue, Chile 6.030 (Sp to S. Chile 0855-0300) 12222 at 0900 by Robert Cowell; King of Hope, Lebanon 6.280 (Fr, Eng to Middle East 1945-2300) 24333 at 2130 by David Wratten; Voice of UAE, Abu Dhabi 6.170 (Eng to USA 2200-0200) 433 at 2240 by Kenneth Buck; Radio Mediterranean via Cyclops (Fr, Eng to N. Africa 2100-2330) heard at 2250 by Ron Pearce.

Abbreviations

Alb	Albanian
Ar	Arabic
Ca	Cantonese
Chin	Chinese
Cz	Czechoslovakian
Dan	Danish
Du	Dutch
Eng	English
Far	Farsi
Fr	French
Ger	German
Gr	Greek
Ha	Hausa
Heb	Hebrew
Hi	Hindi
Hung	Hungarian
Ind	Indonesian
It	Italian
Jap	Japanese
Kan	Kannada
Kor	Korean
Lad	Ladino
Li	Lithuanian
Ma	Malay
Nep	Nepali
Norw	Norwegian
Pa	Pashto
Pol	Polish
Port	Portuguese
Russ	Russian
So	Somali
Sp	Spanish
Sw	Swedish
Ta	Tamil
Te	Telugu
Tur	Turkish
Ur	Urdu
Viet	Vietnamese
Yid	Yiddish

Freq kHz	Station	Location	Time (UTC)	DXer
		USA		
570	WMCA	New York, NY	0430	D
690	WTIX	New Orleans, LA	0100	B
690	WVOK	Birmingham, AL	0700	B
770	WABC	New York, NY	0350	D
970	WYNZ	Portland, ME	0420	D
1010	WINS	New York, NY	2300	A,B,D
1050	WFAN	New York, NY	0200	B
1190	WLIB	New York, NY	0435	D
1430	WENE	Endicott, NY	0415	D
		Canada		
590	VOCM	St. John's, NF	0220	D
600	CBNA	St. Anthony, NF	0340	D
670	CHYQ	Musgravetown, NF	0240	D
680	CIYQ	Grandfalls, NF	?	C
730	CKAC	Montreal, PQ	0350	D
820	CHAM	Hamilton, ON	0330	D
930	CJYQ	St. John's, NF	2320	A,C,D
1050	CHUM	Toronto, ON	0400	D
1450	CFAB	Windsor, NS	0410	D
1570	CKLM	Lavel, PQ	0210	D
		C. America & Caribbean		
1570	Atlantic Beacon	Turks & Caicos Ils	0200	D
1610	Caribbean Beacon	Anguilla	0230	D

DXers:
A: Roy Patrick, Derby.
B: Tim Shirley, Bristol.
C: Mark Thompson, Wakefield.
D: Jim Willett, Grimsby.

Station Addresses

BBC Hereford and Worcester, 43 Broad Street, Hereford HR4 9HH; Hylton Road, Worcester WR2 5WW.
ILR Radio Aire, PO Box 362, 51 Burnley Road, Leeds LS3 1LR.
Deutschlandfunk, External Service, Box 510 640, D-5000 Cologne 1, West Germany.
Radiodiffusion TV Marocaine, 1 Rue El Brihi, Rabat, Morocco.
Radio Nacional Angola, External Service, C.P. 1329, Luanda, Pep. Rep. Angola.
Radio Alma Ata, Ul. Mira 175a, Alma Ata 480013, Kazakhstan SSR, USSR.

Received by Ian Bond.

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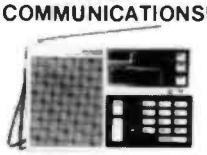

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POST £1

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"They said I couldn't work DX with just 100 watts. Especially with a radio that has less than 1000 switches on the front panel.

But the truth is, I'm working lots of DX, more than some of these blockbuster types, thanks to my Yaesu FT-747GX.

You see, my no-nonsense FT-747GX was designed with me in mind, so I can hop around the band fast to nail those DX stations. While the other hams are warming up their amplifiers, I'm working the new country!

My FT-747GX has a super receiver, with a directly-driven mixer for great overload protection. And, Yaesu included the CW filter in the purchase price (I used the money I saved on postage for the QSL cards!).

And my FT-747GX is loaded with other features. The receiver works from 100kHz straight through 30MHz, and it's a fantastic shortwave broadcast receiver. I can use all twenty memories for that alone! Plus it's got dual VFOs. A noise blanker. Split frequency operation for the pile-ups. And scanning up the band helps me check out openings as they happen.

I just put in the optional crystal oven, and next month I'm going to pick up the FM board.

And with the money I saved when I bought my FT-747GX, I got a second ten-metre antenna for satellite work on the high end of the band. I use my personal computer to tell me what satellites are going by, and the computer even sets the frequencies on the radio for me.

Now my friends are getting FT-747GX rigs, too. I knew they'd figure out my secret weapon sooner or later. But now I'm setting the pace!

Thanks, Yaesu. You've made a rig that makes sense, at a price I can afford."

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