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HIGH SEAS & SHORT WAVES-2
ANTENNAS-3

NEWNES
Short Wave Listening
HAND BOOK

Joe Pritchard
GIUQW

BEARCAT 800XLT BASE STATION SCANNER REVIEWED

For The Radio Listener
ICOM Count on us!

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

ICOM introduces the IC-R7000, advanced technology, continuous 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 frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency 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, attenuator, 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 frequency 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.

Datapost: Despatch on same day whenever possible.

Access & Barclaycard: Telephone orders taken by our mail order dept, instant credit & Interest-free H.P.

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

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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 subjective 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 offences 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 implemented 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 better 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 an unbiased magazine. I have to take both manufacturer's and reviewers' points of view into account, and this is why I have included a letter from the Revco Electronics director of the products being reviewed. If we had not, the letter from the reviewer would appear to be an attack on Revco, and that is not what we want. We want to provide an unbiased publication. The best way to do that is to allow both sides to speak, and this is why I have included both letters.

If you have any points of view that you want to share, please write to me. 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 wonder if anybody or anyone of your readers could help me? A friend and I are reviving some old valve 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 Eminton 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, I was very interested to read the article by Peter Rouse (SWM January 1989 page 18) on modifications to the Revco Discane ("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

Sir, I 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 HQC, Quito, Ecuador; Havana, Cuba; Boston, MAR; 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 "Sleepiphone", 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 your comments.

J. H. WRIGHT, ESQ
BUXTON
DERBYSHIRE

Sir, Maybe someone can tell me where I can get a 40kHz i.f. double-tuned transformer for the Edystone 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
LONDON DERRY
NORTHERN IRELAND
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 Manning’s 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 its 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 of 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 RS32 and RS35.  

5) 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.  

In my 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 £265 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 information to 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 at 100mA, with full volume in the speaker and backgound 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 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.

A WORD IN EDGEGAYS

WHAT'S NEW

Netherlands Media Network

March 2: A look at time measurement. Dave Rosenthal visits the famous station WWV in Fort Collins Colorado. They also check 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?


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 to receive more details on the event, send a 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.
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, Tudor House, Cossham Street, Mangotsfield, Bristol BS16 3EN. Tel: (0272) 565472 for more details.

AMIGA SSTV

Following on the heels of the Amiga Facsimile 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 common amateur standards and has slow scan television protocols (colour and b/w) and permits images to be both sent and received. Transmitted images can be generated from PAK 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 £69.95.

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

THE CLUB OF FRIENDSHIP

To help the growing friendship 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.i.s and licensed amateurs are welcome to join and further details can be obtained by sending an s.a.e. to Ken Norval, G3JFN, Hon. secretary, Cof, 24 Ryedene, Vange, Basildon, Essex.

WHAT'S NEW

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 406-512 MHz. 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. adapter and the memory backup is by means of a capacitor, eliminating the need for batteries. Overall size is 241 x 64 x 181 mm and the weight is 740 g.

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 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 £5.50. Harlech Electronics, Noradco, 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 1 kHz up to 60 GHz 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 killyogs," 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."
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; £29.96 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) 5665.

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:

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

**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 GBPG. 37 Pickering Road, Greasby, Wirral. Merseyside L49 3ND

144/146MHz Contest

**Venezuela:** Radio Mundial in Caracas has returned to short wave 24 hours a day on 5.05MHz. Radio Continental in Barinas has been heard 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 1836 on 4.84MHz.

**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 2200-2225 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 15.46MHz open now at 0300 and 17.86MHz 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 range power off, continuity test by buzzer and diode test.

The Pan 50 has a 3-digit d.c. 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 switching 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; 500V. Resistance - 320Ω; 32kΩ; 32kΩ; 3.2MΩ; 32MΩ. All 110% of reading ± 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 £53.55 excluding VAT plus £3.50 P&P from: Electronic & Computer Workshop Ltd., Unit 1, Cromwell Centre, Steeple, Witham, Essex CM8 3FH. Tel: (0376) 917413.**
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 Thursdays are cont, 2nd Tuesday and last Mondays BBC Computer Nights and 4th Tuesdays Birmingham RAYNET Group. All Thrusdays 17.30 & 21.30. Mics Microwave G0OJA, 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 G8P by Rev. Dobbs on the 8th, 7pm. 11th February, 2pm. 18th, from DIY to Mass Production G3WGU and the 23rd is an informal. F. Whitehead G4CSA on St. Annes 720067.

Lothians RS have a Juke Sale on March 8 and an outside broadcast live on the 22nd. 2nd & 4th Wednesdays, 7pm at the Owls Hotel, Polwarth Terrace, Edinburgh, P. J. Dick G4MDH at 21 West Maitland St., Edinburgh EH12 5EA.

Cheshunt & District AR have Natter Nights on March 1/15 and the History of Communications 3 G0BTX on the 8th. Wednesdays, 6pm in the Church Room, Church Lane, Wormley, Hertfordshire. Roger Friley G4AQA on Hoddesdon 646769.


Thornbury & District AR meet 1st & 3rd Wednesdays, 7.30pm in the Unitarian Church, Thornbury. March 1 is Aerials Illuminate G3PQG of the BBC Engineering Dept, Evesham and the 15th is HF Activity. Tom Cromack G0GFL at Rose Cottage, The Nattle, Oldbury on Severn, Bristol BS12 1RU.

Stourbridge & District AR have a Natter/On-air night on March 6 and their AGM. Tim Anderson G0GTF on Hastings 437513.

Worcester Tom on Sevenoaks G4OAA from February 17 Mondays, 8pm at the Community Centre, Sycamore, Worcester.

Mortimer Community Centre, Sycamore Rd. Mike G4UXC. Something held Natter/On-air night March 14 Wednesdays, 7.30pm at the Manor Club, Sycamore Rd. Ernie G4GCV on Combe Down 832156.

Colchester Radio Amateurs meet in Room 15, Ground Floor. "C" Block at the Gillbed School, Silkmore Lane, Highwoods, 7.30pm. March 2 is The Thomas Barrie by R. W. Homer and the 15th is Very Early Days of Radio. Valves by J. Stanley Wood. Mike G5GGA G4VYJ on Layer-de-la-Haye 348189.

South Manchester AR have Fault finding - entries of the 1st phase of the March 19 G3VSW on February 24, Computers in Education by John Ashnut BSc, 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.

Both & District AR 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 Olsen G4GEV on Come Down 832156.

Loughton & District AR have a 6m night on the Airing club callign G4ONF on February 25 and March 12 is G3OPA Top Band d.f. Set Construction Judging Night, Essex (RSGB R L Ted Whinworth 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 G4FF on Ipswich 463437.

Dragon ARC meet 1st & 3rd Mondays, 7.30pm on Four Crosses, Pentreath Rd, Menal 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. Speakers, Tony Fees on Bethesda 600963.

Maidstone ARS have a Natter Night, RAE and c.w. on March 3. YMCA Sports Centre, Maidstone. Mike G4GUW on Maidstone 433177.

South East Kent (YMCA) AR have a Natter Night on March 1, Ten foot经营 on the 8th and Natter Night Committee meeting/Morse test on the 16th and a Construction Contest on the 23rd. Dover YMCA, Godwynheath, Lyneburne Rd. Des Edwards at 12 East Cliff, Dover. Kent CT11 1UX.

Worcester AR meet 1st & 3rd Wednesdays at Ivy Farm, Armore Park Rd. March 1 is Ham Radio Maritime Mobile. A. See G3FOO at 31 Willhit Ave, Bebbington, Wirral L63 5NE.


Wimbledon & District AR have Antenna Matching Units G6HC on February 24. 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Rd. Nick Lawlor G6AJN on 01-330 2702.

Workshop AR have an Official club meeting on February 28, Video, W5FL lecture on March 14 and Natter Nights on the 27/1. Meet Tuesdays, times and places informal. Carole Gee G4ZUN on Workhop 86614.

Holifax & District AR have Birkett's Component Sale on March 21. 1st & 3rd Tuesdays, 7.30pm at the Running Man Public House, Pelton Lane. 1st Tuesdays are Informal "noggan and natter" nights. David Moss G0JLM on Halifax 202306.

Coventry AR meet Fridays, 8pm at Baden Powel House, 121 St. Nicholas St, Roward. 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 G4HGF on Coventry 610408.

Horse RC meet Wednesdays, 8pm at the Mill, Altrwick Rd. March 1 is SWR G3TEU, the 8th is a Committee Meeting, the 15th is Omega Entdtains G4TVT and the 22nd is Computer Operating Systems by Simon SWL. Geoff G4IGY on 0944 333331.

North & District AR meet Wednesdays, 7.30pm at The Norfolk Dumpling, The livestock Market, Hartford. March 1 is Any Questions? Ask the panel for answers! The 8th is a Surplus Equipment Auction internals & buy (doors open 7pm), the 15th is Computer aided printed circuits workshop, and the 22nd is The Shefford Club project 2m DC XCV, G3WU, Craig Joly G0BID on Norwich 485784.

Taunton & District AR meet 1st & 3rd Fridays at County Hall, Emergency Planning HQ, March 3 is talk by G3GC & the 17th is G5VGE on the 20th at the Salvation Army Common, 65 St. Peter Street. Speakers, Roberton G0EYR on Taunton 275973.

Barnsley ARC meet alternate Mondays, 7.30pm at Monk Bretton Training Centre, Burton Rd, Emie Bailey G4JUE at 881 Ave, Cudworth. Barnsley, S. Yorks 572 8NO.

Hoyland ARC meet Wednesdays, 7.30pm at West Bank House, West St. M. Wardle G0GSC at 11 Skell Ave, Wombwell Ave, Barnsley.

Rotherham ARC meet alternate Wednesdays, 7.30pm in the Church Hall opposite the Old Pontoon, Bowry Rd, Tinsley. F. Moody G0CN on Rotherham 582259.

Doncaster Radio ARC meet Mondays, 7.30pm at Corporation Brewery Taps, Cleveland St. K. McMahon G0JUR on Doncaster 859238.

Sheffield Packet Group meet Tuesdays, 8.30pm in the Rugby Club, Stockbridge. P. Green G4PHL at 6 Yeats Close, Worrall. UK FM Group Northern meet 1st Sundays, in the Daventry room, Doncaster, Barnsley. Ms L. Macdonald at Claxmire, Main St, East Ardsley, Wakefield W3F 2AP.

Southgate AR have lecture on Effects of Solar Activity in RSGB Radio Section G3YLA on March 9 and Portable HF Rig Evaluation night on the 23rd. 2nd & 4th Thursdays, 7.45pm at Holy Trinity Church Hall, St. Helens Hill, London N21. Brian Shelton on Winchmore Hill 01-300 2453.

Acton, Brentford & Chiswick ARC meet 7.30pm in the Church Hall, High Rd. March 21 is Aeronautical Communications G4GD, W. G. Dyer G3SHEG on Acton 3778.
Short Wave Listening Handbook first covers the "science" side of the subject, going from a few simple electrical "first principles", through a brief treatment of radio transmission methods to simple receivers. The emphasis is on practical receiver designs and how to build and modify them, with several circuits in the book, from the crystal set to converters, regenerative receivers, direct conversion and simple superheterodyne sets. Various "peripherals", such as antenna tuners, filters, preselectors, noise limiters and c.w. and RTTY terminal units are also covered.

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

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

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

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

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

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

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

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

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

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

Send £1 to cover the postage and we will send you, by return of post, your FREE copy of "THE LISTENER'S GUIDE" (2nd edition), a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will, I am sure, result in a "good read" but underneath the humour lies a wealth of experience and expertise. You will also receive detailed leaflets on our range of receivers and a copy of our current price list.

LOWE ELECTRONICS LIMITED
Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines) Fax 580020 Telex 377482
There has never been a more exciting time for the VHF listener than right now. With the leading manufacturers making VHF and UHF receivers, and using microprocessor control which would have been impossible even five years ago, the keen listener can carry in his pocket the kind of receiving power that used to take up a nineteen inch rack, and consume enough electricity to light a small house.

We at Lowe Electronics have made it our task to seek out the best of these amazing radios, and bring them to you at attractive prices. We are the sole factory appointed importers for Signal, AOR, and WIN; all of whom represent the very best in scanning monitor receiver design and manufacture, and we show a small selection on this page. Not only do we stock and sell all these radios, we also offer you the best advice in the business, and we carry a full range of listeners' accessories from a humble egg insulator to RTTY and Morse decoders.

Let's start with what is acknowledged to be the finest wide range monitor receiver ever made; the AR-2002 from AOR. This receives in all modes, on frequencies from 25 to 550MHz, and also from 800 to 13000MHz, so there isn't much you cannot receive: airband both VHF and UHF, marine, amateur, FM broadcasts and TV sound, cellular radio, land mobile radio and so on. The AR-2002 is in use in professional installations all over the world, but is available at a price that the amateur can afford.

Coming very soon is the incredible AR-3000. 100KHz to 2036MHz — with no gaps, and in all modes including SSB. Watch this space.

Signal Communications have always specialised in receivers for the airband, and we have often said that Mr. Hayakawa is one of those rare men who truly understand how to design VHF AM receivers. The audio quality which comes from any Signal airband receiver is outstandingly good, and the operating facilities are equally excellent. Top of the Signal range is the R-535, which covers not only the VHF airband from 108 to 136MHz (also 136 to 143MHz), but also the UHF airband from 220 to 380MHz. No less than 60 memory channels can store any frequency within the range of the receiver, and scanning takes place at very high speed, so you don't miss any of the action.

Signal also make the ideal starter receiver, the R-537S, which combines fully tunable operation for searching 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.

Our most successful airband receiver has been without doubt the WIN-108. Designed to incorporate all the features asked for by UK users over the years, the WIN-108 is the most convenient, powerful, and feature packed dedicated VHF airband receiver ever made available. Simply cannot be described in this space, but details of the WIN-108 and all our other models are available on request, enclosing £1 to cover post and packing. You will also receive our "Listeners' Guide" and "Airband Guide" free of charge.

Send right away, and see why you should "look to Lowe" for all your listening requirements.

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25th Anniversary Prize Draw

Anyone making a purchase of more than £5 during this month will have the chance to win our "Gift of the Month" from the following: --- TM-221E, R-535, AR-800, HF-125, TH-215E. All mail orders are automatically included. All shop sales will be recorded on cards, given to you by the manager.
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 magnitudes 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(c) 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 4 MHz, 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

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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—a few 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 coordinates. 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(90) = 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.

Plotting a Complete Pattern

To illustrate further, Table 3.1 gives the magnitudes for every 10 degrees from 0 to 360 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.

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

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

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

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

References

**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 G8BY on 144 and 430kHz, as well as many traders and a bring & buy stall. Further details from G1LKE on (0634) 362154.

**February 26:** The 2nd Tow and Torridge Rally will be held in the BAAC Hall, The Pill, Bridgwater 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 GOAYM. Tel: (0808) 23776.

**March 4:** The Blue Star Radio Rally, organised by the Tyneside Amateur Radio Society, will be held at High Gosforth Park, other sites: Newcastle Racecourse. All the usual attractions as well as talk-in. To find out starting time and other details contact Terry G6VEG. Tel: (091) 2646196.

**March 5:** The Bury Radio Society Annual Hamfest 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, Mihams 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.

**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 hangars. 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, GSL Bureau will be there and talk-in will be on S22. Proceeds from this rally go to the Stanley Ekins 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 Holles, Straight Road, Ipswich - between Buxhall Road and Felixstowe Road (now the A1151) 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 G8LSS, 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 G01O09 on (0752) 504955.

**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 A722.12km 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, Wiltshire. This rally is always popular as it offers something for the whole family. More details from the Rally Manager, Shaun O’ Sullivan G6VPG, 15 Wilton Close, Salisbury, Wiltshire SN1 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, (0072) 72554.

**July 30:** Scarborough ARS are holding their annual Rally at the Spa, on the South Sea Front, 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 (0722) 376847.

**August 13:** Hamfest ‘89 will be held at the Flight Refuelling Sports Ground, Wombourne, Wolverhampton. Door 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 GDUN. Tel: (0202) 479038.

**August 13:** The annual Derby Radio Rally will be held once again at the Lower Bemrose School, St Albans Road, Derby with all the usual attractions including the famous Monster Junk Sale. Details from Martin G3SJJ (0332) 556875.

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

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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 later 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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Godfrey Manning G4GLM

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 his flying experiences.

A regular, T.S. Christian (North Walsham, Norfolk) comments on 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 sun number is noted; apparently, h.f. aircraft frequencies such as 11.75, 11.3, 13.2, 13.291 & 13.306 MHz are more likely to find you, I'm told, as a result.

Dave Lawrence G6HXR (Shnolland, 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.

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

Photograph: Dick Gradenorton

Equipment Revisited

Various bits of gear have been mentioned in this column recently and Peter Stonebridge G8ZGA (Ipswich) provides his thoughts on the HP-82 receiver (see "Airband", January 88). It is 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 groundwave receiver. Although it is a bit inflexible and economical (under £10) it allows s.s.b. and, in some instances, even a.c. reception for £30. Mike Huxley (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 station's transmitter is offset from the nominal frequency by up to about 7.5 kHz.

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 IC-F-2001, Air-7 and Pro-80 and the FRC-8800 and the ACR-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 10000 ft 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 10000 ft, the slightly longer, wider one for the thousands and the thin,...
longest one for the hundreds. At 100ft the smallest pointer was obscured by the thousands pointer (both being almost at zero); and at 10100 ft the smallest pointer was now obscured by the hundreds pointer - both pointing to 1. Otherwise, the indications were indistinguishable. In poor visibility and when disoriented the two readings could be confused - whilst actually at 100ft, the pilot behaved as though at 10100ft and stuck 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 Radan 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 (Gotwick), 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 (Gotwick), 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 Cleaxby; 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 to Cesna 172 'Ml from RAF Woodvale, routeing 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 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 (Willingham, 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 G11HD 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 Boginton, 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 him) 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 10-150m "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 Wistone 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.

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

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

Abbreviations

| a.t.c.c. | air traffic control centre |
| a.f.r.s. | automatic terminal information service |
| b.f.o. | beat frequency oscillator |
| f.m. | frequency modulation |
| ft | foot |
| 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 |

*Note: The asterisk (*) represents an editorial note or additional information that is not part of the main text.
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 Townsend 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 M15 and its “Watchers” operating from Euston Tower in central London on 142.5MHz, the US Embassy on 454.075, “Glasspar” and “Proton Control” Special Branch control stations operating on 147.5and 147.85MHz or Regional Crime Squads on 155.7MHz, Customs & Excise on 86.7MHz 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 M15 transmission is on a frequency very close to one used by downlinks 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 950XL.
The new Uniden Bearcat 950XL has been designed for areas where signals from two base stations arrive at about the same signal strength. In such cases, by maintaining the small frequency difference between transmitters, the receiver can detect a low frequency variation in the received signal. In this way, the receiver can be used as a "quasi-sync" operation, particularly if you are outside the intended coverage area where the signal strengths are lower and a receiver, e.g., c.w.limiting circuits cannot mask the variations in signal strength.

The next small band extends from 71.5 MHz to 72.8 MHz. This forms part of the private mobile radio (p.m.r.) "low" band. The allocation is divided into separate channels each one 12.5 kHz wide and is used by mobile stations transmitting to their base stations. The base stations transmit back to the mobiles 13.5 MHz higher in frequency. A gap exists between 72.8 and 76.9 kHz, which is used by an odd mix of services such as the military and aeronautical avigation marker beacons at around 74 MHz.

Frequencies in the band 76.95-78.0 MHz are allocated to p.m.r. for mobile stations in this case paired with base stations 10 MHz higher in frequency. Another gap exists between 78 and 80 MHz, again allocated internationally for military use.

The 80-85 MHz 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 100 MHz. Now that the police and Fire Service are being moved to different frequencies the band is being reallocated and is currently being used by the fire service for mobile transmit paired with 70.5-71.5 MHz. Another small gap exists between 84-85.5 MHz which again is allocated internationally for military use.

Finally, 85-88 MHz is now used for the p.m.r. "low" band base station transmit frequencies. With the exception of a small band between 86.5 to 86.8 MHz 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.f.m. transmissions are used but the band is divided up into 12.5 kHz channels.

The propagation characteristics of frequencies around 80 MHz 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 organizations such as councils, water boards, car breakdown 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 Whiteley 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 frequencies 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 become 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 hered to 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 25 MHz to 500 MHz (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 refer to a group of consecutive frequencies used for a similar purpose. For example the "2 metre amateur band" extends from 144 to 146 MHz and is so called because the frequency expressed in terms of wavelength approximately equals 2 metres. Actually it's...
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Jack Aldridge

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 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 "hilltopping". 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 pack-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 with a compartment in the back or another AA battery compartment again on the rear panel.

I was pleased to see that the instruction manual told you how to charge these batteries without losing 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.d.v. 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.

If 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 gets 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 features 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 is 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...
memories are enabled. I warned you it was going to be a short fault 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 xoo and yyy. On the 800XLT if 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 this button, the 800XLT checks for activity on that channel every three seconds. But, you must make sure you put your priority frequency in channel one 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.

### 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 when you were younger.

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'AY to London.

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 in particular operated 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 annoying 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
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.
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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 valves.

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
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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 aspect of DXing from how to really listen, how to catch the rare ones from the midst of a pile-up to how to secure that elusive QSL. There is plenty of advice on stting, 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.

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Short Wave Magazine March 1999

25
I'm sure that many of you with wide-range communication receivers have come across the problems associated with the reception of I.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 fails 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 at a low frequency 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 feed 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 adapter. 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 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 at a roof peak, as this keeps the antenna as clear as possible from any sources of man-made interference. At i.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 adapter is not critical provided it is of good quality and nominally 50 ohm. I used 6.3mm diameter UR-43, which is not too unsightly and can be obtained at very reasonable prices particularly from radio suppliers.

The next stage was to connect up the power adapter 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. The unit was then mounted on the power adapter. The use of two SO-239 connectors on the adapter 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.

The performance of the ANT-1 was really quite respectable, particularly at the i.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, although 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 i.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.

<table>
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<th>Abbreviations</th>
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<td>d.c.</td>
<td>direct current</td>
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<td>u.h.f.</td>
<td>ultra high frequency</td>
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<td>( \Omega )</td>
<td>ohm</td>
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Short Wave Magazine March 1989

Jamming - All Quiet on the Eastern Front

In the last few months, there have been several reports of reductions 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 this March when the USSR cut back its 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 duly happened. On July 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 about the Islamic Republic of Iran. RAIRome, The Vatican, Voice of Greece and Voice of Turkey is still 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 beamcd into the country from the Voice of Free China, Taiwan.

Some low power jamming continues in both Korea.

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 antenna, 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 call sign of the new station will be WSHB. That stands for the World Service Herald Broadcasting.

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 — Hugo Judd, has been in Singapore.

RNI Gives Up

Now a follow-up concerning the rusty freighter off the coast of Long Island. In October radio equipment on board the ship 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 strategic 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 operators that if they want to broadcast 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, or 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 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 Caledonia 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 McEvoy, 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 organizer 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. The convention is being held July 14-17 at the Dolphin Hotel, 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

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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, but 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 minimum, the IRC will be selling a set of options. The basic price, including everything except the hotel, banquet and flight work out at DM185. Hotels are in the region of DM100 a night. If you choose the hotel booked by the organizers, further information from International Radio Days, World Trade Centre, Boulevard Emile Jocarn 162, 12, 8-1210 Brussels, Belgium. Bookings must be in by the end of April at the latest.

World News and Information Radio

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INTERNATIONAL RADIO LISTENING FIELD

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.

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 "Bangs" has now been formed and included a bulletin to prove it. "Bangs" 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 the unit. 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 "washingline" 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.

SHORT WAVE LISTENING SYSTEM

Cease and desist! The radio!

The radio offers standard a.m., Upper and Lower sidetone, 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 also the number of 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 in the European market will come complete with a database of 156 frequencies already in the radio!

ANARC 1989

P.O. Box 272301
Tampa, Florida 33688 U.S.A.
Telephone (813) 384-2354

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 wider so the signal has to be clear of side-channel interference if you select it. The radio offers fixed stereo, but with 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 also the number of 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 in the European market will come complete with a database of 156 frequencies already in the radio!

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.

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RADIO DENMARK UPDATE

Back in the 60's 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 facilities 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 ultimatum a few weeks ago seems to have had positive results. Jorgen T. Madsen, head of the short wave service of Denmark's 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.

1989

nearer to 2,068,9565 metres but what are a few decimal places between friends? If we now sub-divide the band into regularly 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 five two five megahertz" they can now say "goto channel 5 twenty two" which is much easier to remember, providing all the users agree on the same channel numbering system.

SCANNING

The 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 the usual address PO Box 1000, Eastleigh, Hants SO5 5NB. Until next month - Good listening.
Don’t worry. Sony haven’t stooped to making bogus claims. The companies opposite are all those who stock our shortwave radios. As you can see, the widest range of shortwaves is only available in a narrow range of shops.

This might give you the impression that they’re fairly exclusive. Far from it.

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 ARE JUST 1 OUT OF 131 COMPANIES WHO CLAIM TO HAVE THE WIDEST RANGE OF SHORTWAVE RADIOS.

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.
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.
Brasky Limited, Colchester Sony Centre, 14-16 Culver Street West, Colchester, Essex CO1 1JG.
J. O. R. Gilbert, 35a High Street, Baldock, Herst.
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.
Whomes Centre Limited, 28 The Mall, Broadway Shopping Centre, Bexleyheath, Kent DA6 7JJ.
Whomes Centre Limited, 32 The Mall, High Street, Bromley, Kent BR1 1TR.
Whomes Centre Limited, 84 Eastgate International Shopping Centre, Basildon, Essex SS14 1EX.
Hamilton Electronics Ltd., 35 London Road, Southampton, Hants.
Dawson Radio Ltd., 23 Seamoor Road, Westbourne, Bournemouth, Dorset BH4 9AA.
Tony Reynolds Radio, 12 Lichfield Terrace, Richmond, Surrey.
R. Jones Ltd., 60 High Street, Whilton, Middlesex.
Whistable Teleradio, 75 Biggin Street, Dover, Kent.
Gerald Gile Sony Centre, 37 St. Stephens Street, Norwich, Norfolk NR1 3ON.
R. N. French, 16 Queens Parade, Hastings, East Sussex.
Manns Radio, 52 St. James St, Brighton, East Sussex.
Malcolm Audio & TV Ltd., 12 South Street, Chichester, Sussex PO19 1EH.
South Midlands Communications, SM House, School Close, Chandlers Ford Ind. Estate, Eastleigh, Hants. SO5 3BY.
Barretts of Canterbury, 1 Rose Lane, Canterbury, Kent.
Paul Dogra & Sons, 6 High Street, Slough, Berks.
Allders Dept. Store, Radio & TV Dept., North End, Croydon, Surrey.
Tru-Fi Sound & Vision, 2 Central Parade, London Road, Redhill, Surrey.
Tru-Fi Sound & Vision, 10-12 Grosvenor Road, Aldershot, Hants.
Tru-Fi Sound & Vision, 10 Church Street, Leatherhead, Surrey.
Lyles (Worthing) Ltd., 224 Findon Road, Findon, Worthing, Sussex.
Weybridge Audio, 5/6 Waterloo Terrace, Baker Street, Weybridge, Surrey.

Short Wave Magazine March 1989
Loughton Photographic Limited, Southend Sony Centre, 11 South Church Road, Southend-on-Sea, Essex SS1 2NJ.
Loughton Photographic Limited, Chelmsford Sony Centre, 1-4 West Street, High Chelmer, Chelmsford, Essex CM1 1XS.
Waters & Stanton Electronics, 18/20 Main Road, Hockley, Essex.
Waters & Stanton Electronics, 12 North Street, Hornchurch, Essex.
Merrow Sound, 34 West Street, Horsham Sussex.
Merrow Sound, 45 Commercial Way, Woking, Surrey.
Merrow Sound, 22 Tunsgate, Guildford, Surrey.
Merrow Sound, 5 High Street, Epsom, Surrey.

South West England: Ron Millard, 31 Southgate Street, Bath, Avon BA1 1TP.
Tape Recorder & Hi-Fi Limited, Bristol Sony Centre, 8-10 Bond Street, Broadmead, Bristol BS1 3LU.
Tape Recorder & Hi-Fi Limited, Weston Sony Centre, 4 Waterloo Street, Weston-Super-Mare, Avon.
C. F. Loader, Plymouth Sony Centre, 20 Armanda Centre, Armanda Way, Plymouth, Devon PL1 1LE.
Hickmans Limited, Swindon Sony Centre, 39b Havelock Street, Swindon, Wiltshire SN1 1SD.
J. P. Williams Limited, Exeter Sony Centre, 15 Paris Street, Exeter EX1 2JH.
J. P. Williams Limited, Barnstaple Sony Centre, Holland Walk, Barnstaple, N. Devon EX31 1DW.
Battarbee's Limited, Taunton Sony Centre, County Walk, Taunton, Somerset TA1 3TZ.
Bee-Jay Television Ltd., 22 Clifton Down Shopping Centre, Whiteladies Road, Clifton, Bristol BS8 2NN.
Tom Molland Ltd., 110 Cornwall Street, Plymouth, Devon PL1 1NF.
Visibly Sounder, 100 Union Street, Torquay, Devon.
Moss of Bath, 45 St. James Parade, Bath BA1 1UQ.
Upton Electronics, 31 Torquay Road, Paignton, Devon TQ3 3DT.
Midlands: B.A.T.S. Sony Centre, 160-162 Corporation Street, Birmingham, W. Midlands B4 6TB.
C.T.S., 3 Regent Grove, Leamington spa, Warwickshire CV32 4NN.
C.T.S., 58 Evesham Walk, Kingfisher Centre, Redditch, Worcester B97 4HA.
R. Tilney Limited, Bamford Sony Centre, 77a Abingdon Street, Northampton NN1 2BH.
Stuart Westminster Limited, Derby Sony Centre, 2c Albert Street, Derby DE1 2OD.
Kings Radio (Hereford) Ltd., 35 Widemarsh Street, Hereford HR4 9EA.
Robbs of Gloucester, 15 Worcester Street, Gloucester, Glos. GL1 3AJ.
Witney Audio Centre, 29 High Street, Witney, Oxon.
David Buswell, 5 Talisman Square, Kenilworth, Warwickshire.
Russell Accot, 124 High Street, Oxford, Oxon.
S. May (Leicester) Ltd., 27 Churchgate, Leicester.
Seymour Chemist Limited, 5 High Street, High Wycombe, Bucks. HP11 2AZ.
Fenway TV, 8 Victoria Way, Newmarket, Suffolk.
University Audio, Peas Hill, Cambridge.
Ringway Electronics Limited, Coventry Sony Centre, 73 Lower Precinct, Coventry, West Midlands CV1 1DS.
R. C. Snelling, Bofield, Nk. Norwich.
Hunttons, 8-9 Lower Temple Street, Birmingham B2.
Johnsons Shortwave Centre, 43 Friar Street, Worcester, Worcs.
Ray Withers Communications, International House, 963 Wolverhampton Road, Oldbury, W. Midlands.
Millers Music Centre, Sussex Street, Cambridge, Cambs.

Northern England: E. W. Hewitt Limited, Stockport Sony Centre, 104 Princes Street, Stockport, Cheshire SK1 1RJ.

E. W. Hewitt Limited, Altrincham Sony Centre, 91a George Street, Altrincham, Cheshire, WA11 1RW.
E. W. Hewitt Limited, Warrington Sony Centre, 48 The Mall, Golden Square, Warrington, Lancashire, WA1 1QE.
Peter Bamford Limited, Hull Sony Centre, 42 Paragon Street, Hull, North Humberside HU1 3ND.
Jones of Oakwood Limited, Leeds Sony Centre, 103 Vicar Lane, Leeds LS1 6PU.
Jones of Oakwood Limited, Wakefield Sony Centre, 35 Cross Square, Wakefield, W. Yorks.
Clearfone Ltd., Manchester Sony Centre, 66/68 Bridge St., Manchester, M3 2RG.
W. M. Hewitt, 549 Ecclesall Road, Sheffield.
Lester and Nix Ltd., 11 King Street, Belper.
Williams Electrical Shops, Sheffield Sony Centre, 955 Ecclesall Road, Banner Cross, Sheffield S11 8TY.
CBS Audio Vision Ltd., St. John's Precinct, Liverpool.
Fairbothams, 58 Lower Hillgate, Stockport.
Williams Electrical Shops, Rotherham Sony Centre, 7 Riverside Precinct, Corporation Street, Rotherham S60 1ND.
Whiteleys, Deansgate, Blackpool.
Bell Bros., Bacup Road, Rossendale, Lancs.
J. G. Windows, 1-7 Central Arcade, Newcastle-upon-Tyne.
Goodrights Limited, Preston Sony Centre, 98/100 Fishergate Walk, St. Georges Centre, Preston, Lancs. PR1 2NR.
Fenhams, 119 Granger Street, Newcastle-upon-Tyne.
Lawsons, 7 St. Ann's Staithe, Whitby.
Errics of Bradford Limited, Bradford Sony Centre, 18 Rawson Square, Bradford, W. Yorks, BD1 3JP.
Hadwins, 29-33 Finkle Street, Kendle, Cumbria.
Misons, 11 Warwick Road, Carlisle, Cumbria.
Searle Audio, 229 Rawlinning Street, Barron, Cumbria.

Scotland: Edinburgh Sony Centre, 386 Morningside Road, Edinburgh, Scotland EH10 5HX.
McMichael Bros., 9 Mill Street, Alloa, Clackmannanshire, Scotland FK10 1DT.
Graham Robertson, 5 Fountain Road, Bridge of Allan, Stirlingshire, Scotland FK9 4ET.
Video One, Glasgow Sony Centre, 31 Sauchiehall Street, Glasgow, Scotland G2 5HS.
Connelly Bros., Hi-Fi Limited, 3 Almondvale Centre, Livingston, Midlothian, Scotland EH54 6NB.
Connelly Bros., Hi-Fi Limited, 7 King Street, Kilmarnock, Scotland KA1 1PT.
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Wales: Radiocraft Sonus Ltd., 251 Cowbridge Rd. Estate, Canton, Cardiff CF1 1RT.
Radiocraft Sonus Ltd., 231 High Street, Swansea SA1 1NY.
Tele- Electrical Services, 9 The Brackia Street Centre, Bridgend, Mid. Glamorgan CF31 1DD.

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<table>
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<th>KIT</th>
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If you would like more information on any kit, simply send an SAE, for a copy of our free catalogue and relevant information sheet. Our products are usually in stock ready for mail order despatch, and delivery is normally within 7 days. Credit card sales and technical advice are also available by phone (office hours).

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Another 1920s counterpart to the record-breaking contact had been Barbara Dunn in Stock, Essex, who recorded in her log, "G2SZ calling AEQ 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 four years, enjoying 2LO broadcasts, but an overwhelming '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.I. time signals; after five 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 Lituanica, a Dutch ship of the Baltic-Americaline 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 Lituanica's two stacks. Barbara had heard their signals 2002km west of Essex, and the

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

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

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 OST, it was their first on a.s. and their first QSO.

Other 1927 ships logged were HVM 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 Capt. Sullivan had informed ship's company of receipt of a wireless message from Neptune." The relevant news-cutting, as so often, backed up her log entry. She logged the USS Memphis of the American Navy, and American freighter, XLV, reporting, "worse explosives on board than going down. 20 tons of Navy powder and my mate. Hi", the ice-patrol ship Medoc, NIVD and HMS Kellett, GFA calling GLYK, SS Adventurers. This was a motor yacht which Col. Millard and Rt/L Sturt. 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 Millard. 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, news-cuttings 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 QR5", to the reply, "Parrot's DK and out DK. 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 Cesarwich 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 expedition. The Dorsetshire in read, "GFA Air Ministry London calling PSL 'OSO GDKB (Dorsetshire) calling G6YL me!' thanking me for my reports of reception of GDKB's signs." One month later, GFA asked X263 to wait while he sent, "G6YL de GFA GEMI good evening." The Dorsetshire had made a rough return voyage across the Bay of Biscay, and the final exchange of messages from Southampton Water requested boxes and lorries for the dismantled s.m., and referred to personnel. Ships and operators in nearly every sea and ocean worked G6YL or were heard by her. The MacMillan Antarctic expedition ship, the schooner Bowdoin, WNP, was logged in July, the Canadian Seigneur's operator J. Miller NC28N, called CO from lat. 21 degrees 25 degrees south, long. 12 0 degrees 16 degrees west, in the south Pacific and was entered in the log, FAMP, Lamotte-Bequet, a French battleship was heard transmitting, "Vénus de quatter 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 Djelef Ora, sailing between Marseilles and Oran, the SS Atalanta or the Ascianus, 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 CO" or "XEK4AP, a German aeroplane between Leipsig-Berlin at about 1038km calling CO" and A6L, and RAF station in Melbourne calling LBO at Calshot. In 1931. John R. Witty G5WO, sailed from Las Palmas to Melbourne by way of Capetown on the Ascianus. He took with him his transmitting and receiving equipment for 7 and 14MHz, and Barbara kept an almost
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.

G2YL had a fine grasp of languages, and apart from being a rare YL operator, this gained her coveted DX. Answering F8CDMA on 6.6MHz, she received the reply, "R OK. Bonsoir cher OM. TNX for QSO. QRK ur sigs. DC. QRA Bordeaux", 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. C'estera avec plaisir. Vous parlez tres bon le francais. Moi 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! FBI! Congrats FB YL! Hi! Rok Hippi New Year YL fer all YL! Hi! Naza! Hi! Hvasalt 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.

Part 2

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 call signs, 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 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 35MHz tests had begun and entered the BR S 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 G2Y!! 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 28 MHz between W and G.”

In 1936, sunspot activity was inducing favourable conditions at these high frequencies. On Sunday 20 October, Nell was at her radio equipment early, at 0721, as she was at her radio equipment early, at 0721, as she heard VK6SA call her on 28 MHz. Twenty minutes later, another Australian was heard calling CQ and Nell answered, but the call did not connect. At 0813, VK4KB called CQ and one minute later, Nell went back to him. She replied, and the first Australian contact on 28 MHz was established at 03:39, for both signals. The following Sunday, Nell’s log recorded:

0901. VU2LJ Assam, India QSO no 1588
1038. VK4KB Maryborough, Australia QSO no 1589
1136. CX1CG Montevideo, Uruguay QSO no 1590
1412. F4BCR Alijer QSO no 1592
1521. W4AP West Palm Beach, Florida QSO no 1593

She had contacted the whole world, represented by 6 continents, on the “useless” 28 MHz band, she had done it in consecutive calls and in only 6hrs 32mins. The world’s press celebrated her great achievement and wireless experts forecast world-wide communication on wavelengths of 56 MHz 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 56 MHz wavelength.”

John Clarcoats, secretary of the RSGB went even further and said, “Then will come 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 21.4-155 MHz, 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 33.3 MHz dish antenna and confirm Jansky’s discovery was Grote Reber W9GFZ. His initial investigations in 1937 were at 3 GHz, but receiver sensitivity at that time caused problems, and he found 1 GHz a better working frequency. The large parabolic reflector which he eventually built worked in the 1150 MHz 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 28-56 MHz callsign, particularly interested in propagation conditions. He observed that reception of the Berlin television transmitter on 42.8 MHz 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. G6DH found that Nelly Corry G2YL, G6CJ and BRSZ 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 William 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.”

Senator Guglielmo Marconi GCVO, Honorary Member.

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

Some of the broadcasters and presenters on Radio Australia.

Photos: Australian Post Office.
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 decrease in the 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 meter was used in some sets, but in others a normal meter was 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 insensitive 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 in the receiver. 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 predetermined value laid down in the specifications by the receiver manufacturer, e.g. so that the meter reads 59 when 50 microamperes are applied to the antenna terminals at 14.300MHz.

**Other Circuits**

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 is in the collector circuit of the meter amplifier (Tr1) and is shunted by a preset resistor (R5) so that the meter sensitivity may be adjusted. The preset 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 sensitive meter and adjusting the bias, it becomes possible to tune to the weakest signals.

---

**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, somewhat musical.
5. Musically modulated note.
6. Modulated note, slight trace of whistles.
7. Near d.c. note, smooth ripple.
8. Good d.c. note, just a trace of ripple.

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**Table 1.**

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</thead>
<tbody>
<tr>
<td>1</td>
<td>Unreadable</td>
</tr>
<tr>
<td>2</td>
<td>Barely readable, some words</td>
</tr>
<tr>
<td>3</td>
<td>Readable with considerable</td>
</tr>
<tr>
<td>4</td>
<td>Readable with practically no</td>
</tr>
<tr>
<td>5</td>
<td>Perfectly readable</td>
</tr>
</tbody>
</table>

---

**Fig.1.**

[Diagram of Wheatstone bridge circuit]

**Fig.2.**

[Diagram of transistor voltmeter circuit]
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 above 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 '86 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 unknown, 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.

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 to 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.

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 (95), extremely strong c.w. signal (S9) of pure tone (19) would be sent as RST 99. 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 potential telephony signal might rate as "5 and 9 plus 10 dB", 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 £26 (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.

Table 2

<table>
<thead>
<tr>
<th>Signal strength</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Barely audible</td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

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
- f.t. frequency
- S signal strength
- s.s.b. single sideband

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, Enelco house, The Quay, Poole, Dorset BH15 1PP. Prices of p.c.b.s include VAT and P&P.

Back Numbers and Binders

Limited stocks of most issues of SWM for the past ten years are available at £1.50 each including P&P to addresses at home and overseas (by surface mail). Binders, each taking one volume of the new style SWM, are available price £3.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where applicable.

Orders for p.c.b.s, back numbers, binders and items from our Book service should be sent to PW Publishing Ltd., FREEPOST, Post Sales Department, Enelco House, The Quay, Poole, Dorset BH15 1PP, with details of your credit card or cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole (0202) 678558. An answering machine will accept your order out of office hours.
Why do amateurs take longer than listeners to reach the one hundred call sign DXCC? Perhaps some amateurs are about level-pulling when it comes to scoring a maximum? This question has been asked and answered recently and took a bit of thinking about.

Basically, only about half of the countries on the current DXCC list (and band) is worked by many DXers and the Russian equivalents are for all practical purposes in agreement with DXCC are in fact real countries, even 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 organizes a DXpedition to that spot. Some are only available at low tidal. 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, the s.w.l. can shift off and listen for his second one. That being said, the Spratlys are considered 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. trying to rack up the 100 countries target is rather easier. However, that's all a question of populations countries, with a resident, active amateur population. However, no one with less than twenty years experience, no matter where, has ever been genuine! However, giving it the benefit of the doubt, it remains the case. Strangely, the Spratlys, Willis and other places have been put on the radio map once or twice only since WWII others mainly in Africa which one could just as easily get, if not even totally silent and hence not hearable.

If we consider the longer view, from World War II to the present, 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 SH3 and Zanzubur 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常规 regime, have therefore counted two countries rather than one. This accounts for the fact that while the current DXCC list contains about 320 countries, the All-Time Past WWII listing, shows about 360. It follows that the chaps with 100 per cent scores — there are one or two — have not been DXpeditioning a genuine DX band first opened up after WWII.

What about the influence of antenna? 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 Equinix, even on a built-in whip, provided the user chooses his bands and times to suit. However, the transmitter then has to show off quite serious effort to crack his pile-up which takes time, while the inexperienced or unenlightened s.w.l. may well enter the DX zone hoping to get his log when in fact he has only heard somebody in the pile-up calling the DXI QSL. For the SWM awards for s.w.l. the Rules are repeated elsewhere in this Issue.

Letters
Many of you will have read GB75QH; this says, GM0DEX, was on from Dunnet Head throughout December, mainly on 14MHz. It finished up with nearly 3000 cards on 100 stations and the DXCC by 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.

OH9SCS 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 very convincing.

Events were wound up in a fine way by an Aurora manifestation; BPSM was heard in Barbados with a TS9 signal, while the Lowlands of Belgium all were him all all showing the characteristic Auroral raps — this one on 14MHz. I was only too pleased to hear a station up in Alert; his phonetics for RCS varied between Real Cool Side and Real Cool Station; far 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 Vietnamese station was closed, but the boys were so physically exhausted, not to mention financially, 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 the most efficiently run in the world; but of course, having been notified them they will get some letter of magnitude of the DX station's QSL problems. No wonder they ask for an s.s.b. or IRC.

Perry Stevens (Bridgewater) 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 hadn't looked back! For the last shot, W301DW K7PSVE VE30CP WAZ3RO W18SM W1EHM VE8CRG NE0 J6HKEA J93BOT not to mention stacks of QSL cards. However, what they says he expects to be at Ascension for three years! Now, just think of the time and money put into working out 20 000 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.s.b. or IRC.

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. This is 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 hears from it. If he knows what he is working, he might give his own address in which case you know enough; but he might not want to give his QSL Bureau address, or even say QSL via some callsign or other. Now, the bureau system is operated in 35 parts, so you either send a card direct to that country's bureau address, or more preferably, belong to a Society that operate a QSL Bureau. In this country that means either ISV or RSGB. Taking RSGB for example, you join RSGB (Lamberts 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 your membership is renewed — you will be sent to your QSL manager. Your outgoing QSLs must go to the outgoing bureau address which is c/o E Allen, G3ORN. Put them in alphabetical order to make life easier for Ted to sort; remember, the bureau chair 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, that his modulation sounded a mite breathy, or you can plot his signal strength variations over several days and operate genial the best like you are there with a chance. Most direct QSLers enclose something to cover the postage, regardless of the QSLs. terminals included in a s.s.b. be as otherwise. However, as course its not worth sending an s.s.b. with a British stamp since you will have to buy a stamp or coin to a shop stop and buy mint Russian stamps of the right standard value the value of the IRC or International Reply Coupons, one of the advantages of surface mail post from any country in the Postal Union. So, three IRCs should cover the postage; they are a lot cheaper.

Don't forget, though, that in many Third World countries, local people will have humbled that envelopes a call for writing in them contain money or IRCs, so a proportion (or even the lot) may be lost.

Now, as to names and addresses. For UK stations, the RSGB Call Book is the standard, (of course see the advertisement for the QSL Bureau) and is pretty reliable, as it is prepared from the DTT listings. For the rest of the world, the QSL Bureau Inc.'s two volumes in the QSL Inc.'s two volumes cover USA, one volume covers the rest of the world. Standard QSL Bureau of course, this is a very expensive joke — for example it shows that I have ordered 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 only the way to get to 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 and sends it to the s.s.b. 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 direct with s.s.b. and a "donation" as well. Thankfully, the QSL Bureau is into the second or three. However, as between these, I already have 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.

Paul Essery GW3KFE

PO Box 4, Newtown, Powys SY16 1ZZ

SEEN & HEARD
Reader's Letters

John Plowman has recently set himself up as a software interface with which change multimode decoding system aimed 16K ROM. This represents a include his BBC. Using this it enables you to remember a 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. Moves produce an active antenna kit at a very reasonable price.

Another newcomer to this side of the hobby is Ken Whyman who has a Panasonic RF2200 receiver covering 3.5MHz to 28MHz. He is led by a 10m sloping dipole. Ken’s interest has been aroused partly by this column and partly because he has just bought a Sinclair Spectrum +2 which lies ideal 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, J&P Electronics+ or Pearson Computing for a range of decoding software.

John Dimond (South Africa) has been a keen operator since 2000 receiver with a Tono 350 decoder, though lately he has been using the RX4 computer programme in conjunction with his BBC-B computer with an extensive library. For FAX reception he uses David Bird’s decoder again with his BBC-B. The other accessories in use include two Marconi QSLs, a Tonic Tuner and a Tonic Tuner indicator. The antennas are a 30m long wire and a 5m vertical.

My thanks to all readers for their valuable contributions.

New Equipment

Richard Wilcox of Technical Software+ 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 RX4000 seems to be very well thought out with 4-pole filtering for the narrow shift modes and a unique keying system. This allows the operator to compensate for coarse tuning steps on the receiver by fine tuning the filters in the interface from the receiver at the same time.

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 and print a complete picture has been received.

Now to the modes available which are: FAX — weather and press most standard charts and included is an indicator picture inversion; Packet – v.f. and f.h. at 1200 and 300 baud; SSTV — includes colour and analogue; TOR — 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 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 tape showing some of the modes the RX-99 can handle. If you already own either an RX-4 system or a TIF1102 Transact 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 to their printer. Last month we heard a few details about a program J&P produce that can help. It’s called “Dedicated Mode” and if you drop the operator 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 between these two, both can be used to decode both modes. The essential part of the name is TOR which stands for Amateur 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 to have the receiving station to retransmit the information back to the source for comparison with the original. This would obviously 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 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 corrupted 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 ‘chip-chip’ 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 little 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 would have probably guessed we sent the lists out in a bit of a hurry and there were a quite a few duplicated station (50 so 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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This is the ultimate listening system for the serious listener with a BBC computer.
We can’t begin to list all the features here so send for full information about it and all our other products.
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**INFO IN ORBIT**

**Pat Gowen G3IOR**

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

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**SEEN & HEARD**

along with your name and address and I'll do the rest. No s.a.e.s needed now.

**What to Listen For**

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

5.833MHz, RTTY, 50/2, 5AF, Triopo II, 2227.

8.033MHz, RTTY, 100/170, Y7A29, UK.


8.083MHz, RTTY, 50/2, RAW7, Khabarovsk, Metro, 2138.

8.622MHz, CW, 7/7, PCH41, Scheveningen, radio, 1750.

8.646MHz, CW, 7/7, DJH59, Wilhelmshaven, German Navy, 1755.

10.15MHz, RTTY, 50/170, 3MA22/26/3, OMA Taiwan, 1425.

12.265MHz, RTTY, 75/7, BZR62, XINHUA Beijing, 1550.

15.95MHz, FAX, 7/7, 7, Moscow Metro, 1130.

16.517MHz, AMQ, 100/170, 7, MFA Cairo, 1135.

20.533MHz, RTTY, 50/7, 7, Jamahiriya News Tripoli.

20.735MHz, CW, 7/7, DAM, Norddeich TS, 1110.

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**GKR**

Vick Radio BTI Radio Station

Call: GKR (Girl Rocks)

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**Centres of Excellence for Maritime Communications**

Fig. 2: QSL received by John Dimond.

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**MIR Operations**

Whilst the 143.625MHz f.m. voice communication channel has been active for ever, the same is not true for the amateur radio communications experiment on 145.500MHz. The burst of weekend activity that preceded the return to earth of Commanauts Vladimir Titov U1MIR and Musa Nanaroy 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 Labuin UA3CR, in a telephone conversation on New Years Day, was exploring the future operations from MIR, the information for 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-UK 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 Drift Data telemetry emanating from UoSAT-205/5CW-11 will be as follows:

Sundays: Channels 2 and 61.

Mondays: Channels 1, 2 and 31.

Tuesdays: Channel 19.

Wednesdays: Channels 17, 18, 19 and 21.

Thursdays: Channels 1, 2, 3 and 61.

Fridays: Channels 0, 10, 20 and 30.

Satundays: 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 145.625MHz downlink to feed into a suitable programmed computer.

A suitable modem is available through the offices of AMSAT-UK, and is a unit into which the audio output of the receiver set to the 145.625MHz 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 name to the secretary of AMSAT-UK, Ron Broadsmith G3AGJ, 9 Herongate Road, Wanstead Park, London E12 5EO. Alternatively you may telephone him on 01-989-7641 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 (40K) computer, a number of programs to decipher both OSCAR-8 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 Fig. 1.
Investigation as a tabular graphed display, so allowing you to see the findings of the listed signals when the satellite is out of your radio range. For details and price, send a s.a.e. to Roger Barker, 79 South Parade, Boston, Lincs PE21 7PN, or telephone him on Boston 6364A.

As can be seen from the pictures taken from space by the on-board CCD camera, then "SPX" is the program named for. For seeing the telemetry displayed on its face, the status, the weekly updated news bulletin, the latest sets of Keplarian elements, the on-board satellite 29MHz schedule, etc., then "sidid" is the program you need. These are available from G4HLM, The Old Vicarage, Haxey, N. T. P. Taylor, 87 Hunters Field, Stamford in the Vale, Faringdon, Oxon SN7 8ED 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, and has been plugged into the life cycle, but is expected to last out a further two years before it enters earth's atmosphere to burn up.

Commercial development has been the good audibility of three of the phase coherent h.f. beacons on Oscar 9. The satellite was commanded to extend it's gravity gradient boom soon after post-launch shakedown, and although it is thought that the extending boom snagged in the wiring, as despite numerous attempts, no emergence resulted. This long boom is now in storage, the 21MHz beacon was 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 considered. As an unexpected boom emergence, the decay lowering of the satellites orbital height to below the density peak of the natural ionised layers, the closer proximity effect upon the inverse square low damping law, or some other effect, none of which theories are thought likely. Whatever the cause, the result is quite fascinating, as the properties 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 reflecting and refracting 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, with plus or minus five minutes of accuracy. The appearance and disappearance of the 145.825MHz will supply the date and time of signal 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 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, 0285, and so on, ending with the call "AMSAT" before it returns to plain carrier. The doppler shift, which also varies considerably in a rotational 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 70.050MHz also, as a further beacon is listed here, though as not so positively identified.

Whilst 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 northern 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 northern 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.

A Beijing 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 of the evening pass of February 26. The print out reads UTC time in hours, minutes and seconds, then satellite azimuth and elevation for range, and finally doppler offset to 145.825MHz kHz.

Reports on reception, findings, experimental operation and further detail on 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 Sussex, Falmer, East Sussex, BN1 9QH. You will receive acknowledgement both as a GSL 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 "microsat" under development. Whereas UoSAT 1 and 2 operate in relatively benign near-polar synchronous low earth orbit, gravity gradient stabilised with a slow spin, giving low thermal gradients, the new box is 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 Desku 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 real receive capability. Commencing on Saturday February 26 at 1500UTC, at the same initial given downlink referente to that of the 145.812MHz beacon, the uplink power will serially decrease until it reaches that giving a downlink power level decreasing to -24dBm, Please listen for the beacon. This is the level of uplink power that would be achieved if one had not used a hand held portable microwave whip antenna, and yet was heard well by several participants, Which can 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 availability of the test to Andy Maclalster W2SB, 1417 Knights way, 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 those who are 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 stream of educational information net satellite activities. It commences with SSTV for the first ten minutes, which then goes into a system "envelope" net on 14.560MHz, leaving the Space Education Net to continue on 145.960MHz. The net only stops when someone currently available will have passed by the time you read this, 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 weather bulletins from 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 137.625MHz, pictures are impossible to synchronise. "I first logged problems with NOAA-9 on November 31st last year, and things have rapidly got worse," writes Lawrence. "NOAA-10 and 11 continue normally, on 137.620 and 137.600MHz respectively. Although NOAA-9's 11 and 9 share a common frequency, NOAA-11 isn't on passageways for the day, so there is no mutual interference problem. Lawrence reports that the allinging NOAA-Scan be heard by ear to be faulty.

He reports that Meteor-2/16 on 137.40MHz and Meteor-2/17 on 137.33 are on when they are over ground that is in nearly full solar illumination, but that he has not heard the Chinese Fen Yu satellite during the past few weeks, and has to assume it is now switched off.

Lawrence finds that the oceanographic research satellites Okean-1 and Kosmos-1766 have been both transmitting on 137.4MHz (the same frequency as Meteor-2/16) almost daily as pictures as they cross Norway and Sweden passing southbound. "One can see it as a hand held microwave whip, and play it back at a later time with perfect synchronisation," he writes. "Unlike the Meteors, both satellites use a clock so that they do not continue, During December Okean started a series of daily transmissions using different frequencies from it's on-board microwave sounder, sideways looking radar and visible light images. 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 February 17 and from June 1760. Late at night Okean transmitted a picture containing half a screen width of radar and a microwave radar image. The quality was outstanding, and continues to be so. I have managed to pull out data from 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, I want to know what 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 telely 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 images from Okean-1 and Kosmos-1766 and other satellite information and details of enthusiasts stations are always welcome. Lawrence asks for feedback on things heard as well as hints and tips on the hobby.
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VISA — VISA AND ACCESS WELCOME —
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 heat and natural energy. It is well known that the complex rays from this variable star has influence on 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 frequencies 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 can 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.

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. 47-70), and says the DX will come, sooner or later, when conditions are right.

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 30.5 in — 1032mb) increased 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 Wierenga's (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 IR stations from Bedfordshire, Devonshire, Rington 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 transmissions he heard were BBC Radio 3 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 IRL haul includes

### TELEVISION

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.

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

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

**SEEN & HEARD**

**BAND II DX**

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

![Fig. 1](image1)

**Fig. 1**

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.

**Radio Handbook 1989**

Ron Ham
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**Fig. 2**

Radio Broadland, Chiltern R., Red Dragon R., R. 210, County Sound, Ocean Sound and Severn Sound.

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**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**
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 Philips 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 fires 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 “dujina stazo” means length of track.

Band I

Although Band I openings are few during the winter months, Bob Brooks (Great Sutton) found test-signal from Austria (ORF-FS1) on December 20, Czechoslovakia (RS-KH) on the 21st and (Prague) on the 28th; Norway (TVE), 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 (Romanian) 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 Ch. E2,3 and 4. He 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 3SR) 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 (59.25 MHz) and
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**Short Wave Magazine March 1989**
a number of pictures flashed in briefly. Most likely caused by the Quadrantids meteor shower David, to keep an eye open for similar activity during the Lyrids on April 22.

Simon He (New Radiot) also received "pings" of pictures, via m.s., from Czechoslovakia, Poland and Sweden on December 14. He also saw Telestarlo (news) and Upasraa Downstream 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 (Gregis St and Gulen) and Sweden (SVT) on the 9th and saw the SPERM (ews) ident from the USSR on the 10th.

Edwina and Tony Mancini (Belpo) 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 ARD2DF and SWF:RB; the Norwegian regionals Bremanger, Kongsberg and Melhus; cookery from Spain; ice hockey and skiing from Chs. R1/2 - most likely from the USSR and testcards from Ireland (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 the evenings of December 2 and 20, between 0730 and 1000 on November 4 and 5, and again on the 10th and at midnight on the 11th. For the period 13 to 28 he reported mainly Marlboro TV and 1700 and 2230, Malaysian TV with F2 type pictures could be seen regularly. At times pictures were very poor and received.

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 11, 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. Amongst the clearer pictures that appeared, sometimes in colour, was a commercial, Fig. 111, at 2050 on the 10th and a news reader, Fig. 12, at 1656 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, seemingly caused by weak 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 TV. His later research gave two possibilities, the 2kw transmitter at Pencuil near Edinburgh, or the 10kw station at Rosneath in the Glasgow area.

David Glenden noted strange happenings at the new year height 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 2139 "Jeu" FR capstone appeared imposed on Ch. 4 from Chatton (Ch. 4). 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-channeling, 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 Brabwil, 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 u.h.f. and v.h.f. haul on the 3rd included test-cards and programmes from Belgium (BRT and RTB), France (TDF and Canal +), East and West Germany (DFR and ARD), Holland (Ned 1/2), Ireland (RT1 and 2, "the latter is now called Nevronk 2" said Simon) and Luxembourg (RTL1 +). Among the various programmes seen by the Mancini's on Canal + were cartoons and the film Psycho.

Long Wave DX

Note: I.w. & m.w. frequencies in kHz, s.w. in MHz, Time in UTC (= GMT) Several of the I.w. stations in the monitored and identified by UK were heard for the first time by Tim Shirley (Bristol) during the early hours of the morning. These 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 Kalingrad 171 (1000kWs) as 142 during daylight and 243 after dark. In contrast, Moscow 263 (2000kw) fell from 244 during daylight to 132 after dark. Kalingrad is about 1210km from Storrington and Moscow is about 2172km away so the effect was unexpected. While visiting Lytham St. Ann's, Neil Wheatley (Newcastle-upon-Tyne) checked the band during daylight and after dark. Eight stations were heard during daylight, the most distant being Kalingrad, some 3320km away. Four additional stations were noted after dark, the most distant being Azal, Morocco 231 (800kWs), about 16800km away.

In London, Phil Townsend has been comparing his dismounted radio car phone radio with a rotating headhome with that of his Panasonic RF 1680L portable. Although many signal strengths recorded at different points 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 a Norwegian testcard over Drottwich 190 (400kW) and heard Molata, Sweden 198 (300kW).

MW Transatlantic DX

Up in Wakefield, Mark Thompson has been observing Transatlantic DXing and heard the broadcasts from CJYQ in St. Johns, Newfoundland 930 at 2320. He used a 0.85m loop with a Saloo SW 5000 receiver and rated them as SIQ. Lower in the band he heard CQYO in Grand Falls NF980, 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. He also heard WINS in New York, 1010. Roy uses a Lowe HF 125 receiver with an a.t.s. and a random wire antenna in the garden. Tim Shirley noted good signals from CJYO 930 around 2300 on several different mornings. He had a spot open after the BBC via another station to his list: WWVQ in Birmingham, AL 690.

Writing from Grimbsy, Jim Willett found conditions rather poor at times, but he did log three stations he's not heard for quite some time: WNYZ Portland, MA 970; WLBL New York, 1190 and WGEN Endicott, NY 1430. All logged between 0415 and 0436 and rated as 211.

Other MW DX

A welcome first report from Switzerland was sent by Martin Ferdy in Zurich. Using a JRC 4060 receiver with a Distong AD370 active antenna, he has heard two of the BBC domestic services between 0700 and 2300.

The next deadlines are: March, 13 April 17 and May 15.
An oblong loop antenna measuring 760 x 490mm has been built by George Milmore in Wotton, IOW. The main winding is 8 turns of 26 swg enamelled wire. The coupling to an EF86 valve pre-amplifier is formed by winding the loop on either side of the main winding and connecting them in series. Using the loop ahead of his Racial RA7-17 receiver, George noted good performance across the whole band and logged many interesting stations.

**MW Local Radio DX**

No sooner had the new BBC Wiltshire and Worcester local radio station welcome reports from listeners both inside and out of their planned service area. 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 day 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 our QSL.

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

Writing from Leeds, Chris Sylvestre says he was interested to read about m.w. DX conditions around the Cat and Fiddle Inn near Buxton. When visiting the area in 1976 he 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 unlicensed stations in S. Ireland have enabled some DXers in the UK to log additional stations. During a visit to Lytham St. Annes, Neil Wheatcroft could hear several stations which were unable during a previous visit. Ian Bond (Wirral) added several stations to his list.

Mark Thompson (Edinburgh) tells me that he especially enjoys local radio DXing. He concentrates on the faint signals underneath the most powerful transmissions and spends several hours monitoring one frequency to get a positive image. He uses a home built 0.85m loop with his Sasho SW5000 receiver.

A modified version of the “Scoper 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; Nor to Africa 1000-1045 & 1200-1250; BBC via Debtac 25.750 (Eng to Africa, Asia 1100-1515); Radio RSA, Johannesburg 25.790 (Eng to UK, S. Africa 1400-1655; BBC Paris, France 25.825 (Fr to Africa 0900-1545) and Radio Denmark, Copenhagen 25.850 (Den 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, RNE, BBC and Radio Denmark are all potent signals in the target areas, but UK listeners should not expect to receive these transmissions clearly. We will reach us by back scatter and other modes. Rapid flutter fading and echo phenomena were frequently mentioned in the reports from UK listeners.

Many very potent signals have been reaching the UK in the 21MHz (12m) band and reception of broadcasts intended for Europe have been good. From time to time however, high levels of background 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: Russian Japan via Mozayki 21.695 (Eng, Jap 0700-0830) 24443 at 0703 by Kenneth Reece using a JRC NR525 receiver and a loop type antenna at Penton; Voice of Iraq, Abu Dhabi 21.730 (Ar 0700-1600) 44343 at 1100 by Kenneth Buck in Edinburgh; Radio Dubai: 21.605 (Ar, Eng 0615-1400) 44333 at 1030 by Sheila Thompson using a Sony ICF 7600US portable in Morden; Voice of Israel, Jerusalem 21.625 (Russ, Eng 0800-1130) 44344 at 1122 by David Nash, using a Tri 560 receiver plus 22m inverted Vee trap dipole in Wallis; Radio RSA, Johannesburg 21.500 (Fr, Eng 1100-1600) 44343 at 1440 by Mark Selby in Aldershot; Radio Japan via Moyal 21.700 (Eng 1500-1700) 44344 at 1505 by John Nash; WYFR via Okechobee 21.615 (Eng, Ger, It 1600-1900) 55534 at 1700 by Neil Dove in Lockerbie.

Broadcasts to other areas logged were: Radio Moscow, UUSR 21.680 (Eng to E Africa 0600-1500) 55433 at 0803 by Leo Barr using a Matsui MR 4088 portable in Sunderland; Radio DW via Kigali 21.650 (Eng to S Africa 0900-0950) 25333 at 0935 by David Wrenn using a Tri R2000 receiver plus 30m wire antenna in Cambridge; Radio Sweden, Stockholm 21.610 (Fr, Sw to SE Asia, Australia 1000-1100) 4444 at 1015 by Philip Rambaut in Macclesfield. Radio Austria, Vienna 21.490 (Ger, Sp, Fr to W Africa 1300-1700) 44340 at 1200 by Peter Hall using an Edystone 940 receiver with a dipole antenna in Chichester; WNSN Scottis Com, Arne 21.640 (Eng, Fr, Ger to Africa 1600-1700) 44344 at 1600 by Ken Whayman using a Saisho SW 2000 portable with built-in whip antenna in Delft. Radio DW via Cylops, Malta 21.680 (Ur, Hi, Eng to S Asia 1430-1650) 44353 at 1615 by Leslie Hollis using a Yaesu FGR-7 receiver plus 26m Windom antenna in Grantham; Radio 51.
Nederlands via Bonaira, Ned. Antillies 21.685 (Eng, Fr. Oo w. to 2100-2125, 5232 at 1834 by Richard Reed/Reddywlns with a Sangees ATS-803A and 3m wire antenna in Sint Maarten.

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 7.8kHz transmission has been audible here around 0530 some mornings. Considerable variations in the signal were noted by Kenneth Reece, he reported them to have dropped to 3433 at 0520, but it was completely inaudible other mornings. If you have your broadcasts and decide to send them a reception report, please note that RNZ request three IRCs if you receive one of their QSL cards.

The propagation conditions have also favored Radio Australia via Camaron 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 a stable condition for prevented reception on a number of occasions.

Broadcasts targeted to areas outside the 17MHz zone were logged in the UK. They stemmed from KYO Sanai, N. Mariana Islands 17.780 (Eng to E. Asia 0200-0800) 24345 at 0705 by David Wattren; Radio ILW, Djibouti 017.780 (Eng to E. Asia 0900-0950) 33333 at 0945 by David Minter in Portland; VOA, Donetsk 17.480 (Fr, Eng, Port to Africa 1100-1220) 33333 at 1120 by Sheila Hughes; BBC via Singapore 17.885 (Eng to E. Africa 0900-1400) 22445 at 1245 by Les Cook; Radio TPI, Djibouti 17.595 (Eng, Fr to N. Africa 1400-1700) logged at 1430 by John Sadler in Bishops Stortford; RTM Tanzania, 17.815 (Eng, Fri to N. Africa 1700-1900) 53317 at 1715 by Alan Smith in Northampton; VOA via Vivian 17.785 (Eng to W. Africa 1600-2200) 44444 at 1730 by Ken Whayman; Radio Nederland via Bonaire 17.650 (Eng, Fr, Du to W. Africa 1830-2125) 44444 at 1833 by Richard Reed/Reddywlns; KVOH Los Angeles, USA 17.775 (Sp, Eng to C. America 1300-1600) 35444 at 1910 by Neil Dove; RCI via Sackville 17.820 (Fr) logged at 1800 by Mike Nunn.

Reports also mentioned broadcasts aimed towards Europe during the day: "UAE Radio Dubai 17.755 (Ar, Eng 0615-1500) 33333 at 1030 by Kenneth Buck; Radio Moscow, USSR 17.810 (Eng 0300-1400) 44444 at 0300 by Francis Hermee in llerfor, Radio Pakistan, Islamabad 17.660 (Ur, Eng 0700-1200) at 1105 by John Nash; VOA, Colombia 17.575 (Eng, Fr 1100-1200) 44444 at 1110 by David Wattren; Radio RSA, Johannesburg 17.425 (Eng 1800-1900) 34444 at 1900 by Darren Taplin, using an Edysto 600S antenna with 800W CW wire antenna in Tunbridge Wells.

Long distance paths have been open in the 17MHz band and many interesting signals have been logged. Solar activity (flares) has disrupted reception from time to time during the monitoring, 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 24422 rating noted at 2112 by Neil Hall is typical. Their transmissions to S. Asia via Camaron 15.415 (Eng 0900-1100) have been audible in the UK, rated at 23333 at 0952 by David Wattren.

Broadcasts from Radio New Zealand via Wellington are in parallel with their transmissions in the 16m band. Listening at 0525, Simon Summerfield reported his DX catch of 15.160 (Eng 2345-0730) with his Grundig 1400S portable. Kenneth Reece has monitored their frequencies during the early mornings and noted considerable variations in reception on a number of occasions, but at times it peaked 23422 around 0630.

The following interesting DXers are operating at 17MHz to European listeners include Radio Japan via Yamata 15.325 (Russ, Sw, Ger, Fr, Eng, Japan 0000-0045) 33333 at 0045 by Shane Waters; UAR Radio, England 15.435 (Ar, Eng 0815-1545) 33333 at 1545 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 15.655 (Sp, Ar, Eng 1600-2145) 33333 at 1800 by Kenneth Buck; RBNB Brasil, Brazil 15.265 (Eng, Ger 1800-1950) logged at 1832 by Ron Penney; home built two transistor receiver in Bulgaria; WRNO New Orleans, USA 15.420 (Eng 1700-2100) 33333 at 1700 by Neil Dove; Radio Kerk, Flanders 14.270 (Eng, Fr, Ger 1700-2100) 33333 at 2100 by Neil Dove; Radio via Bonaire, Ned. Antillies 13.125 (Eng, Fr, Ger, Hung 1900-2200) via Broadland, Devon 14.370 (Eng, Fr, Ger 1900-2200) 33333 at 2100 by Sheila Hughes.

Broadcasts to other areas were reported via low level signals and they stemmed from Radio Japan via Yamata 15.270 (Eng, Japan to Australia 0500-1000) 33333 at 0536 by Kenneth Reece; Radio Yugoslavia.

...
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Radio Denmark, Copenhagen 15.165
(Dan to N. USA 1730-1830 44444 at 1730 by Alan Carr, using an Icon R70 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 Morrovia 14545 (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 R100 receiver in Buckley; 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 RRI via Leipzig 13.610 (Port, Ger, Fr, 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 Rambutt; Radio Nederlands via Pico 17.700 (Eng to S. Asia, Middle East 1430-1525) heard at 1500 by John Sadler; WYFR via Okcheeboe 13695 (Eng, Fr to S. America, Middle East at 1507 by David Wratten; Radio Prague, Czechoslovakia 13.715 (Eng, Cz, Ar, Fr to S. Asia, Middle East at 2215) 456 at 1610 by Kenneth Buck; Radio Vlundus via Komoroslnd 13.645 (Eng, Fr to W. USA 2000-0330) 2332 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 (Eng, Fr, Sp 0700-1000) P3000 at 1245 by Peter Hall; WCSS Scots Corner, Maine 13.760 (Eng, Fr, Ger 1400-1555) 5344 at 1430 by John Nash; also WHRL South Bend, USA 13.760 (Eng 1500-2100) 34333 at 1832 by Andrea Westmore.

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 Rambutt, picked up their transmission via Carnarvon 11.765 (Cnz to C. Asia 1100-1400) at 1201 noted 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 week from the Voices of America were the 1015 to Jerusalem 11.585 (Heb, Russ, Yid, Lad, Eng, Fr 1100-2300) SIO 433 at 1100 by Martin Cottle, Moscow 11.585 (Eng, Fr, Ger 1600-1700) 45554 at 1200 by Peter Hall; WCSS Scots Corner, Maine 13.760 (Eng, Fr, Ger 1400-1555) 5344 at 1430 by John Nash; also WHRL South Bend, USA 13.760 (Eng 1500-2100) 34333 at 1832 by Andrea Westmore.
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C. Asia 0900-1500) 43333 at 1130 by Robert Coverell using a Hammarlund HQ 180X receiver in Blackwood; VOA via Poro 7.115 (Eng, Ind to Australia, SE Asia 1100-1430) 43532 at 1240 by Leslie Holmes; Al in_eq, Guam 11.980 (Chin to S. Asia 1600-1700) SIO 333 at 1645 by Alan Smith; Vaticna Radio, Rome 11.700 (It, Fr, Sp, Port to Africa 0900-2100) heard at 1940 by John Sadler; RHC Havana, Cuba 11.950 (Ar, Sp, Fr to Africa 1630-2000) 35433 by 2040 by Neil Dover; AIR via Delhi 7.115 (Eng to Australia 2045-2230) 25225 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 sometimes the UK. Noted in the reports were 9.645 via Darwin (Eng, Ind to SE Asia 0900-1200) 23322 at 0856 by Kenneth Reece; 9.555 via Shepparton (Eng to S. Pacific 0700-1000) 34443 at 0909 by David Edwardson; 9.770 via Shepparton (Eng to Australia 1000-1100) 34333 at 1000 by David Wratten; 9.580 via Shepparton (Eng to Australia 1200-1500) 2111 at 1221 by Philip Ramsbott, 9.770 via Carnarvon (Eng to SE Asia, SE 1100-1300) 34544 at 1200 by Tim Monks; 0.702 via Scotts Rd (Eng to Egypt 0830-1100) 93432 at 1045 by Edward Robertson, AIR via S. Asia, W. Pacific 2000-2130) 23420 as 2002 by Leslie Hollis. ABC Brisbane 9.560 (Eng to NE Australia 24hRs) was logged at 0900 by Simon Hamer.

Some broadcasts to Europe stem from Radio HCJB, Quito 9.610 (Cl, Sw, Norw, Ger, Eng 0500-0830) 88585 at 0710 by Mario Bahamonde; VOA via Slunes 9.670 (Pol, Ger, Eng 0700-0930) 54444 at 0930 by David Klein; Radio Jordan via Al Karahan 9.150 (Ar, Fr, Eng 0900-1100) 2211 by Roy Pearce at 1605 and noted as "good during the evening" by Roy Patrick; Voice of Saudi Arabia (Eng) at 2135 to 2245 by David Wratten; VOA via Rf, Russ 0000-2155) 44444 at 2155 by Ian Bond; Radio Pyongyang, N. Korea 9.810 (Sp, Ger 1800-2150) SIO 354 at 2110 by Fred Pallant; Radio Cairo, Egypt 9.900(Air, It, Fr, Ger, En 1730-2245) 55555 at 2135 by Darren Taglin, Radio Sofia, Bulgaria 9.700 (Ger, Fr, It 0930-2225) 41444 at 2114 by Leo Bar; Voice of Turkey (Eng, Fr, Ger 0700-2200) 44444 at 2200 by Alan Smith;

Rumbaat Radio Sweden via Hornby 9.565 (Eng, Fr, It, Sw, to Australia 1230-2100) 45554 at 1235 by John Perry in Northwich; VOA via Tjamburg, Finland 9.660 (Eng, Fr, It 0900-1700) 39333 at 1700 by Alan Smith; FARA Radio, Moscow, USSR 34333 at 2030 by John Parry.

A variety of broadcasts are beamed towards Europe in the 6MHz (49m) band. Those noted were: Radio Australia, Russia via USSR 6.020 (Pa, Sp, Ger, Eng 0500-2200) 32333 at 1628 by Ian Bond; Radio Afghanistan via USSR 6.020 (Pa, Sp, Ger, Eng 0500-2200) 32333 at 1628 by Ian Bond; Voice of USSR, Abu Dhabi 6.170 (Eng to USSR 0200-2300) 433 at 2250 by Ron Pearce.

A few of the transmissions to other areas were logged, Radio National Malabo, Equatorial Guinea 6.250 (Sp to Guinea 0500-2200) 34333 at 0543 by Kenneth Reece; WYFR via Okokuchee 6.105 (Sp to S. America 0900-1100) 2220 at 0850 by Philip Ramsbott; Radio Sofia, Bulgaria 6.170 (Eng to Middle East 1945-2300) 24333 at 2130 by David Wratten; Voice of UAE, Abu Dhabi 6.170 (Eng to USSR 0200-2300) 433 at 2250 by Ron Pearce; Radio Mediterranean via Cyprus (Fr, Eng to N. Africa 2000-2300) 32333 at 2250 by Ron Pearce.

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ILR Radio Ave., HR 110, 51 Burnley Road, Leeds LS13 1UR.

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Complete the form in July '89 issue of Short Wave Magazine, or write out your advertisement on the form (on the back of this page) and send it, together with your payment of £2.30, to Trading post, Short Wave Magazine, Eneco House, The Quay, Poole, Dorset BH15 1PP. Advertisements will be published in the earliest available issue and SWM reserves the right to exclude any advertisement not complying with the rules. You must send the correct form as your address of purchase is not available and you address is incorrect. £25. Contact Peter 7HGM, Belfast BT3 3RE.
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We stock a wide range of products for the radio enthusiast by all the major manufacturers and suppliers. Unfortunately, within the space of this advertisement it is only possible to list a fraction of the range that we stock. We have for some while had one of the best prices available on the market. This has now been improved with a detailed catalogue of some of the special items we import, many of which you will not have seen before. And a copy of it is yours for the asking!

GET CONNECTED

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This ATU has been designed for the SWL who wants the best out of his aerial system handles all forms of aerials and simple to install. £69 + £2 p&p

POST £1

COMPLETE VHF/UHF FREQUENCY GUIDE

If you use a scanner receiver then this guide is for you. Covering the range 26 to 2200MHz the guide lists all the main user services together with simplex and duplex frequencies. The new publication gives you so much information. Customers should note that many frequencies cannot be legally monitored without a licence. Refer VHF/UHF £5.95.

MARINE FREQUENCY GUIDE

Here is a new guide that has just been published. It is aimed at the marine enthusiast and runs the text of printed text covering VHF and HF. All the Port and Coastal stations are listed around the UK together with complete traffic schedules, simplex, duplex and channel numbers. Also listed are the world coastal phone stations, Ref. MARINE £4.95.

WORLD SHORT WAVE FREQUENCY GUIDE

This is an old idea under a new title. Previously known as the UK CONFIDENTIAL FREQUENCY LIST, the new publication has had a radical update with much more information added and now represents one of the foremost guides on the subject. Covering every kind of service between 1.6 and 30MHz. It includes broadcast, air, military, marine etc. With Catalgines and times. Ref. SWFGL. Available April.

POCKET GUIDE TO FAX & RTTY FREQUENCIES

A useful guide to FAX & RTTY frequencies of the short-wave bands. List frequencies, modes and times where known. Includes SIDOR etc. Ref. FAX £2.85.

HFC OCEANIC AIRBAND COMMUNICATIONS

For those who find an interest in tracking the world's airliners around the globe, this is a must. It lists all the short-wave band aircraft frequencies, both civil and military, and also VOLMETs. There is also some interesting editorial on the structure of this service. Ref. OCEANIC £5.95.

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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."

South Midlands Communications Ltd
S.M. House, School Close,
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"They laughed when they saw my radio. Then they saw my logbook."