



# 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 VFO's scanning, selectable AGC, noise blanker, pass band tuning and a deep notch filter.

With a direct entry keyboard frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency is altered without changing the main tuning control. Options include FM, voice synthesizer, RC-11 infra-red controller, CK70 DC adaptor for 12 volt operation, mobile mounting bracket, CW filters and a high stability crystal filter.



**Helpline:** Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.

**Datapost:** Despatch on same day whenever possible.

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

**Icom (UK) Ltd.**

Dept SW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.



## |26| Niton Radio



**Cover** The coastal radio station at Niton on the Isle of Wight has an interesting history, as Elaine Richards G4LFM found out when she visited it recently. Bandscan will definitely be returning next month. Peter Laughton apologises to his regular followers.

**Our Reader Survey and Competition** is in the four-page centre section which you are asked to complete and return to the address given.

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# FIRST WORD



This issue is the twelfth since we relaunched *Short Wave Magazine* as a magazine for listeners. The changes in both the fortunes and format have been dramatic, but I would like to know what you, the readers, think about the magazine, and what you are really looking for when you buy it.

To help me to "fine tune" *SWM* this issue contains a Reader Survey in the centre which you are invited to complete and return to the Editorial Offices in Poole.

To give you an incentive to return the Survey we are offering an impressive array of prizes to the winner and runners up in a simple competition, details of which are in

the Survey Form itself. The First Prize is a Lowe HF125 General Coverage Receiver which is listed at £375. As consolation prizes to the five runners up we are offering One-year Subscriptions to *SWM*.

So get your pen out and fill in the Survey Form — **now**.

Over the next few issues I have lined up several exciting features. The April 88 issue marks the First Birthday of the "new look" *SWM* and to celebrate this occasion a special and unusual cover has been designed. I will reveal no more so as not to spoil the surprise, but make sure you ask your Newsagent to reserve your copy.

DICK GANDERTON

# A WORD IN EDGEWAYS

Sir

Further to Miss Godbold's queries about computer interference. Unfortunately it was not specified whether the radio and computer are used for RTTY decoding etc, or simply to listen to Radio One while zapping aliens, but I will assume the former.

The two major sources of interference in my experience are the use of a colour TV as the monitor — a monochrome unit is far "quieter", but a proper monitor is best if this can be connected to the Spectrum Plus — and r.f. interference getting into the radio through the audio connection. This can be countered quite simply by cutting the audio lead and reconnecting it using two r.f. chokes, one in each wire. I used 220µH items, mostly because they were all I had. The use of screened leads throughout will certainly help, including the power supply lead to the computer and the radio, and the headphone lead, and some form of external antenna fed with coaxial cable via an a.t.u., remembering that if the antenna is the ubiquitous long wire then a good earth is mandatory for best signal to noise performance. I use indoor dipoles for 7-28MHz with great success, resorting to a loop for 80m (SWM DX 160/80 May 87).

Direct radiation from the computer to the radio, and the TV to the radio for that matter, is also a problem.

Keeping the radio as far away as possible from the computer is the obvious answer, even an extra metre

can make quite a difference, although it will probably mean extending at least some of the leads. Enclosing the computer p.c.b. completely in a metal box with an external keyboard is also a possibility, assuming the availability of a suitable keyboard, the metal box makes a great heatsink for the regulator, minimising any problems due to overheating. Don't just put the computer complete unit in a biscuit tin, or whatever, without proper ventilation. This will only cure your problems by frying the computer. Finally, extra decoupling of the power supply circuitry within the computer can be advantageous at some frequencies, but this really is a last resort as it involves fitting possibly several different value capacitors in parallel across the supply rails of as many i.c.s as possible, maybe only to find that improvement only exists where signals don't.

Obviously any internal modification or disassembly of the computer will void any warranty and should only be conducted by someone of sufficient competence.

I hope the above will be of some help to Miss Godbold and your other readers. If they can get as much enjoyment out of their equipment as I get out of my ZX81 decoding RTTY and c.w. the effort will be well worth while.

C. R. EVE  
JERSEY

Sir

George Wilcox, on page 2 of the Fifth Edition of Dial Search has comments on "the listener's entitlement to clear reception". I have not heard this mentioned in the current "to-do" on the future of broadcasting, although "the freedom to broadcast" is. I therefore feel that the listener's interest has been lost.

In my opinion the entitlement to clear reception has priority over freedom to broadcast. After all, who listens to a broadcast subject to interference — other than us s.w.l./DXers?

I assume that would-be

broadcasters have in mind good reception by their listeners but at the moment this point seems lost on them.

Is not "the listener's entitlement to clear reception" an ideal subject for the attention of Short Wave Magazine and, perhaps with other radio magazines, putting forward the listener's interests at Westminster.

To create my own small wave, I shall be writing to my MP on the subject.

PHILIP TOWNSEND  
LONDON

This raises some interesting issues. Let's have your views on the subject. ED

Sir

The recent correspondence regarding the Sony PRO 80 from a Northern Sony dealer underlines the difference between a specialist communications dealer such as ourselves and a general domestic stockist of Sony products. Perhaps even more, it highlights my own company's unique position with regard to the Sony range of communications products.

We are the largest stockist of Sony communications equipment in the South, possibly in the UK, and as far as I am aware, the only Sony UK dealer able to offer the customer comparisons between Sony, Kenwood, Yaesu and Icom, etc. As specialists in communications we make it our business to be familiar with the products we sell and in fact produced our own addendum to the PRO 80 instruction manual within 24 hours of receiving

the first delivery, in order to clarify a few points for the benefit of the less experienced. To claim lack of knowledge of a product through insufficient experience is not acceptable to most members of the public. We have a number of enthusiastic and licensed amateurs on our staff, and we also make it our business to have proper antennas for demonstration purposes — a fairly basic requirement I would have thought.

Since October we have had full-colour brochures on the PRO 80, and prior to that we published our own illustrated technical brochure. I sincerely hope my company's product knowledge never falls to the point where we have to invite a customer to provide us with a teach-in on one of our own products!

P. W. WATERS  
WATERS & STANTON  
ELECTRONICS

# A WORD IN EDGEWAYS

Sir

With reference to the letter from Mr Wilson and the reply from Mr Andrews.

Before Mr Wilson starts to compare sensitivity, selectivity, scanning modes, etc. between the Sony ICF PRO 80 and ICF20001D models perhaps he should consider whether he can manage without timer and synchronous detection facilities, which the PRO 80 doesn't have.

Apart from being an

excellent high performance receiver for the home, the 2001D really comes into its own when abroad on trips, business or pleasure. To be woken by virtually distortion-free BBC World News in the mornings makes the set worth every penny as far as I'm concerned.

Talking about synchronous detection and distortion, if I switch on synchronous detection whilst tuned to Radio 4 on 200kHz long wave

the audio takes on a fairly low frequency modulation which results in a warbling effect, particularly on the female voice. This is obviously very annoying and, to me, unlistenable. The effect is not present when tuned to any of the other l.w. stations. Is this due to the BBC employing phase modulation of the carrier to remote switch electrical appliances?

If this is the case then will other broadcasters follow suit

and render synchronous detection — a giant step forward in a.m. fidelity — redundant? Perhaps SWM can answer this one.

Finally, Mr Andrews' statement that many short wave purchasers are not enthusiasts. I can believe this to be true of people spending less than, say £100 but cannot believe it of the person spending £350!

BILL CLAMP  
HAVANT, HANTS

## WHAT'S NEW

### RDS

Recently, BBC engineers completed the installation, ahead of schedule, of Radio Data Systems (RDS) equipment at all of its network and local radio v.h.f. f.m. transmitters serving England. These RDS signals will allow the "intelligent" receiver to automatically tune to the best signal, give a visual indication of the station name and display the current time and date.

The RDS data is carried on an inaudible 56kHz sub-carrier on every v.h.f. f.m. transmitter serving England. Work to extend the system to Scotland, Wales and Northern Ireland started this year.

The system will be dynamically configured from April 1988, when the RDS central computer, located in the Control Room at Broadcasting House, London, is put on line. This will allow codes to be updated, for example when the Radio 2 v.h.f. f.m.



transmitters are carrying Radio 1 programmes. It will allow a Travel Service using the TA (Travel Announcement) and TP (Travel Programme) codes, which will be added in the autumn 1988.

The RDS service will be publically launched at the BBC Radio Show, being held at Earl's Court, London, from September 30 to October 10.

### Engineering Details

High Wycombe: A new v.h.f. f.m. relay station should now be in operation. It is

located at the same site as the existing TV relay at Plomer's Hill on the north-west side of town.

The frequencies to be used are:

Radio 2/1	89.9MHz
Radio 3	92.1MHz
Radio 4	94.3MHz

Llandinam: A new TV relay, at Broneirion, should now be on the air. It is about 0.75km to the west of Llandinam village.

The channels are:

Channel 23	S4C
Channel 26	BBC 2 Wales
Channel 29	HTV Wales
Channel 33	BBC 1 Wales

To take full advantage viewers should use Group A, vertical, outside antennas.

### Long Wave Changes

The BBC changed the frequency of Radio 4 long wave transmitters to 198kHz on 1 February 1988. The transmitters, which are located at Droitwich, Westerglen and Burghead, have been moved from 200kHz (1500m) to 198kHz (1515m) as a result of the World Administrative Radio Conference (WARC) in 1979. This requires all long wave stations to operate on a frequency spacing of 9kHz.

The long wave transmitters, which carry the Radio 4 (UK) programme, operate as frequency standards, being locked to rubidium drive sources. The frequency stability of the Droitwich transmitter will be maintained to an accuracy of better than 1 part in  $10^{11}$  by the National Physical Laboratories Caesium Standard.

Some commercial companies use this transmitter as a reference source to calibrate accurate frequency test equipments. They are advised to check with the manufacturer or suppliers of the equipment so that modifications can be effected.

If you would like reception advice on the long wave transmitters, you should contact:  
BBC Engineering Info Dept  
Broadcasting House  
London W1A 1AA

### Scanner Computer Control Terminal

The Aircastle 2002 Scanner Computer is the result of some very careful evaluation of the needs of the AR2002 user and the combination of many years of hardware and software expertise. It is a stand-alone unit which runs off an external 9-12V d.c. supply and is connected to the AR2002 by means of a ribbon cable.

The unit is controlled by connecting any computer running an asynchronous scrolling terminal program to the built-in RS232 Interface.

Some of the features are: Much faster scanning rates (up to 150 channels per second). In excess of 400 memories (8K

RAM version) or 1000 on RAM expansion option.

Memory can be backed-up by fitting batteries.

Extended frequency range.

Squelch control output to drive a tape recorder on/off.

Price is £169.99 all inclusive.

There are many more, but space doesn't permit a full list. For more details:

Aircastle Products

PO Box 78

Bournemouth

BH1 4SP

### EDXC '88 Antwerp

The European DX Council are holding their 1988 Conference at the Crest Hotel, Antwerp, Belgium, May 20 to 23.

The opening ceremony takes place at 1730 on May 20 in the sumptuous auditorium of the Provincial House in Antwerp, the seat of provincial government and it is hoped that the Governor of the Province of Antwerp will perform the ceremony.

A full round of lectures and displays has been arranged as well as an interesting programme of non-radio activities.

EDXC '88

c/o PENVOX

Rue Jules Lejeune, 37

1060 Brussels

Belgium

# WHAT'S NEW

## Local Radio DX

If you are interested in Local Radio DXing, then the British DX Club has just the booklet for you.

It is called *Radio Stations in the United Kingdom 6th Edition*, and at £1 or 4 IRCs won't break the bank either. It contains details of local radio frequency changes, m.f. transmitters, v.h.f. transmitters, an address and frequency guide as well as information about the broadcasters.

To give you an idea of how easy it is to drive, most of the book has 5 columns on each page. The first gives the frequency (either in kHz for the m.f. stations or MHz for the v.h.f. stations). The second column gives the power used by that station and the third column gives the name of the station, or stations, using that frequency. The fourth column is very useful, it gives any other frequencies used by that station for its broadcasts. The last column is a "notes" column which gives you the number to look



up in the addresses list for the correct station address.

If you would like a copy of this book, send the £1 or 4 IRCs to:

British DX Club  
54 Birkhall Road  
Catford  
London  
SE6 1TE

## Viola

If you want to improve the standard of your drawings and circuit diagrams then this neat and compact A4 drawing board, complete with draughting head and integral clamping system, will be of interest.

The Viola Plastics Compact Drafter is no larger than an A4 ring binder, and the two rules, which are printed in both metric and imperial measurements, are reversible and interchangeable. They are mounted on the 180° protractor head which is carried on four parallel motion arms. The unit can be folded up and carried around as a complete personal draughting unit.

The Viola Compact Drafter costs £10.50 inc. VAT plus £1.50 p&p.

Viola Plastics  
36 Croft Road  
Hastings  
East Sussex TN34 3HE  
Tel: (0424) 432 126

## Masthead Amplifiers

Antiference is extending its range of Uniplus masthead amplifiers with the UP3302. It is an extra high gain u.h.f. masthead amplifiers with a v.h.f. by-pass. This provides a labour-saving installation for areas where there are strong local v.h.f. signals but very weak u.h.f. ones.

The amplifier's u.h.f. gain is 27dB±2dB. The noise (2.5dB) and v.s.w.r. characteristics are good and the housing is weatherproof. It is designed for remote operation, power being supplied from either a base power unit or from a distribution amplifier with a +12 volt line power source (negative earth).

The new amplifier costs £18.50 excluding VAT from Antiference specialist wholesalers.

Antiference Ltd.  
Bicester Road  
Aylesbury  
Bucks HP19 3BJ  
Tel: (0296)82511

## Weather Package

ICS Electronics have put together a low-cost weather facsimile package which will also cope with Navtex and RTTY signals.

For £399.95, inc. VAT, you get an enhanced FAX-1 decoder, mains power supply, Epson-compatible printer, all connecting leads, paper and ribbon.

Just connect the package to any h.f. communications receiver and you should be able to receive weather maps, satellite cloud pictures and navigational warnings from all round the world.

The FAX-1 incorporates a built-in tuning indicator and time and is fully automatic in operation.

For more details contact:

Alan Clemmetsen  
ICS Electronics  
PO Box 2  
Arundel  
West Sussex BN18 0NX  
(024 365) 590

## Young Electronic Designer Awards 1988

This scheme is now in its fourth year and, under the chairmanship of Professor John Eggleston, University of Warwick, sets out to provide the opportunity for young people to develop their talents in a practical, applied way.

The award scheme, sponsored by Cirkit and Texas Instruments, is open to students up to 25 years of age, and they have to produce an electronic device that is original, effective, well designed and has a useful application in everyday life.

Details and application forms are available from:

The YEDA Trust  
24 London Road  
Horsham  
West Sussex RH12 1AY  
Tel: (0403) 211048

## On Air

The latest addition to the ITS 448 Magazine stand on Prestel is called *On Air* and is edited by Keith Maton G6NHU.

Keith can be contacted via the AX.25 packet radio network by sending a message @G4DGK. This will get you more information about *On Air*.

The lively coverage includes news, rally



dates and venues, contact information, a bring and buy section and an amateur radio prize competition. In the first month of operation over 20,000 accesses were made to the new service.

If you are a Prestel subscriber and would like to read *On Air* for yourself just access Prestel and key:

★ 448900

## Communication

The January issue of *Communication*, the monthly journal of the British DX Club, contains some very interesting articles.

Constructional details for a medium wave spiral loop antenna, some very rare and unusual QSL cards and lots of interesting loggings make for a good read.

UK Membership of the BDXC is £7.50 and for this you receive the monthly magazine by

First Class post. Overseas surface mail costs £8.50 and airmail £11.00. Please note that Eire is now classed as overseas by the Post Office. For further details, contact:

Colin Wright  
54 Birkhall Road  
Catford  
London SE6 1TE

## YEAR 88 Project

The Radio Society of Great Britain are hoping to encourage Youth into Electronics via Amateur Radio — hence the acronym YEAR.

All affiliated clubs and societies will be receiving information packs explaining what they can do to help. If your club doesn't

receive one then contact:

RSGB HQ Lambda House  
Cranborne Road  
Potters Bar  
Herts EN6 3JN

# BOOKCASE

## AMATEUR RADIO SATELLITES THE FIRST 25 YEARS

by Arthur C. Gee G2UK Chairman AMSAT-UK  
Published by AMSAT-UK  
Available from Short Wave Magazine Book Service  
146 x 210mm, 34 pages. Price £2.25 plus 75p P&P

Amateur radio satellites haven't always been so many and so successful. Things have moved so fast in this field that the 25 years have simply flown by unnoticed. Development has progressed at such a pace that it has been difficult to keep up with it. New satellites have been launched at such a rate that one seems to have hardly got used to the characteristics of one, before another has appeared with its new technology, to which users have to become acquainted.

The material in this souvenir publication is drawn from the records of the author, AMSAT-UK's chairman. The story starts recalling a conversation with G2BVN after the Sputnik launch when the idea of amateur radio one day being involved in spacecraft was mentioned. Then came the birth of Project Oscar, Orbital Satellite Carrying Amateur Radio. The book follows the Oscar story through to Oscar 8. It also



recounts some of the RS story too. The University of Surrey aren't missed out either, as a great deal of the booklet is devoted to their part in the amateur radio satellite history. Even our own "Info in Orbit" columnist, Pat Gowen G3IOR, gets a mention!

## WEATHER SATELLITE RECEPTION

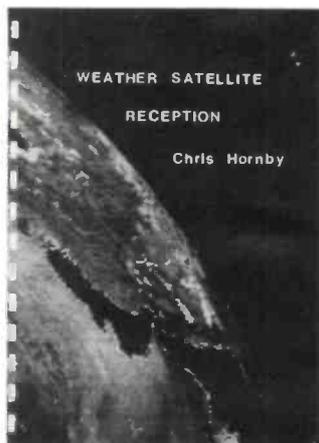
by Chris Hornby  
Available from Spacetech, 21 West Wools, Portland, Dorset DT5 2EA  
149 x 209mm, 91 pages. Price £9.75 plus £1 P&P  
ISBN 1 870919 00 9

This book is aimed at two types of readers, those who have a casual interest in satellite imaging processing techniques but who may not wish to go into a great deal of technical detail as well as those who wish to get involved to the extent of starting their own satellite project.

There are four chapters in the book: Satellites in Education; Reception and Antennas; Decoding Signals; Development. There are also ten appendices covering things like useful addresses, licensing notes, satellites, FAX frequencies and hard copy — to name a few.

All kinds of topics are discussed, reception and decoding techniques, frame formats and orbiting types. After working your way through the book, it's hoped that the reader will feel confident enough to have a go at setting up their own station.

There are plenty of illustrations to give the reader an idea of what results you can expect from various systems including a FAX picture from Bracknell. Both printer dump and photographic



type results are shown to give a good idea of the different levels of resolution that can be achieved. I thought the best one was on page 62, a photograph of the Isle of Portland, land thematic mapper, 30m resolution.

If you think you would like to get into weather satellite watching, or have recently bought all the kit and are wondering where to go, then this book could make the way ahead a little easier for you.

## SCANNERS 2 International VHF/UHF Communications Guide

by Peter Rouse GU1DKD  
Published by Argus Books  
Available from the Short Wave Magazine Book Service  
152 x 233mm, 261 pages. Price £9.95 plus 75p P&P  
ISBN 0 85242 924 X

This book is a companion to *Scanners*. It provides even more information on the use of v.h.f. and u.h.f. communication bands and gives details on how to construct accessories to improve the performance of scanning equipment.

The book is international in scope and contains frequency allocations for all three ITU regions including country by country variations. Also included are international callsign series, marine allocations, spot frequencies of major world airports, repeaters and beacons. The technical section covers construction of broad band antennas and signal boosters, power supplies, chargers and even a complete 10-channel scanner! Hints are provided on servicing, modifications and useful solid-



state devices for experimental circuits.

## GUIDE TO FACSIMILE STATIONS — SEVENTH EDITION

by Joerg Klingenfuss  
Published by Klingenfuss Publications  
Available from Short Wave Magazine Book Service  
170 x 240mm, 252 pages. Price £12.00 plus 75p P&P  
ISBN 3-924509-67-0

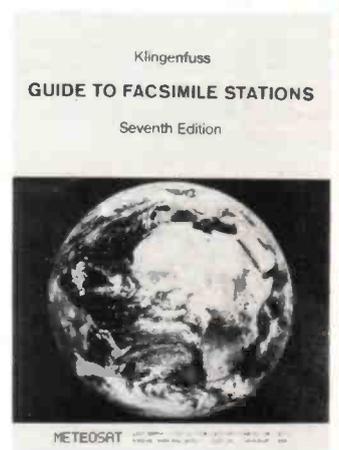
This publication, which is in its Seventh edition, is aimed at the FAX enthusiast and contains a wealth of information in a well indexed fashion.

The first section contains a mouth-watering selection of current FAX decoders with a brief description of their features. The following two sections deal with the basic principles of FAX transmission along with comprehensive technical specifications of standard commercial transmissions.

Satellite enthusiasts are not forgotten as there are details of a wide range of satellites and a very useful table for decoding the positional data broadcast from some Meteo stations.

The section most used is probably the frequency list which contains 374 frequencies between 53kHz and 28MHz. This latest edition includes an additional 28 frequencies over the previous edition. As well as the frequency and station name the list gives the callsign, transmission mode and alternative frequencies for the station.

One really useful item is the inclusion of full schedules for all the main FAX stations. The schedules are arranged in country



order and detail the frequencies, transmission mode, time and chart description. This section ends with a description of the Meteosat dissemination schedule.

The book is rounded off with a selection of sample charts (167 in total) and their interpretation. This information is often very useful when trying to interpret an unusual chart.

Having used this book and the earlier edition for some time I would recommend it to the FAX enthusiast. G4WNC

# GRASSROOTS

Lorna Mower

**Sutherland and District ARS** meet on the 1st and 3rd Wednesdays at 7.30pm, in the Sutherland Arms Hotel, Golspie. For more details you can contact John Cormack G4MOHI on Golspie 3197.

Meetings for the **Ealing & District ARS** are usually held on a regular Tuesday evening at 7.30pm, in the Community Centre, 71a Northcroft Road, Ealing. On March 1 they have a Committee Meeting, the 8th is Morse Training by G3SGT, Preparation for BARTG and the Spring RTTY Contest G8MPP-G1ZTN follows on the 15th, and G4HKS gives a talk on Innovations in Japanese Equipment on the 22nd. More from Anton Berg on North Ealing 1416.

**Barry College of Further Education RS** meet at 7.30pm on a Thursday evening, in the annex of the Barry College of FE, Barry to Bonvilston Road (A4226), near the Welsh Hawking Centre. March 6 is the date set for the Barry Rally, and a Video Film Presentation — Amateur Television as used in our Hobby, is planned for the 17th. Further information available from Dr Kevin Johnston GW4BCB at 68 Heol Isaf, Radyr, Cardiff, S. Glam CF4 6RJ.

Saturday February 27 is a Morse Test at Culbokie, Dingwall for the **Inverness ARC**. They meet on Thursday evenings at 7.30pm, in the Cameron Youth Club, Plane-field Road, Inverness. Contact Ronald MacDonnell G4MOCJT on Dingwall 61783 for more details.

The **Stevenage & District ARS** meet at 8pm every 1st and 3rd Tuesday, in SITEC Limited, Ridgmond Park, Telford Avenue, Stevenage. Further details available from Peter GOGTC on Stevenage 724991.

Meetings for the **North Wakefield RC** are every Thursday evening at 8pm, in The White Horse Public House, Fall Lane, East Ardsley. February 25 is their monthly meeting, March 3 a Visit to Birkenshaw Fire Station, and on the 10th is G4NOK on the Air 2m, 70m and h.f. from the new shack. Club project night, workshop and test gear ready, follows on the 17th and CEBG gives a talk on Power Generation and Dinorwig on the 24th. You can contact Steve Thompson G4RCH on Leeds 536633 for more details.

All meetings for the **Derby and District ARS** are held at 119 Green Lane, Derby, starting 7.30pm. March 2 is the ever famous Junk Sale, an illustrated talk — From Russia With Love — by G4MUB follows on 9th, the 16th is a Night on the Air and the 23rd their AGM. Details can be obtained from Jack Anthony G3KQF on Derby 772361.

**Yeovil ARC** have a Natter Night on February 25, Aerial Matching by G3GC on March 3, G3MYM

gives a talk on Oscillators on the 10th, Propagation Predictions on the 17th and Sines and Cosines on the 24th. The club meets every Thursday at 7.30pm, in the Recreation Centre, Chilton Grove, Yeovil. Further details from David Bailey G1MNM on Yeovil 79804.

On February 26, the ever famous Junk Sale is scheduled for the **Loughton & District ARS**, followed by an Informal evening on March 11. All meetings are in Room 20 of Loughton Hall, Rectory Lane, starting at 7.45pm. More from John Ray G8DZH at 9 Albion Hill, Loughton, Essex IG10 4RA.

**Sheffield ARC** meet every Monday at 8pm, in Firth Park Pavilion, Sheffield 5. Tuition for Morse Code and the Radio Amateurs' Exam takes place between 7 and 8pm. Details from Alan Pemberton G0ILG on Sheffield 395287.

On February 24, the **Farnborough and District RS** have a talk on Instrumentation by G3HEJ. They meet on the 2nd and 4th Wednesdays at 7.30pm, in the Railway Enthusiasts Club, Hawley Lane, Farnborough. Details from Tim FitzGerald G4UQE on Camberley 29231.

The **Crawley ARC** meet at 8pm on the 2nd, 3rd and 4th Wednesdays, in the Crawley Leisure Centre, Haslett Avenue, Crawley. The 2nd Wednesdays are Informal evenings held at members homes, and the 3rd Wednesdays are Committee Meetings. Club Nets are held every Friday at 8.30pm. More details from Dave Hill G4IQM on Crawley 882641.

Thursday February 25 and March 24 are Informal evenings for those at the **Southgate ARC**. March 10 is a Formal evening. The club meets at 7.45pm every 2nd and 4th Thursday, in the Holy Trinity Church Hall (Upper), Green Lanes, Winchmore Hill, London. More from Brian Shelton on Winchmore Hill 2435.

The **Cheshunt and District ARC** meet every Wednesday at 8pm, in the Church Room, Church Lane, Wormley. February 27 and March 9 are Natter Evenings, March 12/13 is the Commonwealth Contest, a talk on 50MHz One Year On by G3WFM follows on the 16th, and the 23rd is a Natter Evening. Further details available from Peter Davies G1KQA on Lea Valley 764930.

Meetings for the **Torbay ARS** are held in the English China Clay Social Club, Highweak at 7.30pm every Friday evening. On Saturday March 12 they have their Annual Dinner at the Temlestow Hotel. Bob McCreadie G0FGX on Haytor 233 can tell you more.

A Junk Sale on March 7 is this month's event for the **Southdown ARS**. Meetings are held on the 1st Mondays, in the Chaseley Home

for Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne, at 7.30pm. In the Clubrooms, Hailsham Leisure Centre, Vicarage Road, Hailsham on Wednesdays and Fridays. Club organised classes, usually held on Wednesdays, commence at 7.30pm. More details from C. R. Evans, G4VOS on Heathfield 3168.

**Halifax and District ARS** meet at 7.30pm in the Running Man Public House, Pellon Lane, Halifax. The 1st Tuesdays being Informal evenings, the 3rd Tuesdays being Formal evenings. March 15 is MGR Services, "Microwave Modules" Demo. More from David Moss G0DLM on Halifax 202306.

The **Felixstowe and District ARS** have a Social evening on March 7 and an AGM on the 21st. All meetings take place at 8pm, in the Scout Hut, Bath Road, Felixstowe. Further details from Paul Whiting G4YQC on Ipswich 642595.

A Craft Fair Planning Night is scheduled on March 1 for the **Rugby ATS**, who meet every Tuesday at 7.30pm, in the Cricket Pavilion, outside Rugby Station. Further information about the Society available from Kevin Marriott G8TWH on Rugby 77986.

**Ripon and District ARS** meet every Thursday at 7.30pm, in the Old Air Raid Shelter (behind Ripon Town Hall). February 25 is a talk by G0CLY. If anyone would like to know more about the club, please contact Miss Liz Bulman at the Lodge, Lister House, Sharow, Ripon, North Yorkshire HG4 5BU.

On March 19, the **Crystal Palace & District RC** have a talk on German Army Communications of WW2 by G3DWW. They meet every 3rd Saturday at 8pm, in the All Saints Parish Rooms, Beulah Hill, London (opposite IBA Transmitting Mast). More from Geoff Stone G3FZL on Forest Hill 6940.

**Wimbledon & District ARS** have a "Meet the Committee" evening on February 26, and G1ADW gives a talk on the Metropolitan Railway on March 11. All meetings are held on the 2nd and last Fridays at 7.30pm, in St Andrews Church Hall, Herbert Road, Wimbledon. David Love G4RBO on Burgh Heath 51559, can fill you in on any other details.

**Mansfield ARS** meet at 7.30pm every 1st and 3rd Tuesday, in the Victoria Social Club, Mansfield. March 15 is Home Brew Test Gear by G4GNC. More details from Keith Lawson G4AAH on Mansfield 642719.

An informal evening on March 8 is scheduled for everyone at the **Keighley ARS**. Meetings start at 8pm every 2nd and 4th Tuesday, and I'm sure Kathy G1IGH on Bradford 496222, can give you

details of their meeting place.

**Edgware & District RS** have Patents for Everyone G3SJE on February 25 and on March 10, an Informal with training for great egg race. They meet on the 2nd and 4th Thursdays at 8pm, in the Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware. Further information available from Ian Cope G4IUZ on Hatfield 65707.

On February 25th, the **Bredhurst Receiving and Transmitting Society** have a Rally Briefing — GB4RRR on the air, Saturday 27th is the third Rainham Radio Rally 10am, March 3 a talk on The New Collectors G3IEE, the 10th is a Construction/Natter Night, an AGM follows on the 17th and finally, another Construction/Natter Night on the 24th. They meet every Thursday evening at 8pm, in the Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham. More from Kelvin GOAMZ on Medway 376991.

**Eden Valley RS** have an AGM on March 17, to be held in The Crown Hotel, Eamont Bridge. They meet every 3rd Thursday at 7.30pm. For further details contact Martin G4FUI on Penrith 66728.

**Wether Satellite Reception** by G4RUB on February 24, is one of many events planned for those at the **South East Kent (YMCA) ARC**. They have a Natter Night on March 2, a descriptive talk on Dayton Ham-Vention by G3VTT on the 9th, a Natter Night on the 16th, and the 23rd is a Club Construction Contest. Meetings are held on Wednesday evenings and Instruction Classes in Morse or Radio Amateur Examination Coaching are on Monday and Tuesday evenings. All events are held at the Dover YMCA, Godwynehurst, Leyburne Road. Further details from John Dobson on Dover 211638.

The **Rhyl & District ARC** meet every 1st and 3rd Monday at 7.30pm, in the 2nd Rhyl Scout HQ (behind little Theatre), Vale Road, Rhyl. They have UK Telephones (BT) on March 7 and a Coast Guard Service talk on the 21st. Mike GWOHWK on Llandegla 621 can tell you anything else.

The **Wakefield & District RS** have a busy month ahead, starting with On the Air on March 1, the 8th is a talk by G1PNV on A Morse Adapter for your FM or Other TX, and the 15th is Club Project Surgery. They meet every Tuesday at 7.45pm, in the Community Centre, Prospect Road, Ossett. More from John Bryan on Leeds 820198.

Meetings for the **St. Helens & District ARC** are held every Thursday at 7.45pm, in the Community Resource Centre, Old Central Secondary School, College Street, St. Helens. Morse

# GRASSROOTS

Tuition is available before the start of the meeting if required. Further details available from Derek Ainscough G1OMY, on Marshalls Cross 818455.

**Workshop ARS** have a Magazine Sale on March 1, a Natter Night on the 8th, an official Club meeting on the 15th, and a Natter Night on the 22nd. They meet every Tuesday, and you can find out details of their meeting place and time by contacting Kevin Fox G4MDQ, on Dinnington 566724.

An Annual Junk Sale on March 3 is the main event for everyone at the **East Kent RS**. Meetings are held in the Parkside Lodge, Kings Road, Herne Bay, every 1st and 3rd Thursday at 7.30pm. More from Brian Didmon G4RIS on Whitstable 262042.

On March 17, the Vale of Evesham **RAC** have a Natter Night. Formal evenings are the 1st Thursdays at 7.30pm, in the Round of Gras, Badsey. Informal evenings are the 3rd Thursdays at 8pm, in the Gardeners Arms, Charlton. For further information contact Mike G4UXC on Evesham 831508.

The **Coventry ARS** meet every Friday at 8pm, in Baden Powell House, 121 St. Nicholas Street, Radford. February 26 is a Night on the Air & Morse Tuition, March 4 brings a Surplus Equipment Sale, another Night on the Air & Morse Tuition follows on the 11th, and the 18th an illustrated talk on Astronomy. More from Jonathan Ward G4HHT on Coventry 610408.

**Sutton & Cheam RS** have a Committee Meeting at 35 Great Ellshams, Banstead on March 2, a Natter Night on the 7th and a Constructional Contest on the 18th. They meet every 3rd Friday at 7.30pm, in the Downs Lawn Tennis Club, Holland Avenue, Cheam. Natter Nights are on the 1st Mondays in the Downs Bar. Further details from John Puttock G0BWW at 53 Alexandra Avenue, Sutton.

**Hastings Electronics & RC** meet every 1st and 3rd Wednesday at 7.30pm. The 1st being a Committee meeting in Ashdown Farm Community Centre, the 3rd a Main meeting in West Hill Community Centre. They also meet every Friday in the Ashdown Farm Community Centre for a Chat night. They have their AGM on March 16. Further details from Dave Shirley G4NVQ on Hastings 420608.

Meetings for the **Acton, Brentford & Chiswick ARC** are usually held every 3rd Tuesday at 7.30pm, in Chiswick Town Hall, High Road, Chiswick. On March 16 there will be a discussion on Members Problems. W. G. Dyer G3GEH on Acton 3778, can tell you any other details.

On February 26, The Radio

**Society of Harrow** have a Constructional Contest, March 4 is an Activity Night, the 11th a talk by G3MNO and the 18th a Junk Sale. They meet every Friday at 8pm, in the Roxeth Room, Harrow Arts Centre, High Road, Harrow Weald. Further details can be obtained by contacting the Chairman, Bob Pickles G3VCA on Ruislip 673287.

The **Chelmsford ARS** meet every 1st Tuesday at 7.30pm, in Marconi College, Arbour Lane, Chelmsford. On March 1 they have General Servicing & Repair of Amateur Equipment. More from Roy G3PMX or Ela G6HKM on Chelmsford 360545 (Home), or 353221 Ex. 3815 (Office).

**Cheltenham ARA** meet on the 1st Fridays in the Stanton rooms, Charlton Kings Library, Cheltenham. Dave Abbott G4RFU at Holmbury, Thornclyff Drive, Cheltenham, can tell you more.

On Wednesday March 23, **Banbury ARS** have their AGM starting at 7.30pm, in The Mill Club, Spiceball Park, Banbury. Further details from Bryan G1IIO on Banbury 51774.

**Port Talbot ARC** meet every Thursday at 7pm, with Morse Tuition commencing at 6.30pm. Meetings take place in the BSC Sports and Leisure Club, Margam, Port Talbot. Contact S. Hill at 31 Ynys Lee, Cwmavon, Port Talbot SA12 9AQ for more details.

**South Powys ARC** have a talk — Meters (Part 3) on March 1. The 1st Tuesdays are talks, the 3rd Tuesdays are Social evenings. They usually meet in the Rafa Club on the first floor, The Struet, Brecon. Contact B. Carter GW8AAG on Bwlch 730158 for more details.

March 3 is Introduction to Amateur Radio for the **Horndean & District ARC**. They meet every 1st Thursday at 7.30pm, in Merchistoun Hall, Horndean. Dan Bernard G4RLE on Portsmouth 755274 can tell you more.

**Chichester and District ARC** meet every 1st and 3rd Tuesday at 7.30pm, in St. Pancras Hall, St. Pancras, Chichester. March 1 is a talk on HF Propagation Predictions using the Commodore 64 by Dr H. P. Williams, and the 15th is a Club Meeting. Further information available from C. Bryan G4EHG on Chichester 789587.

**Bury RS** meet every Tuesday in the Mosses Centre, Cecil Street, Bury. Main meetings are held on 2nd Tuesdays and other meetings are informal. C. J. Ashworth G1PKO on Bury 5018 can tell you more.

**Midland ARS** meet every Wednesday for Morse and Thursdays is their Night on the Air. They also meet every Tuesday, the 1st in the month being a Committee Meeting, the 2nd a

Computer Night, the 3rd is their monthly meeting, and the Birmingham Central Raynet monthly meeting, on the 4th. All meetings take place at 57 Green Lane, Great Bar. Meetings start at 7.30pm, classes at 7pm. On March 15, G8CVR gives a talk on Earthing. If you would like more details then contact Tom Brady on Hamstead 1924.

**Verulam ARC** meet at 7.30pm every 2nd and 4th Tuesday, in the RAF Association HQ, Hew Kent Road (off Malborough Road), St. Albans. March 8 is an Activity Evening and on the 22nd, they will be holding the 1988 G3PAO Memorial Lecture, held annually to commemorate the late George Slaughter. For further information contact Hilary G4JKS on St. Albans 59318.

Meetings for the **Wirral and District ARC** are usually held every 2nd and 4th Wednesday at 7.30pm, in the Irby Cricket Club, Mill Hill Road, Irby. More details from Gerry Scott G8TRY on Wallasey 1393.

The **Todmorden and District ARS** meet at 8pm every 1st and 3rd Monday, in The Queen Hotel, Todmorden. More from G1GZB on Todmorden 7572.

**South Bristol ARC** meet every Wednesday at the Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol. March 2 is Microwave Workshop by Glenn Ross, the 9th QRP Activity Evening, Inter-Club Contest — Bullseye follows on the 16th, and the 23rd is a Contest Planning Evening. Len Baker G4RZY on Whitchurch 834282, will be able to tell you more.

On February 25, the **Yarmouth RC** have an Informal Evening, March 3 is Contest & Special Event Plans, the 10th and 17th are both Informal Evenings, and they have Microwaves in the Oil Industry on the 24th. At Informal Evenings they have h.f. and v.h.f. operation, Morse practice and RAE tuition. All formal evenings begin at 8pm, otherwise meetings start at 7.45pm in Drill Hall, York Road. Contact A. Besford on Yarmouth 721173.

**Trowbridge & District ARC** meet fortnightly on a Wednesday Evening at 8pm, in the TA HQ, Bythesea Road, Trowbridge. A visit by the Fire Prevention Officer is planned for March 2, and the 16th is a Natter Night. Further information can be obtained by contacting Ian Carter G0GRI on Bratton 830383, or at the office on Devizes 6656.

**Fareham & District ARC** have a lecture on Radio Security Service Part 2 on March 2, and G1AVI gives a lecture about Fax on the 16th. They meet every Wednesday at 7.30pm, with Morse classes from 6.30pm, in the Porchester Community

Centre, Westlands Grove, Porchester. More from G3CCB on Fareham 288139.

**Horsham ARC** have a Grand Junk Sale scheduled for March 3. The club usually meets every 1st Thursday in the Guide Hall, Denne Road, Horsham. Anyone wishing for further information can contact Phil Godbold G4UDU, on Steyning 814516.

The **Stourbridge & District ARS** have an Informal Evening on March 7, and an AGM on the 21st. They meet in the King Edward VI School, Stourbridge, every 1st and 3rd Monday. More from Derek Pearson G3ZOM on Kingswinford 288900.

Meetings for the **Dumfries and Galloway RA and Electronic Club** are held every 1st and 3rd Mondays at 7.30pm, in the Eden Bank Hotel, Dumfries. The 1st Mondays are intended to be an activity or event night, whilst the 3rd are to be natter nights. Further details available from John Young GM6LYJ, at 22 Hallmeadow Place, Annan DG12 6BZ.

The **Binstead ARS** meet every Monday at 7.30pm, in "Brickfields", Newnham Road, Isle of Wight. The 1st Monday is Auction Night and the last Monday is Lecture Night. The subject for this month's lecture is Astronomy by G1RHU. If you would like more details on the club and it's activities then contact Bob Griffiths G0ISB at 29 Dubbers, Godshill, Isle of Wight.

Meetings for the **Caithness ARS** are every 2nd Wednesday at 7.30pm, in the Loch Watten Hotel, Watten. Mrs E. Wylie GM1XJY on Barrock 85604, can tell you more.

On March 20, the Eighth Annual Components Fair will take place at the **Pontefract & District ARS**. This event will be held at Carleton Community Centre, Carleton Road, Pontefract. Talk in on S22. More details from Eddie Grayson G6OJX on Knottingley 83792.

**Wyre ARS** have a Video — Last Year Eppics, on March 9 and the 23rd is Club on the Air. They meet every 2nd and 4th Wednesday at 8pm, in the Breck Sports and Social Club. More from Dave Westby G4UHI on Lancashire 854745.

**Llanelli Coleshill ARS** meet on the 2nd and 4th Mondays at 7pm, in the Coleshill Disabled Centre, Llanelli. On March 14, GW4XLE will be giving a talk on Fault Finding. Contact Selwyn on Llandybie 850803, or John on Llanelli 759530 for more details.

On March 16, **Lough Erne ARC** have a talk on the RSGB by G14NKD. The club meets every 3rd Wednesday at 8pm, in the Railway Hotel, Enniskillen. You can get further information by contacting W. A. Ward on Enniskillen 24905.

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# THE ROMAN WALL EXPEDITION

M. Stott G8BGU

This great barrier is 116km long and averaged 10 Roman feet thick and stood to a height of 4.8 to 5.4m. In front is a great ditch, in places hewn out of solid rock, (the land at Housesteads is based on dolerite, a hard stone used for road chips), behind is the Vallum, a kind of fence to keep out intruders and to control traffic.

At every Roman mile there is a mile-castle, and each of these has two turrets spaced out evenly along the wall. There are 19 forts including the coastal ones for the different units, cavalry, infantry and part-mounted infantry. It has its communication system linking the wall forts with out-posts and the rear-ward network, with a northern command HQ in the city of York.

Built as a result of the hostile threat from Caledonia (Scots and Picts) and keeping down the troublesome Brigantes, of what is now northern England and southern Scotland from the time AD124 to about 130, it was abandoned in 142 in favour of a more forward line joining the Clyde and the Forth. This is known now as the Antonine Wall. It was put into commission once more about AD165.

By the end of the second century, it had fallen into such serious condition that it needed much rebuilding under Septimius Severus.

Every fort had an extensive civil settlement, and by the fourth century the army, like most trades and crafts had become hereditary and it was tied to the land. These troops no longer moved about, but became a kind of "home guard" protecting the frontiers, their families and property, living off the land around them.

At each end of the wall are two fine museums, at Carlisle and at Newcastle, the latter has many artefacts, a model of the wall and a reconstruction of the Mithream (Temple) at Carrawburgh.

## The Expedition Project

The site for the expedition will be at the Vallum Lodge Hotel at Bardon Mill on the Military Road. This is 13km east of Greenhead on the B6318 road and 18km west of Chollerford, 51km west of Newcastle and 5km west of Housesteads Roman camp.

Hadrian's Wall is the finest military monument in the whole Roman Empire, and in the central section views of scenic grandeur can be seen. Its history and details of construction of all its various structural elements are very complicated and one should never attempt to study any part without an Ordnance Survey map.

The site is on the north side of the road, 200 metres from the Twice Brewed pub and 0.8m west of the Once Brewed youth hostel, "which can be considered one of the best youth hostels in Europe as it has been recently extended and modernised."

We have the offer of the shop, a glass fronted room set to one side of the hotel, with a large car park all around it, power and hot water and with, I hope, a special price for out-of-season accommodation for Friday, Saturday and Sunday nights if it is wanted. There is also a bar and the facilities for hot meals makes the site most attractive.

## The Scenario

It was a cold March night 1850 years ago, when a fateful message was sent. The message was sent from the Roman general, Quintus Computica, to his garrison leader Didius Germanicus at Wallsend. The contents of the message were to be carried by legionaires and transmitted by signal fires over the 60km.

Unfortunately, on that fateful night, heavy rains and the high winds made lighting the signal fires very difficult. This, coupled with the coldness in the nether regions of the legionaires due to their mode of dress, caused the message to become garbled.

The historic message was to have read "Send reinforcements we are going to advance"; (the real reason was the Quintus Computica's wife Datalus wanted to go shopping in Edinburgh). Unfortunately the garbled message read,

"Send three and fourpence we are going to a dance." Instead of the ten legions of crack foot soldiers he expected, a lowly clerk was sent with the requested amount in a little goat skin bag, he was accompanied by six body guards who also wished to go to the dance.

The proposed raid on the Picts and Scots and the shopping trip to Edinburgh had to be postponed until the following year!

## Station Operation Data

The expedition is to be held on March 26 and 27, the weekend before Easter. The station will hope to operate on 3.5, 14, 21, 28 and 144MHz using all modes of transmission.

It is hoped to set up the site on Friday evening and close down on Monday morning. As there are plenty of things to do in the area it is hoped that the general public will visit the site. Special QSL cards will be issued for the station which will have the callsigns GB1HW and GB4HW.

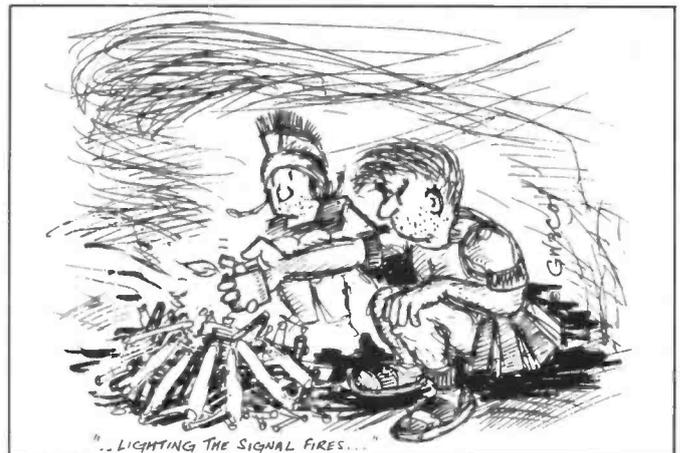
## Things to do and see

The Roman army camp at Carvoran is just 6km to the west and the Housesteads Roman camp is 5km to the east. Also in the east is Chesters Roman site at 16km. The Vindlanda Fort and civilian settlement is about 2.5km south.

You can go walking along the wall itself. As for refreshments, there is no end of choice. The Haltwhistle shops, pub and restaurant are 10km away, the Bardon Mill pottery, pub and Little Chef are just 8km. You could always go to the Haydon Bridge pubs, or hotel/restaurant at 13km or Hexham's good shopping centre, restaurants, Abbey, swimming baths, cinema, etc. Have I sold the area to you yet?

If these don't appeal then there is always the Once Brewed information centre at 1km or the Twice Brewed pub and hotel at 200 metres!

If you would like more information on the expedition run by the Hazelrigg Amateur Radio Club, then contact **M. Scott at Wellview, 12 Castle View, Ovingham-on-Tyne, Northumberland NE42 6AT**. They would welcome any visitors to the wall on March 26 and 27. □



# AIRBAND

Godfrey Manning G4GLM

In the January issue there was a description of a simple dipole antenna, scaled for the centre of the communications (com) part of the airband. Now **Dick Ware** (Gillingham, Dorset) suggests some variations to this arrangement. Firstly, ensuring that the top of the mast is at least level with (if not above) the top of the dipole enables a bias towards ground rather than airborne stations and I suspect that the mast is acting as a reflector, turning the antenna in to a Yagi-like array. My immediate thought is that the gain thus achieved is due to more low-angle radiation being received. The signals arriving at high angles from aircraft have travelled a virtually unobstructed path and so the reduction in gain won't matter so much here. Would an antenna expert like to join the debate? Secondly, the antenna-to-mast spacing matters, as might now be expected from the foregoing. If the antenna is offset  $\lambda/4$  from the mast then maximum radiation is received from the front (from the direction of the dipole). Changing to  $\lambda/2$  spacing gives equal side lobes but with little fore and aft;  $3\lambda/4$  gives three equal lobes at  $120^\circ$  separation in azimuth, one of which projects straight ahead from the dipole (like the one in the  $\lambda/4$  case).

## Flight Data Recording

An interest in flight data recorders is expressed by **Ken Easom** (Cape, South Africa). Two types of recording are made on public transport flights: the actual flight data recorder (f.d.r.) itself which includes time, indicated airspeed, altitude and heading plus other optional information; and the cockpit voice recorder (c.v.r.). I expect that minimum standards are laid down by the International Civil Aviation Organisation but other aircraft apart from commercial flights may carry recorders; if more details become apparent then I will include them in a future "Airband."

The f.d.r. may consist of a magnetic wire recorder, magnetic tape, or a pen recorder. This latter works by scratching multiple traces on a metal foil roll; the variation in trace position needs very accurate measurement in order to determine the value of the appropriate parameter. In the cockpit there will typically be a controller on which an identity and flight number can be set, and the number of recording hours remaining may be shown. Once the wire, tape or foil has been exhausted then the f.d.r. will be changed or re-loaded but this may be after perhaps a couple of hundred flying hours. Of course premature removal will be necessary in order to investigate any irregular occurrence. The "black box" (as the press call it) is invariably a bright colour (e.g. orange/red) these days - this assists its location amongst wreckage. It is crashproof and fireproof within extreme limits. A typical location would be in the forward part of the root of the tail fin, a

Now's the time to start thinking about improved weather (we hope?) so find out where you put your binoculars, and be ready to see your first aircraft of spring!

little above the fuselage; this tends to be one of the least susceptible areas in a crash. There are examples of f.d.r. equipment in my own personal collection to which visitors are welcome by prior arrangement (write to this column or telephone me on 01-958 5113).

Additionally the c.v.r. may be housed elsewhere, such as the nose-wheel bay. This works on a continuous loop of about half an hour and has a microphone unit in the cockpit. When the Japan air Lines Boeing 747 crashed, it remained airborne but out of control for more than half an hour after the initial incident; the important part of the recording had thus been overwritten by later events before the final impact.

Ken also notes other equipment available in emergency. Location beacons can be fitted that give out a sonar signal to enable detection of a submerged aircraft, and life-rafts carry transmitters that put out a characteristic noise on the v.h.f. distress frequency of 121.5MHz. I'm not sure what type of battery enables 30 day operation, Ken, but don't forget that the outputs might be pulsed so that most of the time the sonar or transmitter is only drawing a tiny quiescent current.

As far as dangerous cargo is concerned, there are regulations about this and certainly passengers are advised about carrying anything remotely explosive, inflammable, sharp, or containing compressed gas. The Boeing 747 Combi is so-called because of its mixed passenger/freight configuration. Where-as a cargo explosion is possible following a transgression of the rules, a simple fire would be less serious since the cargo hold is typically equipped with fire detection/extinguishing facilities. A common fire detection wire is a robust metal tube looped around the area at risk; its resistance or capacitance (concentric wires) changes with temperature and this gives rise to a flight-deck warning (typically a red light built in to the handle that itself operates the release of the fire bottle).

## Frequencies and Locations of Ground Stations

Where several v.h.f. ground relay stations are scattered across the country but are simultaneously transmitting the same signal, their frequencies are in fact slightly staggered away from the nominal channel centre (see *Aeronautical Information Circular 8/1988* from the Civil Aviation Authority (CAA). the offsets are as follows:

Number of Stations	Offsets (kHz)
2	-5, +5
3	-7.5, 0, +7.5
4	-7.5, -2.5, +2.5, +7.5

When more than one station is in range the resulting heterodyne (the whistle caused by the slightly different frequencies mixing together in the receiver and causing a beat note) will be at least 5kHz which is outside the receiver's passband. There can be problems with some types of squelch circuit that mistakenly blank off the transmission, behaving as if the heterodyne were just any other interfering noise.

Locations and frequencies have been provided by **Paul Whiteley** (Poulton-le-Fylde, Lancashire), **K. Finlay** (Chester-le-Street, County Durham), **John Walker** (Upper Langford, Bristol), **Chris Kirby** (Huby, York) and **Russell Carter** (Garston, Herts). Relay stations for the air traffic control centres are at Birdlip, Chedburgh, Clee Hill, Daventry, Davidstow Moor (Cornwall), Frimingham, Grantham, Great Dunn Fell (Cumbria), Greenford, Preston, Scafell, Swingfield (Kent), Ventnor (Isle of Wight) and Warlingham (Surrey).

London VOLMET (weather reports) are broadcast as follows (kHz offsets in braces):

North (126.6MHz) from Great Dunn Fell (+3.5); Main (135.375MHz) from Ventnor (-7.5) and Warlingham (+7.5); South (128.6 MHz) from Davidstow Moor (+7.5), Ventnor (0) and Warlingham (-7.5).

The main military air traffic control radar units may also assist civil aircraft in some cases (e.g. Brize Radar provides a lower airspace radar advisory/information service).

Abbreviations used in the table below: R = Radar, Mil = Military, W = West, N = North.

Callsign:	Location:	Lat N:	Long:	MHz
Border R	Boulmer	55°25'	001°36' E	134.85
Brize R	Brize Norton	51°45'	001°35' W	134.3
Eastern R	Watton	52°34'	000°52' E	134.25
Highland R	Buchan	57°28'	001°49' W	134.1
London Mil	W Drayton	Various	Various	Various
Midland R	N Luffenham	52°38'	000°37' W	UHF only
Scottish Mil	Prestwick	55°30'	004°35' W	120.55
Shetland R	Saxa Vord	60°50'	000°50' W	118.15

A *UHF Frequency Listing* and catalogue comes from **Jonathan R. Clough** of Javiation, Carlton Works, Carlton Street, Bradford, W. Yorks BD7 1DA (Tel: (0274) 732146 – chats encouraged!). As well as pointing out the above non-standard offsets on the VOLMET transmissions, Jonathan explains the British Airways Shuttle callsigns. Shuttle 2 is Heathrow to Manchester and 3 is the reverse sector; 4/5 are Heathrow to/from Belfast; 6/7 are Heathrow to/from Glasgow and 8/9 are Heathrow to/from Edinburgh. A suffix letter is added for each flight of the day. Air Force 1 and 2 are the United States presidential flights, the present B-707 type aircraft soon to be replaced by a 747 variant. Our own royalty use Rainbow (Duke of Edinburgh), Unicorn (Prince Charles), Kittyhawk (Her Majesty the Queen), and Kitty (other royal family members or royal flight aircraft not carrying royal passengers at the time).

## Information You May Have Missed

A fascinating series on the wartime radio beams, the secret weapon precursors of our present radio navigation systems, started in the January issue of *Practical Wireless*.

The same issue of *PW* carries a list of marine frequencies on page 61; 156.30MHz (Channel 6) may be involved in helicopter rescue operations.

In the CAA's *General Aviation Safety Information Leaflet (g.a.s.i.l.)* 12/87 there is a map (page 7) showing the airways which may be crossed by gliders without contacting a controller; there are, of course, conditions attached to this privilege. With the *g.a.s.i.l.* came *General Aviation Airmissses* November 1987; the centre insert is a map of the Lower Airspace Radar Service complete with frequencies.

The same *g.a.s.i.l.* details changes to the Southampton and Bournemouth special rules airspace (page 8).

## Some Technical Aspects

Both Russell Carter and Chris Kirby have

helped out with a description of Doppler v.o.r. (d.v.o.r.). You will recall ("Aeronautical Radio," June 1987) that the conventional v.o.r beacon produces a frequency modulated reference signal that is received independently of bearing between aircraft and beacon. Also transmitted is an amplitude modulated signal, but the phase of its modulation varies depending on what bearing the beacon lies relative to the aircraft. Unfortunately, some sites are unsuitable for this system because signal reflections distort the accuracy of the original transmissions.

The d.v.o.r. overcomes this problem but at the expense of more complex electronics and needing a larger site. The reference is now amplitude modulated but the outer signal is unmodulated. It is made to appear as if it comes from a rotating antenna (in fact a series of antennas, placed in a ring, are sequentially fed to generate this effect and there are no actual moving parts). This apparently moving signal (which is displaced 10kHz from the reference signal) is subject to the frequency shifts of the Doppler effect the result of which is a phase difference that is interpreted by the airborne receiver in the same way as conventional v.o.r.

Think of it this way: in conventional v.o.r. the outer antenna is like a rotating beam; only when it is pointing at the aircraft (which it does 30 times a second) is its signal received and therefore available for comparison with the central reference antenna's transmission. Unfortunately, a reflection might be received more strongly; there will be an error since the reflection is at its strongest when the beam antenna is pointing at the reflector which does not lie on the same bearing from the beacon as the aircraft does. Doppler v.o.r. makes use of an omnidirectional antenna that seems to be positioned on the circumference of a merry-go-round that turns 30 times per second. This signal is not subject to direction – dependent reflection effects.

Chris states that a typical airborne v.h.f.

transmitter produces about 2-5 watts and a u.h.f. device 10-15 watts. An h.f. transmitter of 110-150W may be coupled to such a physically short antenna that the e.r.p. is only milliwatts. However, an antenna at 10000m would be a radio amateur's dream, even if only for QRP!

Chris has also sorted out the current definition of decision heights. Where only azimuth guidance is available (from a radar controller or a beacon) the aircraft may not go below the minimum descent altitude (m.d.a.). Then whatever approach procedure is in use will be followed; the aircraft continues to look for the runway until it has obviously been missed due to the poor visibility. Even if the aircraft circles round for another approach, the m.d.a. is adhered to unless the runway can be seen. There is no hurry about the decision to land since the aircraft remains at a steady safe altitude whilst looking for the runway. A precision approach is where vertical guidance is also given either by the glide slope (i.l.s) or by precision approach radar. In this case, the descent is made along the glide path until the minimum decision height (m.d.h.) is reached at which point the pilot must make a quick decision that either the approach can be completed visually or a go-around is required. If the decision is delayed, more height will be lost on the continuous descent which would be a dangerous situation in poor visibility.

Russell would like to remind readers that airway colour designations have now been replaced by the corresponding phonetic letter (e.g. amber is replaced by alpha). What a pity. K. Finlay points out an airway change: UB13 is now believed to have been re-designated UB5.

Paul Whiteley lives near Warton military air traffic zone (m.a.t.z.) in which Beagle Bulldog single piston engined, basic trainers are to be found. No doubt moving much faster are the British Aerospace Hawk advanced jet trainers. On the civil side it is common at large airports for an automatic terminal information service to be transmitted (e.g. on 128.175MHz at Manchester) in the form of a continuous tape recording of actual weather, runway usage, etc. The first bulletin is designated A (Alpha) and the next update is Bravo, etc. To save time, pilots are expected to acknowledge receipt of the a.t.i.s. by telling the controller the appropriate designation letter; on approach I might call, "Manchester, good evening, Shortwave 388 is a Boeing 737 with (information) Charlie, over."

A simple vertical mast with a hut was discovered by **Peter Gummer** (Cleckheaton, Yorks). the Lichfield n.d.b. (LIC: di-dah-di-dit, di-dit, dah-di-dah-dit, 545kHz) is on the east side of the A38 road 1.5 nautical miles north of Alrewas so your guess about this is probably right. By contrast a v.o.r. is a much larger structure with antennas arranged in a circle, often involving an elevated circular mesh and not unlike a top hat in silhouette. □



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# INTRODUCTION TO DX-TV

## Part 8

Keith Hamer and Garry Smith

Years ago, photography was the only means of capturing all those exotics seen on the screen. It was sometimes the only way of convincing the disbelievers that Russian and Spanish television could be seen in the comfort of your own home. Showing photographs of DX reception was also an important social ritual during a DX get-together. Out would come the dusty photo album when fellow enthusiasts dropped in for a chat and back it would go as soon as they dropped off to sleep!

Nowadays the video cassette recorder comes into its own and you can now bore your friends sick with Spanish TV's animated opening sequence over and over again. It's still worthwhile keeping a photographic record of DX, although it is more convenient to record the DX on video tape first. This allows several attempts to be made at photographing the reception while at its best. Avoid the temptation to pause the recorder to take the photograph. Although many machines have an excellent "still frame" mode, experience has shown that a picture taken in this mode, especially the background, looks unnatural and appears to be frozen.

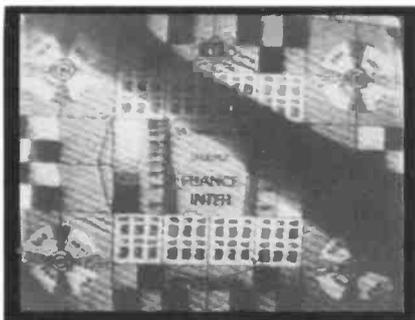
If you do not possess a video recorder, then "live" photography is the only answer. Unfortunately, this demands much more skill because there is nothing worse than attempting to photograph live DX from the screen only to find that the signal fades or losses sync at the moment you were anticipating an improvement.

Although the shutter may have been released at what seemed to be the most appropriate moment, when your prized prints return from the local chemist there's just a screenful of snow, or the picture looks worse on film than it did at the time of reception! The advice is to take several shots, even if the thought of wasting costly film is horrifying; remember, this may be your only opportunity.

### SLR Cameras

Perhaps one of the best cameras suited to

**Fig. 1:** Severe shading of the picture when using a shutter speed of 1/30 second. The photograph shows the old French test card taken when the 819-line system was in use.



**Capturing examples of long-distance TV reception, either on film or video, can create a hobby in itself. There can be complications but, surprisingly, excellent results can be achieved with just a little practice.**

off-screen photograph is the single lens reflex (s.l.r.) type. With this equipment the image seen in the viewfinder enters the camera via the lens system. This means that close-up photograph is possible without the problem of parallax errors. Consequently, there is no excuse for taking a wonderful view of the knobs of the set but only half the screen. Being able to see through the lens also means the focus can be adjusted precisely. A cheap and cheerful camera such as the Russian made Zenith E is a typical s.l.r. camera (an updated version, the Zenith II, is currently available) and it is surprising how many enthusiasts already use one.

The main drawback to the Zenith E is its slowest automatic shutter speed of 1/30th second. The shutter on this particular model is of the focal plane variety which moves horizontally. Unfortunately the TV field frequency of 25Hz (1/25th second) and the vertical composition of the picture often results in diagonal shading across the picture (see Figs. 1 and 2). Perhaps turning the camera (or the set) through 90 degrees would eliminate the diagonal shading effect.

### Time-Lapse Photography

Many years ago one particular enthusiast had accumulated an extremely impressive collection of off-screen test cards and captions using such a camera. It transpired that time-lapse techniques were involved in which the shutter was manually opened for a fraction of a second. Initial reaction assumed the process to be fiddly and critical but it seemed to be a technique worth trying. In order to eliminate any possibility of camera movement an inexpensive tripod and cable release was duly purchased. The first results of time-lapse photography were astonishing to say the least; the shading effect had been totally eliminated. So had the objectionable background grain on the TV picture which always seemed to be present when using a 1/30th second shutter speed. The pictures were now worth looking at.

A decision was made to become acquainted with black and white film processing at that point, thanks to the efforts of a well-known mail order processing company. They lost many prints of extremely rare African F2-layer

reception, in place they sent 20 of someone else's prints showing Russian architecture! Processing is fairly easy, and the equipment was obtained second-hand. Buying film in bulk also reduces costs although it does take a little practice to wind a metre or so of film onto a 35mm cassette in total darkness.

The "B" setting on the Zenith provides manual shutter control. One striking improvement was the smoothness of the picture. A fast shutter speed will tend to freeze any noise particles on the picture and these will show up on the end result. Thinking back the TV pictures on the photographs always appeared grainy even when the live DX picture seemed excellent. Due to the random nature of the noise, a slower shutter speed will average out any movement thus giving the impression of a smoother and cleaner background. Too long an exposure can result in blurred pictures, especially on weaker test cards and captions. Usually the identifications become difficult to read but the overall effect looks more pleasing when compared with the original DX picture.

### Camera Settings

An aperture setting of f4 or f5.6 gives good results when using a film with an ASA rating of 125 (22 DIN). Using reduced i.f. bandwidths for a large proportion of DX reception means that most of the pictures are monochrome, and the use of a black and white film is preferred, such as Ilford FP4.

There is no reason why a colour film should not be used, especially in these days of inexpensive processing. Unfortunately, monochrome reception does not appear very pleasing to the eye on colour prints and often a bluish colour cast is present, unless lens filters are used. There is plenty of room for experimentation here. If you do decide to process the film yourself, black and white is the easiest to do and you can select the best negatives you wish to print. There is also the added bonus of being able to select specific areas of the negative for enlargement.

**Fig. 2:** A different shading effect is present on this picture of the Italian colour bars. The shutter speed was 1/30 second with an aperture setting of f2.



# INTRODUCTION TO DX-TV

For optimum results, set the brightness and contrast controls on the receiver for a normal picture. Whatever you do, don't be tempted to use a flash attachment. If you are using black and white film it is best to reduce the colour control to minimum, otherwise the colour bar portions of test patterns will show an uneven graduation from white to black (compare Figs. 3 and 4).

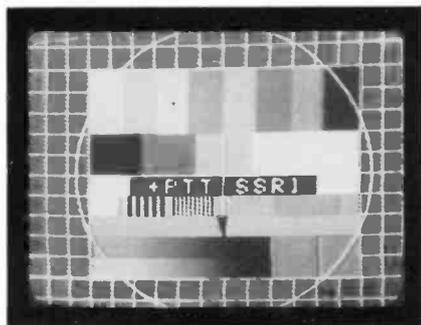
Provided that the screen is to fill most of the print, the exposure can be made in a darkened room. If for some reason the camera cannot be focussed with the screen filling the aperture (as could be the case if the screen is smaller than 150mm), it is best to avoid a darkened room. This is not because a background of striped wallpaper and mock Capo di Monte will make your photographic efforts of Russian TV more plausible, it is simply because a large dark expanse surrounding the screen may fool the automatic processing equipment into giving the wrong exposure when you send your film for developing.

## Mixed Numbers

When using time-lapse techniques, success is assured, especially with static DX pictures such as test cards and captions. Bear in mind that Sporadic-E pictures can move slightly due to propagational effects and this can cause blurring, especially if the exposure is too long. The longer exposures can enhance weak signals and experimenting with time-lapse techniques will produce surprising results. It is advisable not to give more than a one second exposure with test cards incorporating digital clocks. These, of course, change every second and the result will be superimposed numbers of the "seconds" part of the display.

Animated opening sequences and some of the more modern computer originated "hi-tech" captions can be tricky to photograph, especially if letters move across or zoom out of the picture. You will

**Fig. 3:** Note the uneven transition effect of the colour bars near the top of the test pattern. The photograph was taken with the colour intensity control set to normal. An aperture setting of f4 and a shutter speed of 0.5 second was used.



have to decide at which point you consider the caption should be photographed and several pictures should be taken and the best one chosen. Newsreaders and announcers can be difficult to photograph using time-lapse techniques. They often end up looking like "gawping goldfish" with their mouths wide open!

## Recording DX Reception on Video

It is all very well to suggest recording the DX onto video tape initially but how can we record foreign broadcasts on a typical video cassette recorder which is intended for UK reception?

One way is to use a converter system, such as the D-1000, in which all the DX signals are converted to a spare u.h.f. channel. By connecting the recorder between the converter and TV receiver, a convenient way of recording **any** DX signals is obtained. The main drawback is the inability of the video recorder i.f. strip to demodulate foreign sound carriers. Fortunately, a version of the D-100 is now available which enables the sound to be monitored using an f.m. radio receiver. Once extracted from the f.m. receiver, the audio signal can be fed into the video recorder via its auxiliary sockets.

A growing trend among TV DXers is to operate a multi-standard television receiver. Some of the more upmarket sets feature AV inputs and outputs which enable the DX reception to be extracted and recorded at baseband level. This means that most normal domestic video recorders can be connected to the receiver in order to capture both vision and sound information, irrespective of the original transmission standard or channel. We say **most** normal video recorders because one well-known manufacturer was too mean to incorporate AV sockets on its early V2000 format machines! Come to think of it, Sony have adopted the same tactics on some of their recent 8mm camcorders. However, perhaps we are straying from the original topic under discussion!

If the TV receiver is suitable for French system "L" reception which uses positive-going video modulation (instead of the normal negative), there will be no problem when using a normal video recorder since the signal is extracted after demodulation. The same remarks apply to the a.m. sound modulation encountered on system "L" broadcasts.

Recording may be played back via the antenna socket of a normal UK receiver if required. In a machine designed for the UK market the internal modulator will generate a composite output at u.h.f. with a 6MHz f.m. intercarrier sound spacing.

## Recording SECAM Colour

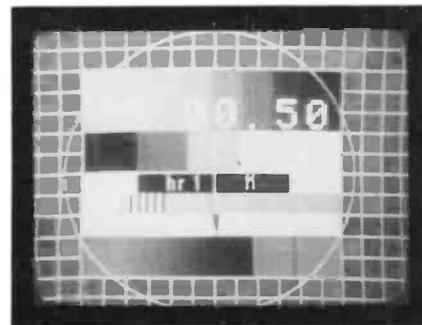
You may be wondering whether it is

possible to record SECAM colour transmissions on a normal video recorder. Well, there are several machines that will oblige, since the recorder circuitry is primarily interested only in the chroma subcarrier frequency which is 4.43MHz for both systems. Broadcast NTSC colour will not record successfully because a much lower subcarrier frequency is employed. We have had first-hand experience or recording SECAM information on several VHS machines, for example, the Ferguson 3V22 (that's the one with the protruding clunky mechanical keys), the later Ferguson 3V29/30 range and the Panasonic NV430. Even the humble Sanyo 9300 (Beta) will cope admirably, which puts paid to a rumour that all Beta v.c.r.s. will not record SECAM. Of course, there are many machines which seem to recognise the system differences and consequently these will ignore SECAM chroma information. A couple of budget-priced domestic recorders actually had a PAL-SECAM switch fitted as standard. The incorrect setting of the switch would produce incorrect colours on playback and, perhaps, a baffled service technician upon being called out to repair the machine! Typical examples of machines fitted with a PAL-SECAM switch were the Alba 400, the Comet equivalent under the Solavox brand name and certain versions of the early top-loading Hitachi VT11E.

## Multi-standard VCRs

Some manufacturers produce multi-standard video recorders which will record DX straight from the antenna. Some will automatically switch between standards upon recognising the incoming signal. Often these are highly priced when compared with the basic UK equivalent and many dealers may be reluctant to offer a repair service when a fault develops. Should you prefer a multi-standard v.c.r. ensure that the machine you buy has a system 1 modulator output designed to

**Fig. 4:** A similar test pattern but photographed with the colour control set to minimum. Note the time display. An exposure of longer than 1 second would have resulted in superimposed numbers as the "seconds" changed.



# INTRODUCTION TO DX-TV

feed a UK TV receiver. The same applies if you are contemplating nipping over the English Channel to a French hypermarket to buy a machine. There is no point in ending up with a v.c.r. with a French system L modulator output, unless you happen to have a multi-standard TV with system L awaiting your return.

## Playback

It must be stressed that to obtain a colour picture the playback of SECAM recordings must be done via a receiver equipped with a SECAM decoder, either at r.f. or baseband. The playback of a SECAM recording through a normal PAL receiver will result in a monochrome display. Disabling the colour killer circuitry within the decoder can sometimes produce a fuzzy blue and red vertical bar effect when presented with a SECAM signal. This effect can be useful since it can confirm whether your video recorder can handle the SECAM system especially if you don't happen to possess a suitable receiver at the time. Incidentally, disabling the colour killer circuitry allows the decoder to resolve chroma information on a lower level of signal albeit very noisy. The actual modification varies between receivers and the appropriate service manual is best consulted. Reducing the threshold level of the decoder in this way does have a few drawbacks, such as allowing the decoder to respond to spurious noise producing coloured speckles over monochrome pictures. Fortunately, the latter annoyance can be removed by setting the colour control to zero.

## Recording Different Line Standards

Some domestic machines can successfully record system M transmissions, namely 525 lines with a frame frequency of 60Hz. Success depends mainly upon the type of servo system design used in the recorder. Some machines display a severe sync loss every few seconds because the servo reference signal is derived from the incoming field sync pulses, which are at a different rate with system M transmissions. Fortunately, the Sanyo 9300 coped well with Canadian 525-line DX reception encountered during the F2-layer peak a few years ago. Similarly, the final 405-line broadcasts were recorded without problems using the same machine.

It must be stressed that on playback the receiver timebases must conform to the original system characteristics. Just for the record, the TV used for playback of the 405-line recordings is an elderly Thorn 1400 dual-standard receiver. The original solenoid operated system switch was replaced by a series of miniature relays in the i.f. section and a more robust one with heavy duty contacts in the line output stage. A multi-way switch performs the

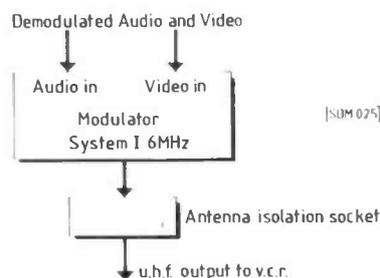
selection of the various TV system combinations. The 405-line recordings were extracted from a receiver at audio and video level using a modulator as an interface (see later). On playback, the video recorder modulator converts the recorded audio and video information into a System I (6MHz intercarrier sound) signal at u.h.f. From its original System A standard (405-lines scanning, positive video modulation and a.m. sound), the recorded signal is presented to the receiver in System I form but with 405-line scanning.

## Multi-band Recorder

Quite a few domestic video recorders have been produced over the years with multi-band tuners as standard enabling DX signals to be recorded directly from the antenna. The best example is the Sanyo 9300 which is a very popular machine among DXers for several reasons; they are cheap to obtain because of their age and are unwanted by the general public on account of their monstrous size. Other examples include certain Hitachi VT11E models, the Solavox/Alba 4000 and Ferguson 3V35E. If you happen to already own such a v.c.r. it is possible to use it as a form of converter. By operating the machine in the E-to-E mode, the TV will display whatever channel is selected. Band switches are normally located adjacent to the tuning presets. Since the band switches and presets are intended for that specific task, (namely to be preset), using them for continual tuning up and down the bands usually provides very fiddly and results in rapid wear.

Such a set-up will only provide pictures because the v.c.r. "front-end" will respond only to 6MHz intercarrier sound signals. A popular method used by some DXTV enthusiasts is to receive the sound channel separately and combine them in the video recorder. For example, a scanner is sometimes used for sound reception and the audio can be fed directly into the recorder and added to the incoming picture signal. There are sometimes snags encountered with this idea because the recording must be made via the v.c.r.s. tuner **and** the audio input. The source

**Fig. 5: How the problems of a live receiver chassis can be overcome by the use of a u.h.f. modulator and an antenna isolation socket**



selector switch found on most basic machines can only be set to TUNER or EXTERNAL but more up-market models kitted out the Dolby noise reduction and stereo provide more versatility in this respect. They can be switched to provide a facility for recording simulcast transmissions, i.e. to allow an external sound source, in this case an f.m. radio tuner, to be added to off-air vision. Some machines feature a MIC socket which overrides demodulated audio originally passed via the i.f. of the v.c.r. Some recorders do not have such a switch or socket. Instead, the overriding is achieved automatically when an external input source is plugged into the appropriate socket.

## Modulators

Adding audio and video take-off sockets to a TV receiver is not as straight forward as one might imagine. The chief problem concerns mains isolation. Many receiver designs still utilise a live chassis, especially the larger screen sizes. Fortunately most monochrome portables feature a double wound mains transformer which offers a completely safe chassis but is must not be taken for granted that every portable is designed in this way. It is so easy to assume the popular 14in colour set would be safe too, but very few models are. We wonder how many service technicians have investigated blown fuses, etc., only to discover the tell-tale wires leading from the terminals of the loudspeaker in an attempt to connect the TV to the hi-fi amplifier. The golden rule is leave well alone if you are not fully conversant with the inside of a television receiver.

A safe way of extracting audio and video signals from a TV receiver is to use an interface such as a u.h.f. modulator, thus producing a composite output for feeding the antenna input on the video recorder (see Fig. 5). In the case of a UK modulator, the sound and vision spacing of the composite output will be set at 6MHz irrespective of the original spacing of the transmission prior to demodulation. The Astec UM1286 and UM1684 are two typical examples of modulators with separate audio and video inputs. Note that some modulators have only a video input and therefore would be unsuitable. The r.f. output of the modulator (at u.h.f.) can be arranged to leave the receiver via an isolated antenna socket in order to overcome the problems posed by a live or dubious chassis polarity. Ensure that the socket is not fitted **outside** the receiver.

The actual take-off points for the video and audio signals will largely depend upon the receiver design and a little experimenting may be necessary. The input of the amplifier may be experimentally connected to the output pin of the vision demodulator i.c., or better still the emitter of any luminance amplifiers immediately following the i.c. output. A buffer

# INTRODUCTION TO DX-TV

amplifier is sometimes required to drive the modulator (see Fig. 6). On a monochrome receiver, the video could be tapped from the cathode of the c.r.t. The circuit in Fig. 7 could then be used. In both circuits the preset is adjusted for optimum results. For audio take-off a point prior to the volume control is preferred since its adjustment will not effect the audio output. Unfortunately, a convenient source of take-off may not be easy to find in some circuits using an integrated circuit containing the whole of the sound stages. Circuits using a separate intercarrier i.c., such as the TBA120 series, provide an audio output at pin 8 but its level will be affected by the adjustment of the d.c. volume control. In some cases it may be more convenient to tap off the signal at the loudspeaker and attenuate it as necessary using a potential divider consisting of preset connected to the input of the modulator.

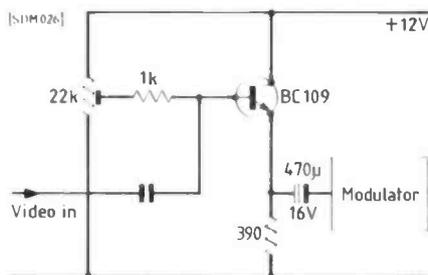


Fig. 6: A buffer stage suitable for feeding the modulator

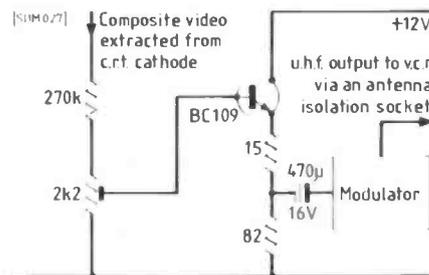


Fig. 7: Using a modulator to extract video information from a monochrome receiver

## Suppliers

Modulators suitable for this type of work are available from:

**Astec Europe, 8b Portman Road, Reading, Berkshire RG3 1EA. Tel: 0734 509411.**

Further details of the D-100 Converter Systems are available by sending an s.a.e. to: **HS Publications, 7 Epping Close, Derby DE3 4HR.**

# LISTEN OUT FOR

**GB5RN:** The Royal Naval ARS London (HMS Belfast) Group will be active from Thursday March 17 to Wednesday April 13. This is to celebrate the fiftieth anniversary of the launch of HMS Belfast. A special QSL card will be issued, all QSLs via the RSGB or Derek Costello G4UKJ, Three Ways, The Green, Stalham, Norfolk NR12 9PZ. Requests for direct QSLs must be accompanied by s.a.e. and return postage. The correct address of the ship is HMS Belfast, Imperial War Museum, Off Morgans Lane, Tooley Street, London SE1 2JH.

**GB7CO:** G4OBK and G0EJK, sponsored by the Central Lancashire ARC will be active from Wednesday March 23 to Tuesday March 29 from the Island of Colonsay. They will be using all h.f. bands and will be especially active in the WPX SSB contest as a multi op station. There will also be a limited amount of v.h.f. activity on 144MHz. DXCC status is Scotland. IOTA ref: EU08. WAB: NR39 Strathclyde. Island Collectors Isle of Oransay NR38 and NR39. QSL will be via G4OBK (1988 callbooks only) or via the RSGB bureau.

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

**ZM1BCC:** From April 15 to 25, an amateur radio station will be operating from the Public Library of the Birkenhead City Council. The station will be operated by local amateurs. Operations will be on the high frequency bands as well as v.h.f. and u.h.f. Times of operation will be from 9am (local time) to 5pm, with later times on Thursday and Friday April 21 and 22. If conditions are good, later times may be operated on other days.

A full-colour QSL card has been designed, showing the proximity to Auckland City. A brief history of Birkenhead from the time it was occupied by the Kawerau Maori tribe to the present, is on the back. Distribution is mainly by the bureau.

It will be of particular interest to the group in Birkenhead to contact other amateurs who live in districts of Birkenhead, Birkdale or Beach Haven in other parts of the world.

**GB0IOS:** Following the successful expeditions over the past few years to Lundy, Skye and the Western Isles, the Mid Northants Exhibition Group are pleased to advise that this year's trip will be to the Channel Islands. A base station will be set up on the Island of Sark, and it is hoped that mobile and portable operation will be made from Jersey, Guernsey, Alderney and Herm. A special effort will be made for WAB collectors, and it is anticipated that all the Parishes on both Guernsey and Jersey will be activated during the week 30 April to 7 May. They will be on all h.f. bands. All QSOs will be QSLed via RSGB or direct via G4VID (s.a.e. please).

**GB3SWR:** This will be used as the talk-in station for the Swansea Mobile Rally at the Swansea Leisure Centre on April 24.

**GB4IMD:** On April 23 the Cornish RAC are celebrating International Marconi Day. They expect to operate from the site where Marconi made his first transatlantic transmission — Poldhu Cove, near Mullion on the Lizard Peninsula. This is very close to where the Goonhilly Satellite Station now stands. Operation will be on 3.5, 7, 14, 21 and 28MHz using s.s.b.

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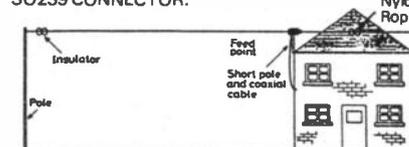


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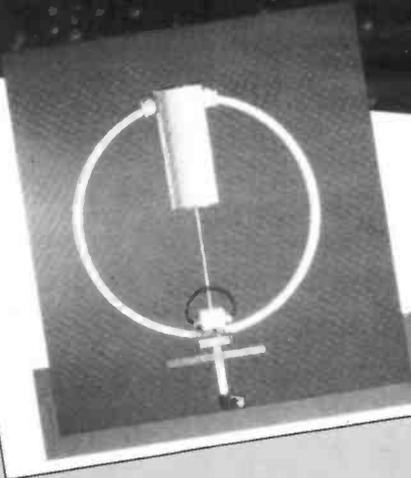
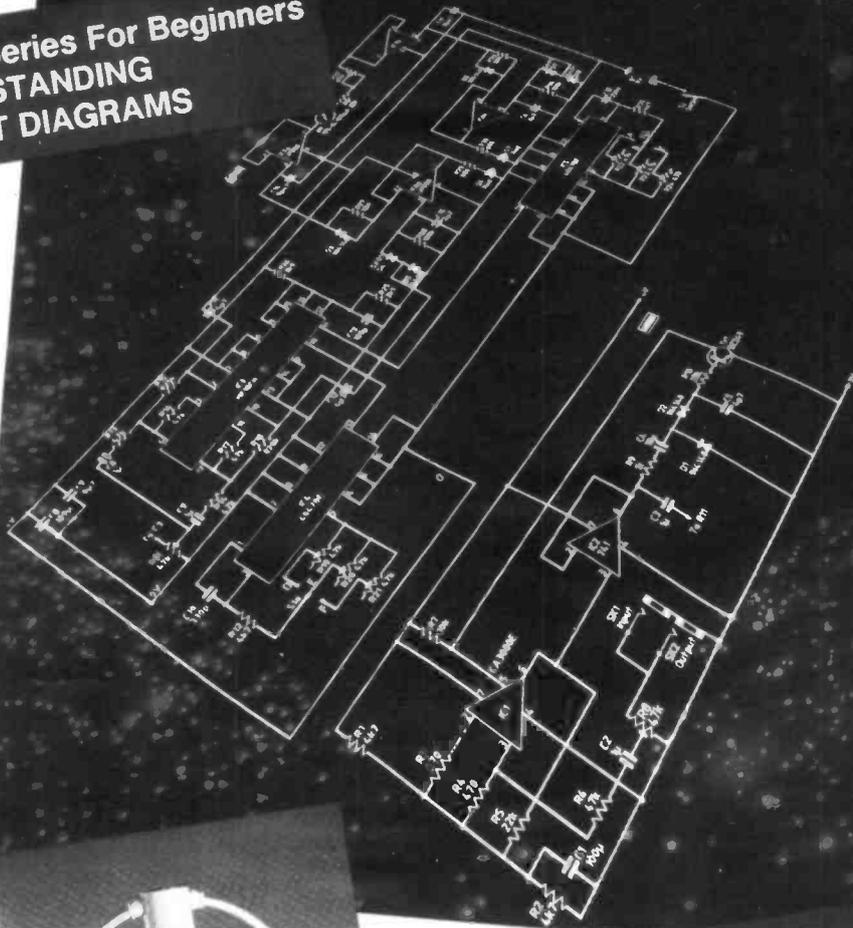
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# SCANNING

Alan Gardener

The basis for these notes was a letter I received from reader **Peter Finn** of Milford Haven, who brought out some very important points which I will elaborate upon.

1. Find out all about scanners before you buy one. A good way of doing this is to read Peter Rouse's book *Scanners*. This is an excellent general guide to the hobby, and could save you from making an expensive mistake later. It is available through the *Short Wave Magazine* Book Service, so no excuses.

2. Decide what you want to listen to and determine if it is physically possible to do so. No matter how much you spend on a receiver you cannot defy the laws of physics. Signals in the v.h.f. and u.h.f. parts of the radio spectrum do not travel as far as signals you may be used to hearing on the short wave bands. Don't expect to be able to switch on the receiver and listen to the world, the scanner bands can be very quiet by comparison.

3. Decide where your interests lie, and choose the features which will be of use to you. For example do you just want to listen to aircraft as part of another hobby, or will you want to listen to other things as well? It is surprising what other transmissions you can become interested in, so it is worthwhile considering this before purchasing.

4. Get as much information as possible, read reviews, get leaflets, ask owners. A good starting point is the "What Scanner" feature in *SWM*, this will tell you what the current trends are and what sort of features you can expect to find.

5. Check dealers for current prices; These vary as the exchange rate goes up and down so it is worthwhile phoning around. Don't forget to consider buying second-hand, as many dealers have receivers in reasonable condition which they have taken in part exchange and will give a warranty on.

## Main Features

**Scan:** The term used to describe the type of operation where the receiver runs through frequencies which have been pre-programmed into the equipment memory channels by the user. For example local airport frequencies or amateur repeater channels. The receiver scans through these memory channels and stops when a signal is detected. The number of memories which can be scanned depends on the make of the receiver but most offer a minimum of 20, with the facility to "Lockout", or temporarily remove from the scan, those memories which are not of interest at the moment.

**Search:** Often confused with Scan, this is the other main feature on most receivers. If you don't know the exact frequency that a particular service operates upon but you have a rough idea, or perhaps you want to monitor activity on one of the amateur bands, then use can be made of the search facility. The user programs into the

**Which is the best scanning receiver to buy? This the most common question asked by readers contemplating buying a scanning receiver for the first time. The simple answer is that there is no simple answer! However, after reading this you will at least be able to make a good choice and avoid some of the pitfalls.**

receiver the upper and lower frequency limits of the band to be searched, and also the frequency step size that the receiver is to search with. The receiver then automatically searches over the set range and stops when a signal is detected.

Some of the more sophisticated receivers offer a whole range of different signal detection systems for use in the search and scan modes. These are designed to prevent the receiver from staying on one frequency for too long if a continuous signal is present, or in some cases if no modulation is present. You should decide whether you are going to make the most use of either the Scan or Search function and choose the receiver with the facilities to suit.

## Frequency Coverage

Many receivers are designed for the American market and the frequency coverage reflects this. So ensure that the bands you want to listen to are present. In general only the so called "continuous coverage" scanners will include the u.h.f. aircraft band for example.

## Tuning Step Size

Again many of the receivers will only tune in multiples of 5kHz as a result of the American method of assigning channels. This can be a problem in Britain as most channels are allocated in multiples of 12.5 or 6.25kHz. Depending on the filter fitted to the receiver the recovered audio can in some cases sound very distorted as the receiver cannot tune exactly to the wanted signal. The better receivers let you select from several tuning steps.

## Types of Modulation

One of the major problems with some of the earlier designs of scanner was the inability to manually switch between different detector stages in order to be able to recover the different types of modulation in use. Yet again this is a result of the American market setting the rules. In the US it would appear that a.m. transmissions are only associated with the

v.h.f. aircraft band, whereas in Britain many bands have a mix of both a.m. and f.m. transmissions, so make sure you can switch between the two types as and when required. In the worst case you may find that the receiver you thought would cover the v.h.f. aircraft band will in fact tune the required frequencies but will not switch to a.m. Some receivers also offer w.b.f.m. — this is useful if you want to listen to f.m. broadcast stations or TV sound. And may also be of interest to DX-TV enthusiasts or radio amateurs, as many Eastern European TV and f.m. broadcast stations operate in the 40-80MHz region and give a good guide to propagation conditions. If you listen to satellites or radio amateurs then s.s.b. is important, but make sure you can switch between u.s.b. and l.s.b. in order to be able to take full advantage of this type of transmission. Single side band also becomes important if you want to use a converter with the scanner as this will then give you good



# SCANNING

quality short wave reception at a fraction of the cost of a dedicated general coverage receiver.

## Other Factors to Consider

**Signal strength meter:** This is useful in determining how close a received station is, or how good a particular antenna is.

**Tuning knob:** Most receivers only have UP and DOWN buttons to permit manual tuning of the receiver (other than by direct keyboard entry). This can be very frustrating if you wish to quickly change from one frequency to another, or want to manually search for new active frequencies. If you think that you may wish to do this, then consider the provision of a tuning knob very seriously.

**Squelch relay output:** Useful if you want to monitor frequencies over a long period of time by connecting a tape recorder to the receiver. Doing this permits you to compress several days activity into just a few hours.

**Computer interface:** If you are interested in finding new frequencies or logging channel usage then this is the option to look for. Many receivers now boast of computer ports, and an increasing amount of software is becoming available, making it very easy to get sophisticated system running.

## Specifications

Specifications can be very misleading. One of the best ways to see if a receiver is up to the mark is to read the reviews. Particularly where measurements have been made, as the manufacturer's figures are usually a minimum standard and many models are much better than the published figures.

**Sensitivity:** This is the ability to hear signals and should be lower than  $1\mu\text{V}$  for 12dB S/N on a.m. and  $0.5\mu\text{V}$  for 12dB S/N on n.b.f.m.

**Selectivity:** This is the ability to reject unwanted signals on adjacent frequencies. The best choice seems to be around  $\pm 7.5\text{kHz}$  at  $-6\text{dB}$  for most services in Britain, but up to  $\pm 12\text{kHz}$  at  $-6\text{dB}$  is usable.

**Spurious response/Image rejection:** This is the ability to reject unwanted signals. The image rejection is usually a problem with older designs of receiver and can result in other transmissions interfering with the wanted signal. It is generally worse on the u.h.f. ranges of receivers where the wider bandwidth circuits cannot provide such a high degree of selection of the wanted signal as is possible on the lower frequency ranges. One common manifestation of this problem is that of local police transmissions appearing in the 430MHz amateur band, usually making reception of weaker signals impossible. A minimum of 50dB rejection should be expected for

both image and other spurious responses, however a lower figure is to be expected on hand-held models as a result of design economies in order to get the circuitry to fit inside the case.

I hope that the above notes have given some guidance, and I would be interested to hear from readers with their experiences of buying scanners.

## UHF Aircraft Band Converters

Reader **A. Sheldon** of Nottingham is trying to obtain a converter for use with his scanner, which will permit him to be able to receive the u.h.f. aircraft band. He has tried contacting Aero Hobby Supplies of Birmingham who were mentioned in Peter Rouse's book *Scanners* as being the suppliers of the Sumatron U-Verter. However it would seem that the company has either moved or ceased trading, so perhaps one of you may be able to help. Do you know if this particular product is still available, or is there any other make of converter that will do the same job? On a slightly different note do any of you know of any modifications or operating tips connected with the Saisho SC7000 scanning receiver, I must admit that this model is not familiar to me but I am assured that it is equivalent to one sold under the Revco brand name. I will pass on any information that you send me.

## Spectrum Monitor

You may remember that I mentioned a "Panadaptor" type of display for use with the Icom R-7000 receiver a few months ago. Well I have now received information on a range of units which are available in this country. The three models are the RX-9019A, B and C. The RX-9019A is the basic unit which runs off 240V a.c. and requires an external oscilloscope on which to display the frequency spectrum. The RX-9019B has a built in display and operates from both 240V a.c. or 13.8 V d.c. and finally the RX-9019C which has the same features plus a built in 20MHz single trace oscilloscope. All units feature a 1MHz sweep width, 10kHz resolution, i.f. rejection of 60dB, image rejection of 40dB and a sensitivity of  $1.5\mu\text{V}$  on linear or  $15\mu\text{V}$  on log. A useful extra feature is the

inclusion of a 10.7MHz marker to indicate the centre of the display, which is the frequency that the receiver is tuned to. This looks like a very interesting unit and I would like to hear from anyone who has had a chance to try either this or a similar item. Contact Microwave Vision & Telemetry Ltd, 373/375 Uxbridge Road, Acton, London, W39RH. Tel: 01-9925726 for further details.

## Computer Interface

On the subject of accessories for the R-7000, Icom UK Ltd are now selling an interface and control program produced by J.T. Electronics, enabling owners of BBC microcomputers to operate their receiver under remote control. The package is named JT602 and consists of a simple interface unit which connects the R-7000 to the BBC computer, the program itself which can be supplied either as a listing, tape or disk, and finally a comprehensive manual which covers the main aspects of the program. Back up information is available should the need arise. The program is written in Basic and permits operation of all the controls normally associated with the receiver front panel. The only major difference being the storage of memory contents on disc rather than in the receiver itself. Having attempted to make sense of the Icom CI-V interface handbook myself (which I am informed is not entirely correct for control of the R-7000) I feel that this package would be a good basis for anyone trying to write a control program for the receiver. Especially as a listing can be supplied to aid this otherwise frustrating and time consuming operation. At the time of writing the price for the complete package is £19.95p, but check with Icom UK on (0227) 363859 before ordering. At this sort of price it may be worth considering even if you don't own a BBC machine, but have enough software writing experience to be able to make the program work on your own computer.

As usual all contributions to PO Box 1000, Eastleigh, Hants S05 5HB. Please enclose an s.a.e. if you require items returning. Until next month — good listening.



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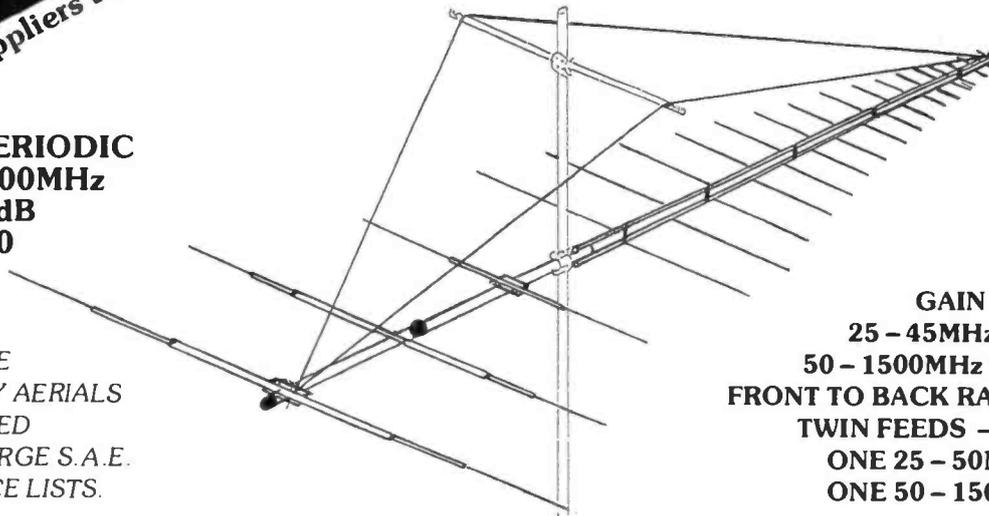
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# WEATHER SATELLITE RECEPTION

Peter Rouse GU1DKD

## Part 2

It is obviously essential to know when weather satellites are going to appear. A look at some of the published data for the "birds" shows a bewildering array of complicated expressions and figures known as Keplerian Elements. In fact, it is possible to predict pass times without most of this data and without even knowing what most of it means.

The essential information is the "Nodal Period" and the "Longitudinal Increment". The Nodal Period is the time taken by the satellite for one complete orbit and the Increment is the number of degrees the earth moves underneath the satellite track during an orbit. If, on any given day, we know the exact time and the exact position the satellite passes over the equator, we can then calculate all future equator crossing times and positions simply by adding the nodal period and increment. However, that is a fairly tedious task and typical of the "number crunching" that computers do so well.

The program shown was written for the BBC, but is adaptable to other computers. It prints out all valid UK passes and shows the date, the equator crossing point in degrees and the time. On average, an afternoon northbound pass will come into range about 7 or 8 minutes after crossing the equator. A morning southbound pass is about 32 to 33 minutes after crossing the equator, (in this latter instance the equator crossing time obviously related to the satellite crossing the equator on the side of the earth opposite the UK).

The first thing that has to be done is to obtain a NOAA reference orbit. This can be done by ringing the UK Weatherwatch Service at Lasham Aerodrome, but only after 6pm. The number is (0256) 83448 and a recorded announcement will give you all the data you need. The recording is updated every Friday and covers both NOAA 9 and 10.

On running the program you will be prompted for the month (numerically) and date of the reference orbit, the equator crossing time in hours, minutes and seconds and the equator crossing point in degrees (always longitude west). Next you will be asked for the satellite number, 9 or 10, so that this can be automatically printed. The program now calculates and prints every valid UK pass with its equator crossing time. Lines 430 and 440 are the ones that restrict the print-out to UK passes. By adjusting the degrees of latitude in these two lines, you can re-configure the print-out for any part of the world. By removing the two lines altogether, you will get a print-out of every single world orbit.

The only statements in the program which are peculiar to the BBC are VDU 2 (printer on) and VDU 3 (printer off).

The program can only give results for a month at most, but this is no bad thing. The satellite characteristics slowly change, which is why Weatherwatch

For the beginner, the easiest satellites to work with are NOAAs 9 and 10. They send infra red and visible images side by side and make useful daylight passes over the UK.

provide regular updates of information. They also give a status report and news of new satellites, etc.

### The Rules and The Clubs

You do not require a licence to receive weather satellite signals, but you do need a letter of authorisation. There is no charge and you should send a letter and s.a.e. to **The Department of Trade and Industry, Radio Regulatory Division, Room 309, Waterloo Bridge House, Waterloo Road, London SE1 8UA.** State that you wish to receive NOAA and ESA signals for amateur meteorological purposes and

require a letter of authority.

It is also a good idea to join the Remote Imaging Group, RIG. Membership is only a few pounds and the quarterly newsletter is packed with information about equipment, books, software, satellite news and charts showing pass times. Also, all RIG members have blanket permission from the DTI to watch weather satellites for amateur purposes. For details send an s.a.e. to **Phil Seaford, 14 Nevis Close, Leighton Buzzard, Beds LU7 7XD.**

The activities of AMSAT-UK are aimed more at amateur satellites, but they also cater to a lesser degree for weather satellite enthusiasts. They stock a wide range of software and books. An s.a.e. to **Ron Broadbent, 94 Herongate Road, Wanstead Park, London E12 5EQ** will bring details of the donation required and other information on AMSAT's work.

In Part 3 we will look at how to build a crossed dipoles antenna with matching amplifier and an inexpensive audio monitor-cum-level indicator. □

```
10 REM NOAA PREDICTOR BY PETER ROUSE (GUIDKD)
20 REM OFFERED AS PUBLIC DOMAIN SOFTWARE FOR THE BBC-B
30 VDU 3
40 CLS
50 PRINT:PRINT
60 PRINT "NOAA SATELLITE EQUATOR CROSSING TIME PREDICTOR"
70 PRINT "INPUT IN SEQUENCE SUPPLIED BY U.K. WEATHERWATCH"
80 PRINT "RECORDED DATA ON 025-683-448 AFTER 1800 HOURS"
90 PRINT:PRINT
100 INPUT "WHICH SATELLITE NUMBER",S:PRINT
110 IF S>10 OR S<9 THEN 40
120 INPUT "WHICH MONTH (NUMERICAL)",M:PRINT
130 INPUT "WHICH START DAY",Y:PRINT
140 INPUT "WHAT IS THE STOP DAY",T:PRINT
150 INPUT "EQUATORIAL CROSSING TIME (HOURS)",H:PRINT
160 INPUT "EQUATORIAL CROSSING TIME (MINUTES)",K:PRINT
170 INPUT "EQUATORIAL CROSSING TIME (SECONDS)",V:PRINT
180 INPUT "EQUATORIAL CROSSING POINT (DEGREES)",X:PRINT
190 INPUT "WHAT IS THE NODAL PERIOD",N:PRINT
200 INPUT "INCREMENT (IN DEGREES)",I:PRINT
210 REM DATA CHECK SEQUENCE
220 PRINT "THE SATELLITE IS NOAA";S
230 PRINT "START DATE IS ";Y;"/";M;"/";"1988"
240 PRINT "THE STOP DATE IS ";T;"/";M;"/";"1988"
250 PRINT "THE EQUATORIAL CROSSING TIME IS ";H; " HOURS ";K;
  " MINUTES ";V; " SECONDS"
260 K=K+(V/60)
270 PRINT "THE EQUATORIAL CROSSING POINT IS ";X; " DEGREES"
280 PRINT "THE NODAL PERIOD IS ";N; " MINUTES"
290 PRINT "THE INCREMENT IS ";I; " DEGREES"
300 INPUT "IS THIS CORRECT";B$
310 IF B$="N" THEN GOTO 40
320 INPUT "PRINTER (P) OR SCREEN (S)";R$
330 IF R$="P" THEN GOSUB 530
340 REM CALCULATION
350 PRINT:PRINT:PRINT
360 PRINT TAB(8)"NOAA";S;" NODAL PERIOD ";N;" MINS ";
  "INCREMENT ";I;" DEGREES"
370 PRINT
380 PRINT " D/M EXP H:M"
390 N=N/60
400 H=(K/60)+H
410 H=H+N:IF H>24 THEN H=H-24:Y=Y+1
420 X=X+I:IF X>360 THEN X=X-360
430 IF X<200 AND X>170 THEN GOTO 460
440 IF X<360 AND X>340 THEN GOTO 460
450 GOTO 410
460 K=(H-INT(H))*60
470 IF Y=T+1 THEN GOTO 500
480 PRINTY;"/";M;" ";INT(X); " ";INT(H);TAB(22)":";INT(K)
490 GOTO 410
500 PRINT:PRINT TAB(8)"AM PASSES ARE SOUTHBOUND - PM PASSES
  ARE NORTHBOUND."
510 VDU 3
520 INPUT "PRESS 'RETURN' TO RE-CYCLE",Z:GOTO 40
530 VDU 2:GOTO 350
```

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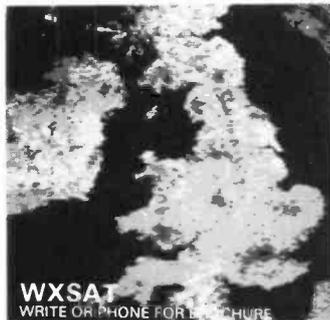
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# SONY ICF-PRO80

Peter Shore

The Japanese Sony Corporation considers the short wave listening hobby to be an important market and devotes considerable resources to the production of new equipment for this area. One of the latest is the PRO80.

## Facilities

The PRO80 is a compact, hand-held continuous coverage receiver, offering the user all frequencies between 150kHz and 108MHz. Frequencies 115.15 to 223MHz (for airband and public services) are available using a converter supplied with this model. At first glance, this set would appear to be a useful tool for anyone wishing to listen seriously both to broadcasters, amateurs and public services. However, closer inspection reveals that the set is missing many of the features which one would expect to find on sets for the serious listener.

The controls are located on the front and top of the set. On the front panel there are nineteen keys, most which have more than one function. It is using the main keypad that frequencies may be tuned directly — press DIRECT followed by the frequency in kHz, followed by EXECUTE. There is no tuning knob, but manual tuning is achieved by two buttons for either an increase or decrease in frequency.

The PRO-80 tunes only in 5kHz steps on short wave, with fine tuning for stations off channel. Mode is also selected using the front keys: AM WIDE; AM NARROW; FM; FM NARROW and SSB. There is a KEY PROTECT facility which enables the chosen station to be locked. The 40 memory channels are provided in four "pages", and this couples with a sophisticated scanning system. The various scan options are: entire frequency coverage of the set, limited scan between two frequencies input by the user (say 17.4 to 18.2MHz), memory scan of all the frequencies stored on any of the four memory pages or program memory scan which automatically scans only the station which have been programmed amongst all 40 memories, in the order programmed.

Controls on the top of the receiver comprise the main power switch, a TNC type connector for the telescopic antenna which is provided with the PRO80, the volume control (a rotary knob) coupled with a two-position tone control (change to high or low tone achieved by depressing the volume control knob), the rotary SQUELCH control which may be set to auto by depressing the knob and the FINE TUNE and SSB knob. To use either of these facilities, it is necessary to select the appropriate function using the front panel controls. Earphone and recording output jacks complete the top panel.

The add-on converter for 115.15 to 223MHz is attached at the TNC socket, with the telescopic antenna connected to the top. An additional two AA size cells are required for the converter.

The newly-launched ICF-PRO80 benefits from much technological developments, but who is it for and how well does it work? Peter Shore investigates.



## Using the Set

Whenever one obtains a new piece of equipment, one is inclined to pop in the batteries, switch on and use whatever it is with only a cursory glance at the handbook. With the Sony ICF-PRO80, that can simply not be done! The operation of the set is complex, and took this author some time to master the finer points.

Batteries are inserted into the rear of the set in a special slide-in box. When

changing the cells it is necessary to complete the operation within three minutes or all memories will be lost.

Direct frequency entry is straightforward, as outlined earlier, and feeding frequencies to one of the forty memories, or recalling one, is equally simple, the latter operation requiring just the touch of a single button.

The liquid crystal display is comprehensive, showing the frequency tuned in either kHz or MHz, the mode (narrow f.m., etc.), whether fine tuning is selected, memory number and page, key protect and priority. There is a TRY AGAIN message, coupled with a buzz to tell the user of an operator error. Successful operations are denoted by a beep!

When tuning the set, it is necessary to press each button within five seconds otherwise the operation fails and reverts to the last selected frequency.

Operation with the v.h.f. converter is more complex. After attaching the device to the TNC socket, it is necessary to remove the battery panel at the back of the set and extract the battery box. This will reveal a FREQUENCY DISPLAY button which must be moved to SHIFT. When the set is switched on once again, an "S" is displayed indicating that the frequency display can be shifted, which will read 100.150MHz. To shift the frequency, it is necessary to keep the PROGRAM key depressed whilst pressing DIRECT followed by the frequency 115000 then EXECUTE. Now frequencies can be displayed in the range of the converter's operation. When entering any frequency directly using the converter, it is necessary to enter three right-hand noughts, e.g. 123MHz must be entered as 123000. This is somewhat easy to forget when first using the set. A 30dB attenuator is provided on the converter.

Each time one wishes to return to the original frequency coverage of the PRO80, it is necessary to remove the batteries and set the FREQUENCY DISPLAY button in the set to NORMAL.

With only 5kHz tuning steps for direct entry on short wave, it is necessary to make frequent use of the fine tuning device, and it is a shame that the frequency display does not alter in conjunction with this device making it easier to know exactly what frequency one station may be using, rather than a hit and miss guesstimation. It was noticed that the frequency calibration on the test model was approximately 1.5kHz out.

The s.s.b. mode is straightforward, although the set's stability was questionable at times, and perhaps the filter is a little too wide for comfortable listening, requiring repeated adjustment to obtain the correct pitch.

The audio quality from the very small loudspeaker located on the front panel of the PRO80 is fair, but should one wish to connect an external speaker, the low audio output from the socket may prove problematic.

# SONY ICF-PRO80

## Performance

Sensitivity on both long and medium wave is poor, whilst on short wave and v.h.f., sensitivity is good and equal to sets such as the ICF-2001D. Sensitivity above 60MHz is poor, although the performance of the converter in this respect is good.

Selectivity on a.m. narrow is good for short wave, but this mode is too narrow for long wave and medium wave. Again, the short wave performance is equal to the 2001D. The a.g.c. holds a.f. output to within 5dB over a 100dB range of input and this is a good result.

The ultimate S/N ratio of 30dB on a strong signal is poor. Oscillator noise and image response of the PRO80 are both considered to be poor. Battery consumption is fair; around 11 hours with alkaline batteries and 2 hours with ordinary cells.

## Conclusions

The ICF-PRO80 is a novel set, limited

by its design and perhaps only moderate overall performance. It is aimed, perhaps, at the listener who wants more than either just short wave or v.h.f. scanning, but perhaps a combination of the two. However, the switching operation between the converter and the main set's coverage should be awarded a prize for its ridiculous complications.

The receiver, like a number of earlier Sony receivers, seems to have been designed by engineers without too much consideration for the end-user. It will be interesting to see what alterations will be made to the design in the coming months. It is certain that other Japanese manufacturers will jump on the bandwagon and bring out similar devices in the future. Until then, this receiver, costing around £350 in the UK, will suit the listener who wishes the benefit of a hand-held listening device which covers short wave and v.h.f., and who will put up with a complex switching operation and moderate performance. □

## SPECIFICATIONS

Frequency Coverage	150kHz – 108MHz 115.15 – 223MHz using FRG-80 converter
Power Output	400mW at 10% harmonic distortion
Power Requirements	4 x AA (R6) cells or AC-D4 6V d.c. converter unit (optional)
Dimensions	90 x 182 x 50mm FRQ-80 converter 40 x 98 x 31 mm
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Yaesu PA4C AC power supply for FRG9600	£ 16.50 (2.50)
Video card for FRG9600	£ 15.00 (2.00)
<b>NEW</b> Signal R535 VHF/UHF air band receiver 108-142.995MHz and 220.000-379.995MHz	£249.00 (4.00)
Signal R5375 air band handheld receiver, tunable 118-136MHz plus crystal control	£ 69.51 (3.00)
<b>NEW</b> Black Jaguar MK2 handheld VHF/UHF scanner 26-29.995MHz • 60-68MHz • 115-178MHz • 210-260MHz • 410-520MHz	£225.00 (4.00)
<b>NEW</b> WIN-108 synthesised airband scanner. 108-135-975MHz	£175.00 (4.00)

58 High Street,  
Newport Pagnell,  
Bucks. MK16 8AQ.

### Royal Blue

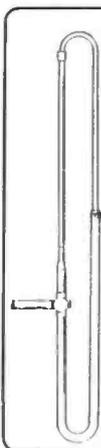


Photo Acoustics have pleasure in presenting the ROYAL BLUE — a Short Wave Listeners folded dipole antenna that covers 2-30MHz. Its neat and compact design (just 6' tall) makes it ideal for unobtrusive outdoor or indoor use. It will work quite happily on your roof or stood in the corner of your shack. It is a truly versatile antenna that will pull in the DX and which works exceptionally well with modern receivers such as the Yaesu FRG8800, Icom R71, Trio R2000 and so on.

To buy this superb new antenna, just send us £25, plus £3 for postage and packing and we will rush one to you.

### WATCH OUT FOR!

**NEW KENWOOD RZ-1** wideband AM/FM receiver. **500kHz-905MHz**. Ultra compact size, size of a car radio! FM stereo broadcast and multichannel TV sound. **Approx. £500.00**. Send a stamped addressed envelope for details.

### Aerials, ATUs and Accessories

KX3 SWL antenna tuner unit for general coverage receiver	P&P £ 67.28 (3.00)
MJ16010 SWL antenna tuner	£ 42.00 (3.00)
Trio HS5 high quality headphones	£ 37.54 (3.00)
Trio HS6 lightweight headphones (not enclosed type)	£ 24.36 (2.00)
Yaesu YH55 enclosed headphones	£ 19.99 (3.00)
Yaesu YH77 lightweight headphones	£ 19.99 (3.00)
G5RV (full size) 102' covers 80-10m	£ 16.75 (2.50)
G5RV (half size) 52' covers 40-10m	£ 14.25 (2.50)
Revcone 16 Element Discone 50-500MHz	£ 31.95 (3.00)
Icom AH7000 wideband discone 25-1300MHz	£ 82.00 (3.00)
Revco PA3 Masthead Preamp 10MHz to over 1GHz Includes special mains PSU	£ 49.95 (3.00)
50-metre rolls of copper wire	£ 7.95 (2.75)
<b>NEW:</b> FAX-1 HF FAX receiver. Obtain weather maps, press photographs and satellite cloud cover detail on any Epson FX-80 compatible printer (GOES WITH ANY HF RECEIVER) also receives RTTY	£279.95 (3.50)
CO660 data receiver for CW/RTTY/ASCII/TOR/AMTOR	£264.97 (5.00)
CO670 as above but with built in LCD display	£327.77 (5.00)

### Books

Confidential frequency list (NEW Edition)	P&P £ 5.95 (0.75)
Air traffic radio (NEW Edition)	£ 2.25 (0.75)
VHF/UHF airband frequency list (NEW Edition)	£ 5.95 (0.75)
The complete guide to VHF/UHF frequencies 25-2000MHz 1988 Edition	£ 4.95 (0.75)
Logbooks	£ 3.50 (0.75)
World radio teletype HF frequency list	£ 3.95 (0.75)
Guide to facsimile stations (IDEAL FOR USE WITH THE FAX-1)	£ 9.95 (0.75)
Radio Amateurs Exam Manual	£ 4.30 (0.75)
A Guide to Amateur Radio	£ 4.35 (0.75)
Towards the RAE	£ 3.80 (0.75)
How to pass the RAE	£ 3.00 (0.75)
HF Antennas for all locations	£ 8.20 (1.50)
The Radio Amateurs Question and answer manual	£ 7.50 (1.50)

**SPEND UP TO £1,200 INSTANTLY WITH A PHOTO ACOUSTICS LTD. CREDITCARD — APPLY FOR DETAILS PART EXCHANGE WELCOME, ASK FOR KERRY G6JZF OR ANDY G4YOW**

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# NITON RADIO

Elaine Richards G4LFM

British Telecom International (BTI) operates a network of 33 manned and unmanned radio stations around the coast of Britain. These stations offer a variety of medium (up to 400km) and short (up to 60km) range radio services for shipping and the offshore industry, as well as carrying out, on an agency basis, work for the DTI and Department of Transport. These services complement long-range radio and maritime satellite services provided by BTI from other locations.

Eight of these medium and short-range coast stations are currently manned. The DTI are introducing automated arrangements which will help to increase the efficiency of the services, and keep down the cost of services to customers. This involves reorganising the coast stations into two networks; the northern and southern regions. This will enable any one of the four manned stations in the north, or any one of the four in the south, to take on traffic from any of the other stations in their region.

Manned stations in the north are Wick, Stonehaven, Cullercoats and Portpatrick; in the south Land's End, Niton, North Foreland and Humber. Each region will have a distress watch and broadcast station, in the north this is to be Stonehaven and in the south, Land's End. The function of these regional control stations will be to provide 24-hour distress watch cover (on behalf of the Department of Transport) and 24-hour broadcast arrangements for maritime information, i.e. weather forecasts, navigational information, etc.

Other stations in the region will provide commercial traffic-handling facilities such as telephone calls and telegrams. Unlike now, they will not be manned for 24-hours a day but will take turns to provide out of hours cover for commercial traffic.

The reorganisation should make no difference to the standard of service to customers, and should be completed by the end of October this year.

As a fore-runner to this rationalisation of services, three coast stations — Niton, Humber and Stonehaven — had their wireless telegraphy (Morse) service withdrawn on 1 November 1987. This is because the Department of Transport no longer required a distress watch to be kept on the Morse distress frequency of 500kHz from those three stations, because of the much reduced level of signals on 500kHz nowadays. The DoT consider that the overlap between the five remaining stations is such that adequate coverage remains.

On the commercial side, while Morse traffic is declining, it is still being used extensively by ships, particularly on high frequencies. Portishead Radio is one of the busiest coast stations in the world and almost certainly the best equipped with modern transmitters and receivers. A recent visit to Portishead certainly bore out that claim, as the previous visit had been

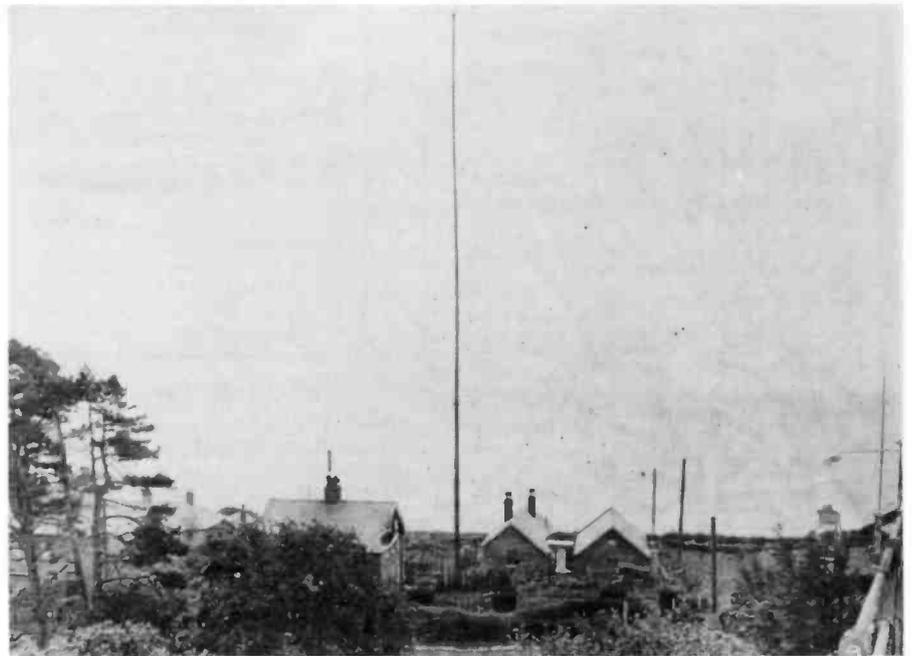
Recently we received a newspaper cutting regarding the closing of the Morse service from Niton Radio. This prompted a little research into coast stations and Niton in particular.



Present day Niton Radio.

eleven years earlier and things have certainly changed! They have recently introduced a computerised transmitter control and selection system to enable the Radio Officers in the control centre at Burnham to control the transmitters at Rugby. Also being developed is a new computerised message-handling system. The h.f. wireless telegraphy service will be maintained there as long as it is economically viable.

Niton Radio as it was in 1927.



## Niton Radio

The coast station at Niton has a history going back many years. In September 1909, it was one of six stations which the Post Office bought from the Marconi International Marine Communications Company to provide a medium-range distress and radiotelegraph service for the 286 British ships then equipped with radio. The number of British vessels licenced is somewhat larger now!

Not only has Niton seen changes in technology (more about that later) but it has seen a lot of changes in the ships themselves. Pre-war, the daily arrivals and departures from Southampton included such well-known names as the Cunarders *Queen Mary*, *Aquitania*, *Ascania* and *Mauretania*, and the P & O "Strath" liners, the Royal Mail Line's *Asturias* and *Almanzora*, the Union Castle's *Athlone Castle* and *Stirling Castle*.

Immediately after World War II, many of these ships were still in service. Now, while some passenger vessels still operate, most of the ships that navigate Spithead and the Solent carry bulk cargoes or containers. They are perhaps less glamorous and elegant, but often larger, more numerous and more demanding in their communications needs for safe and orderly arrival and departure. It has largely been the need for rapid communication and rapid decision that has led to expansion of the radiotelephone service and its extension into the field of yachts and pleasure craft.

A coast station's most important task is to be constantly on the alert for calls from ships in distress. From 1947 to 1948, all Niton's traffic was in Morse code, then the medium frequency radio telephone service was introduced. The v.h.f. service was introduced back in 1959.

As an example of their work, in 1978, Niton broadcast 76 distress calls. When

# Reader Questionnaire

It is now twelve months since *Short Wave Magazine* was re-launched as a magazine for the listening enthusiast. The changes have been dramatic — the increase in circulation alone would indicate that they have been in the right direction — but we would like to find out from our readers exactly what they would like to find in the magazine.

Some of the questions are aimed at finding out about your listening habits and what radio equipment you use. Others are on topics of general interest, while the remainder will give us the information to develop *SWM* along the lines you would like.

WIN-WIN



HF-125

DETAILS AT THE END OF THE QUESTIONNAIRE

## LISTENING HABITS

1 Have you ever listened to broadcast stations from outside your country in the past year?

Yes  No

2 The following stations can be heard in the UK. Please tick those you have heard:

R. Moscow <input type="checkbox"/>	R. Luxembourg <input type="checkbox"/>	R. Havana <input type="checkbox"/>
HCJB Voice of the Andes <input type="checkbox"/>	Trans World Radio <input type="checkbox"/>	R. Netherlands <input type="checkbox"/>
R. Monte Carlo <input type="checkbox"/>	R. Japan <input type="checkbox"/>	R. Beijing <input type="checkbox"/>
WRNO (USA) <input type="checkbox"/>	R. South Africa <input type="checkbox"/>	VOA (USA) <input type="checkbox"/>
R. Australia <input type="checkbox"/>	R. Sweden <input type="checkbox"/>	R. Warsaw <input type="checkbox"/>

3 Do you listen to international broadcasting on:

Medium wave  Short wave  Both

4 Why do you listen to international radio?

Interested in how different people live   
 Looking for alternative points of view to balance local news   
 Find programming not available locally   
 Religious programmes   
 Technical/DX hobby interest   
 More world news   
 Other, please specify

5 What days of the week do you usually listen to international broadcasting? (Tick as many as apply)

Monday <input type="checkbox"/>	Tuesday <input type="checkbox"/>	Wednesday <input type="checkbox"/>
Thursday <input type="checkbox"/>	Friday <input type="checkbox"/>	Saturday <input type="checkbox"/>
Sunday <input type="checkbox"/>		

6 What time of day do you usually listen to international radio:

0000 to 0600 <input type="checkbox"/>	0600 to 0900 <input type="checkbox"/>	0900 to 1200 <input type="checkbox"/>
1200 to 1500 <input type="checkbox"/>	1500 to 1800 <input type="checkbox"/>	1800 to 2000 <input type="checkbox"/>
2000 to 2200 <input type="checkbox"/>	2200 to 2400 <input type="checkbox"/>	No set time <input type="checkbox"/>

## EQUIPMENT

7 What kind of short wave receiver do you have? (Tick as many as apply)

General coverage (all-band)   
 Broadcast bands only   
 Amateur bands only   
 Transceiver

8 What kind of short wave receiving capability do you have? (tick as many as apply)

Single side band (s.s.b.)   
 Amplitude modulation (a.m.)   
 Frequency modulation (f.m.)

9 Does your receiver cover the 11 metre band?

Yes  No

10 Which of these Radio Clubs/Societies do you belong to?

AMSAT   
 BARTG   
 BATC   
 DXAGB   
 EDXC   
 G-QRP   
 RSGB   
 Radio Station DX Club   
 Local Radio Club

# Reader Questionnaire

## BACKGROUND

**11 How would you describe your expertise in radio/electronics?**

- Beginner   
 Average   
 Advanced

**12 How old were you when you first became interested in radio as a hobby?**

**13 Can you solder?**

- Yes  No

**14 Do you construct your own radio equipment or accessories (excluding antennas)?**

- Yes  No

**If "YES", how?**

- From your own designs   
 From designs published in books or magazines   
 From kits

**15 Is your antenna system:**

- Mounted on your house   
 Mounted on a tower/mast   
 In the loft   
 On, or in, the receiver

**16 Have you ever designed or made your own antenna?**

- Designed and made   
 Made from a published design   
 Never

**17 Do you own a home computer?**

- Yes  No

**If "YES" is it:** Class A  Class B

**18 Do you use it in conjunction with your hobby?**

- Yes  No

**19 Do you hold a current UK amateur transmitting licence?**

- Yes  No

**If "YES" is it:** Class A  Class B   
 How long have you held it?

**20 How many hours a week do you devote to radio? (Include time spent reading, writing and QSLing)**

- Up to 1 hour   
 2 to 5 hours   
 6 to 10 hours   
 11 to 20 hours   
 Over 21 hours

**21 How much money have you spent on radio within the past year? (Include magazines, club fees and other incidental expenses.)**

- Up to £50   
 £51 to £250   
 £251 to £500   
 £501 to £1000   
 £1001 to 2500   
 Over £2500

**22 How many radio rallies/exhibitions do you visit each year?**

- None  1  2 or 3  4 or more

**23 Has radio as a hobby influenced your choice of career?**

- Greatly  Somewhat  Not at all

## GENERAL INFORMATION

**24. How frequently do you use each of the following? (please tick one box in each row)**

	Almost every day	1 to 2 times weekly	1 to 2 times monthly	Rarely or never
Newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Television	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local Broadcast Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National Broadcast Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amateur Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Home Video System	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stereo Recordings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**25 Please state how often, if at all, you read each of the following magazines: (Please tick one box in each row)**

	All/Most ***	Occasionally **	Rarely *	Never
Amateur Radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Elektor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ham Radio Today	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio & Electronics World	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Short Wave Magazine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical Wireless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring Times (USA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Popular Communications (USA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
World Radio (USA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electronics & Wireless World	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio Communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please name)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\*\*\* 3 or 4 out of 4 issues \*\* 2 out of 4 issues \* 1 or less out of 4 issues

**26 How old are you?**

**27 What is your sex:**

- Female  Male

**28 How many years of formal education have you completed?**

**29 Please describe your occupation, or previous occupation if unemployed or retired.**

**30 Which national daily newspaper(s), if any, do you read most often?**

The Star	<input type="checkbox"/>	Daily Telegraph	<input type="checkbox"/>
The Sun	<input type="checkbox"/>	The Guardian	<input type="checkbox"/>
Daily Mirror	<input type="checkbox"/>	The Independent	<input type="checkbox"/>
Daily Mail	<input type="checkbox"/>	The Times	<input type="checkbox"/>
Today	<input type="checkbox"/>	Financial Times	<input type="checkbox"/>
Daily Express	<input type="checkbox"/>	Other (Please state)	<input type="checkbox"/>

# Reader Questionnaire

**31** Have you bought any of the following as a direct result of seeing an advertisement in **Short Wave Magazine**?

- Receiver
- Accessories
- Antennas
- Kits
- Components
- None of these

**32** How interested are you in reading about the following facets of radio in **Short Wave** magazine? (please tick one box in each row)

	Very Interested	Quite Interested	Not at all Interested
Broadcast listening on:			
Long/medium waves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Short waves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VHF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data comms (RTTY, FAX, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV-DXing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aircraft radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Licensed amateur radio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satellites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scanning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antennas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer applications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**33** Please state how interested you are in reading each of the following sorts of features in **Short Wave Magazine**? (please tick one box in each row)

	Very Interested	Quite Interested	Not at all Interested
What's New	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Word in Edgeways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
What Receiver/Scanner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seen & Heard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Airband	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scanning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bandscan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bookcase	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grassroots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rallies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Listen Out For	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advertisements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
History	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nostalgia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**34** How many people see your copy of **Short Wave Magazine**?

**35** Do you have any hobbies other than radio?

Yes  No

If "YES" what are they? .....

.....

.....

.....

.....

We would welcome any other comment you would like to make about **Short Wave Magazine**.

.....

.....

.....

## WIN A LOWE HF-125



Thank you for taking the trouble to fill in this questionnaire. To show our appreciation, we are giving away a very attractive prize to the winner of a simple competition, open to anyone returning a completed questionnaire.

Please write in the space provided how many completed questionnaires you think we will receive back by 25 March 1988. The correct answer and the nearest estimate will be announced in our July issue and the winner will receive a prize of a **Lowe HF-125** communications receiver. The five runners-up will each receive a 1 Year Subscription to **Short Wave Magazine**. The Editor's decision is final.

Please return your completed questionnaire to us in an envelope addressed:

**Short Wave Magazine (Competition)**  
**FREEPOST**  
**Enefco House**  
**The Quay**  
**Poole**  
**Dorset BH15 1PP**

You do not need to put a stamp on the envelope. Please do not enclose anything else with the questionnaire.

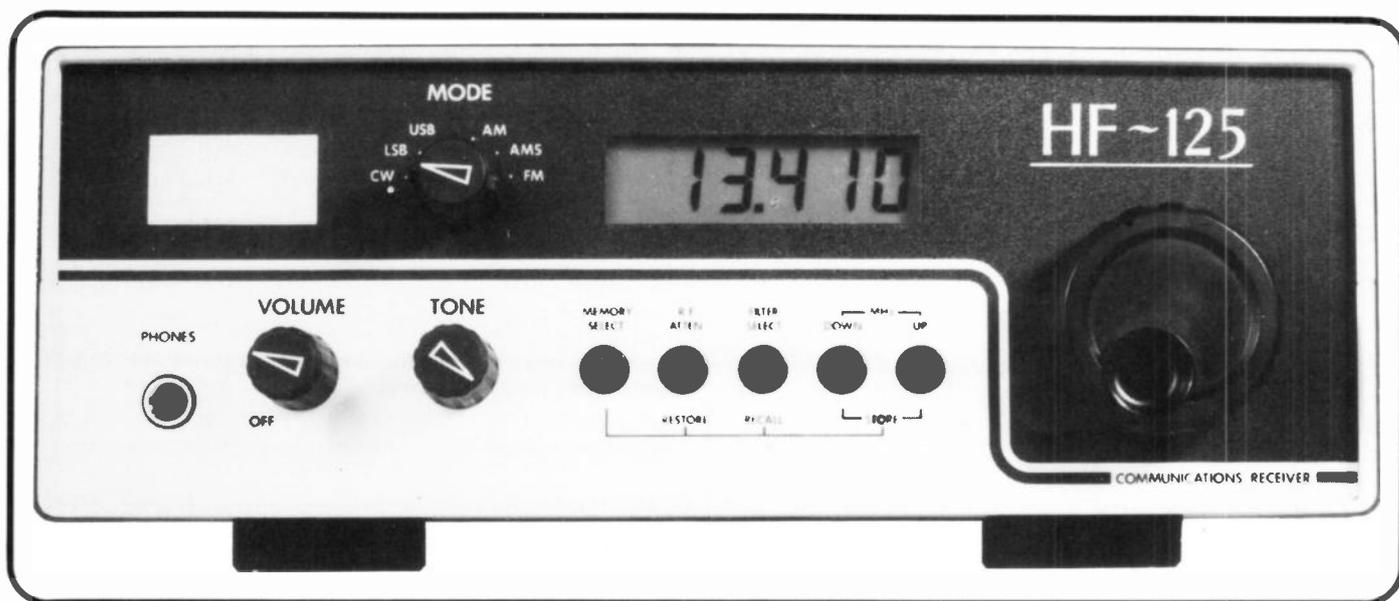
Although we will be using the results of the survey as mentioned at the beginning of the questionnaire, individual replies will, of course, be kept entirely confidential.

My estimate is:

Name and address: .....

.....

Post code: .....



The HF-125 short wave receiver was conceived, designed and is "Made in Britain" for the DX enthusiast. Its ability to perform on a crowded band with strong adjacent stations was a major consideration in its design. The HF-125 is also easy to use, the controls being simple and sensible. Essential bandwidth filters which are often options on other equipment are fitted as standard.

The HF-125 has continuous coverage from 30kHz to 30MHz. Operating modes are AM, USB, LSB and CW. An optional board (D-125) adds FM and synchronous AM. Unlike other receivers, the HF-125 comes complete with a comprehensive range of bandwidths; a 2.5kHz filter for SSB transmissions or for resolving an AM station using SSB mode and ECSS technique (exalted carrier, selectable side band), a 4kHz, 7kHz or 10kHz filter for AM reception, the width chosen dependent on the signal and band conditions. For the CW enthusiast a 400Hz audio filter is included as standard.

Operating the HF-125 is refreshingly simple. The receiver is switched on by a combined on/off volume knob and displays the last frequency used on a large backlit liquid crystal display.

Two buttons, one marked up, the other down, select the correct megahertz and you tune to the required frequency using a large heavy knob with a thoughtfully provided finger recess. The tuning rates relate to a simple design concept of two stations per knob revolution on each mode. Tuning on SSB and CW is in 15.6Hz steps. This allows accurate resolution of SSB signals and ECSS reception of AM. On AM and FM the tuning step is increased to provide comfortable station selection.

Mode selection is by a front panel switch. Initial filter selection is automatic and dependent on mode, AM switches in the 7kHz filter and SSB/CW the 2.5kHz filter. Checking the filter in use is easy, a momentary press of the FILTER SELECT button and the frequency display

changes to indicate the current filter width, another press of the button identifies the next filter on the display and at the same time switches to it. Repeated pressing of the button switches in the other filters in turn. Filters available for use on AM and SSB are 2.5, 4, 7 and 10kHz and on CW, 2.5kHz and 400Hz. If the D-125 optional board is fitted and Synchronous AM is selected the receiver automatically switches to the 4kHz filter. Again this choice can be overridden. On FM, filter width is fixed at 12kHz, the filter select button now switching the squelch in or out.

To further enhance reception other facilities are included. A noise blanker is permanently in circuit to deal with vehicle ignition interference, 20dB of RF attenuation can be switched in when required and an HF or LF cut tone control can be applied to the audio.

The HF-125 has 30 memories which are available in two banks of fifteen. There are four memory functions; review where by pressing the MEMORY SELECT button, frequencies stored in memory are briefly displayed (during memory select the receiver is still tuned to the original VFO frequency), RECALL which transfers memory frequency to VFO, RESTORE which returns the receiver to the original VFO frequency and STORE which transfers a frequency from VFO to memory.

Having now found the optimum reception the outstanding performance of the HF-125 is revealed. Typical values for frequencies greater than 500kHz are a sensitivity on SSB of  $0.3\mu\text{V}$  for 10dB S/N and on AM  $0.7\mu\text{V}$  for 10dB S/N at 70% modulation. Dynamic range is greater than 90dB at 50kHz from the tuned frequency.

The HF-125 operates from 12 volts DC and, as such, is suitable for use from an external battery whilst caravanning or boating. For home use an AC mains adapter is supplied with the receiver. For truly portable listening, in the garden or on a hilltop, an internal rechargeable battery, charger and active whip aerial option (P-125) is available.

Head Office and Showroom

# LOWE ELECTRONICS LIMITED

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

# NITON RADIO

such a call is heard, all routine work on that frequency stops while the coast station alerts the Coastguard, sends particulars of the distress to other ships and maintains communications with the rescue vessels, the Navy and Lloyds. The coast station also maintains a close liaison with the RNLI.

Like other coast stations, Niton also plays a part in preventing distress and casualty incidents. In one year they transmitted over 3600 navigation warnings, 1400 weather bulletins and 1000 gale warnings. They also dealt with 24 cases of medical advice and assistance.

## Expansion

Several factors led the Post Office to move Niton Radio control and its receiving antennas from the old site at Niton Undercliff to St Lawrence, 3km to the east. First, a new site was needed to enable the services to expand and keep pace with a continually growing number of calls, especially on v.h.f. Second, at Niton Undercliff there was a danger of a possible landslip affecting the station — as good a reason to move as any! Also, as the transmitters and receivers were so close to each other, mutual interference between them was creating a problem at the old station.

The transmitters are now at Rill Farm, about 6km west of the old station and about 9km away from the receivers. There are five masts, each about 49m high. The medium frequency receivers are located at the main St Lawrence site, while the v.h.f. transmitters are sited on St Boniface Down, one of the highest points on the Isle



Ancient and modern.

Below is Niton's Marconi d.f. receiver of Wight. Here there is one mast, 49m high, carrying seven antennas.

Finally came the necessity to re-equip all coast radio stations to meet the international requirements for single sideband (s.s.b.) radio telephone communication. This gave improved speech quality and range and only used half the bandwidth of previously used systems. Conserving bandwidth was vital in an area of radio congestion such as mid-Channel.

Niton was able to provide multiple-call working on v.h.f. and m.f. or a combination of both, and selective calling for rapid alerting.

Following privatisation in 1984, the station became part of British Telecom International. The last two major developments at Niton took place in November 1986 and June 1987. In 1986 they took over control of the radio services

provided by the Ilfracombe and Celtic radio stations and in June an automatic radiotelex circuit was opened, linking Niton to Portishead Radio Station.

## True Story

The following story really illustrates how important our coast stations are. On 23 October 1970, Dougie Shaw was approaching the end of his shift at 10pm. He received a distress call from the tanker *Pacific Glory*. A collision had occurred off St Catherine's Point (on the southern tip of the Isle of Wight) between *Pacific Glory* and the tanker *Allegro*.

The *Pacific Glory* called Niton and asked for a v.h.f./link call through to the ship's owners in London. Following standard procedure, the radio operator at Niton dialed through to London, established the call, and called back the *Pacific Glory* to put the call through. He received no reply. He called again, but again there was no reply. Mr Shaw's colleague on duty at Niton noticed a glow on the horizon from the south-facing windows of the station, and surmised it was the vessel in distress. Mr Shaw got up from his console to look and saw the ship silhouetted in flame, approximately 8km out to sea. The tanker had burst into flames between distress calls.

The station was kept very busy that night, communicating with the search and rescue vessels. Had it not been for the professionalism of the station staff and all those involved in the rescue, the appalling toll of casualties that night (13 dead out of 42 crew on board) could have been much worse. □

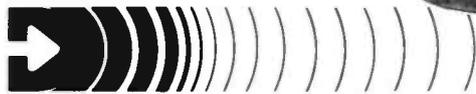


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# COMPUTER NOISE

Richard Wilmot

In almost every article on computer noise that I have seen in various magazines, the author has explained its origin by mentioning the high speed processor clock and its sharp transitions. While it is, indeed, true that all computers do have these clocks, the interference that they cause would just be the fundamental and harmonics every 1 MHz or so up through the bands.

However, as even the most casual user of computer and radio knows, this isn't what you get in practice. The main cause of computer noise is the video signal and its harmonics. With a clear, black screen you get the harmonics of the line and frame synchronisation pulses. The line frequency is 15.625kHz and the frame frequency is 50Hz, so you hear the familiar 50Hz background buzz all over the bands with stronger whistles superimposed on it every 15.625kHz.

With video information on the screen, the position is much the same but with an increased level of noise, the nature of which depends on the exact content of the screen display. It generally appears as fairly broad-band noise with some accentuation of the sync pulse buzz and whistles.

## Check the TV

As a first move in curing the problem, just check that it isn't, in fact, your TV set which is causing the trouble. Try switching it off and disconnecting it from the computer and listen for any improvement. If it is pushing out noise, the only real answer is to use another one which is clean, as screening and filtering a TV set is not usually very successful. Fortunately, most sets do not produce noise problems and only a very small minority create real trouble.

At this point, I should mention that the RGB video output of the BBC computer produces a truly horrific amount of noise and should definitely not be used, or even left connected, as it is the loading of this signal which causes the trouble. Use the u.h.f. output to a TV antenna socket or the PAL (BNC socket) output to a monitor. If you want a colour display from the PAL signal, you will have to connect the two contacts of Link 39 on the computer p.c.b. This is next to the u.h.f. modulator on the board and is clearly labelled. In my experience, careful adjustment of the monitor controls, especially the colour saturation, is needed to achieve a good colour picture and even then the quality is much poorer than that from the RGB signal. If colour is not specifically needed, you get a better definition (nearly up to RGB standard) by leaving Link 39 disconnected. Connecting the two sides of the Link to a miniature switch mounted near the BNC socket on the back of the BBC, gives you the best of both worlds. If you have a RGB-only monitor, you've got problems as PAL to RGB converters are

**There is no single, easy cure for computer noise. However, if you tackle the problem in a calm, logical and informed way, you can, in most instances, reduce the noise to an acceptable level. Each situation is different and must be individually analysed and solved. All that an article like this can do is to tell you some of the things to try.**

hard to come by and expensive. Unless you can find one, you'll have to get a PAL monitor or a TV set.

## Antennas

The next item to consider is your antenna. This should be as good as you can possibly make it and any effort put in to improve it will be well rewarded. It should be sited as high and as far away from the computer as possible so as to maximise the ratio of signal to noise pick-up. Balanced antennas (e.g. dipoles) pick up noticeably less noise than unbalanced ones (e.g. long wires), so it is usually worth putting up a dipole, if you have the space, for any band which is of particular interest. For general short wave listening, however, a long wire is easily the most common and practical antenna but to be effective it really needs to be as long as possible, certainly at least 20 metres. If you do not have the space to put up such a length then you should seriously consider using one of the active antennas currently available. The use of an antenna tuning unit (a.t.u.) can often improve the performance of a long wire against computer noise, although this is not always the case. Finally, those of you with portable receivers should not be tempted to use just the built-in whip antenna. It may produce clear signals when no computer is present but I have yet to hear of one instance where it has produced enough signal to get good copy on a computer decoder.

## What Next?

What you do next depends on exactly how the noise is getting from your computer to the radio. There are three possibilities: direct radiation from the computer itself and its leads, conduction via the power supply through the mains and conduction through any interface unit which you may have connected between the radio and computer.

First, remove any connection between radio and computer. This will probably produce a big reduction in the noise if the interface did not contain isolation as this is usually how most of the noise is transferred.

To distinguish between radiation and

conduction through the mains, disconnect the radio from the mains and run it from a battery. Any reduction in the noise indicates mains-borne interference. The remaining noise is caused by radiation.

If mains-borne noise is a problem, it can sometimes be greatly reduced by simply plugging the computer power supply and radio into different mains sockets as far apart as possible, especially if they are not on the same section of the mains house wiring. Otherwise, it can usually be reduced by the standard practice of wrapping the power lead round a ferrite ring. You may need to do the video lead as well — try disconnecting it to see if it is contributing to the problem. The ring should be as close to the computer as possible and experiment to find the optimum number of turns required.

## Direct Radiation

Direct radiation is more difficult to deal with. If you have followed my advice about antennas, you should have reduced the noise on the short waves to something approaching h.f. band noise levels and the scope for further improvement is, therefore, limited. On v.h.f., the problem may be more acute. First, make sure that your radio is well earthed. If you are not using the mains earth, bear in mind that a simple stake in the ground has a surprisingly high impedance. Even a thick wire buried for tens of metres can be satisfactory, especially if the vertical conductivity of the ground is low. If you are using a long-wire antenna, it may be helpful to screen the first few metres nearest the radio as this section picks up most noise and least signal.

## Screening the Computer

If the radiation noise is still too high, you will have to screen the computer. This is not a job for the novice or the faint-hearted. More than one person has screened his machine only to find that when he reassembled it the ungrateful beast either refused to work or even blew a fuse (or worse!). Unless you are competent to troubleshoot any problems, you should think five times before attempting such a task. Having said that, several people have produced dramatic reductions in noise radiation which have made all the difference between being able to operate with the computer running and not. From the very limited amount of information available, it seems that this improvement is most likely to be realised at v.h.f. The usual method of screening a computer is to spray a film of nickel on to the inside of the case. You will need to remove the contents first and then put it all back afterwards, being very careful that you don't create any short-circuits to your newly conducting case. The nickel film must be properly bonded to the computer

# COMPUTER NOISE

ground and conductive adhesive tape can come in handy here. You must also make sure that film "sticks" well to the case as the last thing you want is a portion of it flaking off and causing a short-circuit on the p.c.b.

You may also find it worthwhile to screen the connecting leads to printer, disk drive, etc. Screened ribbon cable is available but expensive, so you will probably do your experimenting with kitchen foil. Again, the screening must be properly grounded.

## RTTY

If you just want the computer to run, say, a satellite predictor or logbook program while you operate, then I hope that you have now succeeded in reducing the noise to an acceptable level.

If, however, you are using the computer to decode RTTY, c.w., etc, then the noise conducted through most terminal units and other interfaces will still probably be the main source of interference. It is possible to buy interfaces which provide isolation between computer and radio (i.e. there is no direct connection between them), and using these will eliminate this source of noise. Otherwise, you will either have to try winding the leads round ferrite beads or use some sort of isolator to reduce the noise. Note that the noise is conducted as much along the common ground connection as anything and so you won't reduce it by using screened cable for these leads.

If the signal is presented to the computer at TTL level, it is possible to use an opto-isolator, which can provide very effective isolation. A typical circuit is given in Fig. 1. Resistor R1 limits the photo-

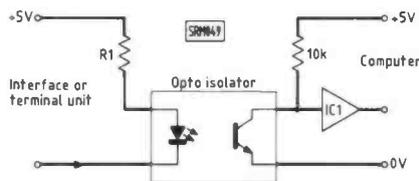


Fig. 1

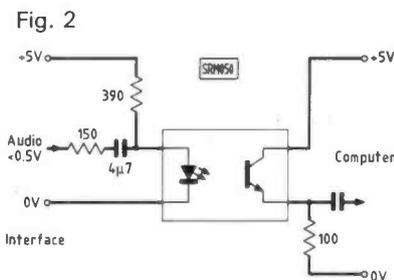


Fig. 2

diode current to a value that does not overload the driving circuit, but should otherwise be as low as possible. Use  $220\Omega$  if driven from 74 series gates and  $470\Omega$  if from 74LS series. IC1 can be almost any type of buffer or gate and is there to reshape the signal to a square wave, as the output from the photo-transistor has a rather long rise time. When operating a transceiver program, a similar circuit can be used, but the two sides of the isolator must have completely separate power supplies and ground connections or you will short-circuit the isolation. With suitable changes in component values, this circuit can also be used for RS232 level signals.

There are two possibilities to isolate audio signals at loudspeaker level or less. These techniques will be needed if you are using direct connection software (e.g. the Spectrum EAR socket programs). An

ordinary audio transformer has been used to provide a moderate amount of isolation which may be sufficient. Otherwise, you can use an opto-isolator in a circuit such as Fig. 2, remembering the constraints on the power supplies mentioned above. The audio signal output from this circuit will be less than the input voltage and so some further amplification may be needed.

As I said at the beginning, each noise problem is different and needs individual analysis and treatment. I hope that I have been able to point out the various things which you can do to help the situation, but only you will be able to determine which methods produce the best results in your particular case. There is really no point in phoning someone hundreds of miles away for help — this is a problem which has to be solved by experimentation on-site. The best general advice is to go for the easy solutions first and leave the difficult stuff, like screening the inside of the computer, to the end if all else fails. It is quite likely that an hour spent in the garden putting up a better antenna will improve your noise situation more than a day spent messing about with ferrite rings and aerosols.

## Let Everyone Know

If you have successfully tackled this problem, please write to the Editor about your experiences so that all the readers can benefit? Even if you tried something which didn't work, this information is still useful to help guide others. To those who haven't yet attempted it, I hope that you now feel more confident of success. It can be, at times, a difficult task but one which amply repays the time spent in solving it when you hear those clear signals every time you switch on. □

## OBITUARY

### Len Eastman G8UUE

I had known Len for nearly ten years when he died peacefully in his sleep, at the age of 71, on Sunday night, January 10. With his going I shall miss not only a friend but an ever-ready source of information on Television.

It was our common interest in Television that brought Len and I together. Although Len was the proud holder of an amateur radio callsign, he was really a short wave watcher at heart. There wasn't a happening on television that Len didn't watch or record. He was probably the country's top man when it came to the reception of Sporadic-E television signals. His photographs, taken live off the television screen, have been seen in periodicals such as *Practical Wireless* and *Short Wave Magazine* for many years.

Many a club evening has been livened up with Len's videos on Sanish Dancing from Spain or a news broadcast from Russia. Apart from the reception of television pictures, and it is said that Len was the first person to actually own a television in Bristol. Len also transmitted television pictures, as he had a very comprehensive amateur television station and his callsign was seen for many years in and around Bristol. He also managed to work the continent on many occasions. However, it didn't stop there as Len had more patience with new comers to television than anybody else I know, he would spend hours sending pictures to assist a fellow amateur in setting up his equipment. More recently, Len was able to put his station to good use when he assisted with signal strength reports for the Bristol TV repeater during its commissioning phase.

Len had a very active life working for Rolls Royce Aeroengines Division in Bristol. On his retirement, he undertook the holiday of a lifetime and went to America. Film of this holiday could often be seen on the regular Sunday evening TV net. A net which Len hardly ever missed, In fact, he was on the net talking and showing pictures to a host of operators in the Bristol area on Sunday evening, January 10.

Sadly the last entry in his log for that day is that of, "Station Closed".

Roger Worth G4ZQF

# STARTING OUT

Brian Oddy G3FEX

Although the very early superhet receivers had to convert the incoming signal ( $f_c$ ) to a low i.f. to avoid losses, subsequent improvements in components reduced the losses and made it possible to process a signal in the h.f. spectrum with little loss and relative ease. Despite further technical advances, the practice of using a low i.f. continued and it is still employed in many modern inexpensive receivers. This is mainly because i.f. tuned circuits can be sharply tuned to provide the selectivity needed in the i.f. chain at reasonable cost.

Simple receivers using a low i.f. are often satisfactory up to about 10MHz, but above that frequency the tuned circuits associated with the input of the mixer become less selective due to losses and unwanted image signals arise — see "Starting Out", *SWM* February '88. Adding tuned r.f. stages ahead of the mixer can help improve the image ratio and also enhance the weak signal performance of the RX. Consequently, many of the older valved communication receivers which used a low i.f. employed at least one gang-tuned r.f. amplifier stage ahead of the mixer. The famous National HRO, for example, had two such stages and used a plug-in coil assembly for each band to reduce losses and simplify wavechanging. The later RCA AR88 used a complex wavechange switch to select the appropriate coils for the two r.f. stages, the mixer and the local oscillator on each of its six ranges.

Since image signals stem from a band twice the i.f. away from the wanted signal,  $f_c$  and on the same side of  $f_c$  as the local oscillator ( $f_o$ ), another easy way of improving the image response is to operate  $f_o$  at several (or even many) megahertz above  $f_c$  so that a high intermediate frequency difference signal ( $f_o - f_c$ ) results. The selectivity of the mixer tuned circuit will then be adequate to reject the unwanted image signals because of the large frequency difference involved. Unfortunately it is not a simple matter to provide adequate selectivity in high frequency i.f. stages, so a conflicting choice arises: a high i.f. for good image response, or a low i.f. for good selectivity.

## Dual Conversion

Most of the more advanced modern superhet designs combine these two

Brian Oddy continues this month by looking at the more advanced designs of receivers, such as the double conversion superhet, and how they achieve their improved performance.

concepts and convert  $f_c$  initially to a high intermediate frequency (IF1) to ensure that a high image ratio exists; then a second mixer is used to convert IF1 to a lower intermediate frequency (IF2) so that adequate selectivity can be achieved by using sharply tuned i.f. circuits before further processing takes place in subsequent stages of the receiver. An RX of this type is known as a **dual conversion receiver**, or double-superhet.

The block diagram of one type of dual conversion receiver is shown in Fig. 1. In this version the r.f. amplifier, first mixer and first local oscillator stages are tuned by ganged variable capacitors so that they remain in step throughout each range selected by the wavechange switch; however, the first local oscillator ( $f_{o1}$ ) always operates above the desired signal ( $f_c$ ) by an amount corresponding to the first intermediate frequency (IF1).

## Stability

The first oscillator must possess good stability. When a frequency synthesiser is used to act as one, the tuning of the r.f. amplifier and first mixer are ganged and brought out as a separate front panel control marked **preselector**, and this has to be peaked up on a desired signal once the synthesiser has been set to the correct frequency. Receivers of this type often employ a **digital frequency display** to indicate to the nearest 100Hz the frequency to which the RX is tuned.

The output of the first mixer (IF1) is passed through a ceramic filter (FL1) to attenuate unwanted frequencies before it enters the first i.f. amplifier. The second mixer input is pre-set tuned to IF1 and the second local oscillator ( $f_{o2}$ ) operates on a frequency equivalent to  $IF1 + IF2$ ; it is derived from a quartz crystal (X1) to ensure stability. Both local oscillators need to be well screened if spurious signals resulting from their harmonics are to be avoided.

## Variable Selectivity

The second i.f. stages are pre-set tuned to the chosen low intermediate frequency (IF2) and a choice of quartz filters (FL2 and FL3) enable the selectivity to be varied. Since short wave a.m. broadcasts are spaced at 5kHz intervals throughout the bands, the wide filter FL2 will usually have a bandwidth of 5kHz to allow all of the incoming signal to be accommodated.

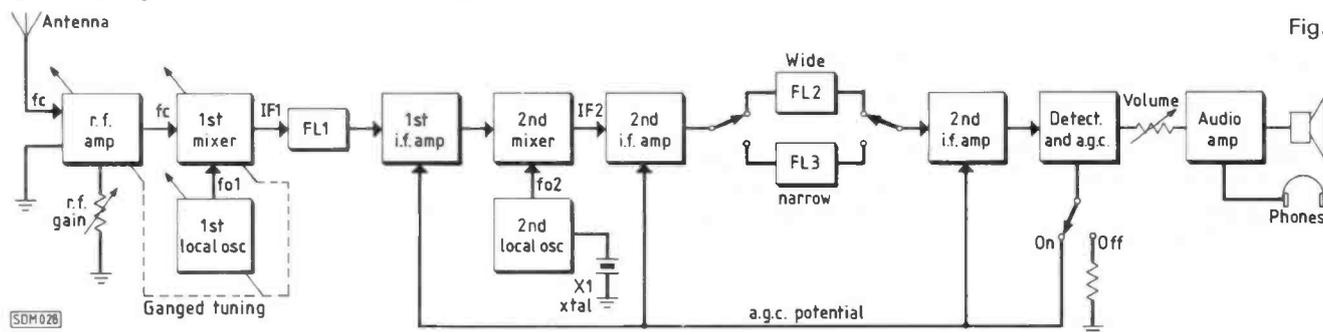
When adjacent channel interference arises, the narrow filter FL3 with a bandwidth of perhaps 2.4kHz may be selected. Such a narrow filter will degrade the wanted signal since it will cut off its higher frequency sidebands, but the unwanted interference will be substantially reduced. Some RXs have additional filters to cater for s.s.b. and c.w. signals, and the need for them will become apparent when reception of these modes is discussed later in this series.

Part of the signal output of the last i.f. amplifier is converted into d.c. potential which varies with signal level, and this is used to automatically control the gain (a.g.c.) of each i.f. stage. A three-position switch marked FAST/SLOW/OFF may be provided to vary the attack and decay time constants of the a.g.c., or turn it off. In some RXs the a.g.c. potential is also used to unbalance a bridge circuit so that a meter placed across the bridge may indicate relative signal strength in SINPO "S" units from 1–5, or in "S" units of the RST code from 0–9.

The a.g.c. potential is not usually applied to the r.f. stage because high amplification at low noise is required there to enhance the overall signal-to-noise ratio of the RX. A potent undesired signal may be amplified to the point where it may swamp a later stage and cause **cross-modulation** effects, whereby the modulation of the unwanted signal is superimposed on a wanted one; a manual r.f. gain control is therefore provided. An alternative approach is to use an **r.f. attenuator** ahead of the r.f. amplifier so that the amplitude of all signals from the antenna may be reduced in steps of 10dB from 0 to -40dB.

The detector stage demodulates IF2 so as to recover the original modulating audio, which is then amplified sufficiently to drive a loudspeaker.

Fig. 1.



# STARTING OUT

## Other Designs

In another type of double-conversion system the tuning of the r.f. stage, first mixer and first local oscillator is fixed, and the tuning of the first i.f., second mixer input and the second local oscillator is made variable — see Fig. 2. This block diagram only covers the stages up to the output of the second mixer, since the second i.f. and subsequent stages are similar to those shown in Fig. 1.

In this version a band-pass filter at the input to the r.f. amplifier allows a narrow band of signals, including the desired one ( $f_c$ ), to be amplified. When this narrow band of signals is mixed with the crystal controlled output from  $f_{o1}$ , the resulting

mixer output (IF1) is also spread over a narrow band. The tuning of the first i.f. amplifier, second mixer and second local oscillator is ganged and variable, but it may only be varied within the narrow band of IF1 so that a wanted signal may be selected and converted to the fixed low intermediate frequency (IF2), and then processed in the subsequent stages of the receiver.

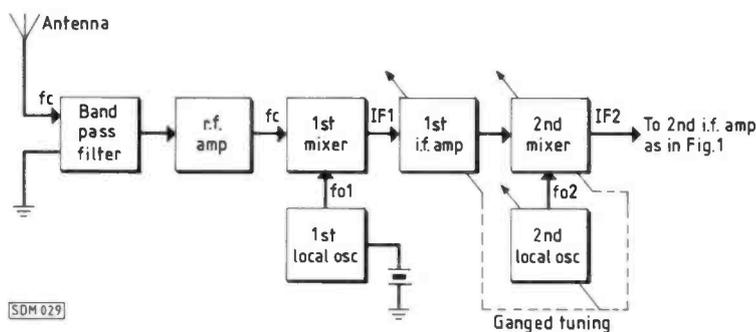
In effect this means that the RX will only tune across a narrow segment of the h.f. spectrum — perhaps 1MHz wide. To change the range it will be necessary to select an appropriate band-pass filter and a suitable crystal. The tuning rate of the second oscillator will be the same on every band, and since it only has to cover a

limited tuning range it may be easier to achieve good stability.

The first three building blocks of Fig. 2, namely r.f. amplifier, mixer and crystal oscillator form the basis of many of the commercial add-on converters which may be used ahead of an existing s.w. receiver to extend its range or improve its performance; for example, a converter with a 144-146MHz input and a 28-30MHz output will enable a s.w. RX covering the 28MHz band to tune across the 144MHz amateur band!

Although the block diagrams have served to illustrate the general principles behind receivers of this type, many superior designs using variations of these principles have evolved during the last decade or two. Some modern communications receiver designs use triple or even quadruple conversion systems to enhance their performance and often convert the incoming signal to a first i.f. in the v.h.f. region — perhaps 44MHz or higher. The second i.f. may be around 9MHz and the third i.f. at 455kHz; if a fourth i.f. is included a frequency of 50kHz is frequently chosen. Of course, in such complex designs the four local oscillator frequencies have to be chosen with great care to avoid spurious responses, and high stability is essential! □

Fig. 2.



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# SEEN & HEARD

## AMATEUR BANDS ROUND-UP

Justin Cooper

PO Box 4, Newtown SY16 1ZZ

### All-Time Post War HPX Ladder

Name	Phone Only	Prefixes
B. Hughes (Harvington)		3353
E. M. Gauci (Malta)		3298
E. W. Robinson (Felixstowe)		2653
M. Ribton (Gillingham)		2103
M. Rodgers (Bolton)		1827
R. Shilvock (Halesowen)		1659
N. Henbrey (Northiam)		1615
B. Patchett (Sheffield)		1307
C. R. Eve (Jersey)		1165
A. Woodcock (Denmark)		986
B. E. Woodcock (Leeds 17)		890
R. G. Williams (Borehamwood)		874
S. Burgess (Stockport)		776
L. Marcquardt (Hereford)		634
D. R. Tanswell (Iver)		621
<b>CW Only</b>		
H. Scott (Rievaulx)		1396
N. Melville (Edmonton)		1241
P. J. Barnes (Blackpool)		548
M. Rodgers (Bolton)		347
C. R. Eve (Jersey, C.I.)		342
<b>RTTY Only</b>		
W. J. Prior (Lochcarron)		552
C. R. Eve (Jersey, C.I.)		500
N. Henbrey (Northiam)		334
D. R. Tanswell (Iver)		301
M. Rodgers (Harwood)		270

Starting score, 500 for Phone, 200 for CW or RTTY. Entries in accordance with HPX Rules.

### Annual HPX Ladder Starting date January 1, 1987

Name	Prefixes
P. McAllen (Southampton)	477
J. J. Sales (Lancaster)	450
A. Hall (Lockington)	406
S. Hill (Port Talbot)	339
N. K. Yule (Bengeo)	302
S. Myers (Liverpool 9)	210

This is the last showing of the 1987 Annual Table, to December 31, 1987. The first listings for 1988 will appear in the next issue of this piece. 200 Prefixes to have been heard for an entry to be made in accordance with HPX Rules. At score 500, transfer to the All-Time list is automatic. Note, the Annual Table is a Phone only listing.

### Most in 1987

E. M. Gauci (Malta)	1049
---------------------	------

Rules as for the Annual Listing. An entry for this listing must be in addition to any claim for the All Time Post War listing.

dropped out as he had an RAE pass and a licence under his belt. I tried the same trick a couple of weekends ago, and logged 200 prefixes in a weekend stint, first on s.s.b. and then again on c.w. — and got a LOT more kick out of it than out of the main station receiver in the process!

### Letters

S. Myers (Liverpool 9) got interested in the amateur bands after reading the October 1987 issue. Steven uses a Philips D2935 receiver, and is aiming at a Datong Active Antenna for the next stage. There is an interesting point in Steven's list of prefixes; he has claimed A6XBVK. Now, clearly he has heard A6XB in contact with

someone . . . or has he? IF — and only if — the operators concerned were using the proper procedure of "own callsign last", then Steven could have heard a VK working A6XB, and losing the back-end of the VK call in a burst of QRM. On the other hand the sloppy abbreviated operating procedures often heard, with either a callsign omitted or a case where A6XB was looking for VK as a directional call. Such operating practices do make things difficult for the SWL newcomer, one could wish for a considerable improvement — though we won't get it!! In this particular case, I am fairly certain that Steven did in fact latch on to A6XB, so the prefix has been allowed to stand.

On a different tack, included in Steven's list I noted W6SAI, who is Bill Orr the well known amateur radio author.

Next to D. A. Whitaker (Harrogate), he has had a most successful 1987, beating his previous countries-heard score by one, thanks to ARRL's recent decision on Aruba! On 7MHz some 161 countries were heard, on 3.5MHz 162 and on Top Band 77, all on s.s.b.

Another new entry comes from N. K. Yule (Bengeo) who came to the amateur bands by way of an interest in oceanic aircraft communications. The receiver is an R600, used with a Mizuho KX3 a.t.u., which in turn is connected to twenty metres of wire suspended at roof-top height, running N-S. The start date was November 20, and the log is up to December 31 — 302 prefixes. The station is operated on all bands, but evidently 21MHz is the favourite. I was amused to note that the first time he came across a pile-up, it was the one on VK9YV on Cocos-Keeling — a baptism of fire indeed!

The SY1UA signal was, in its way, a disappointment to many, as DX operators have come to regard SY as Mount Athos; SY1UA was in fact a 150th anniversary celebration of the University of Athens.

Now Chris Eve (St. Helier, Jersey), he has been thinking about scanners for v.h.f. and narrow f.m. on 28 and 144MHz. By knocking just one of his priorities out of the spec, Chris was able to find a Sony PRO 80 which met all the others, at just under £300. It seems quite good when compared with the main station receiver, and it now sits peacefully alongside scanning for beacons when it isn't being used to attack both ends of a split-frequency contact.

P. Broadbent (Hartlepool) was one of the members of the VE8RCS club station, and is now taking up the hobby again. Paul wants to know if QSLs are required for HPX — quick answer to that is "no". As for the Annual Table, it runs each year from January 1 to December 31, and then restarts; however, when you reach 500 Prefixes I shift you into the All-Time listings. To date Paul has 152 prefixes logged, using a Panasonic DR48 receiver plus the provided wire antenna.

M. Ribton (Gillingham) puts up his usual nice list of new prefixes, and adds a note to say he doesn't know "whether it is an improvement or not". All I can say is, I wish I had as good in my own log!

It is very noticeable that over the two decades since I began writing about amateur radio topics, the average age of the contributors has risen. One wonders why this is. One thought which occurs is that the way in which a newcomer comes into the hobby.

Today's newcomer is faced with a huge variety of manufacturers' rigs to choose from, most of which have a high price tag — especially to a youngster on pocket money or low wages. The idea of home construction of a receiver is never really pushed and made appealing enough. Most people think they're not capable of building something as complicated as a receiver, but it doesn't have to be complicated or built from scratch.

In fact, one can produce, easily enough, a simple receiver that will in skilled hands produce a good performance using no more than, say, three or four transistors, a couple of diodes and a pair of "el cheapo" headphones, provided one is game to accept single band operation.

Even that approach can be regarded as over complicated. How about this for a scenario? Take one transistor or valve portable radio lacking a b.f.o. but covering one or more amateur bands; couple it to an antenna. Take one other transistor portable, preferably covering rather similar ranges of frequency. Switch on the first receiver, and tune to an amateur band. Listen for a noise like "Donald Duck with a peg on his nose", (this is the sound of an s.s.b. signal heard without a receiver beat oscillator). Tune this as accurately as you can.

Now you switch the second receiver on. If it covers similar ranges, tune it around 400-500kHz lower in frequency. If it doesn't cover this range, try half this frequency, one-third, or one quarter. Tune the second receiver carefully around with the volume control right back until you hear the whistle as you tune through the signal on the first receiver. Now tune the second receiver even more carefully until you "resolve" the audio coming out of the first receiver; you may need to adjust the spacing of the second receiver from the first or from the antenna wire, or rotate one receiver relative to the other to adjust the degree of coupling. To tune around the band, you simply adjust both receivers in step, and maybe reduce the coupling on a weak signal.

You don't believe it can be done? Let's just say that one contributor got his first 1000 prefixes or so that way, and then

# SEEN & HEARD

I noted CJ1FG for the Winter Olympics, being VO1FG; IY5MR for a Marconi commemoration, various assorted W200 signals, commemorating the 200th anniversary of the American constitution, while TO8KC was a French Polynesian special-activity station.

E. M. Gauci (Malta) heard JY1; the first time he has appeared in a log to this piece for some years. The operator of JY1 is of course King Hussein of Jordan.

The main activity at the moment for M. Rodgers (Harwood) is c.w., although he does listen to other modes. Mike managed C31 for Andorra, an LB8 for a new Norwegian prefix and RFO in Georgia, USSR for the pick of the crop.

P. Barnes (Blackpool) had only fifteen in his list; as the evenings draw in, Peter says, the bands are shut by the time he gets at them. VX3HO sounded odd to Peter, but worked several stations and gave the name of Garth, and location "near Niagara". I looked up the references and noted that VE3HO is in Ontario, and the towns on either side are Niagara Falls, S. Ontario, Canada on the East bank opposite the falls, with a population of 60,000, and Niagara

on the West Bank, which is in New York State and has a population of 100,000; the two are joined by bridges. Probably some form of special-event activity from the east bank.

Now I come to S. Burgess (Stockport) who has unwrapped a prize comedy of errors over his HPX Listing; he claimed 603 and somehow that got turned into 301; then I had a 127, and in front of me I have a Nil return according to the letter, and a list of 46 new ones. All of this would be easy if everyone would be SURE to note on their list, in accordance with Rule 8, the OLD score to which the NEW score is to be added. If you do this, and I get into a tangle, I can use it to get me back to the beginning, so the slip doesn't show. Turning to the claim, alas I must delete ZA — no activity from Albania has been allowed in years, and frankly I am a bit doubtful about the ZA2RPS operation that was accepted about twenty years ago. On the other hand, I see no reason to doubt the 6W100AD — doubtless

yet another special-event job.

N. Melville (London N18) sticks to his c.w. last and for the pick of his crop offers VK9YD. Neil was doubtful of the W200 series of stations, but as already noted these commemorate 200 years of the American Constitution.

Turning to B. Woodcock (Leeds 17), Basil has established that the incoming noise is antenna-borne, which removes the need for much mains filtering, although I feel a mains filter is no bad thing. Such need be no more than a ferrite ring of suitable grade; take off the mains plug, wind eight or ten turns of the mains lead around the ferrite ring, so that the ring is as near as you can get to the receiver, then put the plug back on, with great care to get live, neutral and earth on the right plug pins. I stress the latter both for safety reasons and because I once had a serious interference problem caused by someone borrowing a mains lead for NFD, changing the plug, and then reversing live and neutral when rewiring it for return to me!

On a different tack, Basil bewails the lack of QSL returns from his reports; an eternal problem, and one which can only be solved by sending much more lengthy reports; by and large, the real DXpedition isn't too bad, provided you go the proper route called for by the DX station; it's the home-based Ordinary Joes who are so stingy with QSLs.

## Other Points

Since commencing this piece I have had some snow, over the night of 21/22 January; one thing no wire antenna takes kindly to is having a layer of snow fall on it, which then solidifies and freezes. Oddly enough, while it was inches thick on the 28 s.w.g. wire, the rope guys for the mast had only a thin coating, as did the coaxial cable where it runs horizontally. I had just got up, and looked outside while waiting for the tea to brew and was just in time to see the wire decide to "call it a day" and slip with quiet dignity to the ground! Luckily I had some spare wire, and ten minutes work later in the day resolved the problem.

One last point, please note the new address, all mail to arrive by the deadlines please.

Deadlines are March 15,  
April 19 and May 10

## DECODE

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

## RTTY

A bumper selection of reports this month starting with Ian Baxter. One of Ian's main interests is the reception of RTTY, both amateur and commercial, which is achieved using a Yaesu FRG-7700 receiver, ZX Spectrum 48K with Technical Software RX-4 program and a 20m long wire antenna. On the amateur bands his best recent DX was 9N7YDY (Nepal) which brings his countries total to 27. Other stations of interest include SV2JL (Greece), C31SD (Andorra), VE3DH (Canada) and TR8JLD (Gabon). This latter station is well worth looking out for as he is very active on the 14 and 21MHz bands. Ian's commercial reports have been included in the frequency list at the end of this section.

One of my regular contributors has supplied me with the schedule for the Iranian news broadcasts from Tehran as follows:

1000-1100UTC	18.56, 19.2, 19.98MHz
1100-1230UTC	19.2MHz
1500-1730UTC	7.96, 7.8, 19.98MHz
1900-2030UTC	7.4, 7.96, 8.05MHz
2030-2200UTC	8.05, 7.96MHz

Most of these transmissions are in English using 50 baud, 425Hz reversed shift.

Now for this month's frequency list, the format is the same as last month, i.e. frequency/mode/speed/shift:

5.24MHz RTTY 50/R	CNM59X9	Rabat
5.275MHz RTTY 50/425	YI072	Bagdad
5.443MHz RTTY 50/ 70C		Khormaksar air
5.733MHz RTTY 50/ HZJ	Jeddah	
5.74MHz RTTY 50/ HZN	Jeddah	
5.887MHz RTTY 50/IMB2	Rome	
6.775MHz ARQ 96/Chan A	XTU	Asecna
7.512MHz RTTY 75/ XVN	Hanoi	
7.555MHz RTTY 50/ Y2V34	E. Germany	
7.972MHz RTTY 75/ XVN	Hanoi	
10.27MHz RTTY 50/ RKA25	TASS	
12.818MHz SITOR 100/170	SAB63	Goeteborg
13.510MHz RTTY 75/425	CFH	Halifax
13.524 RTTY 50/425R	YI072	Bagdad
13.56MHz RTTY 50/ BMB	Taipei	
141.574MHz RTTY 50	CNM9X9	Rabat
14.638MHz RTTY 75/425	WFK54	USIA

14.901MHz RTTY 50/425R	TASS
14.937MHz RTTY 50/ 5UA	Asecna Nigeria
18.56MHz RTTY 50/ EPJ	Tehran
19.227MHz RTTY 75/	Belgrade
19.98MHz RTTY 50/R	EPJ-2 Tehran

Please keep those reports coming to enable me to maintain this list.

## FAX

I have received a very good selection of FAX pictures from Ivor Cooper, a sample of which is shown in this column. Ivor uses a recently purchased Info-Tech M-800 FAX decoder and a NRD-525 receiver to produce some excellent results.

When monitoring FAX transmissions I particularly like to keep an eye out for re-broadcast satellite images. The only problem I have is in searching through all the FAX schedules to find a station sending these pictures at the appropriate time. What is really needed is a chronological list of these transmissions. Well thanks to some material supplied by Jim Bryant I have compiled the following list. All the

transmissions use 120 r.p.m. and an IOC of 576.

0103UTC	Offenbach
0110UTC	Tokyo
0119UTC	Offenbach
0144UTC	Offenbach
0315UTC	Offenbach
0500UTC	Beijing China
0643UTC	Offenbach
0743UTC	Tokyo
0820UTC	Beijing China
0840UTC	Beijing China
0940UTC	Northwood (2)
1005UTC	Northwood (1)
1140UTC	Novosibirsk
1225UTC	Offenbach
1244UTC	Offenbach
1300UTC	Offenbach, Novosibirsk
1310UTC	Tokyo
1355UTC	Northwood (1)
1420UTC	Northwood (2)
1440UTC	Northwood (2)
1503UTC	San Francisco
1539UTC	Offenbach
1710UTC	Northwood (1)
1720UTC	La Jolla
1730UTC	La Jolla
1740UTC	San Francisco
1843UTC	Offenbach
1910UTC	Tokyo
2346UTC	Rota

The frequencies of these stations are:  
Offenbach 134.2kHz  
Tokyo 3.622MHz, 7.305MHz,

# SEEN & HEARD

9.97MHz, 13.597MHz,  
18.22MHz, 22.77MHz  
Beijing 5.527MHz, 8.122MHz,  
10.117MHz, 14.367MHz,  
18.237MHz  
Northwood (1) 4.248MHz,  
6.436MHz, 8.495MHz,  
12.741MHz, 16.939MHz  
Northwood (2) 8.334MHz,  
16.115MHz  
Novosibirsk 5.765MHz,  
9.22MHz  
Rota 5.785MHz, 7.453MHz  
San Francisco 8.682MHz,  
12.730MHz  
La Jolla 8.644MHz, 17.409MHz

If you know of any other stations sending satellite images please drop me a line and I will add them to the list.

## Frequency Indication

From some of the letters I have received, it would appear that some of you are a little unsure when it comes to interpreting the frequencies in frequency lists.

To start with, you will need to understand a few of the basics of f.s.k. Frequency shift keying (f.s.k.) is the most common modulation technique used for RTTY, ASCII and weather FAX. It is effected by literally shifting the frequency of the carrier.

If we look at a RTTY transmission, the signal is in a digital format and consequently has two possible states i.e. a mark or a space (alternatively a logic 1 or 0). When this signal is applied to a transmitter, the higher carrier frequency is sent for a logic 0 (or space) and the lower carrier frequency is used for the logic 1 (or mark). The frequency difference between the two carrier frequencies is known as the shift, with common values being 170, 425 and 850Hz.

Obviously with two trans-

mission frequencies, we have a dilemma when we want to state the nominal frequency of the signal. Fortunately a convention has been established making the published frequency the higher of the two.

This is all very well for RTTY, but what about FAX signals which have black and white levels as opposed to mark and space? Well, in this case it is still the higher frequency which is published which incidentally represents white.

Having clarified the published frequency, the next problem appears when you attempt to tune into a specific station. The common complaint is that to receive the station properly the receiver display shows a different frequency to that published for the station. The most usual reason for this is that the receiver in use does not have a RTTY mode and the signal is being received with the mode switch set to either u.s.b. or l.s.b. When set for u.s.b. or l.s.b. most receivers actually display the frequency of the suppressed carrier, which explains the error when receiving RTTY signals.

What we really need is to establish is how much to add or subtract from the displayed frequency to give the published frequency.

One simple method for checking your own receiver readout is as follows:

- 1) Set your receiver and RTTY decoding equipment in the mode you wish to check.
- 2) Tune the receiver to a strong RTTY signal of known frequency,

i.e. 4.489MHz Bracknell 425Hz shift, 50 baud RTTY.

3) Fine tune your receiver for best copy.

4) Note the difference between the displayed frequency and the known frequency.

This difference represents the correction factor that you will have to apply to your receivers display when trying to locate a signal from its published frequency.

## NAVTEX

Having mentioned this mode for the first time last month, I have received a very interesting letter from **Brian Gregory**. Brian has written his own decoding software for this mode which he runs on a 1979 vintage Heath H89 computer. Being a professional programmer he used the language Modula-2 for this particular mode but he has also written programs for RTTY and FAX using a combination of C and assembler. The main receiver in use is a Sony ICF7600D but Brian adds that the stability of this set is not quite good enough for NAVTEX. In order to overcome this stability problem he has been working on a dedicated receiver for 518kHz NAVTEX. The receiver is a fairly conventional superhet except for an 18kHz i.f. The front-end comprises two f.e.t. r.f. amplifiers followed by a MC3357 narrow band i.f. amplifier and demodulator. The local oscillator frequency is controlled by a 500kHz ceramic crystal. The recovered output from the

demodulator is applied to a comparator before finally passing to the computer.

Brian has completed the prototype and the results to date using a 6.5m antenna have been very good with the following signals logged:

Scheveningen Netherlands  
Ostende Belgium  
Lands End UK  
Cullercoats UK  
Portpatrick UK  
Rogaland Norway  
Stockholm Sweden  
Reykjavik Iceland

The next problem for Brian to tackle is the computer interface on his main station. My thanks to Brian for this comprehensive report.

## Importing Radio Equipment

Ivor Cooper has recently taken delivery of an Info-Tech M-800 FAX decoder and a M-6000 Intelligent Terminal Unit from the USA (lucky chap). The transaction went very smoothly until it came to releasing the goods from Customs at Heathrow Airport. The air-freight company normally charges about £40 for Customs clearance, whereas if you do it yourself it costs £12. Not being one to miss a bargain, Ivor decided to handle the Customs himself. Well, a day and a half later and rather the worst for wear Ivor finally emerged with his equipment! To be fair to the Customs and Excise staff at Heathrow it wasn't really their fault, it's just that the paper work is very complicated. The moral of this story is don't try to clear your own goods through Customs unless you are very familiar with all the paper work.

Reports for May '88 issue  
by March 15 please

## INFO IN ORBIT

Pat Gowen G3IOR

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

## Weather Satellites

This month we show some of the excellent weather-satellite pictures that have been captured by **David Bird** of Stoke Ferry, King's Lynn, in north-west Norfolk. He has a wide interest in radio and electronics, and built the Remote Imaging Group board system that we referred to in earlier columns for receiving his pictures from space. Dave is G8XOC and, with his natural interest in DX at v.h.f., it is not surprising that some of the views we see emanate from satellite passes more distant than those we normally see over the UK.

The signals received are much weaker from low angle satellite

passes close to ones horizon. This is due to attenuation brought about by the longer path and the losses created by a low incidence angle to the ionised and tropospheric layers. They can still be easily captured as strong signals by the use of a beam antenna and a low noise pre-amplifier, preferably built and placed at the cable connection at the antenna itself. With the capture lobe at a low angle, some interference from poorly suppressed electrical apparatus and motor vehicles is inevitable, but this, like the attenuation, is lowest at night and in the early mornings.

Our first picture, Fig. 1, shows a marked low approaching Northern

Ireland from the north-west, with a prominent cloud rotation system. The land boundaries of Denmark, Germany and France are clearly defined, with Poland and Finland visible to the right of the frame.

A view from the Atlantic to the North and Baltic seas, with cloud over the Scottish and Scandinavian mountains can be seen in Fig. 2.

A rare sight in that which we optimistically referred to in moments of enthusiasm as "Summer 1987" can be seen in Fig. 3, which shows the UK and northern Europe in clear skies, but southern Europe in cloud. The ridge of the Pyrenees mountains can be seen by Andorra between

southern France and Catalonia in northern Spain.

An excellent "close-up" of Italy, Sardinia and Corsica set in a silver sea appears on Fig. 4, with the offshore Yugoslavian Islands of Hvar (where your author was YU7LAZ) Korcula, etc., clearly defined off Dubrovnik on the Adriatic coast.

Our next pictures have been supplied by **Mark Smith**, whose station we described in the January column. The expansion facility, its versatility and benefits are demonstrated in the photographs. They are in applied colour, but should look almost as good in our black and white reproduction.

A joint infra-red and visible x1

# SEEN & HEARD



Fig. 1

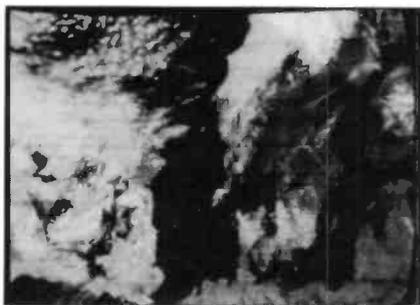


Fig. 2

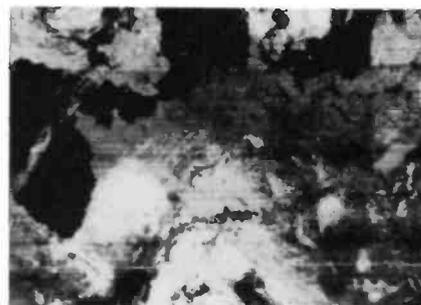


Fig. 3

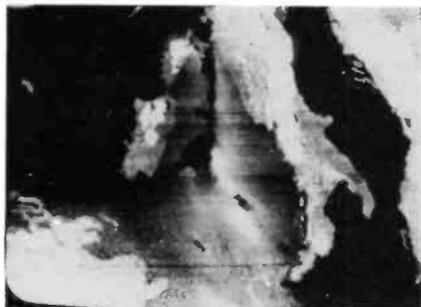


Fig. 4

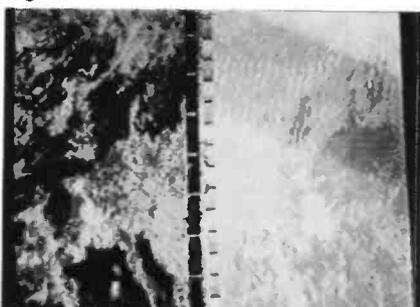


Fig. 5



Fig. 6

picture photograph taken from Mark's monitor is seen in Fig. 5. It was taken from a NOAA-9 pass on 6 July 1987, and shows the considerable difference between the visible light and infra-red frames.

The photograph in Fig. 6 was taken of NOAA-9 the previous day and is an x2 showing good views of England and France, with a "warm" patch appearing to be a new island off Brittany.

Some common words used are "Da" for Yes, "Niet" for No, "Panyeta" for I understand, "Lad Na" for On Tune, "Kharashoo" for Good, Very Well or alright, "Oachim Kharashoo" for Very well indeed or excellent, "Dobray Ootrah" for Good morning and "Zdrad-vootsiya" for Greetings. "Sparseeba" means Thankyou and "Sparseeba Bolshoi" Great Thanks. "Sloshayim" means We are listening whilst "Slayshem" translates as we hear you. "Knapa" means docking or uncoupling, "Nez" under, below or beneath, and "Spatsia" or "Cosmos" means space. "MIR" itself can mean both Peace and World. Some words are self evident, e.g. "Telephona", "Radio", (pronounced "Rar-deeyo"), "Normala", "Radiograma", "Millimetra" with

many technical words strikingly similar to English.

Calling procedures include "Zoup mi Tamira", This is TAMIR. The call used by Romanenko; "Ras, Ras, Tree, Dva, Adeen" is Calling, calling, three, two, one and "Nez Spatsia" is Ground (below) (this is) Space.

## MIR Details

Those who were listening over the Christmas holiday-period to the v.h.f. communications frequencies of MIR and the communicating manned SOYUZ ferry craft were in for a real treat, as activity was naturally at a very high level. A further bonus was a series of excellent sightings in clear skies over the same period, permitting good tracking records to be maintained despite the frequently changing period of the spaceship.

Yuri Romanenko, who had sounded more than a little tired during his earlier almost monosyllabic contacts on 143.625MHz MIR contacts with the ground command noticeably began to speak at length and

cheered up enormously as soon as news came of his return to earth by the new year.

Following the filling, undocking and separation of the Progress supply vehicle on December 19, a SOYUZ-TM-4 was launched carrying Vladimir Titov, Musa Manarov, and cosmonaut Doctor Anatoly Levchenko to dock two days later. After the changeover routine, Anatoly Levchenko returned with the original crew members Yuri Romanenko and Alexander Alexandrov in the old SOYUZ-TM-3 to land at Kazakhstan on December 29. Both Soyuz trips were clearly audible on 121.750MHz, but with competition between a.m. and f.m. as this frequency is used by numerous airports around Europe, which caused more than a little confusion. At times even music could be heard, apparently emanating from Soyuz, but possibly picked up by their uplink receiver and re-broadcast.

A new voice is now on 143.625MHz, that of Titov, who appears delighted to have settled

in remarkably quickly, having been frustrated by technical difficulties that aborted his two earlier attempted missions.

John Branegan GM4IHJ, our regular MIR watcher, has provided a basic MIR guide to cosmonaut spoken Russian, added to by your scribe, which will assist observers to understand what they are hearing. The cosmonauts use a very small set of words for most of their operating procedures, and some of these and their meanings are produced here phonetically. First come the numbers, which are used a great deal in reports:

"Adeen" = one, "dva" = two, "tree" = three, "cheterye" = four, "pyat" = five, "shest" = six, "seyem" = seven, "vo-seyem" = eight, "dey-vayat" = nine, "dey-syat" = ten. Numbers eleven to nineteen use the simple additional phrase of "nard-tsats" so that "adeen-nard-tsats" is eleven, "seyem-nard-tsats" is seventeen, with eighteen being "va-seyem-nard-tsats", nineteen "dey-vayat-nard-tsats" and twenty "dvah-tsats", with thirty said as "tree-tsats" and so on. When we get to one hundred it is "sto". A typical report is a long string of numbers ending in "... Enehay Normala ..." meaning "Otherwise Normal".

Reports for May '88 issue  
by March 15 please

## BAND I DX

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

At his QTH in Caterham, Ray Howgego uses a Sony STR-6046 tuner/amplifier with a 1.5m whip antenna at ground level. He found that, under normal atmospheric conditions, he could receive at

reasonable strength, BBC Radios 2, 3 and 4, from Oxford and Wrotham, between 88 and 94MHz, Radios London, Medway, Solent, east and north Sussex and Radio 1 from the BBC and Capital

Radio and LBC (London), County Sound (Guildford), Chiltern Radio (Luton/Bedford), Invicta Sound (east Kent) and Radios Mercury (Reigate and Crawley) and 210 (Reading) from the IBA between

94 and 105MHz, all at reasonable strength. "I thought this might be interesting because it shows that channel occupancy has reached saturation level, surpassing even the medium-wave. In addition, it

# SEEN & HEARD

makes DXing almost impossible," said Ray. He continued, "Assuming the average broadcast receiver can cope with four signals per MHz, this allows room for only 48 signals within the present allocation". Good point Ray.

## Reports

Each time the high pressure began to fall during this period, true to form, Band II opened. I logged French stations between 98 and 100MHz around 1600 on November 28 and 8 other national voices between 92 and 100.7MHz at 0920 on the 29th. Similarly, during the event on December 22, French signals were predominant from 98 to 100MHz and I counted a dozen French, Dutch or German voices throughout the Band at 1400 on the 23rd.

"I first noticed an opening at 2015 on the 22nd which lasted through the 23rd and ended by noon on the 24th," wrote Ken Lancaster (Rotherham). He noted that his barometer was holding steady at 1030mb (30.45in) after falling slightly earlier in the week. During this event, Ken listened to stations from France and Holland between 98 and 102KHz and a very strong Dutch transmission, in full stereo, on 105.6MHz. He logged a sports programme on 102.1 which became so strong at 2000 on the 23rd that it was as good as he receives Radio Aire from Leeds. "There were quite a few signals up and down the band

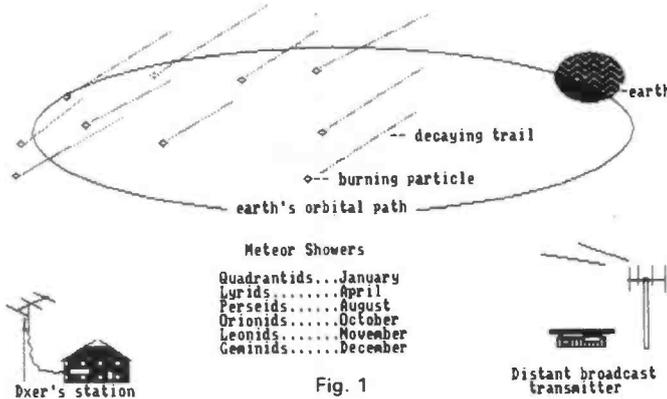


Fig. 1

murmuring away in the background which I did not consider good enough to log," said Ken. He found Band II conditions "very strange" early in January and between the 1st and 11th he again heard continentals which, at times, were numerous and powerful. "A good friend sorts out the languages for me," said Ken.

Further to last October's hurricane which hit parts of southern England, J. T. Whitmore (Southampton) reports that the pen on his Short and Mason barograph fell to 28.3in at 0400 on the 16th and then rose to 29.3in by noon.

On December 23, Simon Hamer (New Radnor) identified signals from Denmark, France, East and West Germany, including AFN and BFBS. While returning from

Edinburgh in late December, Colin Godwin (Malvern), using his Ferguson stereo cassette receiver, logged BBC Radio Lancashire and the IBA stations Marcher Sound, (Wrexham and Deeside) Piccadilly Radio (Manchester), Radio City, (Liverpool) Red Rose Radio (Preston and Blackpool) and Signal Radio (Stoke) between 96 and 104MHz.

## Meteor Scatter

How often have you casually glanced upward and seen a streak of bright light dart across the clear night sky? It was all over in a flash, but what you witnessed was a random meteor particle burning up as it collided with the earth's atmosphere. When this happened

a rapidly decaying trail of ionised gas was created some 95km above us which, for a brief period, may well have deflected the signal from a distant broadcast station well off its intended course.

If a receiver was tuned to that station's frequency, a fragment of the transmitted speech or music would have been heard. Longer bursts of programme means that the signal bounced off a more intense trail left by a much bigger particle, or possibly a fire-ball. Periodically, on its orbit around the sun, the earth encounters great swarms of these particles, known in the astronomical world as meteor showers, Fig. 1. During these happenings large numbers of signal "pings" are heard and, by using radio to count these, it is possible to plot the earth's passage through a particular shower, but that's another story.

Readers with converters for the 70MHz amateur band, or with scanners, often hear meteor scattered signals from the Polish broadcast station at Gdansk on 70.31 MHz. Reference to the *World Radio TV handbook* shows that signals from broadcast stations in Czechoslovakia, Hungary and Romania can also be found between 68 and 73MHz. As a guide, many of the stations that we log within this range during the Sporadic-E season can also be heard via meteor scatter. For the benefit of computer buffs, I used the Trojan Cad-Master light pen on my Amstrad PCW8512 to produce Fig. 1.

Reports for May '88 issue  
by March 15 please

## TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Many TVDXers use a camera during an opening to make a permanent record of what they see at the time. Obviously, one cannot watch the screen for long periods waiting for a caption, logo, programme title or a station ident to appear so some readers leave a video recorder running and select their photographs from the play back. Tropospheric openings usually provide a consistent picture but signals received during a Sporadic-E disturbance are often mixed up with others and may also be subjected to deep and sharp fading.

Although most of us have experienced this fade, just as the camera is about to click, lots of good photographs of title matter are taken like those from Czechoslovakia, (Fig. 1), possibly Holland, (Fig. 2) and the USSR, (Fig. 3), caught when the bands were open by Len Eastman (Bristol). Then there is Belgium, (Fig. 4), Italy, (Fig. 5) and Spain (Figs. 6 and 7), received by Noel Smythe in Caerphilly.

At his QTH in Derby, fellow journalist Garry Smith logged East and West Germany and Switzerland, (Figs. 8, 9 and 10) and Lt. Col. Rana Roy (India) identified pictures from Jullundur, (Fig. 11) and Lahore, (Fig. 12), in India and Pakistan respectively.

## Band I

Although John Raleigh (Bedford) found little Band I activity during the month prior to January 13, he did find pictures from Holland (PTT-NED 1) on most days between December 15 and 27 and again on January 8.

Edwina and Tony Mancini (Belper) noted some early morning and evening activity around Chs. E2 and 4 over a similar period and identified cartoons and skiing from Denmark and Sweden and test-cards from Czechoslovakia (RS-KH), West Germany (ARD SWF/RBG), Holland (PTT-NED-1), Norway (Kongsberg) and Sweden (SVT-Kanal-1).

On December 20, Steve Ralph

(Sittingbourne) tried out a WB4 antenna for Band I and was delighted, at 1130, to find signals from Belgium (RTBF-1) on Ch. E3 and Holland (NED-1) on Ch. E4. However, his highlight came at 1600 when he logged bursts of ice-hockey followed by a nature programme in colour on Ch. R1. Judging by the captions, Steve presumes that these pictures were coming from the USSR.

In Poole, Ian Galpin received burst of pictures on Chs. E2 and 3 from Scandinavia, via meteor scatter (see Fig. 1 in Band II DX) at 1300 on November 2 and on several Band 1 channels during the peak of the Geminid meteor shower on December 12, 13 and 14. "I heard many bursts of European TV carriers on 53.750MHz," wrote Ian. He explained, "This frequency, Ch. E2 sound and Ch. 1a vision, is also a good check for Sporadic-E because it is used for sound transmissions in most of western Europe and for video in Italy. The video carrier has to be at least

59 + 20 on my FT-690 and dipole receiving set up before a picture appears on my dipole fed JVC 3040 TV screen." Between 1605 and 1642 on December 20, Ian found at least two transmitters on Ch. R1 and saw the caption "REKLAM" intermixed with Hungarian adverts.

In New Radnor, Simon Hamer received "pings" of meteor reflected test-cards from Spain (TVE-1) at 0730 on December 13, Norway (Bagn and Bremanger) at 1230 on the 16th and Iceland (RUV-Island) and Sweden (SVT-Kanal-1) Sverige) around 1500 on January 3.

Several unidentified signals and a few glimpses of test-cards from Holland, Norway scribed Bremanger and Televerket, Poland and Sweden were caught at various times in December by Bob Brooks at his QTH in Great Sutton.

## News From India

Lt. Col. Rana Roy noted Sporadic-E disturbances on July 29 and

# SEEN & HEARD

August 5, 9, 14 and 25 when he logged pictures from the USSR including cartoons, a documentary, news with the familiar BPEMR and HOBCTN idents and sport. During the Sporadic-E events he experienced multiple-signals when station identity was almost impossible on the 5th and 9th and he probably received pictures from Alma Ata in north Afghanistan on the 9th and 25th. "August 9 was definitely the best Sporadic-E we had during the season," said Rana.

He also observed tropospheric openings on August 18, September 27 and October 12 and reports seeing Breakfast TV from the low power transmitters at Agra, Bhatinda and Kasauli in Band III on the 18th, programmes from Jullundar with interference from the Agra I.p.t., Ch. 9, on the

12th and pictures from the high power transmitters at Amritsar and Jullundar on Chs. 7 and 9 and again the I.p.ts. at Agra, Bhatinda and Kasauli on Chs. 9, 12 and 6 respectively.

## Tropospheric

Early on December 13, Steve Ralph found ARD-1 on Chs. E7, 8 and 10, WDR, showing an episode of *Sesame Street*, on Chs. E9 and 11 and in the evening he watched sport, followed by the news and the caption "Nachrichten" from DDR-F1 on Ch. E12. "ARD was wiping out RTBF on Ch. E8 and the 14th was much about the same with the addition of Canal + on Ch. L8, Luxembourg (RTL+) on Ch. E7 and NDR-1, Hannover, on Ch. E10," said Steve. At 1330, he tuned to Ch. E12 and found a programme teaching English on

DDR-1. During the opening on the 20th, Steve received pictures from France (TDF-Antenne-2) on the u.h.f. channels L44 and 53, (FR3) on Ch. L29 and 47, Germany (ZDF) on Ch. E45, test-cards from Holland (NED-1 and 2), first naming the transmitter site, "Goes" and later changing to "AVVC-HVS" on Chs. E29 and 32 and a test-card from Luxembourg, scribed "Ecoutez RTL", on Ch. E27.

Around 2100 on December 22, Ian Galpin logged pictures from Canal + on several spots in Band III. Simon Hamer has a massive haul on v.h.f. and u.h.f. signals from a long list of transmitters in Belgium (BRT TV1 and 2 and RTBF 1), Denmark (DR) south and west Jutland on Chs. E7 and 10 respectively, Eire (RTE-1 and 2), France (TDF Canal +), East and

West Germany (DFF-1 and 2 and ARD/WDR-1, NDR-1 and 3, WDR-3 and ZDF), Holland (NED-1, 2 and 3), Luxembourg (RTL+), news *Dagsrevyen* from Norway (STORD, BOKN and LYNGDAL on Chs. E5, 8 and 9) and Poland (TVP, Ch. R8) on December 22 and 23. "A fast moving tropo this time," said Simon. He took about 5 minutes to log all the German stations at lunchtime on the 23rd and added, "Poland and Sweden made a welcome first time appearance for me in Band III and a whole string of West German stations were fighting for predominance on my screen."

Pictures from Radio Telefis Eireann were received throughout the day on December 23 by Bob Brooks who also logged their clock caption on Ireland's Ch. H (207.25MHz) in Band III on

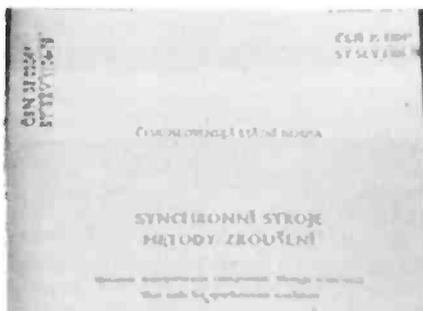


Fig. 1: Czechoslovakia



Fig. 2: Holland?

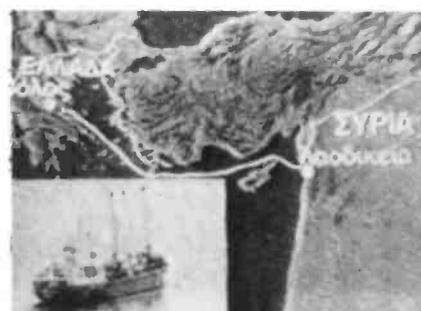


Fig. 3: USSR?

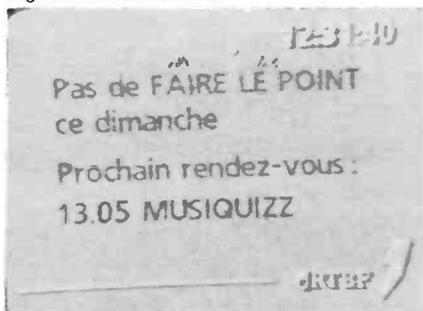


Fig. 4: Belgium (French Service)



Fig. 5: Italy



Fig. 6: Spain



Fig. 7: Spain



Fig. 8: East Germany



Fig. 9: West Germany



Fig. 10: Switzerland



Fig. 11: Jullundur, India



Fig. 12: Lahore, Pakistan

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# SEEN & HEARD

December 6, 22, 23 and 24 and January 9. "The fall in atmospheric pressure from 1035mb to 1025mb on the 23rd gave rise to very good pictures being received from Holland and Luxembourg in Band III," wrote John Raleigh. During these events, the Mancinis watched news *Tagesschau* and the programme *Moonlighting* on ARD-

1, cartoons, a chat-show, forthcoming films and news on Canal +, news *Aktuelle Kamera* on DFF-1, variety on NED-1, *Teletext* from RTBF-1 and Logos and test cards from ARD and RTE.

## SSTV

Although Fred Batty has a difficult location among trees in Surrey, he recently added the RX4 program to his Spectrum software and now

decodes SSTV signals via his R2000 receiver.

Between December 2 and 20, Ray Gilchrist (Millom) received slow scan pictures from stations in Germany, Italy, possibly Japan, Poland, Sweden and Switzerland. Ray saw the JH call sign on a frame but could not be sure if it was direct or from another station taking part in the QSO.

Deadlines are March 15,  
April 19 and May 10

## LONG MEDIUM & SHORT

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

In order to allow for seasonal changes in the state of the ionosphere, an international agreement permits s.w. broadcasters to change their operating schedules four times a year — in March, May, September and November. Some of the s.w. frequencies quoted in this month's LMS can be therefore expected to change soon after publication.

The terms of the agreement require any changes in operating frequency to be made on the first Sunday of those months, but several broadcasters have apparently decided to ignore the agreement. They now change their operating frequency with little or no warning at other times of the year. From the listeners' point of view, changes of that nature are very undesirable.

### DX Report

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

### Long Wave DX

The highlight of the month for Howard Newell in Great Missenden was the arrival of a new Matsui MR4099 receiver. Needless to say he has been testing it out on all bands! He compiled his first l.w. log for the chart mainly at night.

One of the new Steeplestone MBR7 receivers, as depicted in the December *SWM*, was used by Darran Taplin in Tunbridge Wells. He says, "The performance of this receiver seems to be very good. I found the built-in direction finder very useful, in fact I managed to log quite a few new stations, one of them was USSR on 200kHz. The signal was very weak, but I managed to identify it".

Writing from Cardiff, John Berridge says he has now heard fourteen l.w. stations during daylight, but so far he has only been able to identify positively the ten stations noted in the chart. The contacts on the coil turret of his Vega receiver recently became intermittent and an inspection revealed a mis-alignment between the contacts and the associated

spring fingers. He cured the fault by adjusting the position of the index cam on the main shaft, a good tip for other Vega users with similar problems.

The latest report from Paul O'Connor, who is visiting Florida, S. Africa, mentions high static levels caused by local thunderstorms and temperatures of 36°C. One of the recent storms brought down his antenna and a further problem arose when it was restored because the heat of the sun melted the plastics insulation on the wire! The static has so far prevented him from identifying any of the weak carriers below 200kHz which he mentioned in his report last month.

At the time of going to press the second part of the new l.w. band had yet to be implemented, but some of the changes in operating frequency to be expected between 189 and 245kHz are detailed in the chart.

### MW Transatlantic DX

Reporting from Wallsend, David Edwardson says he found the conditions for transatlantic DXing generally good during the month. Using a 1.005m by 0.885m loop in conjunction with an l.f. converter ahead of his Trio R600 receiver, he logged VOXM in St. John's, Newfoundland on 590 at the remarkably early time of 2110, their signal rated as SINPO 23532. He was very surprised to find that their signal was also audible in the morning, noting it as 23332 just before sunrise!

Another broadcast from Newfoundland became audible at 2115 on 930, this stemmed from CJYQ in St. John's, but their signal had to compete with BRT via Wolvertem, Belgium on 927 until BRT closed down, so David could only rate it as 12521 at that time. Later, their signal improved and by 0425 it rated as 24442. David has also been hearing WBZ in Boston on 1030 quite regularly from about 2225. A typical rating at that time being 23332. On some occasions their signal has also been audible just before sunrise!

Another station in Boston, namely WHDH on 850 was heard by Tim Shirley in Bristol at 2330. He also picked up WWKB in Buffalo, New York on 1520 at that time, but other signals from the USA were noticeably absent until after midnight. Some of them were noted in the report from Ian

Baxter (see chart). He used a Yaesu FRG-7700 receiver with a 20m wire antenna in Blackburn and compiled his list between 0006 and 0032.

Encouraged by his initial success at transatlantic DXing last month, Howard Newell started to monitor the band from

Freq MHz	Station	Location	Time (UTC)	DXer
850	WHDH	USA Boston, MA	2330	E
940	WFNC	Fayetteville, NC	0046	F,G
1010	WINS	New York, NY	0040	D,E,F,G
1030	WBZ	Boston, MA	2225	A,B
1050	WFAN	New York, NY	0025	A,B,C,F,G
1090	WBAL	Baltimore, MD	0020	A
1100	WWWE	Cleveland, OH	0130	G
1110	WBT	Charlotte, NC	0116	F
1130	WNEW	New York, NY	0420	C
1190	WOWO	Ft Wayne, IN	0315	C,G
1210	WCAU	Philadelphia, PA	0027	A,C,D,F
1220	WGAR	Cleveland, OH	0133	C,G
1440	WFTQ	Worcester, MA	0330	G
1470	WLAM	Lewiston, MA	0030	C
1500	WTOP	Washington, D.C.	0015	C
1510	WLAC	Nashville, TN	2358	C
1510	WSSH	Boston, MA	0119	B,C,F,G
1520	WWKB	Buffalo, NY	2330	E
1530	WCKY	Cincinnati, OH	0030	C
1530	WCRJ	Jacksonville, FL	0515	C
1560	WQXR	New York, NY	0440	C
1600	WWRL	New York, NY CANADA Ottawa, ON	0330	G
580	CFRA	Ottawa, ON	0355	C
590	VOXM	St. John's NF	0012	A,B,C,G
620	CKCM	Grand Falls, NF	0300	G
920	CJCH	Halifax, NS	2357	B
930	CJYQ	St. John's NF	2325	A,B,C,D,F,G
940	CBM	Montreal	2355	C
1110	CBD	St. John, NB	0045	C,G
1140	CBI	Sydney, NS	0055	C
1220	CKCW	Moncton, NB	0200	C,F,G
1410	GIGO	Pt. Hawkesbury, NS	0210	C
1570	CKLM	Lavel, PQ	0032	A,C
1580	CBJ	Chicoutimi, PQ C. AMERICA & CARIBBEAN	2330	C,G
825	R.Paradise	St. Kitts	0001	E
1470	XEBBC	Tijuana, Mexico	0030	C,G
1500	XEAI	Mexico City, Mexico	0045	C
1570	Atlantic Beacon	Turks & Caicos IIs	0115	C,D
1580	VOA	Antigua	0310	G
1610	Caribbean Beacon	Anguilla	0030	A,C,D,F,G
1100	R.Globo	SOUTH AMERICA Sao Paulo, Brazil	0140	C,G
1220	R.Globo	Rio, Brazil	0015	C,G
1350	R.Buenos Aires	Argentina	0320	G

### DXers

- (A) Ian Baxter, Blackburn.  
(B) David Edwardson, Wallsend.  
(C) Bill Kelly, Belfast.

- (D) Howard Newell, Great Missenden.  
(E) Tim Shirley, Bristol  
(F) Alan Taylor, Coventry.  
(G) Jim Willett, Grimsby.

# SEEN & HEARD

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

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

## DXers

(A) Alan Curry, Stockton-on-Tees.  
 (B) Colin Diffell, Corsham.  
 (C) Bill Eyre, Stockport.

(D) David Hackwell, Warrington.  
 (E) Simon Hamer, New Radnor.  
 (F) Paul Hawkyard, Newcastle-on-Tyne.  
 (G) Sheila Hughes, Morden.

(H) Bill Kelly, Belfast.  
 (I) David Middlemiss, Eyemouth.  
 (J) George Millmore, Wootton, IoW.  
 (K) John Nash, Brighton.

(L) Howard Newell, G. Missenden.  
 (M) Tim Shirley, Bristol.  
 (N) Darran Taplin, Tunbridge Wells.  
 (O) Robert Taylor, Edinburgh.

midnight and picked up CJYQ in St. John's, Newfoundland at 0030. It was not long before he had the thrill of adding three more stations to his growing list of DX, namely WINS in New York 1010; WCAU in Philadelphia 1210 and the Atlantic Beacon, Turks and Caicos Islands on 1570. Hunting for DX proved to be so intriguing that he found himself still listening at 0440!

Another Matsui MR4099 receiver was put to the test by

Alan Taylor in Coventry. He borrowed it from his son so that he could compare its performance with his own Realistic DX302 receiver. Alan uses a Sooper Loop when transatlantic DXing, so he made up a ferrite injector by winding 20 turns of 24 s.w.g. enamel wire around a slab of ferrite material approximately 95 x 12 x 3mm and attached it to the back of the receiver with two strips of Selotape. He then connected it to the loop via a

length of coaxial cable. Between 0020 and 0145, Alan logged quite a number of stations (see chart) and compared the two receivers.

Bill Kelly has been testing out a phased loop in Belfast and he found it to be very good — see his results in the chart. During four nights of these tests, he picked up broadcasts in Spanish from RCN in Tijuana, Mexico on 1470 between 0020 and 0045. These included a football commentary

and several talks. Their news bulletin in Spanish attracted his attention at 0403 on a fifth night. Bill also heard XEAI in Mexico City on 1500 at 0445, this station has not been mentioned before in this series and is subject to confirmation by QSL. Listening in Grimsby, Jim Willett also heard XEBB in Tijuana, Mexico on 1470 at 0315, but he logged his best DX one night at 0250, namely CB138 in Santiago, Chile on 1380.

# SEEN & HEARD

Freq kHz	Station	Country	Power (kW)	Freq 2/88	DXer
153	Brasov	Roumania	1200	153	C*,F*,I*
153	DLF Donebach	W.Germany	500	153	A,B,C,E*,F,H*
153	Ufa	USSR	100	153	G*,I*
162	Allouis	France	2000	162	A,B,C,E,F
171	Kaliningrad	USSR	1000	171	A,C*,F
171	Medi 1 Nador	Morocco	1200	171	C*,D*,E*,F*,I*
177	Oranienburg	E.Germany	750	177	B,C,D,E,F,I
180	Ankara	Turkey	1200	180	D*,E*,I*
182	Polati	Turkey	1200	182	I
183	SaarLouis	W.Germany	2000	183	A,B,C,E,F,H*
189	Motala	Sweden	300	189	C*,D,E*,F,I
200	BBC Droitwich	U.K.	400	198	A,B,E,F,H*
200	Leningrad	USSR	150	198	H*
200	Warsaw 3	Poland	?	198	G*,I*
209	DLF Munich	W.Germany	500	207	C,F,I
209	Azilal	Morocco	800	207	E*,F*,I*
209	Kiev	Ukraine	500	207	C*,G*,I*
218	Roumoules	Monaco	1400	216	B,C,E*,F,H*,I
218	Oslo	Norway	200	216	A,C*,F*,G,I
227	Konstantinow	Poland	2000	225	B,C,D*,E*,I*
236	Junglinster	Luxembourg	2000	234	A,B,C,D*,E*,F,H*
236	Kishinev	USSR	1000	234	C*
245	Kalundborg	Denmark	300	245	A,B,C,F
245	Erzurum	Turkey	200	245	G*,I*
254	Tipaza	Algeria	1500	254	A,B,C,E*,F,G*,H*,I*
254	Lahti	Finland	200	254	A,E*,F*
263	Burg	E.Germany	200	263	D*,F*
263	Moscow	USSR	2000	263	C,D*
272	Topolna	Czechoslovakia	1500	272	B,C,E*
281	Minsk	USSR	500	281	C,E*,F,I*

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

## DXers

- (A) John Berridge, Cardiff.
- (B) Colin Diffell, Corsham.
- (C) David Hackwell, Warrington.
- (D) Davy Hossack, West Lothian.

- (E) Howard Newell, Gt. Missenden.
- (F) Philip Rambaut, Macclesfield.
- (G) Tim Shirley, Bristol.
- (H) Darran Taplin, Tunbridge Wells.
- (I) Jim Willett, Grimsby.

## Other MW DX

Listening at all hours of the night, Bill Kelly logged Titovo Uzice, Yugoslavia 531 at 0655; Leningrad, USSR 549 at 0030; Marseille, France 675 at 0530; Nancy, France 837 at 0705; Alger, Algeria 891 at 0010; Milano Italy 900 at 0300; Lvov, Ukraine 936 at 0035; AFN via Munchen, W. Germany 1107 at 0255; Tangier, Morocco 1233 at 2340; Ajaccio, Corsica 1404 at 0755; Monte-Carlo, Monaco 1467 at 0620; UAE Radio, Dubai 1481 at 0025; Sochi, USSR 1512 at 0445; Vatican Radio, Rome 1530 at 0110; Kaunas, USSR 1557 at 0502 and Leningrad, USSR 1566 at 0230.

Darran Taplin has also been putting his new receiver through its paces on the m.w. band. Several of the more distant stations were Tovarnik, Yugoslavia 1125 at 2131; Biograd, Yugoslavia 1134 at 2130; Rome, Italy 1332 at 2145; Leningrad, USSR 1494 at 2216 and Radio Tirana in Lushnje, Albania 1395 at 1830. Between 2045 and 2300 he picked up six stations in Spain, namely Madrid 585; La Coruna 639; Sevilla 684; Oviedo 729; Barcelona 738 and Murcia 855.

A number of the stations in East Germany (E) and West Germany (W) were logged by DXers including Nordkirchen (W) 549 logged after dark by Robert Taylor

in Edinburgh; Neubrandenburg (E) 657 at 1644, Braunschweig (W) 756 at 1851 and Burg (E) 783 at 2030, all noted by Paul Hawkyard in Newcastle-upon-Tyne; AFN Frankfurt (W) 873 at 1901, R. Bremen (W) 936 at 1844, AFN Munchen (W) 1107 at 2124, AFN Stuttgart (W) 1143 at 2133 and Neumunster (W) 1269 at 1915, all logged by Darran Taplin; RBL Berlin (E) 1360 at 2315, heard by Bill Stewart in Glasgow and DLF Mainflingen (E) 1538 at 1124, logged by Glen Glen-Davison in Newcastle-upon-Tyne at 1124.

Using a Racal RA17 receiver with a random wire antenna in Wootton on the Isle of Wight, George Millmore heard several more E/W German stations namely Frankfurt (W) 594, Munchen-Ismaning (W) 801, Hamburg (W) 972, Burg (W) 1044 and Langenberg (W) 1593, all were logged between 1500 and 1700.

Listening in Brighton during daylight, John Nash has been hearing BBC Radio Ulster via Lisnagarvey, N. Ireland on 1341 and rated their signal as SINPO 54434 at 0840! He also logged two of the official stations in S. Ireland, namely RTE-1 via Tullamore on 567 — 55455 at 1150 and RTE-2 via Athlone on 612 — 43444 at 1420.

Although the multi-lingual BBC broadcasts via Orfordness on 648 are mainly intended for listeners abroad, they also appeal to some

listeners in the UK. Alan Curry finds their *Sports Roundup* of interest and he quotes their signal in Stockton-on-Tees as 43444 at 0939, but reception during daylight is far from good in many areas of the UK. Paul Hawkyard checked their signal in Newcastle at 1630 and could only rate it as SIO 111 and in some areas it is inaudible during daylight. It is a pity that the antenna system used at the transmitter site is so directional. Most of the reports I have received suggest that the signal is a good deal better after dark in many areas of the UK.

Writing from Forfar, Stewart Russell says he enjoys listening to the programmes broadcast during the evening by RSI via Solvesborg, Sweden on 1179 and by BRT via Wolvertem, Belgium on 1512. Eileen and Wyn Mainwaring also listen to the programmes from BRT on a daily basis in Cowes, IOW, buy Wyn says reception there is often noisy. Eileen's Hacker portable receiver is usually given the task of pulling in BRT and other m.w. signals, but Wyn says he intends to construct a m.w. ferrite rod antenna soon so that his Lowe HF125 receiver can be used more effectively on this band.

The report from David Middlemiss in Eyemouth was interesting because he logged two stations which are seldom heard in the UK during daylight, namely Manx Radio, Isle of Man on 1368 at 1445 and RTE-2 via their 10kW transmitter in Dublin on 1278 at 1515. His best DX at night was radio Tirana via Lushnje, Albania on 1395, broadcasting a news bulletin in English at 1900. The broadcast from Manx Radio reach many areas of the UK at night via the sky wave path, Robert Taylor logged them in Edinburgh as SIO 444.

There were two m.w. reports from over seas listeners this time. It was nice to hear for the first time from P. Guruprasad in Molepolole, Botswana, which is about 60km North of Gaborone. He says he listened to SABC Radio Lotus via Maraisburg, Nr Johannesburg on

648 between 1830 and 1930 and as a result of that he has become interested in m.w. DXing. He uses a Philips D-7243 receiver and noted their signal as 14332.

The second report came from a regular contributor, namely George Efstratiades in Thessaloniki, Greece. He used a Philips D-2225 receiver to log the BBC World Service via Zyyi, Cyprus on 1323 at 2200 and rated their signal as SINPO 33333. He added another station to his growing list of m.w. DX at 2230 one night, when he picked up Radio Vilnius in Lithuania, USSR on 666, their signal was 23222.

## MW Local Radio DX

Loop antennas are popular with many local radio DXers because the sharp nulls in their "figure of eight" response may be used to eliminate or "null-out" unwanted signals. Using a "Soooper Loop" ahead of his Grundig 1400SL receiver, Simon Hamer added a few more stations to his growing DX list in New Radnor.

Bill Eyre spent a good deal of time searching the band and he compiled an extensive list for the chart, he now thinks it will be difficult to log many more stations during daylight. Apparently DXing at night in Stockport is made almost impossible by the numerous pirate radio stations in S. Ireland which occupy many of the frequencies allocated to UK local radio stations, it seems that Bill cannot null them out despite the use of a "Soooper Loop".

Because of his location on the Isle of Wight, George Millmore says that unwanted Continental stations come in via the "back door" of his loop during the day when it is peaked on a desired UK local radio station, so he intends to carry out some experiments with a view to making his loop unidirectional. No doubt this kind of problem occurs in other areas of the UK too and one possible solution may be to add a "sense" antenna to the loop, so that a



Jim Willett received this QSL card from Ecosdel Torbes, Venezuela (60m Tropical Band).

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Writing from Zandvoort, Holland Ed Wieringa has been unable to log ILR Pennine Radio on 1278 due to the strong signals from Strasbourg, France and RTE-2 via Dublin or Cork on that frequency.

QSL's were mentioned in several of the reports, John Nash received QSL's from BBC Radio Bedfordshire via Luton 630; Essex via Manningtree 729; Leicester via Freeman's Common 837 and Nottingham via Clipstone 1584 during the month, but he is still awaiting a QSL from BBC Radio Cornwall to confirm his reception of Redruth on 630. QSL's from five BBC stations were received by Tim Shirley, namely Bedfordshire via Luton 630, Shropshire via Shrewsbury 756, Guernsey 1116, Oxford 1485 and London via Brookman's Park 1458.

It was nice to hear from Ian Wilkins in Lympsham for the first time — he says he would like to see the location of some of the more obscure ILR radio stations, e.g. Invicta Sound, quoted in LMS and the transmitter power mentioned too.

## Short Wave DX

As we steadily climb the upward slope of the present solar sunspot cycle the conditions on the 25MHz (11m) band can be expected to improve during the next few years and eventually they will offer unrivalled global reception as we approach the peak.

Although Radio Nederlands established a temporary link on 25.970 to their relay station in Madagascar while their satellite link was undergoing repairs towards the end of last year, so far only Radio Norway International in Oslo have thought it prudent to establish a regular broadcast service on this band. Their transmitting station in Fredrikstad, SE Norway beams their programmes in Norwegian, English and Spanish to S. Africa on 25.730 between 1200 and 1345.

In his latest report from Johannesburg, S. Africa, Simon Illingworth says that the broadcasts from RNI usually reach him at SINPO 45444. Apparently a regular type of fading occurs on their signal at times, but it does not seriously affect reception. Perhaps some of the other broadcasters will soon decide to follow the example set by RNI and make use of this band to reach their listeners.

Listening in Great Yarmouth, Ted Walden-Vincent picked up the broadcasts from RNI at 1300. They have also been received in other areas of the UK too, but reception here is generally poor, a typical rating of 24422 was noted by David Edwardson. Their signal has also been reaching Ed

Wieringa in Holland, but he says it is weak and suffers from fading.

In contrast to the 11m band, a number of broadcasters use the 21MHz (13m) band to reach listeners in several continents. The reception conditions have been generally quite good during daylight, but the band closes a few hours after sunset in the UK.

An interesting broadcast may be heard between 0700 and 0830. This stems from Radio Japan in Tokyo and it is in English and Japanese. It is beamed to listeners in Europe via Moyabi Gabon on 21.695. Kenneth Reece logged their signal in Prenton as SINPO 23333 at 0741.

This band is perhaps the best one to choose if you intend to listen to the broadcasts from Radio RSA in Johannesburg, S. Africa during the day. They are beamed towards W. Africa and Europe on 21.590 and their programmes in English may be heard at 1100 and from 1300. Peter Hall listened to several of their broadcasts in Chichester during the month and he found their signal to be a very consistent SIO 444 around 1400.

The broadcasts from UAE Radio Dubai on 21.605 are also beamed towards Europe and reach the UK quite well. Their programmes are mainly in Arabic, but a news bulletin in English may be heard at 1030. This is followed by a report on the weather in Dubai. A well presented cultural series in English then follows until 1055. A further transmission in English may be heard between 1330 and 1355. Kenneth Buck is a regular listener to their programmes and he logged their signal in Edinburgh as SIO 454.

During the day there are a number of broadcasts to other areas, but they may also be audible here when conditions permit. Those noted by DXers during the morning were SRI via Schwarzenburg, Switzerland 21.695 (Italian/English/German/French to S.Asia 0745-1030), rated as 24343 by Kenneth Reece at 0852; RSI Stockholm, Sweden 21.690 (Swedish/French/English to Middle East 1000-1130); RBI Berlin via Nauen, GDR 21.540 (Hindi/English to S.E. Asia 1145-1445); BBC via Daventry, UK (World Service to E. Africa 1100-1345), all logged by Howard Newell.

Two of the religious broadcasters in the USA may be heard in the UK during the afternoon, namely WHRI in South Bend, USA beaming towards Europe on 21.640. Leslie Hollis rated their signal in Grantham as 45533 at 1530 and WYFR via Okeechobee, Florida 21.525 (English/Arabic/French/Portuguese to W. Africa 1600-1945) was logged by David Middlemiss at 1615.

In his report from Johannes-

burg, Simon Illingworth says the reception conditions on the higher frequency bands have improved and the BBC World Service broadcasts via Rampisham, Dorset on 21.710 reach him very well from 1100 until 1515.

There has been a noticeable improvement in the reception conditions on the 17MHz (16m) band in the UK, especially during the early morning on long distance routes. At times, the broadcasts from Radio Australia via Darwin to E. Asia on 17.715 have been audible here via the short path. Although their transmissions extend from 0100 until 0730, daily monitoring in Torquay from 0400 by George Hewlett on behalf of Telecom Australia reveals that they are inaudible until about 0700.

There were many broadcasts mentioned in the reports, those logged during the morning stemmed from Radio DW Cologne via Wertachtal, W. Germany 17.845 (German to S.E. Asia 0600-1355), rated as 33433 at 0907 by Darran Taplin; UAE Radio Dubai 17.865 (Arabic/English to Europe 0615-1645), noted as SIO 333 at 1030 by Kenneth Buck; BBC via Limassol, Cyprus 17.885 (World Service to E. Africa 0500-1400), rated as 33532 at 1115; Radio Pakistan, Islamabad 17.660 (Urdu/English to Europe 0715-1120), their dictation speed news bulletin in English at 1105 was rated as 44544 at 1105 by Leslie Hollis; Radio Budapest, Hungary 17.710 (Hungarian/English to Australia 1000-1055) and Radio Nederlands via Flevo, Holland 17.605 (English to Middle East 1130-1225) were logged by Howard Newell.

At 1210 Howard heard Radio HCJB Quito, Ecuador 17.890 (English to N. America 1200-1600). At 1240 Leslie Hollis picked up Radio Cairo, Egypt 17.675 (English/Bengali to S. Asia 1215-1430) and noted 44533 in his log. Listening in London, Peter Vlietnick heard

Radio Prague, Czechoslovakia 17.705 (English/Czech to W. Africa 1430-1625) and Vatican Radio, Rome 17.730 (French/English to E. Africa 1530-1600). Russian, Ukrainian, French, English, Polish and German are the languages used by RCI in Montreal, Canada during their broadcast to Europe from 1430 until 1800 and Darran Taplin rated their signal as 44444 at 1600.

In Macclesfield, Philip Rambaut logged radio RSA Johannesburg, S. Africa 17.810 as SIO 333 at 1505 (English to Middle East 1300-1556) and at 1635 he picked up a seldom mentioned station, namely KVOH in Van Nuys, California 17.775 (Spanish/English to C. America 1500-2359) and noted SIO 222 in his log. Using a Philips D-2935 portable with just the built-in whip antenna in Manchester, Michael Hirst listened to the programmes from WYFR via Okeechobee, Florida 17.750 (English/German to Europe 1600-1745), he rated their signal as 333 at 1616.

During the evening Howard Newell logged VOA via Bethany, Ohio 17.800 at 1820 (English to W. Africa 1600-2200); Radio HCJB Quito, Ecuador 17.790 at 1900, with programmes in Czech, German, English, Norwegian, French and Spanish to Europe 1800-2230, also Radio Surinam International via RNB, Brazil 17.835 at 1715 (Dutch/English to Europe 1700-1745). Listening in Corsham at 2045, Colin Diffell heard Radio Nederlands via Bonaire, Ned. Antilles 17.605 broadcasting in Arabic, English, French and Dutch to W. Africa from 1730 until 2125.

The reception conditions prevailing on the 15MHz (19m) band have also improved. The broadcasts from Radio Australia to the S. Pacific area via Shepparton on 15.240 (2100-0730) have been reaching the UK some mornings. George Hewlett rated them as SIO 434 around 0430, fading to 332 by 0645.



QSL card confirming John Nash's reception of FEBC Manila on 11.850MHz 6 September 1987.

# SEEN & HEARD

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2030	T
2.360	R.Maya do Barillas	Guatemala	0115	T
2.380	FBS	Falklands	0630	T
2.420	R.Sao Carlos	Brazil	0035	T
2.490	Vos.1 Fuzhou	China	0030	Y
3.200	Vos.1 Fuzhou	China	1500	J
3.205	AIR Lucknow	India	0100	T
3.210	R.Mozambique	Mozambique	1430	N
3.215	R.Orange	S.Africa	0215	J,N,Y
3.220	R.Togo, Lome	Togo	0500	T
3.230	ELWA Monrovia	Liberia	0640	S
3.230	R.Nepal	Kathmandu	1530	Y
3.230	R.El Sol Los Andes	Peru	0200	T
3.245	R.Clube Varginha	Brazil	2315	T
3.255	Voz de El Tigre	Venezuela	0145	T
3.260	PBS Guizhou Guiyang	China	2345	E
3.270	SWABC 1	Namibia	0306	A,E,R
3.280	R.Huari Pyacucho	Peru	0215	T
3.320	R.Suid Afrika	S.Africa	0303	E,N
3.325	FRCN Lagos	Nigeria	2257	A
3.340	R.Altura	Peru	0425	A
3.365	AIR New Delhi	India	1630	J
3.365	GBC Radio 2	Ghana	2250	A,B,C,R
3.370	R.Baghdad	Iraq	1956	E
3.380	R.Iris Esmeraldas	Ecuador	0350	J
3.905	AIR Delhi	India	1555	E,R
3.915	BBC Kranji	Singapore	2244	E,G,J,Y,Z
3.930	R.Capital	Transkei	1700	N
3.950	PBS Qinghai Xining	China	2355	E
3.955	BBC Daventry	England	1805	C,D,M,S,V,Z
3.965	RFI Paris	France	2325	H,M,Z
3.975	BBC WS Skelton	UK	1835	M,Z
3.985	R.Beijing, China	via SRI Berni	2200	C,F,G,M,Q,R,Y,Z
3.985	SRI Berni	Switzerland	1830	D,M
3.995	DW Cologne	W.Germany	1930	D,I,M,Z
4.040	R.Moscow	USSR	1800	W
4.050	R.Frunze	USSR	1540	P
4.060	R.Moscow Kharkov	USSR	2259	C,J,R,Z
4.220	Xinjiang	China	2230	A,E,P,Y
4.440	R.Santa Rosa	Bolivia	0230	T
4.450	R.Afghanistan	via USSR	2313	A
4.485	R.Moscow	USSR	0715	S
4.500	Xinjiang	China	1535	E,P
4.520	Khanty Mansiysk	USSR	0430	A
4.635	R.Dushanbe, Tadzhik	USSR	0103	E
4.650	R.Santa Ana	Bolivia	2320	A
4.725	BBS Rangoon	Burma	1535	E
4.735	Xinjiang	China	2320	A,E,K,P
4.740	R.Afghanistan	via USSR	0250	E,S,V
4.750	R.Bertoura	Cameroon	2030	O
4.750	PBS Xizang	Lhasa	0005	Y
4.755	R.Huanta 2000	Peru	0436	T
4.755	Sani Radio	Honduras	2330	A,Y
4.760	Yunnan Kuming	China	1325	E
4.760	ELWA Monrovia	Liberia	0600	E,H,M,S
4.760	R.Afghanistan	via USSR	1900	C,H,L,U,W,Y
4.765	R.Moscow	Via Cuba	0200	E,M
4.770	FRCN, Kaduna	Nigeria	2145	A,E,H,O,S,V,Y,Z
4.780	V.Carabobo	Venezuela	0052	E
4.785	R.Baku	USSR	2020	L,Y
4.785	RTM Bamako	Mali	2230	A,E,H,M,O,S,Y,Z
4.790	R.Atlantida	Peru	0445	A
4.790	Azad Kashmir R.	Pakistan	1900	Y
4.795	R.Douala	Cameroon	2130	M,Y
4.795	R.Moscow	USSR	2237	R,Z
4.800	AIR Hyderabad	India	0045	J
4.800	LNBS Lesotho	Maseru	1920	E,O,R,Y
4.805	R.Nac Amazonas	Brazil	2340	A,E
4.810	RSA	S.Africa	1915	O
4.810	R.Moscow Vladivostok	USSR	2206	V
4.810	R.Yerevan	USSA	2050	O,R,S
4.815	R.Beijing	China	1202	E
4.815	R.diff TV Burkina	Ouagadougou	2130	A,O,S,Y,Z
4.820	R.Botswana	Botswana	2055	N,O,Y
4.820	AIR Calcutta	India	1800	B
4.820	Khanty-Mansiysk	USSR	0553	E,S
4.825	V of Selva	Peru	0020	Y

Freq MHz	Station	Country	UTC	DXer
4.830	Africa No.1	Gabon	2030	E,H,M,O,S,V,Y,Z
4.830	R.Rejoi	Costa Rica	0601	E,S,Y
4.830	R.Tachira	Venezuela	0035	A,E,J,X,Y
4.835	RTM Bamako	Mali	2035	D,H,K,O,Y,Z
4.840	R.Bukavu	Zaire	2235	Y
4.845	R.Nacional, Manus	Brazil	2255	Y,Z
4.845	ORTM Nouakchott	Mauritania	2050	A,E,H,O,S,Z
4.850	R.Yaounde	Cameroon	2125	E,O,S,Y
4.850	R.Capital, Caracas	Venezuela	0215	H,Y,Z
4.855	R.Sana Yemen	Yemen	0315	E
4.860	AIR New Delhi	India	1542	E
4.860	Kalinin	USSR	2031	L
4.865	PBS Lanzhou	China	2305	A,E,Y,Z
4.870	R.Cotonou	Benin	2055	O,S,Y
4.875	R.Nac.Boa Vista	Brazil	0830	E
4.880	SABC Radio 5	S.Africa	2015	E,N,O,R,Y
4.885	R.Clube do Para	Brazil	0250	E,Y
4.885	R.Beijing	China	2315	Z
4.885	Voice of Kenya	Kenya	2000	O,Y
4.890	RFI Paris	via Gabon	0450	A,S
4.890	ORTS,Dakar	Senegal	2200	O
4.895	Ashkhabad	USSR	2050	O,P
4.895	R.Moscow Kalinin	USSR	1756	R,Z
4.900	R.diff Nat. Conakry	Guinea	2200	Y
4.905	R.Abu Dhabi	UAE	0350	E
4.905	N'djamena	Chad	2125	E,O,Y,Z
4.910	R.Zambia	Zambia	2000	A,O,Y
4.915	R.Ghana, Accra	Ghana	2050	E,H,O,S,Y
4.915	R.Anhanguera	Brazil	0712	E,R,S
4.915	Voice of Kenya	Kenya	1900	O
4.915	R.Nac.Macapa	Brazil	0802	S
4.915	PBS Guangxi Nanning	China	2259	Z
4.920	AIR Madras	India	1544	E
4.920	VLM4 Brisbane	Australia	0905	E
4.920	R.Quito	Ecuador	0235	H,Y
4.925	R.Nacional, Bata	Eq.Guinea	2000	Y
4.930	Ashkhabad	USSR	2050	O
4.935	SWABC Windhoek	S.W.Africa	1840	O
4.940	R.Abidjan	Ivory Coast	2300	Y
4.940	Kiev	USSR	2035	L,O,R,S,Z
4.945	Caracol, Neiva	Colombia	0857	E
4.945	R.Nat.Porto Velho	Brazil	0720	A,Y
4.950	PBS Xilinhot Hohhot	China	1005	E
4.955	R.Cultura Campos	Brazil	0825	E
4.955	R.Baku	USSR	2022	E
4.970	R.Rumbos	Venezuela	2243	R,Y
4.975	R.Uganda	Uganda	2005	J,O,Y
4.975	Dushanbe	USSR	0320	E
4.980	R.Swaziland	Swaziland	1925	Y
4.980	Ecós del Torbes	Venezuela	0020	A,E,J,R,S,Y
4.985	R.Brazil Central	Brazil	0200	Y
4.990	AIR New Delhi	India	2359	H
4.990	R.Ancash	Peru	1002	E
4.990	FRCN, Lagos	Nigeria	2125	M,O,Q,S,Y,Z
4.990	VOIRI Tehran	Iran	1950	E,L
4.990	Yerevan	USSR	2035	O,Z
5.005	R.Nacional, Bata	Eq.Guinea	0505	J,O,S
5.005	R.Nepal	Khumaltar	1615	Y
5.010	R.Garoua	Cameroon	2130	M,O,S,Y,Z
5.015	Arkhangelsk	USSR	0713	S
5.020	ORTN Niamey	Niger	2010	L,O,R,Y
5.025	R.Rebelde Habana	Cuba	0100	Y
5.025	R.Uganda, Kampala	Uganda	2050	O
5.030	R.Beijing	China	1910	O
5.035	R.Bangui	C.Africa	2200	E,J,O,Y,Z
5.035	Alma Ata	USSR	0653	E,S
5.040	R.Tbilisi	USSR	2045	L
5.045	R.Cultura do Para	Brazil	0804	E
5.045	R.Togo Lome	Togo	2200	O,S,Y
5.050	EM.Jesus Gran Poder	Ecuador	1020	E
5.050	R.Singapore	Singapore	1600	P
5.057	Gjirokaster	Albania	0700	H,S,Z
5.060	PBS Xinjiang	China	2324	Z
5.065	R.Candip	Zaire	0250	Y
5.095	R.Sutatenza, Bogata	Columbia	2350	E,Y
5.200	V.Nat Army	Kampuchea	2330	Y
5.320	R.Beijing	China	2027	E

## DXers

- (A) Ian Baxter, Blackburn.
- (B) Jean-Yves Camus, Creteil, France.
- (C) Alan Curry, Stockton-on-Tees.
- (D) Colin Diffell, Corsham.
- (E) David Edwardson, Wallsend.

- (F) G.Efstratiades, Thessaloniki, Greece.
- (G) G. Glen-Davison, Newcastle
- (H) Bill Griffith, London.
- (I) P. Hawkyard, Newcastle-on-Tyne.
- (J) Bill Kelly, Belfast.
- (K) David Middlemiss, Eyemouth.
- (L) John Nash, Brighton.

- (M) Howard Newell, G. Missenden.
- (N) P. O'Connor, Florida, S.Africa.
- (O) Fred Pallant, Storrington.
- (P) John Parry, Northwich.
- (Q) Ron Pearce, Bungay.
- (R) Philip Rambaut, Macclesfield.
- (S) Kenneth Reece, Prenton.

- (T) Tim Shirley, Bristol.
- (U) Bill Stewart, Lossiemouth.
- (V) Darran Taplin, Tunbridge Wells.
- (W) Phillip Townsend, London.
- (X) Ed Wieringa, Zandvoort, Holland.
- (Y) Jim Willett, Grimsby.
- (Z) Bob Wilson, Nottingham.

# SEEN & HEARD

The programmes in Arabic and English from UAE Radio Dubai 15.435 are intended for listeners in N. America (0200-0400), SE Asia (0415-0600) and Europe (0615-1515). At his listening post in Wallsend (Fig. 1), David Edwardson rated their signal as 34544 at 0340.

Although VOIRI Tehran, Iran 15.080 broadcast to Europe from 0530 until 1500 their programmes are in Spanish, French and Farsi, Davy Hossack logged them at 0705. The Voice of Nigeria, Lagos 15.120 was logged as 34232 at 0830 by John Nash.

Listening in Northwich, John Parry logged Riyadh, Saudi Arabia 15.060 as 45554 at 1530 (Arabic to N. Africa 1100-1700); WYFR via Okeehobee, Florida 15.440 (English/German/French to Europe 1600-1845) – 34553 at 1610; VOA via Monrovia, Liberia 15.445 (English to C. Africa 1600-2200) – 44554 at 1610. The broadcast to Europe in eight languages from RCI Montreal, Canada may be heard on 15.325 between 1430 and 2200. Graham Johnson rated them as 45444 in Nuneaton at 1756.

Writing from Evesham, Edward Broadsmith says he has been hearing the broadcasts to Europe from WCSN in Boston on 15.280 very clearly at 1700. Ron Pearce has also been hearing them on his single 955 Acorn valve receiver in Bungay. He picked up two more stations in the USA, WYFR via Okeechobee, Florida 15.170 at 1700 (English to C. America 1300-2245) and WRNO in New Orleans 15.420 at 1800 (English/French to Europe and N. Africa 1800-2200). Arthur Bolton has also been experimenting with a one valver in Birmingham. Originally his set used a 1T4 valve, but he decided to try a 955 Acorn and found results much better. An h.t. supply of 35V was adequate.

Between 2000 and 2100,

Colin Diffell logged Vatican Radio, Rome 15.120 (English/Esperanto to Africa 1940-2010); BBC via Antigua, W. Indies 15.260 (World Service to S. America 2000-2115); Radio Cairo, Egypt 15.335 (Fulani/French to W. Africa 1930-2230) and Radio HCJB Quito, Ecuador 15.270. Sheila Hughes is a regular listener to HCJBs programmes in Morden at 2130.

Another broadcaster in the USA, namely WCSN in Boston may now be heard on the 13MHz (22m) band. Leslie Hollis logged their transmission on 13.670 as 54544 in Grantham at 1445 and George Efstratiades rated their signal in Greece as SIO 444 at 1400. Some of the other broadcasters using this band were noted in the reports from DXers, Radio Korea Seoul, S. Korea 13.670 (Italian, French, German and English to Europe 0600-0900), rated by Kenneth Reece as 44444 at 0834; Radio Baghdad, Iraq 13.680 (Arabic to Europe 0600-1115), rated by John Parry as 34553 at 0812.

Later, Howard Newell logged WYFR via Okeehobee Florida 13.695 at 1310 (French/English to N. America 1200-2245); Radio Moscow 13.790 at 1345 (World Service to N. America 1100-1600) and Radio Nederlands via Flevo, Holland 13.770 at 1430 (English to S. Asia 1400-1525). Philip Rambaut also heard WYFR and at 1609 he logged SRI Berne, Switzerland on 13.685 as SIO 444. Leslie Hollis picked up WHRI South Bend, USA 13.760 at 1930 and rated their signal as 25432 (English to Europe 1800-2100).

There is certainly plenty to interest the DXer on the 11MHz (25m) band by day or night! The programmes from Radio Australia are beamed to the S. Pacific area via Shepparton on 11.910 from 0400 until 0630 and during some mornings they have been reaching the UK. George Hewlett has noted some jamming around 0415, but

by 0615 their signal may peak 434. The signals from their station in Darwin in 11.800 have been audible here some days around 1200. This transmission is intended for listeners in C. Asia, with programmes in Japanese and English from 1000 until 1330. Leslie Hollis logged them as 43433 at 1215.

The broadcasts from KTWR on the remote island of Guam in the mid-Pacific have been attracting the attention of Sheila Hughes at 0805. They beam programmes in English to E. Asia on 11.805 from 0805 until 0930 and were rated as 34433 by Sheila at 0830. Two seldom mentioned stations were noted in the report from George Estratiades, namely Radio Tanzania, Zanzibar 11.735 broadcasting in Swahili from 1400 until 1815, rated as 232 at 1703 and SLBC Colombo, Sri Lanka 11.800, broadcasting in English and Sinhala to the Middle East for an hour from 1745.

The programmes in English, Norwegian, French and German broadcast by Radio HCJB in Quito, Ecuador on 11.790 between 1900 and 2200 are popular with listeners in Europe. Using a Saisho SW5000 portable plus 10m wire antenna, Nick Rank rated their signal in Buxton as 44333 at 2153. In Malvern, Colin Godwin has been listening to the programmes in English and Japanese from Radio Japan in Tokyo. They are beamed to Europe via Moyabi, Gabon on 11.800 from 2200 until 2359. Colin noted 43334 in his log at 2340.

There are plenty of interesting broadcasts on the 9MHz (31m) band too! Radio Australia beam their programmes to listeners in Europe via Shepparton on 9.655 from 0700 until 1030. Reception here is generally good and it seems that Leo Gieske has also been hearing their transmission in Randburg, S. Africa around 0705!

The DX programmes from RSI Stockholm, Sweden attract a wide audience on Wednesdays at 1100 on 9.630. Daniel Masterson rated their broadcast as 444 at 1125 in Stoke-on-Trent. Some interesting DX was logged by Dick Moon in George, S. Africa, SLBC Colombo, Sri Lanka 9.720 at 0833; KFBS Siapan, N. Mariana Islands 9.465 at 1515 and Radio Tanzania Dar-es-Salaam 9.685 at 1922. Leo

Geiske heard ABC in Perth, Australia on 9.610 at 1600. Three seldom mentioned stations were logged by Jean-Yves Camus in Creteil, France – FEBA Radio, Seychelles 9.510 at 1830 (Amharic to E. Africa 1733-1833); TWR Manzini, Swaziland 9.550 at 1915 (French/Lingala to C. Africa 1915-2015); VOR Addis Ababa, Ethiopia 9.560 at 1830 (French to E. Africa 1800-1855).

Some of the broadcasters noted on the 7MHz (41m) band by DXers were Radio Korea, Seoul, S. Korea 7.275, logged at 1500 by Julian Wood in Buckie; Radio Australia 7.205 (English to Europe 1400-2030), rated as 33433 by Darran Taplin at 1650; Iran's Flag of Freedom 7.080 (Farsi/Azerbaijani to Middle East 1630-1825), logged by Dick Moon at 1645; Radio Bangladesh, Dhaka 7.505 (English to Europe 1815-1915), logged by John Sadler in Bishops Stortford at 1825; Radio Vilnius Lithuania, USSR 7.165 (English to N. America), rated as 44444 by Sheila Hughes at 2300; Voice of Greece, Athens 7.425 (English/Greek to N. America 2359-0350), rated as 55555 at 0130 by Bill Griffith in London.

While monitoring the 6MHz (49m) band in London, Phil Townsend logged Radio Yugoslavia, Belgrade on 5.980 at 2015. Using a Toshiba RPF – 11 portable in Bexhill-on-Sea, David Minter logged RHC Havana, Cuba via Moscow, USSR 6.165 at 2215 and Radio Sophia, Bulgaria 6.070 at 2315. In Nottingham, Bob Wilson picked up the BBC World Service via Ascension Island on 6.005 at 2256.

## Station Addresses

BBC Radio Cornwall, Phoenix Wharf, Truro, Cornwall. TR1 1UA. ILR County Sound, The Friary, Guildford, Surrey, GU1 4YX.

Radio Moscow, English Section, Pyatnitskaja Ultiza 25, Moscow, USSR.

Radio Exterior de Espana, Apartado 156 202, E-28080 Madrid, Spain.

Radio Singapore (SBC), Caldecott Hill, Thomson Road, Singapore 1129, Singapore.

Radio Yerevan, Foreign Broadcasting Department, 5 Mravian Street, Yerevan, Armanian SSR, USSR.



Fig. 1

Please note that  
Deadlines for Reports  
for all sections of  
Seen & Heard are now  
the same

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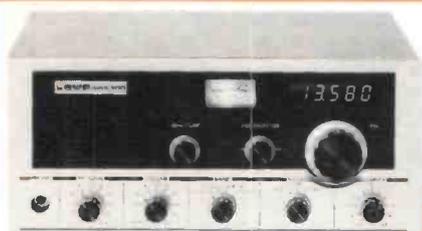


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Lowe SRX30D  
Communications Receiver



- **COVERAGE:** 500 – 30MHz
- **MODES:** a.m., s.s.b. (u.s.b. & l.s.b.)
- **SENSITIVITY:** 10dB (S + N)/N for an input of 0.3µV on s.s.b. 1µV on a.m.
- **RESOLUTION:**
- **SELECTIVITY:** s.s.b./c.w. 8kHz and 4kHz at –6dB respectively
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** speaker plus 60mV into 5kΩ for a recorder
- **IF STAGE:** 45MHz, 2 – 3MHz tunable, 455kHz
- **FEATURES:**
- **REVIEWED:** Practical Wireless April 1982
- **PRICE:** Available on the second-hand market

Icom IC-R70  
Communications Receiver



- **COVERAGE:** 100kHz – 30MHz
- **MODES:** a.m., f.m., s.s.b., RTTY, c.w.
- **SENSITIVITY:** Input for 10dB (S + N)/N, s.s.b./c.w./RTTY 1µV < 1.6MHz 0.15µV > 1.6MHz, a.m. 3µV < 1.6MHz 0.5µV > 1.6MHz, f.m. 0.3µV for 12dB SINAD > 1.6MHz
- **RESOLUTION:** 10Hz, 100Hz & 1kHz
- **SELECTIVITY:** Width control at maximum, s.s.b./c.w./RTTY 2.3kHz at –6dB, 4.2kHz at –60dB; a.m. (N)/RTTY(N) 500Hz at –6dB, 1.5kHz at –60dB; a.m. 6kHz at –6dB, 18kHz at –60dB; f.m. 15kHz at –6dB, 25kHz at –60dB.
- **IMAGE REJECTION:** Better than 79dB
- **IF REJECTION:** At 29.01MHz better than 76dB
- **SPURIOUS REJECTION:** More than 60dB
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** More than 2W in 8Ω
- **IF STAGE:** 70.451MHz, 9.0115MHz & 455kHz
- **FEATURES:** Optional f.m. modules, independent digital v.f.o.s
- **REVIEWED:** Practical Wireless April 1984
- **PRICE:** Available on second-hand market

Kenwood R-2000  
Communications Receiver



- **COVERAGE:** 150kHz to 30MHz
- **MODES:** a.m., f.m., c.w., s.s.b. (u.s.b., l.s.b.)
- **SENSITIVITY:** 150kHz to 2MHz s.s.b./c.w., < 2µV; 2MHz to 30MHz a.m., < 4µV
- **RESOLUTION:** 50Hz, 500Hz, 5kHz
- **SELECTIVITY:** a.m. wide 6kHz at –6dB, 18kHz at –50dB; s.s.b./c.w. 2.7kHz at –6dB, 5kHz at –50dB
- **IMAGE REJECTION:** >70dB
- **IF REJECTION:** >70dB
- **SPURIOUS REJECTION:** >60dB
- **FREQUENCY STABILITY:** ±300Hz for first hour, ±50Hz after
- **AUDIO OUTPUT:** 1.5W at 8Ω and 10% distortion
- **IF STAGE:** Triple conversion: 48.85MHz, 9.85MHz and 455kHz
- **FEATURES:** 50Hz step digital v.f.o., 10 memory freqs., memory scan, programmable band scan, lithium battery memory backup, fluorescent digital display, dual 24hr quartz clocks, 3 built-in i.f. filters, all-mode squelch circuit, noise blanker, r.f. step attenuator, S-meter
- **REVIEWED:**
- **PRICE:** £595

# WHAT RECEIVER

What Receiver has been split into two sections. This part covers communications and general coverage receivers. The second section will deal with portable sets.

Panasonic RFB600LBE  
Communications Receiver



- **COVERAGE:** l.w.: 150 – 420kHz; m.w.: 520 – 1610kHz; s.w.: 1.611 – 29.9999MHz; f.m.: 87.5 – 108MHz
- **MODES:** a.m., f.m., s.s.b.
- **SENSITIVITY:** l.w.: S/N 6dB 70µV/m (at 280kHz), S/N 26dB 600µV/m (at 280kHz); m.w.: S/N 6dB 35µV/m (at 1000kHz), S/N 26dB 400µV/m (at 1000kHz); s.w.: 400Hz 30% mod 50mW S/N 6dB 1.2µV (50Ω) at 6MHz, S/N 26dB 10µV (50Ω) at 6MHz; f.m.: 2.5µV/75Ω (–3dB limit sens), 2.5µV/75Ω (S/N 26dB)
- **RESOLUTION:**
- **SELECTIVITY:** l.w. (wide): ±3.5kHz (–6dB), ±7kHz (–60dB), (narrow): ±1.5kHz (–6dB), ±4kHz (–60dB); m.w. (wide): ±3.5kHz (–6dB), ±7kHz (–60dB), (narrow): ±1.5kHz (–6dB), ±4kHz (–60dB); s.w. (wide): ±3.5kHz (–6dB), ±7kHz (–60dB), (narrow): ±1.5kHz (–6dB), ±4kHz (–60dB)
- **IMAGE REJECTION:** l.w.: 35dB; m.w.: 40dB; s.w.: 50dB; f.m.: 30dB
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:** Within 50Hz during any 60 minutes after warm-up time
- **AUDIO OUTPUT:** 2W r.m.s. max
- **IF STAGE:** l.w., m.w.: 450kHz, s.w.: 39.9 – 40MHz, 450kHz, f.m.: 10.7MHz
- **FEATURES:**
- **REVIEWED:**
- **PRICE:** £499.95

Trio R-1000  
Communications Receiver



- **COVERAGE:** 200kHz – 30MHz
- **MODES:** a.m., s.s.b. (u.s.b. & l.s.b.), c.w.
- **SENSITIVITY:** Below 2MHz – 5µV s.s.b., 50µV a.m. Above 2MHz – 0.5µV s.s.b., 5µV a.m.
- **RESOLUTION:**
- **SELECTIVITY:** a.m. (wide): 12kHz at –6dB, 25kHz at –50dB, a.m. (narrow): 6kHz at –6dB, 18kHz at –50dB
- **IMAGE REJECTION:** Better than 60dB
- **IF REJECTION:** Better than 70dB
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:** ±2kHz max from 1 to 60 minutes after switch-on, ±300Hz max in any subsequent 30 minutes
- **AUDIO OUTPUT:** 1.5W min into 8Ω for 10% distortion
- **IF STAGE:** 48.055MHz & 455kHz
- **FEATURES:**
- **REVIEWED:** Practical Wireless May 1980
- **PRICE:** Available on the second-hand market

Yaesu FRG-8800  
General Coverage Receiver



- **COVERAGE:** 150kHz to 29.999MHz
- **MODES:** a.m., c.w., s.s.b. (u.s.b., l.s.b.), f.m. narrow
- **SENSITIVITY:** 150kHz to 1.6MHz a.m., 30µV/50Ω; 1.6 to 29.999MHz s.s.b., c.w., 0.4µV/50Ω
- **RESOLUTION:** 100Hz
- **SELECTIVITY:** a.m., 6kHz at –6dB, 15kHz at –50dB; s.s.b., c.w., 2.7kHz
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:** ±300Hz during first ½ hr, < 50Hz during any 30min period after warm-up
- **AUDIO OUTPUT:** 1.4W at 8Ω and 10% distortion
- **IF STAGE:** 47.055MHz, 455kHz
- **FEATURES:** 8-bit c.p.u., keypad for digital freq. entry, 12 internal memories, multi-function scanner, noise blanking, dual 24hr clocks, all-mode squelch, tone and attenuation
- **REVIEWED:**
- **PRICE:** £639

Icom IC-R7000  
Communications Receiver



- **COVERAGE:** 25 to 2000MHz continuous
- **MODES:** f.m. wide/f.m. narrow/a.m. upper/s.s.b. lower
- **SENSITIVITY:** f.m., < 0.5µV for 12dB SINAD; f.m. narrow, < 0.5µV for 12dB SINAD; f.m. wide, < 1.0µV for 12dB SINAD; s.s.b., < 0.3µV for 10dB SINAD; a.m., < 1.0µV for 10dB SINAD
- **RESOLUTION:** 0.1, 1, 5, 10, 12.5 and 25kHz
- **SELECTIVITY:** f.m. narrow, 6kHz at –6dB; f.m./a.m., 15kHz at –6dB; f.m. wide, 150kHz at –6dB; s.s.b., 2.8kHz at –6dB
- **IMAGE REJECTION:** >60dB
- **IF REJECTION:** >60dB
- **SPURIOUS REJECTION:** >60dB
- **FREQUENCY STABILITY:** ±5 p.p.m. at 0°C to +50°C
- **AUDIO OUTPUT:** 2.5W at 8Ω at 10% distortion
- **IF STAGE:** Multiple i.f.s between 455kHz and 9MHz depending on mode
- **FEATURES:** dual-colour fluorescent display, dial lock, noise blanker, attenuator, display dimmer, S-meter
- **REVIEWED:**
- **PRICE:** about £960

Yaesu FRG-7700  
Communications Receiver



- **COVERAGE:** 150kHz – 30MHz
- **MODES:** a.m., f.m., s.s.b. (u.s.b. & l.s.b.)
- **SENSITIVITY:** Below 300kHz; 30µV a.m., 3µV s.s.b./c.w.; 300kHz – 2MHz; 25µV a.m., 2µV s.s.b./c.w.; Above 2MHz; 5µV a.m., 0.5µV s.s.b./c.w., 1µV n.b.f.m. for 10dB S + N/N or better
- **RESOLUTION:** 1kHz
- **SELECTIVITY:** a.m. (wide): 12kHz at –6dB, 25kHz at –50dB; a.m. (medium): 6kHz at –6dB, 15kHz at –50dB; a.m. (narrow): 2.7kHz at –6dB, 8kHz at –50dB; s.s.b./c.w.: 2.7kHz at –6dB, 8kHz at –50dB; f.m.; 15kHz at –6dB, 30kHz at –40dB
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:** less than ±1kHz 30 min, after 30 mins ±300Hz
- **AUDIO OUTPUT:** 1.5W into 8Ω for 10% distortion
- **IF STAGE:** 48.055MHz & 455kHz
- **FEATURES:** Clock, timer and sleep timer
- **REVIEWED:** Practical Wireless December 1980 & March 1981
- **PRICE:** £350

### JRC NRD-525 General Coverage Receiver

- **COVERAGE:** 90kHz to 34MHz (optionally to 456MHz in steps)
- **MODES:** RTTY, FAX, c.w., s.s.b. (u.s.b., l.s.b.), a.m., f.m.
- **SENSITIVITY:** 1.6 to 34MHz c.w., 0.5µV; 1.6 to 34MHz a.m., 2µV
- **RESOLUTION:** 10Hz, 1kHz, 10kHz, 20kHz
- **SELECTIVITY:** wide bandwidth >4kHz at -6dB, <10kHz at -60dB
- **IMAGE REJECTION:** >76dB
- **IF REJECTION:** >76dB
- **SPURIOUS REJECTION:** >76dB
- **FREQUENCY STABILITY:** ±3 p.p.m.
- **AUDIO OUTPUT:** >0.5W at 4Ω and 10% distortion
- **IF STAGE:** IF2 - 455kHz
- **FEATURES:** scan and sweep, electronic tuning (via main control or key pad), noise blanker, S-meter, sidetone input, mute input, transmission monitor, squelch, dimmer, tone control, clock, timer, i.f. notch filter, passband shift
- **REVIEWED:** Practical Wireless June 1986
- **PRICE:** £1195

### Eddystone Model 1650 Communications Receiver



- **COVERAGE:** 10kHz to 30MHz in synthesised steps of 5Hz
- **MODES:** (1650/1) a.m., c.w., u.s.b.; (1650/2) a.m., c.w., u.s.b., l.s.b.; (1650/3) a.m., c.w., u.s.b., l.s.b.
- **SENSITIVITY:** 12dB s/n on s.s.b. for 1µV input
- **RESOLUTION:** 5Hz
- **FREQUENCY:** At -6dB: 400Hz, 1kHz, 2.4kHz, 3kHz, 8kHz, 14kHz
- **IMAGE REJECTION:** typically 100dB
- **IF REJECTION:** typically 100dB
- **SPURIOUS REJECTION:** typically 100dB
- **FREQUENCY STABILITY:** 10 p.p.m. above 1MHz
- **AUDIO OUTPUT:** line (600Ω) 10mW pre-set; loudspeaker 1W max. low/medium impedance
- **IF STAGE:** 1.4MHz
- **FEATURES:** remotely controllable, variable speed tuning, built-in r.f. front end pre-selector option, scan and sweep facility, 99 programmable memories
- **REVIEWED:**
- **PRICE:** On application to Lowe Electronics

## WHAT RECEIVER

### Kenwood R-5000 Communications Receiver

- **COVERAGE:** 100kHz to 30MHz
- **MODES:** c.w., s.s.b., a.m., f.m., f.s.k.
- **SENSITIVITY:** 1.8 to 30MHz s.s.b., c.w., f.s.k., <0.25µV; 500kHz to 1.8MHz a.m. (30% mod.), <32µV
- **RESOLUTION:** 10Hz
- **SELECTIVITY:** s.s.b., c.w., f.s.k., 2.4kHz at -6dB, 4.4kHz at -60dB; a.m., 6kHz at -6dB; f.m., 25kHz at -50dB
- **IMAGE REJECTION:** 1.8 to 30MHz, >80dB
- **IF REJECTION:** 1.8 to 30MHz, >70dB
- **SPURIOUS REJECTION:** >80dB
- **FREQUENCY STABILITY:** ±10 p.p.m. or better
- **AUDIO OUTPUT:** 1.5W at 8Ω and 10% distortion
- **IF STAGE:** Double conversion: 58.1125 and 8.83MHz, Triple conversion on f.m.: 455kHz
- **FEATURES:** 10Hz step dual digital f.o.s. micro controlled digital p.l.l., 100 memory channels, memory scroll, memory and programmable band scan, selectable i.f. filters, noise blanker, dual 24hr quartz clocks, r.f. attenuator, lithium battery memory backup, keyboard frequency selection
- **REVIEWED:** Short Wave magazine June 1987
- **PRICE:** £875

### Icom IC-R71E General Coverage Receiver

- **COVERAGE:** 0.1MHz to 30MHz
- **MODES:** a.m./c.w./u.s.b./l.s.b./RTTY
- **SENSITIVITY:** s.s.b./c.w./RTTY, <0.15µV for 10dB s+n/n; a.m., <0.5µV; f.m. (optional), <0.3µV for 12dB SINAD
- **RESOLUTION:** 10Hz, 50Hz, 1kHz
- **SELECTIVITY:** s.s.b./c.w./RTTY, 2.3kHz at -6dB, 4.2kHz at -60dB; c.w. narrow/RTTY narrow, 500Hz at -6dB, 1.5kHz at -60dB; a.m., 6kHz at -6dB, 15kHz at -50dB; f.m. (optional), 15kHz at -6dB, 25kHz at -60dB
- **IMAGE REJECTION:** >60dB
- **IF REJECTION:** >60dB
- **SPURIOUS REJECTION:** >60dB
- **FREQUENCY STABILITY:** <200Hz after switch-on to 60 min., <30Hz after 1hr
- **AUDIO OUTPUT:** >2W
- **IF STAGE:** Multiple i.f.s depending on mode. 70.45MHz, 9MHz and 455kHz
- **FEATURES:** f.m. (optional)
- **REVIEWED:**
- **PRICE:** £825

### Touroport 220 Broadcast Receiver

- **COVERAGE:** 153 - 281kHz; 522 - 1611kHz; 2.3 - 4.215MHz; 4.540 - 6.455MHz; 7.1 - 7.735MHz; 9.500 - 10.135MHz; 11.585 - 12.215MHz; 15.100 - 15.735MHz; 17.500 - 18.135MHz; 21.340 - 21.975MHz; 25.500 - 26.135MHz; 87.5 - 108MHz
- **MODES:** a.m., f.m.
- **SENSITIVITY:** 3 - 4µV e.m.f. for 20dB S-N
- **RESOLUTION:** 1.5, 9 & 50kHz
- **SELECTIVITY:**
- **IMAGE REJECTION:**
- **IF REJECTION:**
- **SPURIOUS REJECTION:**
- **FREQUENCY STABILITY:**
- **AUDIO OUTPUT:** 0.8W into 4Ω with 10% t.h.d.
- **IF STAGE:**
- **FEATURES:** 10-station memory; i.c.d. readout, clock (includes alarm facilities), mains, 6V d.c. or battery options
- **REVIEWED:** Practical Wireless June 1985
- **PRICE:** Available on second-hand market

### Lowe HF-125 General Coverage Receiver



- **COVERAGE:** 30kHz to 30MHz continuous, optional 150kHz to 26.1MHz restricted coverage
- **MODES:** a.m., c.w., s.s.b. (u.s.b., l.s.b.), optional D-125 board adds n.b.f.m. and sync. a.m.
- **SENSITIVITY:** s.s.b., <0.3µV for 10dB s/n; a.m., <0.7µV for 10dB s/n at 70% mod
- **RESOLUTION:** 1kHz
- **SELECTIVITY:** At -6dB: 400Hz, 2.5kHz, 4kHz, 7kHz, 10kHz
- **IMAGE REJECTION:** >89dB
- **IF REJECTION:** >78dB
- **SPURIOUS REJECTION:** >75dB
- **FREQUENCY STABILITY:** +55kHz in first 15 mins., +25kHz in next hour
- **AUDIO OUTPUT:** 0.75W into int. speaker, 1.25W into ext. 4Ω speaker
- **IF STAGE:** IF1 - 455MHz, IF2 - 455MHz
- **FEATURES:** tuning step size increases with faster knob rotation, permanent in-circuit noise blanker
- **REVIEWED:** Practical Wireless March & April 1987
- **PRICE:** HF-125, £375; D-125, £59.50; K-125, £59.50; P-125 Portable Pack (internal NiCads, charger and active whip antenna), £69.50

## Subscriptions

Subscriptions are available at £17 per annum to UK addresses and £19.00 overseas by Accelerated Surface Post outside Europe. For further details see the announcement on page 15 of this issue. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £27.00 (UK) and £30.00 (overseas).

## Queries

We will always try to help readers having difficulties with a *Short Wave Magazine* project, but please observe the following simple rules:

1. We cannot give advice on commercial radio, TV or electronic equipment, nor on modifications to our designs.
2. We cannot deal with technical queries over the telephone.
3. All letters asking for advice must be accompanied by a stamped, self-addressed envelope (or envelope plus international Reply Coupons for overseas readers).

## SERVICES

4. Write to the Editor, "Short Wave Magazine", Enefco House, The Quay, Poole, Dorset BH15 1PP, giving a clear description of your problem.
5. Only one query per letter, please.

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Limited stocks of most issues of *SWM* for the past 10 years are available at £1.45 each, including post and packing to addresses at home and overseas (by surface mail).

Binders, each taking one volume of the new style *SWM*, are available price £3.90 to UK addresses, or overseas, including post and packing. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

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### Components for *SWM* Projects

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

The printed circuit board for the *SWM* Audio Filter, July 87 issue is available from *Short Wave Magazine*, Enefco House, The Quay, Poole, Dorset BH15 1PP, price £2.00 plus 75p post and packing.

# BOOK SERVICE

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### RADIO

#### ★ SHORT WAVE RADIO LISTENERS' HANDBOOK

**Arthur Miller**  
In easy-to-read and non-technical language, the author guides the reader through the mysteries of amateur, broadcast and CB transmissions. 207 pages £6.99

#### AN INTRODUCTION TO RADIO DXING (BP91)

**R. A. Penfold**  
How to find a particular station, country or type of broadcast and to receive it as clearly as possible. 112 pages £1.95

#### A TV-DXERS HANDBOOK (BP176)

**R. Bunney**  
Information on transmission standards, propagation, receivers including multi-standard, colour, satellites, antennas, photography, station identification, interference, etc. Revised and updated 1986. 87 pages O/P

#### BEGINNER'S GUIDE TO RADIO (9th Edition)

**Gordon J. King**  
Radio signals, transmitters, receivers, antennas, components, valves and semiconductors. CB and amateur radio are all dealt with here. 266 pages £6.95

#### BETTER RADIO/TV RECEPTION

**A. Nallawalla, A. T. Cushen and B. D. Clark**  
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#### GUIDE TO BROADCASTING STATIONS

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**Philip Darrington**  
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#### ★ GUIDE TO FACSIMILE STATIONS

7th Edition  
**Joerg Kligenfuss**  
This manual is the basic reference book for everyone interested in FAX. Frequency, callsign, name of the station, ITU country/geographical symbol, technical parameters of the emission are all listed. All frequencies have been measured to the nearest 100Hz. 252 pages £12.00

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3rd Edition  
**Joerg Kligenfuss**  
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#### ★ GUIDE TO UTILITY STATIONS

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**Joerg Kligenfuss**  
This book covers the complete short wave range from 3 to 30MHz plus the adjacent frequency bands from 0 to 150kHz and from 1.6 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 15802 entries in the frequency list and 3123 in the alphabetical callsign list plus press services and meteorological stations. 494 pages £19.00

#### ★ HF OCEANIC AIRBAND COMMUNICATIONS (2nd Edn.)

**Bill Laver**  
Aircraft channels by frequency and band, main ground radio stations, European R/T networks, North Atlantic control frequencies. 24 pages £3.50

#### INTERFERENCE HANDBOOK (USA)

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How to locate and cure r.f.i. for radio amateurs, CBers and TV and stereo owners. 253 pages £6.75

#### INTERNATIONAL RADIO STATIONS GUIDE (BP155)

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#### SATELLITE TELEVISION

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#### SCANNERS

**Peter Rouse GU1DKD**  
A guide for users of scanning receivers, covering hardware, antennas, accessories, frequency allocations and operating procedure. 177 pages £7.95

#### SCANNERS 2

**Peter Rouse GU1DKD**  
The companion to Scanners, this provides even more information on the use of v.h.f. and u.h.f. communications band and gives constructional details for accessories to improve the performance of scanning equipment. 216 pages £9.95

#### AMATEUR RADIO SATELLITES the first 25 years

**Arthur C. Gee G2UK**  
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Updated 1988  
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#### UK LISTENERS CONFIDENTIAL FREQUENCY LIST (4th Edn. 1987/88)

**Bill Laver**  
Covering the services and transmission modes that can be heard on the bands between 1.635 and 29.7MHz. 124 pages £5.95

#### VHF/UHF AIRBAND FREQUENCY GUIDE

A complete guide to the airband frequencies including how to receive the signals, the frequencies and services, VOLMET and much more about the interesting subject of airband radio. 74 pages. £5.95

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# RALLIES

**March 5:** For the second year running, Newcastle Breweries and the Tyneside ARS are joining forces to stage the Blue Star Rally. The venue is the North East Exhibition Centre in Gosforth Park, Newcastle. Doors are open between 11am and 5pm. Following last year's success, three floors of the Centre will house equipment dealers and there'll be many local bargains too. The RSGB will be conducting Morse tests. There is plenty of free parking adjacent to the centre. For more details:

G4MRT

Tel: 091-281 0994

**March 13:** The Bury Radio Society will be holding their 1988 rally at a new venue. The bigger venue is the Castle Leisure Centre, Bolton Street, Bury. There will be the usual large number of stands, a bring & buy and masses of radio and electronic traders. Talk-in will be on S22. More from:

M. L. Jamil G1VQE

29 Harrow Close

Blackford Bridge

Bury

**March 20:** The Tiverton SW Radio Club are holding The Mid Devon Rally at the Pannier Market, Tiverton. There is easy access from junction 27 of the M5 and excellent parking facilities on site. There will be two halls of trade stands, a bring & buy and a mobile snack bar. Talk-in will be on S22. More details from:

G4TSW

Mid Devon Rally

PO Box 3

Tiverton

**April 24:** The Swansea ARS will hold their 7th Annual Rally in the Swansea Leisure Centre on the A4067, Swansea-Mumbles Coast Road. Note that it's a change of venue. Doors will be open between 10.30am and 5pm. There will be plenty of traders, a bring & buy, bookstall, refreshments, licensed bar and an h.f. station. Talk-in will be by GB2SWR. More details from the rally secretary:

Roger Williams GW4HSH

Tel: 0792 404422

★ SWM will be in attendance.

**\*April 17:** The Trafford Amateur Radio Club are holding their second Trafford Rally & Components Fair at The Lancashire County Cricket Ground, Talbot Road, Old Trafford. All the usual facilities including bar, catering and ample on-site parking should help to make this a successful event. Doors open at 11am (10.30 for disabled) and close at 5pm. Talk-in on S22 (G1TRC). For more details contact:

G. C. Oldfield G1IJK

6 Newcroft Road

Urmston

Greater Manchester

M31 1NN

Tel: 061-748 9804

**\*May 1:** The RSGB VHF Convention will be held at Sandown Park Exhibition Centre, Esher, Surrey. All the usual attractions will be there.

**\*May 15:** The Otley ARS are holding the 31st Northern Mobile Rally at the Yorkshire Agricultural Showground, Harrogate. More details from:

G3CQQ

Tel: 0943 602118

**\*May 29:** The East Suffolk Wireless Revival will take place at the Civil Service Sportsground, The Hollies, Straight Road, Ipswich. This is between Bucklesham Road and Felixstowe Road (now the A1156) and adjacent to the Suffolk Showground. Doors open at 10am and there is plenty for all the family to do. More details from:

Colin Ranson

Tel: Ipswich 688204

**\*June 12:** The Royal Naval Amateur Radio Society Annual Mobile Rally will again be held in the sports field, HMS Mercury, Nr Petersfield, Hants. Gates are open between 1000 and 1700. As usual there will be plenty of attractions for all the family at this very friendly rally. More details from:

Cliff Harper G4UJR

Tel: 0703 557469

**June 12:** The open day for the Mid Lanark Society will be held at the Community Centre, Newarthill, by Motherwell. This new venue is about half a mile from the old venue of Wrangholm Hall. There will be the usual traders, a bring & buy stand, demonstrations of packet radio and RTTY, lectures and the annual award of the EHI Trophy. Talk-in will be on S22 and catering will be provided.

**\*June 18:** The Royal Air Force Halton Air Show and Amateur Radio Rally will take place at RAF Halton, near Aylesbury, Bucks. The RAFARS Golden Jubilee Rally will be held inside a hanger. More details from:

Terry F. Owen G4PSH

Tel: 0296 85760

**\*June 26:** The 31st Longleat Mobile Rally will be held, as always, at Longleat Park, Nr Warminster, Wilts. The rally starts at 10am. More details from:

Brian Goddard G4FRG

Tel: 0272 848140

**\*July 10:** The Sussex Mobile Rally will take place at the Brighton Raceground. More details from:

Bob Henaire G1IOS

Tel: 0798 43841

**\*July 15-17:** The RSGB 75th Anniversary National Convention will take place at the National Exhibition Centre, Birmingham. RSGB HQ can give you more details.

**July 28-31:** The AMSAT-UK Colloquium will again be held in the University of Surrey, Guildford. More from:

G3AAJ

Tel: 01-989 6741

**\*July 31:** The Scarborough ARS Rally will be held at The Spa, Scarborough. Doors open at 11am. Talk-in will be on S22 and SU8 as well as GB3NY. More details from:

Ian Hunter G4UQP

QTHR

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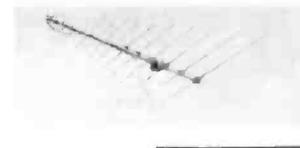
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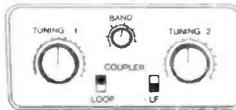
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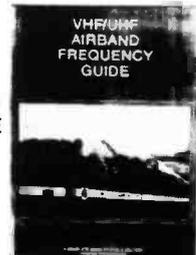
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VHF/UHF AIRBAND  
FREQUENCY GUIDE  
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Completely revised and updated, this publication is one that should be on every enthusiast's bookshelf. The previous edition sold 6000 copies in 18 months. This latest issue is 25% larger and has been completely re-written with a new easy-to-read layout. No other publication offers you so much information for such low cost. It provides complete details of all the services in the UK that make use of the VHF/UHF spectrum with listings from 26 to 2250MHz without gaps, and additional listings to 56GHz. Each section begins with full details of the services that use each segment of the spectrum, followed by details of individual services in frequency order. Users covered include the emergency services, marine, aeronautical, land mobile, etc. Many of these services use duplex frequencies and full details of the splits are included for base and mobiles. Although many of the frequencies listed cannot be monitored without a licence, all listeners should find this book a mine of information. Tremendous value!

This famous listing is now in its fifth edition. Completely updated for 1988 and a lot thicker. Many additional frequencies have been added and of course some have been deleted where the service is known to no longer exist. Packed full of information on all that happens between 1.6 and 30MHz, you will find this fascinating reading. Covering all aspects of the shortwave service, here is just a selection of the listings included: AVIATION, BROADCAST, MARINE, EMBASSY, MILITARY, RTTY, FAX, PRESS, and much more. Not only frequencies and stations, but in many cases times of transmissions as well. This is not an American import, but a UK printed manual specially for UK listeners. If you are one of the few people that haven't purchased one of these yet, then you really don't know what you have been missing. If on the other hand you have our previous editions, we know that you will want to get the latest edition. Available end of March. Order your copy today.

This is the UK's foremost list of military and civil radio frequencies. Nearly three times as large as the 1986 edition and bang up-to-date. Every conceivable airfield is listed from the smallest grass field to the largest of our international airports. We have now included full airways listings plus helipads and off-shore rigs. In addition, there are listings of company frequencies, VOLMETS and miscellaneous air-to-air frequencies. Don't confuse this with other guides you may have seen. This one is REALLY comprehensive and packed with information. For the newcomer there is some interesting editorial plus photographs, and a very useful telephony designation list. Full colour semi-stiff covered in large format style makes this one of the best presented guides yet. Undoubtedly the best manual there is available to the enthusiasts today. There is also a free up-date service to purchasers so you won't need to worry about the information becoming out of date. That's real service!

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