MAY 1989

WHAT DOES THAT MEAN?
INSIDE THIS ISSUE
Your FREE Pull-out Guide to Radio Abbreviations

REVIEWED
ERA Microreader
STANDARD AX-700E

For The Radio Listener
When you are ready to graduate to real listening Look to Lowe

The New HF-225 Receiver

I am particularly proud to announce that the new HF-225 receiver is now in production, and available from the better dealers on the short wave scene. This is the receiver designed to give you high performance under European band conditions, and dig out the weak signals under the welter of Megawatt broadcasters and jammers.

Technically, the HF-225 distinguishes itself by having a low phase noise synthesiser, which gives a reciprocal mixing performance not far off that of "professional" receivers costing up to ten times the price, and that's not just advertising talk, it is really true. The synthesiser actually tunes in steps of 8Hz, which betters most other receivers and gives a smooth "VFO" feel when tuning. As one user has already commented "If you tuned the HF-225 with your eyes closed, you would believe you had a £5,000 receiver on the table".

The HF-225 has a range of low cost options which extend its appeal; such as a keypad for direct frequency entry, which simply plugs into a rear panel jack; an active whip aerial; a rechargeable battery pack for portable use; and an attractive carrying case which protects the receiver whilst allowing full operational use. The new D-225 detector option is really something special, because it gives true synchronous AM detection for dragging sensible programme quality out of a signal being affected by selective fading distortion. The same option also gives narrow band (communications) FM demodulation.

Every listener these days appreciates a receiver which offers facilities for memorising favourite or regularly used frequencies, and the HF-225 offers 30 memory channels for this purpose. Using the memories has been made particularly versatile, because the operator can review the contents of the memories whilst still listening to the frequency he is using, or alternatively in the "Channel" mode, can tune through the memory channels using the main tuning knob, listening to each frequency as it appears on the display. Just like having a bank of single channel receivers under your control. Terrific for checking HF airband channels for activity.

Unlike most HF receivers on the market, the HF-225 comes complete with all filters fitted for every mode:— 2.2kHz, 4kHz, 7kHz, and 10kHz. There is also a 200Hz audio filter for CW, and if the D-225 detector is fitted, a 12kHz filter for FM. The correct filter for each mode is automatically selected by the receiver mode switch, but further selection can be made by the user from the front panel and the receiver remembers which filter was last used. True versatility and all built in at no extra cost. When selecting filters in use, the filter bandwidth is shown on the main display.

The display itself is a high contrast liquid crystal type, and shows frequency, filter bandwidth, detector lock (when D-225 is fitted), and whether the receiver is in memory mode. Automatic placing of the decimal point takes place as the receiver is tuned, so there can be no ambiguity in reading.

At the end of the day, what does the HF-225 offer you as a user? I can do no better than quote what was said by Rainer Lichte about the earlier HF-125:—"The HF-125 is a serious piece of equipment; don't be deceived by the unassuming front panel and the lack of spectacular features. The HF-125 will outperform most competitors. If you like an honest approach to receiver design, this is it. British understatement at its best".

The HF-225 is even better.

John Wilson

LOWE ELECTRONICS LIMITED

Chesterfield Road, Matlock, Derbyshire DE4 5LE  Telephone 0629 580800 (4 lines)  Fax 580020  Telex 377482
The latest scanner from Standard is the AX700E.

Cover: Alan Gardner’s “Scanning” column brings you the first news of the Standard AX700 scanner which is fitted with a pan-adapter display. Alan discusses this feature at length in his column this month.

DXTV Part 18 and Starting Out have had to be held over this month but should, space permitting, appear next month.

REGULARS

First Word 2
A Word in Edgeways 2
What’s New 5
Grassroots 7
Bookcase 10
Airband 14
Scanning 18
Rallies 27
Subscriptions 37
Advertisers’ Index 50
Book Service 54
Trading Post 56

SEEN & HEARD

Amateur Bands Round-Up 34
Decode 35
Info in Orbit 36
Band II DX 39
Television 39
Long Medium & Short 42
LW Maritime Radio Beacons 51

© COPYRIGHT
PW Publishing Limited 1989
Copyright in all drawings, photographs and articles published in Short Wave Magazine is fully protected and reproduction or imitation in whole or in part is expressly forbidden. All reasonable precautions are taken by Short Wave Magazine to ensure that the advice and data given to our readers is reliable. We cannot however guarantee it and we cannot accept legal responsibility for it. Prices are those current as we go to press.
This month we are giving you another free gift in the form of a useful pull-out booklet which will help you negotiate the jungle of abbreviations used in our hobby.

I know, from your letters, that for the newcomer to this hobby, understanding abbreviations and technical terms is one of the hardest things to grasp. I have tried to help with the addition of the Abbreviations boxes which now accompany most of the articles in Short Wave Magazine. Now, with the help of this booklet you should all be able to translate those technical terms and abbreviations in other publications as well.

As well as abbreviations you will also find useful addresses together with some technical explanations which Elaine G4LFM has picked out of the pile for you.

By now you should all have mounted your April issue of Short Wave Magazine. It was free with our April issue of SWM, on the wall of your shack and being used to the best advantage. If you want extra copies these are available from our Service Department at a cost of £1.50 plus 75p post and packing.

As a result of the terrorist attack on the Pan Am Boeing 747 over Lockerbie it would appear that radios and cassette recorders are likely to be banned from passengers’ luggage. As it is not normally permissible to use such equipment while the aircraft is in flight most passengers would probably place their radios in the main baggage, if only to reduce the amount of hand luggage they have to cart around the airport waiting hall for a couple of hours.

Just how this will affect the listener who looks forward to taking his s.w. radio with him on holiday is not yet clear. If there is to be a total ban on taking any such equipment onto a commercial airliner then the s.w.l. going on holiday to listen to stations which he normally wouldn’t be able to hear at home, is at worst, going to be denied his enjoyment. At best he will have the cost of his holiday increased by having to acquire a s.w. radio when he reaches his destination, if indeed suitable ones are available.

The workaholic businessman who takes a small, portable s.w. radio with to listen to the BBC World Service will not be too happy either.

However, if passengers are to be allowed to take radios with them will they be happy at the increased time it takes to have them inspected - if this is indeed possible? Would you like to stand and watch an airport security guard attempt to open your expensive radio to make absolutely certain that it contained nothing that it shouldn’t?

Mrs A. Read RS87871 has suggested, in a letter printed elsewhere in this issue, that perhaps we should be allowed to have our radios checked at the local police headquarters and then sealed so that the airline security stuff would know that it was safe and allow you to take it on board. Is this really practical? Doubtless you will write and air your views on the subject!

DICK GANDERTON

A WORD IN EDGEWAYS

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

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

Sir

Having used a Trio R10000 with a long wire for some time I thought I would try a dipole in the loft for 14MHz.

After getting the bits and pieces from Lovey Electric, which came free with the April issue of SWM, on the wall of your shack and being used to the best advantage. If you want extra copies these are available from our Service Department at a cost of £1.50 plus 75p post and packing.

Although the dipole is not in a straight line, having the legs bent to fit the available space, the difference was quite amazing.

The following evening I heard VK5WP (Aust) around 2200, and later at 2300 I heard VK6AU talking to VP9GO (Bermuda) for quite some time. When VP9GO went to dinner ZF1HK (Cayman Is) called VK6AU and took up the conversation from there. It was like listening to a telephone chat.

Apart from the increase in signal strength, the signal-to-noise ratio is much higher, nothing in clear reception.

I would very much like a QSL card from the above-mentioned hams, but as the Amateur Radio Call Book is out of print, I cannot see any way of writing to them. The bureau takes much too long. That is unless some kind reader will sell me an old issue they have finished with. Most of the addresses would undoubtedly

be the same.

Also, I would suggest Mr J. H. Wright of Buxton looks into the range of Philips receivers, especially the D1835 and D2005.

The D1835 is a little gem for armchair listening. Sensitivity and selectivity are excellent, audio quality is good, and with nine s.w. bands as well as l.w., m.w. and f.m., analogue tuning is no drawback. I have heard stations on this receiver from USA and CAN through to Free China, Japan, Australia and back again and all points between, and I have QSL cards to prove it!

C. STARLETON
TORQUAY
DEVON

Sir

I hope the following information will be of interest to SWM readers. On Wednesday 15 March 1989, I picked up, on my Icom R71E, the Space Shuttle on the frequency 20.1983MHz short wave from 1520 to 1652UTC and at 1825 to 1947UTC with a YL from Mission Control at Cape Canaveral. They were being interviewed by the press for over 80 minutes, and hoped to land on the Saturday morning.

MR A. GLASSEY
DUNDEE

Sir

I was most interested to read the AMATERMINAL advertisement in the April issue of SWM. However, like all newly released products, it is already out of date, as the Mark 2, which I understand is still in the pre-production stage, will provide integral shack central heating and air conditioning. I am also reliably informed that the manufacturers hope to advertise the Mark 2 in the April 90 issue, by which time it should be in full production.

RICHARD Q MARRIS
G2BPQ
SLOUGH

Sir

When I took out my Class A amateur licence in 1985, I decided to reactivate my late father’s callsign G2BPQ. A few days ago, a friend showed me a copy of Short Wave Magazine dated March 1949 he had found in a second hand shop. On page 39 was a photo of PY6CO’s shack in the DX commentary feature. In the picture he had noticed my father’s OSL card on the wall of PY6CO’s shack!

On turning up the OSL file, I was able to find the corresponding card from the PY. The OSL was for a 20 metre ‘phone QSO on 19 November 1948.

Bearing in mind, the publication date of the magazine and the mail between England and Brazil, the photo labs in Brazil must have been fairly speedy!

SWM in 1949 was rather different to that of today! It measured only 8 x 5 inches and had 80 pages with a heavy concentration on constructional and technical articles.

MARTIN PRESTIDGE
WARLEY
WEST MIDLANDS

DICK GANDERTON

FIRST WORD

Short Wave Magazine May 1989
a look inside. The beryllium copper strips were out of alignment by 2-4mm and at one end were wavering about in the wind. To inspect the strip on the turret and to discover whether the turret must be removed, to remove the turret the tape socket must be removed; to get the turret bearing the back p.c.b. must be removed. In fact it's a struggle to get the turret out only to find that the antenna has to be removed.

Only then was it clear that the whole chassis has to be removed from the case and so the battery came out. With the turret on the table the problem was clear - the chassis was broken in one end so that the fulcrum mounting for the contact strip was loose and the contacts didn't connect. Worse still, all the contacts are glued to a brass which was also out of alignment by some 2mm when built!

Another problem was that the tuning control had become dodgy, this was due to a spur gear driving a gearwheel on the tuning capacitor. The smaller gear was a grey plastics moulding, just like old putty; the other was a spring-loaded steel anti-backlash gear. The steel wheel had eaten away the plastics gear teeth. I'm still working on it but, I wouldn't recommend a Vega to anyone. The Sanyo gave up working because of an open circuit at a moulded block holding three minute jack sockets. One jack was connected to the p.c.b. by a tiny lug bent down to just reach the p.c.b. track, to which it was connected by a tiny blob of solder. The solder had parted by micros. Of course, it was almost inaccessible but, after hours of cursing, a touch of the soldering iron put it back on the air again.

The Pioneer went dead, due to dry contacts between the tuning capacitor and a brass spring contact to the shaft, which is wrong anyway. Brass to minimum is, in effect, the support mounting for the contact strip. As the support mounting was loose and the contacts didn't connect. Worse still, all the contacts are glued to a brass which was also out of alignment by some 2mm when built.

Another problem was that the tuning control had become dodgy, this was due to a spur gear driving a gearwheel on the tuning capacitor. The smaller gear was a grey plastics moulding, just like old putty; the other was a spring-loaded steel anti-backlash gear. The steel wheel had eaten away the plastics gear teeth. I'm still working on it but, I wouldn't recommend a Vega to anyone. The Sanyo gave up working because of an open circuit at a moulded block holding three minute jack sockets. One jack was connected to the p.c.b. by a tiny lug bent down to just reach the p.c.b. track, to which it was connected by a tiny blob of solder. The solder had parted by micros. Of course, it was almost inaccessible but, after hours of cursing, a touch of the soldering iron put it back on the air again.

First may I say how very much I enjoy your magazine and keep up the good work. May I please use your letters page to air my views on a couple of topics. The first is the price of radio equipment in the UK compared with N. America. On recent visits to the USA I have noted that the AR2002 scanner is available for US$50. (approx £45.00) the Sanyo 2001 (200ID) is £328.00 approx £192.00. These prices include sales tax and a full one year warranty plus repair service. I paid £487.00 and £299.00 respectively. Perhaps your advertisers can explain the large difference. I have noted that the price for imported TVC equipment is very much more akin to that charged in the US, so it should be possible.

Punt two is a result of a visit to a Ham Rally where a reputable dealer was approached by a lad of perhaps fourteen or fifteen years regarding the purchase of an airband radio. The dealer promptly tried to sell him an airband transceiver (Icom A20) as this was all he had in stock.

I reviewed this set under the Matsumi 4099 badge in the September 87 issue and found it to be extremely good value for money. Since then the price has fallen as different versions of the set have been brought into the UK. Several other readers have let me know that they think this set to be a good buy. Back issues with the review are available from the editorial offices price £1.50 inc. p&p, Ed.
Sir

In reply to the points raised in Nov 88 issue by G4DTC on my series on the Edystone 940 receiver.

Simple test of sensitivity & signal to noise ratio: This is a misconception, as the method described can only show that the complete system of antenna, feeder and receiver is externally noise limited, on that particular frequency. In some cases a poor receiver and a large efficient antenna will give better apparent results than a more sensitive receiver with a small inefficient antenna.

External noise is greater than system noise.

where

\[
\text{External noise} = 10 \log_{10} \left( \frac{\text{Thermal} + \text{Atmospheric} + \text{Cosmic}}{\text{Thermal}} \right) \text{dB}
\]

and

System noise =

Antenna directivity + Antenna gain + Feeder loss + RX n.f.

All external noise may be either measured directly with an antenna and receiver of known noise factor (n.f.) or taken from tables of published data of equivalent sky noise temperature and calculated. Receiver n.f. can be measured directly but the antenna n.f. will have to be calculated.

Local oscillator pulling: A test was made with a weak c.w. input, a.g.c. off, b.f.o. on, and a suitable beat note established. When the r.f. gain control is operated, a shift of beat not will occur. The reason can only be either the b.f.o. or the i.o. changing frequency. As the effect is more noticeable on higher frequencies the b.f.o. can be ruled out. The only possibilities left are (a): l.o. varies because of h.t. variations with load (b): the mixer pulls the l.o. as the load on the oscillator varies with cathode current variations in the mixer. Remove mixer gain control and fix at a constant level. This clears up the problem.

Also local oscillator stability and purity were confirmed by taking a sample output to a frequency counter, deviation meter and scope. A high-level long wave input at 20MHz was swept across the receiver pass band with a sweep generator in an attempt to destabilise the l.o. No spurious f.m. appeared on the l.o. output.

Next the signal was slowly moved, manually across the receiver pass band and any tendency to locking or pulling should have shown up on the frequency counter. The l.o. only moved a few hertz at 20.450MHz with no a.g.c. operating. It only moved unidirectionally when approached from either side and by less than 100Hz, as the signal came in line with the pass band, (a.g.c. on). This is probably caused by the h.t. rail varying as the a.g.c. altered loading as it operated.

After the repair work and alignment was completed, which entailed some component replacement, namely R28, C65, C74, R36, R35, and C100, the noise factor was 12dB.

After replacing R1, 2, 3, 4, 7, 9, 12, 13, 20, 21, 22, 24, 25, 27, 28, 31, 35, 36, 41 & 44, C10, 12, 14, 15, 43, 46, 65, 74, 75, 82, 94 & 100 by the careful use of forceps and a crochet hook, with the selector switch shaft removed, and after re-alignment, the n.f. had reduced to 10dB at the 20MHz test frequency.

After each valve change the receiver alignment was optimised and the noise factor again checked. With the original Mullard valves for V1 and V3 the n.f. was 10dB.

Replacing V1 with:

Z&II(USSR) the noise factor became 9.3dB

Mullard (UK) new 9.0dB

Raytheon (USA) 9.0dB

Telefunken (VGI) 8.5dB

Replacing V3 with:

Mullard (Hol) 7.5dB

Colomar (Fr) 7.5dB

Raytheon (USA) 7.0dB

Regarding the tertiary windings, see "Restoring an Edystone 940 Receiver", part 2 para 3 Sept.'88, for an explanation.

As thermal noise is directly proportional to i.f. bandwidth, we can improve the signal-to-noise ratio or give a lower minimal discernible signal, by reducing this or improving the shape factor. Note that as long as sufficient bandwidth for the signal intelligence is maintained, no distortion will occur.

As for the Sternode modification, if I had to choose from a barely readable output with a 1.5kHz heterodyne, or a tolerable output, but with considerable distortion and limited a.f. response, then I know which I would go for!

The remarks on drift are not relevant if the modifications are done, and if the set is left to warm up and stabilise before use. I have had the 940 on 11.20GHz u.s.b. (RAF VOMMET) for hours to check stability with very little drift.

I might also add that if the tuning dial gear train is properly cleaned, greased and free of backlash, it is possible to offset the b.f.o. correctly, set the crystal phasing control for best performance and then use only the main tuning control, even s.s.b. signals on 21MHz.

I would also like to thank all those who have contacted me as a result of the articles, some from abroad. I shall reply to everyone of you in due course.

T.J. WRIGHT

PAGHAM

W. SUSSEX

The test set-up used by Tim Wright to evaluate the Edystone 940 receiver.
Packet Shop

Andrews Computer Services Ltd (ACS) have recently opened a packet radio and computer shop. The address is 35a Chalk Hill, Watford, Herts., which is just under Bushey Arches. The shop is open Monday to Saturday from 9am to 5.30pm.

There is a live packet station for the demonstration of various TNCs as well as a wide range of computers, printers and other peripherals. They also hold a range of Public Domain Amateur Radio Software. This is available for a small charge to cover the cost of disks and duplication (free if you purchase a computer!).

All enquiries are now dealt with by the Watford shop. Andrews Computer Services Ltd (ACS), 35a Chalk Hill, Watford, Herts. Tel: (0923) 229222; FAX: (0923) 242102.

ISWL Awards

The International Short Wave League currently issues a total of thirteen Certificate Awards to successful claimants. Certificates and claim forms are free and post free worldwide to fully credited members, also being available to non members subject to an advance payment.

The amateur and broadcast band awards are a different colour and both are suitable for framing, each measuring 24x8 and 18x4mm.

The amateur band awards are available to both licensed amateurs and s.w.l.s. Those currently available are: Century Club, Commonwealth Award, Continental Award, European Award, Monitor Award, Pacific Ocean Award, States Award, Zone Award and 5 Band DX Century Award. Broadcast band listeners can apply for the Short Wave Broadcast DX Award which is issued in four classes, Class 1 for 140, Class 2 for 110, Class 3 for 80 and Class 4 for 50 countries confirmed.

If you send a stamped s.a.e to ISWL Awards Manager, 46 Richmond Drive, Rayleigh, Essex SS6 7RH, he will send full details of the awards.

DTI Sweeps Away Radio Receiving Licences

At long last, the need to obtain a licence to operate a radio receiver has been done away with under the Government's latest relaxations in the red tape surrounding the use of radio receiving equipment.

The only remaining exception to this new ruling is that a licence is still needed for the reception of authorised television broadcasts.

"Licences for receivers are not required for radio spectrum management purposes." Industry Minister Robert Atken said, announcing the changes last February.

"Reception of authorised sound broadcasting and of radio amateur transmissions was exempted some time ago. In particular, people will no longer need a separate licence to use television receive-only (TVRO) equipment such as satellite dishes for television broadcasts direct to the home from fixed-service satellites. Removal of licensing will moreover avoid the costs to users and to Government caused by changing requirements as new services develop.

Apparently, some 7000 licences have been issued specifically for receive-only equipment, mostly for TVRO on a once-for-all basis of £10, but including a small number for the reception of meteorological data. The relaxation in the regulations will avoid the need to create new licence categories solely for reception, for instance, for specialised satellite services, which are being liberalised.

A broadcasting station which transmits in bands other than the broadcasting bands is not an "authorised" broadcasting station. These include INTELSAT, EUTELSAT and ASTR.A Satellite receiving dishes for these transmissions will be exempted in the new regulations, but the TV licence will still be required to use a television set which also receives authorised broadcasts.

It is a condition of the present exemption that receivers must not cause undue interference when used, and must comply with any statutory enactment concerning technical specification. A user of reception apparatus which does not meet these conditions may commit an offence attracting a maximum penalty of £400. It is an offence under Section 5 of the Wireless Telegraphy Act 1949 to use receivers with intent to obtain information on the contents, sender or addressee of any message, or to disclose such information. The maximum penalty for this is £2000 fine. These provisions will be unaffected by the new regulations, which do not affect criminal liability resulting from unauthorised reception under the Wireless Telegraphy Act, or the Interception of Communications Act 1985, or any civil liability.

Catalogues

The IR Group has produced its 1989 instrument sales catalogue. It's a 110-page publication featuring a comprehensive range of test and measuring instruments. Many products in the catalogue are also available under a rental or leasing agreement.

The sort of products in the new catalogue include oscilloscopes, signal sources, multimeters, power supplies and logic analysers. There are also special-purpose test equipment for TV/audio, datacomms and fibre-optic applications.

The different manufacturers' names you can expect to see in the pages are Tektronix, Philips, Marconi, Hitachi, Grundig, Thandar, Racal and Stag. IR Group, Dorcan House, Meadowfield Road, Langley, Slough SL3 8AL.

Unitel have recently published their 56-page catalogue on capacitor ranges from AvX, Beck, Kemet, Murata-Erie, Philips, Siemens, Syfer, Thomson and Wimpey-Dublier.

Fully illustrated, the publication is free-of-charge and provides technical and pricing details on a wide variety of products. For further details, contact: Unitel Ltd., Unitel House, Fishers Green Road, Stevenage.

Geoff Watts

The DXCC Countries List, giving the DXCC countries in each ITU Zone and in each CO Zone given in alphabetical order of prefix is available from Geoff Watts.

Also available is a companion to the DXWS Prefix List. This is a useful 15-page cross-reference to all the other prefixes and special prefixes used by each DXCC country. The other DXWS lists available are:

Prefix-Country-Zone List 15 pages

DXCC Countries Guide 11 pages

USSR Obit List and Maps 13 pages

The four lists are always up-to-date, 54 pages of DX reference information. The price of each DXWS is £1.95 (inc. p+p) for UK. For overseas areas, prices range from £2.95 to £4.95 (inc. airmail). For overseas airmail, the single sided version is £1.25 (UK) and £4 (overseas). Geoff Watts, 62 Belmont Road, Norwich NR7 6PU.

Bristol Rally in 1990

Yes, you read that right, 1990. The next Bristol Radio Rally will take place in 1990. The premises they used for the 1988 rally are no longer available, so they have moved to hold the rally over for a year so they can arrange a suitable venue.

They're looking for somewhere that has plenty of space, easy access, good car parking as well as all the other things that make the rally site enjoyable for those who come. Any bright ideas as to where they could hold the next rally should be sent to David Farr G4WUB.

If you would like to be kept in touch with what's happening about the rally, the contact is: David Farr G4WUB. 94 Ridgeway Lane, Whitchurch, Bristol BS14 9PH.
Thinking Day On The Air

In February it was Thinking Day on the Air for Guides and Brownies all over the world. For the first time in a number of years a Guide station was put on from the Isle of Man. Guides from all over the island came to participate and a great deal of fun was obviously had by all.

We’d like to hear about your Thinking Day on the Air, with any photographs you had taken. If we hear from enough groups then we can put together a short feature on this popular event.

VHF Comms in the UK

Many readers will have heard of VHF Communications, but not so many will have seen a copy in recent years. I have heard it said that the magazine doesn’t exist anymore - well that’s not true. Due to problems in the past, it has been several years since a UK agency existed. Consequently, obtaining the magazine, back issues, binders, kits, p.c.b.s, etc., has been somewhat difficult. A full service is now available through Mike Wooding, 5 Ware Orchard, Barby, Nr. Rugby CV23 8UF. Tel: (0788) 89-365.

For those who don’t know, VHF Communications contains constructional articles on transmitters, receivers, demodulators, test equipment, r.f amplifiers and pre-amplifiers. In fact, on all subjects to do with v.h.f., u.h.f. and s.h.f. communication in the amateur bands.

The subscription rate for 1989 is £8.75 including all postage costs. If you’re interested, send a cheque, payable to M. Wooding, to: Mike Wooding, 5 Ware Orchard, Barby, Nr. Rugby CV23 8UF. Tel: (0788) 89-365.

Young Amateur of the Year

The DTI have announced their sponsorship of the Young Amateur of the Year Award for 1989. Anyone who is under 18 and:

is keen on d.i.y. radio construction or
is interested in using radio and gaining operating skills or
is using radio for a community service, such as helping the disabled or in emergency communication networks or
is good at encouraging interest in amateur radio or
is involved in amateur radio in any way, such as in a school scientific project is eligible for the 1989 Award and its £250 cash prize.

The prize, for the most outstanding achievement between 1 April 1988 and 31 July 1989 will be awarded by the DTI and presented at the RSGB HF Convention in October.

The DTI will also send every genuine entrant a copy of the coloured chart of radio frequency allocations. The winner gets to see the DTI’s radio experts at work at the RIS at Baldock in Hertfordshire.

The closing date for applications is 31 July 1989. Entrants do not need to be a radio licence holder to enter. The competition is open to anyone in the UK, the Channel Islands or the Isle of Man, who is under 18 on July 31. Applications or nominations for the Award must be sent to: The Secretary, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Tel: (0707) 59015.

Rare WAB Squares

Two rare squares in Essex will be activated by G0KSY/P and G0KXOU/P on the 7 and 144MHz bands on the following dates:

Square TV109 on Saturday May 13 from 0930 to 2100UTC. Square TV100 on Sunday May 14 from 1000 to 2100UTC.

Birmingham Centenary Award

As it is the year in which Birmingham celebrates the centenary of it becoming a city, the Midlands ARS would like to share the celebrations by offering a Centenary Award. This will take the form of a specially designed certificate and will be awarded to any person who works 100 stations within the city boundary simplex only (not to be confused with Post Codes). You can use any mode other than packet and any band. You must also work a G1 or G3 MAR station and two special event stations from within the city walls with RAYNET or talk-in stations may be included.

The certificate any be endorsed for any special circumstances requested by the applicant, e.g. QRP, etc., and will also be available to s.w.l.s.

The award will run for the whole of 1989 and the closing date for claims is 1 April 1990.

To claim your certificate, send an s.a.e. to Paul O’Connor G1ZCV at 100 Goldbath Road, Billesley, Birmingham B13 0AH who will send you the necessary application and log forms. When these are completed and verified, send them back to Paul with a fee of £2 (£1.50 for MARS members) and you will receive your certificate.

Alpha Have Moved

Alpha Electronics (Southern) Ltd have moved to new premises in Maidstone. So all their test equipment sales and hire business can now be contacted at: Alpha Electronics (Southern) Ltd., Unit 8, Coldred Road, Parkwood Industrial Estate, Maidstone, Kent ME15 9XN. Tel: (0622) 690187.

No Swindon Rally in 1989

There will be no Swindon Rally this year. Wroughton Science Museum is not available and the organisers haven’t been able to find a large enough alternative site. It is hoped to hold the rally in 1990 though.

Snippets from Sweden

Albania: The French transmission from Radio Tirana at 1800-1830 now uses the new frequency of 6.08MHz in parallel with medium wave 1215kHz.

Antarctica: Radio Nacional Aracangol San Gabriel on 15.476MHz can sometimes be heard on an extended schedule until after 0100. Reception is possible after 2200 when Radio France International via Gabon leaves 15.475kHz.

Ascension Island: In September this year, the BBC will take two new 250kW relay transmitters into operation. Four new antennas will be installed at the British relay base.

Ethiopia: English to Europe from the Voice of Ethiopia is now between 1500 and 1600 on 9.56 and 7.166MHz.

Iran: The Voice of the Republic of Iran has an additional English broadcast between 1400 and 1500 on 702kHz medium wave intended for northern Iran and the south-west USSR.

Lao: Lao National Radio has been heard with a broadcast in English at 2200 on the new frequency on 9.595MHz.

Sri Lanka: Trans World Radio uses new 11.83MHz instead of 11.92MHz during the English broadcast to India at 1200-1239, 5.98MHz is in parallel. The frequency of 5.59MHz is also used between 0000 and 0130 for broadcasts in South Indian vernacular languages. The transmitter has a power of 12.5kW. Trans World Radio also plans to install a 100kW transmitter at Puttalam where their present medium wave station of 400kW is situated.

The construction of the Voice of America relay station in Puttalam is well behind schedule. It will be at least five years until anything comes out of it.

UK: The BBC will leave its long-time-used frequency of 18.08MHz as of July 1, this is a result of the World Administrative Radio Conference in 1979.

Turkey: The Turkish Police Radio in Ankara is on the air daily until 1500 on 6.34MHz. It’s been heard in North America from 0457. The Turkish Meteorological Station has been noted from 0509 on 6.9MHz.

Ireland: As of January 1, most of the Irish pirate radio stations closed down as government legislation went into effect imposing heavy fines for unlicensed broadcasting. Radio Dublin has remained on 6.91MHz and has applied for a court injunction to stop the legislation.

The Voice of the Republic of Ireland has been heard testing on Fridays at 2100 on 6.135MHz claiming 2kW and a second transmitter on 27.83MHz.

Ratchet Drivers

The price of the Fretrade (TEP) ratchet driver mentioned in "What’s New" February ‘89 SWM should be £4.54 incl. VAT and P&P and they are available from Electronic & Computer Workshop Ltd., Unit 1, Cromwell Centre, Stepfield, Witham, Essex CM8 3TH.
Derby & District ARC meet at 119 Green Lane, 7.30pm. May 3 is a Junk Sale, the 10th is Video Show, the 17th is Satellite TV, talk/ demo by GB3GF and the 24th is Visit by Birkett's of Lincoln. Kevin Jones G4FPY on Derby 669157.

Aylesbury Vale ARC meet 1st & 3rd Wednesdays, 8pm at the Old Village Hall, Hardwick, located 5km out of Aylesbury, just off the A413 to Buckingham. For more details contact Martyn on Milton Keynes 560026.

Sutton & Cheam RS have a Natter Night in the Downs Bar on May 1 and their AGM on the 19th. 3rd Fridays, 7.30pm at Downs Lawn Tennis Club, Holland Avenue, Cheam. John Puttcock G0GVV on 01-644 9945.

Norfolk ARC meet Wednesdays, 7.30pm in The Norfolk Dampling, The Livestock Market, Harford. May 3 is Pub Life, the inaugural story G0DAQ. The 10th is Polar Ski-trek expedition G0/PAS3H, the 17th is first NFD briefing and the 24th is G3BNB repeater AGM. Craig Joly GOBDG on Norwich 485784.

Wimbledon & District ARC have a Desert Island Radio competition on April 28 and General Activity on May 12. 2nd & last Fridays, 7.30pm in St Andrews Church Hall, Herbert Rd. Nick Lawlor G5AUY on 01-330 2703.

Southgate ARC have Marconi & Microwaves by Mr Stan Woods on May 11 and a popular c.w. computer programme "Dr QSO" by G0ASA on the 25th. Holy Trinity Church Hall (Upper), Winchmore Hill. Birt 3rd Shelton G7DIN on 01-360 2453.

Chelmsford ARC have KW Communications for Ten-Tec on May 2 1st Tuesdays, 7.30pm at Marconi College, Abbot Road. Roy Murtay G3PWX on Chelmsford 353221 Ext. 3815.

Huntingdonshire ARC meet 1st & 3rd Thursdays, 7.30pm at The Medway Centre, Coneygre Rd. GBLRS on Huntingdon 56772.

YeoVil ARC meet Thursdays, 7.30pm at The Recreation Centre, Chichester. May 3 is Exam Enrolment for RAE Class, the 18th is Great Circle Propagation G3MYM and the 25th is a Natter Night. David Bailey G1MMN at 7 Thatchem Close, Yeovil BA21 3BS.

Verulam ARC meet 2nd & 4th Tuesdays, 7.30pm at the RAF Association HQ, New Kent Rd, St. Albans. 2nd Tuesdays are informal activity evenings, 4th Tuesdays are monthly formal meetings, May 23 is a 6 metre Equipment talk GSCUB. George Christofi G0JKZ on 01-427 4800.

Bedford & District ARC have a DX Foxhunt and Bar-B-Q on May 9 and HF Antenna Experiments at Warwick School GGGLU on the 23rd. 2nd & 4th Tuesdays, 8pm at Warwick 3 Ambulance Centre, 61 Emscote Rd. P. A. Brown G4HQH on Marton 632370.

Todmorden & District ARC have RAYNET talk by G6FMP on May 1 and Surplus Equipment/ Junk Sale on the 15th. 1st & 3rd Mondays, 8pm in The Queen Hotel. Esde Tyler G0AEC on Halifax 882038.

Bedford & District ARC have visit to Stewartby Brick Works on May 2 and Crime Prevention by Bedfordshire Constabulary on the 16th. Allen’s Club, Hurst Grove, 8pm. Glen Loake G6GBI on Bedford 266443.

Torbay ARC meet at the ECC Social Club, Ringslade Rd, Hove. May 4th is Natter Nights are Fridays. April 29th is their AGM Bob McCreddie G0GFX on Haytor 6233.

Acton, Brentford & Chesswick ARC have a talk on Antenna Projects by G3IGM on May 16. Chesswood Town Hall, High Rd, 7.30pm. W. G. Dyer G3GHE at 188 Gunnersbury Ave, Acton, London W3 ILB.

Brighton & District ARC meet 1st & 3rd Wednesdays, 8pm at the Roast Beef Bar, Brighton Racecourse. May 3 is Electrifying Horsepower G6MOG and the 17th is Visit to TA Troop of Royal Corp of Signals. Harold Lunson G3WR on Brighton 641100.

Biggin Hill ARC have a Quiz on May 15 and Planning Night for Aylmers Farm on the 19th. All meetings in Room 20 of Loughton Hall, 7.45pm. John Ray G6D2H on 01-868 3434 after 7pm.

The Radio Society of Harrow meet Fridays, 8pm at The Harrow Arts Centre, Uxbridge Rd, Hatch End. May 5 is an Activity Night. Chris Friel G4AUF on Ruislip 655522.

Vale of Evesham RAC have a Visit to the Club by Howes Communications - Kit Manufacturers on May 4. Formal meetings on 1st Thursdays, 7.30pm at The Meb Club, Worchester Rd. John G3DEF on Evesham 64107.


Fylde ARC meet 2nd & 4th Thursdays at South Shore Tennis Club, Midgeoland Lane, Blackpool. May 11 is an Equipment Sale and the 25th is an informal/preparation for field day. F. Whitehead G4CSA on St. Annes 720887.

Lothians RS meet 2nd & 4th Wednesdays. 7.30pm at the Orwell Lodge Hotel, Polworth Terrace, Edinburgh. They have a Construction Competition/d.f. tune up on May 10 and a d.f. hunt on the 24th. P. J. Dick GM4DTH at 21 West Maitland St, Edinburgh EH12 5EA.

Thornbury & District ARC have RAYNET on May 3 and h.f. activity on the 17th. 1st & 3rd Wednesdays, 7.30pm in the United Reform Church, Chapel St. Tom Cromack G0FGF at Rose Cottage, The Narte, Oldbury-Super-Sermon, Bristol, Avon BS1 1RU.

Colchester RAS meet in Room 15, Ground Floor, “C” Block, Gilberd School, Brinkley Lane, Colchester. 7.30pm. May 11 is Project (Quenies). Mike Griggs on Layer-de-la-Haye 348199.

Loughton & District ARC have Radio Navigation by Tony Mothw on May 5 and Planning Night for Aylmers Farm on the 19th. All meetings in Room 20 of Loughton Hall, 7.45pm. John Ray G6D2H on 01-868 3434 after 7pm.

Dragon ARC meet 1st & 3rd Mondays, 7.30pm at the Four Crosses, Pentreath Rd, Menai Bridge. May 1 is a general get together on Bank Holiday and the 15th is Meteosat demo, let us find out what the summer weather is going to be. Tony Rees on Bethesda 600963.

Mansfield ARC have an Inter Club Quiz on April 28 and their AGM on May 12. 2nd & 4th Fridays, 7.30pm at the Westfield Folk House, Westfield Lane, Keith Lawson on Mansfield 642719.

Halifax & District ARC meet 1st & 3rd Tuesdays, 7.30pm at the Running Man Public House, Pellon Lane. 1st Tuesdays are informal Noggin and Natter Nights. May 16 is John Bowyer G4GKS on Packet. David Moss GD6LM on Halifax 20236.

Wirral ARC have RSGB Videos on May 16th, the Find NFD organisation on the 17th. Iw Farm, Arrowe Park Rd, Birkenhead, 7.45pm. Alex Seed G3FOO at 301 Withe Ave, Bebington, Wirral 2LT 5B9.

Rugby ARC meet Tuesdays, 7.30pm at the Cricket Pavilion outside Rugby Radio Station. May 2 is Annual Construction Competition. Judging, the 18th is talk by G5LP on DXpedition to Lundy and the 23rd is the first of these years f.h. hunts. Kevin Marriott GBTVH on Rugby 77986.

Keighley ARC meet Tuesdays, 8pm in the Clubroom, rear of Victoria Hall. May 2 is night on the air G0KRS, the 9th/23rd are Natter Nights and the 16th is an Annual Foxhunt. Kathy G1IGH on Bradford 496222.

York ARC meet Fridays, 7.30pm in the United Services Clubroom, 61 Micklelegate. Keith Cass G3WVO at4 Heverworth Village, York YO3 0AF.

Hastings Electronics & RC meet Fridays, 8pm at Ashdown Farm Community Centre, Downey Close, May 3 is a Natter Night, 2nd and 3rd Wednesdays, 7.45pm at West Hill Community Centre, Croft Rd. May 17 is East Sussex Model Engineers. Tim Anderson G0GTF on Hastings 437513.
When you are ready to graduate to real listening
Look to Lowe

The R-5000 from Kenwood

The R-5000 has established itself as one of the world's outstanding receivers, and a glance at the photograph will tell you what a range of facilities are on offer. The photograph of course only tells you what is on the front panel, but behind it is the engineering skill of Kenwood. The Kenwood engineers, widely acknowledged to be the best in the business, have made the R-5000 into one of the finest receivers you could wish to own. Not only in sheer performance but in the ease of use which is the hallmark of their careful approach to total design.

The R-5000 will satisfy the most demanding applications, whether in winking out the weakest rare amateur DX, or listening to Radio Hanoi under conditions in a heavily congested Broadcast band. The combination of operating facilities means that the operator can match the performance of the receiver to the prevailing conditions on the air. The result — total satisfaction.

Am I alone in being so enthusiastic? I don't think so. Read what Angus McKenzie said in his review (Amateur Radio magazine). "I was most impressed with the front end, as it is far superior to much of the competition. The selectivities of the various filters on CW, SSB, and AM were excellent. . . . " In "Short Wave Magazine", Ken Michaelson remarked "I used the R-5000 for some weeks and was impressed with its performance . . . . I was able to resolve signals which when I first tuned them in seemed too weak to decipher. These comments give you some idea of the listening satisfaction which can come from a truly top class receiver.

The R-5000 scores on quality of construction as well as performance. Rainer Lichte says in his review:— "The entire electronics are housed in a sturdy metal cabinet. This outer barrier and elaborate shielding of critical inside parts combine to form an RF-tight enclosure. Excellent workmanship is evident everywhere, the finish is outstanding." Ken Michaelson said much the same thing:— "In passing, I must comment on the finish of the interior. The whole assembly, when the top cover was lifted off, was a picture. Gleaming plated screening and circuit boards and components all having the appearance of being carefully put together. Quite different to some I have seen."

I think that there is little doubt that the R-5000 is one of the really classic receivers of the future, but having bought it, you will then find that you can extend its usefulness by adding the internally fitted VHF converter, giving you 108 — 174 MHz coverage in addition to the normal 30kHz — 30MHz range, with the VHF frequencies read out on the main receiver display. All the HF modes are available on VHF as well — AM, USB, LSB, CW, FM, FSK. There is also a selection of high specification optional filters for special needs, and even a voice synthesizer option which will announce the frequency in English (and Japanese if you prefer. . . .)

As Rainer Lichte concludes: — "The multitude of functions puts the R-5000 almost in a class by itself. Undoubtedly this is the best receiver ever offered by Kenwood." Well, he likes it, Ken Michaelson likes it, and Angus Mckenzie likes it. I just think it's terrific and I'm sure you will agree when you try an R-5000 for yourself at one of our branches or your nearest Kenwood approved dealer. By the way, just to keep the record straight, the ONLY Kenwood approved dealer in London (apart from our own branch at Eastcote) is Radio Shack Ltd. Anyone else trying to sell you an R-5000 has no connection whatsoever with the U.K. sales and service organisation, and should be treated with due caution, even if you may be getting "Forty quid off, John."

In the words of Dr Samuel Johnson when he referred to London: — "Prepare for death if here at night you roam," "And sign your will before you sup from home."

Caveat Emptor.

John Wilson.
G3PCY/5N2AAC

R5000 £875 inc VAT
VC20 £167 inc VAT

FREE

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

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

Short Wave Magazine May 1989
There has never been a more exciting time for the VHF listener than right now. With the leading manufacturers making VHF and UHF receivers, and using microprocessor control which would have been impossible even five years ago, the keen listener can carry in his pocket the kind of receiving power that used to take up a nineteen inch rack, and consume enough electricity to light a small house.

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

Let's start with what is acknowledged to be the finest wide range monitor receiver ever made; the AR-2002 from AOR. This receives in all modes, on frequencies from 25 to 550MHz, and also from 800 to 1300MHz, so there isn't much you cannot receive: airband both VHF and UHF, marine, amateur, FM broadcasts and TV sound, cellular radio, land mobile radio and so on. The AR-2002 is in use in professional installations all over the world, but is available at a price that the amateur can afford.

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

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

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

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

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

25th Anniversary Prize Draw

Congratulations to Mr Cole of Poole, and Mr Dicker of Dunmow who were winners in our January and February prize draw. To celebrate our 25th year in Short Wave, anyone making a purchase of £5 or more will automatically be included in that month’s draw for a substantial prize — for example a WIN-108. All mail order sales are included automatically; all shop sales will be recorded on cards given to you by the manager.
MARINE UK RADIO FREQUENCY GUIDE
compiled by Bill Lover
Published by Spa Publishing
Available from Short Wave Magazine Book Service
210 x 296mm, 62 pages. Price £4.95 plus 75p P&P
ISBN 0 9512729 6 9

The latest in a range of frequency guides compiled by Bill Lover, this one covers all the UK short wave and v.h.f. marine radio networks.

The book starts with a series of explanatory chapters dealing with the marine band, digital communications, facsimile (FAX), main i.f./h.f. calling frequencies, long distance communications, Portishead Sector Watch, the v.h.f. band, radio aids and weather broadcasts. The rest of the book is devoted to a listing of ports stations giving location, frequency and channel number, a list of the world marine coastal phone stations and the international marine short wave allocations. A useful reference book for those listeners into the maritime radio scene.

RAE MANUAL
A Guide to the Radio Amateurs’ Examination
by George Benbow G3HB
Published by Radio Society of Great Britain
Available from Short Wave Magazine Book Service
83 x 242mm, 132 pages. Price £5.00 plus 75p P&P
ISBN 0 900512 84 3

This book, which is almost compulsory reading for anyone taking the Radio Amateurs’ Examination, has been out of print for some time now, awaiting revision to cope with the latest changes to the examination syllabus.

However, it is at last available - although the companion book, How to Pass the RAE is now out of print!

The most important amendment is the addition of a chapter on electromagnetic compatibility covering the new section in Part 1 of the examination. However, information on licensing conditions has been deleted so that a copy of the free booklet How to Become a Radio Amateur, obtainable from the Department of Trade and Industry, is essential for the RAE Candidate.

The book is intended primarily as a basis for formal tuition and contains all the technical information necessary to pass the examination, although the treatment is necessarily brief.

WORLD RADIO TV HANDBOOK 1989
edited by Andrew G Sennitt
Published by Billboard Ltd
Available from Short Wave Magazine Book Service
147 x 226mm, 576 pages. Price £17.95 plus 75p P&P
ISBN 0 9902285 13 0

One of the most eagerly awaited events in the life of the listening enthusiast is the publication of the latest edition of WRTH. The 43rd edition has just arrived and is in much the same format as last year’s edition, even having the same number of pages.

Of course, that doesn’t imply that the content hasn’t changed, after all there would be little point in publishing it annually if the information contained within its covers didn’t change regularly. WRTH is a reference work designed for the short wave listener, as well as those working in the broadcasting industry and is an indispensable adjunct to the s.w.f. radio.

As well as giving all the essential information on each country of the world, including signature tunes, frequencies, powers and times of transmission as well as addresses and contact names.

At the back of the book is a section titled “Listen to the World” which reviews the previous year’s happenings in the world of short wave radio broadcasting. Also in this Interesting section as an article on satellite television, the first time that WRTH has dealt with this subject. The section ends with the now famous “Equipment Test Bench Section” covering s.w. receiver reviews as well as the “1989 WRTH Receiver Value
continuing from part 4 on the subject of "directivity gain" it should be mentioned that the cross-sectional area of the main lobe from a parasitic beam antenna may not be circular. more often than not it will be elliptical. in fig. 5.1 for example, if the beam widths at 3 db were, say, 40° horizontal and 35° vertical, the directivity gain with reference to an isotropic would be:

\[ 10 \times \log_{10} \left( \frac{41235}{0.78534 \times 40 \times 35} \right) = 15.74 \text{dBi} \]

however, it is more usual to quote directivity gain with reference to a half-wave dipole - this being more or less accepted as the standard antenna - in which case dbd (reference dipole) is used. (note that gain quoted in "db" is meaningless!) since the power gain of a dipole over an isotropic radiator is 1.64 (2.14 dbi) it is only necessary to subtract 2.14 from directivity gain in dbi, as above, to obtain that with reference to a dipole. this would be 15.74 - 2.14, which gives 13.6 dbd. see also fig. 5.1.

directivity gain with reference to a dipole can also be obtained directly from:

\[ 10 \log_{10} \left( \frac{32027 \times \text{oh} \times \text{ov}}{} \right) \]

fig. 5.1: example of directivity gain from a yagi type parasitic beam antenna with an elliptical cross-section (main lobe) at -3 db from maximum forward radiation.

antenna bandwidth

the functional bandwidth of an antenna may depend on any one of several different performance parameters, but mainly on the radiation pattern and impedance characteristics. with antennas consisting of thin linear elements - the types most used for amateur radio applications - impedance match and directivity gain are the main criteria. however, with very thick cylindrical, biconical and disco antennas with considerable "cone angle" the radiation characteristics may be satisfactory over such a wide bandwidth that radiation pattern variation ultimately determines one or both of the frequency limits relative to a given centre frequency.

it, on the other hand, an acceptable bandwidth for a given radiation pattern exceeds that for impedance, the bandwidth may be arbitrarily specified by the frequency limits (f1 to f2) at which the voltage standing wave ratio on the transmission line, between transmitter and antenna, rises to an unacceptable value.

for most antennas the v.s.w.r. must be as close to unity ratio of 1:1 as possible at the centre frequency (f0) of the transmitting band concerned - which will normally be the frequency to which the antenna is tuned. incidentally, v.s.w.r. is often talked about but not always fully understood.

it should be noted that bandwidth may also be dependent upon the "q" of the antenna. the higher the "q" factor, the narrower the bandwidth, resulting in the antenna becoming "sharply tuned" at its resonant frequency. this is a problem likely to arise with inductively loaded antennas and multi-band systems incorporating inductive/capacitive "traps".

impedance

the input impedance of an antenna is also of prime importance because it directly affects the transfer of r.f. power to or from the antenna. a transmission line or cable of a given impedance used to feed r.f. from the transmitter must either match in impedance to the input impedance of the antenna or be connected via an impedance-changing device to meet this requirement. an impedance mismatch between transmission line and antenna can produce a high, and usually unacceptable, v.s.w.r. which can result in loss of power to the antenna and cause the transmission line to radiate. as well as modifying the radiation pattern of the antenna, radiation from a transmission line is often the cause of bci or tvi.

which antenna, what purpose?

readers will no doubt appreciate that for any one application, transmitting or receiving, there are many types of antenna to choose from and that operation over a number of frequency bands may call for several different antennas, see fig. 5.3. the antenna has yet to be developed that will operate with a high degree of efficiency on every frequency within the spectrum covered by the h.f., u.f.f. and v.h.f. bands.

fig. 5.2: directivity gain of a half-wave dipole from either lobe width at -3 db from maximum radiation.
Antenna Systems - VHF and UHF

There is of course the simple half-wave dipole which can be used in two different ways, i.e. horizontal with radiation bi-directional, or vertical with radiation omni-directional. The dipole can be directly centre fed with 72 twin transmission line, but if coaxial cable is used then a balance-to-unbalance (balun) device must be used to connect cable to antenna. The balun must also provide the appropriate impedance transformation. An alternative is to “end feed” via a quarter-wave stub - the “J” match. At v.h.f. or u.h.f. the dipole is not often used by itself, but two horizontal dipoles crossed at right-angles make a suitable antenna for satellite working.

An antenna at one time used almost exclusively for v.h.f. operation is the “ground-plane”, consisting of a vertical radiation some fraction of a wavelength long and mounted above an artificial ground made of four or more radials. Because of the high angle vertical radiation, which limits its working range, this antenna is now hardly ever used.

End-Fed Folded Dipole

A far better arrangement for v.h.f. omni-directional operation is a “folded dipole” [10] end fed from a 50Ω coaxial transmission line via a quarter-wave stub, as in Fig. 5.4. Two configurations are shown: “A” with a closed quarter-wave stub and adjustment for minimum s.w.r. by moving the shorting bar at the bottom and 50Ω cable feed points; and “B” with an open ended stub, adjustment for minimum s.w.r. being made by positioning the 50Ω cable feed points in conjunction with tuning the half-wave section using the movable shorting bar at the top - note the gap as indicated by “X”. This antenna can be dimensioned for virtually any frequency band from low v.h.f. to around 500MHz u.h.f. It also has a wider bandwidth for low s.w.r. than can be obtained with a linear dipole. The “tilt angle” of the otherwise low angle of maximum vertical radiation does not exceed
Here at Raycom the Yaesu FRG-9600 has always been a favourite. We have taken the '9600, fine tuned it, added our own modifications and tuned what has always been a good scanner into a unit offering unmatched versatility for its price. The standard model covers 60-905 MHz with AM/FM/SSB, and our Mark 2 mod extends this to 950MHz and has an 'N' connector fitted. Our Mark 5 mod fits an active front end to increase coverage to 100KHz to 950MHz with a display mod to give a correct frequency readout. These mods can also be fitted to your '9600! Phone us for details.

**YAESU FRG-9600**

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRG-9600</td>
<td>60-905 MHz</td>
<td>£499.00</td>
</tr>
<tr>
<td>FRG-9600 Mk 2</td>
<td>60-950 MHz</td>
<td>£545.00</td>
</tr>
<tr>
<td>FRG-9600 Mk 5</td>
<td>0.1-950 MHz</td>
<td>£699.00</td>
</tr>
</tbody>
</table>

**SCANNER CORNER**

- **Bearcat 100XLT** £199.99
- **Bearcat 70XLT** £139.99
- **Bearcat 55XLT** £94.99
- **Sony AIR-7** £229.95
- **Sony PRO-80** £299.95
- **Sony SW-1 short wave kit** £239.95
- **Sony IC-7600S** £149.95
- **Maric II 0.1-950 MHz** £375.00
- **AOR AR2002** £469.00
- **Standard AX700R Pan Display** £169.99
- **ROYAL 1300 discone (AH7000)** £59.95

We hold extensive stocks of accessories for scanners and antennas. Please call us or send SAE for our accessories catalogue. 73

**ICOM IC-R7000**

Listen in on public and private radio communications: weather, fire, coastguard TV, airband and many, many more. Wideband frequency coverage provides you with all the channels you need to become a VHF and UHF listener. Turn on the infra-red remote control (optional) for 'armchair copy'. Frequency coverage is guaranteed to 1300MHz, starting at 25MHz, but may extend on individual units to 2GHz! Features include:

- USB, LSB, FM, FM-N, AM
- 99 memories
- Optional infra-red remote control
- Variable speed scan and delay
- Optional voice synthesizer
- Six tuning steps
- Sensitivity less than 1uV for 12dB SINAD

Raycom package deal including FREE Royal 1300 discone worth £59.95!

<table>
<thead>
<tr>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>£989.00</td>
</tr>
</tbody>
</table>

(plus £64) plus £10 post/packing

**CHALLENGER BJ200**

**BJ200 Scanner Package**

**Challenger BJ200 HF/VHF/UHF Scanning Receiver**

- 26-30, 60-88, 115-178, 210-260, 410-520 MHz
- 16 memories, search scan priority and delay function
- FREE Raycom air-band antenna £229.00

<table>
<thead>
<tr>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>£199.00</td>
</tr>
</tbody>
</table>

(plus £10 post/packing)

**RAYCOM COMMUNICATIONS SYSTEMS LIMITED**, INTERNATIONAL HOUSE, 953 WOLVERHAMPTON ROAD, OLD BURY, WEST MIDLANDS B69 4SE, TEL 021-544-6767, FAX 021-544-7124, TELEX 339483/DENTIC.

**RAYCOM**

**RAYCOM COMMUNICATIONS SYSTEMS LIMITED**

-Raycom gives you more BUYING POWER-

- ALL MAJOR CREDIT CARDS ACCEPTED-
- ACCESS, DINERS, INSTANT CREDIT UP TO €1000 (SUBJECT TO STATUS) WITH RAYCOM CREDIT CARD (APR 29.9%). FOR CREDIT ON CERTAIN ITEMS AT MRP. CALL NOW FOR MORE DETAILS.-

ORDERING INFORMATION:

- WE STOCK ICOM, YAESU, BEARCAT, MFJ, BUTTERNUT, CUSHCRAFT, AEA, TONNA, NAVICO, TEN-TEC AND WELZ AMONG MANY OTHERS. CALL FOR FULL LIST.

RAYCOM gives you more BUYING POWER

- ALL MAJOR CREDIT CARDS ACCEPTED-
- ACCESS, DINERS, INSTANT CREDIT UP TO €1000 (SUBJECT TO STATUS) WITH RAYCOM CREDIT CARD (APR 29.9%). FOR CREDIT ON CERTAIN ITEMS AT MRP. CALL NOW FOR MORE DETAILS.

- WE STOCK ICOM, YAESU, BEARCAT, MFJ, BUTTERNUT, CUSHCRAFT, AEA, TONNA, NAVICO, TEN-TEC AND WELZ AMONG MANY OTHERS. CALL FOR FULL LIST.
AIRBAND

Godfrey Manning G4GLM

Aircraft can often be tracked visually in good weather - as you of prove this month. Godfrey provides the usual mix of frequency information mixed in with your flying stories and all the news.

Sensitive but unfortunately the NiCd batteries only last 2 hours per charge.

It should be simple enough to disconnect the backlight (or route it through an on/off switch); just follow its wiring. But please note that this may invalidate the guarantee on your set.

The backlight may be quite low-powered - in the case of the Wiltox, for example, in the December issue, it only contributed about 10 per cent of the power consumption and may not be worth removing.

Frequency and Operational News

James notes that 243.45MHz is available during displays for communication within aircraft formations. In the 2/89 General Aviation Safety Information Leaflet from the CAA, I see that the Rochester d.b. (IRCH, 369.4kHz) is only operating on a 10 mile range.

Weston airfield (Weston-super-Mare) has closed to all except gliders. At Northolt the aviation magnetic designation has changed from 08/26 to 07/25.

Not a new frequency, but nonetheless useful to know about, Hong Kong VOLMET transmits at 20 minutes to and 10 minutes past the hour on 13.282MHz, other h.f. stations of note are Johannesburg (8.932MHz) and Bangkok, New York Centre and San Juan sharing 11.3896MHz. Thanks to Geoffrey Powell (Tamworth, Staffordshire) for pointing these out.

Alan Jarvis notes that when Bristol approach changed frequency, it had actually swapped with Leeming approach. Here’s the final score: Bristol 132.4MHz, Leeming 127.755MHz. One possibility might be that this change has solved someone’s interference problem.

Some travellers just can’t seem to get by without access to a telephone. You must not use a cellular ‘phone on an aircraft, but British Airways have now started an experimental satellite telephone service in some of their Boeing 747s.

Information Sources

"Where could I obtain a listing of SeCal's and the aircraft to which they are assigned?" asks Eric Sillick VE3IRL (Ontario, Canada). Although allocated by Aeronautical Radio Inc. (ARINC) in the United States, an easier source of this information is High in the Sky published by The Aviation Society. For current prices send a self-addressed envelope and an international reply coupon to Ken Barker, 44 Laburnum Park, Bradshaw, Bolton BL2 3BU, England. You might, however, be expected to arrange payment in pounds sterling.

I must ask all readers to note again the sheer impossibility of me sending direct replies to your questions. I’m delighted by the response to this column, and all answers will be printed here - that way, everybody gets to share the information.

You Write

Lucky Rob Browning G4UMW lives five miles from Cranfield aerodrome at Bromham, Bedford, under the approach to Runway 22 in fact. “Aircraft of all kinds, please the Christmassy local population to confuse you, the photo that was to be identified by quiz entrants was actually published in the January edition - which hit the newsagents just before the festive season! For the results, see last month’s issue. Sorry that your letter was sent slightly too late to enter, Bill.

Alan Jarvis noted huge swings in barometric pressure recently. The peak was 1046mb and Alan set his altimeter to zero at this time. At midday on Friday 25 the Bristol OFE was so low at 931mb that some pilots’ altimeters could hardly cope with this setting! Alan’s was now showing 3300ft higher than when he had zeroed it during the high pressure weather. Another of Alan’s weather-dependent observations is Concorde. At 1945hrs it passes overhead, and, with binoculars, can be seen heading out to sea abeam Porthcawl. When the afterburners are switched on for transonic acceleration, two bright white points of light can be seen. Quite a sight.

Aeronautic photographer Roger Syrrat (Winslow, Buckinghamshire) managed a nice shot of LN-BWG, a Convar 580 that’s still in passenger service and was recently sub-chartered by Ryanair when they were awaiting extra capacity in the form of new ATR-42 equipment. Lyton is, as you say, being planned for major expansion but I was given to understand that spectators will not be forgotten. Roger favours Birmingham where a public park (adjacent to the long-term car park) has a grassy bank with seats provided that overlook the apron. Sounds idyllic. Most own aircraft have to taxi past this position.

Now is the time of year to get out and about and see what’s flying. And don’t forget to write in about it!

<table>
<thead>
<tr>
<th>Abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAA</td>
</tr>
<tr>
<td>ft</td>
</tr>
<tr>
<td>h.f.</td>
</tr>
<tr>
<td>hrs</td>
</tr>
<tr>
<td>i.s.</td>
</tr>
<tr>
<td>kHz</td>
</tr>
<tr>
<td>mb</td>
</tr>
<tr>
<td>MHz</td>
</tr>
<tr>
<td>O.F.E</td>
</tr>
</tbody>
</table>

Flying Lessons

"I had 10 flying lessons in a Rallye 110 from Bogg Hill - tremendous fun" writes Peter Wade (Sevenoaks, Kent). If you want to brush up on your skills without leaving your armchair then I suggest you look at the Microsoft Flight Simulator program for the IBM PC type computer (but it won’t run on your Spectrum). Thanks, Peter, for the documents you sent me. One is free from the Civil Aviation Authority (CAA) Printing and Publication Services, Greville House, 37 Grattan Road, Cheltenham, Gloucestershire GL50 2BN (but don’t forget to send 50p postage UK or £1.30 overseas). It’s Document No. 297 Air Traffic Control at Gatwick Airport.

On a clear day Peter can see the Detling and Lydd stacks - the aircraft are 64km away. We’ve all noticed the condensation trails left by aircraft in cruise; have you thought that, since nearly 8am are travelled each minute, you can work out how far the aircraft has travelled whilst remaining in sight?

Peter has various radios including a "Receiver Unit Type 88 Ref No 100/1541". It covers 2-20MHz and any details would be welcome. Although probably dating from World War II its performance is better than some modern types that we won’t mention!

Equipment Problems

Recent “Airband” correspondents have complained about the excessive selectivity of some receivers, which causes problems with offset relay transmissions. Peter had his Yaesu 3600 modified by Raycom Communications Systems Ltd who fitted a 25kHz filter for £15.

In his St. David’s Day letter, Alan Jarvis (Cardiff) suggests that the FRG-8800 can resolve offset relay transmissions if it is tuned about 3kHz away from the nominal centre frequency.

From Whitwick, Leicestershire, James Dennis reports the Signal R-535 as being...
CONFIDENTIAL FREQUENCY LIST

If you are looking for the frequencies of Interpol, oil rigs, aircraft, ships or commercial stations you will find them in CONFIDENTIAL FREQUENCY LIST. The new 7th edition has not only been considerably expanded in an improved format, but now contains over 30,000 CW, voice, RTTY and FAX frequencies from 4 to 28MHz.

Details of scheduled press and weather broadcasts, time signals, navigation warnings and similar material has been developed and updated. New features include international Call-sign List, extended list of abbreviations, several useful charts and a world time zone map.

Price £12.95 + £1 p&p UK or £1.75 overseas

PASSPORT TO WORLD BAND RADIO 1989
WORLDWIDE SHORTWAVE BROADCASTING... AT A GLANCE

Which station broadcasts on what frequencies? At what time? To what parts of the world? In which language?

PASSPORT TO WORLD BAND RADIO answers all these questions and more in the new expanded 1989 edition. The most up-to-date Worldscan schedules are presented in clear easy-to-read graphics in handy frequency order. And there’s more. There are a number of new features and articles, a list of major stations in alphabetical order by country, and a buyers guide with ratings of dozens of receivers.

Price £12.95 + £1 p&p, or £2 overseas.

MONITORING TIMES

Recent issues have featured monitoring the Shuttle launch, Satellite TV, Radio Wars in Nicaragua, Greenpeace, Swiss Army radio communications, Broadcasting’s Secret Frequencies, Voice of Iran and more. Regular articles cover Maritime, Aeronautical, Utility World, Short Wave Broadcasting, technical subjects, etc., in over 100 pages. Send for a copy today. Only £2.20 per copy (incl. post). Ask for subscription details.

Grove Shortwave Directory 1989........... £12.95 + £1 p&p
World Radio TV Handbook 1989........... £17.95 + £1 p&p
Communication Satellites.................. £13.25 + £1.25 p&p
Worldwide Maritime FAX.................. £9.95 + £1 p&p
Flight Routings.............................. £4.00 + £1 p&p
Guide to Utility Stations 1989............ £18.75 + £1 p&p
Guide to FAX Stations..................... £12.25 + £1 p&p
Limited Space Antennas................... £9.95 + £1 p&p

Two or more books postage free in UK

ASK FOR OUR FREE CATALOGUE OF ALL BOOKS

INTERBOOKS
8 Abbot Street, Perth PH2 6EB, Scotland.
Tel: 0738-30707

ARE COMMUNICATIONS

The very latest “2 in 1” ICR7000HF Receiver
500kHz — 2GHz

EXCLUSIVE TO
A.R.E. COMMUNICATIONS

YES, 500kHz to 2GHz CONTINUOUS receive in one unit. Using the ICR7000 multimode facilities, this probably makes the “2 in 1” ICR7000HF Receiver the most versatile scanner available today. Because of the enormous frequency coverage, the ICR7000HF has 200 mode sensitive channels for increased flexibility.

With excellent strong handling characteristics, using a direct fed Double Balanced Mixer, the need for a pre-amp is unnecessary.

Compare the price of an ICR71E at £855 and an ICR7000 at £989!!

Available from stock, the new ICR7000HF.

Only £989.00 incl. VAT. Phone 01-997 4476 for immediate delivery.

*Also available as an after-fit to your existing ICR7000 only £129 incl. VAT.

Opening hours Monday - Friday 9.30-5.30 Saturday 10.00-1.00.

ARE Communications Limited, 6 Royal Parade, Hanger Lane, Ealing, London W5 1ET, England
Fax 01-991 2565
Tel 01-997 4476
The ERA Microreader enables the listener to read Morse (c.w.) and teleprinter (RTTY) transmissions. These are both forms of data transmission. To put it simply, those transmissions that are not speech or music will be data transmissions. The radio signals contain information which is coded through the radio. It can be switched on and off in a particular manner, or in tones which are added to the signal, or a combination of both. Morse (c.w.) is the grandfather of all data transmissions. Nothing could be simpler. The transmission (carrier wave) is just switched on and off in sequence to form the characters of Samuel Morse's code. Experienced operators learn the code and are able to read the transmissions like another language but for those who do not know the code the Microreader offers salvation. It translates the received c.w. into characters which appear on a scrolling liquid crystal display, rather like those Piccadilly Circus advertising screens. Received c.w. at up to 30 words per minute the Microreader displays the actual letters and numbers of the c.w. moving across the screen.

RadioTeleType (RTTY) is a data mode which uses a typewriter keyboard to generate audio tones which have a start and stop (called mark and space) series of elements to convey the data. The early systems were electromechanical and very complex and heavy items of equipment. More recent equipment is computer controlled and the readout is from a v.d.u. (visual display unit) driven by a computer. The Microreader decodes the RTTY signals directly from the radio receiver and they appear on the liquid crystal display as scrolling letters and numbers.

The Microreader

The Microreader is a self contained c.w. and RTTY decoder housed in a case just 134 x 54 x 133mm. The unit requires an external supply of 12 to 14 volts d.c. at 200mA which could be obtained, in some instances, from the receiver. For safety the supply line is reverse polarity protected so that accidental reversal of the supply polarity will not harm the unit. The back panel contains the input socket, a 3mm jack socket, to take the signal from the headphone or external loudspeaker output of a receiver via a screened lead. This input has a useful parallel jack socket to allow continued use of the headphone or external loudspeaker output on another loudspeaker or headphones. The panel also contains two preset controls; one for adjust of the gain of the unit, the other to adjust the angle of viewing to give the best contrast for the liquid crystal display. In the units with the Morse tutor option there is a centre-off switch which selects the normal reader function or the Morse tutor facility. The viewing angle does help with the contrast between the display and the background of the display unit, but I would have been happier if the display had included back lighting. The display has to be mounted at eye level and in a position of reasonable light to ensure a clear reading. The preset gain control does require a little time to set up correctly although in practice it is not difficult to get the level right by following the suggested instructions in the manual.

Using the Microreader

The first thing to say is that it does take time and practice in use before the full benefits of the Microreader can be utilised. The operation of the unit in itself is very simple but it does require practice to tune in the signals correctly to obtain a good reading. I had never had any experience of RTTY reception at all before I tried the Microreader but by the end of an evening's operation I was quite adept at tuning in signals and getting consistent readings on the display.

Decoding c.w. is the simpler of the two modes. The Microreader contains a c.w. filter centred on an audio frequency of 800Hz and optimum performance occurs when the signal lies in the centre of the filter passband. There are two filter positions: WIDE and NARROW. In the WIDE position signals that are not exactly on the centre of the passband may be decoded. The NARROW position, which brings a 80Hz bandwidth digital filter, does require accurate tuning. Thankfully there is a very easy to use tuning aid built into the unit.

The front panel has four i.e.d.s to aid tuning. The top three are mounted in a line with a red i.e.d. in between two amber i.e.d.s. The centre red i.e.d. indicates the signal strength at 800Hz by its brightness. The amber "L" i.e.d. indicates the signal is tuned low and the amber "H" i.e.d. indicates that tuning is too high. It soon becomes clear in use how to tune in to a signal in the centre of the passband. If the receiver is fitted with an incremental tuning control (e.g. sometimes called a "clarifier" or "fine tune"), this can be helpful. The manual contains helpful advice on the correct tuning procedure.

The Microreader has a CW NARROW position which is very helpful on the amateur bands where c.w. stations are often found where the adjacent stations may well interfere with the clean decoding of an individual station. Some receivers contain narrow c.w. filtering facilities but I found it best to operate the receiver without internal filtering and to rely upon the filtering provided by the Microreader. The CW NARROW position also includes another, very clever, facility: In that position the Microreader performs a word search on the received text. The system memory contains all of the commonly used words and code groups in amateur radio communication. If the text position the Microreader performs a word search on the received text. The system memory contains all of the commonly used words and code groups in amateur radio communication. If those codes or sequences are not included in the received text the text will simply be displayed without any recognition of that position. For example the received signal "QSL VIA BUBO" would appear on the screen as the corrected "QSL VIA BURO". For these reasons the CW NARROW position is the one to use for amateur transmissions.

Clever Facility

Another clever facility built into the Microreader is its ability to cope with differing speeds of Morse sending without having to alter any controls. If the spacings and character formations are near enough correct, the unit will decode the speed, word and character formation automatically, allowing the receiver to be tuned to the correct position across the keyboard. The microreader has a back panel which contains the input socket, a 3mm jack socket, to take the signal from the headphone or external loudspeaker output of a receiver via a screened lead. This input has a useful parallel jack socket to allow continued use of the headphone or external loudspeaker output on another loudspeaker or headphones. The panel also contains two preset controls; one for adjust of the gain of the unit, the other to adjust the angle of viewing to give the best contrast for the liquid crystal display. In the units with the Morse tutor option there is a centre-off switch which selects the normal reader function or the Morse tutor facility. The viewing angle does help with the contrast between the display and the background of the display unit, but I would have been happier if the display had included back lighting. The display has to be mounted at eye level and in a position of reasonable light to ensure a clear reading. The preset gain control does require a little time to set up correctly although in practice it is not difficult to get the level right by following the suggested instructions in the manual.

RTTY Made Simple

The RTTY operation is also made simple by the intelligence of the unit. The front panel switch gives the choice of commercial 252Hz shift (WIDE) or Amateur 170Hz shift (NARROW) but the reader automatically samples and selects the baud rate and if the signal is normal or reversed tones. I followed the manual and tuned in RTTY signals by beginning in the CW Wide position to get the signal into the passband and then switching to the required RTTY mode. The receiver is simple enough even for someone like me, who knew nothing about RTTY, to be able to master the operation of the decoder. The manual also contains a useful trouble shooting page for possible problems with RTTY operation.

I began simply by decoding some of the stronger commercial signals. These can often be found just below the amateur bands. Sadly about half them are scrambled but there are enough normal transmissions to be able to gain experience in using the mode.
Morse Tutor

The Microreader comes with a Morse tutor facility which was fully exploited by my wife who is learning Morse code. She quickly pressed it into service and found it a valuable asset in learning to read Morse. The unit will give Morse receiving practice from a choice of four menus: Letters, Numbers, Letters and Numbers, Punctuation and Abbreviation.

The speed required can be set in the range 6 to 18 words per minute and the spacing between characters can also be changed, allowing the characters to be sent at the chosen speed but with the overall word-per-minute rate being slower. This facility is very useful for increasing the speed at which Morse can be received. The required speed can be received with wide spacing which is then gradually reduced until Morse is accurately read at normal spacing.

The tutor sends groups of 9 characters, each lesson being ten groups long. As the Morse is sent, the characters being made are scrolled across the screen. Unless the operator chooses to change the lesson, it will repeat the same characters. The Morse student can listen to the lesson once, not looking at the readout screen, and attempt to write down the characters. The repeat can be used to check the lesson by reading the characters on the screen.

The Microreader can also be used for sending practice. A Morse key is plugged into the rear panel jack and Morse code is sent in the usual way. During the first few words the Microtutor adjusts to the speed and spacing of the operator and may show odd readings. The tutor is a critical way to check on Morse sending. It will display exactly what is sent, so bad spacing will be recorded, as will incorrect shaping of the characters. It can be embarrassing to the experienced operator of Morse code in showing up habitual mistakes. I know: it showed up mine!

Impressions

I was very taken by the Microreader. It is a clever little device offering the short wave listener a simple and inexpensive way to decode RTTY and c.w. It does take a little practice to use but after a few sessions, I found it simple and reliable in use. The major moan is that the I.o.d. display does have to be positioned in relation to the ambient lighting and the operator’s eyes to be clearly read. Perhaps backlighting the display would have helped the readability. Comparing its cost with a similar American product, it is excellent value for money.

Footnote

ERA have just introduced a Mark 2 version of the Microreader which clears up some of the points raised by George in his review. The visible differences between a Mark I and a Mark II are on the front panel. The single l.o.d. for tuning has been replaced by a three-colour bargraph and the two push-buttons by a ten-position, rotary, mode switch allowing more options to be selected. Also, three separate I.o.d.s automatically indicate the RTTY shift.

Internally all the filters have been changed to make the unit compatible with v.h.f. tone pairs and additional filtering, including two notch filters, makes a significant improvement in readability under poor conditions. The amount of text editing has been increased to try to make more sense of bad Morse sending and to achieve this the processor speed has been increased to 12MHz. The display, however, is still of the l.o.d. type without backlighting as the marginal improvement gained by the addition of backlighting is, says Bill Green of ERA, not worth the extra cost incurred.

Cost

The Microreader Mark 2 costs £139.95, inc. V.A.T. and postage from ERA Ltd., 26 Clarendon Court, Winnington Quay, Warrington WA2 9QP. Tel: (0925) 573118.

References

[10] Out of Thin Air, PW Publishing Ltd.

Abbreviations

<table>
<thead>
<tr>
<th>BCI</th>
<th>cm</th>
<th>dB</th>
<th>dBd</th>
</tr>
</thead>
<tbody>
<tr>
<td>dBi</td>
<td>f.m.</td>
<td>h.f.</td>
<td>MHz</td>
</tr>
<tr>
<td>cm</td>
<td>m</td>
<td>Q</td>
<td>r.f.</td>
</tr>
<tr>
<td>dB</td>
<td>s.w.r.</td>
<td>TVI</td>
<td>u.h.f.</td>
</tr>
<tr>
<td>dBd</td>
<td>v.h.f.</td>
<td>v.s.w.r.</td>
<td>Ω</td>
</tr>
</tbody>
</table>

10°, as shown in Fig. 5.5, thus making it ideal for maximum performance over ground working distances. As a point of interest, the 144MHz band version of this antenna is used world-wide by individual radio amateurs as well as by 144MHz repeater stations in various countries, including Indonesia, Sri Lanka and Japan. Suitable re-dimensional it is also used in Greece by f.m. broadcast stations, and in the UK for taxi and other commercial communication bands.

We will look at further types of antenna in the next part.
This month Alan begins with a look at an interesting new feature appearing on two new scanners, one of which is our cover subject, and examines some of its uses. His survey of what you can hear on your scanner has now reached the middle part of the v.h.f. radio spectrum.

Other features include improved frequency stability, now better than ±0.25p.p.m. above 30 MHz; tuning step sizes of 10 kHz, 100 kHz, 1 kHz, 5 kHz, 9 kHz, 10 kHz, 2.5 kHz, 25 kHz and 100 kHz; notch filter and i.f. shift for improved short wave reception; programmable clock and timer functions; separate antenna sockets for h.f., v.h.f./u.h.f. and a.f.; Extra CI-V commands for a.f. and r.f. gain, squelch level and signal strength - improving the versatility of the receiver when operated under computer control.

Aaltogether this is a very impressive receiver. However I would like to have seen a facility to permit the locking out of individual frequencies within a search band, a wider frequency span on the pan-adaptor and perhaps a slightly better than specified receive sensitivity - although the published figures are usually worst case ones. Of course this is just a personal opinion and should not detract from the fact that this is undoubtedly the most advanced scanning receiver likely to appear outside the professional market - at least for the present!

If you are a little put off by the three figure price tag of the R9000 but would like a scanner with a built in pan-adaptor then the new Standard AX7000, featured on the cover this month, may be just the thing. The UK model's specification should be finalised by now so keep an eye open for the first examples. Frequency coverage is expected to be from 50-995 MHz but may extend up to 950 MHz if Ray Withers can manage to perform "Micro-surgery".

I have also heard of an interesting hand-held covering 25-850 MHz and 800-1300 MHz but I am still awaiting a further report from Agent X.

With the introduction of these two new receivers I thought that it may be a good idea to take another look at the subject of pan-adaptors - you may remember I touched upon the subject before in the August 1988 column. The basic idea of such a display is to allow the analysis of signals appearing within the frequency range of the receiver and to present the results in a pictorial or graphical form with the horizontal axis displaying the frequency range and the vertical axis displaying the amplitude or strength of a signal. By selection of suitable frequency and amplitude ranges it is possible to use such a display for different purposes. The most common use is in finding previously undiscovered transmissions. For this application the frequency span needs to be fairly wide - say a few MHz. By watching the screen any transmissions occurring within the display range become immediately noticeable. Very useful if you are a military operator searching for very short duration clandestine transmissions, or looking at the characteristics of frequency hopping signals.

Once a signal is detected it can prove useful to examine it more closely. A much narrower frequency span is required for this - perhaps just a few kHz. This permits analysis of the modulation present on a transmission which may in turn reveal additional information.

From this a field in which the military is very interested. By examining the characteristics of a signal it may prove possible to identify the type of equipment being used and with the addition of other intelligence may lead to an assessment as to the strength of the opposition. This is possible because various types of equipment are known to only be used at certain levels of troop deployment - for example by squads or battalions.

Military operators try to disguise this by changing power levels or antennas and by using the same callsign from different locations or different call signs from the same location! However each transmitter has its own "fingerprint". This permits analysis of the modulation present on the transmission, the way in which the carrier frequency changes when initially switched to transmit, the depth of modulation or any spurious signals transmitted as sidebands. All of these tell-tale characteristics can be as accurate in identifying the equipment as the serial number.

From the casual listeners point of view it may not be too important to know that an amateur station is using a Satsumar TXR 3000 GTI just from the fact that its transmit frequency sweeps over several MHz each time the transmit button is released, but it can be quite amusing watching it happen. I believe that a number of listeners may be glued to the small screen over the next few
**AX 700E**

AT LAST — a scanner from Standard! For longer than I care to remember people have been asking why Standard do not make a scanner — well now they do. Unfortunately I only have a Japanese leaflet here in the shop, so I can't tell you too much about it, but you can see from the photograph that the AX 700E has maintained Standard's reputation for innovation. The strange looking liquid crystal display not only shows the frequency, mode and so on, it is also a panadapter! For those of you who are new to scanning I had better explain what that is. The vertical line on the left hand side of the display is to show signal strength and the horizontal line along the bottom is the frequency range. This range can be set to 100, 250 or 1000kHz. The frequency displayed at the top is the frequency at the centre of the line. In other words, if the displayed frequency is 14.50MHz and the width of the display is set to 100kHz, then the left hand side would be 145.00MHz and the right hand side would be 146.00MHz. Now comes the magic. Every time a signal comes up within that frequency range (i.e. 145-146MHz), it will show up as a spike on the display. The height will show the signal strength and the position will indicate the frequency. By simply turning the tuning knob a cursor can be slid along to line up with the new signal and its exact frequency will be displayed at the top of the screen! To receive the new signal, just press a button and that signal becomes the one that is heard and the display will shift to place it in the middle of the screen. The width of the spikes is governed by the setting of the step size (10, 12.5, 20 or 25kHz) so you can see that it is possible to monitor the activity on up to 100 channels simultaneously. If, for instance, you are looking for a specific signal but you only know the band that it is in and not the spot frequency, just set up the appropriate band edges and then sit back and watch the display. Any signals that then appear can be instantly spotted and tuned to in seconds. That's what a panadapter can do for you!

As for the rest of the scanner, it covers 50 to 904.995MHz with AM and FM (wide & narrow), it is powered by 13.8V dc and it measures just 180mm W x 180mm D x 75mm H. There is a lot more to it but I can't decipher Japanese, but we should have some English leaflets by the time that you read this ad. and may be even some radios, so come into the shop and see for yourself. You can even play with our new active antenna which should be ideal for use with this set.

Norman G4THJ

**SEE US FOR ALL YOUR SCANNER AND RECEIVER NEEDS**

We stock scanners and receivers by Bearcat — Black Jaguar — Yaesu — Icom — Uniden as well as most accessories such as plugs and power supplies and a range of antennas including our new active scanner antenna at just £89.95 (plus PSU).
months, discovering all sorts of strange signals not previously noticed.

What Can I Hear? Part 4

We finished our last look at the radio frequency spectrum at 136MHz and the top end of the v.h.f. airband. This month we move higher in both frequency and altitude, as we examine the part between 136 and 138MHz.

This small band is perhaps one of the most interesting to monitor as it is used almost exclusively for down-links from orbiting satellites. Most of these send information relating to the world’s weather or geography, normally by converting the measured parameters to audio tones before transmission. Decoding the information is a fairly involved process with many articles on the subject having been published over the past few years. However it can still be quite entertaining trying to identify individual satellites as they pass within radio range.

Fairly narrow tuning steps are required in order to tune on to the correct frequency and then follow the signal up and down in frequency as it is effected by doppler shift. Single sideband is a useful addition if you want to pick out the really weak ones.

For information about satellite frequencies you could try Peter Rose’s book Scanners 2, obtainable from the SWM Book Service, of course. For more detailed information about practically anything in space that radiates signals, Communications Satellites by Larry van Horn is really excellent.

Moving up in frequency we encounter the p.m.f. “Mid Band” starting at 138MHz and reaching up to 141MHz. This band is mainly used by the nationalised - for the time being anyway! - Fuel, Power and Transport industries. The mobile stations are pared 33MHz lower in frequency than the base stations which use 12.8kHz channel spacings.

The interesting thing about this allocation is that each channel is offset by 6.25kHz in order to reduce interference to services outside the UK.

As the v.h.f. f.m. Broadcast band is exclusively uplink frequency, some of the mobile transmit allocations will be lost. In order to accommodate the displaced users a new allocation has been created at 148MHz. This will be paired with mobile transmit frequencies at 138.5-140.5MHz. The vacated channels at around 138/139MHz are likely to be reallocated to new services just requiring a simplex channel. For example, some of the new national digital paging systems. This can create problems when trying to listen to weak satellite signals just a few hundred kHz away.

The band 141-144MHz is a real mixture of odd allocations including TV and radio outside broadcast talk-back channels. These are used to relay information back to programme presenters from the studio or control centre which may be located some distance away. Military aircraft are another user, with many airbases having spot frequencies scattered around the band.

Perhaps the most interesting user of this segment is the Russian orbiting space station MIR which normally is be found transmitting voice communications at around 142.4-142.6MHz. The final user is another service which has been displaced from the v.h.f. f.m. Broadcast band - the Police who use part of this allocation for mobile stations.

The band of frequencies 141-146MHz is perhaps the best known portion of the v.h.f. frequency spectrum, being otherwise known as the 2 metre amateur band. This small portion of the spectrum is crowded with just about every sort of transmission you could possibly imagine, ranging from c.w. - Morse code to you and me at just above 144MHz. s.s.b. centred around 144.3/Hz, digital packet repeater stations at around 144.65MHz, propagation beacons around 144.9MHz and from 145MHz up to 145.8MHz.

The segment above 145MHz is split into 25kHz channels with activity occurring around the Calling Channel 145.5MHz (Channel 20) or the many repeater stations in the segment 145.6-145.8MHz (Channel R0-R3).

The purpose of a repeater is to extend the range of mobile stations by receiving signals and re-transmitting them from the much better located repeater site. The mobile stations transmit 600kHz lower in frequency than the repeater output. This requires careful design in order to prevent the transmitter from interfering with reception of the mobile signal due to the very narrow frequency spacing between the two. In order to prevent interfering signals from actually reaching the repeater, a special tone is transmitted by the mobile station in order to initially “open up” the station, in which the repeater is required to identify itself in morse code at least every 15 minutes. By listening to these stations it is often possible to spot enhanced propagation conditions by identifying the callsigns of distant repeaters.

Finally the top segment of the band 145.8-146MHz is internationally assigned for amateur satellite communications. Radio amateurs have for several years been launching their own communications satellites. These act as giant repeater stations, re-transmitting weak signals back down to the earth. In order to accommodate all the stations wishing to use the satellites s.s.b. is used in preference to n.b.f.m. However you may just be lucky if you tune to 144.825MHz as this is a special satellite down link channel and sometimes has a synthesized speech transmission on it giving details of the satellites condition.

Well that should keep you busy until we venture still further up in frequency - standby for the next instalment.

I seem to have run out of space again - so that’s it for this month. If you have any views or comments relating to the column then send them to the usual address: PO Box 1000, Eastleigh, Hants SO5 5HB. Until next month - good listening.

---

**Abbreviations**

| a.f. | audio frequency |
| a.m. | amplitude modulation |
| c.w. | continuous wave (Morse) |
| f.m. | frequency modulation |
| f.s.k. | frequency shift keying |
| GHz | gigahertz |
| h.f. | high frequency |
| Hz | hertz |
| i.f. | intermediate frequency |
| kHz | kilohertz |
| l.s.b. | lower sideband |

<table>
<thead>
<tr>
<th>Frequency Service</th>
<th>MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>136.000</td>
<td>Meteorological satellites</td>
</tr>
<tr>
<td>138.000</td>
<td>PMR “Mid band” Base transmit paired with</td>
</tr>
<tr>
<td>139.500</td>
<td>New JRC band mobile transmit paired with</td>
</tr>
<tr>
<td>140.500</td>
<td>PMR “Mid band” base transmit paired with</td>
</tr>
<tr>
<td>144.000</td>
<td>Centre of s.s.b. activity / s.s.b. calling frequency</td>
</tr>
<tr>
<td>144.650</td>
<td>Digital packet frequency</td>
</tr>
<tr>
<td>144.900</td>
<td>Centre of beacon segment</td>
</tr>
<tr>
<td>145.000</td>
<td>R0 input Repeat base station transmit frequencies</td>
</tr>
<tr>
<td>145.200</td>
<td>R8 input</td>
</tr>
<tr>
<td>145.550</td>
<td>S20 Centre of n.b.f.m. activity (n.b.f.m. calling frequency)</td>
</tr>
<tr>
<td>145.600</td>
<td>R0 output Amateur repeater base station transmit frequencies</td>
</tr>
<tr>
<td>145.800</td>
<td>R8 output</td>
</tr>
<tr>
<td>146.000</td>
<td>Amateur satellite down-links</td>
</tr>
</tbody>
</table>

---

**Frequency Allocations 136-146MHz**

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>136.000</td>
<td>Meteorological satellites</td>
</tr>
<tr>
<td>138.000</td>
<td>PMR “Mid band” Base transmit paired with</td>
</tr>
<tr>
<td>139.500</td>
<td>New JRC band mobile transmit paired with</td>
</tr>
<tr>
<td>140.500</td>
<td>PMR “Mid band” base transmit paired with</td>
</tr>
<tr>
<td>144.000</td>
<td>Centre of s.s.b. activity / s.s.b. calling frequency</td>
</tr>
<tr>
<td>144.650</td>
<td>Digital packet frequency</td>
</tr>
<tr>
<td>144.900</td>
<td>Centre of beacon segment</td>
</tr>
<tr>
<td>145.000</td>
<td>R0 input Repeat base station transmit frequencies</td>
</tr>
<tr>
<td>145.200</td>
<td>R8 input</td>
</tr>
<tr>
<td>145.550</td>
<td>S20 Centre of n.b.f.m. activity (n.b.f.m. calling frequency)</td>
</tr>
<tr>
<td>145.600</td>
<td>R0 output Amateur repeater base station transmit frequencies</td>
</tr>
<tr>
<td>145.800</td>
<td>R8 output</td>
</tr>
<tr>
<td>146.000</td>
<td>Amateur satellite down-links</td>
</tr>
</tbody>
</table>

---

**Abbr.**

- a.f.: audio frequency
- a.m.: amplitude modulation
- c.w.: continuous wave (Morse)
- f.m.: frequency modulation
- f.s.k.: frequency shift keying
- GHz: gigahertz
- h.f.: high frequency
- Hz: hertz
- i.f.: intermediate frequency
- kHz: kilohertz
- l.s.b.: lower sideband
- MHz: megahertz
- n.b.f.m.: narrow band f.m.
- p.m.r.: private mobile radio
- r.f.: radio frequency
- s.h.f.: super high frequency
- s.s.b.: single sideband
- u.h.f.: ultra high frequency
- u.s.b.: upper sideband
- v.h.f.: very high frequency
- w.b.f.m.: wideband f.m.
The versatile CIRKIT Weather Satellite System is a popular means of getting started on weather satellite watching. Peter Rouse GU1DKD has built the kit version of the system and in this review looks at the decoder section and provides some general notes on FAX reception.

**Construction**

The decoder board was easy to assemble, but anyone who has not tried to fit IDC plugs and sockets to ribbon cable may find it a difficult job. The sockets are normal piston type, but the plugs which solder to the board can be hard to fit. My own tip is to solder the plug to the p.c.b. first and then fit the cable by squeezing the heads onto them, preferably in a vice.

Alignment of the master oscillator is best done with a digital frequency meter although it can be done with an off-air signal simply by adjusting for a perfect vertical edge to the picture (the p.i.f. is adjusted to give a slow slip rate). The a.d.c. is set up simply by adjusting a pre-set resistor to give an even distribution between black and white. It is necessary to supply a cassette tape with some sample signals (several other firms who make decoder kits do provide a line-up tape) particularly as any previously recorded tapes are unlikely to work with this system.

The decoder is supplied with all cables, plugs, sockets and switches but a dual rail 5 volt power supply is not included. The instructions could do with a little bit of tidying up, particularly when it comes to explaining about the use of the synchronisation.

**SATPIC**

The most impressive part of the system is the SATPIC software originally devised by McPonson and Atkinson for Timestop who've since sold-off their interests to a number of different firms including CIRKIT in Mode 2 (eight colours). The average constructor will not have a d.f.m. and so is likely to face a frustrating wait for a satellite pass before any kind of alignment can be attempted and I think it would be very desirable if CIRKIT were to supply a cassette tape with some sample signals (several other firms who make decoder kits do provide a line-up tape) particularly as any previously recorded tapes are unlikely to work with this system.

The decoder is supplied with all cables, plugs, sockets and switches but a dual rail 5 volt power supply is not included. The instructions could do with a little bit of tidying up, particularly when it comes to explaining about the use of the synchronisation.

**Fig. 1: Preset or customised parameters can be set using the Menu Screen.**

Criticism of the decoder arises. With the BBC-B, this pulse is applied to the printer port and so if hard copies are required the computer has to be tipped up and leads swapped over. When this is done several times a day it is bound to lead to problems with poor connections on the plugs and sockets. I have used other systems where the user port has been effectively used to provide input for the synchronisation and so cannot understand why it was not done with this system.

**Fig. 2: The p.c.b. has two distinct circuits. The top set of i.c.s form the synchronisation chain and the bottom row the a.d.c.**
advantage when using Mode 2 where colour scaling has been chosen to give an even distribution of scale between black and white.

Further selection allows the picture to be started in any corner of the screen and a simple press of two keys allows access to both picture height ratio and line sampling rate. This means that the user is able not only to set-up for non-standard formats but also zoom-in by as much as eight times. In fact it is even possible to zoom-in further widthwise and produce quite spectacular close-ups albeit with a slightly squashed image in terms of height.

Once in picture receive mode, images can be stored to disc or tape simply by pressing two keys and the file is automatically labelled using sequential numbers. The system will even advise you that a disc is full and retain the picture whilst you check discs to find one with available space.

Weather pictures

Weather satellite pictures on a black and white monitor using Mode 2 are excellent and on clear days there is no problem in following the course of major rivers such as the Thames when using zooming. Even the darker shading of the built-up areas of cities shows up and it is possible to see the three dimensional effect created by major mountain ranges such as the Alps. The system was used daily throughout June and August and some extremely good definition pictures were obtained. Although the ultimate goal of weather satellite freaks seems to be 64 grey levels it is surprising how a good 3-dimensional effect can be obtained with just eight levels.

The set-up used to test the system was an Icom R7000 scanner (Wide-band f.m. modified with 50kHz filters) and a Philips N5748 cassette deck (Black Tulip system). The feed audio was taken from the headphone socket of the cassette deck and potential buyers should be aware that the so called “monitor” output of the Cirkit receiver does not provide enough drive to get the decoder to fully function so either a separate amplifier (or the monitor amplifier of the receiver) must be used.

FAX

The FAX options were tested using an FRG-7700 and JVC Hi-Fi type graphic equaliser, which I will explain later. The weather charts show up reasonably well in black and white in Mode 0 but it is not possible to read the smaller figures printed on them unless zooming is used which means a full and readable chart may need the tape to be processed about four times. On selecting WEFAAX the system defaults to reproducing only about 60 per cent of the picture. To be fair, this limitation is imposed more by the computer than the decoder or software and the semi-professional FAX decoders now appearing on the market send their output straight to a printer where it is possible to get better resolution than on a v.d.u.

The v.f.f. news pictures are a very impressive feature. The pictures are transmitted at regular intervals throughout the day on 139kHz by DPA in Germany. These pictures and WEFAAX ones are sent using F.S.K. which involves transmitting a 1.9kHz centre frequency which is pulled 400Hz up or down to produce peak white at one extreme and black at the other. The decoder does not have an f.m. demodulator but appears to rely on the fact that with the b.f.o. set to put peak white into the centre of the audio filter passband, all remaining frequencies will be progressively lower in amplitude by the time they reach the detector and so give an approximate grey scale. In practice, because the roll-off slope of the filter is not linear, the results on v.f.f. news pictures tends to mean a fairly contrasty picture. In practice this is no bad thing as these pictures look best when decoded in mode 0 where the image is only in two colours.

Any receiver capable of receiving s.s.b. should be able to resolve these signals and as Mike Richards G4WNC recently pointed out in his “Decode” column, you do not need a sophisticated receiver to get started on FAX. Many of the h.f. WEFAAX transmission such as those from Bracknell on 4.782MHz can easily be copied by a simple receiver.

However, if you intend hunting for DX FAX then you may need to improve the system. Even on my FRG-7700 I find the normal 2.6kHz bandwidth i.f. filters too wide for F.S.K. where there are strong signals on adjacent channels. Even the DPA press picture transmissions can be a problem because DCF (Frankfurt) on 140.3kHz often sends out a stream of RTTY day and night. You do not need to carry out complicated modifications and fit expensive i.f. filters because the signal can be cleaned-up at audio level hence my use of a graphic equaliser. Any off-centre transmission such as RTTY is going to be fairly high or low pitched and so can filtered out leaving the wanted FAX signal unaffected.

A graphic equaliser is a bit of overkill in my case but the unit was already to hand and perhaps a better solution would be to use a proper parametric filter such as the PW Arun

Conclusion

As I said at the start, SATPIC has been revamped and it is a pity that a method of recovering stored images from disc was not included. As it stands a BASIC program has to be written and run to view the images. You even have to devise the program yourself from some notes to get the grey scales right. In practice you have to copy the program to each of the discs you use for storage and I am puzzled as to why this could not have been included in the ROM as the idea of these chips is to do away with this kind of fiddling about. Perhaps available space in the ROM is at a premium in which case two of the colour palettes and the rather useless comment line could be got rid of without spoiling performance.

There appears to be something odd about the way the Mode 0 pictures are stored because whenever I tried to recover them from disc and perform a screen dump I got strange results. Eventually by fiddling with the parameters on my “Printmaster” ROM I was able to print them but only at a reduced size (all other modes print as normal). The hardware and software have been honed to near perfection over the years but I feel it’s time the same was done to the SATPIC instructions. The six pages seem fairly high on waffle and detailed instructions on how to work everything out for yourself - why not just list a table of examples of the various figures for typical zoom rates in various modes.
PHOTO ACOUSTICS LTD announce a NEW RANGE OF ON GLASS ANTENNAS FOR 2 METRES AND 70cm

- Quick and easy to install
- Simple SWR tuning by means of tuning screw on matching unit
- Easy removable whip for car wash
- Swivel joint for 180° angle adjustment
- If removal of the antenna installation is necessary, a quick dismantling procedure leaves no trace of the installation
- Ideal for the radio amateur who cannot fix anything to the 'company car'

The four New Models are as follows:

- **GF151/L Half Wave 0dB mobile antenna for 2 metres**
  - **PRICE**: £27.99
  - **p&p**: £4.00
- **GF401/L Half Wave 0dB mobile antenna for 70cm**
  - **PRICE**: £27.99
  - **p&p**: £4.00
- **GF404/L 3dB mobile collinear antenna with open coil for 70cm**
  - **PRICE**: £28.99
  - **p&p**: £4.00
- **GF411/L 3dB mobile collinear antenna with encapsulated coil for 70cm**
  - **PRICE**: £28.99
  - **p&p**: £4.00

**Please Note:** Maximum power handling of these antennas is 25 watts.

**WEATHER SATELLITES**

- *WEATHER SATELLITES* (photo)
- *SSTV*

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>General</th>
<th>P-L detector (no Doppler-shift problems)</th>
<th>Squelch control</th>
<th>Manual frequency selection of Scan</th>
</tr>
</thead>
<tbody>
<tr>
<td>137.5/137.9/137.225 MHz</td>
<td>Built-in LF, amplifier and loudspeaker</td>
<td>Volume control</td>
<td>Frequency locked by means of internal switches</td>
</tr>
<tr>
<td>Very sensitive: 0.28µV at 12dB gain</td>
<td>Very sensitive: 0.28µV at 12dB gain</td>
<td>Very sensitive: 0.28µV at 12dB gain</td>
<td>Very sensitive: 0.28µV at 12dB gain</td>
</tr>
<tr>
<td>Frequency stability: ±3ppm</td>
<td>Frequency stability: ±3ppm</td>
<td>Frequency stability: ±3ppm</td>
<td>Frequency stability: ±3ppm</td>
</tr>
<tr>
<td>Automatic or manual synchronisation</td>
<td>Automatic or manual synchronisation</td>
<td>Automatic or manual synchronisation</td>
<td>Automatic or manual synchronisation</td>
</tr>
<tr>
<td>Four transistors, 24032 bits</td>
<td>Four transistors, 24032 bits</td>
<td>Four transistors, 24032 bits</td>
<td>Four transistors, 24032 bits</td>
</tr>
</tbody>
</table>

**ACOUSTICS**

- Automatic scrolling
- Crystal stable output reference oscillator
- SLOW SCAN TELEVISION (SSTV)
  - Recreational or long range/WX-237:
  - A high-quality unit with a relatively low price.
  - At present the reception of weather satellite pictures is very popular. Many weather broadcasts are viewed around the world.

**WEATHER SATELLITE ACCESSORIES**

- **METEOSAT RECEIVER** (2 channel)
  - **Inc. VAT**: £270.25
  - **P & P**: £4.00
- **METEOSAT PRE-AMP** (fits on dish and powered by the Meteosat Receiver via the coaxial)
  - **Inc. VAT**: £92.00
  - **P & P**: £4.00
- **METEOSAT DISH** and **HORN**
  - **Inc. VAT**: £119.00
  - **P & P**: £10.00
- **10M WESTFLEX** 103 fitted with 'N' connectors
  - **Inc. VAT**: £29.85
  - **P & P**: £4.00
- **33M DIN extension cable** (for remote use of Meteosat Receiver)
  - **Inc. VAT**: £19.95
  - **P & P**: £4.00
- **2XY/137** Crossed element aerial with phasing harness (For use with the NOAA satellites)
  - **Inc. VAT**: £43.15
  - **P & P**: £5.00

**AUTHORIZED AGENTS FOR KENWOOD, ICOM & YAESU, FULL SERVICE FACILITIES AVAILABLE**

Spend up to £1,200 instantaneously with a PHOTO ACOUSTICS LTD credit charge card - Apply for details part exchange welcome. Ask for Kerry Grif or Andy G4YOW.

**Retail Showroom Open Monday-Friday 9:30-5:30, Saturday 9:30-4:30**

Goods normally dispatched within 24 hours. Please allow 7 banking days for cheque clearance. Prices correct at time of going to press - E&OE
BUILD A RECEIVER!

Building your own receiver is one of the most satisfying aspects of amateur radio. Nothing quite beats the thrill of hearing stations from far away on a set you constructed yourself. The first contact on a homebrew transmitter comes a close second thought! Fortunately we offer kits for both, but it’s the receivers’ turn to be featured this month:

**DcRx DIRECT CONVERSION COMMUNICATIONS RECEIVER**

The HOWES DcRx series of receiver kits offers amazingly good performance for simple, easy to build equipment. These receiver kits have made an excellent introduction to radio for many newcomers, as well as providing the basis of a QRP station for thousands of licenced operators around the World. These are simple band receivers, and as such avoid complexity and expenses, whilst offering very pleasing results for both SSB and reception. Versions are available to cover the 20, 30, 40, 80 and 160M amateur bands, plus a 5-45MHz HF airband variant. A case and a couple of tuning capacitors are the only major parts you need to add. We can supply suitable capacitors at £1.50 each for all but the 160M version. The DcRx receivers can form part of a transceiver in conjunction with one of our transmitters, and there are many other interfacing modules that can be added as you build up your station.

**MBRX H.F. MARINE BAND COMMUNICATIONS RECEIVER**

The HOWES MBRX is a more sophisticated Direct Conversion receiver offering full coverage of the HF marine band from 1.6 to 3.95MHz, including the 80 and 160M amateur bands, international distress frequency, coastal stations etc. Additional features include a switched RF attenuator, RF amplifier stage, two stage active filtering, fine tune control, and an AGC system. As with the DcRx kits, up to 1W audio output is available for loudspeaker or headphones. Two 36pF (or 500pF) tuning capacitors are required. This kit will enable you to build an SSB and CW receiver with good facilities and performance at a sensible price.

**NEW ACTIVE ANTENNA**

**AA2 ACTIVE ANTENNA KIT**

Surprising as it may seem, there is no need for large receiving antennas at frequencies below 30MHz. Good results can be obtained by using the new HOWES AA2 active antenna kit and just a few feet of wire or metal rod. The AA2 can be used with a single wire or a miniature dipole, indoors or out and covers 100kHz to 30MHz applications. Direct or coax powering can be used, and there are two selectable gain settings. Ideal for use with a "black box" general coverage receiver or one of our kits.

**AVAILABILITY**

If you would like more information on any item, or the rest of our range, simply drop us a line enclosing an SAE. We have an information sheet on each kit, plus a catalogue showing the full range.

**ICOM R71 General Coverage Receiver**

FIRST CLASS SHORT WAVE RECEIVER.

BUY THIS FOR £855 AND RECEIVE AN ARA 30 FREE. WORTH £129.

Also R7000 complete with ARA 900 £999.

**SPONSOR OFFER – This month only**

KRM 2000 £475
CAR 3000 £585
AOR 3000 £100

PROFESSIONAL ELECTRONICS SCRAPBOOK.

For further information please contact your local dealer.
Short wave listeners in both North America and the rest of the world got quite a surprise when they began to hear test broadcasts from a new religious broadcaster late in January. Gerry Dexter explains all.

with the programming aired on the government's official Radio Marti broadcasts and so wants to put on a station of its own. New Conventual Educational Ministries also has plans to put a 100kW short wave transmitter on air from Jacksonville, Florida. Another group wants to establish World News and Information Radio (WNJR) which would relay the programmes of the USA's National Public Radio network to a short wave audience.

Indonesian-based religious broadcaster WHRI is now airing a programme called "Radio Libertas", a feature produced by a Croatian group - perhaps the Croatian National Resistance - seeking the establishment of a sovereign Croatian state, independent from Yugoslavia. The program, "In the Land of Croats", can be heard from 1600 to 1657 weekdays on 21.840MHz.

Mayin Corea, still a member of the Panamanian Senate but living in exile in the Miami, Florida area is airing an own program. There is a couple of other Latin stations on somewhat similar frequency, however, and Radio Norte has been active on this very busy wave in past years, though it has been silent for several years. Radio Mil, once commonly heard on 4.930 and also silent for many years, was relayed for a time over Radio Clarin recently but that seems to have been discontinued and only Radio Clarin is heard on the 11.700MHz channel now. Other Dominican stations include the occasionally active Radio Santiago on 9.778 and the religious station Radio Amanecer, which is sometimes well received to 0300 on 6.035MHz.

In Mexico, Radio Mil reappeared briefly on its usual frequency, but the station was active for only a couple of days before it vanished again. Like many of the Mexican short wave outlets it is activated briefly every now and then just to keep the licence in good standing. These are never known about in advance by short wave DXers so the only way to get them is to check frequencies occasionally and rely on luck. Or maybe get tipped off by a fellow listener who might run across one of these stations in an active stage.

Peru

After several years when every week seemed to bring a new station on the air from Peru, activity has slowed greatly in recent months. Those knowledgable about both DXing and Peru indicate this is due largely to the reduced interest rates Peru is now suffering - 2000 per cent in 1988 and predictions of 30 000 in 1989! At least one source of Peruvian mini-stamps can no longer supply customers and those in the know about such things are saying it may be a waste of one's time and money to try to send reception reports to that country as things are.

Only one new station has been reported in the past few months - Radio Nuevo Mundo in Pucallpa on 4.881MHz, heard in the 1000 and 0100 time frame. Our 10-meter Peruvian DXers, unaware of the 4945.5kHz Radio Cuzco, on 6.895 and Radio Cuzco on 6.091 are currently well heard most days.

A second transmitter has been installed at Radio For Peace International in Costa Rica. It is rated at 5kW but the station hopes to increase that later in the year. Two of the following three channels should be in use during the station's regular schedule: 7.375, 13.663 and 21.560MHz. Frequencies may vary slightly.

An old/new Colombian station recently reactivated is Radio Reloj in Bogota, now operating on 5.995MHz which was active on 4.795 back 10 years ago! It is affiliated with the Caracol network and is part of a large group-owned system. Reports in Spanish may be received four times per time: Radio Aparato Aereo 9291, Bogota, Colombia.

Your truly had the pleasure of attending the mid-winter SWL FEST February 24-26 which was held near Philadelphia, and the DXers - both listeners and amateur operators - attended. Attendees included a number of people who are decision makers for some of the top North American listening clubs, including the North American Short Wave Association, Speedx, Ontario DX Association and Canadian International DX Association. Talks and discussions covered such subjects as pirate and clandestine radio, QSLing, RTTY and facsimile reception. There were several receivers, RTTY and computer-aidee programs on display.

The weekly ANARC s.w.l. net was conducted live on the scene via ham radio. This net exchanges DX tips and other s.w.l. news each Sunday at 1500 on 7.220. Another edition of the SWLFEST is expected to occur in February of next year and any readers who find themselves in North America during the appropriate dates will find the event very interesting.

That does it for this time. Another "DX Letter From America" in three months. Good listening!
GAREX ELECTRONICS
WEATHER SATELLITE SYSTEMS

NEW NEW NEW NEW NEW NEW NEW

SPECTACULAR NEW ATARI ANIMATED SYSTEM

Garex are proud to announce that they have been appointed sole UK dealer for this incredible new Timestep product. Following on from Timestep's phenomenal success in the education market a special low cost Atari ST version of their animation system is now available. Simply plug in your existing receiver to view amazing pictures. For the ultimate, add a Meteosat receiver for unbelievable value. A 15 frame animation that is completely automatic once set up. Just watch the clouds roll by! New pictures are added twice an hour if required, the oldest being discarded automatically. This sophisticated package will run on any Atari ST1040 and compatible colour monitor, comes complete with all software and colour-keyed Atari hardware.

Optional 18 grey scale adaptor for colour monitor £24.95

For those who would like a one-stop-shop, we offer the complete package of a ready-to-run system: Meteosat Dish & Receiver, Atari Interface Unit, Grey Scale Adaptor, 14" Colour Monitor, Atari ST1040 Computer, Software (including Demo-disc) AND, OF COURSE, ALL PLUGS AND CABLES. On your doorstep £1,685.00

COMPACT FRAME STORE SYSTEM

The basic MICROWAVE METEDSAT system, no complications, a complete plug in and go package requires no computer, no software, and can be up and running, including dish alignment within 30 minutes. Nothing more to buy: Dish, Microwave Receiver, Frame Store, 12" B/W Monitor AND ALL PLUGS AND CABLES. Designed by Timestep, supplied by Garex. £995.95

137MHz VHF SATELLITE ACCESSORIES

137MHz Active Antenna - 39m cable £74.75
137MHz 10 channel Receiver £195.25
5AE for full details and prices of other "separates".

GAREX VHF RECEIVERS

The celebrated Timothy Edwards designs now owned & manufactured by GAREX.

• A simple but versatile design capable of covering spot frequencies in the range 25-200MHz.
• Excellent sensitivity (typically better than 0.4 V for 12dB SN/IN).
• Double superhet (10.7MHz and 455kHz IFs).
• Choice of IF bandwidths from "W-SAT" to "12.9kHz" PMR standards.
• The basic receiver is a single channel crystal controlled.
• Multichannel option.
• 2 watt audio output stage having a low quiescent current.
• Size: 153 x 33 x 12mm. Requires 10MB DC supply.

PRICES Stock Versions: if fully assembled, aligned & tested boxed 6m, 4m, 2m Weather Sat. Complete boxed versions & special options: details & prices on request. Crystals can be supplied if required; most popular 2 metre frequencies and the currently active Weather satellites are readily available. Crystal prices on request.

• Mains power supply module: £15.00

GAREX VHF PREAMPLIFIERS

• Compact size: 34 x 9 x 15mm.
• Up to 26dB gain.
• Can be made for any frequency in the range 40-200MHz.
• 3dB bandwidth 3MHz (at 145MHz).
• Uses BF381 (G.791 NF at 200MHz).
• Input & output impedance 50 ohms.
• 1dB compression: +10dBm.
• Saturated output: +15dBm.
• Supply voltage 17V DC at 5-10mA.

Stock Versions: fully assembled, aligned & tested boxed 6m, 4m, 2m Weather Sat. Other versions: prices & details on request.

• HIGH PERFORMANCE + 2 metre PRE-AMPLIFIER
• 3 Band-pass stages for improved selectivity.
• 1dB gain with S/N NF, Switch 30 watts.
• RF switched (fail-safe action): gas-filled relays.

Assembled, tested
Boxed Version £49.50
Gas-filled Relays as used in pre-amp £14.95

MAIN DISTRIBUTORS FOR REYCO ELECTRONICS LTD

Prices include UK P&P and 19% VAT. Ask for details of our Interest Free Credit

GAREX ELECTRONICS
HARRISON HOUSE, AKEMAN STREET, TRING HP23 6AA
TEL: TRING (0442) 8590 AND CHEDDINGTON (0296) 666864

Callers by appointment only
RALLIES

April 30: The Kelso ARS will be hosting the 6th Anglo-Scottish Rally in the Talit Hall, Kelso. The rally is open from 11am to 5pm, and there will be the usual stands, talk-in on S22, Morse Tests, Door prizes, and the RSGBI, bar, hot and cold snacks, raffles, etc. Entrance fee is £1, junior ops, YLs and XYLs are welcome and admitted free. For further information, contact: Bruce Cavers Tel: Kelso 24684.

April 30: The British Amateur Television Club will be holding their 1989 rally in new and larger premises. They will be using the Founders Suite at the Coventry Crest Hotel. This is located on the A46, about 450 metres south of Junction 2 of the M6. There will be the usual wide range of trade stands and demonstrations covering all aspects of both amateur and satellite TV equipment. The hotel training centre has been made available for technical lectures which are to be given in the afternoon. There is ample parking and the rally opens at 10am. Admission is free to BARTC members who bring their ticket from COTV and 50p to non-members.

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

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

May 21: The Parkanur Rally, organised by the Mid-Dorset Amateur Radio Club will be held at the same venue as last year, the Silverwood Hotel, Lurgan, Co. Armagh. Doors open at 12 noon and the entrance fee is £1. There will be trade stands, a bring & buy, bookstall. QSL Bureau will be there and talk-in will be on S22. Proceeds from this rally go to the Stanley Eakins Memorial Fund, Parkanur, near Downpatrick.

May 21: The British Telecom South Wales District ARS are holding their first rally at the BT HQ, Coryton, North Cardiff. The site is within 100 metres of Junction 32 on the M4. There will be the usual licensed bar and catering facilities available.

May 28: The 13th Annual East Sussex Wireless Revival will take place at the usual venue of the Civil Service Sportsground, Straight Road, Bexhill, East Sussex. That's between Bexhill on Sea and Eastbourne. Join the A1156 and adjacent to the Suffolk Showground. There will be the usual traders, an RSGB book stand, and antenna testing range, Bring & Buy, car boot sale, trade stands, plus non-radio stands, a children's play area and a model flying display. Doors open at 10am. Further information from Colin Ranson G8VPG, 100 Stoneyhill Road, Lewes, West, Ipswich IP2 9HR. Tel: (0473) 464047.

May 28: The rally will be at the Maidstone (Wye) Summer Rally on the A229 at Tice Village. Admission is £1 at 10.30am, but disabled visitors can get in free at 10am. Also free overnight parking with a snack bar, children's play area, a video on the children's videos, and a playroom. G8YSC active on all bands, ATV demo, beer tent and the usual trade stands. More details from: G6FZD Tel (0622) 50709.

May 28: Plymouth Radio Club are holding their mobile rally at Plymstock School, Church Road, Plymstock, Plymouth, from 10am and there will be a large, free car park, refreshments, raffle, trade stands, demonstrations and talk-in on S22. Full details from: Joe G1RXN on (0752) 593865.

May 29: The Doncaster Radio Club will be held at the Bircoots Sports Centre, near Bawtry, Doncaster. This rally is organised by the Doncaster ZANET Group and they rely on this rally for their source of income to keep the group running.

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

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

June 11: The Elavaston Castle Radio Rally will be held in the showground of the Elavaston Castle Country Park. This is 8km south-east of Derby.

June 25: The 32nd Longleat Amateur Radio Rally will be held as usual in the grounds of Longleat House, Warminster, Wiltshire. This rally is always popular as it offers something for the whole family. More details from: Shrun Oakley GB9VPG, 15 Wilton Close, Salisbury, Wiltshire SP18 3DX.

June 30 - July 2: The Popular Flying Association Rally is again being held at Cranfield Aerodrome, Bedfordshire. The rally covers the whole spectrum of sporting aviation from light aircraft through powered gliders and microlights to airband radio. For more details, contact: Popular Flying Association. Tel: (0273) 461616.

July 2: The Newport Amateur Radio Society will be holding their 2nd Grand Supershow Equipment and Junk Sale at Brynglas House, Newport. Doors open at 11am (10.30am for disabled visitors) and it finishes at 4pm. There will be surplus/second-hand equipment and junk stands. From 12 noon to 3pm there will be an auction held in the main hall of the building. Light snacks and refreshments will be available. Talk-in by GW1NRS on S22. The money raised will go towards training young people in line with Project YEAR.

July 9: The 1989 Droitwich Strawberry Rally will take place at the High School, Droitwich. There will be trade stands, a Bring & Buy family entertainment and strawberry fields (weather permitting). There is both free entrance and car parking. Details from: Derek Batchelor G4RBS. Tel: Worcester 641733.

July 15: The Cornish Radio Amateur Club rally will be held at Richard Lander School, Truro. There will be the usual trade stands, a Bring & Buy, computer displays/demos and refreshments. There is plenty of free parking as well as attractions for all the family. More details: Rolf Little. Tel: (0822) 72552.

July 23: The Burnham Beeches and Maidenhead & District ARC are staging the sixth Mike Michael Rally. This is the Dermalmit Centre, Burnham, near Slough. Doors open at 10.30am (10.15 for disabled visitors). The CAMRA bar will again be attending. Tea, coffee and food will also be available. There's ample car-parking on site and the car boot sale will be staged again this year. Attractions include radio controlled cars, ATV groups, public station and on-air QRP. Entrance fee is £1 and the car boot area will be £5 per car and driver for the day. Contact Bob Hearn GO8TD on (0484) 29868.

July 28-31: Dataspace '89 (organising the RSGB Data Symposium and the AMSAT-UK Colloquium) will be held at the University of Surrey. Full details and booking forms for tickets and accommodation can be obtained from: Ron Broadbent G3AAJ, AMSAT-UK, London E12 5EO or RSGB HQ, Lambda House, Cranborne Road, Potters Bar EN6 3JW.

July 30: The Hildesworth Radio Society are holding their rally at Hildesworth College, St Peters Road, Broadway, Kent. There will be trade stands a Bring & Buy, a talk-in station, refreshments, a licensed bar, etc. Contacts are: Alan on (0832) 593072 or Ron (0304) 812723.

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

August 13: Harfest '89 will be held at the Flight Refuelling Sports Ground, Wimborne, Dorset. Gates open at 10am and there's free car parking, as well as new catering facilities. The day will feature radio and electronics trade stands, field displays and a craft and gift fair. More details from: Bob GD6UN. Tel: (0202) 479038.

August 13: The annual Derby Radio Rally will be again held in the Lower Bermskoe School, St Albans Road, Derby. All the usual attractions will be there including their Monster Junk Sale. More details from Martin G3SJ2. Tel: (0322) 556875.

August 20: The West Manchester Radio Club's Red Rose Summer Rally will be held in the Astley & Tyldefields Miners Welfare, Memorial Road, CR18 2SR, Astley, Tyldefields, Manchester. More details from: D.R. Camac on (0204) 24104.

August 27: The Galashields & District ARS are holding their open day at the Focus Centre, Livingstone Place, Galashields at 11am. There will be trade stands, a bring and buy and all the usual activities. Ligneon Lodge Lane, Galashields. More details will be available. Talk-in will be on S22. For more details, contact: John Campbell GM0AMB. Tel: (0833) 22686.

If you are organising a rally and would like it mentioned in Short Wave Magazine, drop us a line, preferably as soon as you have fixed the date but no later than 6 weeks in advance (mark the envelope “SWM Rally Calendar”) and we'll do the rest. Please ensure that you include all details, including such essential information as venue, starting time, special features and a contact for further information.
The arrival of a letter signed "Eckersley", telling of the writer’s visit to the Chalk Pits Museum’s Wireless and Communications Exhibition was an opportunity to acquire some first-hand wireless history not to be missed on any account. We accordingly invited Myles Eckersley and his sister Joan Le Grand to visit us again, to talk to us about their famous father. They accepted our invitation, bringing with them a fascinating family scrapbook and documents.

Peter Pendleton Eckersley was born in 1892 into a scientific family. His father was William A. Eckersley AMICE fellow of the Royal Geographic Society, who built railways from Dorset to Italy, Peru and East Africa, and was in charge of Thames protection work and sea-wall construction in France. P.P.Eckersley’s mother was Rachel Huxley, daughter of the Rt. Hon. Professor T.H. Huxley FRS and aunt to Professor Julian Huxley and Aldous Huxley. One of the first items in the family scrapbook is a booklet entitled British Engineers and features William Eckersley.

Peter was a scholar at Bedales school from 1907-11. His elder brother Thomas Lydwell Eckersley first introduced him to wireless when he walked up their garden path and saw Tom winding a veld black tube with some bright green, silk-covered wire.

"What are you doing?" he asked.

"Oh, this is wireless." Tom answered.

His life seems to have been a steady procession of "firsts" from then on. Tom installed some fascinating equipment in their playroom such as induction coils, Leyden jars, ebonite rods, X-ray tubes and galvanometers; Peter was happy to be his "laboratory assistant", arranging shelves and operating switches as required. At that time, wireless was just the sensual pleasure of handling all these lovely objects - a simple delight which stayed with him throughout his life. At Bedales, a progressive school for the time, where scholars were encouraged to investigate things, they were allowed to use a chicken hut in the grounds to build a transmitting station because they wanted to test Sir Oliver Lodge’s counterpoise antenna against Marconi’s grounded one. They christened this first laboratory, Wavy Lodge, and it had its own proper visitors’ book.

An early name is Robert Best, Bob Best, an acquaintance of Sir Oliver Lodge, was Peter’s lifelong friend and involved with him in the Wavy Lodge experiments. Norah Lodge also signed the book; Sir Oliver’s son and three daughters were pupils at Bedales, together with the Prime Minister, Ramsay MacDonald’s sons. The brothers dragged their transmitter outside to transmit what must have been the very first sports OB, the results of a 1910 cricket match back to Wavy Lodge. P.P.Eckersley’s ambition was fired and he knew with absolute certainty what he wanted from life.

"My ambition was to become a leading man of science, a successful man of business and a dominant figure on politics."

There can have been few schoolboys with such a clear vision of their road ahead, and who followed it with such single-minded dedication to fulfillment.

"Wavy Lodge" at Bedales school was Peter Eckersley’s first laboratory.

Outside Broadcast. With their equipment mounted on a wheeled trolley, Peter Eckersley and Bob Best sending cricket results back to "Wavy Lodge".

Those famous words, followed by "Writtle calling", in a distinctive and much-imitated voice came through thousands of telephones, horn loudspeakers and vibrated many a speaker cone in the heady first days of broadcasting. In his time with Marconi and as Chief Engineer of the BBC, Captain Eckersley became known wherever a wireless enthusiast adjusted cat’s whisker on crystal or delicately tuned in his home-built valved receiver.

By 1917, he was working with others to design duplex wireless telephony for use in aircraft, and was the first person to achieve this breakthrough, which allowed wireless to be used with the simplicity of a telephone. He was at Brooklands aerodrome as a member of the Wireless Experimental Establishment to hear the historic first speech signals from an aeroplane in flight. At the end of the war, Captain Eckersley, his warrant is dated 1 December 1918, joined the Marconi Wireless Telegraph Company at Writtle in charge of technical development in the aircraft department. Two years later, he was head of the design department and was responsible for the first airport transmitter at Croydon aerodrome. The Writtle experimental staff in 1920 included Noel Ashbridge (later Sir Noel, Technical Director of BBC), Rolls Wynne (Chief Engineer of BBC), H.L. Kirke (later Head of Research, BBC) and B.N. MacLarty (Marconi’s engineer-in-chief). Myles Eckersley has the distinction of claiming Noel Ashbridge and Rolls Wynne as his two godfathers. The whole team became the “Brains Trust” of the British Broadcasting. Captain Eckersley, however, like many pioneers, received public acclaim but never the official recognition which his work so richly deserved. In 1921 the Postmaster General received an application for a licence to broadcast...
THE RST CODE

Readability
R1 Unreadable
R2 Barely readable, occasional words distinguishable
R3 Readable with considerable difficulty
R4 Readable with practically no difficulty
R5 Perfectly readable

Signal Strength
S1 Faint, signals barely perceptible
S2 Very weak signals
S3 Weak signals
S4 Fair signals
S5 Fairly good signals
S6 Good signals
S7 Moderately good signals
S8 Strong signals
S9 Extremely strong signals

Tone
T1 Extremely rough hissing note
T2 Very rough a.c. note, no trace of musicality
T3 Rough, low-pitched a.c. note, slightly musical
T4 Rather rough a.c. note, moderately musical
T5 Musically modulated note
T6 Modulated note, slight trace of ripple
T7 Near d.c. note, smooth ripple
T8 Good d.c. note, just a trace of ripple
T9 Purest d.c. note

THE SINPO REPORTING CODE

<table>
<thead>
<tr>
<th>Rating</th>
<th>Signal strength</th>
<th>Interference</th>
<th>Noise</th>
<th>Propagation disturbance</th>
<th>Overall readability</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Excellent</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Excellent</td>
</tr>
<tr>
<td>4</td>
<td>Good</td>
<td>Slight</td>
<td>Slight</td>
<td>Slight</td>
<td>Good</td>
</tr>
<tr>
<td>3</td>
<td>Fair</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Fair</td>
</tr>
<tr>
<td>2</td>
<td>Poor</td>
<td>Severe</td>
<td>Severe</td>
<td>Severe</td>
<td>Poor</td>
</tr>
<tr>
<td>1</td>
<td>Barely audible</td>
<td>Extreme</td>
<td>Extreme</td>
<td>Extreme</td>
<td>Unusable</td>
</tr>
</tbody>
</table>

BROADCASTING BANDS

<table>
<thead>
<tr>
<th>Band</th>
<th>Frequency Limits</th>
<th>Band</th>
<th>Frequency Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long</td>
<td>150 - 285kHz</td>
<td>41m</td>
<td>7.100 - 7.300MHz</td>
</tr>
<tr>
<td>Medium</td>
<td>525 - 1605kHz</td>
<td>31m</td>
<td>9.500 - 9.775MHz</td>
</tr>
<tr>
<td>120m</td>
<td>2.300 - 2.400MHz</td>
<td>25m</td>
<td>11.700 - 11.975MHz</td>
</tr>
<tr>
<td>90m</td>
<td>3.200 - 3.400MHz</td>
<td>19m</td>
<td>15.100 - 15.450MHz</td>
</tr>
<tr>
<td>75m</td>
<td>3.900 - 4.000MHz</td>
<td>16m</td>
<td>17.700 - 17.800MHz</td>
</tr>
<tr>
<td>60m</td>
<td>4.750 - 5.060MHz</td>
<td>13m</td>
<td>21.450 - 21.750MHz</td>
</tr>
<tr>
<td>48m</td>
<td>5.900 - 6.200MHz</td>
<td>11m</td>
<td>25.600 - 26.100MHz</td>
</tr>
</tbody>
</table>

PULL-OUT SUPPLEMENT

WHAT DOES THAT MEAN?

Your Guide Through the Abbreviations Jungle

by Elaine Richards G4LFM

CONTENTS

1 Airband
2 Data Communications
3 Short Wave Listening
4 Radio Data
5 Satellites, Television
6 Q Codes
7 Phonetic Alphabet
8 The RST Code
9 SINPO Reporting Code
10 Broadcasting Bands

In this booklet you will find the answers to most of your questions concerning technical abbreviations. Keep it by you when reading through your books and magazines so that you can refer to it when necessary.

Each section has a table of the most commonly used technical abbreviations, followed by useful addresses and a selection of technical terms applicable to that section's topic.

Good reading!
AIRBAND

a.d.f. automatic direction finder
a.s.i. airspeed indicator
a.t.c. air traffic control
a.t.i.s. automatic terminal information service

ATP British Aerospace

a.t.s.o.r.a. air traffic services outside regulated airspace
a.t.z. aerodrome traffic zone

CAA Civil Aviation Authority

CAVOK Cloud And Visibility are OK

com communication

c.p.i. commercial pilot’s licence
c.w.r. cockpit voice recorder
d & D distress and diversion
d.f. direction finder
d.m.e. distance measuring equipment
d.v.o.r. doppler very high frequency omni-directional radio range
e.t.a. estimated time of arrival
e.f.r. flight data recorder
e.f.r. flight information region
f.i. flight level
f.o.d. foreign objects & debris
ft foot
g.a.s.i.l. general aviation safety information leaflet

GAVFFS General Aviation

g.c.s.s. global command and control system
h.s.i. horizontal situation indicator
i.a.s. indicated air speed

ICAO International Civil Aviation Organisation.

i.f.f. identification friend or foe
i.f.r. instrument flight rules
i.l.s. instrument landing system
i.n.s. inertial navigation system
i.w.s.i. instantaneous vertical speed indicator

speed indicator

LATCC London Air Traffic Control Centre
i.o.m. locator outer marker
m.a.t.z. military air traffic zone
mbar millibar
m.d.a. minimum descent altitude
m.d.h. minimum decision height

NAT North Atlantic Treaty Organisation
NATO North Atlantic Treaty Organisation

NATS National Air Traffic Service
nav navigation
n.d.b. non-directional beacon
NOTAM NOTifications to AirMen

o.b.s. omni bearing selector
PFA Popular Flying Association
p.p.l. private pilot’s licence
p.t.t. push-to-talk

RAF Royal Air Force
r.m.d.i. radio magnetic direction indicator
r.m.i. radio magnetic indicator
R/T radio telephone
r.v.r. runway visual range
s.c.a. subsidiary communications

SELCAL SELECTive CALLing

s.o.c. sector operation centres
s.r.z. special rules zone
s.s.r. secondary surveillance radar

STCICS Strike Command Integrated, Communications System

TACAN Tactical Air Navigation

t.m.a. terminal manoeuvring area
t.o.t. time on target
v.d.f. very high frequency direction finding
v.f.r. visual flight rules
v.i.t.s. vertical interval time signal
v.m.c. visual meteorological conditions

VOLMET VOLUME METEORological reports
v.o.r. very high frequency
v.s.i. vertical speed indicator

class...? I am going to send this frequency on kHz (or MHz) with emissions of class...?

QTS Will you send your callsign for tuning purposes or so that your frequency can be measured now (or at...hours) on MHz? I will send my callsign for tuning purposes or so that my frequency may be measured now (or at...hours) on MHz.

QTX Will you keep your station open for communication with me until further notice (or until...hours)? I will keep my station open for communication with you until further notice (or until...hours).

QSO Have you new...? (callsign)? Here is news of... (callsign).

Q-R-Q Codes take the form of a question when the code-group is followed by a question-mark.

Some Q-R-Q Codes have taken on a more informal meaning in the Amateur Service, and become simply abbreviations:

QRM Interference from other stations

QRN Interference from atmospheric noise or electrical apparatus.

QRO High power

QRP Low power

QRT Closing (closed) down

QRX Wait - Stand by.

QSB Fading

QSL Verification card; confirm contact.

OSO Radio contact

OSY Change frequency

QTH Location

ITU PHONETIC SPELLING ALPHABET

<table>
<thead>
<tr>
<th>Letter</th>
<th>Word</th>
<th>Letter</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Alpha</td>
<td>N</td>
<td>November</td>
</tr>
<tr>
<td>B</td>
<td>Bravo</td>
<td>O</td>
<td>Oscar</td>
</tr>
<tr>
<td>C</td>
<td>Charlie</td>
<td>P</td>
<td>Papa</td>
</tr>
<tr>
<td>D</td>
<td>Delta</td>
<td>Q</td>
<td>Quebec</td>
</tr>
<tr>
<td>E</td>
<td>Echo</td>
<td>R</td>
<td>Romeo</td>
</tr>
<tr>
<td>F</td>
<td>Fox</td>
<td>S</td>
<td>Sierra</td>
</tr>
<tr>
<td>G</td>
<td>Golf</td>
<td>T</td>
<td>Tango</td>
</tr>
<tr>
<td>H</td>
<td>Hotel</td>
<td>U</td>
<td>Uniform</td>
</tr>
<tr>
<td>I</td>
<td>India</td>
<td>V</td>
<td>Victor</td>
</tr>
<tr>
<td>J</td>
<td>Juliet</td>
<td>W</td>
<td>Whiskey</td>
</tr>
<tr>
<td>K</td>
<td>Kilo</td>
<td>X</td>
<td>X-ray</td>
</tr>
<tr>
<td>L</td>
<td>Lima</td>
<td>Y</td>
<td>Yankee</td>
</tr>
<tr>
<td>M</td>
<td>Mike</td>
<td>Z</td>
<td>Zulu</td>
</tr>
</tbody>
</table>
QRY What is my turn? Your turn is number.... (or according to any other indication) (relates to communication.)

QRZ Who is calling me? You are being called by.... on kHz (or MHz).

QSA What is the strength of my signals (or those of?)? The strength of your signals (or those of...) is.... kHz (or MHz).

QSB Are my signals fading? Your signals are fading.

QSD Is my keying defective? Your keying is defective.

QSI I have been unable to break in on your transmission or will you inform.... that I have been unable to break in on his transmission on.... kHz (or MHz).

QSK Can you hear me between your signals and if so can I break in on your transmission? I can hear you between my signals; break in on my transmission.

QSL Can you acknowledge receipt? I am acknowledging receipt.

QSN Did you hear me (or.... callsign) on.... (or MHz)? I did hear you (or.... callsign) on.... (or MHz).

QSO Can you communicate with....direct (or by relay)? I can communicate with....direct (or by relay through....).

QSP Will you relay to....? I will relay to....

QSR Shall I repeat the call on the calling frequency? Repeat your call on the calling frequency, I did not hear you (or I have interference).

QSS What working frequency will you use? I will use the working frequency....kHz.

QSU Shall I send or reply on this frequency (or on.... kHz or MHz with emissions of class....)? Send or reply on this frequency (or on.... kHz or MHz with emissions of class....).

QSV Shall I send a series of Vs on this frequency (or.... kHz or MHz)? Send a series of Vs on this frequency (or.... kHz or MHz).

QSW Will you send on this frequency (or on.... kHz or MHz with emissions of...?)

non-directional beacon (n.d.b.): these devices operate in the 190-1750kHz band and although the trend is to replace them with v.o.r., they are still in widespread use. They are non-directional in the sense that their signal is identical no matter which point of the compass you are receiving it from.

directional radar: A v.o.r. beacon simultaneously transmits two signals on the same frequency. At the centre of the beacons antenna complex is a single radiator transmitting a signal that is frequency modulated by 30Hz. Surrounding this is a circle of phased antennas whose transmission is also modulated by 30Hz. On board the aircraft, the phase of the two received signals is compared and depends upon the relative bearing of aircraft from beacon.

instrument landing system (i.l.s.): A radio beam navigational aid that allows aircraft to find the runway once they are positioned somewhere near the start of the final approach. The equipment responds to the aircraft sending out a pulsed signal and timing how long it takes for the ground stations to reply to be received.

VOLMET: A computer-synthesised voice which, having announced the station to which the listener is tuned, proceeds to recite the weather reports at each of the named airports.

When it finishes, it starts all over again.

secondary surveillance radar (s.s.r.): Enables the air traffic controller to see an aircraft’s flight level and identity on the radar display screen.

DATA COMMUNICATIONS
a/d analogue to digital
AMTOR AMateur Teleprinter
Over Radio
a.p.t. automatic picture transmission
ASCII American Standard Code for Information Interchange
ASTUR Atari ST Users on Radio
BARTG British Amateur Radio
Teledata Group
BBS Bulletin Board System
CCIR International Radio
Consultative Committee
CCITT International Telegaph and Telephone Consultative Committee
c.p.u. central processing unit
CRUG Commodore Radio
Users Group
d.C. Digital Communications
Experiment
d.i.l. dual in line
EPROM Erasable programmable read only memory
FAX Facsimile
f.s.k. frequency shift keying
IARU International Amateur
Radio Union
INFODUTCH Information Of Direct
i.o.c. Use To Computer Hobbyists
index of co-operation
ITU International
TelecommunicationsUnion
m.p.u. microprocessor unit
PDSL Public Domain Software
Library
p.p.m. parts per million
RAM Random Access Memory
r.f.i. radio frequency interference.
RIG Remote Imaging Group
r.i.t. receiver incremental tuning
ROM Read Only Memory
r.p.m. revolutions per minute
RSGB Radio Society of Great Britain
RTTY Radio TeleType
SARUG Spectrum Amateur
Radio Users Group
SITOR Simplex Telegraphy
On Radio

SWM MAY 1989

SWM MAY 1989
central processing unit (c.p.u.): The unit containing the arithmetic, logic, and control circuits which direct and co-ordinate the operation of the computer and the peripheral devices.

FAX: The process of scanning a still picture to obtain corresponding electrical signals which can be used locally or remotely to produce a recorded likeness of the picture.

time division multiplex (t.d.m.): A multiplex system in which each signal is allowed use of the communications path for a short time interval. Usually there are a number of signals and they use the path in turn.

Public Domain Software Library
Winscombe House
Beacon Road
Crowborough
Sussex TN6 1UL

ASTUR
Michel Geeraert
W. Elischoitaan 21
B-8460 Koksijde
Belgium

SSTV TDM
Slow Scan TeleVision
time division multiplexing

CRUG Simon Lewis GM4PLM
69 Irvine Drive
North Clippens
Linwood
Paisley
Renfrewshire PA3 3TB

BARTG Mrs P Beedie GW6MOJ
Ffynnonlas
Salem
Llandeilo
Dyfed SA19 7NP

SARUG Paul Newman G4INP
3 Red House Lane
Leiston
Suffolk IP16 4JZ

TELEVISION RECEPTION

ATV amateur television
Band I 45 - 68MHz
Band II 87 - 108MHz
Band III E5 - E12 (175 - 230MHz)
Band IV 471 - 608MHz
Band V 615 - 856MHz

BC Broadcast
BDXC British DX Club
BST British Summer Time
CB citizen's band
CEPT Conference of European Posts Telecommunications Administration
Ch. Channel
c.i.o carrier insertion oscillator
db decibel
d.s.b. double sideband
c.w. continuous wave (Morse)
DSWCI Danish Shortwave
Clubs International
DTI Department of Trade & Industry
DX "long distance"

TELEVISION RECEPTION

SSTV Slow Scan TeleVision
TV television
TVI television interference
v.c.r. video cassette recorder
WRTH World Radio TV Handbook

BARTG Mrs P Beedie GW6MOJ
Ffynnonlas
Salem
Llandeilo
Dyfed SA19 7NP

SARUG Paul Newman G4INP
3 Red House Lane
Leiston
Suffolk IP16 4JZ

SSTV Slow Scan TeleVision
TV television
TVI television interference
v.c.r. video cassette recorder
WRTH World Radio TV Handbook

BATCH British Amateur Television Club
BBC British Broadcasting Corporation
b/w black & white
Ch. channel
FSTV Fast Scan Television
IBA Independent Broadcasting Authority
NTSC National Television Standard for Color (US Colour TV Standard)
PAL Phase Alternate Line (Colour TV Standard)
r.c.e.b. residual current circuit breaker
SEACAM (French Colour TV Standard)
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>kHz</td>
<td>kilohertz</td>
</tr>
<tr>
<td>km</td>
<td>kilometre</td>
</tr>
<tr>
<td>kW</td>
<td>kilowatt</td>
</tr>
<tr>
<td>l.c.d.</td>
<td>liquid crystal display</td>
</tr>
<tr>
<td>l.e.d.</td>
<td>light emitting diode</td>
</tr>
<tr>
<td>l.f.</td>
<td>low frequency</td>
</tr>
<tr>
<td>l.o.</td>
<td>local oscillator</td>
</tr>
<tr>
<td>l.s.b.</td>
<td>lower sideband</td>
</tr>
<tr>
<td>l.t.</td>
<td>low tension</td>
</tr>
<tr>
<td>l.w.</td>
<td>long wave</td>
</tr>
<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>mA</td>
<td>milliampere</td>
</tr>
<tr>
<td>m.c.w.</td>
<td>modulated continuous wave</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>mm</td>
<td>millimetre</td>
</tr>
<tr>
<td>m.o.s.f.e.t.</td>
<td>metal oxide silicon field effect transistor</td>
</tr>
<tr>
<td>ms</td>
<td>millisecond</td>
</tr>
<tr>
<td>mV</td>
<td>millivolt</td>
</tr>
<tr>
<td>mW</td>
<td>milliwatt</td>
</tr>
<tr>
<td>m.w.</td>
<td>medium wave</td>
</tr>
<tr>
<td>n.b.f.m.</td>
<td>narrow band frequency modulation</td>
</tr>
<tr>
<td>NF</td>
<td>nanofarad</td>
</tr>
<tr>
<td>ns</td>
<td>nanosecond</td>
</tr>
<tr>
<td>N-type</td>
<td>coaxial connector system</td>
</tr>
<tr>
<td>p.c.b.</td>
<td>printed circuit board</td>
</tr>
<tr>
<td>p.d.</td>
<td>potential difference</td>
</tr>
<tr>
<td>p.e.p.</td>
<td>peak envelope power</td>
</tr>
<tr>
<td>pF</td>
<td>picofarad</td>
</tr>
<tr>
<td>p.I.</td>
<td>phase locked loop</td>
</tr>
<tr>
<td>p.m.r.</td>
<td>private mobile radio</td>
</tr>
<tr>
<td>p.p.m.</td>
<td>parts per million</td>
</tr>
<tr>
<td>p.s.u.</td>
<td>power supply unit</td>
</tr>
<tr>
<td>RAM</td>
<td>Random Access Memory</td>
</tr>
<tr>
<td>r.c.c.b.</td>
<td>residual current circuit breaker</td>
</tr>
<tr>
<td>r.d.s.</td>
<td>radio data system</td>
</tr>
<tr>
<td>r.f.</td>
<td>radio frequency</td>
</tr>
<tr>
<td>r.f.c.</td>
<td>radio frequency choke</td>
</tr>
<tr>
<td>r.f.i.</td>
<td>radio frequency interference</td>
</tr>
<tr>
<td>r.i.t.</td>
<td>receiver incremental tuning</td>
</tr>
<tr>
<td>r.m.s.</td>
<td>root mean square</td>
</tr>
<tr>
<td>ROM</td>
<td>Read Only Memory</td>
</tr>
<tr>
<td>R/T</td>
<td>radio telephone</td>
</tr>
<tr>
<td>S + N/N</td>
<td>ratio of Signal + Noise to Noise</td>
</tr>
</tbody>
</table>

**BAEC**

Mr C. Bogog
Dickens
26 Forrest Road
Penarth
South Glamorgan

**DXAGB**

DX Association of Great Britain

**DXCC**

DX Century Club

**DXNS**

DX News Sheet

**e.c.s.s.b.**

exalted carrier single sideband

**EDXC**

European DX Council

**Es**

Sporadic-E

**FCC**

Federal Communications Commission (USA)

**g.c.**

general coverage

**IBA**

Independent Broadcasting Authority

**IFRB**

International Frequency Registration Board

**ILA**

International Listeners Association

**ILG**

International Listening Guide

**IRC**

International Reply Coupon

**I.R.C.**

Independent sideband

**ISWL**

International Short Wave League

**ITU**

International Telecommunications Union

**JOTA**

Jamboree on the Air (Scouts)

**I.s.b.**

lower sideband

**m.u.f.**

maximum usable frequency

**n.b.f.m.**

narrow band frequency modulation

**p.m.r.**

private mobile radio

**OM**

"old man"

**PO**

Post Office (usually PO Box No.)

**QTHR**

"radio amateur’s address is in the latest Callbook"

**RAE**

Radio Amateur’s Examination

**RAIBC**

Radio Amateur Invalid & Blind Club

**RAOTA**

Radio Amateur Old Timer’s Association

**RAYNET**

Radio Amateur Emergency NETwork

**r.i.t.**

receiver incremental tuning

**RO**

radio operator (officer)

**RSGB**

Radio Society of Great Britain

**RX**

receiver

**s.i.d.**

sudden ionospheric disturbance

**SLT**

ship’s letter telegram

**Sp-E**

Sporadic-E

**s.s.b.**

single sideband

**t.r.f.**

tuned radio frequency

**t.t.l.**

transistor-transistor logic

**TV**

television

**u.h.f.**

ultra high frequency

**u.s.b.**

upper sideband

**v.**

volt

**v.c.o.**

voltage controlled oscillator

**v.f.o.**

variable frequency oscillator

**v.h.f.**

very high frequency

**v.i.f.**

very low frequency

**v.s.w.r.**

voltage standing wave ratio

**W**

watt

**W.B.F.M.**

wide band frequency modulation

**w.p.m.**

words per minute

**WAF**

Worked All Britain (award scheme)

**WARC**

World Administrative Radio Conference

**WRTH**

World Radio TV Handbook

**X.Y.L.**

"wife"

**Y.L.**

"young lady"

**maximum usable frequency (m.u.f.):** In radio wave propagation via the ionosphere the m.u.f. is the highest frequency that can be used between two points at a particular time.

**sudden ionospheric disturbance (s.i.d.):** A short-lived abnormal increase in the D and E regions of the ionosphere resulting in a sudden radio fade-out.

**tuned radio frequency (t.r.f.):** A receiver system in which all amplification of the received radio signal prior to detection is made at radio frequency.

**audio frequency (a.f.):** A frequency, in the range 0 - 18kHz, of a sound wave audible to the human ear.

**amplitude modulation (a.m.):** Where the instantaneous amplitude of the carrier is proportional to the instantaneous value of the modulating wave.

**beat frequency oscillator (b.f.o.):** A variable-frequency oscillator whose output can be mixed with that of the final i.f. amplifier in a superheterodyne receiver to produce an audio frequency beat when the receiver is tuned to an unmodulated signal.
effective radiated power (e.r.p.): The product of the power supplied to an antenna and its relative gain in a given direction with respect to a half-wave dipole.

frequency modulation (f.m.): Where the instantaneous frequency of a constant amplitude carrier is proportional to the instantaneous value of the modulation and the rate of change of frequency is proportional to the amplitude of the modulation.

modulated continuous wave (m.c.w.): A carrier wave modulated by a steady audio frequency tone.

liquid crystal display (l.c.d.): A display consisting of a very thin layer of crystals, suspended in a liquid, sandwiched between two conducting glass plates across which the control voltage is applied. The conducting areas of the plates are such that, by applying voltages to specified areas the crystals can be changed from transparent to opaque as desired. Any pattern can be obtained.

single sideband (s.s.b.): A method of operation in which either the upper or lower sideband of an a.m. signal is transmitted, the unwanted sideband being filtered out. The carrier may be partially or wholly suppressed.

short wave listener (s.w.l.): A term used to describe anyone who is a listener to radio signals for hobby purposes. It's no longer only applied to those who listen on the short wave bands.

superheterodyne: A receiver system in which the received radio signal is mixed with the output of a local oscillator so as to provide a constant intermediate frequency which is then amplified by the tuned intermediate frequency amplifier stages prior to detection.

DXAGB
E. A. Rickett
Flat 13
63 Eton Avenue
Hampstead
London NW3

AFRTS
601 North Fairfax Street
Suite 360
Alexandria
Virginia 22314
USA

ISWL
Yvonne Blain
167 Wombridge Road
Trench
Telford
Shropshire
TF2 60A

Medium Wave Circle (publish MWM)
Harold Emblem
137a Hampton Road
Southport
Merseyside PR8 5DY

BDXC
Colin Wright
54 Birkhall Road
Catford
London SE6 1TE

ILA
1 Jersey Street
Hafod
Swansea
SA1 2HF

DSWCI
c/o Bent Nielsen
Betty Nansens Ave 49
DK-200 Frederiksdberg
Denmark

RADIO DATA

A. amplify
a.c. alternating current
a/d analogue to digital
a.f. audio frequency
a.g.c. automatic gain control
a.m. amplitude modulation
a.t.u. automatic tuning unit
ATV amateur television
BAEC British Amateur Electronics Club
BCI Broadcast Interference
b.f.o. beat frequency oscillator
BNC coaxial connector system
cm centimetre
c.r.t. cathode ray tube
c.t.s.s. continuous tone signalling system
c.w. continuous wave (Morse)
d.a.m. dynamic amplitude modulation
dB decibel
dBi decibel relative to an isotropic source
dBm decibel relative to one milliwatt
d.c. direct current
d.i.l. dual-line
d.m.m. digital multimeter
d.s.b. double sideband
DX "long distance"
EPROM Erasable Programmable Read Only Memory
e.r.p. effective radiated power
Es Sporadic-E
f.e.t. field effect transistor
f.m. frequency modulation
f.s.d. full scale deflection
f.s.k. frequency shift keying
GHz gigahertz
h.f. high frequency
h.g. harmonic generator
h.t. high tension
Hz hertz
i.c. integrated circuit
i.c.w. interrupted continuous wave
i.f. intermediate frequency
i.f.t. intermediate frequency transformer
i.s.b. independent sideband
kg kilograms
telephony, supported by the RSGB and many radio societies around the country, eager to have this permanent signal by which to calibrate their sets. Five months later, very limited broadcasting was permitted on 700 metres with 250 watts on Tuesday evenings from 8-8.30pm. By the following February, the first historic broadcast was made on a wavelength changed to 400 metres in the following month. The broadcasts went out weekly and after every 10 minutes there was a 3 minute close-down for “legitimate PC transmissions.”

Rhymes

It was then, that the famous “Hello CQ. Hello CQ. This is Two Emma Toc. Writtle calling.” was first heard. It was usually followed by an announcement of a record, the music was played on a mechanical gramophone with the microphone held to its horn. Then there was a retrospective announcement of the record, followed by the obligatory, “We are now closing down for three minutes, when transmissions will resume.” and the three minutes’ silence. Capt. Eckersley was responsible for transmissions, heading the design team engineers, and was probably the first and last chief engineer/performing artist. He was an unerring instinct for popularising a new and esoteric science, and enjoyed relaxed informality and deflating pomposity. This he combined with a warm, extrovert personality and a wicked talent for composing Lear-type verses at the drop of a hat. He left the engineers to manage things in general, whilst he went home to listen to reception, but on one particular night, well primed with the local beverage, he abandoned the records and announced that he was going to recite. Surprised listeners heard through their headphones:

“Hey diddle didrode,
Two grids in one quadrode.
The outer one form the plate.
The electrons got muddled
With so many grids.
But the final mu value was eight.”

Opus followed opus with a cavalier disregard of the obligatory three-minute silences as he was carried away by his performance, well past the bare half-hour allowed. Finally, he signed off with a song at the piano to a famous tune;

“The concert’s ended now, sad wails the heterodyne
You must switch off your valves; I must switch off mine.
Write back and say you heard me, your hook up and where and how.
Quick! for the engine’s falling fast.
Goodbye, Goodbye.”

This was not what the company was licensed for, and he admitted to being slightly taken aback when told afterwards what he had said! The Writtle team waited uncomfortably for the heavens to descend on them, but he had swept the cobwebs out of the laboratory and asked his listeners’ attention. Of the many postcards received, only one was critical, and that came from the publicity department of Head Office! The general tenor was “Please give us more!”

Peter Eckersley inside “Wavy Lodge”.

Writtle became a highly sought-after signal among aficionados who would avidly tune in everything from ships’ Morse and time signals, to experimental stations, and even after the advent of 2LO, Writtle was always the popular station. Captain Eckersley evoked those early days of wireless perfectly when he said,

“If you had wireless as an amateur that had never done anything but, parp, parp, par, par, par, parp, suddenly you heard a voice or even music - well, it was fascinating!”

The 2MT team introduced drama to broadcasting by sitting around a kitchen table in a hut and reading a scene from Coriano de Bergerac. Capt. Eckersley read Cyrano in company with Ben Travers, his sister Agnes and the others. They had one microphone passed from one speaker to another, which they rehearsed beforehand with a spoon standing in for the microphone and they had practised so that their scripts did not rustle or the microphone drop in its travels.

Perhaps his flair for drama was foreshadowed in the scrap book mementoes of Bedales where three play programmes are preserved. In 1903, A Midsummer Night’s Dream included Tom Eckersley as Snug the joiner, and Peter as one of the fairies. By 1908 when the school production was Twelfth Night he played Sir Toby Belch, and in the 1909 performance of The Merchant of Venice he starred as Shylock. Peter’s school report for music said that he was good, and had “several times taken the choir for me and has done well.” His singing at the piano remained a popular feature from 2MT, and on one occasion after a record of the tenor Melchior had been played, a listener wrote in to say it was the finest imitation of an opera singer that Capt. Eckersley had ever done! The whole thing was fun and a great adventure for listeners and engineers alike from beginning to end.
THE UK's SCANNER SPECIALISTS

BLACK JAGUAR MkIII

The new Mark III is probably our most popular hand-held scanner with 16 channels of memory and a sensitive receiver. Selectable AN or FM reception and the facility to power the set from the mains or car using one of the many accessories now available.

Frequencies: 28-30 MHz, 50-88 MHz, 115-179 MHz, 200-280 MHz, 350-520 MHz

**£199 LOW NEW PRICE**

Black Jaguar Accessories (suitable for all models, BJ200, Challenger etc.)
- Mobile Mount: £6.95
- Base Mount: £5.95
- BJ1 Car Supply (Mk III version only): £14.95
- BCA6 Mains Slow/Fast Charger: £14.95
- Airband Rubber Duck Antenna: £6.00
- 84 UHF Sub-Antenna: £4.95

We are the UK Distributors for Bearcat Scanners

Handheld Scanners
- Bearcat 55 XLT: £99.00
- Bearcat 70 XLT: £109.99
- Bearcat 100 XLT: £119.99
- Bearcat 100 XLT: £119.99
- Bearcat 200 XLT (with 900 MHz) **new low price**: £229.00

Base/Mobile Scanners
- Bearcat 175 XLT: £169.99
- Bearcat 210 XIW: £179.99
- Bearcat 580 XLT: £199.00
- Bearcat 900 XLT (including 900 MHz): £269.00

NEW MODELS

COBRA SR295 Base Receiver - Ideal for aircraft enthusiasts
- Covers 29-54 MHz, 118-174 MHz, 406-512 MHz: £149.00
- AOR 800 Handheld with 900 MHz: £199.00
- AOR 900 Handheld with 900 MHz: £235.00
- AOR 2002 Base with full coverage: £290.00
- AOR 3000 New Broadband Base Model: £200.00
- SAB9 MW and Airband Handheld: £169.99
- Sony Air 7 Handheld - Airband: £249.95
- Sony Pro 80 Handheld - Wide band: £259.95

NEW LOW LOSS JAPANESE COAX

Essential for best performance with wideband UHF scanners. We have directly imported this cable which has exceptional low loss.

**Frequency**
- 5D: 0.055
- 8D: 0.039
- 10D: 0.031

**Loss/mtr @ 100 MHz (dB)**
- 0.171
- 0.085
- 0.068

**Loss/mtr @ 1 GHz (dB)**
- 0.187
- 0.130
- 0.105

**Price per meter**: £0.56, £1.40, £1.99

DISCONE ANTENNAS - New British Made Antennas

Nevada WB1300 (25-1300 MHz)
- Wideband Top of the range stainless steel: £59.95

**Nevada Discone**
- (50-700 MHz)
- High Quality 8 Element: £24.00

**NEW BUMPER CATALOGUE**
- £2

**NEVADA COMMUNICATIONS**
- 189 London Road, North End, Portsmouth PO2 9AE. Telex: 869107

**spacetech**

L. E. Hornby, 21 West Wool, Portland, Dorset DT5 2EA. Tel: 0305 822753

THE SPACETECH ARCHIMEDES WEATHER SATELLITE PODEUL

**£199 LOW NEW PRICE**

Black Jaguar Accessories (suitable for all models, BJ200, Challenger etc.)
- Mobile Mount: £6.95
- Base Mount: £5.95
- BJ1 Car Supply (Mk III version only): £14.95
- BCA6 Mains Slow/Fast Charger: £14.95
- Airband Rubber Duck Antenna: £6.00
- 84 UHF Sub-Antenna: £4.95

We are the UK Distributors for Bearcat Scanners

Handheld Scanners
- Bearcat 55 XLT: £99.00
- Bearcat 70 XLT: £109.99
- Bearcat 100 XLT: £119.99
- Bearcat 100 XLT: £119.99
- Bearcat 200 XLT (with 900 MHz) **new low price**: £229.00

Base/Mobile Scanners
- Bearcat 175 XLT: £169.99
- Bearcat 210 XIW: £179.99
- Bearcat 580 XLT: £199.00
- Bearcat 900 XLT (including 900 MHz): £269.00

NEW MODELS

COBRA SR295 Base Receiver - Ideal for aircraft enthusiasts
- Covers 29-54 MHz, 118-174 MHz, 406-512 MHz: £149.00
- AOR 800 Handheld with 900 MHz: £199.00
- AOR 900 Handheld with 900 MHz: £235.00
- AOR 2002 Base with full coverage: £290.00
- AOR 3000 New Broadband Base Model: £200.00
- SAB9 MW and Airband Handheld: £169.99
- Sony Air 7 Handheld - Airband: £249.95
- Sony Pro 80 Handheld - Wide band: £259.95

NEW LOW LOSS JAPANESE COAX

Essential for best performance with wideband UHF scanners. We have directly imported this cable which has exceptional low loss.

**Frequency**
- 5D: 0.055
- 8D: 0.039
- 10D: 0.031

**Loss/mtr @ 100 MHz (dB)**
- 0.171
- 0.085
- 0.068

**Loss/mtr @ 1 GHz (dB)**
- 0.187
- 0.130
- 0.105

**Price per meter**: £0.56, £1.40, £1.99

DISCONE ANTENNAS - New British Made Antennas

Nevada WB1300 (25-1300 MHz)
- Wideband Top of the range stainless steel: £59.95

**Nevada Discone**
- (50-700 MHz)
- High Quality 8 Element: £24.00

**NEW BUMPER CATALOGUE**
- £2

**NEVADA COMMUNICATIONS**
- 189 London Road, North End, Portsmouth PO2 9AE. Telex: 869107
Ken Michealson continues with his appraisal of the vintage Drake R-4C receiver.

Mention was made previously about modes CW 15, CW 5 and CW 25. These three modes would give greater selectivity on c.w. by the insertion of the crystals concerned. However, they were not fitted in the receiver unit so I am unable to comment on them. There were up to 15 additional tuning ranges available, each 500kHz wide, by fitting the appropriate crystals in the accessory crystal sockets at the top of the rear panel. With the exception of the band from 5.0 to 6.0MHz, these additional ranges could be anywhere between 1.5 and 30MHz. A full list of the crystals required, together with the bands they cover, is given in the instruction manual. Only the five amateur band crystals were supplied as standard, and were the only ones fitted in the review set. Crystal selection is with the 16 position XTALS switch mentioned above. The switch has a window to the right of centre, through which one can see which crystal is in use. However, when the knob is turned to the NORMAL position the window is blank, but the proper crystals for the various amateur bands are selected by the BAND switch, (except the 1.5MHz setting). The numbered positions of this switch correspond to the accessory crystal sockets on the rear panel, so that when the switch is turned to a certain position the crystal in the socket having the same number is brought into circuit. The range window provides a convenient place to write in the frequency covered in each accessory band when the crystals are installed. However, when operating out of band frequencies, care has to be taken in comparing a vintage car to its modern counterpart. When the R-71E, you either tune in the desired frequency or read it directly off the display, with the R-4C you have to mentally work out how much to add on to the dial readings and set the p.b.t. and/or the “notch” together with the microprocessor.

The R-4C performs very well when compared with modern receivers, such as the Icom IC-R71E, which uses a microprocessor-controlled phase-locked loop, (p.i.l.), consisting of two loops for the local oscillator, giving greater stability. The R71E’s basic circuit uses an up-conversion with a first i.f. of 70.4515MHz and a second i.f. of 9.0115MHz. In the days when the Drake R-4C was designed, there was no idea of using a microcomputer to control a receiver and, as far as I know, a phase locked loop wasn’t thought of either. There is an r.f. amplifier in both sets, but whereas the R-4C has to be tuned on the desired band by the preselector control, the R-71E has a bandpass filter for each 1MHz band covered. In addition, at this stage it has a pre-amplifier and an attenuator. The R-4C uses a simple mixer, a 6EJ7, whereas the R71E has a double balanced mixer. Even in the early stages of the receivers a difference is noticeable in the operation of the two units. There is a very effective notch filter on the R-4C which, when used with the “passband tuning” control, is a great aid to removing an unwanted carrier. The two controls should be used together, the passband tuning being set first. After adjusting the “notch” the p.b.t. may be trimmed to fine tune the “notch”. But nevertheless, when I change from one receiver to the other the technological advances made over the last ten years are very noticeable, rather like looking at a vintage car to its modern counterpart.
For products you can rely upon to give amazing results

For information on **Active Antennas, RF Amplifiers, Converters, Audio Filters**, the **Morse Tutor** and **Speech Processors** send or telephone for a free catalogue and selective data sheets as required.

All our products are designed and made in Britain. Orders can be despatched within 48 hours subject to availability.

---

**Reg Ward & Co. Ltd.**

1 Western Parade, West Street, Axminster, Devon EX13 5NY.

**Telephone:** Axminster (0297) 34918

---

**YAESU**

**SONY**

**YAESU**

**FRG 8800** £639.00

Super HF/VHF receiver (VHF option) LCD direct readout with 8-Bit CPU function control. All 12-button keypad entry or V.F.D. Frequency selection. Full 150kHz-2.99999MHz range. AM/FM/LSB/USB/DX 12 memories with back up. 100, 120, 240V, plus 12V d.c. operation (optional). Clock and timer with built-in - last/first tune dial lock - computer control socket. FRG8800 VHF CONVERTIBLE £100.00 (118-174MHz direct readout) £49.00 (wide band FM unit).

**YAESU**

**FRG 9600** £499.00

All-mode scanning receiver providing features never offered before covering 68 MHz from 905 MHz continuously, with 100 keypad-programmable memory channels.

---

**VHF HANDY RX**

A lightweight but tough little monitor receiver 141.00-170.99 MHz with accessories.

**HX850E REGENCY**

2) Channel memory AM/FM selectable scanner 60-89MHz, 118-136MHz, 140-174MHz. 49kHz-49.999MHz.

**LOWE HF-125** £375.00

Coverage is continuous from 30kHz to 30MHz and operating modes are AM, LSB and CW with an optional FM and synchronising AM board. A comprehensive range of bandwidth filters are available.

---

**MAILING**

**FLAT 5 0 N G**

**ELECTRONICS LIMITED**

Clayton Wood Close West Park Leeds LS16 6QG

Tel: 0532 744822
Radio interception stations were set up during the war by the Services, under the control of the Government Code and Cypher School (GC&CS) - which, after hostilities ended, became the Government Communication Headquarters (GCHQ). Although there is now no state of war it is a safe bet that interception of radio messages still continues, with Warsaw Pact countries being the prime area of interest.

But there is more to the story. Admiralty records recently declassified under the 30-Year Rule show that there were, until the late 1950s at least, a number of h.f. direction-finding stations, the existence of which has never been discussed before. One of these was at Goonhavern in Cornwall, and is described below.

The declassified papers describe an organisation called the Admiralty Civilian Shore Wireless Service. After 1945, ACSWS performed the signals intelligence duties for the Royal Navy, both at home and overseas. In 1975, which is the most recent date of the declassified papers, there was a proposal to make the ACSWS a uniformed part of the Navy, but the idea was abandoned and sometime after that date, it seems, ACSWS was absorbed into GCHQ.

According to these papers, the Admiralty h.f. direction-finding system consisted of a chain of four radio interception stations. The main station was at Irton Moor, Scarborough (more recently named as a GCHQ station specialising in listening to Soviet trawlers), which controlled the other three stations at Goonhavern, Ford End near Chelmsford and Bower near Wick, Northern Scotland.

Goonhavern is a small village on the main road to Land's End, at the top of a hill leading down to the sandy beaches of Perranporth and Porthleven on the north coast of Cornwall. Not too far away are other military establishments, such as RAF St Mawgan, from where Nimrods fly on maritime patrol, and RAF Portreath, the radar station covering the Western Approaches. The Ordnance Survey map shows two installations, helpfully called "Masts", and these were visited by the author in 1987.

**The Goonhavern Site**

The two installations are almost identical. Site 1 is at reference SW777543 and Site 2 at SW796564. Both are on farming land, and at the time of my visit one was protected by a herd of bullocks and the other by growing wheat. Site 2 is the better preserved (Fig. 1). From observations made at the sites it is possible to deduce the way the h.d.f. system worked.

The typical site consisted of a sand-covered circle of land fenced off from the surrounding land, with an enclosed track leading to it. At the perimeter of the sand circle was a small shed composed of two halves, evidently a toilet and a store. Outside was a wooden bridge, about half a metre above the sand circle, leading to another hut at the centre of the circle.

Outside the central hut, midway along each wall, was a mast base - four masts in total. These bases were connected by copper braid to the ground under the sand and an entry into the wall evidently brought the feeder cables into the hut; a ring of concrete guy bases surrounded the masts and the hut.

A large pit could be seen inside the hut at Site 2, the other hut being locked. The external dimensions of the circle varied slightly between the sites: at Site 1 the distance between the mast base and the guy bases was 5 paces, but at Site 2 it was 3 paces, and at Site 1 the radius of the circle from the mast was 25 paces while at Site 2 it was 15 paces. At both sites the distance between the guy bases was some five paces. Also near Site 2 was another deserted building which had evidently taken power from the silent electricity substation nearby; the power sockets were labelled "Site 2", "Essential", "Lighting" and "Stand By".

**Adcock DF**

From this description it is clear that the two sites each housed a d.f. station of the Adcock type, standard during the war, and Fig. 2 shows what the installations would have looked like when active. At each side of the hut there was a 10m high mast holding a monopole antenna, four in all, and above the hut was a central wire antenna for sense determination. The direction of the signals was determined by comparing the signal received at each antenna using either mechanical or electronic means.

The Goonhavern installations were evidently of the buried U-type Adcock variety, where the feeder cables from the ends of the monopoles passed under a ground shield before entering the hut - which probably accounts for the sandy base there today. The archetypal Adcock used dipole, not monopole, but all the h.f. Adcocks were monopole or U-type.

**Goniometer**

The electro-mechanical way of analysing the incoming signal relied on the use of a goniometer, a device powered by an electric motor, situated inside the hut, which electrically simulated the physical rotation of the antennas (the site for this could have been the pit inside the hut). Operators would determine the direction of the target transmitter by tuning to the loudest sound. Later in the war a cathode ray tube device was invented which indicated the bearing on a 360° dial.

However, individual Adcock stations were only accurate to about 8°, which could cause great problems with longer distances into the North Atlantic. A number of experiments were conducted by the Admiralty into making Adcock arrays more efficient. Essentially, two or more Adcock stations were grouped together to analyse the incoming wavefront over a broader area. Another experiment involved Adcock antennas configured as an interferometer: this entailed separating two arrays by a multiple of the wavelength being intercepted, the multiple reflecting the electrical characteristics of the arrays. For two Adcock arrays a separation of around 18 to 30 wavelengths can be calculated from data given in the professional literature.

Regarding the Goonhavern installations, the horizontal distance between the two sites...
Do you use a computer in your Shack? There is an enormous potential for the computer to be used by the aurora wrangler. For example, greyscale propagation, to tell us what time to hunt the real DX on Top Reach or if it is worth looking further; particularly with a waveform display, and computerized scoring; sorting listings to suit the particular requirements; antenna design; for real-time direction finding; Morse training; smarting up one's operating skills (The "Doctor DX" program of Macarthur, for example); circuit design; and much more.

However, there is a snag for most of us, and that is the electrical noise things kick up! The simpler machines which use a domestic TV set as a monitor have the internal line-timebase that beats the corresponding TV, of course, the television itself is a "clock" oscillator to drive everything, and of course there are sharp leading and trailing edges of pulses up all the time.

So what can you do? Screening the inside of the case with conductive paint or a thick layer of rubber, of course, to the inside of the case is a start but you'll probably find the device is built upon ground-reference circuits. A walk round the back of the computer's mains lead around a ferrite ring where it leaves the case, plus the use of a ferrite ring applied to the lead-in to the video input. Further improvement can be obtained by doing similar things to the stationary mains cord, where the two must always assume supression at source is the most important. In general terms, the s.m.s. instructions go for the more advanced machines where you have a dedicated screen rather than a TV, but you still need to be careful. For example, the TR7S, which is very similar, is a noisiest thing that can be seen in two metres. The leads can be screened, or you may get away with using a ferrite ring. In the case of the TV monitor, I have always had use two ferrite rings, one that of the computer's mains lead around a ferrite ring where it leaves the case, plus use of a ferrite ring applied to the lead-in to the video input.

Even the early TV sets weren't too much better, since the line timebase of a normal size never had a scan small enough, as c.r.t.s. were smaller and longer. Things like electric can-openers, electric drills and the rest weren't heard of, the vacuum cleaner had an on-off street lighting if your road happened to be lit by the blue or orange lights for which every other was vacuous cleaner and would also have a "clock" oscillator to drive everything, and of course there are sharp leading and trailing edges of pulses up all the time.

In general, the pictures used for the more advanced machines where you have a dedicated screen rather than a TV, but you still need to be careful. For example, the TR7S, which is very similar, is a noisiest thing that can be seen in two metres. The leads can be screened, or you may get away with using a ferrite ring. In the case of the TV monitor, I have always had use two ferrite rings, one that of the computer's mains lead around a ferrite ring where it leaves the case, plus use of a ferrite ring applied to the lead-in to the video input.

Talking of v.h.f. one wonders just how many s.w.s. got involved in the Aurora activity, if any, as a result of the evening of March 13? Alas, I had a meeting to attend at Lindrindel Wells that evening, some of the调 voices were heard and hence looking northwards, I was surprised to be able to see, very dimly it is true, the aurora — the first time I have ever seen it! Perhaps someone who knows of this auroral "in-tray" actually told you. I travel this road fairly regularly — all 365 of them! — I was able to satisfy myself that the"loom" of any township lights. Of course, there doesn't have to be a visual effect, if not a curtain of ionization, and hence reflection, which is continually in movement the roughness is in reality a doppler-effect demonstration that the curtain is in motion. Incidentally you should be alerted in mid-afternoon to an auroral event, which fades out, as a result of changing the phase usually crops up that evening, so leave your beam pointing northwards. As a result of observing and playing in one's direction, I don't mean savagely to true north, but "in that general direction" as in most of these events the auroral beam is moving into a more southerly direction, and southward, of which in case each of the contact is aiming at the right spot on the aurora itself. I have never seen as many auroras as one would expect, since the auroral "rusty-bug saw" as one aims the beam north. As the Aurora Borialis appears to be a bit of a novelty, I add at this point an aurora event is in progress, a v.h.f. listener beamning northwards may well find a far-distant station who has such a rough-sounding signal as to be all but uncopyable on s.s.b., and about T1 on c.w.

The interesting bit is when the DX is weakly audible, say, when beaming east or south, with a T9 signal which is surrounded by noise and only a point of auroral "rusty-bug saw" as one aims the beam north. As the Aurora Borialis appears to be a bit of a novelty, I add at this point an aurora event is in progress, a v.h.f. listener beamning northwards may well find a far-distant station who has such a rough-sounding signal as to be all but uncopyable on s.s.b., and about T1 on c.w.

Another Award
Just a reminder on this one: The Worked all Britain Awards are available to all hams who achieve a "hard" band for a whole string of these, and support for the WAB programme is tantamount to support for RAIBC. The membership section shows who has a copy of the list of current members. Normally, for this sort of activity, the old-fashioned highly sensitive v.h.f. converter fed into a tunable i.f. in the form of a good general-purpose receiver capable of copying s.s.b. and c.w. is a good proposition. With it you can try all sorts of areas and termino that a.m. and f.m. just "don't cut the mustard!"

The next three deadlines are May 15, June 19 & July 17

SEEN & HEARD

AMATEUR BANDS UP-TO-DATE
Paul Essery GW3KFE
PO Box 4, Newtown, Powys SY16 1ZZ

Letters
Eric Chapman (Jersey) wonders if anyone has heard the legiti-

cmate operation from Albania. I recall two that were said to be legitimate, and the ZA2BOS operation of 1970 was considered to be legitimate by ARR for DXCC credit. However, so far as I'm aware that was the only accepted account. Possibly all the Top Bands have been made into an HRO modified to operate on 50 volt h.t., by a station in the West Indies, and I think the ZA2BOS, once reckoned in, has main electrolytics coming within several miles to carry noise to him for s.w.s., those were indeed the days!

Grapevine
If you have a 144MHz receiver or scanner, one useful frequency to monitor is 144.525MHz, simply because this is used over large areas of the UK as a DXalerting frequency so that if you tuned in to hear some good DX you can pass the word to others, and of course to you as well. I tuned it on to club members on v.h.f. to avoid this channel, too, even though DX operators accept that it's not their frequency alone.

WARC Bands
If your receiver covers these bands, then gives them a whirl. Although in theory they are still c.w.-only, the alleged lack of activity is beginning to cause minds to change, and there is sometimes paywall available for the s.s.b. c.w.看看 the band. Of course, as GOAPV (Potter Heigham) noted; it is quite a surprise to try a CQ just to satisfy that the gear is still OK on 10.140 MHz, so get back on 28 MHz.
due to work commitments. Yes, indeed. 28MHz is a band which should be checked from end to end — or at the very least over the bottom megahertz — for even if it sounds totally dead, it will often yield a totally unexpected signal from somewhere.

A first-time report from Michael Grimes (Northampton) who recently lashed out on a Low-HF-125. At the time of his letter, the antenna was all indoors, but an outdoor skywave is being considered, and the construction of an a box for a DSB end of the following: on 160, DJ0EC and YQ9JD: on 30 CU2BR, BK1BE, OZ1JZB: on 40, CM2LN, CSUSA, CS1EJL, DJ6ATE, ES1BPJ, ES1BPQ, FM1FMA, K4JEJ, ON7SH, OZ1ECC. PA3PBZ, PZ2JRR, RA3AZD, SM4HCM, SP9JZT, SV6AEK, VO1SA, YU9OP, YU3SW, YV9PM, ZC4AB, ZL3GS, 4X6LA, 8Y4OR; on Twenty we find A4UR, EA3OT, J9A9A, SM4SET, TA1U, V506V, VY2AH, Y3XKN, SP3A65Q, 4XAFR. RW7TQ: Pietem gave with HABKAZ, OK2BAI, SM6PWYJ, I1SRLI, U1A73A, VK2JN, RA1CA, RA22D, ZL2APR. The following are those who have listened to a program. Ten Michael found CU2BR, CB78L, I7MBKL, J28DN, ON8LS/F, and RA1BR.

R. Watters (St. Austell) uses an FRG-7770 plus an a.t.u., while the antenna is of 20 metres of wire, end fed, up 2.8 metres. R. Watters has noted a common question for several years. Over the 3-4-5 March contest period, the following stations were heard and logged: on 7MHz JASOVO, and J1A1CP, around 2100Z. On 14MHz, YU2QG was noted at R558, around 2002Z, and SM2CW appeared an hour later. While on 21MHz, Robert noted OC2L, and OA4QJ who were working HL5BD who said his QSL route was via HI1ASS, and ON8LS/F was doing good business at 120Z2. As for Ten, Robert noted VE7Z5, W8LTJO and K2D2MI in contact, both YLs. On March 4, 18MHz yielded KCSUT, WBUPY, N4LBJ, W1QDY, W2AH working OK1JJA and 9H4W, while on 14MHz, J3TAAJ, KA7HPIJ, N4JOP, VE3BY, and W6CNE were all booked in.


Letters

Chris Swann has sent me his usual comprehensive report and posed a few questions as well. One of his questions involves measuring the frequency? In this column, but a second question has got me stumped. Chris would like to know if there is a freely available publishing giving an international listing of ships callsigns. I must admit I don’t have one, though I know they exist and I guess would be to try an HMSO book. Any readers know of a source for this information then please write to me and I will publish the details. The final point from Chris concerns his J & P Electronics FAX program. He has now purchased a copy of the “Decode” program from J & P and reports great success dumping FAX images from his Spectrume to his printer. I have received a very welcome letter from Chris Kirby who was very active during the early days of the column. After a period of inactivity radio that is Chris has now settled himself down in the lovely town of Banbury so I will look forward to seeing reports soon. Chris has been working Labal RA-17 receiver which he is currently using with a trap dipole antenna, though he is hoping to improve on this soon.

One interesting snippet of information from Chris is that he was wrong for just invested in some sophisticated FAX equipment and he is hoping to be able to send me some samples which should prove interesting.

John Hunt has been a short wave listener for years but although interested in utility stations has never had the equipment to decode them. That has all changed now as John has been given an IBM PCI having a PC though is only half the battle as you need the appropriate hardware and software to interface with the radio. The software isn’t too much of a problem as mentioned two sources of programs in this column. The hardware is a little bit more serious as you need a terminal unit which can interface to a RS-232 port. So, the question is what do you readers know of a terminal unit which can handle 170Hz, 426Hz shifts and work with a RS-232 port, so if I please drop me a line and I will tell all.

SEEN & HEARD

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

Shanghai Coast Radio Station

The People’s Republic of China

This verifies your reception of XSG as follows:

Date: 23 March 1988 Mode: CW A1A

Time: 2230 UTC

Power: 10 kW

Freq: 3795 kHz

Tic: 10 kHz

Sign: CW

Fig. 1

Equipment News

I received a letter from Richard Wilmot of Technical Software giving some background to the changes he has made to the instructions for the popular RX-4 program. First of all there are no changes to the program only the instructions themselves.

There is now better coverage of the different versions of the program for the new RX-B which is very well produced and informative.

Probably the most common difficulty with the RX-4 is the reception of AMTOR and other ARQ signals. The solution is simplicity itself as all you do is keep the audio low! Fortunately most listeners, me included, tend to increase the audio level if they are suffering errors, whereas with the RX-4 the level should be reduced.

In addition to the RX-4 info, Richard has also sent me a manual for the new RX-B which is very well produced and informative.

The second item of equipment news comes from J & P Electronics who are about to announce a brand new FAX transceiver program for the Spectrum. Although aimed at the ham radio market, I know a lot of amateurs are also keen short wave listeners and would like to have a FAX program that could be used for amateur and utility stations alike. The new program is able to send images from the Spectrum’s memory which can be created using a digiport or one of the common graphics packages. In addition it

your own continent and three for a signal from a country in a different country. Multiply by the total number of countries heard for a final score. Include the following detail in your log: Date, time, band in use, call sign, call of the station being worked (if possible), reports given and received (if possible), plus your own assessment of the signal and any other comments. Send it in alone or with your normal letter, on the normal deadline. Incidentally since occasionally the deadlines aren’t given for each section of “Seen and Heard” just check with one of the other sections where the date does appear! This gives you a week to play with.

Have Fun!
to this the program can generate simple text messages for transmission by taking input from the keyboard.

Like other programs in the J&P Range some external hardware is required in the form of a drum speed generator, tone generator and p.p. switching. This is all provided in the form of an IGM unit.

The big question is the price and J&P have done well here as the total package can be bought for £63.00 for the tape version or £66.00 for a disk based version.

Schedules

Jan Nievenhuls has sent me an interesting selection of station schedules and QSL addresses which I have listed here:

U.S. Navtransfac Totsuka, Japan.
Callsign: NDT

Frequencies: 4.965MHz, 12.777MHz, 22.3245MHz

GSL Address: U.S. Navtransfac Totsuka/NDT, c/o Department of Navy, U.S. Navcommsa, Japan. Commanding Officer, Box 3, FPO Seattle 98762-1805, U.S.A.
Copenhagen Meteo, Denmark.
Callsign: OXT

Transmitter power: 20kW
Mode: FAX 120/576
Frequencies: 5.85MHz (0030-1005UTC)
3.6MHz (0005-0025, 1010-1215, 1245-1305 and 1830-1850UTC)
13.85MHz (1220-1240, 1310-1330 and 1805-1825UTC)
17.510MHz (1335-1355UTC)

Ice charts for the area around Greenland and Antarctic are transmitted on 10.30, 0945, 1015, 1155, 1220, 1245, 1310, 1335, 1805 and 1830UTC

GSL address: Copenhagen Meteo/OXT, Danmarks Meteorologiske Institut, Lyngbyvej 100, DK-2100 Copenhagen 0.

Pana Dakar, Senegal
Callsign: BVX317

Frequencies: 16.117MHz (0800-1500UTC)
19.3827MHz (0800-1800UTC)
15.8424MHz (1600-1900UTC)
16.117MHz (1600-1900UTC)

Callign: BVX221

Frequency: 20.3278MHz (1500-1600UTC)

Transmissions are in English and French.

GSL address: Agence Panaricaise d’Information (PANA), Service Technique, BP4056 Dakar, Senegal.

The final schedule for this month comes from John McLaren who extracted this information from a CNA GSL letter.

Central News Agency Incorporated.

Frequencies/callsign: MIR (0030-1005UTC), 3MA28.

Frequency: 5.85MHz (3MA22)

Transmitter power: 20kW

Antenna: Rhombic

Schedule: Monday to Saturday:
0230-0330, 0930-1030 and 1330-1500UTC

Saturday: 1330-1500UTC only

GSL address: Central News Agency Incorporated, 209 Sungkiang Road, Taipei, Taiwan, Republic of China.

Incidently 1989 is the 60th anniversary of the founding of the CNA and they are giving away commemorative sets of stamps to those who send in reports.

All these schedules were obtained from the stations themselves so are as up-to-date as possible.

If you receive any station details or schedules please write and let me know so I can spread the word.

INFO IN ORBIT

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

MIR Activity

Chris Van Der Bergh reports that lots of interesting projects are going ahead on MIR. At times he has been unable to follow the happenings, as the 143.628MHz voice channel has been reverting to scrambled speech, which they pre-announce by saying "...we are going over to the 2D regime..." or simply "...we are going over...". The SOYUZ-TM series also has this speech scrambling facility, known in this case as a "2D regime".

The cosmonauts often make use of the "stroke" (RTTY) working via the "strela", which is assumed to be a "space phone". The crew have also been improving their television, telephone, telemetry and data communications by the use of their "sapphire" laser beam communications system to tracking ships, such as the Yuri Gagarin, which is now moored off Madeira. Furthermore, they are using a new downlink known as "VHF-2", the frequency of which is as yet unknown. Listeners with scanners may wish to investigate when the spacecraft is overflying in the hope of locating it.

One of the可爱的 problems has been that of interference, especially when they overfly Western Europe, as the operators on MIR have been heard to complain of signals being received from radio amateurs (?), police, fire brigade, aircraft, ships, and even broadcast stations! It is felt very likely that the sheer intensity of signals on the "second channel" of their receiver may be overlooking the image attenuation, by assuming the likely I.F. of their receiver, doubling it and adding to the likely uplink frequency.

Chris reports that the MIR cosmonauts have been mapping earth's surface on a daily basis, taking many pictures and have been engaged in many astro-physical, medical and technical experiments. The first of the two new 12 tonne modules intended originally to go up to MIR by Energia in April has been postponed now until at least September, with the follow up to re-attain symmetry now probably due for launch in December. (With but one module attached to a side docking port, manoeuvres will be difficult, as the centre of gravity of the assembly is altered). The full function and purpose of these huge attachments which are even bigger than MIR itself is yet not fully known, but is understood that they have to provide solar cells, water, showers, a much enlarged hatch for the "space bike" (?) and that they will be used extensively for spacewalks in the future. They will also provide further extended facilities for gravity free metallurgy and some of the biotechnological and experiments.

Some of the tense conversation reported in last month's column may have been due to the apparent frustration experienced by the crew due to the change of schedule brought about by the module delay. One of the functions is undoubtedly the "space bike" upon which Serebrov is the pre-trained expert. His mission may now be frustrated, which has a re-scheduling effect on both existing and future crews, and Volkov appears to be most unhappy about this situation. It now looks as if Volkov and Krikalov will be returning on April 29, possibly accompanied by Polyakov. The new crew was to be Vikorenko and Sererov, but this may now change. Thus, the stimulating task of docking and setting up the new modules will now fall to the new crew, a prospect not exactly pleasing to Volkov.

One of the conversations overhead by Chris related to the new large Soviet shuttle BURAN. Krikalov spoke of wanting to perform some work in connection with the next flight, which could be manned. He referred to an integrated, circular orbit and was told that the number of orbits to be made by the coming BURAN mission would evolve later. He asked if the flight would be "...propositional controlled..." which evoked a positive answer. The linking, or perhaps even the docking of BURAN with MIR therefore exists as an exciting future possibility. A further plan, first mentioned on February 27, is to retrieve SALYUT-7 from orbit and to return it to earth using BURAN. That faithful Salut-7 module attached 19.965MHz beacon, so useful in propagation studies, will be sorely missed!

Re-entry entries

The faithful UoSAT-1 OSCARB-8 satellite, which has given such splendid service since its launch from Vandenberg, California at 1127UTC on 6 October 1981, is now returning to earth rather more rapidly than desired. Its drag factor (orbital decay) is showing a figure almost as high as the MIR space station, but sadly, unlike MIR, it has no Progress attached to help boost it up again! At the time of preparing this column, UoSAT-1 was at around 415km altitude and descending at an ever increasing rate of 330 metres per day. As it approaches more of earth's atmosphere, it loses its velocity, brakes and falls to a lower orbit, which brings it lower into more atmosphere, until
COMING IN 1990, A NEW AND PRESTIGIOUS EVENT
MARCH
9TH
AND
10TH
1990
HUGE EXHIBITION AREA RESTAURANTS AND BARS DISABLED FACILITIES
FREE PARKING FOR 3000 CARS ON-SITE LEISURE AND CAMPING FACILITIES

Traders wishing to exhibit at this exciting event, please contact
The Secretary, London Amateur Radio Show, 126 Mount Pleasant
Lane, Bricket Wood, St Albans, AL2 3XD. Telephone: 0923 678770.

PICKETS LOCK CENTRE, PICKETS LOCK LANE, EDMONTON, LONDON N9 (in the Lee Valley Leisure Park)

Practical Wireless May 1989 Issue

The Team TRX 404 CEPT CB Transceiver Reviewed

Wireless Goes to War - the first time Boer War Exploits

Valved Communications Receivers
The Collins 75A-2

Plus your Favourite Regular Articles

On Sale at your Newsagent NOW!

TAKE ADVANTAGE OF OUR SUBSCRIPTION OFFER

One Year
$17.00 UK
$19.00 Overseas

Three Year
$45.00 UK
$50.00 Overseas

Fill in the Order form below and post it to: PW Publishing Ltd., FREEPOST, Subscriptions Dept., Enefco House, The Quay, Poole, Dorset BH15 1PP (no stamp required). Credit Card Orders taken on (0202) 678558.

Overseas subscriptions outside Europe are now despatched by Accelerated Surface Post for faster delivery.

If you already have a subscription you can still take advantage of our offer, but you must quote your subscription number.

Please indicate the type of subscription required:

To: PW Publishing Ltd., FREEPOST, Subscriptions Dept., Enefco House, The Quay, Poole, Dorset BH15 1PP

Name..........................................................
Address.......................................................

I enclose cheque/PO (Payable to PW Publishing Ltd) £..................................

charge to my Access/Visa Card the amount of £.................................

Signature..........................................................

To commence with issue dated...............................................

Fees current at April 1989

Telephone: 0923 678770

Short Wave Magazine May 1989
eventually friction will burn it up on re-entry.

What is more, the elevating solar flux is causing our earths atmosphere by radiative heating, which in itself is further contributing enhanced decay to that in some cases, even more rapidly than first thought. The telemetry is showing signs of this frictional heating already, as the previous temperature of around -25°C is now up to -14°C and rising.

A contest is being run by AMSAT, ARISS, UK, the University of Surrey and by G3OR, with prizes being offered to he or she who most accurately predicts the time and day of the entry of OSCAR-9. AMSAT-UK are offering a selection of their computer software, with up to six guesses allowed from contestants. The University of Surrey are giving handsome UoSAT T-shirts to the winners, whilst your columnist is offering a 308 page colour illustrated hardback on the history of space travel. For this latter prize, we need a single time and date, 1 January to 31 December. A photograph of you and your station, or a good weatherstation picture, or a short write up on your interest and findings on satellites. All entries must be received by the contest organisers within one month of the earliest re-entry date prediction.

The current issue of Practical Wireless gives full details of the contest, the entry addresses for entries, plus some hints, tips and formulas on the best ways of calculating the descending and final demise of the satellite, which will aid in entering, a calculated probability rather than a wild "guessimation". Time of preparing this column, according to the variable accuracy of the numerous recent Keplerian element sets that the demise of the final demise of OSCAR-9 calculates from early as August 19 to as late as December 28. The peaks of probability occur in the first ten days of November.

Satellite Teach-in

Vinny has now written the following to a series of satellite teach-ins each Sunday at 1900 on 28.460MHz. The initial course is multiple choice questions, in which no one is starting on satellites, and future broadcasts will cover all aspects of space interest and a wide range of specialist subjects. Vinny should be a good signal throughout the year now that the ten metre band is showing good propagation.

Weather Satellites

Lawrence Harris reports that he has many follow ups to his valuable and appreciated information content that appears regularly in this column, with many callers keen to see his equipment. He replies to all questions, but rightfully expects a stamped self-addressed envelope to accompany the request. Part of his well stocked station is shown in Fig. 1, with Lawrence seated at the functioning end of things. This month he again furnishes us with some more topical data on the many new happenings on the weather satellite aspect of our hobby.

"The January to February period was marked by NOAA-9 being 'fixed', whilst NOAA-10 was "missing" says Lawrence. He found that METEOR's 2/6 and 2/17, on 137.40 and 137.62MHz respectively were normally on when over ground that was near full solar illumination, and that they both continued to operate normally, although showing the earlier related "sticky aperture" problems as they neared twilight conditions. Readers will recall that Lawrence first logged clock synchronisation problems with NOAA-9 on November 1st last year with the problem increasing with time. At one time NOAA-9 signals, being on the same frequency, were coinciding with those emanating from NOAA-11, despite the American statements that NOAA-9 would be switched off during such clashes of dual and mutual appearance. Lawrence observed a very curious effect on his monitor screen when he was able to observe that was initially a NOAA-9 picture of the western Atlantic change to slowly mix and intermingle with the incoming picture from NOAA-11. The merging pictures eventually turned to one of Europe only, as the NOAA-9 went below horizon.

"NOAA-9 was commanded off in early December only to come back on November 15 at 1423, to all intents and purposes with all systems correct," he writes. "However, the faults returned on December 17 and became worse. Nothing happened until January 20, when NOAA-9 was transmitting unmodulated frames. This continued until January 26 when a signal came from NOAA-9 with a normal signal, with fully synchronised pictures. At 137.40MHz October 10 only a visible picture was being transmitted, and the following pass at 1718UTC showed all was normal again.

Our regular correspondent tells us that NOAA-10 and 11, on 137.50 and 137.62MHz respectively continue normally. Now problems exist with the frequency clash between NOAA's 9 and 11, as NOAA-9 crosses NOAA-10s 0300 and 1500UTC, whilst NOAA-11 performs its passes at around 1300 and 0100UTC.

Sadly FEN-YUNG-1, the sitting Chinese weather satellite is still in operation, and is unlikely to be recoverable.

OKEAN-1, the oceanographic research satellite and COSMOS-1766, both on 137.40MHz (the same as METEOR-2/6-11) have been transmitting pictures with daily regularity. Lawrence points out that they are the only by ear, by listening to the signals only, it is apparent that they sound quite different. He uses a tape recorder to record the data from the transmissions, and is able to achieve perfect synchronisation when playing the tapes back later. "I have been getting very good results from all the different equipment formats," writes Lawrence. "The microwave sounder, visible light pictures, the sideways looking radar, and often inclusion of the "piano-key" telemetry all work well. The RADAR image shows very clear details, and, of course, it is cloud free. It often stops after a few minutes of operation, perhaps due to power constraints."

"Unlike previous oceanographic satellite transmissions, picture reception is no longer limited to just the eastern passes. I, and other enthusiasts, are now regularly picking up OKEAN on westerly passes covering the UK. I am hoping to complete a RADAR/Microwave image of the whole of the UK shortly," he concludes. "We shall have the opportunity of seeing one of these exciting OKEAN pictures in our next months column, as Lawrence has taken some photographs now awaiting processing."

Fig. 2
Many of the new DXers, who we welcome; read TV and Scrambled Signals, and who do have to use either the reception of radio and television signals from afar. Therefore, with this in mind, I decided to use the Trojan Cadmader light pen and Amstrad PCW to illustrate these points with a rough plan of the earth's atmosphere. The atmosphere was divided into two sections, the ionosphere and the troposphere because the likelihood of DXers having conditions prevalent on these two regions of the earth's atmosphere.

Broadly speaking, signals from about 10 to 30 MHz hop between the earth's surface and the upper – F2 region of the ionosphere before reaching their intended destination. These events do have to do with the reception of radio and television signals from afar. Therefore, with this in mind, I decided to use the Trojan Cadmader light pen and Amstrad PCW to illustrate these points with a rough plan of the earth's atmosphere. The atmosphere was divided into two sections, the ionosphere and the troposphere because the likelihood of DXers having conditions prevalent on these two regions of the earth's atmosphere.

When you read this, your log may already contain some of the lesser events indicating the start of the 1989 Sporadic-e season. If not, it should begin very soon. I was not a bit surprised to learn that those dedicated TVXers Edwina and Tony Manco (Belper) have added a Luxor full band unit and a 900mm dish antenna for satellite TV to their station. At present, they move the dish hand over about 8am at a time. By March 10, their Astra log read: Galavision (Spain); TVE1, RAI Uno, RAI Due; TV5 (France); Superchannel; SAT 1 and 3 SAT German, RTL + German speaking (Luxembourg); NRK scrambled (Norway); SVT (Sweden) scrambled; EuroSport, Holland (NER 1) test-card only not yet on full transmission, and finally, ScreenSport, Eurovision, Aargestei Earth Station, NASA WSN Station and Filmm scrambled. This is the first satellite TV report in the column, I wonder where it will lead?

On the subject of new equipment, Bob Brooks (Grange Sutton) has added a Grundig V5520 video recorder to his station. "It tunes through Bands I, II, III and u.h.f. and receives and records Teletext!" said Bob.

Band I

Around 1900 on February 3, Dave Coggin's (Knutford) received auroral reflected signals on Chs. E2 (48.25MHz) and Ia (53.75MHz). On March 18, Patrick Moore (Selsey) observed a giant sunspot group and, as expected, an aurora manifested late on the 18th, large enough to be observed even from the southern England. Fortunately it was an almost clear night and although the moon was bright, Joan and I observed a "white" light on the sky which is certainly a "white" light on the sky. The aurora was reflected off some of the sound and vision channels in Band I as the signals were reflected by the auroral display.

The level of auroral activity is also responsible for the "F2" openings seen by DXers during recent months, (see Fig. 1 in Band II DX). For instance, I received strong but too smearable to identify pictures via the "F2" region of the ionosphere on Ch. R1 (49.75MHz)continually between 0900 and 1100 on February 18 and 25. It is difficult to tell on a television dial whether such signals are on ch. E2 or R1. However, I proved the latter by using my ex-military R21 v.h.f. communications receiver to find the channel on which the associated vision pulses could be heard. Readers with scanners could set up a couple of memories to these vision channels ready for an immediate check when smearable pictures appear.

At 1100 on the 25th, the face of an announcer, with several images was very clear for a short time but it was still impossible to read the text on the screen. "F2 has been in everyday since the 10th. Some of it has been short-lived, only a minute or so," said Gary Smith (Derby). On the 13th and 14th, Garry saw the Iranian test-card, on Ch. E2, for almost an hour. At midday on the 15th he identified at least 2 strong African stations. Garry photographed a typical F2 picture, Fig. 1, which he received on Ch. E2 from an unidentified source between 0840 and 0920 on January 15.

Simon Hamer (New Radnor) received smearable F2 pictures, in the region of Chs. E2/R1 around 0800 on February 16, 18 and 21 and at midday on the 26th. Writing about the 26th, Simon said, "There were several stations with Arabic and Roman captioning. At 1210 a quiet was seen. . . . At 1220 a news bulletin was observed. Again several stations were being fed with the same programmes from two different sources for a few minutes, following some unusual transmissions which may have been from Radio Amman - ARA?" On the 19th, he saw a news bulletin from an unidentified source, and on the 21st, he had a similar effect from a "normal" source.

When you read this, your log may already contain some of the lesser events indicating the start of the 1989 Sporadic-e season. If not, it should begin very soon. I was not a bit surprised to learn that those dedicated TVXers Edwina and Tony Manco (Belper) have added a Luxor full band unit and a 900mm dish antenna for satellite TV to their station. At present, they move the dish hand over about 8am at a time. By March 10, their Astra log read: Galavision (Spain); TVE1, RAI Uno, RAI Due; TV5 (France); Superchannel; SAT 1 and 3 SAT German, RTL + German speaking (Luxembourg); NRK scrambled (Norway); SVT (Sweden) scrambled; EuroSport, Holland (NER 1) test-card only not yet on full transmission, and finally, ScreenSport, Eurovision, Aargestei Earth Station, NASA WSN Station and Filmm scrambled. This is the first satellite TV report in the column, I wonder where it will lead?

On the subject of new equipment, Bob Brooks (Grange Sutton) has added a Grundig V5520 video recorder to his
David Glenday (Airbroach) logged "warbles" and voices just below Ch. 1200, followed by the TCCP logo, for about 10 minutes at 1530 on December 29 and January 10. "The 3.5 hour time difference should be around the longitude of Moscow," said Rana.

Sporadic-E

At his home in Meerut, Lt. Col. Rana Roy saw a Russian clock showing 1200, followed by the TCCP logo, for about 10 minutes at 1530 on December 29 and January 10. "The 3.5 hour time difference should be around the longitude of Moscow," said Rana.

Simon received test-cards from Iceland (RUV Island) on February 19, Finland (YLET TV1) on the 21st and the USSR and Italy (RAI) on the 26th and 27th respectively. He got off to a good start in March with Denmark (DR), Finland, Germany (ARD/SWF1), Norway (Greipstad and Gulen), Sweden and the USSR on the 1st and Finland on the 6th.

The Mancinis saw various programmes, during the mornings, from Portugal RTP1 and Spain TVE1/2 on February 14, test-cards from Holland (PTT NED1) on days 13, 1, 18, 20 and 21, Norwegian regional stations Kongsmark and Bremeranger on the 13th and 20th respectively, Poland's (TVPI) test-card on the 28th, the HOBDOCTN (news) caption and Skiing from the USSR on the 18th and a programme schedule from Germany's ARD1 on March 5. David Glenday and Bob Brooks received programmes from Spain on the 10th and 14th respectively.

Tropospheric

Among the signals received by Garry Smith, in Band III, during the tropo-opening on January 16 was a test-card from Austria (ORF) and identical from the German regional Brogaczakriegel, Fig. 2, and NDR-3, Fig. 3. "Chris Howles alerted me that morning, he saw ORF FS2, on PM 5544, (test card) on Ch. E241," said Garry.

During the tropo-opening on March 5, Simon Hamer received pictures from Austria (ORF FS1), Belgium (BRT and RTBF), France (TFD), Germany (ARD/SWF1) and saw their news (Tagesschau), Holland (NED1/2/3), Ireland (RTÉ1 and Network 2), Luxembourg (RTL+) and Switzerland (+PTT SRG/) in Band III and Austria (ORF FS2), France Holland, Ireland and Switzerland (+PTT TS1) in the u.h.f. band. One of the films he saw on Radio Telefis Eireann was Haunters of the Deep, set in Cornwall. At 1900 on the 10th and 2020 on the 11th, he received pictures from France on two channels in Band III and about 6 spots in the u.h.f. band. In addition, on the 10th, he noted a very fluttery picture on Ch. E35 possibly "E.T.B." which serves the Basque region of Spain. "The suspected Spanish Basque E.T.B. made a reappearance for ten-minutes, again fluttery," said Simon on the 11th.

Edwina and Tony received pictures from France (Canal +) on March 2 and 5 and RTÉ1 on the 8th. While the atmospheric pressure was at the record low on February 25/26, David Glenday received good colour pictures from Bilsdale and as soon as the barometer began to rise Bilsdale had gone and Eyemouth took its place. "Eyemouth for me is an ultra-fringe local," said David. These must be interesting stations for checking conditions David, because I see that both transmitters carry BBC1 and 2 on Chs. 33 and 26.

The next three deadlines are May 15, June 19 & July 17.
NEW
RX-8 MULTIMODE RECEIVE
For the BBC computer

FAX screen and printer
PACKET HF and VHF
SSTV in colour
RTTY copies any signal
AMTOR/SITOR ARQ and FEC
MORSE best copy available
UoSAT 1 and 2
ASCII all speeds

Full specification in every mode. Printer and tape/disc support. Text store etc etc.
This is the ultimate receive system for the serious listener with a BBC computer.
We can’t begin to list all the features here so send for full information about it and all our other products.
RX-8 system (EPROM, interface, leads and instructions) £259.00 inc VAT and P&P.
For CBM64, Spectrum and BBC we still have our famous RX-4 program for RTTY, CW, SSTV, AMTOR ARQ. Tape £25, disc £27. TIF1 interface needed for CBM64 and BBC £20 kit, £40 ready made and boxed.

technical software
From, Upper Llandwrug, Caernarfon LL54 7RF
Tel: 0286 881886
It tells Julian Wood: Kenwood

Ron John Nash: Kenwood

Noel BST. Please along side your receiver

450 He various states members.

Calcutta India.

Max Louis Kenneth Curry: Sangean

Patient: Wratten:

Edwardson: Trio

Matsui at

162 MHz; Time

An recent issue of

Edwardson: Trio

rs

206

200

189

197

198

200

207

207

216

216

225

234

245

254

265

272

281

Nador, Morocco 171 (1200kW);

Sealouis, W. Germany 183 (2000kW); Monte Carlo via Roumoules 216 (1400kW); Junglinster, Luxembourg 234 (2000kW) and Tipaza Algeria 254 (1500kW).

No doubt his Beverage antenna is the key to obtaining such remarkable results and also accounts for the BBC Radio broadcasts on 1492 kHz at 5555 between 1000 and 1700. Three BBC transmitters share 198; Burghead (50kW), Droitwich (500kW) and Westergen (60kW).

An interesting report, which compares i.e. reception in the relative quiet of Selsey with that in Bus Torment, was sent along by Jon Baker. Jon logged four stations in Selsey which were inaudible in fact on Kaliningrad, USSR 171 (1000kW) S24 by day and 343 at night; DLF Munich, W. Germany 200, only heard during daylight; 333; Monte Carlo via Roumoules 216, only heard after dark, Par 322, Topolna, Czechoslovakia 272 (1500kW) S33 by day and 343 at night. Surprisingly, the broadcasts from Oranienburg, E. Germany 177 (750kW) were received during daylight in Selsey, but were audible by day and night in Surbiton! These results suggest that a remote country location is best for DXing, but no doubt the clear sea paths at Selsey played their part too.

A comparison between reception during daylight and after dark was made by Philip Rambaut in Macclesfield. Many of the signals he logged were heard during the day and at night, albeit with varying S/N ratios, but those from Azteal, W. Germany 200 (800kW) and Oslo, Norway 216 (200kW) could only be heard during daylight. At night three additional broadcasts became audible: Brussels, Belgium 193 (1200kW); Kristianow, USSR 234 (1000kW) and Luhij, Finland 254 (200kW).

MW Transatlantic DX

During a recent period of particularly good conditions, Roy Jackson (of DJQ) sent me interesting DXing and SSTV logs.

MW DX

2435 at 2335; also WSSH Boston, MS 1510, logged at 2345. Roy heard several more transatlantic signals later. These signals were all heard again during the next four nights.

Listening in Bristol at 0300. Tim Shirley heard WYX in Smyrna, GA March 17 and also WA6XCH who heard two signals, WNY at 300 and WYX, both at approximately 2330 and 2345...

In Wakefield, Mark Thompson has been experimenting with a 1 metre spiral loop consisting of four turns spaced 10mm apart and tuned by a twin-pant gong 50pF variable capacitor. It has resulted in a general improvement and doubling of the strength of the transatlantic DX signals and enabled him to add WCAU and WYX to his log, all fed by 0230. Apparently the loop has good directional properties which can be used to eliminate the European signals on 1008 when listening to WINS in New York on 1010. He noted that the programmes from CQJQ can be received more clearly via CQJQ in Grand Falls on 680.

Nador, Morocco 171 (1200kW);

Sealouis, W. Germany 183 (2000kW); Monte Carlo via Roumoules 216 (1400kW); Junglinster, Luxembourg 234 (2000kW) and Tipaza Algeria 254 (1500kW).

No doubt his Beverage antenna is the key to obtaining such remarkable results and also accounts for the BBC Radio broadcasts on 1492 kHz at 5555 between 1000 and 1700. Three BBC transmitters share 198; Burghead (50kW), Droitwich (500kW) and Westergen (60kW).

An interesting report, which compares i.e. reception in the relative quiet of Selsey with that in Bus Torment, was sent along by Jon Baker. Jon logged four stations in Selsey which were inaudible in fact on Kaliningrad, USSR 171 (1000kW) S24 by day and 343 at night; DLF Munich, W. Germany 200, only heard during daylight; 333; Monte Carlo via Roumoules 216, only heard after dark, Par 322, Topolna, Czechoslovakia 272 (1500kW) S33 by day and 343 at night. Surprisingly, the broadcasts from Oranienburg, E. Germany 177 (750kW) were received during daylight in Selsey, but were audible by day and night in Surbiton! These results suggest that a remote country location is best for DXing, but no doubt the clear sea paths at Selsey played their part too.

A comparison between reception during daylight and after dark was made by Philip Rambaut in Macclesfield. Many of the signals he logged were heard during the day and at night, albeit with varying S/N ratios, but those from Azteal, W. Germany 200 (800kW) and Oslo, Norway 216 (200kW) could only be heard during daylight. At night three additional broadcasts became audible: Brussels, Belgium 193 (1200kW); Kristianow, USSR 234 (1000kW) and Luhij, Finland 254 (200kW).
In New Radnor, Simon Hamer picked up two seldom mentioned broadcasts from Icoland at 0130. His log also includes notes on Antipode 1100, which has not been reported for some time and several other stations in the Caribbean area.

Other MW DX
Listening at 2157 in Sunderland, Bob Barr heard a broadcast in Farsi from Isfahan, Iran on 1467 at a distance of over 4000km! He logged them at 2322 and made a short recording of it which he then compared with a s.w. broadcast so as to confirm the language.

Stations in Algeria, Egypt, Morocco and Tunisia were logged at night by Mark Thompson. He adopted an unusual approach of ignoring all broadcasts except for those in Arabic. Mark then proceeded to identify the stations by comparing them with similar frequencies in the m.w. and s.w. bands. This task was simplified by making use of memories.

A visit to Sidmouth enabled Sheila Hughes to try a little m.w. DXing from a new location. Sheila picked up a number of broadcast signals via sky wave paths after 2200, the most distant from Albania and Italy.

Broadcasts from Scandinavia have been attracting Edward Turnball in Gosforth. Owing to the clear paths across the North Sea, reception is good during daylight. An outstanding signal reaches him from Pori, Finland at 0530 at all times. They broadcast in Finnish, Swedish, English, German and occasionally French. The broadcasts from Norway via Kvitsøy 1314 were logged by David Middlemiss in Eyemouth. He rated them as SIO 444 during daylight.

A useful tip when noting the exact frequency of a station was sent in by Matthew Clarke in Birmingham. He says, "In Europe the frequencies of m.w. stations can be checked to see if they are correct by adding the digital dights together. The total will either be 9 or one of its multiples (e.g. 18)."

MW Local Radio DX
The new local radio station Wiltsire Sound in Swindon will no doubt welcome detailed reception reports on their broadcasts via Lacock 1332 and Swindon 1368, but do remember to include an i.s.e. if you require a QSL letter. They have already been heard well outside their intended service area. In Luton, Louis Whitfield rated the Swindon signal as 2223 during daylight, but he reported interference from the R. Sussex Dukhurst transmitter on 1368 (5000W) at night, which degraded the signal to 12112.

Both transmissions are reaching New Radnor during the day, but Simon Hamer says that the Swindon transmissions interfere with Mark R.V. via Foxdale IOM also on 1368, he can retrieve the Manx signal by using a "Soogle Loop. At night Simon experiences little difficulty in receiving the sky wave signal from Manx R.

Signals from Hereford and Worcestershire are also being heard in this area. Their transmission via Worcester on 718 was rated as 444 by David

Written in Cambridge during the day. It is also being received very well in Denbigh by Martin Dool, but due to a pirate station their 819 transmission via Hereford suffers from some co-channel interference. Simon Hamer is able to receive both transmissions very clearly by day and night.

Both transmissions are reaching Mark Thompson in Wakefield during daylight He logged 738 as SIO 444 at 0950 and 819 as 232 at 0959. The improved performance of his new loop enabled him to log two stations which were hitherto barely audible: R. Solent (975kW) SIO 323 at 2200 and R. Tay 1584 (0.21kW) SIO 222 at 0645.

The next three deadlines are May 15, June 19 & July 17.

---

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

<table>
<thead>
<tr>
<th>City</th>
<th>Frequency</th>
<th>Signal Strength</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeds</td>
<td>819</td>
<td>801</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Dxers:
- A: Jon Baker, Selby.
- B: Ian Bond, Wirral.
- C: Matthew Clarke, Birmingham.
- D: Alan Curry, Stockton-on-Tees.
- E: Martin Dool, Denbigh.
- F: Simon Hamer, New Radnor.
- G: Francis Heane, Bristol.
- H: Sheila Hughes, Northants.
- I: David Middlemiss, Eyemouth.
- J: George Milmore, Woolton, I.O.W.
- L: P. Parker, Reading.
- N: Mark Selby, Aldershot.
- O: Tim Shirley, Bristol.
- P: Jurgen Thié, Spain.
- Q: Mark Thompson, Wakefield.
- R: Phil Townsend, London.
- S: Neil Wheatley, Newcastle-upon-Tyne.
- T: Louis Whitfield, Luton.
- U: Martin Dool, Denbigh.
- V: David Whitfield, Cambridge.

In Leeds, Chris Nickyl logged three stations during the evening which he had not heard before: R. Broadland via Brundall 1152 (0.83kW), R. Forth via Colinswell 1548 (2.4kW) and Northants 86 via Kings Heath 1577 (0.7kW). P. Parker in Reading compiled his first log for 1988 including R. Norfolk via Postwick 856 (1.5kW) and via West Lynn 877 (0.3kW), both were heard during daylight.

In London, Phil Townsend spent a good deal of time trying to find the antennas with his S.E.M. QRM eliminator in an attempt to overcome the interference from the electric trains which pass nearby. Having failed to obtain satisfactory results, he discovered that the interference was caused by the QRM eliminator feeding into the receiver direct. After removing the paint between the joints in the case of his Lowe SRX-30 receiver and then earthing it, the eliminator became more effective, but Phil has not yet managed to get it to eliminate the crackles, so further antenna experiments are now proceeding.

---

**SEEN & HEARD**

---

Short Wave Magazine May 1989

43
Short Wave DX

Solar activity is increasing faster than expected and it now seems that the peak of this sunspot cycle (No. 22) will be the highest since records began in 1755.

From time to time the generally excellent conditions in the 25MHz (11m) band have been disturbed and very few stations have been able to operate and complete fade-outs (s.i.d.) have resulted. RSA in Johannesburg 25.850 (0900-1050, Eng to UK, S. Africa 1400-1556) have been reaching their target very well during most days. In Sutton-in-Ashfield, Noel Compston rated them as SIO 444 at 1445.

R. Norwegian International, Oslo has exported a Sunday LR broadcast schedule to include listeners in additional target areas. Various beam headings are involved, so their transmissions at predetermined (350kW), Kvitsoy (500kW) and Sveio (500kW) time-share their broadcasts on 25.780 MHz. Programmes in Norwegian are beamed to Austria, Middle East 0600-0645; Africa 1000-1045 (Eng on Sundays) 2000-2145, 1445-1545, 1800-1845; S. Africa, Africa 1100-1145; E. Africa, Middle East 1400-1445.

The RFI schedule could also include Canada, because Alan Roberts says that their transmission to Africa is reaching so well in Quebec around 1230 despite their beam heading of 170 degrees. Alan has noted an improvement in the reception conditions during the last few weeks and he can now receive the BBC World Service via Daventry 25.780 (Eng to E. Asia, Africa 1100-1515) from 1240 onwards; RSA 25.790 from 1400 onwards; RFI via Issoudun 25.810-25.850 to 2000 onwards to 0900-1556.

In the final analysis, however, it means that the results are: Alan Roberts, Sheffield; E. Reece, London; Peter Morgan, Newport; Tim Shirley, Bristol. Those heard during the early morning are: R. Japan via Moyabi 21.640 (Eng, Japanese station, East 1500-1700) 2322 to 1530 by Leo Barr in Sunderland; R. DW via Cyclons 21.680 (Ir, Hi, Eng, to S. Asia 1600-1645) 0444 at 0821 by Kenneth Reece in Preston; R. Moscow, USSR 21.635 (Eng, Ind to S. Asia 2300-1230) 333 at 0005 by Mal Tedds, Nottingham.

Later, Vatanic, R. Rome 21.465 (Eng, Fr, Port to Africa 1100-1220) was heard in Padova; R. Hungary; RF Paris via Issoudun 21.645 (Fr, Sp to C. America 1130-1400) was noted as 3333 at 1218 by Alex Macdonald in London: Voice of the UAE, Dubai Ab 21.730 (Ar to Middle East 0600-1600) 444 at 1240 by Philip Rampton, Johannesburg; R. 21.590 (Eng to S. Asia 1300-1355) 4444 at 1300 by Alan Curry in Stockton-on-Tees; R. Sweden via Horby 21.615 (Eng, Sw, Fr to USA 1400-1530) SIO 555 at 1410 by Kenneth Buck in Edinburgh, R. Japan via Moyabi 21.700 (Eng, Japanese station, East 1500-1700) 2322 to 1530 by Leo Barr in Sunderland; R. DW via Cyclons 21.680 (Ir, Hi, Eng, to S. Asia 1600-1645) 0444 at 0821 by Kenneth Reece in Preston; R. Moscow, USSR 21.635 (Eng, Ind to S. Asia 2300-1230) 333 at 0005 by Mal Tedds, Nottingham.
YOUR ONE STOP LISTENER SERVICE!
HUGE STOCKS - BEST PRICES - GOOD BACKUP - FREE SECURICOR
MOST EVERY ITEM IN THIS MAGAZINE FROM STOCK!

SONY AIR-7 HAND HELD AM/FM 108-175MHz
+ LW/MW/FM UNBEATABLE VALUE!
The best VHF monitor there is. That is a fact! 108-175MHz plus LW/MW/FM broadcast. Covers all marine VHF, FM, LCD display memories scanning, lockout, priority etc. Suppliers are short but we are the UK's largest stockist so check with us!
£227 FREE SECURICOR

SONY ICF6700DS PORTABLE COMMUNICATIONS!
Not a toy, but a serious communication receiver 150kHz-300MHz AM/SSB plus FM 76-154MHz Digital, readout, memories, clock and provision for external antenna. Listen to the DX at work! Mains or battery.
New SW-1 In stock £249 £159 FREE SECURICOR

SCANNING AERIALS

CLP 5130 Beam 13dB gain! Illustrated above, this beam antenna covers 105-150MHz. A brilliant gain of up to 10dB and a front to back ratio of 18dB provides the means dramatically improving reception. With a VSWR better than 2:1 it can also be used for transmission up to 500 watts.
£99.00 plus post £3.00

CLP 5130 50MHz-1300MHz version in stock £179.00 + £7.50 Securicor

D130N Discane
The D130N antenna is the leader in discanes and is used by military and research establishments. Write for better recommendation. Covering 25-1300MHz with low VSWR, it is supplied complete with 50 ft of ultra low loss cable and 6 plugs.
£82.00 plus post £3.00

LISTENER ANTENNAS

20 130 Discane 25-1300MHz £82.00 (2.00)
CLP1510 Log aerial 150-1300MHz £89.00 (2.00)
Rooney Discane 70-500 MHz £32.00 (2.50)
Swin Jim 5m vertical £95.00 (2.50)
GBV 80-150m dipole 10ft £169.00 (1.50)
GBV 40-10m dipole 5ft £149.00 (1.50)
Royal Blue Monopole 30-200MHz £29.00 (2.00)
Son 14 15MHz-30MHz £49.00 (2.00)
Son 14 VHF 30MHz £45.00 (2.00)
Racing D100 Active antenna £99.00 (—)
AT100ATU 150kHz-30MHz £99.00 (2.50)
CXTX 3 way oso switch £65.00 (1.50)
Antenna Groundplane 115 135MHz £195.00 (2.50)
PVC wire per metre £0.15 (—)
0.75 5ft insulators £0.75 (0.20)
$0.25 dipole centre insulators £2.25 (0.75)
Self Assembling Tape £4.49 (0.75)
FRA7700 Yorvic active antenna £44.95 (2.50)
FRA7700 Pa ATU 150kHz-30MHz £59.00 (2.00)

RECEIVERS (Free delivery)

R5000 Short Wave 150-300MHz £875.00
R2000 Short Wave 150-300MHz £595.00
VC20 VHF con. for R5000 £147.50
VC10 VHF con. for R2000 £161.95
FRG8800 150kHz-30MHz £638.00
FRG8800 VHF converter £100.00
IC-211 Short Wave 150MHz-30MHz £825.00
Sony 7500ST Short wave £169.00
Sony ICF3010 handheld Short wave + all £329.00
Low HF135 Short wave £375.00
FRG8800 Scanner 50-950MHz £509.00
IC-2000 Scanner 25-2000MHz £597.00
AOR 2002 Scanner 25-150MHz £475.00
Sony Air-7 VHF scanner £247.00
Sony Pro-60 VHF + SW scanner £325.00
R535 Air band monitor £215.00
R535 Air band scanner £249.00
R535 Air band scanner £125.00
Win 08 Air band scanner £175.00

WRITE FOR A COPY OF OUR LATEST PRICE LIST AND CATALOGUE
We stock a wide range of products for the radio enthusiast by all the major manufacturers and suppliers. Unfortunately, within the scope of this advertisement it is only possible to list a fraction of the range that we stock. We have for some while had one of the best mail order price lists available listing over 700 items. This has now been combined with an illustrated catalogue of some of the special items we import, many of which you will not have seen before. And a copy of it is yours for the asking!

WATERS STANTON
RETAIL & MAIL ORDER - 18-20, Main Road, Hockley, Essex SS5 4QS.
Tel: (0702) 206835, 204965
RETAIL ONLY - 12, North Street, Hornchurch, Essex RM11 1QX
Tel: (0402) 44765
Visa and Access by telephone
24hr Answerphone Early Closing Wednesday
**STEPHENS-JAMES LTD.**

47 WARRINGTON ROAD, LEIGH, LANCs. WN7 3EA

Telephone (0942) 676790

Turn at the Greyhound Motel on the A580 (East Lancs. Road).

**SHOP HOURS**

Mon-Fri 9.30-4.30pm

Sat 9.30-4.30pm

24 HOUR MAIL ORDER SERVICE

**TEN-TEC**

We are pleased to announce we are now the official North-West Stockist for the full range of the TEN-TEC range of HF equipment.

- "Paragon" HF transceiver with full general coverage receive facilities. £1836.00
- "Corsair" MkII HF Amateur Band Transceiver. £1300.00
- "Argory" MkII HF Amateur Band Transceiver. £1436.00
- "Century 22" CW only Transceiver. £868.00

FULL RANGE OF ACCESSORIES AVAILABLE

SEND S.A.E. FOR DETAILS

---

**ANTENNA RANGE**

- **Cushcraft**
  - A4 3 Element Tribander Beam... £282.99
  - A4 4 Element Tribander Beam... £363.36
  - 10-300 3 Element 10m Monobander. £115.04
  - 15-300 3 Element 15m Monobander. £139.70
  - 20-300 3 Element 20m Monobander. £206.21
  - A8/2 Blend Vertical 25m High. £164.36
  - AP/5 Band Vertical 25m High. £123.38
  - 18 Element 2m Boomer Antenna. £108.94
  - 15 Element 2m Boomer Antenna. £89.26
  - Ringo Range 2m Vertical. £47.96
  - Buttermilk HRF05 6 Element Vertical Antenna. £168.00

- **Explorer 4 Element Tribander** Butternut £77.05

- **ATV 5 Band Vertical** £148.00

- **Astellon**
  - TS2 MK3 3 Element Tribander. £348.00
  - TS2 MK3 4 Element Tribander. £323.00
  - TS1 MK3 30/20/15/10 Triband dipole... £117.30
  - VNC 2 Triband Vertical. £171.58
  - DB4 6.9 Element Beam. £129.37
  - 4V1/4-4m 4 Element Beam. £44.46
  - 4V5/8 6m Element Beam. £54.05
  - LW5/2m Element 2m. £20.83
  - LW5/2m Element 2m. £26.36
  - PB4/14m Parabeam. £77.06
  - SBY/3 Element Crossed. £39.98
  - SYl/3 Element Crossed. £50.80

- **HAND HELD SCANNING REDEIVERS**
  - W1/10 Airband. £176.00
  - AB1/10 Airband. £193.00
  - ARS/101. £236.00
  - Basestation Receiver AR200. £487.00

---

**Kenwood Range**

- TS450 HF Transceiver. £199.95
- AT-40 Automatic Antenna tuner. £240.98
- SP940 Speaker with filters. £187.95
- TS440S, HF Transceiver. £138.91
- AT-44 Automatic Antenna tuner. £144.92
- PS300 30w power supply. £221.49
- TS1406 HF transceiver. £882.00
- PS430 power supply. £172.76
- SP430 Speaker. £140.81
- AT-230 Automatic Antenna tuning unit. £369.95
- TS230 Antenna tuning unit. £206.97
- TS2300 Speaker with filters. £149.95
- TS3221 LF line amplifier. £148.60
- MD80' Basic station microphone. £48.00
- MD90A Deluxe microphone. £99.22
- TR7512 2m Multimode Mobile Transceiver. £598.00
- TR816 70cm multimode transceiver. £888.00
- TM320E 4S watt 2m Transceiver. £485.00
- TM221E 6S watt FM Transceiver. £317.00
- TM421E 6S watt 3m, 35 watt Transceiver. £372.00
- TS100S HF Transceiver + Antenna. £99.95
- TH25 FM Handheld Transceiver. £258.00
- TH2202 Handheld FM Transceiver. £215.28
- TH2218 Handheld FM Transceiver. £252.95
- TH400E 2m Handheld FM Transceiver. £298.00
- R2000 General coverage receiver. £975.00
- VC200 HF Converter 106-174 MHz. £141.21
- R2000 General coverage receiver. £858.00
- TS700 Dual Band Transceiver. £1468.00
- FS9600 Full range of accessories. £237.94
- TS808 Diode Band Transceiver. £1488.00
- HF meter, DC leads, Antennas etc.
- Full size G3BU, Antenna £16.50
- Half size £14.90
- High Power 7 MHz traps £19.90
- 3.3 Reha traps £8.90
- 200 watt, 6MHz traps £9.90

---

**ERATON APPLICATIONS LTD.**

**WHAT'S NEW?**

Excellent. Amazing. Unbelievable. We don't use such words to describe the Microreader but many of our customers do. What then would they say about the MkII Microreader? With three times more signal processing, six times more power packed into this small unit the MkII Microreader will be ahead of anything in it's class well into the nineties. The question most people ask is "Are they as good as people say they are?" To which the answer must be now or they're actually bad. But don't just take our word for it, we will be pleased to demonstrate the MkII Microreader together with our amateur products at most rallies this year.

**FEATURES**

1. SMALL & COMPACT, Ideal for the small shack. The built-in LCD display eliminates the need for separate measurement systems.
2. LOW COST, Compare this with any other self-contained reader with these features. Only the highest quality components are used to guarantee performance and reliability.
3. EASY TO USE. No computers to set up or lapes to load. No filters, interfaces or special leads. Just connect to a key socket or speaker and switch on.
5. RTTY. Decodes and displays both commercial and amateur RTTY. Built-in shift indicator. Automatic polarity sense. Unique synchronous sampling system for high noise immunity and wide operating range. Two dedicated control processors to decode and display text (45/50 '75 Band — 170/425/850 Hz shift).
6. TUTOR. The built-in tutor contains all the features you would expect including audio repeat. Plus the ability to see what's being sent or what your sending!
7. RIGBASE. For direct connection to portable terminal units or printers at 1200 to 9600 baud or to our intelligent buffer/interface at up to 1 Mega baud.

**PRICE £139.95**

Includes VAT and Postage

Full 12 months guarantee Also available from:-
R.A.S. (Nottingham) or CRT Jersey CI

---

**ENTROPY MICROREADER MkII**

**To order or for more information on this other ERA products just ring or drop us a line**

**ERA Ltd**
26 Clarendon Court
Winwick Quay
Warrington WA2 8QP. Telephone (0925) 573118
often peaks to 433 by 0900. In Spain, Jurgen Thiell has been hearing their broadcasts via Shippton 17.705 (Eng) or W. USA 1200-0800) from 2200 and via Darwin 17.75 (Eng to SE Asia 0000-0600). Broadcasts to other areas were noted too. They stemmed from KYOI Saipan, N. America via 1600-1700 at E Asia 0200-0800) 43483 at 0645 by Kenneth Reece; R. Moscow, USSR 17.565 (Eng, Fr to W. Africa 1730-2000) 2221 by Alex MacKow. BBC via Mahe, Seychelles 17.885 (Eng to E. Africa 0900-1400) and 1115-1330 by R. Oman, Thumrait 17.35T (Ar to Middle East, N. Africa 0800-1700) 33320 at 1500 by Christian Pritchett; RTM Tanger 17.55, Fr (Eng to Middle East, N. Africa 1400-1700) 534 at 1558 by Neil Wheatley in Newcastle-upon-Tyne; VOA via Monrovia 17.740 (Eng to W. Africa 1600-1630) logged by John Coulter at 1605; VOA via Greenhill 17.545 (Eng to E. Africa 1300-1830) 3540 at 1900 by Ivar Folland; BBC Mal 1730-2200) 3540 at 1900 by Fred Pallans in Storrington; R. Netherlands via Bonn 17.565, Fr (Ar, Fr, Du to W. Africa 1730-2000) 1924 by Mal Tedds; BBC via Antigua 17.760 (Eng to S. America 2000-2115) 33320 at 2000 by Mark Selby; BBC via Grenville 17.855 (Eng to W. Africa 1600-2000) 2222 at 2131 by Ian Guevara in Stockton; VOA via Tinag 18.720 (Eng to E. Asia 2000-0100) 54444 at 0047 by Richard Radford-Reynolds South Africa via VOA, CA 17.775 (Eng, to C. America 1400-0100) 24333 at 0532 by David Williams.

In contrast, relatively few of the broadcasts to Europe were logged. Among these were the broadcasts from the UAE, Abu Dhabi 17.820 (Ar 0800-1600) 4343 at 1425 by Kenneth Greeton; FL 17.75 (Eng 1700-1745) 43433 at 1705 by John Nash in Brighton; R. RSA, Johannesburg 17.795 (Eng 1800-1915) 5443 by Mark Selby; RC via Sackville 17.820 (Rus, UK, Fr, Eng, Pol, Ger 1430-1800) 55444 by Mark Selby; R. HCJB, Quito 7.790 (Cz, Ger, Eng, Sw, Norw, Dan, Fr, Sp 1800-2230) 43443 at 2140 by Sheila Hughes. Broadcasts to Europe have been open to the UK in the 15MHz (19m) band. The good propagation conditions enable QSL cards. Remember that New Zealand to reach the UK though intended for other areas. During some days however, very little DX could be received because solar events disrupted reception.

Ron Pearce picked up R. Australia’s broadcasting to the central Pacific areas via Shippton 15.160 (Eng 2100-0700) at 2100. Their transmissions were noted by John Perry in Northwich at that time. Around 0500, David Edwards heard a few transmissions from Saint John's in Newfoundland at 1600-2000) 2222 at 0544 by Kenneth Greeton; their transmissions via Camaroon to E. Africa 1500-1800) 43443 at 1055 by Alex MacKow; R. RSA, Johannesburg 15.365 (Eng 1800-2055) as “perfect reception” at 1900 by Richard Radford-Reynolds South Africa via VOA, CA 17.775 (Eng, to C. America 1400-0100) 24333 at 0532 by David Williams; R. RSA, Johanneburg 15.365 (Eng 1800-2055) as “perfect reception” at 1900 by Richard Radford-Reynolds South Africa via VOA, CA 17.775 (Eng, to C. America 1400-0100) 24333 at 0532 by David Williams.

The 13MHz (22m) band has attracted another broadcaster. Jordan’s in Amman. Their news bulletin in English on 13.685 was rated as 2234 at 1400 by Roy Patty. Other broadcasters using the band include SRI via Sottos, Switzerland 13.685, (It, Fr, De, Ru, Sl) 4343 at 1333 by Mark Selby; R. RSA, Johannesburg 15.365 (Eng 1800-2055) as “perfect reception” at 1900 by Richard Radford-Reynolds South Africa via VOA, CA 17.775 (Eng, to C. America 1400-0100) 24333 at 0532 by David Williams; R. RSA, Johanneburg 15.365 (Eng 1800-2055) as “perfect reception” at 1900 by Richard Radford-Reynolds South Africa via VOA, CA 17.775 (Eng, to C. America 1400-0100) 24333 at 0532 by David Williams.

The 9MHz (31m) broadcasts from R. Australia to Europe and S. Asia via Shippton 26.550 (Eng 0700-1030) are being received here quite well. David Minter (Portland) noted 43333 at 0300 which is typical now. Their transmissions via Shippton to S.
<table>
<thead>
<tr>
<th>Freq (kHz)</th>
<th>Station</th>
<th>Country</th>
<th>Power (kW)</th>
<th>DXer</th>
</tr>
</thead>
<tbody>
<tr>
<td>520</td>
<td>Hof-Saale</td>
<td>W.Germany</td>
<td>0.2</td>
<td>M*,P*,U*</td>
</tr>
<tr>
<td>531</td>
<td>Am Bedia</td>
<td>Algeria</td>
<td>600</td>
<td>H*,O*,P*,T*</td>
</tr>
<tr>
<td>531</td>
<td>Asisbiz</td>
<td>Algeria</td>
<td>100</td>
<td>J*,M*,P*,U*</td>
</tr>
<tr>
<td>540</td>
<td>Berneck</td>
<td>Switzerland</td>
<td>100</td>
<td>O*,P*,T*,U*</td>
</tr>
<tr>
<td>540-1</td>
<td>BRT-2 Wavre</td>
<td>Belgium</td>
<td>150/50</td>
<td>J*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>540</td>
<td>Sirk Benour</td>
<td>Morocco</td>
<td>600</td>
<td>H*,P*</td>
</tr>
<tr>
<td>549</td>
<td>Les Trembles</td>
<td>Algeria</td>
<td>600</td>
<td>H*,O*,P*,U*</td>
</tr>
<tr>
<td>567</td>
<td>RTF 1 Tullumore</td>
<td>S.Ireland</td>
<td>500</td>
<td>G*,H*,T*,U*</td>
</tr>
<tr>
<td>567-1</td>
<td>West Berlin</td>
<td>W.Germany</td>
<td>100</td>
<td>H*,T*</td>
</tr>
<tr>
<td>576</td>
<td>R.DDR Swinemuiden</td>
<td>E.Germany</td>
<td>250</td>
<td>P*,T*</td>
</tr>
<tr>
<td>585</td>
<td>Orf Wien</td>
<td>Austria</td>
<td>600</td>
<td>H*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>585</td>
<td>RNE 1 Madrid</td>
<td>Spain</td>
<td>200</td>
<td>H*,T*</td>
</tr>
<tr>
<td>586</td>
<td>HFR Frankfurt</td>
<td>W.Germany</td>
<td>400</td>
<td>J*,P*,T*</td>
</tr>
<tr>
<td>603</td>
<td>BBC-R4 Newcastle</td>
<td>UK</td>
<td>2</td>
<td>K*,E*,M*,K*,Q*,P*,T*,U*</td>
</tr>
<tr>
<td>612</td>
<td>RTE 2 R.Ireland</td>
<td>S.Ireland</td>
<td>100</td>
<td>E*,M*,P*,T*,U*</td>
</tr>
<tr>
<td>621</td>
<td>RTBF-Wave</td>
<td>Belgium</td>
<td>300</td>
<td>J*,P*,O*,T*,U*</td>
</tr>
<tr>
<td>621</td>
<td>RNE 1 Santa Cruz</td>
<td>Tenente</td>
<td>100</td>
<td>P*</td>
</tr>
<tr>
<td>630</td>
<td>Vigo</td>
<td>Norway</td>
<td>100</td>
<td>B*,S*</td>
</tr>
<tr>
<td>630</td>
<td>Tunis-Dessida</td>
<td>Tunisia</td>
<td>600</td>
<td>P*</td>
</tr>
<tr>
<td>639</td>
<td>Sersopp</td>
<td>USSR</td>
<td>700</td>
<td>G*</td>
</tr>
<tr>
<td>639</td>
<td>BBC Lilmax</td>
<td>Czechoslovakia</td>
<td>500</td>
<td>M*</td>
</tr>
<tr>
<td>648</td>
<td>BBC Oran</td>
<td>Algeria</td>
<td>1500</td>
<td>J*,K*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>648</td>
<td>Palma Majorca</td>
<td>Spain</td>
<td>10</td>
<td>O</td>
</tr>
<tr>
<td>657</td>
<td>BBC Wales</td>
<td>UK</td>
<td>2</td>
<td>E</td>
</tr>
<tr>
<td>666</td>
<td>Bodenseesender</td>
<td>Germany</td>
<td>300/180</td>
<td>H*,L<em>T, T</em></td>
</tr>
<tr>
<td>670</td>
<td>Monte Carlo</td>
<td>Monaco</td>
<td>600</td>
<td>H*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>675</td>
<td>Hilversum-3 Logic</td>
<td>Spain</td>
<td>250</td>
<td>H*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>679</td>
<td>RNE 1 Sevilla</td>
<td>Spain</td>
<td>3000</td>
<td>H*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>684</td>
<td>Bograd</td>
<td>Yugoslavia</td>
<td>2000</td>
<td>Q*</td>
</tr>
<tr>
<td>693</td>
<td>BBC Drottah</td>
<td>UK</td>
<td>150</td>
<td>O</td>
</tr>
<tr>
<td>702</td>
<td>Monte Carlo</td>
<td>Monaco</td>
<td>300</td>
<td>O</td>
</tr>
<tr>
<td>702</td>
<td>Aachen/Merseburg</td>
<td>W.Germany</td>
<td>5</td>
<td>H*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>711</td>
<td>Rennes 1</td>
<td>France</td>
<td>300</td>
<td>J, O</td>
</tr>
<tr>
<td>711</td>
<td>Heddernhein</td>
<td>W.Germany</td>
<td>5</td>
<td>O*,U*</td>
</tr>
<tr>
<td>720</td>
<td>BBC Lisnagasy</td>
<td>N.Ireland</td>
<td>10</td>
<td>O</td>
</tr>
<tr>
<td>720</td>
<td>BBC Lisboa</td>
<td>Portugal</td>
<td>0.5</td>
<td>J*,K*,O*,T*</td>
</tr>
<tr>
<td>729</td>
<td>WDR 2 Langenport</td>
<td>W.Germany</td>
<td>200</td>
<td>O</td>
</tr>
<tr>
<td>729</td>
<td>RTE 1 Cork</td>
<td>S.Ireland</td>
<td>10</td>
<td>S*</td>
</tr>
<tr>
<td>729</td>
<td>Oviedo</td>
<td>Spain</td>
<td>5</td>
<td>L*,T*</td>
</tr>
<tr>
<td>730</td>
<td>Paris</td>
<td>France</td>
<td>4</td>
<td>J</td>
</tr>
<tr>
<td>730</td>
<td>RNE 1 Barcelona</td>
<td>Spain</td>
<td>250</td>
<td>L*,U*</td>
</tr>
<tr>
<td>747</td>
<td>Hilversum-2 Holm</td>
<td>Spain</td>
<td>400</td>
<td>H*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>756</td>
<td>Brunswick</td>
<td>W.Germany</td>
<td>800/320</td>
<td>H*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>756</td>
<td>Sorts</td>
<td>Switzerland</td>
<td>500</td>
<td>J*,T*</td>
</tr>
<tr>
<td>763</td>
<td>Burg</td>
<td>E.Germany</td>
<td>1000</td>
<td>H*,O*,P*,U*</td>
</tr>
<tr>
<td>792</td>
<td>Sevilla</td>
<td>Spain</td>
<td>20</td>
<td>L*</td>
</tr>
<tr>
<td>801</td>
<td>BBC via Munich</td>
<td>W.Germany</td>
<td>420</td>
<td>L*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>810</td>
<td>BBC Westerlund</td>
<td>W.Germany</td>
<td>100</td>
<td>J*,K*,T*</td>
</tr>
<tr>
<td>810</td>
<td>Warsaw</td>
<td>Poland</td>
<td>300</td>
<td>J</td>
</tr>
<tr>
<td>837</td>
<td>Nancy</td>
<td>France</td>
<td>200</td>
<td>J*</td>
</tr>
<tr>
<td>837</td>
<td>R.Popular, Seville</td>
<td>Spain</td>
<td>10</td>
<td>L*</td>
</tr>
<tr>
<td>844</td>
<td>Aume</td>
<td>France</td>
<td>540</td>
<td>G*,H*,J*,T*</td>
</tr>
<tr>
<td>855</td>
<td>Murcia</td>
<td>Spain</td>
<td>125</td>
<td>L*,T*</td>
</tr>
<tr>
<td>854</td>
<td>Sarant</td>
<td>Egypt</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>864</td>
<td>Paris</td>
<td>France</td>
<td>300</td>
<td>J*</td>
</tr>
<tr>
<td>864</td>
<td>AFN Frankfurt</td>
<td>Germany</td>
<td>150</td>
<td>J*,E*,F*,H*,J*,L*,T*</td>
</tr>
<tr>
<td>864</td>
<td>BBC Washford</td>
<td>UK</td>
<td>70</td>
<td>A*,K*,G*,T*</td>
</tr>
<tr>
<td>864</td>
<td>Algiers</td>
<td>Algeria</td>
<td>600/300</td>
<td>H*,O*,P*,T*,U*</td>
</tr>
<tr>
<td>900</td>
<td>Milano</td>
<td>Italy</td>
<td>600</td>
<td>G*,L*,U*</td>
</tr>
<tr>
<td>918</td>
<td>Ripiento, Madrid</td>
<td>Spain</td>
<td>20</td>
<td>J</td>
</tr>
<tr>
<td>927</td>
<td>BRT-1 Weldenstein</td>
<td>Belgium</td>
<td>300</td>
<td>B*,I*,J*,U*</td>
</tr>
<tr>
<td>936</td>
<td>Radio Beveren</td>
<td>Belgium</td>
<td>100</td>
<td>L*</td>
</tr>
<tr>
<td>936</td>
<td>Porto</td>
<td>Portugal</td>
<td>600</td>
<td>D*,E*,H*,L*,U*,R</td>
</tr>
<tr>
<td>936</td>
<td>NHW/DWR Hamburg</td>
<td>W.Germany</td>
<td>300</td>
<td>J*,H*,L*,T*</td>
</tr>
<tr>
<td>918</td>
<td>Algiers</td>
<td>Algeria</td>
<td>600/300</td>
<td>L*,L*,T*</td>
</tr>
<tr>
<td>930</td>
<td>SER R.Bibao</td>
<td>Spain</td>
<td>10</td>
<td>P*</td>
</tr>
<tr>
<td>1008</td>
<td>Hilversum 5 R.</td>
<td>Holland</td>
<td>400</td>
<td>I*,L*,Q*</td>
</tr>
<tr>
<td>1017</td>
<td>Wolfsheim</td>
<td>W.Germany</td>
<td>1600</td>
<td>H*,O*,L*,T*</td>
</tr>
<tr>
<td>1026</td>
<td>Gnar-Dobit</td>
<td>Austria</td>
<td>100</td>
<td>U*</td>
</tr>
<tr>
<td>1035</td>
<td>Prog 3 Lisbon</td>
<td>Portugal</td>
<td>120</td>
<td>T*</td>
</tr>
<tr>
<td>1044</td>
<td>DAF-1 Burg</td>
<td>Germany</td>
<td>250</td>
<td>J*</td>
</tr>
<tr>
<td>1044</td>
<td>Sebas Alou</td>
<td>Morocco</td>
<td>300</td>
<td>H*</td>
</tr>
<tr>
<td>1055</td>
<td>Tondra</td>
<td>Libya</td>
<td>50</td>
<td>O</td>
</tr>
<tr>
<td>1055</td>
<td>BBC-R1 Rio de Janeiro</td>
<td>W.Germany</td>
<td>150</td>
<td>O</td>
</tr>
</tbody>
</table>

Pacitic areas on 9.580 (Eng 0800-2030) were noted as 22248 by 0830 by Alan Smith and to SE. Asia on 9.770 (Eng 1000-1100) as “good” at 1000 by Jim Shirley. Broadcasts from R. New Zealand 9.850 (Eng to Australia 0900-1115) have also been reaching us. David Edwardson noted them as 24532 at 0900. Broadcasts to other areas have also been heard: WSCN Scott's Corner, MN 9.870 (Eng, Fri, Ger to W. Africa 0400-0555) SIG 333 at 0541 by Matthew Clarke; BBC via Ascension Island 9.600 (Eng, W. Africa 0545-0815) 43443 at 0628 by Kenneth Reece; R. HCBg Guito, Ecuador 9.745 (Eng to Australia, S. Pacific 0700-1030) 54334 at 0757 by Mark Selby; BBC via Kranji

---

**SEEN & HEARD**

Pacific areas on 9.580 (Eng 0800-2030) were noted as 22248 by 0830 by Alan Smith and to SE. Asia on 9.770 (Eng 1000-1100) as “good” at 1000 by Jim Shirley. Broadcasts from R. New Zealand 9.850 (Eng to Australia 0900-1115) have also been reaching us. David Edwardson noted them as 24532 at 0900. Broadcasts to other areas have also been heard: WSCN Scott's Corner, MN 9.870 (Eng, Fri, Ger to W. Africa 0400-0555) SIG 333 at 0541 by Matthew Clarke; BBC via Ascension Island 9.600 (Eng, W. Africa 0545-0815) 43443 at 0628 by Kenneth Reece; R. HCBg Guito, Ecuador 9.745 (Eng to Australia, S. Pacific 0700-1030) 54334 at 0757 by Mark Selby; BBC via Kranji...
**ICS - IMAGE RECEPTION BY RADIO**

Use any short wave SSB receiver

**FAX-1** Delivers crisp black and white images to Epson printers, £273.95 inc. VAT (£4.00 p&p).

**AMIGA-FAX** brings high quality grey scale images to the Amiga Screen £109.95 inc. VAT (£2.50 p&p).

**AMIGA-SSTV** brings high quality colour SSTV to the Amiga, £109.95 inc. VAT (£2.50 p&p).

*Send/Receive capability

ICS Electronics Ltd
PO Box 2
ARUNDEL
West Sussex BN18 0NX
Telephone: 024365 655
Facsimile: 024365 575
SEND FOR DETAILS!

---

**JOHNSONS "SOUND SERVICE"**

**P "SHORT WAVE" PANASONIC RÁDIO**

**“MULTIBAND”**

**FIRST COME (SCOOP PURCHASE) FIRST SERVED**

**RF B60DL**
A compact multiband PLL quartz synthesized digital tuner, with clock/timer and 36 station pre set memories.
- Multi-band reception FM/LM/AM (1.615-29.999MHz).
- Double Superhetdyne system on LW/MW/SW.
- 36 channel pre-set with memory back up up to 3 stations per band.
- Two tuning methods: rotary electronic dial or 2-way direct access (frequency or meter band).
- LCD multi colour information display including dual time clock.
- Operation hold switch.
- AC/DC adapter, earphone, carry case and long range shortwave wire antenna included.

**DIMENSIONS:**
198 (W) x 118 (H) x 33.5 (D) mm
650g (without batteries)

**POWER SUPPLY:**
240V ac 50Hz (via adapter supplied) or
4 x UM3 batteries (not included.)
2 x UM3 batteries required for clock and memory (not included.)

**RF B600L** (available ex-stock).
We carry a good range of receivers to choose from. Why not give us a call? A very nice Edystone B40A available shortly! Offers invited.

Remember, if you’re spying out for a good radio, Czech us out first and that way you won’t get caught.

**JOHNSONS SHORTWAVE RADIO**
43 Friar Street, Worcester WR1 2NA Tel: 0905 25740

---

**J. BIRKETT**
RADIO COMPONENT SUPPLIERS
25 The Strait
Lincoln, Tel: 20767
(LN2 1LF)

**EX-MILITARY COMMUNICATIONS RECEIVER R210.**
Frequency 2 to 16MHz in 7 switched bands AM, CW, SSB, FCo, Aerial inputs 80 ohm balanced line, long wire or whip, CW filter, BFO, Noise blanker, complete with 240 volt AC power pack, loudspeaker jack and pair of lightweight headphones.

Price £79.80 car. Mainland only £6.00.

**EX MILITARY COMMUNICATION RECEIVERS TYPES R210.**
 unconverted £50 (car £6.00).

Special receiver type GPO40A. Battery/mains covering 153kHz - 33kHz. Callers only £195.00.

Pye Westminster W19F. 80 - 110 MHz. 10 channel £15.00 (carriage £3.00).

Dymar 25W. 15 channel FM 80 - 110MHz £15.00 (carriage £3.00).

---

**ACCESS AND BARCLAY CARDS ACCEPTED.**
The AFR-1000 Automatic RTTY Decoder has features never seen before for such a low price. Decodes RTTY (CCITT No.1 and CCITT No.2) SITOR-AMTOR-FEC, Morse Code, ASCII including 8 Channel News Service. A special feature is the Auto Speed Check Mode enabling precise measurement of teletype transmission speed. Includes composite video output and RS232 Interface service with DTR for printers. Supplied complete with power, audio and video leads. Post and packing £5.00.

S.A.E. — details of this and other Pocom Decoders.

Stockists of DAIWA — POCOM — ICOM — YAESU — WAVECOM — MICROWAVE MODULES

APPROVED KENWOOD DEALER.

Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands.
Telephone: Stourbridge (0384) 390063/371228. Open Monday thru Saturday.
Instant H.P. subject to status, Access, Visa and real money.

S.E.M. UNIT C, UNION MILLS, ISLE OF MAN
Tel. Marown (0624) 851277

QRM ELIMINATOR
A unique design, which has revolutionised interference suppression. Connects in your aerial lead and phases out interference before it gets to your receiver. Any sort of QRM, it can be next to your RX (or your computer?) or several miles away, e.g. power lines, 1.5-30MHz. £75.95. Ex-stock.

S.E.M. VHF CONVERTER
Plugs into any HF receiver aerial socket to give you coverage from 118 to 146MHz. Tune your receiver from 2 to 30MHz £65.00. Ex-Stock.

S.E.M. HF CONVERTER
Plugs into your VHF scanner aerial socket and converts its range to cover 100kHz to 50MHz. Gives you full LF, MF, HF, VHF, UHF coverage. £150.00-

VERY WIDE BAND PRE-AMPS
3kHz to 500MHz, 9dB gain, 1.5dB N.F. and unprecedented performance. Basic Pre-Amp £37.00. Switched through when OFF £42 from stock.

AUDIO MULTIFILTER
Gives variable selectivity 3kHz-20kHz, passband tuning, Hi or Lo pass filters and 2 notch filters. They say this is the best filter anywhere. £75 from stock.

If you require more information on our products, ring or write.
Prices include VAT and delivery.
C.W.O. or CREDIT CARD by phone.

QRK KITS AT QRK PRICES!

A 3-BAND RECEIVER KIT FOR £63!

★ Complete in every detail!
★ 80-40-20m Bands!
★ Direct Conversion!
★ Fully Detailed Manual!

Other Super Kits include:
DTR3 TRANSCIEVER, ATUs, AUDIO FILTER etc etc... all ‘well styled’ and complete!

For full details of the ‘CARLTON’ and the rest of our range, send an SAE to:

LAKE ELECTRONICS, 7 MIDDLETON CLOSE, NUTHALL, NOTTINGHAM NG16 1BX.
Or ring Alan G4OZW on (0602) 362989 (callers by appointment only).

INDEX TO ADVERTISERS

Aerial Techniques ...... 41
Air Supply ................. 53
ARC Communications .... 15
Brietel ....................... 49
Breanthurst Electronics .. 41
Colinor Electronics ........ 53
Component Centre .......... 26
Datag Electronics ........ 52
Dewsbury Electronics ..... 50
Dresser Communications .. 24
Effekt Electronics ......... 30
ERA .......................... 46
Flightdeck ................. 53
Garage Electronics ....... 28
Hayes, C M Communications. 24
COMM (UK) ................. 28
ICS Electronics ............ 49
Interbooks .................. 15
J & P Electronics .......... 53
Javelion ..................... 53
Johnson Shortwave Radio 49
Lake Electronics .......... 50
Lee Electronics ........... 19
London Amateur Radio Show 37
Low Electronics ........... 53
Nevada Communications ... 30
Photo Acoustics .......... 23
Raycom Communications Systems 13
SpaceTech .................. 30
S & C ........................ 50
S C S ........................ 50
S E M ......................... 50
Stak ........................ 26
South Midlands Communications Cover 21
Steve ........................ 26
SpaceTech .................. 30
Stefan's Jones .............. 46
Technical Software ......... 41
Water & Station ........... 45

SCANNING?

HAVE YOU NOTICED THAT THERE IS SO MUCH RADIO SPECTRUM TO SCAN, AND LITTLE OR NO INFORMATION AVAILABLE ON WHERE THE REALLY INTERESTING TRAFFIC IS?! LOOK NO FURTHER — WE OFFER A WIDE RANGE OF FREQUENCY LISTINGS AND BAND PLANS.

FOR A FREE COPY OF OUR LATEST CATALOGUE, JUST SEND AN A4 SAE TO S.S.C. P.O. BOX 71 BOURNEMOUTH DORSET BH1 1DT.

G2VZ LOOP ANTENNAS WITH ATU FOR H.F., HAM BAND TRANSMISSION (SWR One to One 40, 15 and 10 One Point Five to One 80 and 23 and SWLs LONG AND MEDIUM WAVE FOR SCL. Loops 21 inches square or triangle. No special skills required. Circuits, Parts Lists sources of supply assembly data, HIGH FREQUENCY LOOP 810 to 10 Metres ES. LONG AND MEDIUM WAVE LOOP 45 to 1000 Metres SCL, SWL 8, SHORT WAVE ATU LOOP OR LONG WIRE E4. PRE AMP L.W. MW S. WAVE E2. PHOTO COPY HRD MANUAL £4. MW LOOP WITH PRE AMP ATU £3. PRE AMP FOR G2VZ HF LOOP OR ATU £4. SHORT WAVE ATU BUILT IN PRE AMP FOR LOOP OR LONG WIRE £7. SAE details. All projects D.I.Y. F. G. Ryland, 38 Parkside Avenue, Millbrook, Southampton SO1 5AF. Tel: (0703) 775064.
Fig. 1: Kenneth Reece's log in Prenton

Singapore 9.740 (Eng to S. Aile 0900-1515 35333 at 1356 by John Nash; R. Prague, Czechoslovakia 9.605 (Eng, Fr, Ar to Africa 1430-1825) 35333 at 1420 by Sheila Hughes; SLBC Colombo, Sri Lanka 9.720 (Eng to Asia 2300-1230) 34333 at 1525 by David Warrant; KYOI Saipan, N. Marianas Islands 9.465 (Eng to E. Asia 2000-2200) 43444 at 2030 by Christian Pritchard; Voice of Israel, Jerusalem 9.010 (Eng, Fr to Africa 2000-2005) 43444 at 2001 by Ian Curry; R. Finish by Pol 9.670 (Eng, Fin, Sw to E. Asia, S. America 2200-2300) 333 at 2209 by Mal Tedds; Voice of Turkey, Ankara 9.445 (Eng, Tur to USA 2300-0450) 33333 at 2302 by Neil Whestley; Voice of Israel, Jerusalem 9.435 (Eng, Heb to USA 0000-0255) at 0000 by Francis Hearne; WCSN Scotts Corner, MN 9.850 (Eng, Fr, Ger to W. Africa 0000-0155) 34444 at 0130 by David Minter.


Broadcasts to Europ in the 7MHz (41m) band include WCSS Scotts Corner, MN 7.365 (Eng, Fr, Ger 0800-0750) 580 533 at 0830 by Smith; WYFFR via Okeechobee, FL 7.355 (Russ, Ger 1400-0730) 54445 at 0700 by Mark Selby; R. Peace and Progress, USSR 7.440 (Eng 1400-1430) 35443 at 1415 by John Nash; R. Australia via Carmenavan 4.205 (Eng 1430-2030) 44343 at 1732 by Kenneth Reece; R. Prague, Czechoslovakia 7.345 (Eng, Fr, Sp, Port, PO 2100-2130) 43333 at 1800 by Sheila Hughes; R. Bangladesh 1.760 (Eng, Ben 1815-2000) 44333 at 1815 by David Warrant; RRI via Nauen 7.295 (Fr, 1815-1945) 444 at 1915 by Mal Tedds; AWR via Delhi 7.410 (Eng, 1845-2230) 34453 at 1905 by John Parry; Voice of Greece, Athens 7.430 (Gr, Eng, Fr, Ger 1900-1930) 44444 at 1930 by Francis Hearne; RAI Rome 7.290 (Eng 1935-1955) 43233 at 1936 by Alan MacKow; Voice of Israel, Jerusalem 7.485 (Fr, Eng 2000-2035) 44333 at 2030 by Neil Dove; IBRA Radio via Cyclops 7.110 (Pol, Ger, Eng 2000-2115) 434 at 2045 by Terry Roy; R. Budapest, Hungary 7.220 (Ger, Tur, Hung, Eng, Sio 1730-2200) 44444 at 2101 by Alex MacKow; R. Moscow, USSR 7.150 (Eng 1700-2000) 444 at 2228 by Ian Bond; R. Polonia, Warsaw 7.270 (Ger, Fr, Eng 1900-2351) at 2350 by Francis Hearne; WHRI South Bend, USA 7.405 (Eng 0020-0000) 33233 at 0330 by Christian Pritchard.

This aspect of our hobby has been attracting a growing number of listeners and many interesting beacons have been heard since the last chart in the February '89 SWM.

Since relatively low power transmitters are employed at most of the beacon sites, most newcomers to beacon DXing tend to assume that their range will be very limited, but in practice this is far from the truth, as the latest chart clearly shows. Just how well the "ground wave" signal from a particular beacon can be received during daylight will largely depend upon the nature of the path between the transmitter and the point of reception. As the signals follow the contours of the earth's surface they lose energy due to its resistivity. The resistivity is not constant - flat pastoral country or marshy and low-lying areas have much lower resistivity than those containing rocks. Hills and mountains tend to absorb energy. The lowest losses occur over sea paths.

After dark a different situation arises because additional "sky wave" signals may arrive at the receiving point via the ionosphere. Beacons in Iceland, Scandinavia, France, Spain, Portugal and as far south as Algeria have been heard by DXers via sky wave paths during the last three months.

Some listeners who would like to try beacon DXing have been disappointed to find that their L.W. receiver will not tune to the beacon band, which extends from 285 to 351MHz in the UK. Provided it covers one or more of the L.W. bands and it has provision for an external antenna and earth, then the problem may be overcome by installing a v.f.f. converter ahead of the set. For those who enjoy simple home construction projects, full details of the PW "Taw" and "Tawe" i.f. converter are published in the November '86 Practical Wireless - back issues and a printed circuit board for the PW "Taw" are available from PW Publishing in Poole. An excellent ready made crystal controlled i.f. converter, operating 10kHz to 500kHz with a 28.010 to 28.500MHz (10m) i.f. is available from Datong Ltd - see ads in SWM.

A problem was frequently mentioned in the letters from newcomers: the difficulty in reading the beacon callsigns, which are in Morse code. If you are unfamiliar with Morse code, simply jot down the dots and dashes forming each letter as you hear them and decode them later by referring to a copy of the code. Be sure to note down the frequency of each beacon alongside the dots and dashes! A cassette tape recorder can make things easier, since the callsigns can be played back as often as is necessary to decode them. In no time at all you will start to recognise the dots and dashes associated with some letters and you will be well on the way to mastering the code.

Finally, some beacon news. Alan Jarvis (Cardiff) informs me that the beacon on Flat Holm in the Bristol Channel area, on 296.5kHz, has recently been taken out of service and replaced by a beacon at Nash Point, which is the South Glamorgan coast between Barry and Porthcawl. It uses the callsign NP on 296.5kHz. A word of caution here; because there is also a beacon at Nieuwpoort on the Belgian coast which uses the callsign NP on 296.5kHz.
is exactly 2km, this is 16 times the wavelength corresponding to a frequency of 2 MHz and 32 times the wavelength corresponding to 5 MHz - both frequencies covering areas of the h.f. spectrum used largely by shipping. It is likely, therefore, that the two Goonhaverns functioned together as an interferometer, thus increasing the accuracy of its bearings.

Counter-Espionage

Goonhavern was active with the three other locations, and may have played its part in a major post-war spy trial. In 1961, Gordon Londsdale and Helen Kroger were convicted of espionage for the Soviet Union, having obtained secret information from the Portland Naval Base. Evidence was given at their trial by an anonymous civilian who stated that direction-finding equipment had located the transmitter near Moscow employed to send instructions to the spies.

Although not mentioned in the newspaper reports, a book published after the trial referred to "interception stations" in the Isle of Wight (mentioning Wick), the Midlands, and the South Coast. The southern station was probably Goonhavern.

With a history spanning U-boats to spies, the station now stands derelict.
I am sure that this system is likely to appeal to those who want to make a start on weather satellite and FAX reception and that being the case, the instructions assume the buyer is already well versed on the technicalities of the subject.

Despite the short space of time in which I have been using the system I have already devised a couple of modifications and these have been successful enough to elicit some comments of surprise from Cirkit themselves when they saw the results (to the point where they are now using some of my pictures to demonstrate the system).

The first was to take the preset contrast range control out to a front panel. This allows contrast to be individually optimised for each type of satellite and FAX system whereas the unit as it stands rather relies on a compromise setting for all systems.

The second modification was to play around with the value of the resistor connected to pin-7 of the a.d.c. chip. This is the reference voltage pin and a surprising difference in picture quality can be obtained by optimising the resistor for an individual i.c. rather than just following the value recommended by the manufacturer.

It may seem that I have criticised the system in several areas but I must stress that this is only because of the expectation that overall this is an excellent and versatile combination of electronics and software. Having received the unit for review I am not prepared to part with it and have decided to buy it and I feel I can offer no better recommendation than that. My only regret is that I do not have advanced programming skills because the decoder is clearly capable of producing a considerable range of grey levels and can obviously be used with any computer that will accept 8-bit data from the outside world.

I would really love to see what it could do hooked to a machine such as the Commodore Amiga with its stunning graphics capability.

The cost of the interface (Cirkit order number 41-03416) is £33.83 and the SATPIC software (40-90030) £32.50 direct from Cirkit Distribution Ltd, Park Lane, Broxbourne, Herts EN10 7NQ Tel: (0992) 444111.
HOW TO ORDER

Add 75p per order postage (overseas readers add £1.50 for surface mail postage) and send a postal order, cheque or international money order with your order (quoting book titles and quantities) to PW Publishing Limited, FREEPOST, Enefco House, The Quay, Poole, Dorset BH15 1PP. Payment by Access, Mastercard, Eurocard or Visa also accepted on telephone orders to Poole (0202) 678558. Books are normally despatched by return of post but please allow 28 days for delivery.

* A recent addition to our Book Service. O/P = Out of print, O/S = Out of stock.

RAYO

AIR & METEO CODE MANUAL
10th Edition
Joerg Klingenfuss
Contains detailed descriptions of the World Meteorological Organization's Global Telecommunication System operating FAX and RTTY meteor stations, and of its associated data processing equipment. It contains detailed description of the Aeronautical Fixed Telecommunication Network amongst others.
289 pages £14.00

BETTER RADIO/TV RECEPTION
A. Nallavalle, A. T. Cusden and B. D. Clark
An Australian publication giving guidance and advice to both listeners seeking reliable reception of some distant radio stations and to DX listening hobbyists.
134 pages £9.95

BETTER SHORTWAVE RECEPTION (USA)
W. S. Orr WESAI and R. D. Cowen WIXL
receivers, antennas, propagation, DX listening techniques for the short waves and v.h.f. 176 pages. £3.95

*PASSPORT TO WORLD BAND RADIO 1989
This book gives you the information you need to explore and enjoy the world of broadcast band listening. It includes features on different international radio stations, receiver reviews and advice as well as the hours and frequencies of broadcast stations by frequency. 396 pages £12.95

SCANNERS (updated)
Peter Rouse G1IDK
A guide for users of scanning receivers, covering hardware, antennas, accessories, frequency allocations and operating procedures. 117 pages £7.95

SCANNERS 2
Peter Rouse GUIDK
The companion to Scanners, this provides even more information on the use of the v.h.f. and u.h.f. communications band and gives constructional details for the easiest and best performance of scanning equipment. 216 pages £9.95

SHORT WAVE RADIO LISTENERS' HANDBOOK
Arthur Miller
In English and non-technical language, the author guides the reader through the mysteries of amateur, broadcast and CB transmissions. 207 pages £6.99

RADIO TYPE CODE MANUAL
10th Edition
Joerg Klingenfuss
This book provides detailed descriptions of the characteristics of telegraphy circuits on short waves, with all commercial modulation types including voice frequency. It provides comprehensive information on all RTTY systems and c.w. alphabets.
96 pages £8.00

THE SATELLITE EXPERIMENTER'S HANDBOOK
(AUS)
A guide to understanding and using amateur radio, weather, TV and broadcast satellites. 104 pages £9.25

*1934 OFFICIAL SHORT WAVE RADIO MANUAL
Edited by Hugo Gernsback
Sub-titled the "Complete Experimenter's Set-Building and Servicing Guide" this reprint is a fascinating look at a bygone age. Features a complete directory of all 1934 s.w. receivers as well as servicing information, construction hints, building projects and circuits. Also contains ideas on how to build vintage sets with modern components. 260 pages £9.00

BEGINNERS

AN INTRODUCTION TO RADIO DXING (BP19)
R. A. Penfold
How to find a particular station, country or type of broadcast and to receive it as clearly as possible. 176 pages £1.95

BEGINNERS 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

BEGINNER'S GUIDE TO ELECTRONICS
Dow Bishop
For beginners thinking of a career in electronics; theory and applications in computers, radio, TV, recording, medical and industrial electronics. 240 pages. £5.95

ELECTRONICS SIMPLIFIED - CRYSTAL SET INSTRUCTION (BP1)
F. A. Wilson
This book is especially written for those who wish to take part in basic radio building. All the crystal sets in the book are complete sets for a modern component, 72 pages. £1.75

QUESTIONS & ANSWERS RADIO
Eugene Trundle
Basics of electrical theory, radio and semiconductors, receivers, amateur and CB radio, and test equipment. 172 pages £3.95

THE SIMPLE ELECTRONICS CIRCUIT AND COMPONENTS Book One (BP62)
The aim of this book is to provide an in-expensive but comprehensive introduction to modern electronics. 309 pages £3.90

TELEVISION

AN INTRODUCTION TO SATELLITE TELEVISION (BP195)
F. A. Wilson
Answers all kinds of questions about satellite television. For the beginner thinking about hiring or purchasing a satellite TV system there are details to help you along. For the engineer there are technical details including calculations, formulae and tables. Plenty of advice for the DIY enthusiasts. 104 pages £9.95

A TV-DXERS HANDBOOK (BP176)
P. Banning
Information on transmission standards, propagation, receivers, channels, satellite dishes, antennas, photography, station identification, interference etc. Revised and updated 1989. 67 pages £9.95

THEORY

COMMUNICATION (BP99)
Elements of Books 5 F. A. Wilson
Fundamentals of line, microwave, submarine, satellite, digital modulations, radio and telegraphy systems are covered, without the more complicated theory or mathematics. 266 pages £2.95

LEVEL II RADIO & ELECTRONICS THEORY
Ian Ridpath ZL1BCG
A sequel to Amateur Radio & Electronics Study Course, this book covers advanced theory up to a level needed on most technician courses. The handbook format is designed to make the student feel as though the pages are his own notes. 109 pages £8.70

PRACTICAL ELECTRONICS CALCULATIONS and FORMULAS (BP53)
F. A. Wilson
This has been written as a workshop manual for the electronics enthusiast. There is a strong practical bias and higher mathematics have been avoided where possible. 249 pages £3.95

*SOLID STATE DESIGN FOR THE RADIO AMATEUR
Wes Hayward ZL1DO and Doug Daffew N5THB
Back in print by popular demand! A revised and corrected edition of this book covering all aspects of solid-state design. 256 pages £10.95

LISTENING GUIDES.

AIR BAND RADIO HANDBOOK
David J. Smiley
With airband radio you can ransopel on the conversations between aircraft and those on the ground who control them. The author, an air traffic controller, explains more about this listening hobby.
174 pages £6.95

AIR TRAFFIC CONTROL
Daniel Adair
A guide to air traffic control with maps, drawings and photographs explaining how aircraft are guided through crowded airspace. 176 pages £6.99

DIAL SEARCH
5th Edition 1988/89
George Wilcox
This listener's check list and guide to European broadcasting. Covers m.w., l.w., v.h.f. and s.w., including two special maps, making it useful in most of your portable and many more.
48 pages £3.25

GUIDE TO BROADCASTING STATIONS
20th Edition 1986/89
Philip Darrington
Frequency and station data, receivers, antennas, Latin American DXing, computers and radio, etc. 240 pages. Special Offer

GUIDE TO FACSIMILE STATIONS
8th Edition
Joerg Klingenfuss
This manual is based on continuous monitoring of the radio spectrum from the radios since the recent past. It is a useful summary of former activities of utility stations and provides information to the active radio monitor in the classification and identification of radio signals. 126 pages £8.00

*GUIDE TO UTILITY STATIONS
7th Edition
Joerg Klingenfuss
This book covers the complete short wave range from 3 to 30 MHz and the adjacent frequency bands from 0 to 10kHz and from 1 to 3MHz. It includes details on all types of utility stations from old ones back to today and more. It has 1802 entries in the frequency list and 3131 in the alphabetical callsign list plus address services and meteorological stations. 494 pages £19.00

HF OCEANIC AIRBAND COMMUNICATIONS
3rd Edition
Bill Laver
Aircrew channels by frequency and band, main ground radio stations. European RTV networks. North Atlantic control frequencies. 20 pages £3.50

INTERNATIONAL RADIO STATIONS GUIDE (BP255)
Revised and updated in 1989. This book shows the sites, names, country, frequency, wavelength and power of stations in Europe, the Near East and N. Africa, North and Latin America and the Caribbean, plus short wave stations worldwide. 126 pages £4.95

THE COMPLETE VH/UHF FREQUENCY GUIDE
Updated 1988
This book gives details of frequencies from 26-2250MHz with no gaps and who uses what. Recently updated, there are charts on equipment requirements as well as antennas, etc. 60 pages £9.95

THE INTERNATIONAL VH/ FM GUIDE
7th Edition
Juliet Baldwin and Kris Partridge G8AUU
The latest edition of this useful book gives concise details of operators and stations worldwide plus coverage maps and further information on UK repeaters. 70 pages. £2.85

*THE POCKET GUIDE TO RTTY AND FAX STATIONS
Bill Laver
A handy reference book listing RTTY and FAX stations, together with modes and other relevant information. The listing is in ascending frequency order, from 1.6 to 21.1MHz. 48 pages £2.95

WORLD SHORT WAVE FREQUENCY GUIDE
(Previously known as UK Listeners Confidential Frequency List)
Bill Laver
Covering the services and transmission modes that can be heard on the bands between 1.65 and 29.7MHz. £7.95
INTERFERENCE

INTERFERENCE HANDBOOK (USA)

3rd Edition

R. E. G. Perry G8CCJ

This book has been compiled especially for students of the City and Guilds of London Institute RAE. It is structured with carefully selected multiple choice questions, to progress with the reader's recognised course of instruction, although it is not intended as a test text.

293 pages. £6.95

VHF/HF RADIO FOR AMATEURS (USA)

H. S. Brier W9EGQ

ARRL HANDBOOK 1981-1982

G. J. Van de Ven

Jessop G6JP

Orr W6SAI

Keith Brindley

W. H. Orr G6FL

This book describes a down to earth manner how the main categories of test equipment work. The subjects covered include analogue and digital meters, oscilloscopes, signal sources, frequency, time and event counters, spectrum and logic analyser, displays and automatic test equipment. 134 pages. £10.95

OSCILLOSCOPES, HOW TO USE THEM, HOW THEY WORK

Revised 2nd Edition

Ian Nickman

Content describes oscilloscopes ranging from basic to advanced models and the accessories to go with them. 133 pages. £9.95

PROJECT CONSTRUCTION

HOW TO DESIGN AND MAKE YOUR OWN P.C.B.

R. A. Penfold

This book has a number of power supply designs including simple unregulated types, fixed voltage regulated types and variable voltage stabilised designs.

82 pages. £2.95

POWER SUPPLY PROJECTS (BP76)

R. A. Penfold

This book gives a number of power supply designs including simple unregulated types, fixed voltage regulated types and variable voltage stabilised designs.

92 pages. £2.95

PROJECTS IN AMATEUR RADIO AND SHORT WAVE LISTENING

F. G. Reyer G3GGR

Full constructional details are given for all projects including housing the units in a suitable case. All the projects are either on p.c.b. or matrix board.

80 pages. £4.95

VHF/UHF AIRBAND FREQUENCY GUIDE (Updated)

A complete guide to the airband frequencies including how to receive the signals, the frequencies and services, VOIs and an air and quick reference for all radio amateurs interested in DX. 36 pages. £2.95

THE RADIO AMATEUR’S DX GUIDE (USA)

5th Edition

A. Michaels

The guide contains information not easily obtained elsewhere. It includes a very comprehensive list of DXCC countries and other useful data.

175 pages. £12.95

INTERFERENCE HANDBOOK (USA)

What causes it? All questions of problems, difficult, expensive and time-consuming to cure? These questions and many more are answered in this book. 44 pages. £4.95

TELEVISION INTERFERENCE MANUAL (RSGB)

B. Priestly

TV sets and systems, spurious-radiation TV, short-signal TV, audio breakthrough, transmitter design. 78 pages. £2.95

AMATEUR RADIO

AMATEUR RADIO CALL BOOK (RSGB)

Winter 87/88 Edition

This useful work now incorporates a 48-page reference section of useful information for amateur radio enthusiasts. 310 pages. £7.00

AMATEUR RADIO LOGBOOK

Strategic notes for transmitting amateur in horizontal A format. 25 lines per page. 80 pages. £2.30

AMATEUR RADIO OPERATING MANUAL (RSGB)

A new and comprehensive manual covering every aspect of amateur operating, including international callsign series holders, all major DXCC countries list, etc.

204 pages. £6.16

AMATEUR RADIO SATURNES the first 25 years

Arthur J. Pepper

The material in this souvenir publication is drawn from the author’s archives. It is many a pictorial account on the pattern of developments which have occurred over the last 25 years. 34 pages. £2.25

CARE AND FEEDING OF POWER GRID TUBES (USA)

The operation of EIMAC power grid valves and provides design and application information very useful to the user of these valves.

160 pages. £6.75

PASSPORT TO AMATEUR RADIO

Reprinted from PW 1981-1982

The famous series by GW3JGA, used by thousands of success amateur trainees, is intended for their studies. Plus other useful articles for students of amateur radio.

96 pages.

PRACTICAL IDEAS FOR RADIO AMATEURS

Ian Peelo G3WXY

Offers a wealth of hints, tips and general practical advice for all transmitting amateurs and short wave listeners. 128 pages. £6.95

QUESTIONS & ANSWERS AMATEUR RADIO

F. C. Judd G2RXC

What is amateur radio? The Radio Amateurs’ Exam and Licence Handbook, equipment and all operating procedures and codes used by amateurs. 127 pages.

AMATEUR RADIO’S GUIDE TO RADIO WAVE PROPAGATION (HF & VHF)

F. C. Judd G2RXC

Shows the operation of the mechanism and variations of propagation in the hf. bands. 144 pages. £8.95

AMATEUR RADIO’S MAP OF NORTH AMERICA (USA)

Shows radio amateur prefix boundaries, continental boundaries and zone boundaries. 760 x 433mm. £2.50

AMATEUR RADIO’S MAP OF THE WORLD (USA)

Showing prefixes and countries, plus listing by order of country codes. 704 x 111mm. £2.95

AMATEUR RADIO’S WORLD ATLAS (USA)

Seventeen pages of maps, including the world-polar projection. Also includes: location of international call sign countries. £3.95

THE ARRL OPERATING MANUAL

Another very useful book from the ARRL. Although written for beginners it should also be of use to the interested UK amateur.

684 pages. £14.75

THE COMPLETE OX’ER

BobLucher W9KNI

Now in its fourth edition, this book covers equipment and operating techniques for the DX chaser, from beginner to advanced. 187 pages. £7.95

THE RSGB HANDBOOK (RSGB)

G. L. Renbow G3HSB

The latest edition of the standard aid to studying for the Radio Amateurs’ Examination. Updated to cover the latest revisions to the syllabus. pages £5.00

THE RADIO AMATEUR’S DATA GUIDE (USA)

15th Edition

A. Michaels

D I G I T A L E Q U I V A L E N T S AND PIN CONNECTIONS

(USA)

B. Priestly

An invaluable compendium of facts, figures, circuits and data and is indispensable to the designer, student, service engineer and all those interested in computer and microprocessor systems.

203 pages. £11.95

NEWNES ELECTRONICS POCKET BOOK

5th Edition

Presenting an analysis of electronics in a readable and largely non-mathematical form for both the enthusiast and the professional.

315 pages. Hardcover £8.95

NEWNES RADIO AND AMATEUR LISTENER’S POCKET BOOK

Steve Money G3FXZ

This book contains useful and intriguing data for the traditional and modern radio amateur as well as the shortwave listener. Topics such as AMTOR, packet radio, SSTV, computer communications, arrears and maritime communications are all covered. 201 pages. Hardcover £6.95

NEWNES ELECTRONICS AND RADIO ENGINEER’S POCKET BOOK

17th Edition

Keith Brindley

Useful data concerning math, abbreviations, codes, symbols, frequency bands/societies, UK broadcasting stations, semi-conductor devices, etc. 201 pages. Hardcover £6.95

NEWNES TELEVISION AND VIDEO ENGINEER’S POCKET BOOK

Eugene Trunde

This is a valuable reference source for practitioners in “entertainment” electronic equipment. It covers TV reception from v.h.f. to l.f. h.d. displays, colour camera technology, microwave links and video disc equipment.

205 pages. Hardcover £9.95

POWER SOURCE GUIDE (BP235)

J. C. Van der Ven

£2.50

This guide has the information on all kinds of power devices in all categories (other than the usual alphanumeric sort) such as voltage and power making some selection of replacements easier. 192 pages. £6.95

TRANSMITTER SELECTOR GUIDE (BP234)

J. C. Van der Ven

£10.95

This guide has the information on all kinds of transistors in useful categories (heres again the usual alpha numeric sort) such as voltage and power making some selection of replacements easier. 192 pages. £4.95

FAULT FINDING

ARE THE VOLTAGES CORRECT?

Revised from PW 1974

How to use a multimeter to fault-find on electronic and radio equipment, from simple resistive dividers through circuits, transistors, i.c.s and valves.

44 pages. £1.50

MODERN ELECTRONIC TEST EQUIPMENT

Keith Brindley

This book describes, in a down to earth manner how the main categories of test equipment work. The subjects covered include analogue and digital meters, oscilloscopes, signal sources, frequency, time and event counters, spectrum and logic analyser, displays and automatic test equipment. 134 pages. £10.95

SERVICING RADIO, HI-FI AND TV EQUIPMENT

Gordon J. King

A practical book looking at semiconductor characteristics, d.c. and signal tests, fault-finding techniques for audio, video, i.f. and oscillator stages and their application to transistor radios and hi-fi.

208 pages. £10.95

TRANSISTOR RADIO FAULT FINDING CHART (BP70)

C. E. Miller

A property, should enable most common faults to be traced reasonably quickly. Selecting the appropriate answers on the back of the chart, the reader is led through a sequence of suggested checks until the fault is cleared.

635 x 455mm (approx) £0.95

Short Wave Magazine May 1989

55
This book deals with the condition. The condition includes mains adapter and 322 taking...Theory, design, construction, operation, the secrets of G3ACC.

NOTEBOOK Wilson G6XN

SALE Sony Air Antennas.

SALE SONY Air Antennas.

SALE W1FB

SALE 200kHz to 30MHz, £7.50. Racal 1217 receiver,...Available.

SALE Racal R5000 all wave receiver, 100kHz to 30MHz, £100.00 o.n.o. wanted.

SALE D. Cowan W2LX

Yagi, quad, quagi, uhf, vertical, horizontal and "slipper" antennas are all covered. Also towers, ground...£1.75.

Computing

An Introduction to Computer Communications (BP177)

R. A. Pantel

Details of various types of modem and their applications, plus how to interface computer, modem and...£5.00.

Microprocessors Systems and Circuits (BP77)

Elements of Electronics Book 4

F. A. Wilson

A comprehensive guide to the elements of microprocessors systems, which are becoming more...£1.28.

Morse

Introducing Morse

Collected Articles from PW 1982-1985

Ways of learning the Morse Code, followed by constructional details of a variety of keys including...£10.00. Racal 1217 portable receiver telephone system. Also networking systems...£2.50.

The Morse Code for Radio Amateurs (RSGB)

Margaret Mills G3ACC

A device for learning to send and receive Morse code signals up to the 12 w.p.m. required for the radio amateur aspiring to a Class A licence having passed the RAE. £19.00. £2.48.

The Secret of Learning Morse Code

Mark Francis

Designed to make you proficient in Morse code in the shortest possible time. This book points out many of the pitfalls that beset the student. £7.49.
ICOM

Count on us!

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

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

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

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

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

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

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

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

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

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

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

South Midlands Communications Ltd
S.M. House, School Close,
Chandlers Ford Industrial Estate,
Eastleigh, Hants SO5 3BY
Tel: (0703) 255111
UK Sole Distributor

"They laughed when they saw my radio. Then they saw my logbook."