

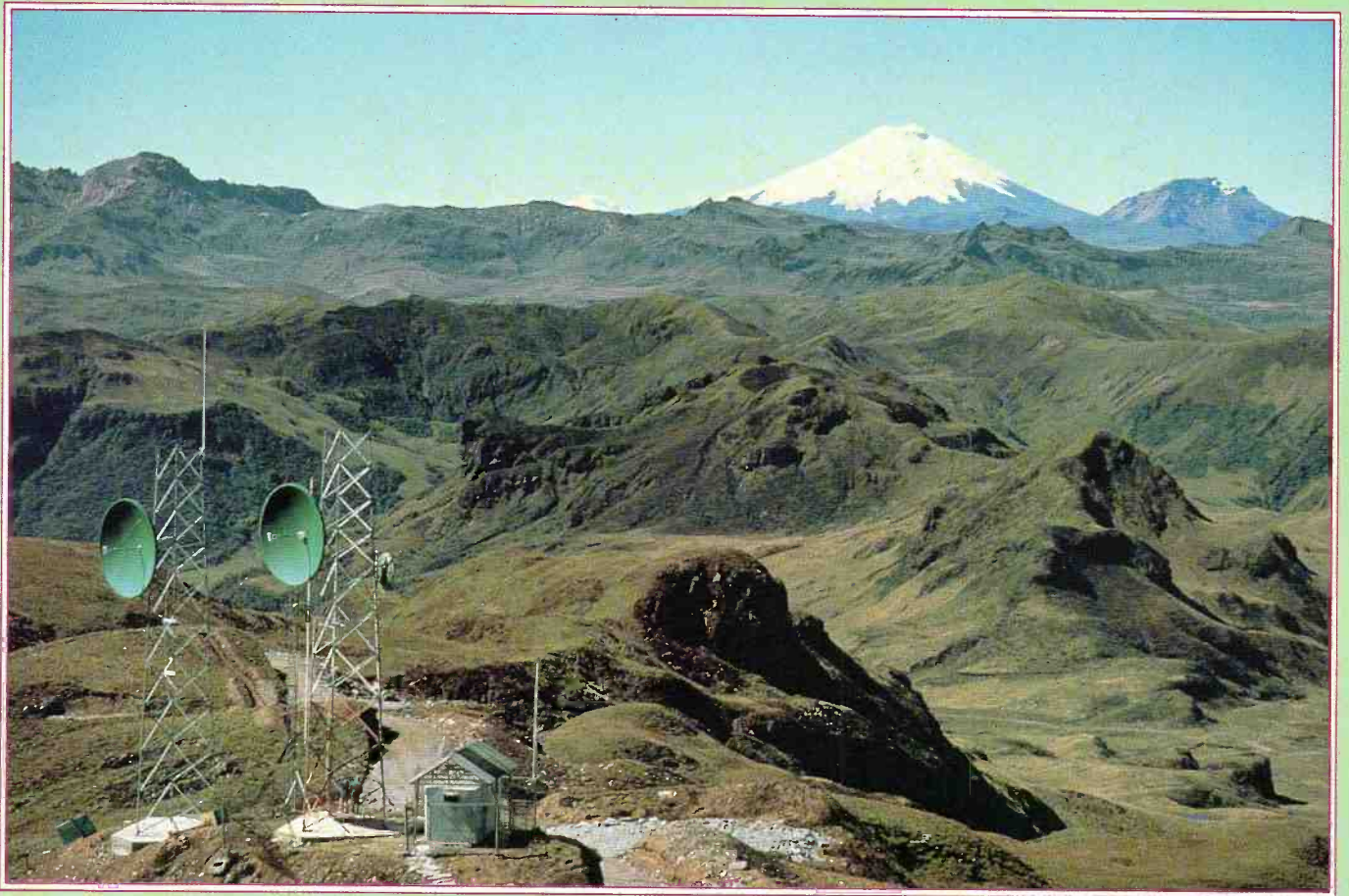
Short Wave Magazine

£1.60

JULY 1990

ECUADOR

Join the SWM DXpedition to Quito



A CONVERTER FOR THE R210
Extend your R210 receiver to 30MHz

AND

**Regular Features for Scanning, Airband
and Broadcast Enthusiasts**

ISSN 0037-4261



For The Radio Listener

NEVADA

introduce the world's

FIRST

1000 CHANNEL PROGRAMMABLE SCANNER

the

Fairmate HP100E

packed full of the latest features

- 8 - 600MHz and 830 - 1300MHz frequency coverage
- An incredible 1000 channel memory capacity
- 10 independent search bands
- A fast 40 channel per second search speed
- User-selectable search steps from 5KHz to 995KHz
- Modes - AM, FM and new Wideband FM for commercial reception
- Selectable 10dB attenuator
- Keypad and rotary tune controls

Each Fairmate 100E comes complete with:

- Full set of high capacity Ni-Cads
- Two antennas (one VHF, one UHF)
- Carry case
- Shoulder strap
- Belt clip
- DC cable
- Earpiece for private listening

**FAIRMATE HP100E MARK 2
NEW VERSION NOW AVAILABLE
WITH EXTENDED FREQUENCY RANGE**



**All this for
£249**



**Send £2
for our latest Catalogue
packed full of information
on Scanners, Amateur & CB Radio**

**use your credit card for same day despatch
HOTLINE: 0705 662145 FAX: 0705 690626**

**NEVADA
COMMUNICATIONS**

ON SALE JUNE 28th

AUGUST ISSUE ON SALE
JULY 26th

[29] Ecuador.



Cover Ecuador is an ideal place for the short wave listener. The equator passes through this country which is situated high up in the Andes. The SWM/HCJB DXpedition 91 will give you the chance to hear stations that you only read about in WRTH. As well as visiting HCJB's installations around Quito you and your partner will find many other interesting things to do. Cover transparency courtesy HCJB.

EDITOR: Dick Ganderton, C.Eng., MIEE, G8VFN
ART EDITOR: Steve Hunt
EDITORIAL ASSISTANT: Sharon George
TECHNICAL ARTIST: Rob Mackie

Editorial & Advertising

Enefc House, The Quay,
Poole, Dorset BH15 1PP
Poole (0202) 678558 (24hrs)
FAX (0202) 666244
Prestel MBX 202671191

ADVERTISEMENT DEPARTMENT
ADVERTISEMENT MANAGER
Roger Hall G4TNT
(071-731 6222)
Dave Gadsden G4NXV
ADVERTISEMENT PRODUCTION
Marcia Brogan

© COPYRIGHT

PW Publishing Limited 1990
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.

Short Wave Magazine

Alternatives to Denco Coils	10	<i>R. A. Penfold</i>
Using a Solar Radio Telescope Part 3	16	<i>Ron Ham</i>
SWM Review		
Palomar P-405 Pre-amplifier	20	<i>Jack Aldridge</i>
DXpedition to Ecuador	29	<i>Two Weeks DXing in Ecuador</i>
An Easily Built 16 – 30MHz Converter for the R210 Receiver	30	<i>Bryan Robertson G4POL</i>
Decoding the Data Part 4	33	<i>Mike Richards G4WNC</i>
SWM Review		
Circuit Satellite Receiver Kit	37	<i>Peter Rouse GU1DKD</i>

PULL-OUT SECTION

This Month's Brainteaser	Competition
Book Service	Order Your Technical Books

REGULARS

A Word in Edgeways	2	<i>Your Letters</i>
What's New	3	<i>Latest News & Products</i>
Trading Post	5	<i>Readers' Adverts</i>
Grassroots	6	<i>Club News</i>
Rallies	7	<i>Where to Go</i>
Bandscan	12	<i>Broadcast Station News</i>
Airband	14	<i>Aeronautical Radio News</i>
Scanning	24	<i>For the Scanning Enthusiast</i>
Services	34	<i>Important Information</i>
Starting Out	40	<i>For the Beginner</i>
RADIOLINE	55	<i>News & Info Hotline</i>
Advertisers' Index	59	<i>Find that Advert</i>
Subscriptions	60	<i>Save Some Money</i>

SEEN & HEARD

Amateur Bands Round-Up	42	<i>Paul Essery GW3KFE</i>
Decode	43	<i>Mike Richards G4WNC</i>
Info in Orbit	45	<i>Lawrence Harris</i>
Band II DX	49	<i>Ron Ham</i>
Television	49	<i>Ron Ham</i>
Long Medium & Short	52	<i>Brian Oddy G3FEX</i>

GOOD LISTENING

A WORD IN EDGEWAYS

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

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to other magazines. The views expressed in letters published in this magazine are not necessarily those of Short Wave Magazine.

Dear Sir

It can fairly be claimed, I believe, that your magazine brings to its readers nothing but joy for within its pages are contained numerous items aimed at further stimulating the interests of radio listeners. Alas! this claim is open to question for the June issue, for having read the opening paragraphs of Alan Gardener's 'Scanning' (Scanning and crime) I feel that to own a scanner and to participate in the hobby of listening to all the voices that come flooding in from far and wide is now no longer the fascinating pastime that it was, for it's now ILLEGAL. Now of course, I do understand the situation through which the criminal element could and do mis-use this facet of our hobby but I imagine there are thousands of retired folk like myself, who have discovered this wonderful hobby since their retirement and have 'fallen in love' with it because of its adaptability to their situation. As I sit in my flat ten floors above the waters of Portsmouth Harbour a whole new world has opened up to me. I hear the voice of the Queen's Harbour Master controlling the shipping of one of the busiest ports in Europe beside keeping a fatherly eye on the myriad little ships using this port. Space does not permit the listing of all the sources of broadcasts to which I listen, but if you will consider for a moment my geographical location and visualise some of the radio traffic to which I have access you will appreciate the depth of my concern as I strive to come to terms with the reality of the law as it stands. So what is to be done? Clearly with the growing interest in scanners and the advancement in their technical capabilities the hobby will flourish which

means, presumably that many more will continue to break the law in pursuit of the recreation. Perhaps it is time to review the whole policy of what constitutes 'illegal listening' (doubtless a hard term to define) or perhaps some sort of 'scanners permit' be introduced which would at least provide the authorities with a record of those participating.

To conclude, Mr Editor, you will have gathered that I am far from being at ease with this situation. I know, of course, that it has always been this way and as Alan remarks, we may have always condoned our listening on the grounds that what we heard was not passed on. This is now not good enough, I suggest and perhaps some endeavour ought to be made through the pages of your magazine to 'legalise' this most fascinating and ever-growing hobby!

I look forward to further correspondence on this matter.

With kind regards to you and your staff.
PERCY G. TANNAC
TRINITY GREEN
GOSPORT

Dear Sir

I just had to write to tell you about a one-valve receiver I have, plus two transistor amplifiers. I've been interested in s.w.l. for many years and built a 'Codar Clipper' kit up for my son who was about 12 years old in 1966. He eventually married, but kept the little radio safe in a shoe box until last year when I retired and he gave it to me. I had to make up a battery for it to run on, six PP3s in series for h.t. plus a 1.5 volt cell for l.t. current, fitted a new 1/4in jack socket and on/off switch to it and plugged in the 13th ex-RN phones which cost 2s.6d. (12.5p) WWII surplus, it worked a treat. Then last week came 'JOY', I picked up Radio Australia's broadcast to S E Asia on 13.740 in the afternoon at 1630GMT. The frequency I checked out on my Yaesu 7700. So as you often say in SWM there's a lot of satisfaction in building something yourself and having such results. By the way, the aerial used was a length of wire attached to the protective chicken wire I used on the carport roof to protect the pvc sheeting from damage should we get more storms like last January 25 and the earth is a metal fence post. Now I'm retired I can listen daily, and of course spend more time reading my SWM after doing the various jobs around the house.

PATRICK CONNAR
TROWBRIDGE
WILTS

Dear Sir

In reply to the letter of Mike Knell in March SWM, I feel that I must agree with his point's made in the letter. I think that along the same lines that many young people have been pressurized by their peer group to sacrifice the majority of their leisure time in order to become successful after leaving school or higher education.

People if they wish to join in with this hobby do not have the time or early commitment to construct their own equipment which was a major part of the hobby some time ago. The idea of speed and convenience plays a large part in society so if instant results are not obtained first time then the younger people will soon lose interest and move into another hobby which allows quicker results.

I must also say that the RSGB and other organisations are trying to remedy this unfortunate situation by introducing the novice licence for transmitting and also in the education of schools and groups in the use of telecommunications.

ALEX HILL (Age 17)
BICESTER
OXON

Dear Sir

I can confirm Mr C. Stapleton's remark in the April issue regarding burnt-out front end transistors in the ICF-2001D. I bought a 2001D in May last year. The front end died soon after I had rigged up and constructed an outdoor random wire aerial and independent earth. The dealer exchanged the set for another one without question. The second one went the same way soon after. Again, the dealer obliged. The third set is holding out - but for how long? To be fair, I had been switching from the outdoor aerial to the active antenna that was provided with the set - the AN-1 to compare results. And now here is the

odd bit. If one switches the AN-1 on with the attenuator set to zero and the frequency range switch set to l.w./m.w./s.w., a very large voltage transient (nearly 9 volts) appears at the output socket and decays slowly. Switching off has the same effect, except that the polarity is reversed. This would normally be fed to the front end of the 2001D. Could this be the problem? My verdict on the 2001D? In pursuing my hobby of electronics and radio I have bought (or been sold) some lemons. However, the 2001D takes the biscuit - if that doesn't sound too Irish! For me, it's goodbye Sony!

L. McKAY
PURLEY
SURREY

A WORD IN EDGEWAYS

Dear Sir

Although George Millmore read a letter by Peter Robinson in the April issue with interest, I read George Millmore's letter in the June edition with amazement. I have no wish to enter the issue of Morse code in the RAE but do want to correct the completely erroneous impression that Morse as a communications mode is dead. Anyone who doubts the continued use of c.w. Morse transmissions should consult an authoritative source such as the Guide to Utility Stations or the Admiralty List of Radio Signals to name but two. As someone who conducts research into various radio communication systems I may have an unfair advantage over Mr Millmore but as an illustration here are a few documented facts.

1. From 4MHz to 5MHz there are in excess of 450 REGISTERED stations employing c.w. mode and the same density appears at regular intervals in the spectrum up to 27.017MHz.

2. Random c.w. examples show diverse use. Italian Navy stations on 4.6153MHz callsign IDR2, Polish Press Agency on 23.408MHz callsign SOY240B, Paris Interpool on 10.390MHz callsign FSB57, Tokyo Meteo on 7.515MHz

callsign JMB2, Ministry of Foreign Affairs, German Democratic Republic on 14.818MHz with callsign Y7A60 and Kingston, Jamaica on 3.535MHz callsign 6YI.

3. Some of the Russian 'Aeroflot' airline routes use c.w., notably Cuban control stations.

There are all the coastal radio stations from approximately 400-520kHz who use Morse as well as other modes and most Navies use c.w. as well as the hi-tech methods.

There is a return to c.w. Morse as a reliable, low-cost means of communicating over all distances with uncomplicated equipment. Clandestine and routine military operations can establish radio links with ease under the arduous conditions often encountered.

I would agree that compared to some systems the speed of message sending is low but it is usually a first-time contact without for example, the awful burping repeats of the packet fanatics. The speed with which four or five figure encrypted groups can be sent when using the shortened figures Morse (eg: dit-dah for one) is very fast and efficient.

I have access to sophisticated software that 'reads' Morse but it can't follow a fading signal or a

Dear Sir

I have read the article in the December issue of SWM written by Mr John Palmer of Havant, who mentioned that he uses an Amstrad PCW 8256 for translating RTTY/Morse code and storing amateur radio frequencies.

I myself have a PCW 8256 and a Trio R2000 receiver and I am in need of information as to what software and hardware I need to use my equipment as listed above. Obviously, I also need to know where I can purchase these items and if possible, a price list.

In appreciation of your help

P. CATON, MIDDLESBROUGH, CLEVELAND

Can any of our readers help Mr. Caton? This is typical of many of the letters we receive from readers. Sometimes we can answer the query off the top of our heads. Other times it would take too long to research the reply. ED.

Dear Sir

I read in the Seen and Heard column of your May issue that s.s.b. is to eventually replace the a.m. transmissions of short wave broadcasting stations. While I applaud anything that would relieve the congestion in the broadcast bands, I feel any improvement will be quite temporary as long as stations can increase power at will. Most interference is man made noise, usually from another transmitter, so with s.s.b. we may simply be

increasing the overall noise level

Medium wave reception in Europe after dark, particularly in winter, is really terrible, with local stations being completely swamped by high powered stations hundreds of miles away! Perhaps we should adopt the American practice of reducing power after dark, particularly if the transmission interferes with neighbouring stations.

**ANDY CADIER
FOLKESTONE
KENT**

signal partially masked by QRM, a good operator continues to copy the message under conditions that the software won't accept.

Yes, during the last fifty years radio technology has progressed considerably but

the last large-scale combined forces, land and sea exercise off the Scottish coast and on the UK mainland was a disaster as far as 'hi-tech' communications was concerned.

**T. BERNASCONE
MIDDLESBOROUGH
CLEVELAND**

WHAT'S NEW

Special Event Stations

GB2NTS: This station will be on the air over the week July 15-22 for the Castle Country Four Castles Event. The castles will be Grampian Region Drum Castle, Castle Fraser, Craigievar Castle and Leith Hall. A certificate is available for overseas stations if they work any two of the stations or for the UK if they work any three. Annotation is available for working all four stations (the cost for the certificate is 50p, \$1 or equivalent). Robbie GM4UQG, PO Box 59, Hamilton, Lanarkshire ML3 6QB.

GB70SIG: To celebrate the 70th Anniversary of the formation of the Royal Corps of Signals, the Scarborough Special Events Group, with members from

RSARS, RNARS and RAFARS propose to run a special event station from the Royal Signals Training Centre, Burniston Barracks, Scarborough during the period June 10 to July 7.

Operation will be around 3.725 and 7.055MHz on the h.f. bands, plus 144MHz s.s.b. operation and f.m., in addition to activity on the RSARS nets. Special QSL cards will be available and further details can be obtained from: Roy Clayton G4SSH, QTHR.

GB50BOB: On July 8, this station will be on the air from the Science Museum Wroughton.

GB50BOB: This time this station will

be on the air from RAF Swinderby over the weekend August 3/6.

GB50RAF: Again the Science Museum Wroughton will be on the air, this time using a different callsign on August 12.

GB4MR: This station will be active on Sunday July 22 for the duration of the McMichael Rally. The station will be active on all the h.f. bands, and all contacts will be sent a special QSL card. This year the station is being operated by members of the Berkshire Downs Repeater Group, who administer the 144MHz repeater GB3RD, the 430MHz repeater GB3BK and the 1296MHz repeater GB3RU. All the repeaters are located near Reading.

WHAT'S NEW

Power Unit

The Jim PSU -101 is a high-quality, regulated, 12V d.c. supply that will power a hand-held scanner while giving convenient desk top use. It also charges the scanner's internal NiCad batteries.

The PSU -101 is suitable for use with the following models:

Fairmate HP100E
Jupiter MVT5000E
AOR AR-1000
Bearcat 50XLT
Bearcat 55XLT

Made in the UK by SSE, the power supply is built to full UK safety standards and costs £26.

Nevada, 189 London Road, North End, Portsmouth PO2 9AE. Tel: (0705) 662145.



Digital Wind Speed

The 'Windy' is a hand-held anemometer available from Incastec Associates Ltd. This compact instrument, running on a PP3 battery, gives an accurate digital readout of windspeed in knots or metres/sec (switchable) with comparison scales for Beaufort or km/h.

The 'Windy' retails at £75 including VAT. For further details, contact: **Incastec, 75/77 Christchurch Road, Ringwood, Hants BH24 1DH. Tel: (0425) 476211.**

Catalogues

Klippon now produce a full-colour guide to the selection of enclosures for various applications and environments.

The brochure provides tabulated information on the environments, finishes and advantages of using mild steel, stainless steel, die cast aluminium, cast iron, polyester (GRP), polycarbonate and ABS enclosures.

Copies are available free of charge. Klippon. Tel: (0795) 580999.

The latest catalogue from Mauritron Technical Services details the copies of workshop manuals they hold for all kinds of equipment of all ages. There is a section on amateur radio and CB as well as test equipment. Their catalogue is available free of charge. MTS 8 Cherry Tree Road, Chinnor, Oxon. Tel: (0844) 51694.

Another firm to offer catalogues free of charge are RF Engineering Ltd. They have recently been appointed UK distributor for Barker and Williamson Inc, for all kinds of equipment - antennas, transmatch, switches, etc. Other products on offer are air-wound inductors, chokes and cables to mention only a few. RF Engineering Ltd. Tel: (0706) 214118.

Johnsons Shortwave Radio have quite a large catalogue available to readers. It contains detailed descriptions of many of their products lines. Most radios have reviews where full details of all the functions can be ascertained. Johnsons Shortwave Radio, 43 Friar Street, Worcester WR1 2NA.

Hamlin has produced a new brochure on its latest range of l.c.d. modules which covers dot matrix and intelligent graphic types, in standard TN or Supertwist STN technology. Copies are available free of charge. Hamlin. Tel: (0379) 644411.

The Vintage Wireless Company Ltd have produced a short form component catalogue in lieu of newsheet No. 134. Their full illustrated catalogue will be available later. Vintage Wireless Company Ltd. Tel: (0272) 565472.

East to West QRP Weekend

This event, sponsored jointly by the G-QRP Club and the Czech QRP group, will be the largest QRP event yet organised. It will take place from September 28 to 30.

It is open to all QRP operators in Europe and Asiatic Russia, whether members of a QRP Club or not. The objective is maximum QRP communication between stations in eastern Europe/Asiatic Russia and stations in western Europe.

Logs will be adjudicated by the Czech QRP group and merit awards will be produced and issued by the G-QRP Club. The leading UK entrant will also receive an EI-Bug paddle donated by G4ZPY Paddle Keys.

Mods for the PRO-2004

Do you own a Realistic PRO-2004 and would like to improve its performance? You can now get details on a wide range of modifications you can do yourself to change the specification and performance of your scanner.

Changes such as continuous scanning, squelch control, turbo scan and many more are detailed. Also given are details of other kits and upgrades that are available.

Paul Beckett, 3 Pasture Close, Baldwins Gate, Newcastle, Staffs ST5 5DQ

WAB

The WAB presented over £5000 to the Guide Dog for the Blind Appeal at the Drayton Manor Rally. The dogs sponsored by the WAB will, once trained, be returned to the hobby for blind s.w.l.s or licensed amateurs.

On a different tack, someone walked off with their vital book of 'Numbers for Issue' on the Sunday at the NEC. Without it they are unable to complete their membership list in time for the AGM. If you bought a book from the WAB Stand at the NEC on Sunday 21st, please contact any of the Committee as soon as possible.

Via Computer

Radio Station HCJB, The Voice of the Andes, has announced plans to make its programme schedules and programme information available to computer users who have the appropriate equipment via a short telephone call.

Listeners who are equipped with a computer and modem may dial a computer Bulletin Board in London and request the HCJB programme information.

HCJB is also hoping that many new listeners might be contacted through this novel method of making programme information available.

The London telephone number to dial is 081-673 7294. After answering a few initial questions, users of the service should select the Kybernesis Service keying the letters KCH.

Plans are also in hand to make the information available in the United States through the CompuServe Information Service public forum area (GO ACCESS) in the near future.

UK Agent for Key Research

Key Research Co, manufacturers of the search and store modules for the PRO-2004 and 2005 scanners mentioned in 'Scanning' last month, have appointed **B.S. Sutherland, 336 Charlton Road, Westbury-on-Trym, Bristol BS10 6JZ Tel: (0272) 500742**, as their UK agent.

TRADING POST

FOR SALE Sony 2001D system includes AN1 aerial. Mint condition, seven weeks old. Boxed original - PRO receiver, new £319.95 (ask Electronics) my price £225. Buyer collects. Keith Palmer. Tel: Potters Bar, Herts 46348.

FOR SALE Azden PCS 6000 2m transceiver, £300. Also Tokyo HC200 a.t.u., £80. Buyers must collect. C. Holloway. Tel: 071-987 2296 anytime or 071-240 1277 office hours ask for Charles.

WANTED National receiver NC-60, must be reasonable condition and also manual for receiver. Bill GMOKMG on 041-649 4345.

FOR SALE Thermion 13.8V 25A linear p.s.u., fan cooled, fully protected, twin metering, £35.00. 13.8V 15A linear p.s.u. current metering, £20.00. S. G. Brown headphones, £5.00. Over 200 valves new and used, £20.00. Crate of assorted components, transformers, etc, £8.00 the lot. G4FZG QTHR. Tel: Cheltenham 580329.

FOR SALE Panasonic RF3100L f.m., l.w., m.w., s.w. 1.6-30MHz digital readout, b.f.o., good condition, handbook, boxed, £50. Paul Chace. Tel: Chichester 776649.

FOR SALE Realistic PRO-2005 scanner, purchased 11-8-89, mint condition, box and manual, telescopic and listeners' guide. Demonstration given. Buyer collects, £280. Further details from Trev Williams. Tel: St. Albans 30590.

WANTED Denco coils, especially green series. G. Leese. Tel: Barnsley 288718.

FOR SALE Sony ICF-SW1S kit, cassette size radio, 150kHz to 30MHz and f.m. stereo. Includes active antenna, p.s.u., earphones, case, manuals, £100. Also ICF-7600DS, £70. Matthew Searle. Tel: Reading 815354.

EXCHANGE Lowe HF125 receiver plus key pad in mint condition. Also Microreader and other bits and pieces. Required AR1000 or Jupiter II scanner or case equivalent. L. Chatters. Tel: Bodmin, North Cornwall 850868.

FOR SALE Realistic PRO-34 scanner, six weeks old, boxed, extra, load coil telescope whip aerial, £140. J. Wingrove. Tel: 071-228 4835.

FOR SALE Medium wave 'sooper loop' high gain pre-amp. Trio R-1000, £200 mint condition. JVC TV 5 inch B/W with 12 volt car plug/lead, £12. Eight track tape recorder. Eight track f.m./a.m. player. OTO carriage extra. Wanted any PW mags pre 1975 (cheap/free) cost of postage arranged. Write to M. B. Evans, 120 Loughton Way, Buckhurst Hill, Essex IG9 6AR.

FOR SALE Signal R535 v.h.f./u.h.f. airband receiver, in original box, as new, complete with p.s.u., NiCads, charger, handbook and carrying case, £200 o.n.o. Mike Norris. Tel: Bolton 862866 evenings.

FOR SALE Realistic PRO-32 hand-held scanner, 200 channels, complete with NiCads and a.c. adaptor/charger. Boxed with manual, v.g.c., £110. M. Woodcock. Tel: Abingdon 531918.

FOR SALE Realistic DX300 comms receiver, 0.30MHz, £70. Also s.e.m. h.f. converter, £30. M. Mayer. Tel: Nuneaton 327611.

FOR SALE Racal RA17L communications receiver, complete in Racal case in very clean condition, coverage 0.5 to 30MHz continuous, with two official handbooks, £150.00. K. Watmough G3WXB, Devonian Hotel, 74 Royal Parade, Eastbourne, Sussex. Tel: Eastbourne 20059.

FOR SALE Wavecom 4010 super-decoder, fitted with all four software modules (A, B, C and D) plus weather fax option, pristine condition, £850 o.n.o. Bill Hetherington. Tel: 091-482 1344.

FOR SALE Realistic PRO-32 scanner (with NiCads) in original packaging, £130. M. Loveridge. Tel: Kidderminster 747658.

FOR SALE Sony ICF-2001D receiver complete and in excellent condition, £180. Eddystone 730/1A receiver v.g.c., offers. B. Lacey. Tel: Barnsley 289324.

FOR SALE Eddystone '640' communications receiver circa 1947. Included: speaker, 's' meter, manual and diagrams. Best offer from enthusiast secured. Alan Tait. Tel: Exeter 841506.

FOR SALE Eddystone CE10 short wave receiver, 500kHz-30MHz with b.f.o. 9 volts with mains p.s.u., £65. **Want** 2m hand-held. Derek Garner, 26 Wordsworth Ave, Warrington, Cheshire. Tel: Warrington 55924.

WANTED Disabled enthusiast desires buying Xtal controlled receiver TM56B or SR11 receiver with crystals, channels 0, 67, 16, 73, 8 and 14, must be in working order. Eric Allen. Tel: Berwick-Upon-Tweed 308717.

FOR SALE Yaesu FRG7, excellent condition, boxed, instruction manual, £100. Yaesu FRT-7700 antenna tuner, £35. Datong AD370 active antenna, £40. P. Haylins. Tel: Wells, Somerset 76045.

FOR SALE Bearcat 200XLT hand-held, purchased in October 1989, still with six months' warranty and boxed, £190 o.n.o. Realistic PRO-2021 scanner, 12 months old, £130 o.n.o. L. Harrison. Tel: Little Haywood, Staffs 882833 ask for Les.

FOR SALE Elliot 1mA f.s.d. moving coil chart recorder. Two chart speeds, 1 & 6 inches per hour; supplied with three rolls of paper and one bottle of red ink, £57. C. Clements. Tel: 0846 678205.

FOR SALE Philips D2999 communications receiver, one year old, immaculate condition, plus three years extra warranty, £250 no offers. Also Philips D2935 world receiver, three months old, £75. Mr Ireland. Tel: 061-626 3991.

FOR SALE AOR-2002 scanner, excellent condition, good working order, £350 o.n.o. R. West. Tel: North Walsham 406314.

FOR SALE Grundig international 650 receiver, mint condition and little used, 148-30000 Kc/s plus f.m. broadcast. Keypad/rotary frequency selection, full screen displays, 60 memories, exceptional audio quality, £325 o.n.o. Tony Edwards, 5 Greencourts, Winterton-On-Sea, Great Yarmouth, Norfolk. Tel: Great Yarmouth 393560.

FOR SALE Trio/Kenwood R-2000 communications receiver as new, with makers box and manual, very little used, £275. A. Dinwoodie, 9 Juniper Close, Ferndown, Dorset BH22 9UB. Tel: Bournemouth 891253.

FOR SALE Yaesu FT757GX mobile general coverage h.f. transceiver plus YD148 mike, £550 o.n.o. Also Yaesu FT208R synthesised handle 2m, offers. D. Greenspan. Tel: 081-653 2292.

FOR SALE Kenwood R-2000 communications receiver, hardly used, £360. Datong AD370 antenna, £30. Anoraks medium wave loop, £20. Diamond disccone scanner antenna, £40. P&P extra. T. Roy, 16 Acacia Rd, Felling Gateshead, Tyne & Wear NE10 0DU. Tel: 091-477 3581 anytime.

FOR SALE Sony Air7 as new, boxed with all accessories and manual plus Sony protective carry case, hence perfect condition, £170 or o.n.o. Steve Hall, 23 Venners Close, Barnehurst, Kent DA7 6SF. Tel: Dartford 342399 evenings.

FOR SALE Jupiter2 hand-held scanner, mint condition, case included, £250 o.n.o. R. Carter. Tel: Garston, Herts 672346.

FOR SALE ERA Mk2 Microreader, bought March 1990, still as new, current price £155, yours for £120. T. Hyder. Tel: Hythe 843347.

FOR SALE Heathkit SB313 receiver, nine bands covering 10, 15, 19, 20, 40, 41 and 75 to 80m, u.s.b., l.s.b., c.w. and a.m. Offers or **exchange** anything electronic or photographic, modern or old. Ray Milton. Tel: Folkestone, Kent 44783 evenings only.

FOR SALE Microwave module decoder for RTTY-ASCII, £100. Also 12 inch monitor (green), £80 + Yaesu FRT-7700 a.t.u., £40. All in mint working condition, buyer collects, willing to negotiate any reasonable offer. T. Powell. Tel: Shropshire 622368 after 6pm.

FOR SALE Jupiter MVT-5000 with charger NiCads case, military airband antenna, mint condition in original box, £225. Also Bremi BRS-27 power supply, £15. I. Smith, 13 Fern Gore Avenue, Accrington, Lancashire BB5 0NF. Tel: Accrington 31673.

FOR SALE Realistic PRO-34, 200 channel scanner with manual, £110. M. Harvey. Tel: Reading 752971 evenings and weekends.

FOR SALE Realistic PRO-2004 scanner a.m./f.m., coverage from 25 to 520MHz, 760 to 1300MHz, search and scan banks 300 channels. Handbook and manual, plus radio lists, £150 o.n.o. Will deliver. Andy Stulpa. Tel: St. Osyth, Essex 820937.

FOR SALE Radcom mags, 1967, 1969-77, 1980-88. Some bound volumes, £50 o.n.o. Buyer collects or could deliver. S. Fisher, 'Arkle', 31 Frith Avenue, Delamere, Northwich, Cheshire CW8 2JB. Tel: Sandiway 888277.

FOR SALE Yaesu FRG-7, 0-30MHz receiver, very good condition and trapped vertical antenna, both items together, £130. Also ERA microreader Mk2 as new, few hours use only, built in c.w. tutor, £120 o.v.n.o. Ian Hatton. Tel: Derby 834740.

FOR SALE Realistic PRO-2005 scanner, boxed, instructions, excellent condition, bargain, £200. M. Rutter. Tel: Wolverhampton 724510.

FOR SALE Pocom AFR-1000 auto, c.w.-baudot-tor RTTY decoder, as new, boxed. Nine inch video monitor. Mains power unit. Complete ready to plug into receiver, £315 o.n.o. the lot. Buyer collects. C. Head. Tel: Kingsbridge, Devon 531500.

FOR SALE Jupiter II hand-held scanner, 25-500MHz and 800-1300MHz, complete with leather case, boxed and mint as new. Only few months old, cost £299, will accept £245. G. Richardson. Tel: Peterborough 53657.

FOR SALE Drake SSR-1 communications receiver 0.5-30MHz a.m., s.s.b., c.w., modified external digital readout, £95. Buyer collects or pays carriage. Bill Fry. Tel: Maidenhead 26305.

SWM JULY 90 TP

Write out your advertisement in BLOCK CAPITALS - up to a maximum of 30 words plus 12 words for your address - and send it together with your payment of £2.30, to Trading Post, Short Wave magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP. You must send the flash from this page, or your subscription number as proof of purchase of the magazine. Advertisements from traders, apparent traders or for equipment which it is illegal to possess, use or which cannot be licensed in the UK will not be accepted.

GRASSROOTS

Lorna Mower

Aylesbury Vale RS have a Quiz Night with TV celebrity quiz master on July 4, 1st & 3rd Wednesdays, 8pm at Hardwick Village Hall, Hardwick, 8pm. Geoff on Buckingham 817496 or Martyn on Milton Keynes 560026.

Widness & Runcorn ARC meet every 2nd Tuesday (twice monthly), 7.30pm at the Scout Hut, Castle Rd, Halton Castle, Runcorn. Dave Glover G1VJP on Newton-Le-Willows 225445.

South Bristol ARC have Pictorial History of WD & HO Wills by Fred Rice on July 4, a Bring & Buy on the 11th, a 2m Activity evening on the 18th and a Video of the Bristol Lundy Expedition G0DRX on the 25th. Wednesdays at the Whitchurch Folkhouse, Bridge Farm House, East Dundry Rd. Len Baker G4RZY on Whitchurch 832222.

West Kent ARS meet 1st & 3rd Fridays, 8pm at the Annexe of Albion Rd School, Tunbridge Wells. July 20 is SOS by Phil Sale. R. Taylor G3OHV on Crowborough 664960.

Bromley & District ARS meet 3rd Tuesdays, 7.30pm at The Victory Social Club, Kechill Gardens, Hayes. Geoffrey Milne G3UMI on 081-462 2689.

East Kent RS have an Operating night at Bishopstone on July 5 and a talk by Ken Smith on the 19th. 1st & 3rd Thursdays, 7.30pm at the Cabin Youth Centre, Kings Rd, Herne Bay. Brian Tutt G4ZZK on Herne Bay 366232.

Shefford & District ARS meet Thursdays, 8pm at the Church Hall, Ampthill Rd. June 30 is an Annual Barbecue, July 2 is an evening with Biggleswade Archery Club and the 12th is Pedestrian DF Hunt. Nigel G1JKF on Southampton 71149.

Chesham & District ARS have a Barbecue on June 30 and 'Electrostatics' by Chris G1XET on July 18. Wednesdays, 8pm at The Stable Loft, Bury Farm, Pednor Rd. Liz Cabban G0ETU on Chorley Wood 83911.

York ARS meet Fridays, 7.30pm at York City Social Club, Bootham Crescent. Keith Cass G3WVO at 4 Heworth Village, York YO3 0AF.

Horndean & District ARC have History of Computers by John Lansdown on July 5. 1st Thursdays, 7.30pm at Merchistoun Hall, London Rd. S. Swain, 35 Mavis Crescent, Havant, Hants PO9 2AE.

Mansfield ARS meet 1st

Thursdays, 7.30pm at The Polish Catholic Club, off Windmill Lane, Woodhouse Rd. Mrs M. Lowe G7BQF on Mansfield 755288.

Spalding & District ARS meet Fridays, 7.30pm at the Riverside Leisure Centre, Albion Street. Dennis Houlst G4OO on Spalding 750382.

Trowbridge & District ARC have a Family Picnic at White Horse Hill, Westbury, 6.30pm. Ian G0GRI on Bratton 830383.

Loughton & District ARS meet alternate Fridays, 8pm at Deben Community Centre, Loughton Hall, Rectory Lane. June 29 is an RSGB Video night and July 13 is The Grid Dip Oscillator and its uses by G0LWF. Mike Pilsbury G4KCK on 081-504 4581.

Acton, Brentford & Chiswick ARC have a talk/demo of Home Brew Helical Antennas given by G2FHV on July 17. Tuesdays, 7.30pm at the Chiswick Town Hall, High Road. Details from P. Truitt at the above address.

Southgate ARC have Construction evenings on June 28/July 26 and a talk on Radio Data Service by G3LWA on July 12. Meet at 7.45pm in Holy Trinity Church Hall (Upper), Winchmore Hill, London N21. Brian Shelton on 081-360 2453.

Verulam ARC meet 2nd & 4th Tuesdays, 7.30pm at the RAF Association HQ, New Kent Rd, (off Malborough Rd), St. Albans. July 24 is a talk on Electromagnetism by Oliver Heavyside. Andy Ince G0BZS at Cottage No. 1, Rounton, 28 Nascot Wood Rd, Watford WD1 3SD.

Stourbridge & District ARS now have a new secretary, so all future correspondence should be addressed to Dennis Body G0HTJ at 53 Grove Rd, Wollescote, Stourbridge, West Midlands DY9 9AE. They meet 1st & 3rd Mondays at the Robin Woods Centre, Scotts Rd.

Bury St. Edmunds ARS have a talk on July 17 by Pat Gowen G3IOR on Satellites And Their Working

They meet 3rd Tuesdays, 7.30pm at the County Upper School, Beetons Way. Ian Capon G0KRL on Beyton 70527.

Stevenage & District ARS have a committee meeting at 82 Lingfield Rd on June 28, Planning Club v.h.f. station on July 3, HF Night on Air/Project evening on the 10th and Repair of Club Gear on the 24th. Ground Floor Lecture Room, 'D' Block, Ridgemoor Training Enterprise, Ridgemoor Park. Peter Daly G0GTE on Stevenage 724991.

Derby & District ARS have a Junk Sale on July 4. Wednesdays, 7.30pm at 119 Green Lane. Kevin Jones G4FPY on Derby 669157.

The Sutton & Cheam RS meet 3rd Fridays, 7.30pm at Downs Lawn Tennis Club, Holland Ave, Cheam with natter nights on 1st Mondays in the Downs Bar. July 2 is a natter night. John Puttock G0BWW at 53 Alexandra Ave, Sutton, Surrey SM1 2PA.

Bredhurst Receiving & Transmitting Society have the following new postal address: c/o P.W.C.A., Parkwood Green, Wigmore, Gillingham, Kent ME8 9PN. Also the new contact number for their Chairman, Ken Godwin G1HTA, is Medway 271548.

North Ferriby United ARS meet Fridays, 8pm in the Football Club Social Room, Church Rd. Frank Lee G3YCC on Hull 650410.

Salop ARS meet Thursdays, 8pm at 'Ye Olde Bucks Head', Frankwell, Shrewsbury. Details from Fred Hall G3NSY on Shrewsbury 790457.

Delyn RC have a Visit to Chester Police Station on July 3 and a Barbecue on the 17th. They meet every other Tuesday, 8pm in the Daniel Owen Centre, Mold, Clwyd. S. Studdart on Deeside 819618.

Yeovil ARC meet Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. July 5 is HF propagation fundamentals G3MYM, the 12 is How jFets Work G3MYM and the 19th is Measuring jFet characteristics G3MYM. David Bailey G1MNM, QTHR or their

Chairman G4JBH on Yeovil 28341.

Coventry ARS meet Fridays, 8pm at Baden Powell House, 121 St. Nicholas Street, Radford. June 29/July 13 are nights on the air with Morse, July 1 is a Treasure Hunt, the 6th is a 2m DF contest (outdoors) and the 20th is Members Mini Lectures. Neil Blair G7ASZ on Coventry 523629.

Rugby ATS have a 144MHz direction finding competition round three on July 17. Tuesdays, 7.30pm at the Cricket Pavilion, outside Rugby Radio Station. Kevin Marriott G8TWH on Coventry 441590.

Norfolk ARC have CQ Stateside, night on the air on July 4, Mobile DF Hunt on the 11th, an informal & committee meeting on the 18th and Using Satellites demonstration by G3IOR on the 25th. Wednesdays, 7.30pm at The Norfolk Dumpling, The Livestock Market, Harford, Norwich. Steve Sewell G4VCE on Mulbarton 78258.

Cheshunt & District ARC have natter nights on July 4/18 and a Junk Sale on the 25th. Wednesdays, 8pm in the Church Room, Church Lane, Wormley. Roger Frisby G4OAA on Hoddesdon 646795.

Felixstowe & District ARS have a Ten-Pin Bowling evening on July 9 and a night on the air on the 23rd. Meetings in the Back Room of the Ferry Boat Inn, Felixstowe Ferry, 8pm. Paul Whiting G4YQC on Ipswich 642595 (daytime).

Mid-Warwickshire ARS have a 2m DF Foxhunt on July 10 and Scanners & Open evening G8XDL on the 24th. 2nd & 4th Tuesdays, 8pm at 61 Emscote Rd, (St. Johns Ambulance HQ). Mike Newell G1HGD on Kenilworth 513073.

Wimbledon & District ARS meet 2nd & last Fridays, 7.30pm in St. Andrews Church Hall, Herbert Rd. June 29 is CATS v WDARS quiz at home on June 29, Op-Amps on July 13 and a DF Hunt on the 22nd. Nick Lawlor G6AJY on 081-330 2703.

Keighley ARS have natter nights on July 3/10/24 and Packet Radio on the Air on the 17th. Meeting at 8pm, in the Clubroom, rear of Victoria Hall. Kathy on Bradford 496222.

Thornbury & District ARC have Message Handling for RAYNET by G1ABT on July 4 and HF activity/natter night on the 18th. United Reform Church, Chapel Street, 7.30pm. Tom Cromack G0FGI on Thornbury 411096.

Club Secretaries:
Send all details of your club's
up-and-coming events to:
'Grassroots', Short Wave Magazine,
Enefc House, The Quay,
Poole, Dorset BH15 1PP

RALLIES

***Short Wave Magazine and Practical Wireless
in attendance.**

July 1: The Worcester & District Droitwich Strawberry Rally will be held at the High School, Droitwich. There will be the usual trade stands, Bring & Buy, family entertainment and strawberry fields (weather permitting). Gates open at 11am with free car parking and entrance. **Tony G4OPD. Tel Worcester 620507 or Derek G4RBD. Tel: Worcester 641733.**

July 1: The York Radio Rally will be in the Tattersall Building, York Race Course, The Knavesmire, York. Doors open at 11am with an entrance fee of 50p (children admitted free). There is ample free parking. On show will be amateur radio, electronics and computing, arts and crafts, there's a grand Bring & Buy, Morse tests, lectures on various aspects of amateur radio, a raffle and talk-in on S22. A licensed bar and cafe will be available for refreshments. The Knavesmire is well signposted and there will additional RAC signs round the main approaches to York. **Frank Webb G3ZKS. Tel: (0904) 625798.**

July 1: Newport ARS are holding their 3rd Grand Surplus Equipment and Junk Sale at the Brynglas Community Education Centre, Brynglas Road, Newport. The Sale is open from 10.30am to 4pm (10am for the disabled). **Kevin GW7BSC. Tel: (0633) 262488.**

July 6, 7 & 8: The Popular Flying Association Rally is again being held at Cranfield Aerodrome, Bedfordshire. All activities related to flying, including airband radio will have a place there.

***July 14:** The Cornish Radio Amateur Club Rally will be held in the Richard Lander Scholl, Truro. There will be the usual trade stands, Bring & Buy, a computer display/demo and a weather satellite demo. There will be refreshments, and free parking. Doors open at 10am (9.30am for the disabled). **Rolf Little G7FKR. Tel: (0872) 72554.**

***July 15:** The Sussex Amateur Radio and Computer Fair will be held at Brighton Racecourse. All the usual traders and other attractions will be there. Doors open from 10.30am to 4.30pm, entrance is £1. **Ron Bray G8VEH (QTHR). Tel: (0273) 415654 office hours, (0903) 763978 other times.**

July 22: The Burnham Beeches and the Maidenhead & District Amateur Radio Clubs are staging the 7th McMicheal Rally at the Haymill Centre, Burnham, near Slough. Doors open to the public at 10.30am (10.15am for the disabled). Admission is £1, the car boot sale pitches cost £5. There will be the usual trade stands, packet radio demo, refreshments, (tea and coffee on the RAIBC stand this year - honestly!), bar as well as the GB4MR special event station.

***July 29:** The Scarborough ARS Rally will be held at the Spa, Scarborough. Doors open at 11am. Many trade stands, large Bring & Buy, Morse exam and demonstration for the Morse examiners, refreshments and

bar. Details from **Ian G4UQP (QTHR). Tel: (0723) 376847.**

July 29: The Rugby ATS will be holding their Car Boot Sale at Lodge Farm, Walcote, near Lutterworth, Leicestershire. Talk-in will be provided by GB8CBS on S22. Pitches are £5 for the whole day, entrance for visitors is 50p per cae. Gates open at 10am. **David G4DDW. Tel: (0455) 552599.**

***August 12:** Hamfest '90 will be held at the Flight Refuelling Sports Grounds, Wimborne, Dorset. The event will feature Radio and Electronics Trade Stands, Craft and Gift Fair, Bring & Buy, a vintage wireless exhibition and full family entertainment. Talk-in on S22. The event opens at 10am. Free parking and overnight camping on the Saturday night by prior arrangement. **John G0API. Tel: (0202) 691649 or Rob G6DUN. Tel: (0202) 479038.**

August 12: The 1990 Derby Mobile Rally will take place once again at Lower Bemrose School, St Albans Road, Derby, just off the A511 Derby Ring Road. Gates open at 10.30am with all the usual attractions including the Giant Junk Sale. **Kevin Jones G4FPY, 20 Pinecroft Court, Oakwood, Derby DE2 2LL. Tel: (0332) 669157..**

August 19: The West Manchester Radio Clubs Red Rose Summer Rally will be held at the Bolton Sports and Exhibition Centre, Silverwell Street, Bolton.

August 26: The Three Cs Rally will be held at the Tiddenfoot Leisure Centre, Linslade, Leighton Buzzard, Beds. Entrance fee is £1, children free. **A Perkins. Tel: (0582) 33885.**

August 26: The Open Day of the Galashiels & District ARS will be held at the Focus Centre, Livingstone Place, Galashiels. There will be trade stands, a Bring & Buy, catering and all the usual activities. Talk-in on S22.

August 27: The Huntingdon Junk Sale & Auction will be held at the Medway Centre, Coneygear Road, Huntingdon, Cambs. The doors open from 10am to 4pm, food and drink will be available all day. **G1YVS. Tel: (0836) 611025 or (0487) 830212 (eves).**

September 9: The Vange ARS will be moving the rally this year to The Laindon Community Centre, Aston Road, Laindon, Basildon, Essex. Doors open from 10am to 4.30pm with admission at 50p. The rally will include many traders, a Bring & Buy, refreshments and free raffle. Talk-in on S22. **Doris Thompson. Tel: (0268) 552606.**

***September 9:** The Lincoln Hamfest will be held in the Exhibition Centre, Lincolnshire Showground. Gates open at 10.30am (10am for the disabled) and the rally closes at 5pm. All the usual trade stands will be there, along with the Real Ale Bar. There will be lots of attractions for the whole family too. Caravans welcome by prior arrangement. Talk-in on S22 by the West Lincs RAYNET Group. **Sue Middleton. Tel: (0522) 531788.**

***September 16:** The British Amateur Radio Teledata Group annual rally will be held at Sandown Park Exhibition Centre, this time in the larger Surrey Hall. **Peter Nicol G8VXY. Tel: 021-453 2676.**

September 16: The Bristol Radio Rally will be held in Brunel's Great Train Shed, Temple Meads Station, Bristol. All the usual traders will be there, a large Bring & Buy, food and refreshments as well as displays and demonstrations. **D.S. Farr. Tel: (0272) 839855.**

September 23: The Centre of England Amateur Radio Rally will be held at the National Motorcycle Museum, Bickenhill, near the NEC. There will be a Bring & Buy and over 60 trade stands, all housed in three large exhibition halls. Concessionary rates for all those who wish to visit the Motorcycle Museum and ample free parking. Doors open at 10.30am. **Frank Martin G4UMF. Tel: (0952) 598173.**

September 23: The Peterborough Mobile Rally will be held in the Werrina Sports Stadium, Peterborough from 10am to 5pm. All the usual traders will be there, a Bring & Buy and tables may be hired on the day (space permitting). Talk-in is on S22 and SU22 by G3DQW. **Robert Maskill. Tel: (0836 542630) any evening.**

September 30: The 6th North Wakefield RC Rally will be held at Outwood Grange School, Potovens Lane, Outwood, near Wakefield. Admission is 50p at 11am - disabled 10.30am. Fully licensed bar with real ale, good selection of food from cafe, raffle, Bring & Buy, radio, computer and electronic traders and repeater groups. **Richard G4GCX on (0532) 622139.**

September 30: The Harlow & District ARS will be holding their Amateur Radio & Electronics Rally at the Harlow Sports Centre. The Main Hall will provide a large and varied selection of traders, both old and new to the event. The studio upstairs will be solely dedicated to the Bring & Buy, along with the many special interest groups. Catering and licensed lounge bar as usual. Entry is still £1 accompanied children free. **Alf G7FNY. Tel: (0279) 418392 (daytime).**

***October 7:** The Great Lumley Amateur Radio & Electronics Society will be holding their rally in the Community Centre, near Chester-le-Street, in Great Lumley. Doors open at 11am (10.30am for disabled). **Barry G1JDP. Tel: 091-388 5936.**

October 14: Computercations will be held again this year at Hillhead campsite on the Dartmouth road in Brixham, South Devon. **Bill Trezise. Tel: (0803) 522216.**

***October 20/21:** The 4th North Wales Radio Rally will be held at the Aberconwy Centre in Llandudno. Rally open as at 11am on both days and the entrance fee is £1 with OAPs 50p and children under 14 free. **Mr B Mee. Tel: (0745) 591704.**

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



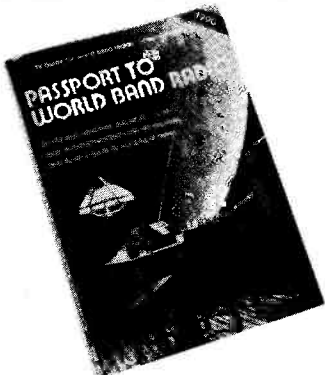
		Price	Carr
HF-225	HF general coverage receiver, 30kHz to 30MHz.....	£395.00	£8.00
(The HF-225 has been voted "Receiver of the Year" by World Radio and TV Handbook, against all other manufacturers' products")			
Options			
D-225	Synchronous AM and FM detector.....	£39.50	£1.00
K-225	Keypad for direct frequency entry.....	£39.50	£1.00
B-225	Internal NiCd battery pack.....	£49.00	£2.50
W-225	Active whip aerial.....	£19.50	£2.50
C-225	Delux carrying case for HF-225..	£23.86	£3.00
S-225	Wharfedale speaker and lead.....	£49.50	£3.00



R-5000	Kenwood HF communications receiver. 100kHz to 30MHz.....	£875.00	£8.00
Options			
DCK-2	12volt dc power kit.....	£9.29	£1.00
VC-20	VHF converter for 108 to 174MHz.....	£167.21	£3.00
VS-1	Speech synthesiser for R-5000..	£32.26	£1.00
YK88A-1	6kHz AM crystal filter.....	£48.05	£1.00
YK88C	500Hz CW filter.....	£46.08	£1.00
YK88CN	270Hz CW filter.....	£54.64	£1.00
YK88SN	1.8kHz SSB filter.....	£46.74	£1.00
SP-430	External speaker unit.....	£40.81	£2.50



NRD-525	JRC communications receiver. 90kHz to 34MHz.....	£1095.00	£8.00
Options			
CMK165	VHF/UHF converter. 34-60, 114-174, 423-456MHz.....	£391.35	£8.00
CMH530	RTTY demodulator.....	£102.19	£1.50
CMH532	RS232 interface unit.....	£91.75	£1.50
CFL231	300Hz CW filter.....	£126.37	£1.00
CFL232	500Hz CW filter.....	£126.37	£1.00
CFL233	1kHz RTTY filter.....	£126.37	£1.00
CFL218A	1.8kHz SSB filter.....	£117.89	£1.00
NVA88	Matching external loudspeaker...	£62.86	£2.50



THE LISTENERS' BOOK OF THE YEAR..... £12.95

Never has a title been so well chosen as the "Passport to World Band Radio". This is the one book which seems to contain everything you need to know about listening to the amazingly diverse world of radio broadcasting. Let's just run through what this book contains: —

Obviously it has a complete listing of all short wave broadcasters, not simply in order of frequency, but also listing by language and country of origin, AND also the timing of the broadcasts. Almost two hundred pages of such information would make the book worthwhile on its own, but you also have detailed reviews and comment from an acknowledged and respected authority on such matters covering no less than forty radio receivers ranging from the sublime to the gor-blimey. To add to all this, you also get over a hundred pages of general news, views, and information.

The "Passport" is an absolutely indispensable companion to the short wave listener and the price is so reasonable for so much information. Get one soon before they are out of print.

The price for this constant companion. Slightly less than that for a pedigree dog. It's £12.95 for callers, or we can send it to you for an extra £1.55 for postage and packing.

FREE

Send four first class stamps to cover the postage and we will send you, by return of post, you FREE copy of "THE LISTENERS' GUIDE" (2nd edition) - a commonsense look at radio listening on the LF, MF and HF bands. In unique style will, I am sure, result in a "good road" 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

26 YEARS IN SHORTWAVE

When it comes to scanners Look to Lowe

AR-3000 – The Ultimate Receiver



It is an acknowledged fact that AOR are the foremost manufacturer of VHF/UHF monitoring receivers in the world. In the AR-3000, even AOR have excelled themselves, because they have produced what is without doubt the ultimate receiver for wide band monitoring use.

Designed for the professional market, the AR-3000 is nevertheless affordable by the listening enthusiast, and the specification is enough to make any keen listener want this astounding receiver. Brief details: —

Imagine a frequency coverage from 100kHz to 2036Mhz: that's from below Radio 4 on the Long Wave to beyond satellites on 1.7GHz; and there are no gaps in the tuning range. Any frequency within this astounding range is yours to use as you wish.

Imagine all mode facilities, including AM, FM (communications), FM (broadcast), Upper Sideband, Lower Sideband, and even CW. Yours to command with the AR-3000.

Imagine tuning in 50Hz steps for accuracy on SSB/CW, with any step available at your choice from 50Hz to 100kHz, selectable in 50Hz increments. For really high speed tuning you can even increase all the steps by a factor of 10 by a touch of the main tuning knob.

Imagine 400 memory channels in 4 banks of 100, with each bank having its own priority channel, and each bank having its own programmable search system.

Imagine High speed scanning at 20 channels per second, with each memory channel having frequency, mode, and RF attenuator setting stored safely in it.

Imagine having a real time clock for accurate logging.

Imagine having a built in RS-232 computer interface for total control by a personal computer.

Imagine having all this with the outstanding performance which AOR built in to their famous AR-2002, but have now improved on for the AR-3000.

The AR-3000 is the monitor's dream receiver, and it is finally becoming available for general sale now that the Government orders have been fulfilled. Contact us right away for details of delivery schedules, and be prepared to own the best receiver anyone has yet produced.

AR-3000 — a dream come true.

AR-3000..... £765 carr by Securicor £10

For the past 26 years Lowe Electronics have specialised in seeking out the best in radio and bringing it to our customers. Those customers will also tell you that we have another speciality — looking after them. Whatever is best in radio, we sell. Whatever we sell, we back with really expert advice and service. We are pleased to represent the best companies in the receiver world, and in addition to the AOR range shown here, we also distribute receivers from Signal Communications and WIN, two of the top names in Airband radio. For full information and a copy of our Airband Guide, simply send us four first class stamps and mention that you saw our ad. in Short Wave Magazine". Happy listening.

Shops in **GLASGOW** Telephone 041-945 2626. **DARLINGTON** Telephone 0325 486121. **CAMBRIDGE** Telephone 0223 311230
BARRY Telephone 0446 721304. **LONDON** Telephone 081-429 3256. **BOURNEMOUTH** Telephone 0202 577760
All branches are closed all day Monday.

ALTERNATIVES TO DENCO COILS

R. A. Penfold

This article provides a good starting point to enable coils to be wound with reasonable results. However, these notes on coil winding are for guidance only and you will almost certainly need to do a little 'fine tuning' of the coils to optimise results and get the frequency coverage right. The materials for accurate d.i.y. copies of Denco coils are not available and without special equipment you are unlikely to be able to make them anyway. However, the original Denco terminology and pin numbers have been used throughout the article to give correlation with the genuine coils.

Construction

All coils in the Denco range were wound on unique 3/8in diameter, polystyrene formers with adjustable dust iron cores. However, ordinary 10mm (3/8in) formers should suffice for d.i.y. coils, but they must be fitted with adjustable cores. Maplin Type 450 Formers (LB18U) with Type 8 Cores (LB43W) are the ones used for this article.

The ends of the windings need anchor points. The bases of most formers do not have these as they are only designed to be bolted to a panel. If you require single band only operation, mounting the coil holder onto a p.c.b. fitted with pins to act as connection points for the ends of windings might be satisfactory. For plug-in band changing the coil former must be mounted on a suitable plug.

The most suitable is the Maplin Octal type (HL01B is the plug, HL00A the socket). These are large, but then they need to be to take a 10mm former. DIN plugs are too small, and most other types

Many projects specify Denco coils to make life easier for the constructor. Unfortunately they are no longer made and supplies seem to have long since dried up. This article outlines some alternatives to enable you to build those designs.

simply do not offer a suitable number of ways. Either invert the former, or carefully saw off the base so that it can be glued in place on the plug, using a good quality, gap-filling, adhesive, without covering any of the pins. A short rod fitted into the bottom of the former and the hole in the plug will stiffen the assembly, improving the chances of the two sections staying together in use.

An alternative is to drill small holes in the base section of the coil and then take the leadouts through these. This will keep everything nicely in place and there should be no difficulty in mounting the coils on a circuit board. To give plug-in band changing the leadouts can be wired to any plug with enough ways. You will need to mount the holder firmly onto the plug, of course.

The Denco Coils used a B9A (Noval) base with nine pins. Obviously an Octal base has only eight pins, so the original numbering used by Denco cannot be adhered to. Keep a record of which winding is connected to which pin, then there should be no problems.

Alternative Formers

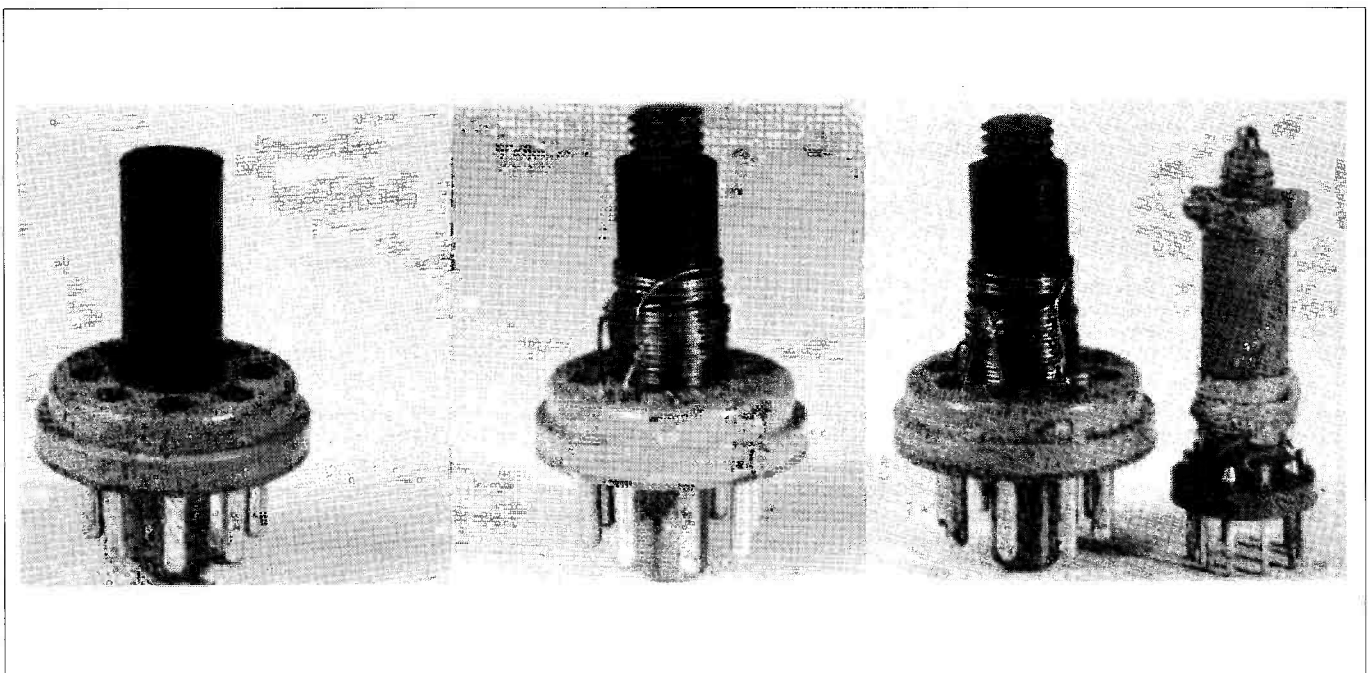
The coils could also be wound on miniature formers, such as the Maplin Type 722 formers, which have a six-pin base. These are not much use for plug-in band changing as matching holders are not available, but they are excellent for mounting on circuit boards. Being about half the diameter of Denco Coils, they need about three times as many turns as equivalent coils wound on 10mm formers.

Remember that the dust iron core is still required whichever type of former is used. **Only adjust the cores using proper trimming tools, otherwise you will almost certainly break the core inside the former.**

Range 5 Coils (10.5 to 31.5MHz)

The main (tuned) winding (pin 1 to pin 6) is about 6.5T of 20 s.w.g. (0.9mm) enamelled copper wire and should cover about 9mm along the length of the former. This is the same for all the r.f. and aerial coils, **Transistor or Dual Purpose**. The aerial/input coupling winding (pin 8 to pin 9) has 2T of 30 s.w.g. (0.32mm) enamelled copper wire wound over the top of the tuned winding. In fact, this coil fits in the slight gaps between the turns of the tuned winding. The output coupling winding (pin 5 to pin 7) is 1T of 30 s.w.g. (0.32mm) enamelled copper wire, wound on top of the other two coils.

The **Green Coils**, used in t.r.f. sets, have a feedback winding (pin 3 to pin 4) instead of the output winding (pin 5 to



The d.i.y. version of a 'Green' Range 4 (5 to 15MHz) coil wound on a 10mm former fitted onto an Octal plug. The photograph on the right shows the home-made coil alongside an original Denco coil from the 'Blue' Range.

ALTERNATIVES TO DENCO COILS

pin 7). This is wound below the tuned winding and has 4T of 30 s.w.g. enamelled copper wire.

The **Transistor Oscillator Coils** seem to operate on harmonics, and are not much different to the Range 4 Oscillator Coils. Follow the winding instructions for the Range 3 Oscillator Coils.

The **Dual Purpose Oscillator Coils** have approximately 5.5T of 20 s.w.g. enamelled copper wire as the tuned winding. The feedback winding is 2T of 30 s.w.g. (0.32mm) enamelled copper wire wound over the main winding, at the top of this coil.

Range 4 Coils (5 to 15MHz)

All windings are wound with 30 s.w.g. enamelled copper wire. The aerial and r.f. coils have 15.5T for the main winding. The output coupling winding is 2T wound over and at the bottom of the main winding. The aerial/input coupling winding is 4T wound above the main winding (i.e., not over it, but higher up the coil former).

The **Green Coils** have the tuned and aerial windings as above. The feedback winding is 8T of wire wound on top and in the middle of the main winding. Use 1T less on the main winding of an **Oscillator Coil**. The coupling windings on the **Transistor Oscillator Coils** are 4T of wire (pin 8 to pin 9), and 2T on the other winding, wound below the main winding. The coupling winding on a **Dual Purpose Oscillator Coil** is about 4T.

Range 3 Coils (1.67 to 5.3MHz)

All windings must be of thin, enamelled copper wire, about 32 or 34 s.w.g. (0.25 or 0.2mm). There are 42.5T on the main winding. The aerial/input coupling winding is 11T of wire, wound above the main winding. The output winding is 4T of wire wound on top and at the bottom end of the main winding. About 20T should suffice for the feedback winding of the **Green Coil**. The main winding on the **Transistor Oscillator Coil** has 32T, while the coupling winding (pin 8 to pin 9) has 11T. The other coupling winding has 3T. On a **Dual Purpose Oscillator Coil** about 7T should be satisfactory.

Winding Direction

In some cases, particularly the **Oscillator** and **Green Coils**, the direction in which the coils are wound is crucial. Always wind the coils in the same direction, starting with the lower pin number and finishing with the higher pin number. It does not matter whether you wind the coils clockwise or anticlockwise, provided all windings go the same way with no changes in direction midway through a winding.

Be prepared to experiment a little. You can increase the coverage in the l.f. direction by adding more turns to the main winding, or in the h.f. direction by removing turns from this winding.

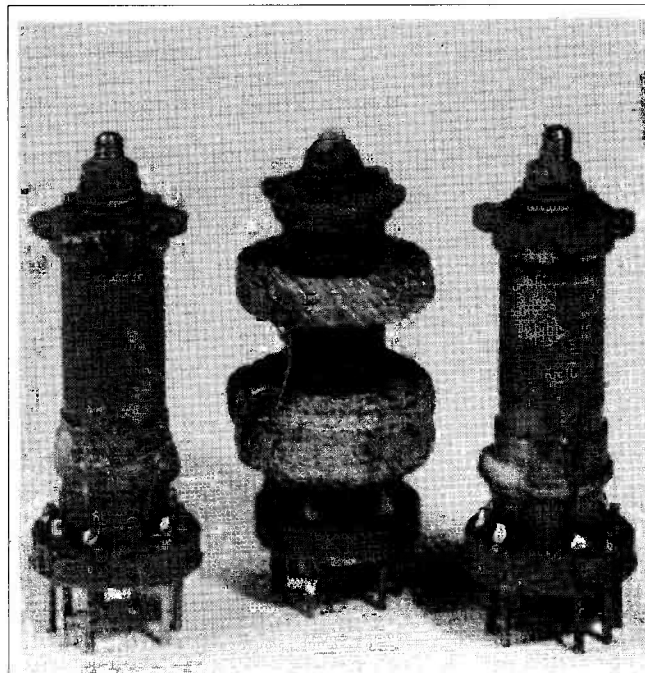
Spreading some glue on the former

before you start winding the coils can help to keep everything in place on the finished unit, but is a bit messy. Using a generous amount of epoxy adhesive once everything is finished and you are satisfied with the results is perhaps a better bet.

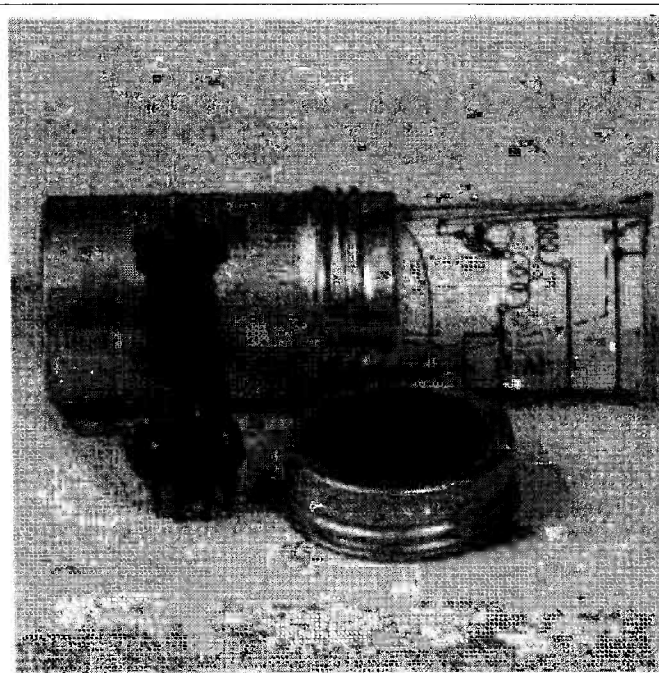
Home-made coils are unlikely to be as accurate as ready-made ones, and it is probably best to have separate tuning controls for the aerial, r.f. and oscillator stages. This is less convenient than ganged tuning capacitors, but enables everything to be kept perfectly tuned, and makes careful alignment unnecessary. Alternatively, fit large aerial/r.f. trimmer capacitors (50pF or even 100pF variables across the aerial and r.f. tuned windings). Again, this will enable everything to be kept accurately tuned, and will avoid the need for accurate alignment. □

Abbreviations

d.i.y.	do it yourself
DIN	West German Standards Organisation
h.f.	high frequency
in	inch
l.f.	low frequency
mm	millimetres
p.c.b.	printed circuit board
pF	picofarads
r.f.	radio frequency
s.w.g.	standard wire gauge
T	turns
t.r.f.	tuned radio frequency



A selection of genuine Denco coils showing their construction. This shows how difficult it would be to copy the construction exactly. Litz wire is used extensively, wave wound as well!



The original Denco coils were supplied in an aluminium screw-top cannister of the type used for 35mm films. This was intended to be used as a screening can around the coil. Full instructions were also supplied with each coil.

BANDSCAN

Peter Laughton

Dayton Hamfest is held annually in the Hara Arena Exhibition Centre on the outskirts of the city. I can still hear the bustle of hand-held portables, people bargaining for software and generally having a good time. Outside you could wander along no less than eight miles of flea market stands. There were some real bargains to be found amongst some real rubbish - the skill was to spot the jewels in the junk. Inside, the equipment was mostly new.

I expected to see new receiving equipment from Icom of Japan. It didn't turn up at Dayton and people on the Icom stand said that design problems will mean a delay before the ICR-1 and ICR-100 are launched. The super-wide coverage receiver, the SR-1000, from Grove Enterprises of North Carolina was also conspicuous by its absence. Japan Radio Company showed off a new transceiver called the JST-135, otherwise the news from Dayton 1990 was in the fields of add-on units, computer software and especially digital technology.

Interest in amateur radio is currently stable in the US, although the lack of new blood is worrying many amateur radio organisations. Interest in scanning receivers and general short wave broadcast listening seems to be experiencing a boom. The newcomers are not so much the hobbyists, but people with a specific interest in trying to hear broadcasts from a particular part of the world. Fred Osterman is manager of Universal Radio in Reynoldsburg Ohio. Like many dealers at the show, he is convinced there's a growing short wave interest, thanks to the influx of the cheap entry level portables.

Ethiopian Clandestine

BBC Monitoring reports that a new clandestine station is broadcasting to Ethiopia. It calls itself the 'Voice of the Ethiopian People For Peace, Democracy and Freedom' and started broadcasting on April 21 from what is claimed was liberated territory of the Ethiopian People's Revolutionary Democratic Front. The station says its using frequencies in the 49, 44, 43, 40 and 31 metre bands and has broadcasts in the Amharic language between 0400 and 0500UTC, as well as 1500-1600 and 1900-2000. The BBC noted the 0400 broadcast on the out-of-band frequency of 7885kHz.

On The Move

In Melbourne, Australia, tension is mounting at Radio Australia over plans to move the station out of a purpose-built building completed just eight years ago. The parent body, the Australian Broadcasting Corporation, wants to combine RA with ABC domestic services

Peter Laughton was one of over 30000 people who descended on the city of Dayton, Ohio, USA at the end of April.

in a huge building to the south of the city. One of the former managers of Radio Australia, Peter Homfray, was quoted recently as saying that if the move goes ahead the ABC is sure to prune Radio Australia back to five languages. Meanwhile in London it has now been decided that the BBC World Service is to move out of the rented accommodation at Bush House on the Strand. In 1995, a new purpose-built building in White City, west London, will be the service's new home.

Returns To The Airwaves

Dr Adrian Peterson, formerly director of Adventist World Radio Asia, and now based in Indianapolis in the USA says that the media programme 'Radio Monitors International' is to be revived in July. The programme used to air on airtime bought from the Sri Lanka Broadcasting Corporation. Adrian tells us the new series should appear on the AWR short wave network, although a final schedule has still to be finalised. The programmes are being launched at a conference of Adventists being held in Indianapolis in July which is expecting some 50000 attendees.

Radio Earth, a programme production company based in the state of Illinois, not far from Chicago, which has hired airtime on several short wave stations, now intends to start broadcasts this month from Radio Peace International, in Costa Rica. The experimental transmissions are on Saturdays for half-an-hour starting at 23hrs UTC on 13660 and 21565kHz.

As I predicted the Czech external service, Radio Prague, resumed on Monday 7 May after a five week absence. Portuguese and Italian programmes have disappeared, and the station only announces other languages as being Czech/Slovak, French, German and Spanish. Some regular voices are missing and they call the station 'Radio Prague International'. However, in between programmes the interval signal drops the word 'international'. English to Europe appears at 1700-1727, 2000-2030 and 2100-2115UTC on 5930, 6055, 7345 and 11990kHz. Between 1830 and 1845 we noted them on using just 6055 and 7345kHz. How long Radio Prague can remain on the air is still an open question though. Finances are very tight at the station, now operating with just 40 per cent of the staff they had a year ago.

Cuban Jamming Increases

In Washington DC, officials at Radio Marti have announced that their programme is now being jammed by Cuban authorities 24 hours a day. The deliberate interference on 1180kHz has been gradually stepped up. Short wave coverage has been increased too. We note new 6.030MHz between 0600 and 0930UTC being used for Radio Marti.

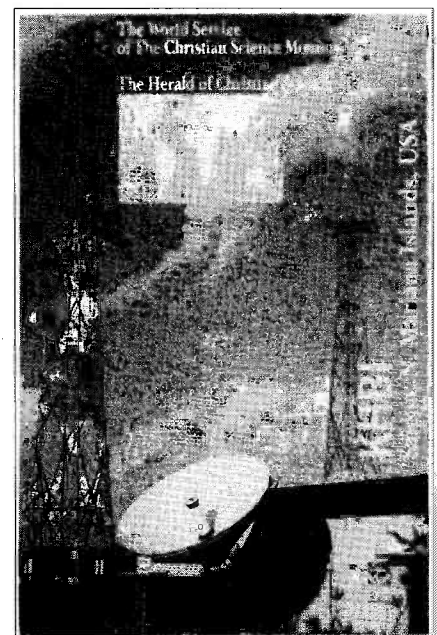
Christian Science QSLs

After a period of testing, the Christian Science Monitor transmitter stations are now verifying reception reports. They've printed up three QSL cards, depicting their three short wave transmitter sites. The cards are being sent out with the current programme schedule. If you want the card officially verified you have to return it to Boston for checking. Such a system is also used by Radio Canada International. For more details drop a line to World Service/Herald, Box 860, Boston MA 02123, USA.

Spanish Developments

The director of Spanish Foreign Radio, Omero Valencia, has been explaining to SWM why they suddenly started broadcasts in German and Russian on May 7. It seems they took the decision after an EBU meeting in Geneva. At the meeting, most of the EBU members said they were going to increase their output in German and Russian. Since REE didn't have broadcasts in these two languages, when the director came back from the meeting in Geneva, he simply ordered them on the air.

Spain has been trying to set up a new



One of three new cards from KHBI.

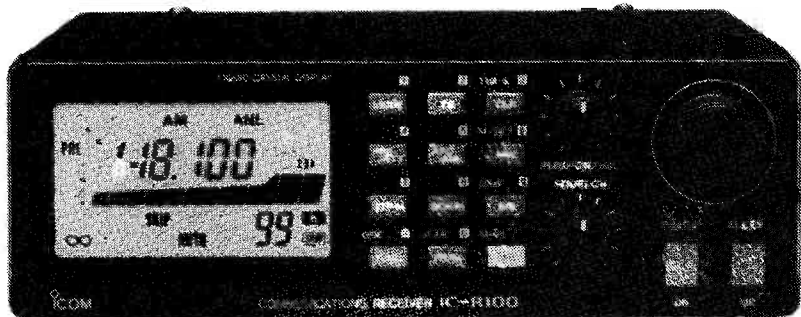
ARE

COMMUNICATIONS
THE SHOP WITH THE SMILE

WE SELL ALL WELL-KNOWN BRANDS
LET US QUOTE FOR YOUR CHOICE
KENWOOD – ICOM – STANDARD

PHONE 081-997 4476

Only from ARE the
IC-R100 with SSB
capability, USB and
LSB, from 500kHz to
1800MHz.



£499
inc. VAT

IC-R100 Mobile/Base Receiver

For the enthusiast who prefers a more permanent installation the IC-R100 is ideal giving full frequency coverage of 500kHz-1800MHz and AM/FM. FM wide modes of operation. The IC-R100 boasts 100 memory channels to store your favourite stations and has features similar to the little pocket receiver. 48 monthly payments of £16.77

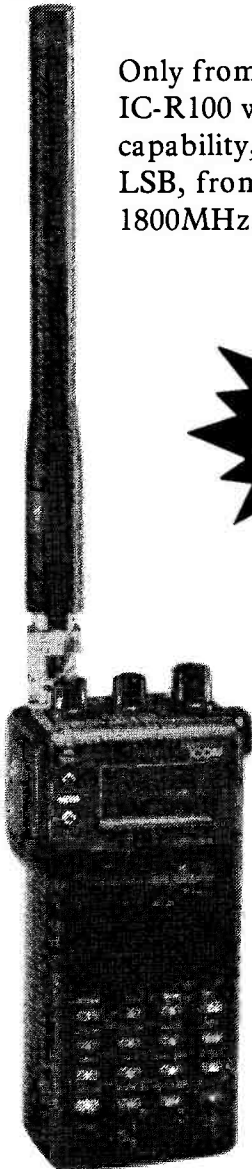
**NO DEPOSIT!
UP TO 4 YEARS
TO PAY**

IC-R1 Handportable Receiver

The new IC-R1 is a pocket-size receiver with continuous 150kHz through 1300MHz, AM/FM and FM wide reception. With 100 memory channels this tiny receiver is packed full of features: Multi-scan functions, 11 search step increments, clock timer, power-save, S-meter and a convenient frequency selection via the keypad or tuning knob.

36 monthly payments of £16.03

£399



ICR700HF Receiver 500kHz-2GHz



ICR700HF Receiver 500kHz-2GHz

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.

**NO
DEPOSIT**

Now available on super credit terms.
48 monthly payments of £33.23 APR 29%
Cash/cheque/credit card price

£989



Opening Hours Monday-Friday 9.30 to 5.30
NOW OPEN SATURDAY MORNINGS 10.00-1pm

ARE Communications Limited, 6 Royal Parade
Hanger Lane, Ealing, London W5A 1ET, England
Tel: 081-997 4476 Fax: 081-991 2565

AIRBAND

Godfrey Manning G4GLM

What's On HF?

In addition to last month's list, **Mohammed Momoni** suggests 5652kHz is used by Shanwick at night. New York (presumably the Oceanic Control Area) uses 8846, 8855, 8864, 13306 and 13420kHz. Note that flights from Europe contact Gander and not New York over the west side of the Atlantic.

In 1978 I experienced the worst of the French air traffic control dispute. Instead of returning Menorca-Heathrow in two hours, it took overnight involving a stop-over at Madrid. The final sector, by DC-8, was expected to go over the so-called 'Spanish Track', routing over the Atlantic well to the west of French airspace in a suitably equipped aircraft. In the event we crossed the Brest peninsula! Was this the start of this dodge to beat the air traffic strike? Now **Tim Christian** (North Walsham, Norfolk) believes this has become a regular occurrence with aircraft flying along 8°W between Madrid and Prestwick. On the way they talk to Shanwick on 5598kHz, starting and finishing the journey on v.h.f. of course. I am reminded that increasing numbers of short-haul aircraft, such as the Boeing 757, are suitably equipped with inertial navigation systems for north Atlantic routings. Tim recommends US Department of Defence charts - they show communications frequencies.

Whereas most airlines have v.h.f. operations frequencies, few have their own h.f. facilities. Most share the large networks such as British Airways, Portishead, etc. A source close to Novair reveals that this airline has just started its own h.f. operational control based in Hangar six at Gatwick. The callsign is Novair London and the frequencies, with e.r.p.s, are as follows: 6556kHz/500W; 10021kHz/500W; 11363kHz/1500W. Coverage is Europe and north Atlantic out to 40°W. All u.s.b., of course. Frequencies 11363 and 10021 are shared with TAROM; 6556 is shared with Madras and Columbo a.t.c. I note with regret that Novair may be up for sale by its owner, Rank. Readers will be familiar with the way Novair began after the British Caledonian takeover.

Follow-Ups

In May **Roger Ryton** (Newbury, Berkshire) asked you to find the GIBSO on-request reporting point. No prizes, but **John Snell** (Newton Abbot, Devon), **Ronald Galliers** (Islington, London), and **Dick Ware** (Gillingham, Dorset) all combed their radio nav charts (or perhaps they'd flown there!) and came up with N50°45.1' W002°30.3' on airway R8, 45nm from Southampton v.o.r. on a

If you get withdrawal symptoms between air shows, Godfrey recommends some good books and videos to help you out.

bearing of 260°; this puts it over land just north of Portland. Dick Ware asks why it's called GIBSO.

Also in May **David Hulme** (Manchester) wanted the u.h.f. frequency of London Mil North and Dick Ware puts forward 262.8MHz.

Back to Ronald Galliers' comments in March concerning the Daventry sector changing from 134.75 to 121.02MHz. **Graham Duke** (Newport, Gwent) tells us that this change was effective from 16/11/89. See also my review of Graham's book.

Help!

In return for the above information, I reward Ronald Galliers with the location of the WILLO on-request reporting point, over land between Gatwick and Shoreham. It's at N50°59.1' W000°11.4' on the intersection of the following radials (bearings from beacons): Midhurst 109° at 17nm distance; Biggin 207°; Mayfield 265°. It's an important point on one of the Gatwick Standard Terminal Arrival Route (STAR) holding patterns.

John Snell's request is for the address of Sandpiper antennas. I suggest searching the usual advertisements, but perhaps a helpful reader could write in with this information since John lost some bits of his antenna in the January gales.

Frequency & Operational News

Another large batch of frequency changes is listed in the CAA *General Aviation Safety Information Leaflet 4/90*. I thought some of these lower airspace radar services were already available, but they are mentioned again: Luton 129.55, Wattisham 135.20, Yeovilton 127.35MHz. Aerodrome changes: Birmingham Approach 131.325 replaces 120.5; Fenland Air/Ground 122.925 replaces 123.05; Woodvale 121.0 replaces 120.65MHz. At Lyneham, 118.425 is available in case of interference on 123.4MHz.

Next, nav aids. Manchester v.o.r. (MCT 113.55MHz) suffers local f.m. radio interference on north-easterly radials. Bembridge (IW) n.d.b. has moved to 274.5 from 276.5kHz. The Woodley (WOD) n.d.b. has vacated 357kHz which

is now occupied by nearby Heathrow (NE). WOD is now on 352kHz. A recipe for confusion unless pilots take care; WOD is just outside the Heathrow control zone and NE is just inside. Muddle them up and the consequences are obvious.

Derby (Burnaston) airfield has closed altogether. Pilots must not use this magazine as a substitute for NOTAMS.

Now a consideration when planning future equipment, as mentioned in the CAA *Aeronautical Information Circular (AIC) 19/1990*. It seems likely that from 1998 the channel spacing in the 118-137MHz com band will be halved to 12.5kHz. This is important for airlines and indeed anyone choosing new equipment now that has a lifetime in excess of 8 years.

We all hate departure flow control regulation, but it's here to stay. According to AIC 21/1990 there will eventually be two Euro flow management centres providing, hopefully, better coordination. Not that this will do anything to slow down the insatiable demand for more air travel; it will just lead to better-controlled delays.

Book Reviews

Thanks to Graham Duke for sending a review copy of the latest (3rd) edition of his book *Air Traffic Control* (Ian Allan, 112 pages, £3.95, ISBN 0-7110-1842-1, not presently available from the SWM Book Service). Graham is presumably a controller himself; the book doesn't say so but he uses Guild of Air Traffic Control Officers notepaper! The book describes civil control in UK and north Atlantic airspace, aided by plenty of illustrations. Although a small-sized softback it has extensive coverage of its subject, although small airfield control, services outside regulated airspace, and military zone penetration only get the briefest mentions.

It feels as though the book suffers from an all too familiar author's problem: where to start on an extensive subject. After the first few pages, though, there is better consistency although I do feel that re-arrangement into departure, en route, arrival, and more specialised areas would make the text flow better.

Some specific points would be worthy of elaboration in the next edition. Although it is shown just how important inertial navigation and instrument landing systems are in the context of the book, neither is properly explained. Taxiway block numbers are referred to at Heathrow again with no explanation at all. It is a pity that a north/south orientation of long wire antennas is insisted upon and that an a.t.u. isn't considered important; with a fixed-length h.f. antenna close to the ground, an a.t.u. matters more than direction! Finally, most

NEW — NEW — NEW — NEW — NEW — NEW — NEW — NEW

AR1000 HANDHELD SCANNER

Frequency ranges: 15 to 600MHz, 805 to 1300MHz
Frequency selection: By direct keypad entry or by tuning knob on top panel
Memory channels: 1000 arranged conveniently in ten banks of 100, with direct keyboard access to any memory.
Search bands: Ten bands which come pre-loaded with the ten most important UK bands of interest as follows:

Bank 1	VHF air	118 – 138MHz	25kHz step	AM
Bank 2	UHF air	225 – 400MHz	50kHz step	AM
Bank 3	VHF PMR1	71 – 87MHz	12.5kHz step	NFM
Bank 4	VHF PMR2	165 – 174MHz	12.5kHz step	NFM
Bank 5	Band 3	174 – 225MHz	12.5kHz step	NFM
Bank 6	VHF marine	156 – 163MHz	25kHz step	NFM
Bank 7	VHF amateur	144 – 146MHz	12.5kHz step	NFM
Bank 8	UHF amateur	433 – 435MHz	25kHz step	NFM
Bank 9	Cell 1	890 – 905MHz	12.5kHz step	NFM
Bank 10	Cell 2	935 – 950MHz	12.5kHz step	NFM

Reception modes: AM, FM (narrow), and FM (wide) which gives access for the first time to FM broadcast and TV sound in a handheld scanner

Frequency steps: User programmable from 5 to 995kHz, in any multiple of 5kHz or 12.5kHz
Complete with set of 600mA/H NiCd batteries, 240V mains charger, DC power cord with cigar lighter plug, soft carrying case, belt clip, carrying strap, earpiece, high performance DA900 flexible antenna.

ONLY £249.00 + p&tp £4.00



IC – R1 HANDPORTABLE RECEIVER

The new IC – R1 is a pocket-size receiver with continuous coverage from 150kHz to 1300MHz, AM/FM and FM wide reception. With 100 memory channels this tiny receiver is packed full of features: Multi-scan functions, 11 search step increments, clock timer, power save, S-meter and a convenient frequency selection via the keypad or tuning knob.

Price: £399.00 p&tp £4.00



IC – R100 MOBILE/BASE RECEIVER

For the enthusiast who prefers a more permanent installation the IC – R100 is ideal giving full frequency coverage of 500kHz to 1800MHz and AM/FM and FM wide modes of operation. The IC – R100 boasts 100 memory channels to store your favourite stations and features similar to the little pocket receiver.

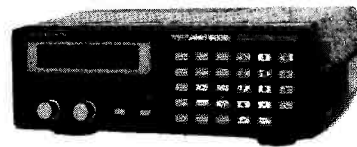
Price: £499.00 p&tp £5.00



REALISTIC PRO – 2005 BASE/MOBILE RECEIVER

The PRO – 2005 has a frequency coverage of 25 – 520MHz and 760 – 1300MHz and AM/FM and FM wide modes of operation. There are 400 memory channels, so there should be no problem retaining your favourite stations. This receiver has a host of features such as Programmable Band Scans, Priority channel, lockout, etc., but the best thing about it is the price:—

Special offer whilst stocks last ONLY £299.95 p&tp £5.00



AR900UK HANDPORTABLE RECEIVER

What a scanner! the AR900UK covers all the bands you ever needed, in AM or FM modes (on any frequency), has 100 memories built in, enables you to monitor so much of interest and all in a tiny handheld package. No wonder thousands are already in use. Designed for the UK listener, the AR900UK offers every facility at a reasonable cost. Frequency ranges 108 – 136, 137 – 174, 220 – 280, 300 – 380, 406 – 470 and 830 – 950MHz.

ONLY £199.00 p&tp £4.00



AR800E HANDPORTABLE RECEIVER

The baby of the family. Covers 75 – 105, 118 – 174, 406 – 495 and 839 – 950MHz in AM and FM modes. Comes complete with rechargeable battery pack, charger and flexy aerial. As with all AOR models, every channel spacing in current use can be programmed.

NEW Low Price £169.50 p&tp £4.00



AUTHORISED AGENTS FOR KENWOOD, ICOM, STANDARD & YAESU. FULL SERVICE FACILITIES AVAILABLE

SPEND UP TO £1,200 INSTANTLY WITH A PHOTO ACOUSTICS LTD. CREDIT CHARGE CARD — APPLY FOR DETAILS

PART EXCHANGE WELCOME, ASK FOR KERRY G6ZF OR ANDY G4YOW

RETAIL SHOWROOM OPEN MONDAY-FRIDAY 9.30-5.30, SATURDAY 9.30-4.30



Goods normally despatched within 24 hours. Please allow 7 banking days for cheque clearance. Prices correct at time of going to press—E&OE

PHOTO ACOUSTICS

USING A SOLAR RADIO TELESCOPE

Ron Ham
Part 3

What luck for me!, this was a case of being in the right place, at the right time and with the right equipment ready and working. During this storm solar bursts were also heard at 28MHz on days 2, 3 and 6 and at 50 and 70MHz on the 3rd and 6th, aurora manifested on the 4th and 6th, a radio blackout occurred on the 4th and ionospheric disturbances were reported by World Service on the 5th, 9th and 10th.

I wrote the word "severe" against the noise-storm entries in my log for September 15, 16 and 18, 1974 and it was no surprise when an aurora, lasting several hours, manifested during the afternoon of the 15th.

At midday on October 13, 1974, after a 10-day period of solar activity, signals from an OSCAR satellite took on an auroral tone as it crossed the north pole and from about 1400 to 1715 there were many auroral reflected contacts made between amateurs in the UK and Finland, Ireland, Scandinavia and Scotland on 144MHz. During this aurora, tone-A signals from 12 broadcast Eastern-European broadcast stations were received in Sussex between 48 and 71MHz. The reflection area for most signals seemed to be due north, but, toward the end of the event they were peaking in the north-east which shows how the movement of auroral ionisation can be plotted by radio. Do remember that it is very important to include the time and peak beam headings when sending reports to the various auroral coordinators.

I have already stressed the value of monitoring the sound while the telescope is running and the following example will emphasise this point. At 0745 on August 22, 1976, I was beacon checking when suddenly, a strong burst of solar noise spread across the 28MHz band. I spent the rest of the day on exercise with 2464 (Storrington) Squadron, Air Training Corps and, as squadron signals instructor, I had a v.h.f. radio-telephone (Pye Cambridge) permanently installed in my car. Communications between stationary and mobile units on the South-Downs and back to our HQ were satisfactory. However, at 1158, I was unable to hear the reply to my call because the incoming signal was completely overpowered by a very high background noise. It was a good 10 minutes before our channel cleared and although I only had the Pye vertical rod antenna on my car, this sound was familiar and remembering that burst at 0745, I soon realised that it was coming from the sun. Of course, it was 'Sir's' lot to explain this event to the cadets in the radio class and to the RT operators at the following evening's parade. My first thought on arrival home after the exercise was to check the midday solar recordings and there, looking spectacular on the

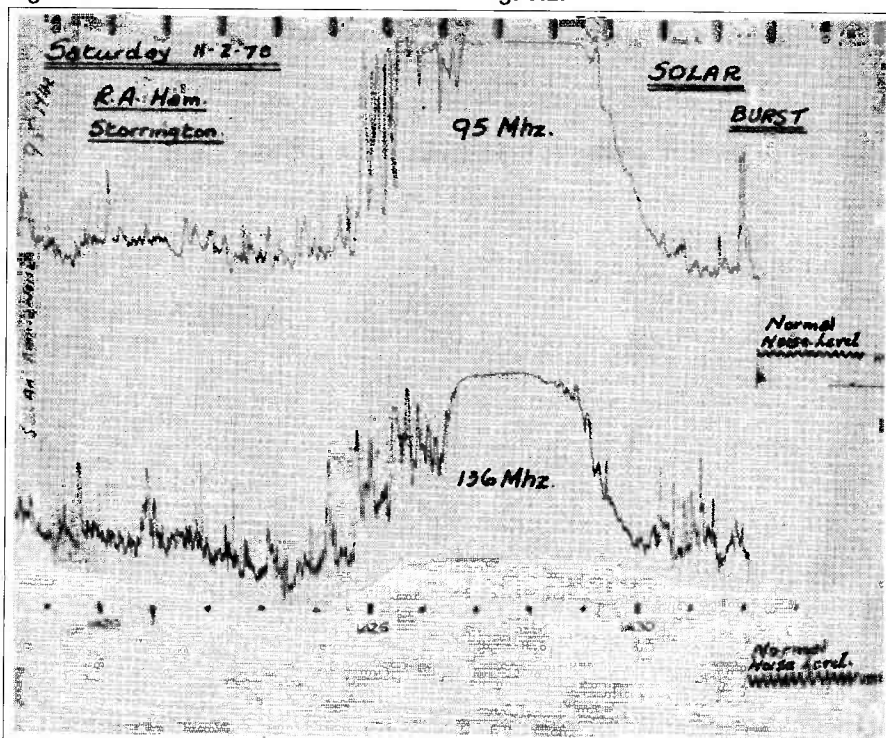
Ron continues his account of the extended observations of the sun's activity and the effect it had on radio communications.

chart, was this massive burst, which had lasted for 16 minutes, at 95 and 136MHz. A colleague told me later that he also heard it for about 30 minutes on 28MHz, proving, that on this day, the solar radio noise was spreading over a wide chunk of the spectrum.

The noise storm from August 1 to 8, 1975, was severe on days 6 and 7 at 95 and 136MHz and bursts were heard at 50MHz on the 8th. I entered the word "severe" in my daily log during the November storm from the 17th to 22nd because, on these days, the recording pens, on both observational frequencies, were hitting the upper stops. In addition, some of the bursts within the storm were heard at 28MHz on days 18 and 20. Auroral reflected signals were reported on the 17th and 22nd and World Service announced that ionospheric disturbances were affecting signals on their north-Atlantic route on days 23 and 24.

The rise in solar activity over the next 5 years began in 1976 with noise storms occurring in January, March, August, September, October, November and December of that year and January, February, March, April, June, September, October, November and December, 1977. During the September, 1977, event

Fig. 3.1.



auroral openings were reported on days 13, 19, 22, 24 and 25, plus an ionospheric disturbance on the 24th.

1978 was a memorable year for Cmdr Henry Hatfield and myself because during a major noise storm on February 11 we both recorded a massive burst of radio noise, Fig. 3.1 and Henry, using his spectrohelioscope, actually saw and photographed the event taking place on the sun's surface. The sun was very active during the month, in fact, I recorded radio-waves, mainly noise storms, daily from the 2nd to the 26th with severe storm conditions on days 3 and 9 to 12 inclusive. February's weather is not always good for visual observations, but a clear spell on the 5th enabled Henry to count 27 sunspots. Unfortunately, rain



Fig. 3.2.

USING A SOLAR RADIO TELESCOPE

and snow prevented further observation until the 11th, so we had no idea what was causing the solar storm which had been raging since the 7th.

Our luck and the weather changed on the 11th. It was a bright, frosty and sunny day and Henry, with his spectrohelioscope, found that two large ugly looking spots and an active area between them was responsible for all the radio noise that we were recording. Now for the lucky bit, at 1420, Henry decided to photograph these two spots while the sky was clear, then, at 1425, a massive explosion occurred and manifested, for at least 5 minutes, well above the level of the prevailing noise storm which is clearly seen on my recording, prior to the big burst, in Fig. 3.1. What a unique opportunity this was! Henry, not only recorded the radio noise from this massive burst at 136MHz, he witnessed and photographed the explosion actually taking place at the left of the upper of the two "troublesome" sunspots Fig. 3.2. Soon after the land line between Sevenoaks and Storrington was buzzing with excitement as two solar radio astronomers compared notes.

The Discovery

By June 1973, my telescope had completed 5 years work and I was frequently called upon to give talks on the instrument and its results. However, in October 1973, I met Nell Corry G2YL when talking about solar activity to the Guildford and District Radio Society. Nell was their President and she told me that, in 1935, Denis Heightman G6DH heard a "hissing" sound above the background noise of his 28MHz receiver and suggested that this was caused by a solar event.

This was a unique opportunity for me. I had the chance of talking to the pioneers and hearing about their work first hand. Therefore, with the consent of Nell and Denis, I began to research their work from original material and, at the request of Patrick Moore and Henry Hatfield I reported my findings, by lecture, in March 1975 to a national meeting of the British Astronomical Association. Unfortunately Nell died before my research was complete but Denis attended the BAA meeting in London and saw my article entitled 'The Hissing Phenomenon' published in the June 1975 *BAA Journal*. Also, 'The Sun's Influence', *PW* November 1979, or reprinted in *Out Of Thin Air* available from the *SWM Book Service* at £1.80 plus 75p post & packing.

Briefly, contemporary radio enthusiasts found the short-waves very exciting because the majority of them had learnt, from experience, that signals transmitted on these bands were vulnerable to a variety of natural

disturbances. Many of those who studied propagation were members of the RSGB's Research and Experimental section and were always ready to investigate something new.

Often during 1935, Denis, a prominent member of the 28MHz group, heard the "hissing" whilst operating on the 28MHz band and consistently observed that this noise only occurred during daylight hours and usually preceded some form of radio disturbance. In January 1936, Nell, another experienced radio operator became the author of the 28MHz report which was published monthly in the RSGB's *T & R Bulletin*.

Nell produced these reports until December 1939 which included her own work on the band and the gen about 28MHz happenings that she received from operators around the world. The information which she gathered was recorded daily in a set of five Diaries (1936-40 inc.) which Nell gave me before her death.

From her diaries and *Bulletin* reports, I found that at least 24 radio amateurs had reported hearing the "hissing" and furthermore it was not confined to 28MHz, because her entries on July 31, 1938 and June 25, 1939 revealed that Miss Barbara Dunn G6YL and Denis, respectively, heard the "hissing" at 56MHz.

Although very few radio enthusiasts were able to observe during the early war years, the "hissing" was reported again in February, March and November 1940 and in June and July 1941.

The important contribution that Denis made to our scientific knowledge was recognised by Dr. R.L. Smith-Rose when he was guest of honour, in 1956, at the fourth annual dinner of the London UHF group when, in his after-dinner speech, he mentioned that "radio astronomy is based on the 'hiss' phenomena, first observed by a British amateur, Denis Heightman, in 1935."

I found further evidence of all this in "Cosmic Notes", compiled by the Propagation Section of the RSGB's Radio Experimental Section, published in the July 1936 issue of the *T. & R. Bulletin*. This piece, covering the period March 14 to June 3, is a good example because it lists such items as "fade-outs" logged by G2NJ, G2XG and the magazine *Wireless World*, "hissing" heard by BRS25, G2YL, G5OJ and G6DH and solar activity, described as "Bright eruption on the Sun", by *Wireless World* and "Very vigorous eruptive prominences on the sun" (May 6), "Prominence near CM on sun" (May 25), and "Prominence of May 25 dying out" (May 26), observed by a Mr. A.M. Newbegin. From my research into the "hissing" phenomenon back in 1972 I believe that this is Mr. Algernon Montagu Newbegin, FRAS, an active

astronomer, whose Sussex home and observatory was called 'STARWEEN'

Frequency Change

Although I updated the equipment in October 1978 and moved my observational frequency to a clear spot around 146MHz, this made no difference to the results and the "hissing" was often heard during 1979 when continuous noise storms were recorded for some period during each month except December. Aurora was reported at 1800 on January 4 and around 1915 on the 7th and an Ionospheric disturbance was announced by the World Service around 0630 on the 6th.

While the noise storm was in progress on February 12, I heard a burst at 0915 on 50MHz and, during the afternoon, Henry Hatfield had positive results on his newly installed equipment at 1296MHz. At 1309 on the 23rd a burst swept from 28-146MHz and in March a Sudden Ionospheric Disturbance (s.i.d.) occurred between 1035 and 1143 on the 9th when solar noise was recorded at 60 and 136MHz. Aurora manifested from 2200 to midnight on the 10th, h.f. blackouts were logged on the 23rd and 30th and World Service reported an Ionospheric disturbance at 0300 on the 29th.

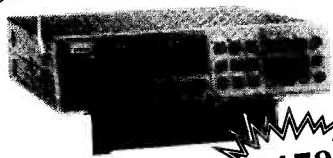
The noise storm on March 30 was mainly between 28 and 30MHz. Aurora at 0100 on April 4 followed the noise storm on the 3rd when Henry counted 35 sunspots and saw an arched filament about a quarter of the sun's diameter in size. Solar bursts were heard at 50 and 70MHz during the noise storm from June 9 to 13 and Henry logged a slight increase in noise level at 1296MHz while the storm was in progress at 146MHz on July 4. Aurora was reported on August 13 and 29, a s.i.d. occurred on the 18th and World Service announced an Ionospheric disturbance on the 21st. Henry saw a flare on the east-limb and a group of seven spots just past central meridian on the 14th and a bright spray followed by an eruptive prominence on the 15th. He logged bursts at 28 and 1296MHz on the 14th and solar noise between 50 and 60MHz was reported at 1715 on the 29th. A bright loop prominence seen by Henry could have accounted for the s.i.d. and noise storm on September 14. I logged bursts at 50MHz during the storm on October 12 and the fact that Henry observed 'too many sunspots to count in many groups spread across the sun' was no doubt the reason for the storm between November 8 and 10.

Part 4

In Part 4 Ron concludes the story of his solar radio telescope. □

NEVADA ...in tune with the **ACTION!**

SPECIAL OFFER



£179

BEARCAT 590XLT BASE/MOBILE SCANNER

Giving full coverage of the aircraft band plus the other main public service bands. A special bulk purchase enables us to offer this radio at the **Special Price**

- ★ 100 Memory Channels
- ★ Fast Scan Rate
- ★ 29-54, 118-174, 406-512 MHz

NEW

BEARCAT 760XLT BASE/MOBILE SCANNER WITH UHF BAND

With 100 memory channels, and coverage of the UHF band, the 760XLT is ideal at home or in the car. Pre-programming of preset bands is possible for fast access. Freq. Coverage 66-88, 118-174, 406-512, 806-952MHz

£249



JUPITER MVT - 6000 MOBILE/BASE RADIO

Now in stock this superb mobile version of the Jupiter 11 Handheld Radio. Covers 25-1300 MHz supplied complete with 240V AC supply and mobile bracket.

£345



UBC 200XLT (200 CH MEM)

(66-88, 118-174, 406-512, 806-956 MHz)

Still our most popular
Handheld **£229**

REMOVABLE
BATTERY PACK



BEARCAT SCANNERS HAND HELDS

- UBC 50XL (10 CH MEM.)£99
(66-88 MHz, 136-174 MHz, 406-512 MHz)
- BC 55XLT ((10 CH MEM.).....£99
(29-54 MHz, 136-174 MHz, 406-512 MHz)
- UBC 100XL (16 CH MEM.) ONLY£169
(66-88 MHz, 118-174 MHz, 406-512 MHz)
- UBC 100XLT (100 CH MEM.).....£199
(66-88, 118-174, 406-512 MHz)

BASE SCANNERS

- UBC 145XLT NEW LOW PRICE£99
(66-88, 136-174, 406-512 MHz) 16 MEM.

- UBC 175XLT (16 CH MEM.).....£169.99
(66-88, 118-174, 406-512 MHz)
- BC210 XLW (20 CH MEM.) SPECIAL OFFER £99
(29-54, 136-174, 406-512 MHz)



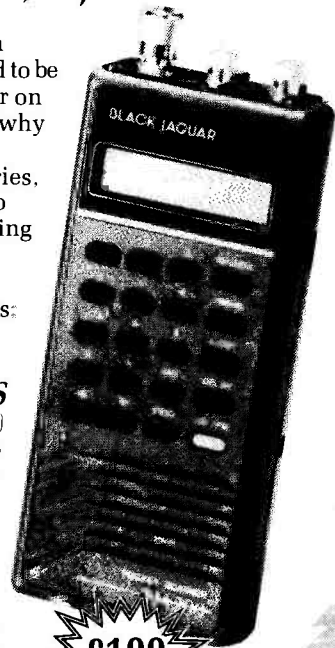
BLACK JAGUAR Mk111

Independantly tested by a European magazine, the Black Jaguar was found to be the most sensitive handheld scanner on the market! That probably explains why it is still so popular.

Features include 16 channel memories, selectable AM/FM and the facility to power the set from the mains/car using one of the many accessories now available. Covers civil and military airbands plus lots more! Frequencies: 28-30, 50-88 MHz, 115-178 MHz, 200-280 MHz, 360-520 MHz.

BLACK JAGUAR ACCESSORIES

- (Suitable for all models. BJ200, Challenger etc.)
- Mobile Mount£6.95
 - Base Mount£5.95
 - BJ1 Car Supply (Mk 111 version only)£14.95
 - BCA6 Mains Slow/Fast Charger£14.95
 - Airband Rubber Duck Antenna£6.00
 - SA7 UHF Stub Antenna£4.95
 - Telescopic Antenna (TNC)£6.75



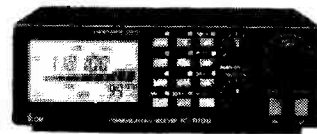
£199

ICOM We are pleased to be appointed ICOM dealers for the South Coast.

NOW AVAILABLE

- NEW ICOM ICR1 150kHz-1300MHz
100 memory channels, built in 'S' meter
Plus many more features. **£399**

- NEW ICOM IC-R100
All band receiver
100kHz-30MHz
99 Memory Channels **£499**



- NEW ICOM IC-R72
Budget priced HF receiver
100kHz-30MHz
99 memory channels **£599**

- ICOM R7000 (625 - 1300 MHz)**£925**

Britain's largest stockist of scanning receivers



LOW NOISE PRE-AMPLIFIER Now suitable for Transceivers

- ★ Covers 25-2100 MHz
- ★ Low Noise GaAs FET
- ★ Switchable Filters
- ★ Variable Gain Control
- ★ With full RF Switching

This new amplifier is a must for the scanner enthusiast and will allow reception of signals that were inaudible without it. Some Pre-amplifiers cover from 100Hz upwards - but this causes the short-wave bands to be amplified creating intermodulation problems at VHF/UHF. Our new pre-amplifier uses switchable filters to give optimum performance on the band in use and starts from 25 MHz avoiding the shortwave bands

**£79.95
NEW**

New FAIRMATE HP 100E JUST LOOK AT THESE FEATURES

- ★ 8-600MHz.
830 — 1300MHz
- ★ 1,000 Channels of Memory
- ★ Keypad or Rotary Tune Controls
- ★ Selectable Search Increments
From 5kHz to 995kHz
(In any multiple of 5kHz or 12.5kHz)
- ★ All Receive Modes Selectable
AM/Narrow band FM/Wideband FM
- ★ Low Battery Consumption
- ★ Selectable Attenuator

EVERY SET IS SUPPLIED COMPLETE WITH

- ★ Full set of High Power N. Cads
- ★ Two Antennas
- ★ Earphone
- ★ Belt Clip
- ★ N. Cad Charger
(If required)
- ★ Carrying Case
- ★ DC Cable
- ★ Shoulder Strap

.....£7.65

£249



**NEW MKII
VERSION
WITH
EXTENDED
FREQ.
COVERAGE.**

SEND £2 FOR OUR
NEW
**BUMPER
CATALOGUE**
INCLUDES £2 VOUCHER

AOR SCANNERS

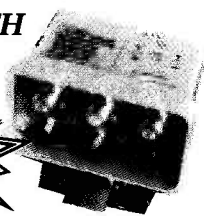
AOR 3000 (call for info)£765
AOR 2002 Base with Full Coverage£487
AOR950 Base
(60-80, 108-174, 220-390, 406-470, 830-950)....£249

MASTHEAD ANTENNA SWITCH

For Scanning Enthusiasts
Select 2 antennas at the
masthead remotely from
one cable.

Frequency: DC to 1.3 GHz
Connectors: 'N' Type

£49.95



SONY RADIOS

We are the main Short Wave Stockist

SONY ICF SW1E Short Wave + VHF
World's Smallest S/Wave Radio...£149.95

SONY ICF 2001 D (150kHz - 136MHz).....£299.95

SONY ICF 7600 DA Pocket S/Wave S/Hand.....£129.85

SONY ICF 7600 D Pocket S/Wave S/Hand£99.00

SONY AIR 7 Airband H/held.....£229

SONY PRO 80 Wideband H/held£299

SONY AN1 Active Antenna£49

RING FOR DETAILS OF THE SONY RANGE

SCANNING ANTENNAS

NEVADA WB 1300 Discone (25-1300 MHz)
Stainless Steel top of the range.....£59.95
NEVADA DISCONE (50-700 MHz)
8 Element High Quality.....£24
NEVADA PA 15 (200-960 MHz) A new
Collinear Ant. with over 9dB gain at 900 MHz£49.95
NEVADA MOBILE ANT. (50-1300 MHz)
MAGNETIC MOUNT Complete£27.90
GUTTER MOUNT Complete.....£26.90
LOG PERIODIC (105-1300 MHz) 20 El.
Beam with over 12dB gain.....£89

LOW LOSS JAPANESE COAX

Essential for optimum performance with wideband UHF scanners.
We have directly imported this cable which has exceptional low loss and is good
for frequencies up to 3GHz. Loss at 1GHz for 10 mtrs is 1.87 dB - 5D, 1.3 dB - 8D,
1.05 dB - 10D

MODEL 5D (8.1mm Dia)£0.56 per MTR
MODEL 8D (11.1mm).....£1.40 per MTR
MODEL 10D (13mm Dia.).....£1.99 per MTR

USE YOUR
CREDIT CARD
FOR SAME DAY
DESPATCH

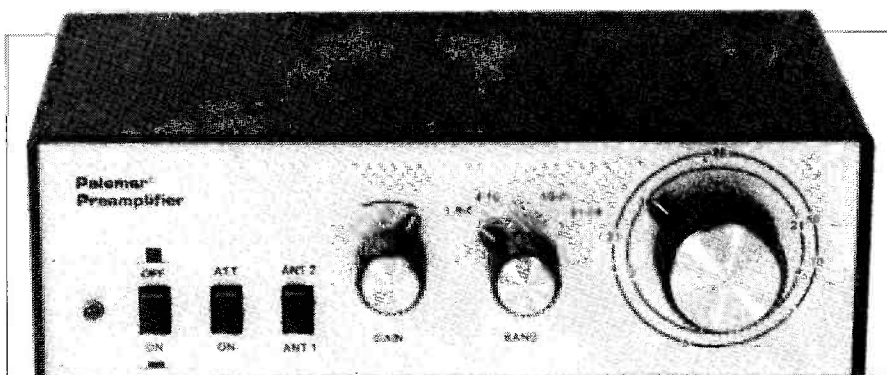
NEVADA

189 LONDON ROAD NORTH END
PORTSMOUTH PO2 9AE

HOTLINE (0705) 662145

PALOMAR P-405 PRE-AMPLIFIER

Jack Aldridge



Over the years there have been many pre-amplifiers on the market but Palomar have gone one step further and made this one tunable from 1.5MHz through to 54MHz. This has many advantages not the least of which is the ability to protect both the pre-amplifier and the main receiver from strong out-of-band signals.

Getting Started

The P-405 came with a two-page A4 sheet that contained all the operational information plus a full circuit diagram. Although this information was very brief, the essential points of its operation were adequately covered. It was also refreshing to see a full circuit diagram included.

The external connections were very straightforward with three SO-239 connectors on the rear panel for the two antenna connections and that to the receiver. An externally mounted PP-3 type battery supplies the power. This was perhaps slightly unusual but in practice a good technique as battery replacement was very simple. The battery was secured to the rear panel by a rectangular 'Terry' clip.

Facilities

Palomar have done their homework with the facilities provided on the P-405. Two antennas can be connected and selected via a push button on the front panel. This is very useful as the wide coverage of the P-405 would need to be supported by two antennas. The power switch uses another push button and this has been conveniently arranged so that when switched to OFF, the selected antenna connects directly to the receiver. Besides providing amplification, 20dB of attenuation is selectable via another front panel switch. This switch is arranged so that the attenuation is inserted despite the position of the main on/off switch so adding to the versatility of the P-405.

As the P-405 is a tunable pre-amplifier there were controls for setting the operating frequency. These comprised a four position band switch and a 32mm

The P-405 pre-amplifier from Palomar Electronics has been designed to provide some added life to your receiver so should be received with interest by listeners.

rotary tuning control with a dial and a 270 degree scale marked with the frequency. The band ranges used were 1.8 to 4.0MHz, 4 to 10MHz, 10 to 21MHz and finally 21 to 54MHz.

The only remaining item on the front panel was an l.e.d. that indicates the power is on. In fact with a total consumption of only 9.5mA I suspect that most was being drawn by the l.e.d.!

Under The Bonnet

The external finish and presentation of the P-405 was of a very high quality. It appeared to be well lacquered so it should maintain its looks over prolonged periods of use. This high quality was also in evidence with the covers removed, which

was reassuring and made a pleasant change from some equipment I have seen.

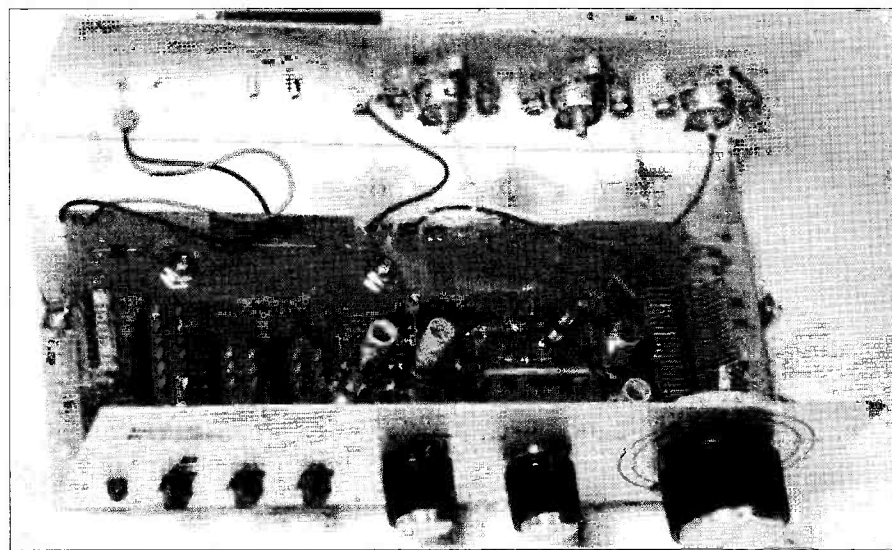
The printed circuit board was double-sided glass fibre that was tinned, printed with the component designations and covered with a protective lacquer. One interesting point concerned the size of the printed circuit board. As the box size is determined primarily by front panel controls it is quite common to find that within the box is a very small board. This is not so with the P-405 as the board has been expanded to occupy the full width of the case.

This may seem a strange point to note, but the result of this larger board is that the components are wider spaced and so the connection between the front panel controls and the amplifier are kept much neater. This makes it much easier to manufacture a unit with a predictable and repeatable performance than if hard wiring techniques were used. The additional advantage for the user is that servicing is very much easier and well within the capabilities of a skilled amateur.

Circuitry

The two antenna sockets are fed to the tuned circuits via an antenna selection switch and the switchable attenuator. The coupling to the tuned circuits was via a low impedance winding on each of the four tuning coils and the band switch. The variable tuning was achieved with a 140pF variable capacitor that was directly coupled to the front panel.

Limited overload protection was supplied by a pair of back-to-back diodes connected effectively across the tuned circuits. The amplification was provided by a 40673 dual insulated gate m.o.s.f.e.t. This device has been around for several years and is often used very successfully in this role. The variable gain control operates by adjusting the bias to gate 2



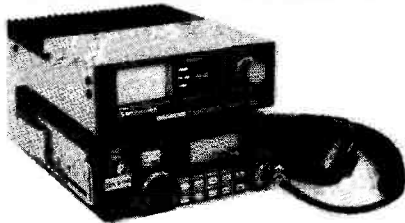
THE COMPANY THAT BRINGS YOU THE LATEST TECHNOLOGY - FIRST !

SALES HOTLINE 021 552 0073 and HELPLINE 021 552 0051 (Office Hours)

ANOTHER RAYCOM PACKAGE

The **TOKYO HX240** HF Transverter when coupled to an all-mode 2m rig will give you 50W on 80 to 10m. RAYCOM have put together this unique unit with the new YAESU FT290RII.

IT WORKS GREAT !



- FT290R II £429.00
- TOKYO HX240 £249.00
- 1/2 Size G5RV £ 14.95
- 12 Amp PSU £ 59.95
- Nicads & Wall Charger £ 31.30
- Total regular price £784.20

RAYCOM PACKAGE .. £699.00

YOU SAVE £85.20 !

Includes ALL D.C. and Co-ax leads
EXCELLENT HF AND VHF STARTER PACK
COME IN AND TRY IT FOR YOURSELF - YOU
WILL NOT BE DISAPPOINTED
 FULL RANGE OF YAESU AND ICOM ALSO STOCKED

HP100E/AR1000

Exclusive to RAYCOM
Short wave converter Module

Made in the UK by AKD
 Coverage 200kHz to 30MHz

- HP100E with converter £299.00
- HP100E no converter £249.00
- Converter only £ 59.00

NOTE
 HP100/AR1000 not purchased from RAYCOM requires modification to work with the converter Cost £15.00

THE UK SCANNER EXPERTS

WE HAVE SECURED LIMITED QUANTITIES OF THE NEW ICOM SCANNERS DIRECT FROM JAPAN - HURRY TO RESERVE YOUR ONE NOW !

The FANTASTIC ICOM ICR1 and ICR100

- IC-R1 500kHz to 1300MHz £399.00
- IC-R100 500kHz to 1800MHz £499.00

OTHER HIGH QUALITY SCANNERS FROM RAYCOM

- BEARCAT UBC 50/55XL 66-88/136-174/406-512MHz £99.95
- 10 memories, channel review, including FREE charger worth £4.95
- BEARCAT BC 70XLT 66-88/136-174/406-512MHz £149.99
- 20 memories, full frequency display, with FREE car charger kit worth £4.50
- BEARCAT UBC 100XLT 66-88/118-174/406-512MHz £199.99
- 100 memories, airband, search, including FREE car charger kit worth £4.50
- BEARCAT UBC 200XLT 66-88/118-174/406-512/806-956MHz £229.99
- 200 memories, top of the range, including FREE car charger kit worth £4.50
- BEARCAT UBC760XLT 66-88/108-174/350-512/806-956MHz MOBILE £229.99
- 100 memories, 5 search bands, including FREE mains adapter worth £4.95
- NEW JUPITER MVT 6000 mobile ONLY £329.00
- 25 to 550 MHz and 800 to 1300MHz, 100 Memories
- JUPITER MVT 5000 Hand-held ONLY £249.00
- 25 to 550MHz and 800 to 1300MHz, 100 Memories
- AOR 3000 base Limited Supplies available £699.00
- 0.1 to 2036 MHz, 400 mems, LSB/USB/CW/WFM/NFM/AM

MANY OTHER TYPES AND MODELS STOCKED - NEW AND USED.

SEND AN SAE FOR OUR LATEST USED LIST

URGENTLY WANTED - USED SCANNERS AND HAM GEAR, WORKING OR NOT.

ICOM IC-R7000



Listen to weather, fire, coastguard, TV, airband and many, many more. Wide frequency coverage provides you with all the channels you need to become a VHF and UHF listener. Frequency coverage is guaranteed from 25 to 1300MHz, but may extend on individual units to 2GHz! Features include:

- USB, LSB, FM, FM-N, AM
- 99 memory channels, keypad entry
- optional infra-red remote control
- variable speed scan and delay
- optional voice synthesizer
- six tuning steps
- sensitivity < 0.3µV for 10dB SINAD

Save £108! Raycom price £925
 including FREE Royal 1300/AH7000 25 - 1300MHz discase complete with co-ax and plugs.

CHARGE IT!

Why not take advantage of the **RAYCOM Credit Card** and spread the payment for that scanner you've always wanted. Example: Yaesu FRG9600 MKV package £70 deposit and £28 per month (APR 36%). Call for a quote and written details! Licensed credit broker.

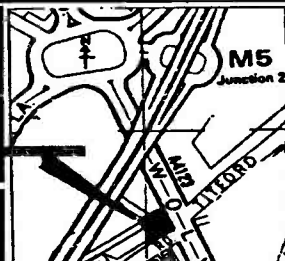
YAESU FRG9600



- 9600 standard 60-905MHz £469.00
 - 9600 MkII 60-950MHz £499.00
 - 9600 MkII pack 60-950MHz .. £545.00
 - 9600 MkV 0.2-950MHz £625.00
 - 9600 MkV pack 0.2-950MHz .. £699.00
 - Standard to MkII .. Upgrade £ 40.00
 - Standard to MkV .. Upgrade £149.00
 - MkII to MkV Upgrade £129.00
- Packs include PSU and ROYAL 1300!

RAYCOM COMMUNICATIONS SYSTEMS LIMITED, INTERNATIONAL HOUSE, 963 WOLVERHAMPTON RD, OLDBURY, WEST MIDLANDS B69 4RJ. TEL 021-544-6767, Fax 021-544-7124, Telex 336483 IDENTI G

RAYCOM
 COMMUNICATIONS SYSTEMS LIMITED



Telephone 021 - 544 6767

RAYCOM gives you more BUYING POWER
 ALL MAJOR CREDIT CARDS ACCEPTED. BC, ACCESS, DINERS. INSTANT CREDIT UP TO £1000 (SUBJECT TO STATUS) WITH RAYCOM CREDIT CARD (APR 36%). INTEREST FREE CREDIT ON CERTAIN ITEMS AT MRP. CALL FOR MORE DETAILS.

ORDERING INFORMATION

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

TEL: 021-552-0073

PHONE BEFORE 4PM FOR NEXT DAY DELIVERY BY COURIER (£15.00) - OR 2PM FOR DELIVERY BY POST (£10.00). PLEASE ALLOW TIME FOR CHEQUES TO CLEAR. MANY OTHER ITEMS IN STOCK. PLEASE CALL FOR MORE INFO AND FOR EXTRA SPECIAL DEALS!

INFOLINE 0836-771500 5-9pm (weekdays)

OPENING HOURS 9-5.30 MON TO SAT, 73 DE RAY GAKZH, PETER GAEDW COLIN and JOHN on the phone.

PALOMAR P-405 PRE-AMPLIFIER

of the 40673. A certain degree of protection from signals applied by the inadvertent connection of a transmitter are provided by a second pair of back-to-back diodes that are connected across the toroidal output transformer.

As the main supply was from a 9V battery the only processing was provided by an electrolytic capacitor for smoothing and to reduce the source impedance and a few small value capacitors to provide r.f. decoupling. Overall, it is a very simple but effective design.

In Use

The use of SO-239 connectors made the inclusion of the pre-amplifier into my system very simple as these are in use for all my h.f. antenna connections. Most of the air tests were performed using my Icom IC-720A and a nest of dipoles.

I started with a look around the amateur bands and found the general performance to be very good and met my expectations. The operation of the tuning control was critical as the point of maximum gain was very sharp. The tuning scale markings proved to be slightly confusing at first due to the markings appearing both above and below the dial. Unfortunately there was no explanation of this in the manual. A little logic revealed that the two l.f. bands were marked below the dial while the



h.f. bands were marked above the dial.

With the basic performance established I set about some simple performance measurements. The first test was to establish the gain of the pre-amplifier. This turned out to meet the specification producing 20dB of gain throughout its operating range. I next measured the adjustment range of the variable gain control on the front panel. The review model gave a useful range of about 10dB, which was slightly less than the specified 15dB. This control meant that the total unit gain could be varied from 10dB through to 20dB.

The next step was to move on to the performance of the attenuator. This was specified as 20dB but I had noticed that during the on air tests it appeared to be giving somewhat less than 20dB. This was easily explained by the configuration of the attenuator that was of the T type as opposed to the more normal Pi type for this application. The reason for the

apparent variation on attenuation is that this type of attenuator only gives its design attenuation when operated at its correct impedance. Most antenna systems used by listeners tend to exhibit impedances that vary widely with frequency so will result in varying losses from this type of attenuator. When I tested the attenuation using an accurate 50Ω signal source the expected 20dB was obtained. It is important to keep a sense of proportion with regard to the attenuator performance as it is rarely used to insert precise levels of attenuation but rather to lower the level of an incoming signal to reduce overload problems in the receiver. For this function the attenuator proved to be perfectly adequate.

By combining the attenuation and gain control facilities you could achieve an overall adjustment range of -20dB to +20dB that was very useful.

I use the P-405 to receive several different types of signals throughout the range of the unit. These signals varied from straight forward broadcast stations through to complex utility modes. Throughout these tests the P-405 performed extremely well and was very useful. I've always had my doubts about the real usefulness of h.f. pre-amplifiers, but the P-405 has convinced me that this type of tunable and variable gain unit can be worthwhile.

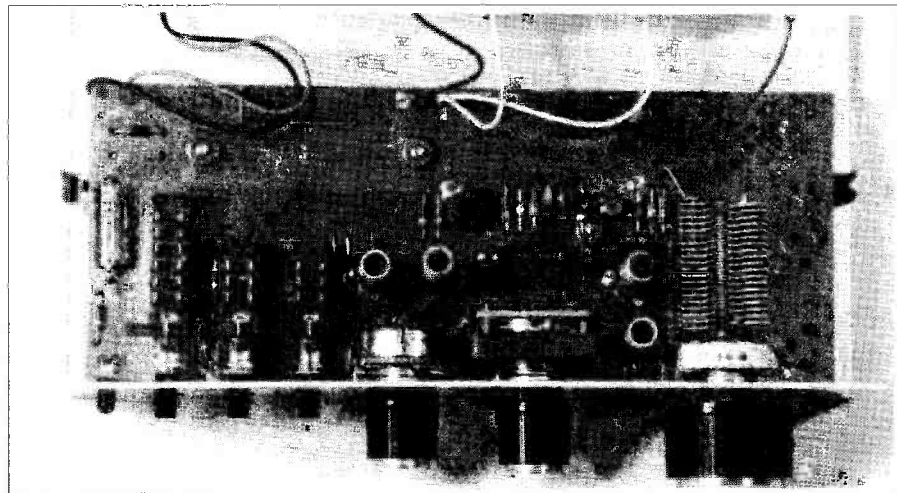
Although my receiver did not suffer problems with image and other spurious signals the P-405 could help to reduce this in some receivers particularly the simpler types.

Summary

I found the P-405 to be a very well designed and useful pre-amplifier. I'm sure many readers will find a use for such a unit. It was also refreshing to see such high quality both in terms of construction and performance, a feature that is often lacking in the accessory market.

So finally I can confidently recommend the P-405 as representing good value for money.

The Palomar P-405 can be obtained from **Bredhurst Electronics, High Street, Handcross, West Sussex**, price £119.95. My thanks to them for the loan of the review unit. □



Specification:

Frequency Range	1.8 to 54MHz in four bands 1.8 to 4MHz 4 to 10MHz 10 to 21MHz 21 to 54MHz	Variation Power	15dB
Gain	20dB with 50Ω input and output	Size	9V PP-3 type battery 70mm high 210mm wide 130mm deep
		Weight	0.5kg



The New Cirkuit Summer Catalogue

- 100s new products
- £10 worth discount vouchers
- Latest books
- Low cost multimeters
- 184 pages
- Only £1.60 available from larger newsagents or directly from Cirkuit



Cirkuit Distribution Ltd.

Park Lane, Broxbourne, Herts EN10 7NQ
Telephone (0992) 444111

OUT NOW! OUT NOW! OUT NOW!

TURBO-CHARGE YOUR SCANNER !!

Do you own an **R7000**, **FRG9600** or **AR2002**?

Why not upgrade your Scanner into a professional monitoring station with the **SCANMASTER** remote control unit from E.M.P. Ltd

SCANMASTER plugs into the 'Remote' socket on your scanner and takes over its operation and hence greatly expands the facilities and functions available.

SCANMASTER is like a T.N.C. in that you supply it with 12 volts D.C. and talk to it with a terminal via its RS232 interface.

SCANMASTER can be left stand-alone for un-attended monitoring.

SCANMASTER is in constant use by many 'official' organisations.

SCANMASTER has many powerful and easy to use features such as:

- * Over 700 memories available.
- * Remarks can be assigned to memories.
- * Parallel Printer Interface for hard copy output.
- * Real Time Clock for time/day logging.
- * Frequency offset button for split channels.
- * Signal strength logging via A/D.
- * Squelch relay output for switching tape-recorder On/Off.
- * Versatile search facility.
- * Extensive User Manual.
- * And many more features.

Special Price (UK)£149.99 including Postage & Packing.

28 day money back guarantee if not entirely satisfied. When ordering, please state which scanner you have.

E.M.P. Limited . 51 High Street . Portland . Dorset . DT5 1JQ . Tel (0305) 826900.



Despatched by return of post (subject to availability).
Main Dealer: Garex Electronics. Tel (044282) 8580 or (0296) 668684.
Dealer Enquiries Invited



SCANNING

Alan Gardener

Product News

Rather a nice looking pre-amplifier is now being stocked by Lowe Electronics. Called the LNA-3000 the unit is intended for masthead mounting as the circuit is housed inside a substantial weather proof case complete with mounting clamp. The advantage of masthead mounting is that the amplifier has a chance to boost really weak signals before they are subjected to any further loss in the coaxial cable connecting the antenna to the receiver. The unit can be powered from any 12-15V d.c. source, either by means of a separate power cable or via the coaxial cable with the addition of the DCC-12N interface unit mounted at the receiver end. The electrical performance of the amplifier is good with a gain of 13dB and a specified frequency range of 50-3000MHz (± 1 dB). This makes it ideal for use with scanners capable of reception above 1GHz.

The two most important parameters to be considered when looking at pre-amplifiers are the noise figure and the intermodulation performance. The noise figure indicates how well the amplifier can boost incoming signals without adding additional noise.

The LNA-3000 offers a typical noise figure of 1.8dB over the range 50-500MHz, 1.8dB at 1GHz, 2.5dB at 2GHz

This month Alan looks at a new pre-amplifier and explains some of the important parameters. He describes a simple d.i.y. stand for a popular handheld and a mod for the Tandy PRO-2022.

and 3.4dB at 3GHz. These are very good figures for such a wide band design and should be of particular interest to anyone with an eye on the 1.6GHz weather/navigation satellite band.

The intermodulation performance indicates how well the circuit behaves in the presence of strong signals.

This is of particular importance if the amplifier is going to be used in an area where there are likely to be several transmitters operating within a few miles of the receive antenna - city centres are a typical example.

If an amplifier is not particularly linear signals entering the circuit mix with each other and produce additional spurious signals at other unwanted frequencies. With very poor designs this can result in the wanted signals being masked by spurious signals actually making reception worse with the pre-amp in

circuit - especially when many strong signals are present.

Intermodulation performance is generally measured by injecting just two signals into the circuit to be tested. Although in real life the amplifier may well be subjected to more than two signals at once this technique does give a good repeatable measure of the circuit performance. The output of the amplifier under test is monitored by means of a specially designed receiver or spectrum analyser. The level of input signals are increased until a spurious signal is produced which is a combination of the two test signal frequencies.

The permutations that normally produce the most troublesome signals are $(2 \times f_1) - f_2$ or $(2 \times f_2) - f_1$. Both of these are termed 3rd order products. It should be noted that the spurious signals increase in level at a much greater rate than the wanted signals so there is a point at which the unwanted signal levels become the same as the wanted signals.

By plotting a graph with the input signal level on one axis and the output signal level on the other it is possible to determine the point at which this occurs - generally referred to as the 3rd order intercept point. This figure can then be used to determine the level of spurious signals which will be produced for any given set of input signals.

One word of warning though - the figure can be quoted at either the input or output of a device. Manufacturers generally quote the figure at the output but in most cases it is more useful to know the figure at the input as this is where the signals will be entering the circuit. To obtain this figure subtract the gain of the unit from the output 3rd order figure.

Most average quality scanning receivers have a 3rd order intercept point of around -20dBm. As long as any additional pre-amplifier has an input 3rd order intercept point much greater than this figure then any spurious signals will be generated inside the receiver rather than the pre-amp.

However, be careful as the receiver's 3rd order intercept point will be lowered by an amount proportional to the gain of the pre-amplifier. This will worsen its strong signal handling performance. For this reason you should not use more gain ahead of a receiver than is absolutely necessary.

The LNA-3000 has a 3rd order intercept point of +22dBm measured at the output. Taking the amplifier gain of 13dB into account this gives an input 3rd order intercept of +9dBm - a good figure which should ensure freedom from pre-amplifier overload problems except under the most arduous of conditions. It also makes the LNA-3000 ideal for use as a distribution amplifier. If you have more

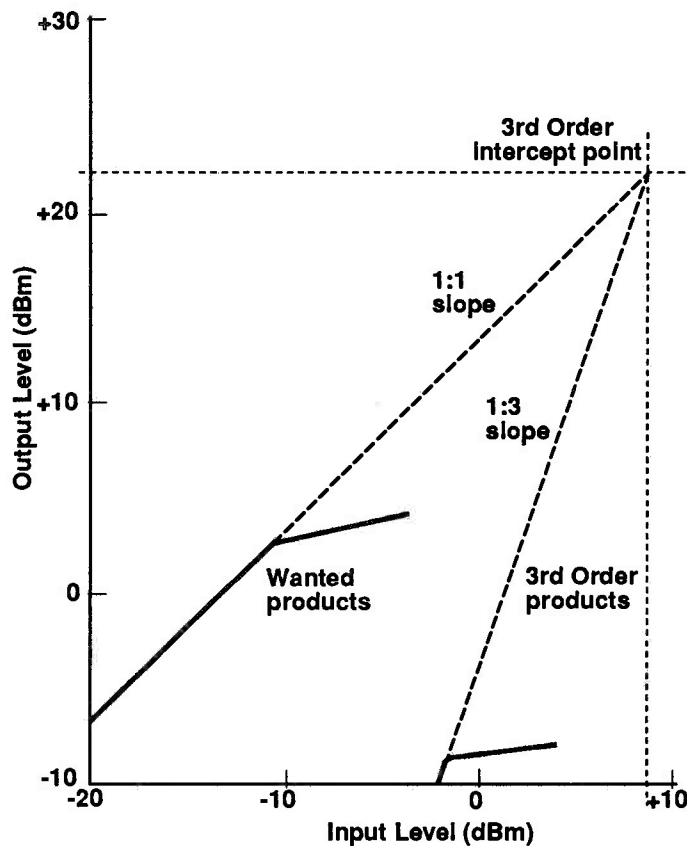


Fig. 1: Graph showing the derivation of the 3rd order intercept point.

SCANNING

than one scanner but only one antenna, you could connect it to the input of the LNA-3000 and feed the output via a low-loss TV antenna splitter to the receivers.

Most of the good quality splitters work well up to the 1GHz region and provide a reasonable degree of isolation between the two output ports. The lower cost resistive ones do work but you lose twice as much signal through them so it's worth paying a bit more.

It is very difficult to achieve wide bandwidth, low noise and good intermodulation performance so it is perhaps not surprising that the LNA-3000 sells at around £112 - however if you are particularly interested in frequencies around or above 1GHz it may well prove a useful addition to your monitoring post.

If you would like more information contact: Lowe Electronics Ltd, Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: Matlock (0629) 580800.

AOR AR-3000

A few lucky AR-3000 owners (yes there are some!) have told me that the latest models have only one antenna socket on the rear of the receiver in place of the two found on earlier examples (one for up to 30MHz and the other for beyond 30MHz). No serial numbers above 2000 have so far been reported so it looks as if there may still be a few production difficulties.

However, the new circuit board layouts look a lot more professional than some of the earlier versions I have seen so perhaps dealers may soon be able to clear their waiting lists.

There are a couple of other points concerning the receiver. If you intend to use the AR-3000 on h.f. with anything more efficient than the wire antenna supplied ensure that you switch the r.f. stage out of circuit.

To do this open the receiver and look at the top circuit board - take care of the loudspeaker leads when you do this. You should find two small slide switches mounted next to each other. Make a note of the original positions and slide each of them to the opposite position.

You will now find that the strong signal handling performance is much improved when the receiver is used with full sized or resonant antennas. Leave the amplifier in circuit if you only intend to use small whip antennas. Note that the switches only effect the h.f. range up to 30MHz, the v.h.f./u.h.f. performance remains unaltered.

If you need to reset the microprocessor controller for any reason there is a small push button mounted on the controller p.c.b. **Warning: Pressing this button erases all the memory contents - only use it as a last resort.**

There is also a small slide switch hidden on this same board. Operating it seems to do very little so its use remains unknown - any ideas anyone?

Icom ICR-1

The general belief is that a few examples of this desirable hand-held scanner may appear in early September. However the model which is currently available in Japan has not had a particularly encouraging review in the Japanese amateur radio press. I suspect that a few changes may have to be made to improve its signal handling performance before the model becomes more generally available.

I don't find this too surprising as the original specification seemed incredible in terms of both size and performance and I am sure that several litres of midnight oil have already been burnt in the competing manufacturers' design departments.

Until then I am continuing to save pennies in my cardboard cutout ICR-1 money box!

AOR AR-1000 Fairmate HP-100

This hand-held is becoming very popular with readers, especially those interested in the airbands. **K. Naylor** of Oxfordshire

is pleased with his AR-1000 but found it a bit unstable mechanically when he tried to stand it upright on a table whilst using a telescopic whip antenna. To get around this problem he has devised a very simple but effective fold down stand for use with the receiver.

Like all the best ideas this one is very cheap and easy to implement. All that is required is around 300mm of stiff wire such as that used for coat hangers, a short length of 3mm welding or brazing rod would be ideal. This is formed into the shape shown in **Fig. 2** and the two loose ends are inserted into the tubular section forming the bottom of the supplied belt clip. If the fit is a bit on the loose side you can wrap a small amount of tape around the rod in order to build up it's diameter a little.

You should now have a handy stand for your favourite scanner which you can adjust to give the correct operating angle. If you want to experiment with the angle you may have to change the supplied dimensions a little but they do give a good starting point.

My thanks to K. Naylor for this very practical suggestion.

Tandy PRO-2022

Ray Milton of Kent has been busy examining the circuit of his Tandy PRO-2022 scanner and has come up with a useful modification which provides manually selectable a.m. on the four most popular bands.

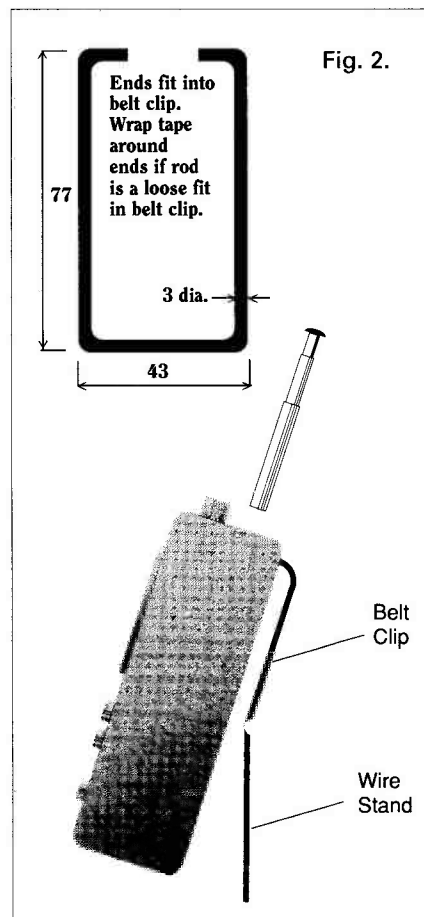
He discovered that the selection of each frequency band is made by means of a transistor driver stage. The driver for the 108-136MHz a.m. aircraft band also provided an additional feed to another stage in order to switch from f.m. to a.m.

By fitting a switch and a few additional diodes it is possible to simulate this switching action on any of the other ranges except the highest, 806-960MHz, as this uses a different polarity switching signal. However, as Ray points out it is very unlikely that you would want to select a.m. on this band.

As is customary with all modifications of this type here is the statutory health warning - **please be sure of your own abilities before you start work and also be warned that any changes to the receiver are more than likely to invalidate any warranty in force on the equipment.**

Disconnect the power and open the case. You need to be able to get to the underside of the main circuit board so be careful not to disturb any interconnecting leads too much.

Locate the surface mounted transistors near to the mains transformer (see **Fig. 3**) and carefully solder three new diodes as shown making sure that they do not short against any other



SCANNING

sections of the circuit board. A piece of insulation tape under the diodes may be advisable. Connect all three diode cathodes (the end with the band) together and run some thin insulated cable from this point to the new switch.

You may want to mount the switch at the rear of the receiver to avoid having to drill the moulded plastics front panel. The next stage is to add another diode in place of link JW48.

By fitting this diode you will retain the existing automatic selection of a.m. on the v.h.f. aircraft band. If you don't want automatic operation just remove the link and fit the diode into the position marked D4 in the diagram.

Connect a 39kΩ resistor between JW47 and JW48 and finally run a lead

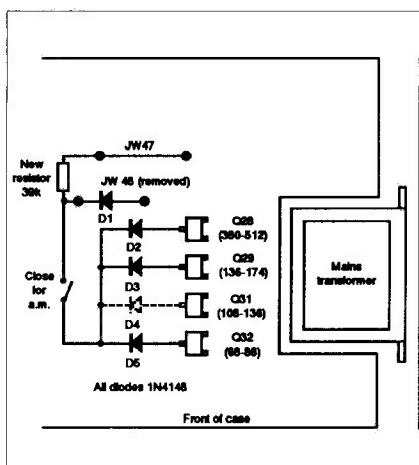


Fig. 3.

from the junction of the resistor and JW48 to the other contact of the new switch. Operating the switch so that the contacts are in the closed position should select a.m.

Give the modification a quick test before you screw the case back together.

There you have it - quite a simple modification which I am sure will be appreciated by existing owners as it should greatly improve the versatility of the receiver on the v.h.f. bands. My thanks to Roy for passing on these details.

If you have any interesting modifications, hints or tips that you would like to share with the rest of us why not drop me a line at PO BOX 1000, Eastleigh, Hants SO5 5HB.

Until next month - Good listening. □

AIRBAND

14

aeronautical messages are transmissions and very few are broadcasts but the book confuses this fine detail.

I liked the real-life transcripts of air-ground dialogue. These are the best way to illustrate the text and make the book come to life. Appropriately placed illustrations help, too. This is not just a textbook on air traffic control; there's plenty of helpful advice about receivers, antennas, and other information for the s.w.l. At the end is a frequency list for airways control.

To the technically-minded enthusiast who has noticed that air traffic control exists and now wants to know more details I commend this book which is good value for money. I suspect that the true first-timer will need to re-read certain sections of the book after gaining experience, but that's what learning is all about. It might even appeal to a p.p.l. student who wants to know how the big aircraft behave!

I couldn't resist adding *Rescue* by **Paul Beaver** and **Paul Berriff** (Patrick Stephens, 192 pages, profusely illustrated mainly in colour, £9.99, ISBN 1-85260-291-0) to my library. Those who watched the accompanying television series (made in association with Scottish Television) will have sensed the life and conditions of rescue helicopter crew. There was no formal technical information; viewers had to contend with 'needles split' in checklists, 'winch to pilot' during rescues, engine failure

planning, 'quarter-mil topos' for navigation, and much more, without any explanation. If you already knew about flying then you could apply your knowledge, otherwise the finer points would be lost on you.

Make no mistake, the book is written along the same lines. You won't learn to fly helicopters by reading it but the atmosphere is there. This is not drama, this is real life and makes a true impression on an audience now hardened by seeing misfortune and violence acted out every day in the media. The success of the book is that it can bring this message home without fading in to the background of routine excitement to which the average television viewer has become accustomed.

This column's readers will especially like the transcriptions of air/ground and between-crew dialogue; also, there is a summary of the main distress and rescue radio frequencies and helicopter base locations. Don't get this book as a technical exercise. Read it for the experience, and then think just what the rescue crews really do in each day's work.

Video Reviews (VHS - PAL)

Wings - The Jet Age (Visnews Ltd., Cumberland Avenue, London NW10 7EH. Tel: 081-965 7733. About 54 min. Around £11 by post). Lots of exciting film clips of all manners of aircraft. Like a

rapid airshow spanning the years - but little else. I found the commentary rather silly; apart from telling you which aircraft type was in shot, not much information was imparted. Although supposedly a history, there is no methodical structure. Enjoy watching rareities such as a Trident automatic landing (seen from the cockpit) and the Avro 707 "mini Vulcan" in formation. But turn the sound off first.

Talking of Vulcans, *Delta 83* (30 mins, £16.20 by post) is from The Vulcan Association - but you'll have to join first! Well worth it at £9 for the current year, to keep XH558 (the last flying Vulcan) alive and displaying. The aircraft has its 30th birthday this year so it's catching me up fast! I make no apology for emphasising that, without further support, 1990 will be the last year in which a Vulcan flies. Back to the video. Featured are B1 Vulcans from Waddington. It gives a good idea of the atmosphere of a V-force base around 1960 but, again, is non-technical. The commentary and style of presentation match the period and now look dated but will I'm sure bring reminiscences back to anyone who was associated with these aircraft all those years ago. Join the Vulcan Association, 207 Weoley Castle Road, Weoley Castle, Birmingham B29 5QW. Mention *SWM* when sending your subscription.

The next three deadlines (for topical information) are June 29, August 3 and September 7. All correspondence to the *SWM* office please. □

dressler

COMMUNICATIONS LTD.

VISA

AMEX

RSGB

MON.-FRI. 9.00-5.30
SAT. 9.30-5.00

DRESSLER ACTIVE ANTENNAS

ARA 30

ACTIVE ANTENNA
50kHz...
40MHz WITH LIMITED PERFORMANCE UP TO 100MHz

Professional electronic circuitry with very wide dynamic range. Meets professional demands both in electronics and mechanical ruggedness. 1.2m long glass fibre rod. Circuit is built into waterproof 2.5mm thick aluminium tube. Ideal for commercial and swl receiving systems. £139. See review in Practical Wireless August 1985 issue p.35. Both antennas come complete with 7 metres of cable, interface, power supply and brackets.

£139

ARA 1500

50MHz - 2GHz

Frequency 50-1000 Gain 11.5dB
1000-1500 11.0dB

£159.00

'N' Connection

Now fully tuneable interface. Intercept point +21dBm Typical.

191 FRANCIS ROAD
LEYTON · E10 6NQ · LONDON
TELEX 8953609 LEXTON G
PHONE 081-558 0854 081-556 1415
FAX 081-558 1298

24hr Hotline ansaphone 081-558 0854

Or contact your local agent anytime on the following numbers: Stewart (Bromley, Kent) 01-466 5199, 0660 634526, Terry (Biggleswade, Beds.) 0767 316 431.

YAESU



YAESU
FRG
8800

FRG 8800 HF RECEIVER
£585.00

VHF CONVERTER £100.00



YAESU
FRG 9600
50-950 MHz
£500.00

KENWOOD

R5000 HF Receiver only... £799
R5000 + ARA 30... £899
RZ1 Mobile scanner 500kHz - 905MHz... £469

ICOM

ICOM R71
General Coverage Receiver
£855



FIRST CLASS SHORT WAVE RECEIVER.
BUY THIS FOR £855 AND RECEIVE AN
ARA 30 FREE. WORTH £139.
Also R7000 complete with
ARA1500 £999.

ICR9000 150kHz - 2000MHz incl. ARA 30 +
ARA 1500 and delivery... £3995

SONY

SONY ICF 2001D
76-108MHz 116-136

£299

AIRBAND
153kHz-29.995MHz
FM - AM - SSB 32 MEMORIES
INC PSU, CARRY STRAP
& EARPHONE

Complete ICF2001D system including all above,
plus AN 1... £349
Sony AIR7... £229
Sony Pro 80-150-kHz, 115-224MHz,
AM-FM-SSB... £299
Sony AN1 Active Antenna... £55
Sony AN3 Airband Antenna... £53

76-108MHz
SONY SW 7600DS
NEW MODEL ICF-SW/7600DS featuring stereo
FM+USB/LSB & larger display... £165.00

76-108MHz
153kHz-29.995MHz
Complete with case,
mains power supply,
earphone and frequency list.

STANDARD



STANDARD
AX700
PANADAPTOR DeLuxe
£575.00

JRC NRD 525
SPECIAL Price NRD 525 Receiver.
£1150 incl. ARA 30 £950 without

GRUNDIG 500... £280
ICOM R1... £399
ICOM R100... £499
AOR 1000... £249
AOR 2515... £575
AOR 2002... £459
AOR 3000... £799
By the time you read this advert the AOR 3000
should be in stock at £695 not £799.

Bredhurst electronics



BREDHURST ELECTRONICS LTD.
High St, Handcross, W. Sx. RH17 6BW
(0444) 400786

SITUATED AT SOUTHERN END OF M23 — EASY ACCESS TO M25 AND SOUTH LONDON

RECEIVERS

HF225	£425
ICR71	£855
R2000	£595
VC10VHF Converter	£161
FRG8800	£649
FRV8800VHF Converter	£100
R5000	£875

HF TRANSCEIVERS

TS960SD	£3199
TS940s	£1995
TS440s	£1138
TS140s	£862
TS680s	£985
FT767GX	£1569
FT757GX2	£968
FT747GX	£658
IC765	£2499
IC751A	£1500
IC735	£979
IC725	£759
IC726	£989

2M TRANSCEIVERS

TH25E	£238
TH205E	£199
TH215E	£228
TS711E	£698
TR751E	£589
TM231	£269
FT411 + FNB10	£259
FT290R II	£429
FT211RH	£309
FT212RH	£309
IC23E	£265
IC225H	£365
IC275E Inc PSU	£1069
IC25E	£275
IC25ET	£295

70CMS TRANSCEIVERS

TS811E	£998
TR851E	£689
TH405E	£245
TH415E	£268
TM431E	£318
FT790R II	£499
FT711RH	£349
FT712RH	£375
IC49E	£299
IC45E	£310
IC448E	£429

DUAL BAND TRANSCEIVERS

TM721E	£699
TS790E	£1495
FT470R + FNB10	£384
FT736R	£1199
FT4700RH	£499
IC32E	£399
IC321OE	£499
IC2400E	£635
IC2500E	£675

SCANNING RECEIVERS

ICR7000	£989
FRG9600M	£509
Icom ICR100	£495
AR2002	£487
R535 Airband	£248
Standard AX700C	£575

ANTENNA TUNER UNITS

FRT7700	£59
FC757AT	£349
AT230	£208
AT250	£366
ICAT100	£379
MFJ941D	£118
MFJ949C	£165

DATONG

AD370 Active Antenna	£77.62	3.00
FL3 Multimode Filter	£145.54	2.00
D70 Morse Tutor	£63.40	2.00
ASP Speech Processor	£93.15	2.00

COAXIAL SWITCHES

SA450 2way SO239	£19.49	1.50
SA450N 2way N	£26.99	1.50
Drae 3way SO239	£20.18	1.50
Drae 3way N	£26.11	1.50
C54 4way BNC	£30.39	1.50
MFJ-1701 6way SO239	£38.35	1.50

POWER SUPPLIES

BNOS 12/5E	£74.75	5.00
BNOS 12/20E	£178.25	5.00
DRAE 6amp	£84.99	3.00
DRAE 12amp	£113.10	5.00
DRAE 24amp	£163.42	5.00

HAND HELD RECEIVERS

R537S Airband	£69.00	2.00
FAIRMATE HP100E	£249.00	2.00
Win108 Airband	£175.00	2.00
AOR AR1000	£249.00	2.00
Yupiteru MVT-5000	£299.00	2.00

PALOMAR ANTENNA PRODUCTS

Antenna Noise Bridge - Up to 100MHz	£59.95
Tuner-Tuner - Tune your ATU without transmitting	£99.95
LED S.W.R. Meter - Auto SWR up to 2kW	£124.95
P.E.P.	£23.95
9:1 Balun. For the T2FD Antenna.	

GOODS NORMALLY DESPATCHED WITHIN
24HRS - PRICES CORRECT AT TIME OF GOING TO
PRESS - E60E

MAIL ORDER & RETAIL

ANTENNA RANGE

J Beam 'MiniMax' Triband	£378.35
J Beam TB3MK3 Triband	£365.70
Butternut HF6VX	£182.85
Butternut HF2V	£163.30
Cushcraft A3 Tribander	£329.00
Cushcraft 2M 215WB	£99.00
Tonna 20505 5ele 50MHz	£50.72
Tonna 20609 9ele 144MHz	£33.12
G Whip tribander 10, 15 and 20m	£44.39

MORSE KEYS

Kent Morse key kits	£33.50	2.50
Kent T'win-paddle kits	£42.50	2.50
Hi Mound MK704	£20.00	2.00
Hi Mound MK706	£22.00	2.00
Bencher BY1 Black Base	£67.42	2.50
Bencher BY2 Chrome Base	£76.97	2.50

FILTERS

AKD HPF1	£7.65	1.00
AKD Braid Breaker	£7.65	1.00
AKD Notch Filter	£8.75	1.00
AKD High pass filter	£8.25	1.00
LF30A Low pass filter	£32.26	2.00

ANTENNA BITS

Bricommm Balun 1.1 kW	£15.26	1.50
Bricommm Balun 4.1 kW	£16.25	1.50
Bricommm 7.1MHz Epoxy Traps (pair)	£13.65	1.50
Self Amalgamating Tape 10m x 25mm	£4.25	0.75
T-piece polyprop Dipole centre	£1.60	0.25
Small ceramic egg insulators	£0.65	0.20
Large ceramic egg insulators	£0.85	0.20

CABLES ETC.

URM 67 low loss coax 50ohm per metre	£0.95	0.25
UR 76 50ohm coax dia. 5mm per metre	£0.35	0.10
UR 70 70ohm coax per metre	£0.35	0.10
UR 95 50ohm coax dia. 2.3mm per metre	£0.40	0.10

BREDHURST ELECTRONICS LTD HIGH ST, HANDCROSS, W. SUSSEX. RH17 6BW (0444) 400786

Open Mon-Fri 9am-5pm except Wed 9am-12.30pm. Sat 10am-4pm

GAREX ELECTRONICS

WEATHER SATELLITE EQUIPMENT

ATARI ANIMATED SYSTEM

Automatic frame capture and animation from Meteosat, also still pictures from NOAA & other VHF satellites. Complete system from antenna to colour monitor, including Atari ST1040 computer & software **£1695.00**
 Atari interface unit + software only **£458.85**
COMMODORE AMIGA Interface + software for animation & superb high resolution pictures (600 pixels×400 lines) **£458.85**
PCSAT+ for IBM & clones, expandable system from XT+CGA up to 386+VGA. Interface and standard software **£458.85**
 Upgrade software for Animation, NOAA, VGA & Paint available.
 Complete system: Meteosat antenna, preamp, receiver/interface, software & cables (state which computer) **£688.85**

COMPACT FRAME STORE SYSTEM

The basic METEOSAT system, no complications, no computer, just a plug in and go package that can be up and running in 10 minutes. Antenna through to 12" mono monitor: **£995.95**

SATELLITE SEPARATES

Meteosat Receiver antenna input, 2 watt audio output **£270.25**
 Meteosat Preamp 15dB gain 0.6dB NF GaAs FET **£109.25**
 NOAA 2 channel High Immunity Receiver **£149.95**
 NOAA BASIC Turnstile Antenna **£39.95**
 NOAA BASIC Preamp 3 pole filter, boxed, 14dB gain **£28.70**

GAREX VHF RECEIVERS

A simple but versatile design capable of covering spot frequencies in the range 25–200MHz; sensitive double superhet with choice of IF bandwidths from "W-SAT" to "12.5kHz" PMR. Single channel xtal controlled with multi-channel options. (Prices from **£49.95**)
 Mains power supply module 12V regulated 250mA **£15.50**

GAREX VHF PREAMPLIFIERS

Miniature General Purpose only 34×9×15mm, any frequency in range 40–200MHz, up to 25dB gain
 Stock versions: 6m, 4m, 2m & 137MHz (W-SAT) **£11.45**
 Airband 118–136MHz (reduced gain) **£11.45**
 Other frequencies in the range 40–200MHz to order **£13.75**
 High Performance 2 metre Preamp
 3 band-pass stages, 16dB gain, 1dB NF, RF switched (up to 35 watts) with gas-filled relays, assembled pcb **£39.95**
 Boxed version, with BNC connectors **£49.95**
 Gas-filled relays as used in preamp **£4.95**

4 METRE 0.5 WATT TX

High quality PMR front end by famous manufacturer, modified by Garex to make 4 metre convertre: 10–11MHz output. Full circuit and connection details **£16.95**

GAREX DC/DC INVERTERS

A popular line for many years. Economy package: chassis section cut from commercial R/T gear, re-wired & tidied up to make a free-standing unit, no expensive cabinet, just basic value for money.
 12V DC input, 250V 150mA DC output **£10.95**
 12V DC input, 400V 200mA DC output **£11.95**
 24V versions to order.

4 METRE 0.5 WATT TX

Tx Low Power driver unit matching above Rx, with modulator, fully aligned with data **£15.95**
 (or + xtal for 70.45MHz **£19.95**)

REVCO TABLE MICROPHONES

Very high quality PTT Base Mikes 600 or 2.4k ohm (state which) **£55.00**

PYE ANTENNA RELAYS

12V Operation, handles 50 watts up to 200MHz **£1.95; 5 for £7.50**

AUDIO BOOSTER

10 watt add-on PA, high quality audio unit by famous R/T maker, useful for noisy areas, Public Address, boosting audio from hand-helds; new, assembled pcb, full circuit data **£9.95**

SCANNER BARGAIN!!!

New cabinet, sub-frame and complete MPU pcb & LCD display, front panel and keyboard for AOR2002/Regency MX8000 Scanner; (less PLL & Rx) ideal for refurb., early model upgrade, spares or experiments. Amazing value only **£29.95**

WRITE (Sae, please) or PHONE for full details.

MAIN DISTRIBUTORS FOR REVCO ELECTRONICS LTD

Prices include UK P&P and 15% VAT
 Ask for details of our interest Free Credit

GAREX ELECTRONICS

HARROW HOUSE, AKEMAN STREET, TRING HP23 6AA

TEL: TRING (044282) 8580
 and CHEDDINGTON (0296) 668684

Callers by appointment only

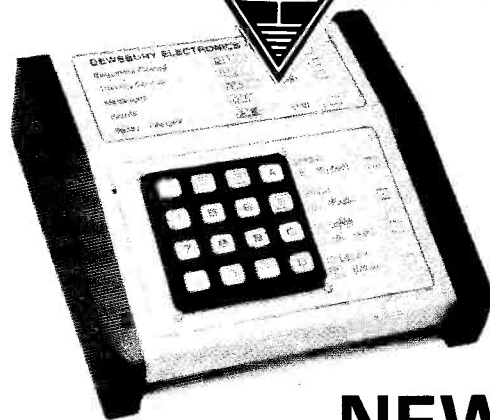
Moving soon – Watch for details!



DEWSBURY

ELECTRONICS

G4CLX



NEW!

The NEW DEWSBURY ELECTRONICS
SUPA-TUTA
 makes learning Morse
 easier than its ever been

The self contained unit contains all one needs to learn Morse, and learn it thoroughly. From ABSOLUTE BEGINNER to EXPERT, all can make use of the on-board facilities.

1. Beginners Course, a gentle introduction to Morse Code over 10 lessons, including letters, numbers and accented characters.
2. Training Courses, no less than 90 different training sequences, with answers for checking, plus a further 10 sequences of random letters and figures, but without answers.
3. Ten different messages of 500 characters each, with answers.
4. Random words, Supa-Tuta has a library of words and abbreviations, no answers for this one!
5. Variable Speed, 2–99 wpm, variable sidetone 500–1250Hz, variable inter character spacing, a relay switched output and built in sidetone speaker. Works from 9–14 volts DC at 300mA.

Price £69.95

inc VAT and postage

Send SAE for details

FULL RANGE OF KENWOOD PRODUCTS STOCKED
 We are also stockists of DAIWA – POCOM – JRC – TAR – WAVECOM – VIBROPLEX – MICROWAVE MODULES – B.N.O.S.

Dewsbury Electronics, 176 Lower High Street,
 Stourbridge, West Midlands DY8 1TG
 Telephone: Stourbridge (0384) 390063/371228
 Fax: (0384) 371228



Instant finance available subject to status.

Written details on request.



AN EASILY-BUILT 16-30MHz CON

Bryan Robb

P

One of the few drawbacks of the R210 ex-MOD receiver is that its coverage stops at 16MHz. This easily constructed converter will extend this all the way to the top of the short wave spectrum at 30MHz.

Sunspot Cycle

In view of this shortcoming, together with the fact that we are now at the peak of the current eleven-year sunspot cycle, it was decided to produce a simple but highly efficient converter which, when placed ahead of the R210 will extend its range from 16 to 30MHz.

This will give you reception of all of the upper half of the short wave spectrum, at present providing excellent worldwide coverage.

converter, thus preventing overloading of the receiver if used with a large antenna. This is a facility not available on the R210. The signal then passes via S2. In the 'off' position this switch routes the signals directly to the R210, in the 'on' position routes the signals via the converter and also supplies the converter with a 9 to 12V supply.

In the interests of simplicity the feed from the converter and the bypass link are joined at the output socket. This saves having to use a more expensive 3-pole switch and has no effect on the performance of the converter.

Circuit

There are three stages to the converter. A high pass filter, a crystal oscillator and a mixer. Fig 1.1 shows the block diagram of the converter. Fig 1.2 shows the circuit diagram. Signals from the antenna are fed to S1. This is an attenuator which precedes the converter. It is arranged this way so that it may be used directly either directly ahead of the R210 or the

Chebyshev Filter

When the converter is in circuit the signals pass through a high pass filter. This is a seven-element Chebyshev design which has an input and output impedance of 50Ω. This filter allows all signals through above 16MHz and attenuates those below. The lower the frequency the

The articles by Tom Harrison GM3NHQ in *Short Wave Magazine* on converting the R210 ex-MOD receiver accentuated its limited coverage - it is only capable of receiving signals between 2 and 16MHz. This, however, seems to be one of its few drawbacks, as the sensitivity and selectivity of this receiver, when in good working order, puts some of the more recent equipment to shame.

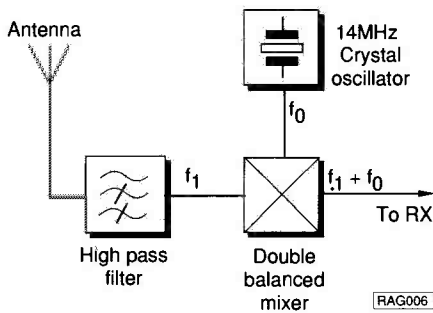


Fig. 1.1: Block diagram of the converter.

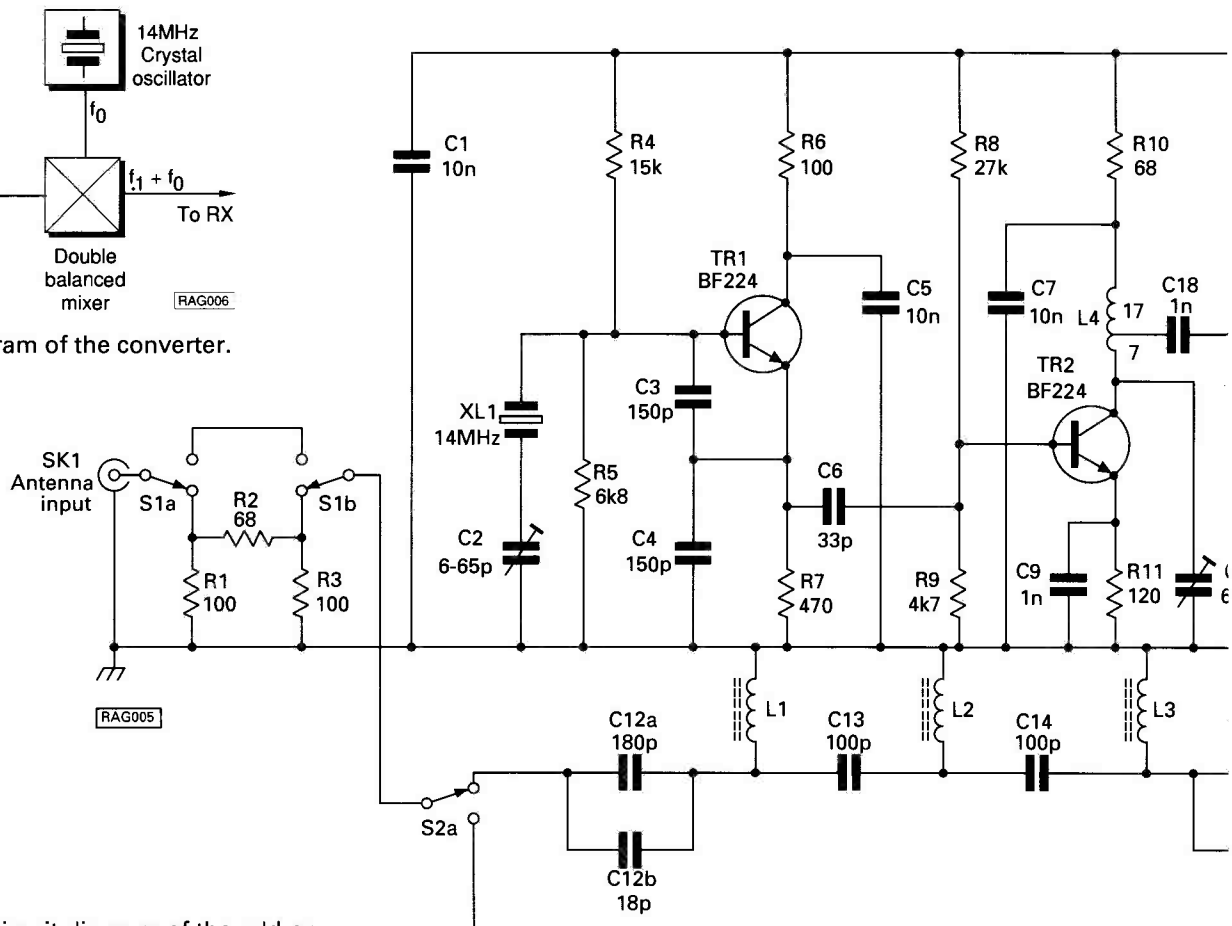
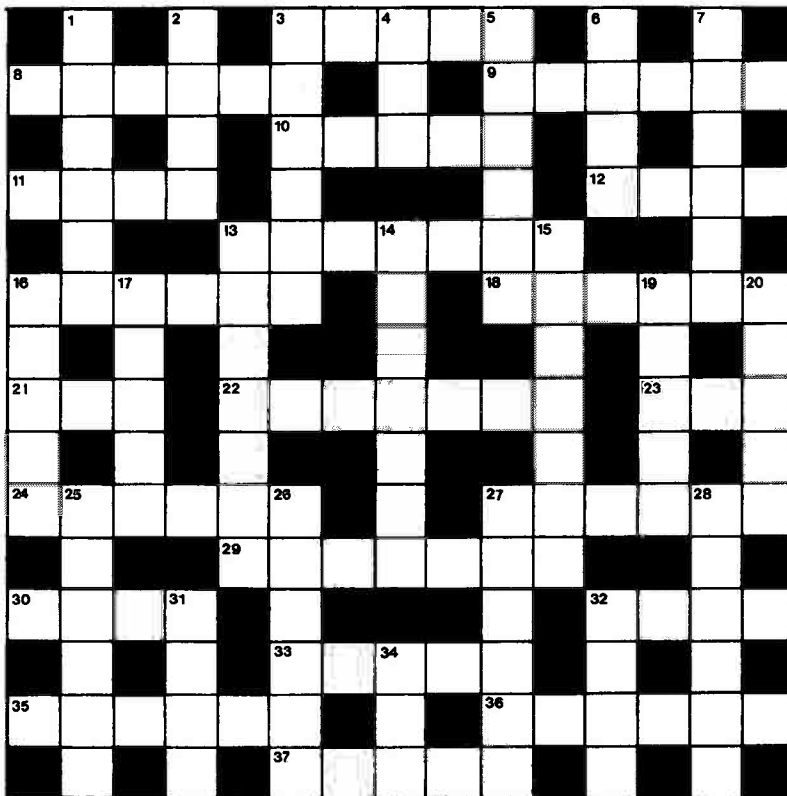


Fig. 1.2: Complete circuit diagram of the add-on, 16 to 30MHz converter for the R210 receiver.

THIS MONTH'S BRAIN-TEASER

Across

- 3 Shortened blue stone colours
Mercedes (5)
- 8 Las Vegas state in Portsmouth (6)
- 9 Presents acknowledgement of
merit (6)
- 10 Avoid library fine, replace with new
equipment (5)
- 11 Frequency of the proceedings,
control (4)
- 12 High volume (4)
- 13 Profession summoning card (7)
- 16 American Indian tribe (6)
- 18 Hulled grain or fourpenny coin in
plural (6)
- 21 Poorly (3)
- 22 One million tons (7)
- 23 Dirty small room for lion (3)
- 24 Top Floor or attic for impoverished
poets (6)
- 27 Despicable or hateful (6)
- 29 Insignia, possibly royal (7)
- 30 Short plural amplifier (4)
- 32 Record lined up (4)
- 33 Good luck bracelet (5)
- 35 Citizens advice writing desk (6)
- 36 European consortium aeroplane (6)
- 37 Powerful tower (5)



Down

- 1 Recover expenditure (6)
- 2 Sea movement acknowledges
short title (4)
- 3 Insects after egg (6)
- 4 Criticise universal Greek god (3)
- 5 Cutting wood (6)
- 6 Autumn tumble (4)
- 7 Do not alter your set? (6)
- 13 Music pot (7)
- 14 Italian pub dish (7)
- 15 Ford services regional television (7)
- 16 Getting old! (5)
- 17 More competent (5)
- 19 Sound sense (5)
- 20 Transmits outward message (5)
- 25 Protective clothing taken to
extreme! (6)
- 26 Stormy drinking vessel (6)
- 27 Drilling rig worker (6)
- 28 Serviceable item comes in
handy (6)
- 31 Walk up and down to change
voltage (4)
- 32 Horse drawn carriage fires
jingles (4)
- 34 Everyone or thing (3)

Send your completed crossword to: **Short Wave Magazine, Crossword Competition July 1990, Enefco House, The Quay, Poole, Dorset BH15 1PP** to arrive not later than Friday 13th July 1990. The first correct entry drawn from a 'hat' will win a 1 year subscription to *Short Wave Magazine*. The Editor's decision is final and no correspondence will be entered into.

Name

Address

.....

.....

Post Code

SWM BOOK SERVICE

The books listed have been selected as being of special interest to our readers. They are supplied from our editorial address direct to your door. Some titles are overseas in origin.



0202
665524

HOW TO ORDER

POST AND PACKING: add 75p for one book, £1 for two or more books. Orders over £35 post and packing free. (Overseas readers add £1.50 for one book, £2.50 for two or more for surface mail postage) and send a postal order, cheque or international money with your order (quote book titles and quantities) to **PW Publishing Limited, FREEPOST, Enfield House, The Quay, Poole, Dorset BH11 1PP.** Please make your cheques payable to Short Wave Magazine, payment by Access, Mastercard, Eurocard or Visa also accepted on telephone orders to Focus (0202) 665524. Books are normally despatched by road or post but please allow 28 days for delivery. Prices correct at time of going to press. Please note all payments must be made in Sterling.



0202
665524

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

RADIO

AIR & METEO CODE MANUAL

10th Edition

Joerg Klingenfuss

Detailed descriptions of the World Meteorological Organisation Global Telecommunication System operating FAX and RTTY meteo stations, and its message format with decoding examples. Also detailed description of the Aeronautical Fixed Telecommunication Network amongst others. 289 pages £14.00

BETTER RADIO/TV RECEPTION

A. Nallawalla, A. T. Cushen and B. D. Clark

An Australian book giving guidance and advice to listeners seeking reliable reception of distant radio stations, and to DX listening hobbyists. 134 pages £9.95

BETTER SHORTWAVE RECEPTION (USA)

W. S. Orr W6SAI and S. D. Cowan W2LX

Receivers, antennas, propagation, DX listening techniques for the short waves and v.h.f. 158 pages £5.50

PASSPORT TO WORLD BAND RADIO 1990

This book gives you the information 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 languages of broadcast stations by frequency. 398 pages O/S

SCANNERS (Third Edition)

Peter Rouse GU1DKD

A guide for users of scanning receivers, covering hardware, antennas, accessories, frequency allocations and operating procedures. 245 pages £7.95

SCANNERS 2

Peter Rouse GU1DKD

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 accessories to improve the performance of scanning equipment. 216 pages £9.95

SHORT WAVE RADIO LISTENERS' HANDBOOK

Arthur Miller

In easy-to-read and non-technical language, the author guides the reader through the mysteries of amateur, broadcast and CB transmissions. 207 pages £7.99

RADIOTELETYPE CODE MANUAL

10th Edition

Joerg Klingenfuss

This book gives detailed descriptions of the characteristics of telegraph transmission on short waves, with all commercial modulation types including voice frequency telegraphy and comprehensive information on all RTTY systems and c.w. alphabets. 96 pages £8.00

THE SATELLITE EXPERIMENTER'S HANDBOOK (USA)

A guide to understanding and using amateur radio, weather and TV broadcast satellites. 207 pages £7.50

1934 OFFICIAL SHORT WAVE RADIO MANUAL

Edited by Hugo Gernsback

A fascinating reprint from a bygone age with a directory of all 1934 s.w. receivers, servicing information, constructional projects, circuits and ideas on building vintage sets with modern parts. 260 pages £9.95

HIGH POWER WIRELESS EQUIPMENT

Articles from *Practical Electricity* 1910-11

Edited by Henry Walter Young

A reprint of interesting practical articles from the early days of radio. 99 pages £6.85

BEGINNERS

AN INTRODUCTION TO RADIO DXING (BP91)

R. A. Penfold

How to find a particular station, country or type of broadcast

and to receive it as clearly as possible.

112 pages £1.95

BEGINNER'S GUIDE TO RADIO

9th Edition

Gordon J. King

Radio signals, transmitters, receivers, antennas, components, valves and semiconductors, CB and amateur radio are all dealt with here. 266 pages £7.95

ELECTRONICS SIMPLIFIED - CRYSTAL SET CONSTRUCTION (BP92)

F. A. Wilson

Especially written for those who wish to take part in basic radio building. All the sets in the book are old designs updated with modern components. 72 pages £1.75

QUESTIONS & ANSWERS RADIO

Eugene Trundle

Basics of electrical theory, radio and semiconductors, receivers, amateur and CB radio, and test equipment.

110 pages O/P

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. 209 pages £3.50

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. 104 pages £5.95

A TV-DXERS HANDBOOK (BP176)

R. Bunney

Information on transmission standards, propagation, receivers including multi-standard, colour, satellites, antennas, photography, station identification, interference etc. Revised and updated 1986. 87 pages £5.95

GUIDE TO WORLD-WIDE TELEVISION TEST CARDS

Edition 3

Keith Hamer & Garry Smith

Completely revised and expanded, this is a handy reference book for the DXTV enthusiast. Over 200 photographs of Test Cards, logos, etc., world wide. 60 pages £4.95

SATELLITE TELEVISION INSTALLATION GUIDE

2nd Edition

John Breeds

A practical guide to satellite television. Detailed guidelines on installing and aligning dishes based on practical experience. 56 pages £11.95

THEORY

COMMUNICATION (BP89)

Elements of Electronics Book 5

F. A. Wilson

Fundamentals of line, microwave, submarine, satellite, digital multiplex, radio and telegraphy systems are covered, without the more complicated theory or mathematics. 256 pages £2.95

FILTER HANDBOOK A practical design guide

by Stefan Niewiadomski

A practical book, describing the design process as applied to filters of all types. Includes practical examples and BASIC programs. 195 pages £25.00

FROM ATOMS TO AMPERES

F. A. Wilson

Explains in simple terms the absolute fundamentals behind electricity and electronics. 244 pages £3.50

AUDIO (Elements of electronics - book 6)

F. A. Wilson

This book studies sound and hearing, and examines the operation of microphones, loudspeakers, amplifiers, oscillators, and both disk and magnetic recording. Intended to give the reader a good understanding of the subject without getting involved in the more complicated theory and mathematics. 320 pages £3.95

PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE (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 W7ZOI and Doug DeMaw W1FB

Back in print by popular demand! A revised and corrected edition of this useful reference book covering all aspects of solid-state design. 256 pages £10.95

The ARRL ELECTRONICS DATA BOOK

Doug DeMaw W1FB

Back by popular demand, completely revised and expanded, this is a handy reference book for the r.f. designer, technician, amateur and experimenter. 260 pages £8.95

LISTENING GUIDES

AIR BAND RADIO HANDBOOK (3rd Edition)

David J. Smith

Listen to conversations between aircraft and ground control. The author, an air traffic controller, explains more about this listening hobby. 174 pages £6.99

AIR TRAFFIC CONTROL

David Adair

A guide to air traffic control with maps, drawings and photographs explaining how aircraft are guided through crowded airspace. 176 pages O/P

DIAL SEARCH

6th Edition

George Wilcox

The listener's check list and guide to European broadcasting. Covers m.w., l.w., v.h.f. and s.w., including two special maps. 54 pages £3.95

FLIGHT ROUTINGS 1990

T.T. Williams

Identifies the flights of airlines, schedule, charter, cargo and mail, to and from the UK and Eire and overflights between Europe and America. 104 pages £4.95

GUIDE TO BROADCASTING STATIONS

20th Edition 1989/90

Philip Darrington

Frequency and station data, receivers, antennas, Latin American DXing, reporting, computers in radio, etc. 240 pages £9.95

GUIDE TO FACSIMILE STATIONS 9th Edition

Joerg Klingenfuss

This manual is the basic reference book for everyone interested in FAX. Frequency, call sign, name of the station, ITU country/geographical symbol, technical parameters of the emission are all listed. All frequencies have been measured to the nearest 100Hz. 378 pages £12.00

GUIDE TO FORMER UTILITY TRANSMISSIONS

3rd Edition

Joerg Klingenfuss

Built on continuous monitoring of the radio spectrum from the sixties until the recent past. A useful summary of former activities of utility stations providing information in the classification and identification of radio signals. 126 pages £8.00

RSGB RADIO DATA REFERENCE BOOK

G. R. Jessop G6JP

The 5th Edition of an essential book for the radio amateur's or experimenter's workbench.
244 pages. Hardback O/P

SEMICONDUCTOR DATA BOOK

A.M. Ball

Characteristics of some 10000 transistors, f.e.t.s, u.j.t.s, diodes, rectifiers, triacs and s.c.r.s. 175 pages. O/P

TRANSISTOR SELECTOR GUIDE (BP234)

J. C. J. Van de Ven

This guide has the information on all kinds of transistors in useful categories (other than the usual alpha numeric sort) such as voltage and power properties making selection of replacements easier. 192 pages. O/P

FAULT FINDING

ARE THE VOLTAGES CORRECT?

Reprinted from PW 1982-1983

How to use a multimeter to fault-find on electronic and radio equipment, from simple resistive dividers through circuits using diodes, transistors, i.c.s and valves.
44 pages. £1.50

GETTING THE MOST FROM YOUR MULTIMETER (BP239)

R. A. Penfold

This book is primarily aimed at beginners. It covers both analogue and digital multimeters and their respective limitations. All kinds of testing is explained too. No previous knowledge is required or assumed.
102 pages. £2.95

MORE ADVANCED USES OF THE MULTIMETER (BP265)

R. A. Penfold

This book is primarily intended as a follow-up to BP239, Getting the most from your Multimeter. By using the techniques described in this book you can test and analyse the performance of a range of components with just a multimeter (plus a very few inexpensive components in some cases). The simple add-ons described extend the capabilities of a multimeter to make it even more useful.
85 pages £2.95

OSCILLOSCOPES, HOW TO USE THEM, HOW THEY WORK

Ian Hickman

This book describes oscilloscopes ranging from basic to advanced models and the accessories to go with them. 133 pages. O/P

PRACTICAL HANDBOOK OF VALVE RADIO REPAIR

Chas E. Miller

The definite work on repairing and restoring valved broadcast receivers dating from the 1930s to the 60s. Appendices giving intermediate frequencies, valve characteristic data and base connections.
230 pages. Hardback £20.00

SERVICING RADIO, HI-FI AND TV EQUIPMENT

Gordon J. King

A very practical book looking at semiconductor characteristics, d.c. and signal tests, fault-finding techniques for audio, video, r.f. and oscillator stages and their application to transistor radios and hi-fi.
205 pages. O/P

TRANSISTOR RADIO FAULT FINDING CHART (BP70)

C. E. Miller

Used properly, should enable most common faults to be traced reasonably quickly. Selecting the appropriate fault description at the head of the chart, the reader is led through a sequence of suggested checks until the fault is cleared. 635 x 455mm (approx) £0.95

CONSTRUCTION

HOW TO DESIGN AND MAKE YOUR OWN P.C.B.s (BP121)

R. A. Penfold

Designing or copying printed circuit board designs from magazines, including photographic methods.
80 pages. £2.50

INTRODUCING QRP

Collected articles from PW 1983-1985

An introduction to low-power transmission, including constructional details of designs by Rev. George Dobbs G3RJV for transmitters and transceivers from Top Band to 14MHz, and test equipment by Tony Smith G4FAL.
64 pages. £1.50

MORE ADVANCED POWER SUPPLY PROJECTS (BP192)

R. A. Penfold

The practical and theoretical aspects of the circuits are covered in some detail. Topics include switched mode power supplies, precision regulators, dual tracking regulators and computer controlled power supplies, etc.
92 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. 91 pages. £2.50

PRACTICAL POWER SUPPLIES

Collected articles from PW 1978-1985

Characteristics of batteries, transformers, rectifiers, fuses and heatsinks, plus designs for a variety of mainsdriven power supplies, including the PW "Marchwood" giving a fully stabilised and protected 12V 30A d.c.
48 pages. £1.25

QRP NOTEBOOK

Doug DeMaw W1FB

This book deals with the building and operating of a successful QRP station. Lots of advice is given by the author who has spent years as an ardent QRP'er. All the text is easy-to-read and the drawings large and clear.
77 pages. £4.95

TEST EQUIPMENT CONSTRUCTION

R. A. Penfold

Describes, in detail, how to construct some simple and inexpensive, but extremely useful, pieces of test equipment.
104 pages. £2.95

50 (FET) FIELD EFFECT TRANSISTOR PROJECTS

F. G. Rayer

50 circuits for the s.w.l., radio amateur, experimenter or audio enthusiast using f.e.t.s. 104 pages. £2.95

ANTENNAS (AERIALS)

AERIAL PROJECTS (BP105)

Practical designs including active, loop and ferrite antennas plus accessory units. 96 pages. £2.50

ALL ABOUT CUBICAL QUAD ANTENNAS (USA)

W. I. Orr W6SAI & S. D. Cowan W2LX

Theory, design, construction, adjustment and operation of quads. Quads vs. Yagis. Gain figures.
109 pages. £5.50

ALL ABOUT VERTICAL ANTENNAS (USA)

W. I. Orr W6SAI & S. D. Cowan W2LX

Theory, design, construction, operation, the secrets of making vertical work.
191 pages. £7.50

AN INTRODUCTION TO ANTENNA THEORY (BP198)

H. C. Wright

This book deals with the basic concepts relevant to receiving and transmitting antennas. Lots of diagrams reduce the amount of mathematics involved.
86 pages. £2.95

ANTENNA IMPEDANCE MATCHING

Wilfred N. Caron

Proper impedance matching of an antenna to a transmission line is of concern to antenna engineers and to every radio amateur. A properly matched antenna as the termination for a line minimises feed-line losses. Power can be fed to such a line without the need for a matching network at the line input. There is no mystique involved in designing even the most complex multi-element networks for broadband coverage. Logical step-by-step procedure is followed in this book to help the radio amateur with this task.
192 pages £11.95

BEAM ANTENNA HANDBOOK (USA)

W. I. Orr W6SAI & S. D. Cowan W2LX

Design, construction, adjustment and installation of h.f. beam antennas. 198 pages. O/P

HF ANTENNAS FOR ALL LOCATIONS (RSGB)

L. A. Moxon G6XN

Taking a new look at how h.f. antennas work, and putting theory into practice. 260 pages. £5.19

*NOVICE ANTENNA NOTEBOOK

Doug DeMaw W1FB

Another book from the pen of W1FB, this time offering "new ideas for beginning hams". All the drawings are large and clear and each chapter ends with a glossary of terms. 130 pages £5.95

OUT OF THIN AIR

Collected Antenna Articles from PW 1977-1980

Including such favourites as the ZL Special and "2BCX 16-element beams for 2m, and the famous "Slim Jim", designed by Fred Judd G2BCX. Also features systems for Top Band, medium wave/long wave loop designs and a v.h.f. direction finding loop. Plus items on propagation, accessories and antenna design. 80 pages. £1.80

PRACTICAL WIRE ANTENNAS - Effective HF

Designs for the Radio Amateur

John D Hays G3BCQ

Wire antennas offer one of the most cost-effective ways to put out a good signal on the h.f. bands and this practical guide to their construction has something to interest every amateur on a budget. 100 pages. £7.53.

SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS (USA)

W. I. Orr W6SAI & S. D. Cowan W2LX

Efficient antennas for Top Band to 2m, including "invisible" antennas for difficult station locations.
191 pages. £6.75

THE ARRL ANTENNA BOOK (USA) 15th Edition

A station is only as effective as its antenna system. This book covers propagation, practical constructional details of almost every type of antenna, test equipment and

formulas and programs for beam heading calculations.
£12.95

THE ARRL ANTENNA COMPENDIUM (USA)

Volume One

Fascinating and hitherto unpublished material. Among the topics discussed are quads and loops, log periodic arrays, beam and multi-band antennas, verticals and reduced size antennas. 175 pages. £7.50

WIRES & WAVES

Collected Antenna Articles from PW 1980-1984

Antenna and propagation theory, including NBS Yagi design data. Practical designs for antennas from medium waves to microwaves, plus accessories such as a.t.u.s, s.w.r. and power meters and a noise bridge. Dealing with TVI. 160 pages. £3.00

W1FB'S ANTENNA NOTEBOOK

Doug DeMaw W1FB

This book provides lots of designs, in simple and easy to read terms, for simple wire and tubing antennas. All drawings are large and clear making construction much easier. 124 pages. £5.95

25 SIMPLE AMATEUR BAND AERIALS (BP125)

E. M. Noll

How to build 25 simple and inexpensive aeriels, from a simple dipole through beam and triangle designs to a mini-rhombic. Dimensions for specific spot frequencies including the WARC bands. 80 pages. £1.95

25 SIMPLE INDOOR AND WINDOW AERIALS (BP136)

E. M. Noll

Designs for people who live in flats or have no gardens, etc., giving surprisingly good results considering their limited dimensions.
64 pages. £1.75

25 SIMPLE SHORT WAVE BROADCAST BAND AERIALS (BP132)

E. M. Noll

Designs for 25 different aeriels, from a simple dipole through helical designs to a multi-band umbrella.
80 pages. £1.95

25 SIMPLE TROPICAL AND MW BAND AERIALS (BP145)

E. M. Noll

Simple and inexpensive aeriels for the broadcast bands from medium wave to 49m. 64 pages. £1.75

THE RADIO AMATEUR ANTENNA HANDBOOK

William I. Orr W6SAI & Stuart. D. Cowan W2LX

Yagi, quad, quagi, l-p, vertical, horizontal and "sloper" antennas are all covered. Also towers, grounds and rotators. 190 pages. £6.75

COMPUTING

AN INTRODUCTION TO COMPUTER COMMUNICATIONS (BP177)

R. A. Penfold

Details of various types of modem and their applications, plus how to interconnect computers, modems and the telephone system. Also networking systems and RTTY.
96 pages. £2.95

AN INTRODUCTION TO COMPUTER PERIPHERALS (BP170)

J. W. Penfold

Covers a wide range of computer peripherals such as monitors, printers, disk drives, cassette recorders, modems, etc., explaining what they are, how to use them and the various types of standards.
80 pages. £2.50

MICROPROCESSING SYSTEMS AND CIRCUITS (BP77)

Elements of Electronics Book 4

F. A. Wilson

A comprehensive guide to the elements of microprocessing systems, which are becoming ever more involved in radio systems and equipment.
256 pages. O/P

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 lmbic, Triambic, and an Electronic Bug with a 528-bit memory.
48 pages. £1.25

THE MORSE CODE FOR RADIO AMATEURS (RSGB)

Margaret Mills G3ACC

A guide to 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 pages. £2.88

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.
87 pages. £4.95

GUIDE TO UTILITY STATIONS

8th Edition
Joerg Klingenfuss

This book covers the complete short wave range from 3 to 30MHz plus the adjacent frequency bands from 0 to 150kHz and from 1.6 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 15802 entries in the frequency list and 3123 in the alphabetical call sign list plus press services and meteorological stations. 502 pages. £19.00

HF OCEANIC AIRBAND COMMUNICATIONS

3rd Edition
Bill Laver

Aircraft channels by frequency and band, main ground radio stations, European R/T networks, North Atlantic control frequencies. 29 pages. £3.50

INTERNATIONAL RADIO STATIONS GUIDE (BP255)

Revised and updated in 1988, this book shows the site, 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. 128 pages. £4.95

MARINE UK RADIO FREQUENCY GUIDE

Bill Laver

A complete guide to the UK s.w. and v.h.f. marine radio networks. Useful information, frequency listings and the World Marine Coastal Phone Stations. 62 pages. £4.95

NEWNES SHORT WAVE LISTENING HAND BOOK

Joe Pritchard G1UQW

A technical guide for all short wave listeners. Covers construction and use of sets for the s.w.l. who wants to explore the bands up to 30MHz. 286 pages. £12.95

THE COMPLETE VHF/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 chapters on equipment requirements as well as antennas, etc. 88 pages. £5.95

THE INTERNATIONAL VHF FM GUIDE

7th Edition

Julian Baldwin G3UHK and Kris Partridge G8AUU

The latest edition of this useful book gives concise details of repeaters and beacons 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 essential information. The listing is in ascending frequency order, from 1.6 to 27.1MHz. 46 pages. £2.95

SHORT WAVE LISTENERS CONFIDENTIAL

FREQUENCY LIST

Bill Laver

Covering the services and transmission modes that can be heard on the bands between 1.635 and 29.7MHz. £8.95

VHF/UHF AIRBAND FREQUENCY GUIDE (Updated)

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

WORLD RADIO TV HANDBOOK 1990

Country-by-country listings of long, medium and short wave broadcast and TV stations. Receiver test reports. English language broadcasts. The s.w.l.'s "bible". 576 pages. £18.99

INTERFERENCE

INTERFERENCE HANDBOOK (USA)

William R. Nelson WA6FGQ

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

RADIO FREQUENCY INTERFERENCE (USA)

What causes r.f.i.? Are all r.f.i. problems difficult, expensive and time-consuming to cure? These questions and many more are answered in this book. 84 pages. £4.30

AMATEUR RADIO

AMATEUR RADIO CALL BOOK (RSGB)

Spring Edition

Now incorporates a 48-page section of useful information for amateur radio enthusiasts. 310 pages. £7.70

AMATEUR RADIO OPERATING MANUAL (RSGB)

A mine of information on just about every aspect of amateur operating. International call sign series holders, prefix lists, DXCC countries list, etc. 204 pages. £6.16

AMATEUR RADIO SATELLITES the first 25 years

Arthur C. Gee G2UK

This souvenir publication mainly a pictorial account of the pattern of developments which have occurred over the last 25 years. 34 pages. £2.25

AN INTRODUCTION TO AMATEUR RADIO (BP257)

I. D. Poole

This book gives the newcomer a comprehensive and easy to understand guide through amateur radio. Topics include operating procedures, jargon, propagation and setting up a station. 150 pages. £3.50

HINTS AND KINKS FOR THE RADIO AMATEUR

Edited by Charles L. Hutchinson and David Newkirk

A collection of practical ideas gleaned from the pages of QST magazine. 152 pages. 0/5

HOW TO PASS THE RADIO AMATEURS' EXAMINATION (RSGB)

Clive Smith G4FZH and George Benbow G3HB

The background to multiple choice exams and how to study for them with sample RAE papers for practice plus maths revision. 88 pages. £5.65

PASSPORT TO AMATEUR RADIO

Reprinted from PW 1981-1982

The famous series by GW3JGA, used by thousands of successful RAE candidates in their studies. Plus other useful articles for RAE students. 96 pages. £1.50

PRACTICAL IDEAS FOR RADIO AMATEURS

Ian Poole G3YWX

Offers a wealth of hints, tips and general practical advice for all transmitting amateurs and short wave listeners. 128 pages. £5.95

QUESTIONS & ANSWERS AMATEUR RADIO

F. C. Judd G2BCX

What is amateur radio? The Radio Amateurs' Exam and Licence. Technology, equipment, antennas, operating procedures and codes. 122 pages. 0/P

RADIO AMATEUR'S GUIDE TO RADIO WAVE PROPAGATION

(HF Bands)

F. C. Judd G2BCX

The how and why of the mechanism and variations of propagation in the h.f. bands. 144 pages. £8.95

THE 1990 ARRL HANDBOOK FOR THE RADIO AMATEUR

This is the 66th edition of this very useful hardback reference book. Updated throughout it has several new sections covering oscilloscopes, spectrum analysers, digital frequency synthesis, phase-noise measurement and new constructional projects. 1200 pages. £15.95

*THE ARRL OPERATING MANUAL

Another very useful book from the ARRL. Although written for the American radio amateur, this book will also be of use and interest to the UK amateur. 684 pages. £12.95

THE ARRL SATELLITE ANTHOLOGY

The best from the Amateur Satellite News column and articles out of 31 issues of QST have been gathered together in this book. The latest information on OSCARs 9 through 13 as well as the RS satellites is included. Operation on Phase 3 satellites (OSCAR 10 and 13) is covered in detail. 97 pages. £4.95

THE COMPLETE DX'ER

Bob Locher W9KNI

Now back in print, this book covers equipment and operating techniques for the DX chaser, from beginner to advanced. 187 pages. £7.95

THE RAE MANUAL (RSGB)

G.L. Benbow G3HB

The latest edition of the standard aid to studying for the Radio Amateurs' Examination. Updated to cover the latest revisions to the syllabus. 132 pages. £5.65

THE RADIO AMATEUR'S DX GUIDE (USA)

15th Edition

The guide contains information not easily obtained elsewhere and is intended as an aid and quick reference for all radio amateurs interested in DX. 38 pages. £2.95

THE RADIO AMATEUR'S QUESTIONS & ANSWER REFERENCE MANUAL

4th Edition

R. E. G. Petri 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 any recognised course of instruction, although it is not intended as a text book. 280 pages. £7.95

VHF HANDBOOK FOR RADIO AMATEURS (USA)

H. S. Brier W9EQG & W. I. Orr W6SAI

VHF/UHF propagation, including moonbounce and satellites, equipment and antennas. 335 pages. £7.95.

VHF/UHF MANUAL (RSGB)

G. R. Jessop G6JP

Theory and practice of amateur radio reception and transmission, between 30MHz and 24GHz. 520 pages. £8.94

MAPS

IARU LOCATOR MAP OF EUROPE

DARC

This multi-coloured, plastics laminated, map of Europe shows the AIRU ("Maidenhead") Locator System. Indispensable for the v.h.f. and u.h.f. DXer. 692 x 872mm. £5.25

RADIO AMATEUR'S MAP OF NORTH AMERICA (USA)

Shows radio amateur prefix boundaries, continental boundaries and zone boundaries. 760 x 636mm. 0/5

RADIO AMATEUR'S PREFIX MAP OF THE WORLD (USA)

Showing prefixes and countries, plus listings by order of country and of prefix. 1014 x 711mm. £2.95

RADIO AMATEUR'S WORLD ATLAS (USA)

Seventeen pages of maps, including the world-polar projection. Also includes the table of allocation of international call sign series. £3.50

DATA REFERENCE

DIGITAL IC EQUIVALENTS AND PIN CONNECTIONS (BP140)

A. Michaels

Equivalents and pin connections of a popular selection of European, American and Japanese digital i.c.s. 256 pages. £5.95.

INTERNATIONAL DIODE EQUIVALENTS GUIDE (BP108)

A. Michaels

Possible substitutes for a large selection of many different types of semiconductor diodes. 144 pages. 0/P.

INTERNATIONAL TRANSISTOR EQUIVALENTS GUIDE (BP85)

A. Michaels

Possible substitutes for a popular selection of European, American and Japanese transistors. 320 pages. £3.50

LINEAR IC EQUIVALENTS AND PIN CONNECTIONS (BP141)

A. Michaels

Equivalents and pin connections of a popular selection of European, American and Japanese linear i.c.s. 320 pages. 0/P

NEWNES AUDIO & HI-FI ENGINEER'S POCKET BOOK

Vivian Capel

This is a concise collection of practical and relevant data for anyone working on sound systems. The topics covered include microphones, gramophones, CDs to name a few. 190 pages. Hardback. £9.95

NEWNES COMPUTER ENGINEER'S POCKET BOOK

This is 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. Hardback. £9.95

NEWNES ELECTRONICS POCKET BOOK

5th Edition

Presenting all aspects of electronics in a readable and largely non-mathematical form for both the enthusiast and the professional engineer. 315 pages. Hardback. £8.95

NEWNES RADIO AMATEUR AND LISTENER'S POCKET BOOK

Steve Money G3FZX

This book is a collection of useful and intriguing data for the traditional and modern radio amateur as well as the short wave listener. Topics such as AMTOR, packet radio, SSTV, computer communications, airband and maritime communications are all covered. 160 pages. Hardback. £8.95

NEWNES RADIO AND ELECTRONICS ENGINEER'S POCKET BOOK

18th Edition

Keith Brindley

Useful data covering math, abbreviations, codes, symbols, frequency bands/allocations, UK broadcasting stations, semi-conductors, components, etc. 325 pages. Hardback. £9.95

NEWNES TELEVISION AND VIDEO ENGINEER'S POCKET BOOK

Eugene Trundle

This is a valuable reference source for practitioners in "entertainment" electronic equipment. It covers TV reception from v.h.f. to s.h.f. display tubes, colour camera technology, video recorder and video disc equipment, video text and hi-fi sound. 323 pages. Hardback. 0/P

POWER SELECTOR GUIDE (BP235)

J. C. J. Van de Ven

This guide has the information on all kinds of power devices in useful categories (other than the usual alpha numeric sort) such as voltage and power properties making selection of replacements easier. 160 pages. £4.95

VERTER FOR THE R210 RECEIVER

rtson G4POL

rt 1

greater the attenuation - the quoted figure at 10MHz is 40dB.

The signal then passes directly to the r.f. input port of the Double Balanced Mixer, the ports of which are all terminated at 50Ω.

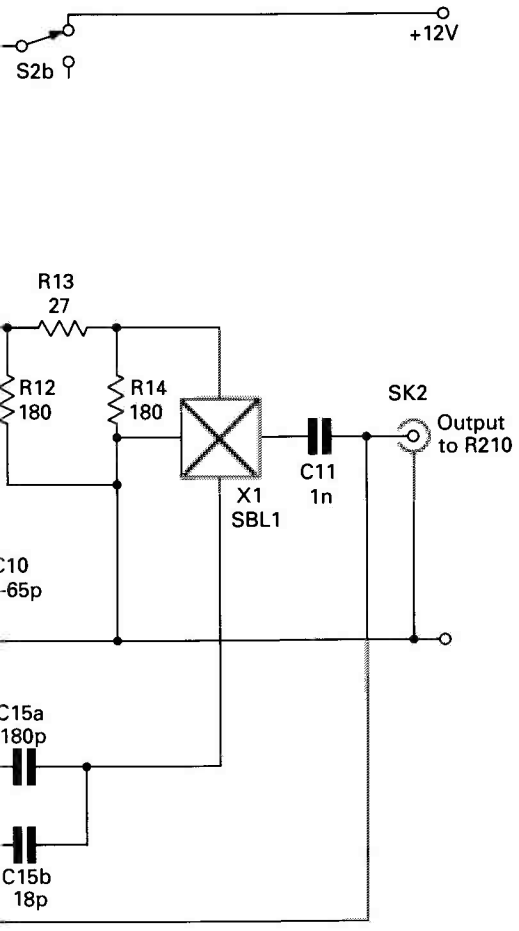
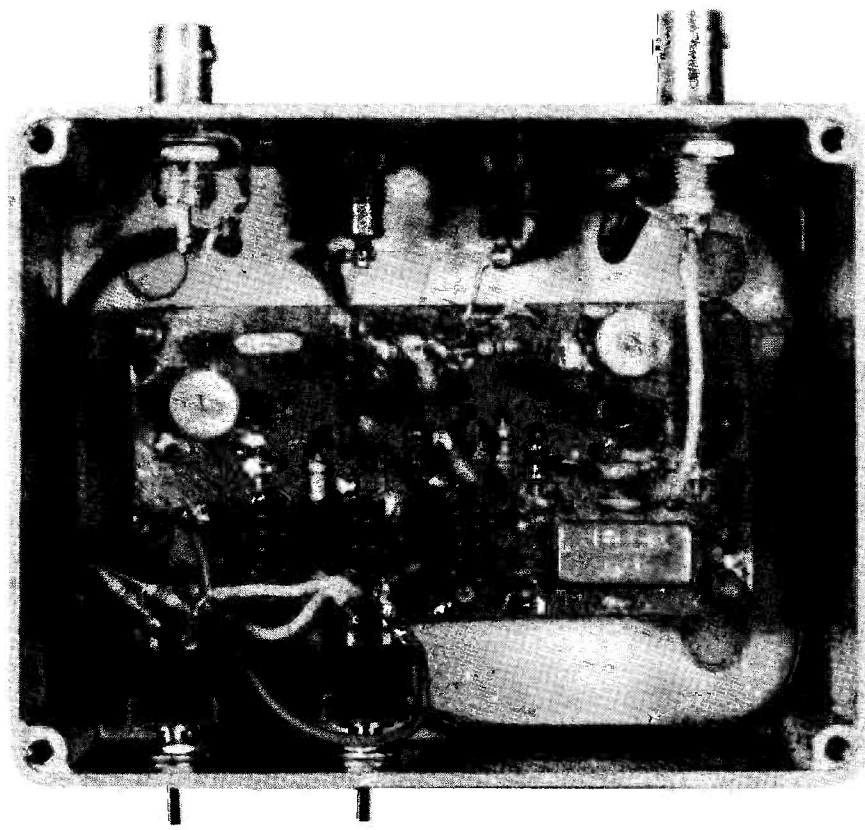
The conversion frequency is generated by a 14MHz, crystal-controlled, Colpits oscillator TR1. The output of this oscillator is buffered and filtered by TR2 and L4.

This 14MHz signal is then matched to the mixer by a resistive pad. The resultant output from the mixer is fed, via C11, to the antenna socket of the R210 Receiver.

Construction

The converter is built on a double-sided printed circuit board using the ground plane technique.

Part 2 will give the full details of the construction of the converter. To enable you to acquire the necessary components a complete parts list is given alongside the circuit diagram. □



YOU WILL NEED

Resistors

Carbon film (0.25W 5%)		
27Ω	1	R13
82Ω	2	R2,10
100Ω	3	R1,3,6
120Ω	1	R11
100Ω	2	R12,14
470Ω	1	R7
4.7kΩ	1	R8
8.2kΩ	1	R5
15kΩ	1	R4
27kΩ	1	R6

Capacitors

Plate ceramic		
10pF	2	C12b, C16b
33pF	1	C8
100pF	2	C13, 14
150pF	2	C3, 4
180pF	2	C12a, 15a
1nF	3	C8, 8, 11
10nF	3	C1, 5, 7

Mixature foil trimmer

5 - 65pF2	C2, 10
-----------	--------

Semiconductors

Transistors	
BF224	2 TR1, 2 (a)

Miscellaneous

Crystal 14MHz HC19 (DXL1) (a); Double balanced Mixer SBL1 (M1) (b); 5.23mm dia coil former and F29 core (c); Mix. Toggle switch d.p.d.t. (2); Diecast box 110 x 85 x 50mm; BNC sockets (2); Printed circuit board; Toroidal cores T502 (3) (b).

Suppliers

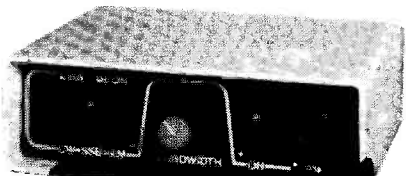
- (a) P.R. College Electronics, Marlow, Somerset TA18 5NS. Tel: (0460) 73718
- (b) Circuit Holdings PLC, Park Lane, Broxbourne, Herts EN10 7NG
- (c) GPL Electronics, 8 Southdean Close, Helmington, Middleborough, Cleveland TS8 9HB. Tel: (0642) 591157
- (d) Maplin Electronics Supplies Ltd, PO Box 3, Rayleigh, Essex
- (e) Crickwood Electronics Ltd, 40 Crickwood Broadway, London NW2 3ET. Tel: 06-455 50099

ENTERPRISE ERA RADIO APPLICATIONS ALTD.



NOW WITH
VERSION 3
SOFTWARE

ERA LTD
26 CLARENDON COURT
WINWICK QUAY
WARRINGTON WA2 8QP
Tel: (0925) 573118.



Price £99.50

SEE
REVIEW
PW SEPT 89

BP34

The BP34 audio filter helps you hear weaker stations by eliminating adjacent channel & wide band noise interference. A must for SWLs/Contest groups/CW operators/Weather Fax users.

Easy to connect & use but despite it's apparent simplicity, the BP34 has the highest performance specification of any filter you can buy. Exceptionally sharp cutoff, 80dB of stopband rejection & less than 0.3dB passband ripple makes the BP34 more versatile than a whole set of expensive crystal filters!

To order or for more information ring or write. We are open Saturdays for personal callers.

Also available from:

Electromart	— Swansea	Third Eye	— Aberdeen
Flightdeck	— Stockport	Wants	— Plymouth
Johnsons SW	— Worcester	Ward Elect	— Birmingham
R.A.S.	— Nottingham	Waters &	— Hornchurch
Star	— Tyne & Wear	Stanton	— Essex

All Products unconditionally guaranteed for 2 years.



All prices
include VAT
& P&P

£154.95

MKII MICROREADER

The Microreader is a small compact unit that allows anyone equipped with a suitable SW receiver, to read Morse & RTTY signals simply and without fuss. No computers, interfaces or program tapes are needed, just connect the Microreader to the ear or speaker socket & switch on. The decoded words appear on the built-in 16 character LCD display screen.

The Microreader contains all the filtering & noise blanking needed to allow reception even under bad conditions. A three colour bargraph tuning indicator makes precise tuning simple, while shift indicators take some of the guess work out of RTTY. Despite the fact the Microreader contains two fast processors (12MHz), it is extremely quiet generating virtually no RFI. The Micro-reader can also if you wish, transfer the decoded messages to any printer, computer or terminal unit equipped with an RS232 port.

In the tutor mode, the Microreader will send random groups of characters with variable speed & spacing, or plug in your own Morse key to check your sending. In both cases the characters are shown on the display.

The MKII Microreader comes complete with audio lead & demonstration tape. Full technical support & advice & a free upgrade service.

PHILIPS * TATUNG * SONY

IN THE 1990 "PASSPORT TO WORLD BAND RADIO" ALL OF THESE MAKES WERE "EDITOR'S CHOICE" AS GOOD RADIOS AND GOOD BUYS!

TMR 7602 HITECH TATUNG

VERY LIMITED STOCKS NOW LEFT IN U.K.

SPECIFICATIONS & FEATURES
★ 150-29.999 continuous tuning with no gaps. Phase locked loop-double conversion Superheterodyne ★ Full Shortwave/AM/SSB 150-29999kHz No Gaps! + FM 87.5 — 108 Mono/Stereo ★ Five Tuning Functions: Direct Press Button Frequency Input Auto Scanning, Manual Scanning Memory Recall and Manual Tuning Knob ★ Built-in Clock and Alarm. Radio Turns on Automatically at preset time & Frequency. ★ Large digital frequency display. ★ Fourteen Memories — Nine Memory Channels For Your Favourite Station Frequencies. — Last Setting of Mode & Waveband Stored in 5 Memories. ★ Direct Press-Button Access To All 12 Shortwave Broadcast Bands.
★ Two Power Sources — Battery or AC Mains Adaptor. ★ General Coverage of all AM Bands In LW/MW/SW (Dedicated Broadcast Band Coverage on all Versions! Plus of Course The FM Band for Quality Sound Broadcasts in Headphone Stereo. ★ SLEEP Function Turns the Radio On or Off After an Adjustable Time of 10-90 Minutes.
★ Separate BASS & TREBLE Controls for Maximum Listening Pleasure. ★ External Antenna Jack for Better Reception. ★ Adjustable RF GAIN Control to Prevent Overloading When Listening Close to Other Strong Stations or if There is Interference.
★ New improved wide/narrow filter (6/2.7kHz) ★ BFO Control (Beat Frequency Oscillator) Enables Reception of SSB/USB/LSB (Single Side Band) and CW (Morse Code) Transmissions. ★ Illuminated Display to Facilitate Night-Time Use. ★ Designed for Both Portable and Desk Top Use. ★ Five dot LED Signal Strength Indicator.
★ Dimensions: — 29.2cm x 16.0cm (11.5in. x 6.3in. x 2.36in.)
★ Output: — 1200mW (10% THD). ★ Weight: — 1.7kg. (3.75lbs) Without Batteries.
★ Wide/Narrow Filter Switch.

£109.99

COMPLETE WITH MAINS POWER

SUPPLY, EXTERNAL AERIAL JACK, CARRYING STRAP & 14 PAGE INSTRUCTION BOOK

£8 CHECK/TEST/POST & PACK

+ FREE 100 page Frequency Book.

S.A.E. on all correspondence, detailed catalogue £1 + 50p p&P.

ITC-R610 — SABINA
10-BAND WORLD RADIO
"SEE WRTH 1990 REVIEW"
£44.95 + £4 carriage

PANASONIC RFB65DL
150-29.999MHz SSB/BFO
Tunes in 1kHz Steps
THE NEW WORLD LEADER
IN ITS CLASS & CATEGORY

E.R.A. MICROREADERS
HOWES EASYBUILD KITS
SONY AN-1 & AN 102
ACTIVE AERIALS

GRUNDIG SATELLITS
400 ★ 500 ★ 650
INTERNATIONAL RADIOS
BACK IN STOCK

"VENTURER" MULTIBAND
AIR/MARINE/PSB/LW
MW/SHORTWAVES
(SAME RADIO & SPECS AS MBR7 MK II)
BUT MUCH LESS MONEY
PHONE FOR SPECIAL OFFER

PHILIPS D2935
LATEST RELEASE
NOW IN STOCK AGAIN.
REVIEWED FEB 1990
"AMATEUR RADIO"
AND NOV 89
"SHORT WAVE MAGAZINE"

RAVE REVIEW 1990
WRT HANDBOOK
ITC-R610 SABINA
10-BAND WORLD RADIO

Send for the new Sony Short Wave Guide Book. (Everything you want to know about radio.) £1.99 post paid.

JOHNSONS SHORTWAVE RADIO

43 FRIAR ST., WORCESTER WR1 2NA Tel: 0905 25740

If you don't know what you want, we've probably got it.

VISA



DECODING THE DATA

Mike Richards G4WNC
Part 4

In the last part we dealt with some of the causes of errors in a RTTY signal and ways of minimising their effects. However for the commercial operator who needs to be able to transmit important messages accurately, RTTY falls somewhat short of the requirements.

The problems of interference on a radio link cannot be avoided so what is needed is a way of detecting when the signal has suffered some corruption. This would need to be backed up by a method of repeating the lost information. Ideally this process should be fully automatic. An analogy for this process would be a conversation between two people in a busy street. Although both parties could hear each other perfectly for most of the time, if a noisy vehicle passes some detail may be lost in which case the listener says Pardon and the speaker repeats the relevant details. This is a simple example of repeat request and is automatic inasmuch as you automatically say pardon without really thinking about it.

If we are going to adapt this process for a radio link it needs to be simplified and broken down into its component parts. The main functions are:

- 1: Error detection.
- 2: Automatic request for a repeat.
- 3: Repeat errored data.

Teleprinter Over Radio

The most common system that fulfils this requirement is TOR which is an acronym of Teleprinter Over Radio. One commercial implementation of this system is SITOR.

So let's now examine each of the three stages to see just how the system works.

Error Detection

This is perhaps the most difficult part of the operation because we are asking a machine to be able to detect an error in data which is virtually random. The first compromise we have to accept is that the error detection system is by no means perfect.

The technique used for TOR signals relies on a special code to represent each character. You will remember that RTTY used the International Telegraph alphabet No 2 which was a five-bit code. Well TOR signals use the Moore code of which the full character set is shown in Table 4.1. This is a seven-bit code with one very special feature - every valid code is made up of four logic 1s or marks and three logic 0s or spaces.

It is this unique feature that provides the error detection. At the receiving end of the link the decoding equipment is set up to only accept characters that

So far in this series I have concentrated on the very basic RTTY system of data communication. This month I will take a look at two of the slightly more sophisticated systems used by commercial operators.

comprise four marks and three spaces. Any other combination is considered to be an error.

So there we have the basis of a simple error detection system. The next stage is to see how we can set about correcting the errors.

Automatic Repeat Request

This is where the term ARQ originates as is simply an acronym for Automatic Repeat reQuest. From our studies so far it is quite easy to see how an error is detected but the only way to correct the error is to ask for the lost information to be repeated. The problem here is that with a RTTY signal we would have to wait until the end of the transmission - not very practical. The system used with TOR is to split the message up into fixed length smaller units to reduce the time you have to wait before a repeat can be requested. The actual length used for TOR signals is three characters. In practice the system includes an additional feature called an acknowledgement so that after each three characters have been sent the transmitting station waits to receive either an acknowledgement or a repeat request from the distant station. This comprehensive checking

system is required to cover situations where the repeat request may be effected by interference. The system is set up so that if the transmitting station does not receive either a repeat request or an acknowledgement, it will automatically repeat the last three characters.

From this you can see that the system operates to a fixed pattern which I have illustrated in Fig. 4.1.

This is not however the complete story as the Moore code includes a few special characters which are required to control the process. These special characters are known controls 1, 2 and 3, alpha and beta idles and repeat request. The idles are used when there is no data to be sent but the link is to be kept open. The reason for needing these characters is that the TOR system requires two stations to interact and this interaction must be kept going even if there are gaps in the message.

The control signals 1 and 2 are sent alternately as the acknowledgement from the receiving station. Control 3 is reserved for use when changing the direction of transmission - essential for the exchange of messages.

One other point I have yet to mention is the transmission speed. Anyone who is familiar with the UK Telex network will no doubt be aware that the standard transmission rate is 50 baud. As the TOR system was designed with the linking of mainland Telex links with ships, it was necessary to be able to transfer data at 50 baud. However as we have seen the TOR system requires the interaction of two stations which if both stations were using 50 baud would result in a much slower overall rate. The solution is quite simple and involves using 100 baud over the TOR link which, in the absence of errors, gives an overall rate of the required 50 baud.

Selcalls

One added bonus with the TOR system is that it supports the use of selcalls. This is a very powerful facility which is particularly useful for the commercial operator. A TOR selcall comprises four alphabetic characters which are programmed into the TOR equipment and act rather like a callsign. When the receiving equipment is in standby mode it will respond to any other station which transmits its unique selcall. A typical use of this would be the shore station that has Telex traffic for a ship. If the shore station puts out a call with the ship's callsign on an agreed calling frequency the ship's equipment will automatically respond and receive the traffic. So it is quite feasible for messages to be sent reliably to a ship even while the radio officer is off duty.

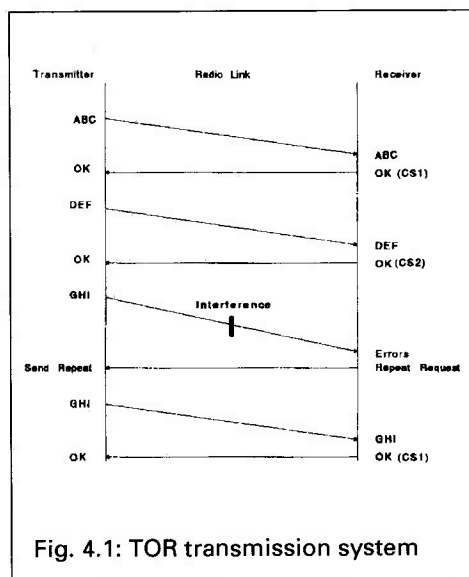


Fig. 4.1: TOR transmission system

DECODING THE DATA

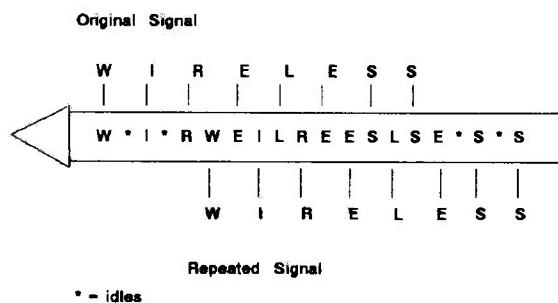


Fig. 4.2: FEC - Interleaving of direct and repeated signal

So there we have a very basic introduction to the operation of the TOR data system. Your next question is what is its prime use and how do I recognise it. There are two main uses for this mode, one is for ship to shore Telex communication and the other is amateur communications. Finding TOR signals is actually very easy as they have a very distinctive chirp-chirp sound.

A good place to start is on the 14MHz amateur band where signals can usually be found between 14.070MHz and 14.080MHz.

Broadcast Mode

So far I have covered the basic TOR system which is known as Mode A. As you may have guessed there is a Mode B which although it uses the same Moore code behaves in a rather different way.

The problem with the basic Mode A is that it is only possible to communicate between two stations whereas the radio medium is ideal for broadcasting messages to many. Mode B has been created to overcome this shortcoming. A more descriptive name for the mode is Forward Error Correction or FEC for short. The principle used in this system is to send all message characters twice but

the repeated set is delayed by three characters. This is illustrated in Fig. 4.2.

The receiving equipment uses the same error detecting logic as with Mode A but if an error is detected in the original message the repeated information is checked and used if uncorrupted.

The secret of the error correction system is the time delay between the original and repeated information. The principle being that interference is usually of short duration so is unlikely to effect both the original and repeated signal. The effective speed is 50 baud, the same as with Mode A.

Summary

That just about completes this series covering the decoding of data. I have only covered the basic modes primarily in response to letters from readers of my 'Decode' column. I hope this has perhaps clarified a few points and even sparked off a new interest in the utility modes. For further reading there are a number of publications available from the *Short Wave Magazine* Book Service. For regular information on utility listening my 'Decode' column seems to satisfy the demand of a lot of listeners. □

Binary	Letters	Figures
1000111	A	
1110010	B	7
0011101	C	
1010011	D	8
1010110	E	9
0011011	F	1
0110101	G	2
1101001	H	
1001101	I	3
0010111	J	4
0011110	K	5
1100101	L	6
0111001	M	
1011001	N	
1110001	O	0
0010101	P	0
0101110	Q	1
1010101	R	2
1110100	S	3
1001110	T	4
0111100	U	5
0100111	V	6
0111010	W	7
0111010	X	8
0101011	Y	9
1100011	Z	+
1111000	Carriage return	
1101100	Line feed	
1011010	Letter shift	
0110110	Figure shift	
1011100	Space	
1101010	Blank	
1100101	Control 1	
1101010	Control 2	
1001101	Control 3	
0001111	Idle - alpha	
0110011	Idle - beta	
1100110	Signal repetition	

SERVICES

Subscriptions

Subscriptions are available at £19 per annum to UK addresses £21 in Europe and £22 overseas. Subscription copies are despatched by Accelerated Surface Post outside Europe. For further details see the announcement elsewhere in this issue. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £32 (UK), £37 (Europe) and £37 (overseas).

Components for SWM Projects

In general all components used in constructing SWM projects are available from a variety of component suppliers.

Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

The printed circuit boards for SWM projects are available from the SWM PCB Service.

Back Numbers and Binders

Limited stocks of most issues of SWM for the past ten years are available at £1.65 each including P&P to addresses at home and overseas (by surface mail).

Binders, each taking one volume of the new style SWM, are available price £4.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the

year and volume number for which the binder is required. Prices include VAT where appropriate.

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

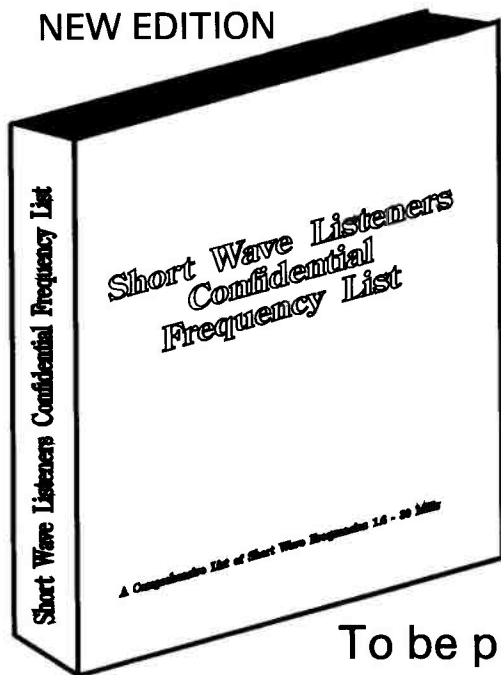
Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole (0202) 665524. An answering machine will accept your order out of office hours.

JUPITER

STILL WORLD LEADER IN SCANNERS?

Just Published!

NEW EDITION



Short Wave Listener's
Confidential Frequency List

The UK's Best Seller since 1987!

£8.95
Post &
Packing
£1

- Every entry reviewed or updated
- 200 Pages packed with information
- Numerical Frequency listings
- Block designations of primary users
- Station location and modes
- Best times for UK reception
- Military & Civil Air channels
- Marine Channel numbers
- Military Ground & Sea listings
- Broadcast & Press listings
- AM SSB CW RTTY SITOR FAX

We are looking for Overseas Trade Outlets. Please write to Waters & Stanton Trade Sales.

To be published end of May 1990

18th Birthday Celebrations

Shortly we shall have achieved eighteen years in amateur radio. As a way of saying thank you to our old customers and hopefully winning some new ones, we intend making some unique offers over the next few months. Here are some examples. If you don't see what you need, then please phone!

KENWOOD R2000
150kHz - 30MHz
SSB-CW-AM-FM
10 Memories VHF Option

£535



KENWOOD R5000
100kHz - 30MHz
SSB-CW-AM-FM-FSK
10 Memories VHF Option

£789



SONY ICF 2001D
150kHz - 30MHz + Airband
SSB-CW-AM
32 Memories Mains/Batt

£275



ICOM R7000
25MHz - 2GHz!
SSB-CW-AM-FM
99 Memories Many Options

£889



JUPITER 25-1300MHz Simply the "BEST"

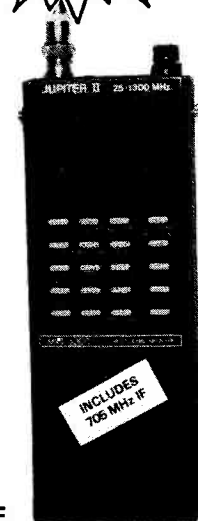
The Most Logical
The Most Sensitive
The Most "Widely Used"

£275

MVT 5000 (New Price)
Now includes Ni-cads, case
and 12V charge lead.

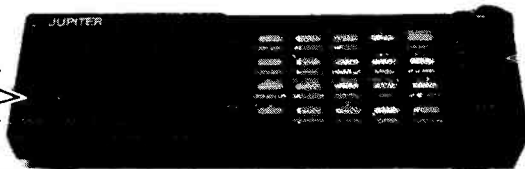
General Features

- Switchable AM/FM.
- 25-550MHz & 800-1300MHz.
- Proper manual up/down electronic tuning.
- 100 memories in 5 banks of 20.
- Selective bank scanning.
- 10 programmable band segments.
- Priority channel.
- Any memory channel can be temporarily passed.
- Steps of 5, 10, 12.5, 25 or 30kHz.
- Auto frequency correction for step changes.
- Band Search or Memory Scan.
- Carrier or audio locking.
- Permanent/temporary hold.
- Delay.
- Slow/Fast speed (20 steps per second).
- Battery saver circuit.
- Large speaker for good audio.
- BNC Socket.
- Proper English manual for UK market.
- Not an American import
- Key lock.
- Telescopic antenna.



INCLUDES ACPSU. MVT 6000BASE/MOBILE

£345



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 (04024) 44765

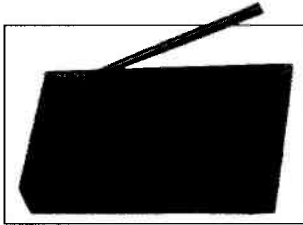
Visa and Access by telephone 24hr Answerphone

Open 6 full days

BBC WORLD SERVICE SHOP

SONY ICF SW7600

The World Band Receiver is an exciting addition to the Sony range with 13 SW bands FM stereo (with headphones). It is remarkable value at £149.95.



FEATURES INCLUDE:

- 10 Memory Presets
- Built in clock and timer
- SSB reception
- FM stereo through earphones

Comes complete with AC adaptor, compact antenna, earphones and carrying pouch.

BBC WORLD SERVICE SHOP
DEPT SW-JUNE
BUSH HOUSE, STRAND
LONDON WC2

Allow 28 days for delivery
Pay by sterling cheque to BBC
World or by credit card (quoting
number & expiry date)

Mon-Sat 10-5 (Holborn or Temple Tube)

Visit the shop for books on shortwave radio satellite TV, and a range of receivers



HIGH QUALITY ACCESSORIES

THE CARLTON 'SCANNER SPECIALISTS'

FOR SCANNING MONITOR RECEIVERS



The JIM PSU-101 is a high quality UK manufactured fully regulated 220-240v AC power supply with Radio Base holder combined! For use with: FAIRMATE HP-100E, AR-1000, YUPITERU MVT-5000, REALISTIC PRO-38, ICOM IC-R1, UNIOEN UBC50XL, BC55XLT, UBC70XLT, UBC200XLT, UBC205XLT, UBC100XLT. Special versions are available with 9vDC or 6vDC for PRO-34 or WIN 108 etc.

Payment: By postal order or cheque.
Price includes postage.
Further information send A4 SAE.

Solid State Electronics (UK)

6 The Orchard, Bassett Green Village
Southampton SO2 3NA.

Price: £26.50



NEW
PSU-101
MMII

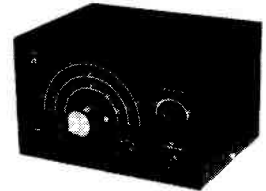


QRP KITS AT QRP PRICES!



**A 3-BAND RECEIVER
KIT FOR £66.50!**

- ★ Complete in Every Detail!
- ★ 80-40-20m Bands!
- ★ Direct Conversion!
- ★ Fully Detailed Manual!



Other super kits include:
DTR3 TRANSCEIVER, ATUs, AUDIO FILTER etc etc ... all 'well styled' and complete!

For full details of the 'CARLTON' and the rest of our range, send a SAE to:

**LAKE ELECTRONICS, 7 MIDDLETON CLOSE,
NUTHALL, NOTTINGHAM NG16 1BX**

or ring Alan G4DVV on (0602) 382509 (callers by appointment only).

Reg Ward & Co. Ltd.

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

Telephone: Axminster (0297) 34918

YAESU SONY

YAESU FRG 8800 £649.00

Super HF/VHF receiver (VHF option) LCD direct readout with 8-bit CPU function control, 21-button keypad entry

or V.F.O. frequency selection. Full general coverage 150kHz-29 999MHz. AM/FM/LSB/USB/CW. 12 memories with back up. 100, 120, 220, 240V, plus 12V d.c. operation (optional). Clock and timer on/off control - fast/slow tune dial lock - computer control socket. FRV8800 VHF CONVERTIBLE £100.00 (118-174MHz direct read-out - plug in). FRVWFMM £49.00 (wide band FM unit)

YAESU FRG 9600 £499.00

All-mode scanning receiver providing features never offered before covering 60 through 905 MHz continuously, with 100 keypad-programmable memory channels.

IC-R71E HF Receiver £855.00

100kHz-30MHz CW/SSB/AM/RTTY/FM (optional). Direct frequency entry. 32 memories. Scanning. Remote control and 12 volt d.c. option.



IC-R7000 VHF/UHF £989.00

Continuous coverage receiver. 25MHz-2000MHz. FM/AM/SSB modes. Direct frequency entry. 99 memories. Scanning, remote control option.

KENWOOD ICOM

KENWOOD R5000 £875.00

The frequency range is continuous from 100kHz to 30MHz and its modes of operation are USB, LSB, CW, AM, FM and FSK. An optional VHF converter (VC20) extends the frequency range to include 108 to 174 MHz.



R2000 £595.00

This is an innovative all-mode SSB, CW, AM, FM receiver that covers 150kHz-30MHz. With an optional VC-10 VHF converter unit, coverage of the 118-174MHz frequency range is possible. New microprocessor controlled operating features and an "UP" conversion PLL circuit assure maximum flexibility and ease of operation.

★ SONY ★ SONY ★

ICF PRO 80

£299.00

- Super-wide coverage (PRO80 - 150kHz-108MHz plus 115, 15MHz-223MHz; PRO70 - 150kHz-108MHz)
- Pro-feel 8-way tuning system
- 40-station random preset memory
- 2-position AM selectivity
- SSB and narrow FM reception*
- Squelch controller (auto & manual)



ICF 2001D

£299.00

Super-wide coverage (150-29999.9kHz, 76-108MHz, 116-136MHz) with the versatility of both digital and "precise-feel" analog tuning. There's also two types of scan modes, either auto-stop or 1.5-second hold. 2-position AM selectivity, AM RF-gain control, AM attenuator, 3-position tone control, direct meter band access, 4-event programmable timer and SSB* reception. Plus an external antenna for AM, FM and AIR Band. In short, everything an enthusiast could ever want in a high-performance receiver - and can only get from Sony!



ICF 7600DS

£159.00

Direct access digital keyboard and large, easy-to-read LCD Multi Display. Advanced quartz-locked PLL-synthesizer. With the memory preset, you can select one of your 10 favourite stations at the touch of a button. There's also auto-scan or manual tuning with the up/down keys. A sensitivity select switch for all bands, from 153 to 2999.9kHz and 76 to 108MHz, plus SSB fine-tuning reception, 2-position tone control, a built-in clock and timer, a sleep switch.



AIR 7



£229.00

- AIR band/FM/AM reception
- Compact, hand-held design
- Quartz PLL-synthesizer digital tuning
- Microprocessor control of direct, scan, present tuning, plus the program, priority and delayed scan functions for AIR band
- 30-station preset memory (10 per band)
- Front-panel oval speaker
- Rubber-booted helical antenna
- Carrying belt and earphone

AIRHANDY SKYVOICE REAL VALUE AT £129.00 carriage £3.00 (KE-3000), airband monitor 118-136MHz/AM720 channels

VHF HANDY RX super low price £99.00 carriage £3.00

A lightweight but tough little monitor receiver 141.00-179.99MHz with accessories **HX850E REGENCY new low price £179.00 carriage £3.00**

20 Channel memory AM/FM selectable scanner 60-89MHz, 118-136MHz, 140-174MHz, 406-495MHz

AR900 VHF/UHF AIRBAND H/HELD SCANNER £199.00 carriage £3.00

AR800 VHF/UHF £169.00 carriage £3.00

Handheld scanner 75-105, 118-174 406-495 830-950MHz.

AR1000 WIDEBAND HANDHELD SCANNER £249.00 carriage £3.00



LOWE HF-225

Coverage is continuous from 30kHz to 30 MHz and operating modes are AM, USB, LSB and CW with an optional FM and synchronous AM board. A comprehensive range of bandwidth filters are standard: 2.5, 4, 7 or 10kHz.

JUPITER II Handheld

25-550MHz 800-1300MHz.

£275 carriage £4.00

JUPITER BASE STATION

25-550MHz 800-1300MHz 12VDC or 24VAC 100 memories 5, 10, 12.5, 25 or 30kHz steps.

£345 carriage £5.00

**OPEN TUES.-SAT. 9.00-5.30 (CLOSED MONDAYS)
LUNCH 1.00-2.00**

**STOCK ITEMS USUALLY
DESPATCHED WITHIN 48 HOURS**



**Instant credit available. Mail/Telephone
order by cheque or credit card. Cheques
cleared before goods despatched.**

CIRKIT SATELLITE RECEIVER KIT

Peter Rouse (GU1DKD)

The receiver is a 6-channel, crystal controlled, dual-conversion, superhet with i.f.s at 10.7MHz and 300kHz (50kHz bandwidth). There are two stages of r.f. amplification followed by a mixer and all these use 3SK88 dual-gate m.o.s.f.e.t.s. Two ceramic roofing filters are used at 10.7MHz and final i.f. amplification and demodulation is carried out by a Plessey SL6601 i.c. which tracks doppler shift and provides a squelch output facility which can be used (with external circuitry) to switch a tape recorder on and off. A small audio amplifier is included on-board and provision is made for line-powering a masthead preamplifier.

The kit comes with all components including ready wound coils and screening cans, a trimmer tool, loudspeaker, switches, sockets and a crystal for 137.62MHz (NOAA-11). The p.c.b. is double-sided and roller tinned. However, a case is not included nor is a power supply (12V).

Assembly

Ease of assembly, or the lack of it, in assembly falls into two categories. First, no attempt has been made at miniaturisation and so a reasonably well spaced component layout means that assembly is fairly straightforward. However, what is fiddly is trying to fit any component that is soldered to the ground plane. This is because the leads do not have holes through the board. It is perfectly good practice to use only the ground plane, but without holes the components tend to waggle around all over the place whilst you try and hold the

The Cirkit v.h.f. receiver tunes the 137MHz weather satellite band and is designed to work with the decoder reviewed in the May 1989 issue of SWM. Peter Rouse now reviews the receiver.

board, the solder and iron all at the same time. At first, I thought that perhaps holes for these components may have conflicted with p.c.b. tracks underneath but a close examination revealed that this was rarely the case and as such is a pointless way of making the job more difficult. Even so, despite the reputed trickiness of constructing v.h.f. equipment, anyone who can solder reasonably well should be able to complete this project.

Alignment

This is where things got tricky and where I realised that the kit was perhaps only suitable for the more experienced constructor. The first difficulty came in peaking-up the crystal oscillator and multiplier stages. A look at the circuit diagram revealed that this should have been a fairly simple procedure but in practice a certain amount of re-trimming was necessary to get what appeared to be a reasonable level of first local oscillator signal. Ideally, a digital frequency meter is needed to trim the crystal exactly onto frequency and peaking of the multipliers

is made easier if you have some form of r.f. meter. A d.f.m. will also be needed to adjust the oscillator frequency of the phased locked loop in the final i.f. circuit. Naturally there can be a certain amount of interaction between these two if adjustments are done solely with an off-air signal (what may seem best for one pass can be very different for another pass where the doppler shift is not the same and tuning errors will be compounded by the fact that the shift could start falling outside the passband of the i.f. filters).

Sensitivity

Having finally trimmed the oscillator and multiplier stages, the receiver was hooked up to a signal generator and the r.f. and mixer stages peaked. Then, I noticed that sensitivity was not the 0.1 μ V for fully quieting claimed by Cirkit. No amount of re-trimming would improve the figure and so an examination was made of voltages in these stages. Here I discovered that the G2 voltages on the r.f. amplifier and m.o.s.f.e.t.s were considerably lower than those I would have expected. For the benefit of anyone who already owns, or is going to buy this kit I will now go into detail as, with the following component changes, the receiver will actually perform better than claimed.

(1) Remove, or do not fit, resistors R3, R5 and R8. These appear to have been included to dampen the Q of some tuned circuits but in fact this is not necessary and only worsens the noise figure slightly.

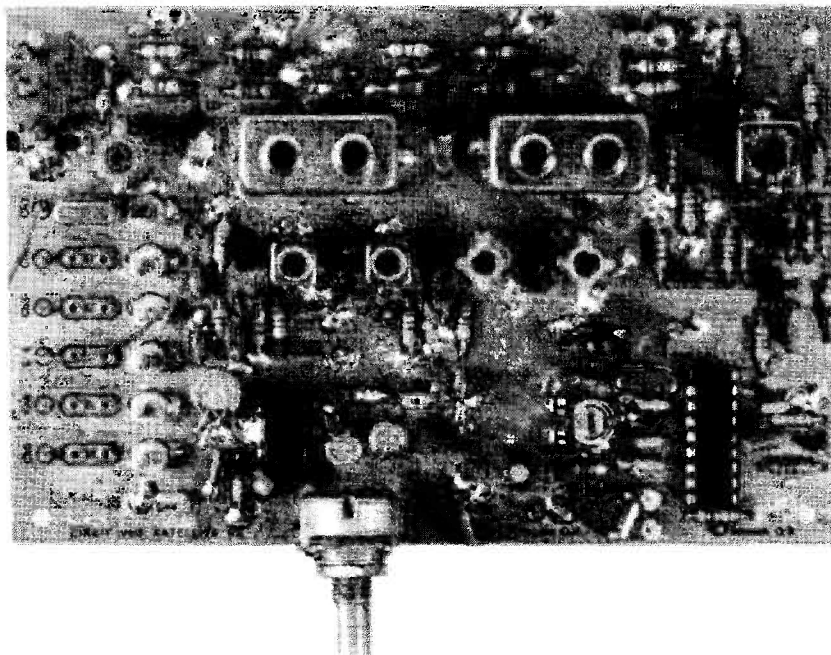
(2) Use 39k Ω resistors to replace R2 (4.7k Ω) and R7 (6.8k Ω).

With these changes made, the receiver performed well on the bench and my first off-air recordings confirmed that I was getting a noise-free signal slightly earlier than with my existing receiver.

Impressions

The receiver has been in use now for nearly a year and is used in conjunction with the Cirkit demodulator and a BBC-B computer. Results have been excellent and the combination of receiver, masthead amplifier and non-steerable Lindenblad antenna have given impressive results. Picture coverage from NOAA-11 extends Eastwards as far as Cyprus and Syria, Southwards to the tropic of Cancer and Northwards to just short of the North Pole (there have even been some tantalising but noisy glimpses of the East coast of Canada).

The receiver, demodulator and power supply are all housed in the same case which has switching options on the front panel and a meter to give some indication of the audio level being fed to the



CIRKIT SATELLITE RECEIVER KIT

demodulator. The grey level pre-set has been brought out to the front panel as I find contrast levels vary slightly between satellite types and it's useful to be able to make adjustments. A home-brew a.g.c. circuit is also included to take care of levels when the station is left unattended recording signals automatically.

Pin 6 of the SL6601 is the squelch output which is high under no-signal conditions and goes low when a signal is received (the threshold is set by an on-board pre-set resistor). I have developed a simple circuit which will switch a relay on and off and so actuate a tape recorder (It even works with a large variety of scanners) and this will be described in detail in the next article, with some more modifications for both the receiver and demodulator.

Conclusions

Although v.h.f. equipment kits have a notoriously high failure rate even amongst experienced constructors, this one should not present any great difficulties to the capable enthusiast who has access to a d.f.m.. Once it is working properly it

performs extremely well (as good as and in some cases better than some commercially made units I have tried). Components are of good quality and the instructions adequate with a comprehensive list of test voltages.

Perhaps Cirkit could take a closer a look at the resistor values in the r.f.

stages and consider drilling the board to take ground plane leads. I do not endorse products lightly but will simply say that as with the decoder, having had the receiver on loan I decided to buy it rather than send it back at the end of the test period.

More Modifications

In the next article we will see how further simple modifications will not only considerably reduce breakthrough from the national paging service on 138MHz but will also greatly improve the general signal-to-noise ratio in the i.f. stages.

The relay activated switch will also be described along with a simple method of improving the stability of the synchronisation oscillator of the Cirkit demodulator reviewed in the May '89 issue of *Short Wave Magazine*.

The Cirkit v.h.f. weather satellite receiver is available from **Cirkit Distribution Limited, Park Lane, Broxbourne, Herts, EN10 7NQ**. The cost is £42.52 and an additional crystal for NOAA-10 is available at £4.78 (prices do not include V.A.T.)

Abbreviations	
a.g.c.	automatic gain control
d.f.m.	digital frequency meter
i.c.	integrated circuit
i.f.	intermediate frequency
kHz	kilohertz
kΩ	kiloohm
m.s.f.e.t.	metal oxide silicon field effect transistor
MHz	megahertz
p.c.b.	printed circuit board
Q	the 'goodness' of a tuned circuit
r.f.	radio frequency
V	volts
v.h.f.	very high frequency
μV	microvolt

BANDSCAN

12

relay transmitter site in Central America. In the middle of May a new Costa Rican government was sworn in, and this will mean more delays than expected, because the land granted to Spanish Foreign Radio by Costa Rica did not meet the necessary technical conditions. So, they have had to start the whole process again, looking for new land. The transmitters and other equipment is now in Costa Rica, and they expect to begin construction of the relay station as soon as possible. It could be on the air before Christmas. Spanish Foreign Radio's relay station will be equipped with three 100kW transmitters to cover the southern part of the United States, Central America, the Caribbean and the northern part of South America.

Chinese Ship Problems

As you might recall, a pirate broadcasting vessel, known as the *Goddess of Democracy*, is an initiative of the French weekly, *Actuel*, a Chinese dissident group, as well as 18 other newspapers and press organisations, some of them Taiwanese. The radio ship left the port of La Rochelle in western France in mid-

March and made a short stop-over in Singapore, though the *Goddess of Democracy* got lost in a storm.

It reappeared at a port in Taiwan, claiming that it would take a transmitter on board. However, at this point at the end of May, Taiwan was busy trying to repair diplomatic relations with the mainland. A pirate radio ship was the last thing the Taipei authorities wanted.

The French organisers seemed to be totally confused as to what was happening. They refused to give the frequency of the new station, although they said it would be on both medium and short wave. Even the organisers seem to realise that one medium wave transmitter on board the ship won't cover all the Chinese mainland.

In spite of the veil of secrecy surrounding the operations, the organisers claimed back in March that small transmitters would be set up throughout the People's Republic to re-broadcast the *Goddess of Democracy's* radio signals. No mention was made whether these transmitters in major Chinese cities would be on medium wave or f.m. However, this method of simply re-broadcasting an off-air signal is very

easy for the authorities to jam. In fact, short wave broadcasts from the BBC, Taiwan and VOA are currently interfered with quite effectively.

The radio ship has been flying the flag of Saint Vincent and the Grenadines, a small Caribbean island nation. St Vincent is one of the 166 member countries of the ITU - the International Telecommunications Union - and, as such, is required to observe the ITU's rules and regulations.

Rene Fontaine, a spokesman for the ITU told *SWM* that any broadcast activity from a ship is in contravention of the ITU regulations. It is up to the member state concerned to enforce that regulation if the ship is in international waters. The likelihood of the *Goddess of Democracy* being shadowed by a vessel from the St Vincent PTT is somewhat remote, of course.

As we go to press, the ship had left Taiwan and was heading for Japan, in the hope that backers in Tokyo would sell them a transmitter. The French crew and ten foreign journalists on board the *Goddess of Democracy* are determined to carry out their project, despite the considerable risks involved.

Now
available

the **NEW**
1990 catalogue
from NEVADA



...in touch with
the World!

Packed
full of
products
and
information
on all the
latest
equipment...

still only
£2.00

Send **Now** for your
copy (Includes a £2 Voucher)
Or Call using your Credit Card
on our **HOTLINE (0705) 662145**

The UK'S Leading Distributor with Approved Dealers throughout the UK
189 LONDON ROAD NORTH END PORTSMOUTH PO2 9AE

NEVADA
COMMUNICATIONS

STARTING OUT

Brian Oddy G3FEX

An automatic gain control (a.g.c.) is usually provided in a superheterodyne receiver to vary the amplification of the radio frequency (r.f.) and intermediate frequency (i.f.) stages in sympathy with the strength of incoming signals, so that a relatively constant audio listening level is maintained. It also prevents the r.f./i.f. stages from being overloaded by a potent signal and helps to counteract the effects of fading. The action of the a.g.c. is usually 'delayed', so that a weak incoming signal has to exceed a predetermined level before the reduction in gain commences. The operation of several types of a.g.c. circuit has already been outlined in this series - see November '88 SWM.

In the absence of a signal, the a.g.c. will set the gain of the r.f./i.f. stages to maximum, so unless the volume control is turned well down a high level of noise will be emitted from the loudspeaker. When a signal arrives it will be necessary to turn the volume up so that the demodulated audio can be heard at a comfortable listening level. As soon as the signal ceases, or the receiver is tuned to an unoccupied frequency, the a.g.c. will increase the gain to maximum and a high level of noise will once again be emitted from the loudspeaker. Such a high noise level can be very annoying to an operator who has to monitor an unoccupied frequency for a long period. If mobile operation is contemplated it may prove to be a serious distraction.

Squelch

These undesirable effects can be eliminated by incorporating a circuit in the audio stages of the receiver which will cut off the audio output until an incoming signal is present. Such an arrangement is known as a squelch circuit. One of the simplest methods of muting a receiver is to use the a.g.c. potential to control a switch which, in the absence of an incoming signal, prevents the noise output from the demodulator from passing through the audio stages.

In some of the older receivers this is achieved by using a valve to control a relay - see Fig.1. The circuit is set up initially in the absence of a signal. The bias on the cathode of the triode valve (V2) is carefully adjusted by means of the squelch control (R2), so that the anode current (I_a) flowing through the relay coil (RLA) is just sufficient to make the relay 'pull-in' and close the contacts (S1), thereby shorting the audio input to the control grid of the audio pre-amplifier (V1) to earth and muting the receiver. During normal operation the arrival of a fairly strong signal will produce a negative a.g.c. potential. Since it is applied as a bias to the control grid of V2 it will cause a reduction in I_a and allow the relay to

The high noise level produced by a receiver in the absence of an incoming signal can be both annoying and distracting. Various methods of silencing the noise have been devised and some are now in common use.

'drop out', thereby opening S1 and allowing the audio to pass into the pre-amplifier. Whilst this simple arrangement will operate satisfactorily with fairly strong signals, it is quite unsuitable with very weak signals because they do not result in a negative potential owing to the delay introduced into the a.g.c. system. The squelch circuit must therefore be disabled when listening for weak signals by opening the switch S2.

Some modern receivers still use the a.g.c. potential to control an electronic switch known as a squelch gate, which will only allow the demodulated signal to pass through the audio stages when the a.g.c. potential exceeds a certain value. Such systems however do not respond to weak signals, so an alternative approach is usually adopted in which the noise component of the demodulated audio is used to operate the squelch gate. In the absence of an incoming signal the high noise level will result in the gate being closed and the receiver muted. However, the presence of even a weak incoming signal will result in a substantial reduction in demodulated noise, so the gate will open and the signal will be heard.

The circuit of the audio stages of a receiver incorporating a squelch system of that type is shown in Fig.2. Note that the output from the demodulator is routed along two paths. A conventional role is

played by the Class A audio pre-amplifier (TR1) and power amplifier (TR2) stages in the main path, namely to build up the wanted audio output from the demodulator to a level which will be sufficient to drive a loudspeaker (LS) - see pages 33, 34, March '90 SWM.

In contrast, the role of the stages in the second path, known as a side chain, is rather unusual. The task of the first two stages (TR3, TR4) is to amplify the noise component of the demodulated output, which has a wide spectrum. For satisfactory operation of the system it is essential to tailor the response of the noise amplifier so that only the high frequency components of the noise (i.e. those above the wanted audio signal) are amplified. This has been achieved in this circuit by using small value coupling capacitors (C3, C5) between the stages and by employing a small inductor (L1) in the collector of TR3, which is effectively in parallel with a capacitor (C4) and forms a resonant load in the noise spectrum. Furthermore, frequency selective negative feedback has been introduced by using small value by-pass capacitors (C6, C7) across the emitter resistors of TR3, TR4, thereby reducing the gain at low frequencies. The general principles of negative feedback have already been outlined in this series - see May '90 SWM.

The output from the noise amplifier is rectified by a voltage-doubler employing two diodes (D1, D2) to produce the positive d.c. potential required to control the *npn* transistor (TR5), which acts as an electronic switch or squelch gate. Some positive forward bias is always applied to the base of TR5 by the potential divider (R3, R4), but the actual amount is determined by the setting of the squelch control (R5). The rectified noise voltage produced in the absence of an incoming signal will result in a much higher positive bias being applied to the base of TR5 via R5, which will drive it into saturation. When in the saturated state, TR5 will

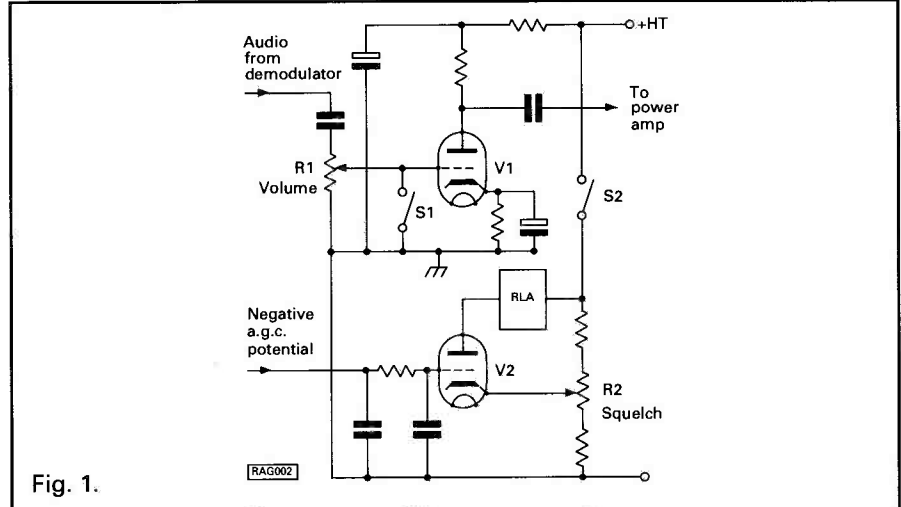


Fig. 1.

STARTING OUT

behave as a closed switch. Since its collector is connected to the base of the audio pre-amplifier (TR1), it will effectively short circuit R2 and the audio input when saturated, thereby muting the receiver.

The sensitivity of the squelch is controlled by the setting of R5, which determines the amount of forward bias applied to the base of TR5 - the higher the bias the greater the incoming signal level must be to open the squelch. To ensure that weak signals will open the squelch, it is necessary to adjust R5 very carefully to the point where the squelch only just operates in the absence of a signal.

Circuit Variations

Although the concept of amplifying the noise and then rectifying it to produce a d.c. control potential to operate a gate is the basis of many squelch systems, in practice a number of variations in the individual stages may be encountered. In some designs a high-pass filter may be employed ahead of the noise amplifier to ensure that only the higher frequencies present in the noise are applied to the noise rectifier. However, the components required for a passive filter tend to be rather cumbersome, so an active high-pass filter based on an operational amplifier may be used - see page 37, August '89 *SWM*. The squelch control is sometimes installed at the input to the noise amplifier, so that the overall sensitivity of the system may be controlled. Several different types of squelch gate are in common use. The circuit of one such alternative, known as a diode squelch gate, is shown in Fig. 3.

In this arrangement the path between the demodulator and the input to the audio pre-amplifier is controlled by a gate consisting of two diodes, which will only allow the demodulated signal to pass through them when their junctions are forward biased. The receiver noise is amplified and rectified to produce a positive potential as in Fig. 2, but in this circuit it is applied via the squelch control (R2) to the base of an *npn* transistor (TR6) which controls the application of forward bias to the diodes (D3, D4) in the gate. In the absence of an incoming

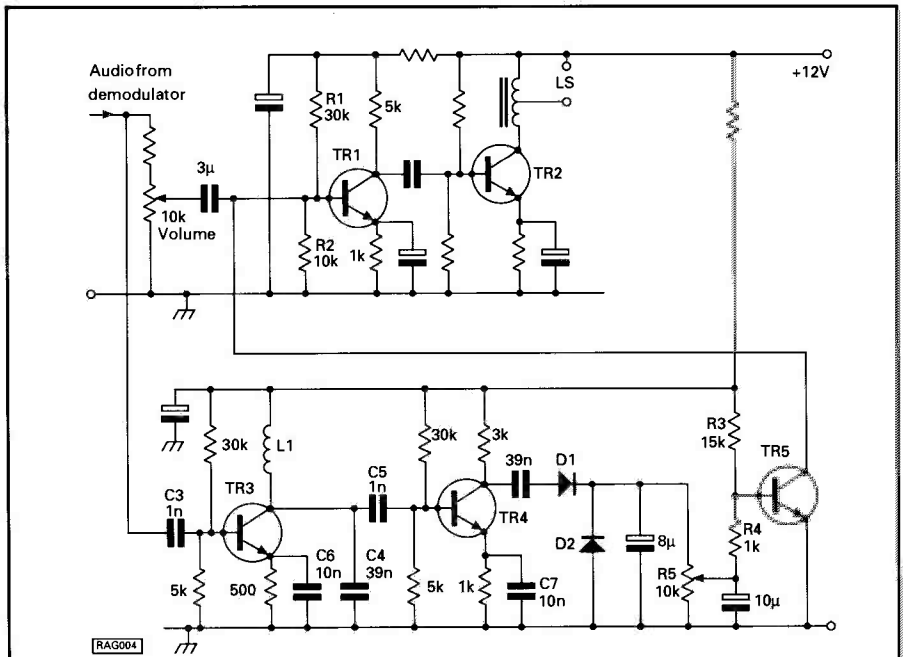


Fig. 2.

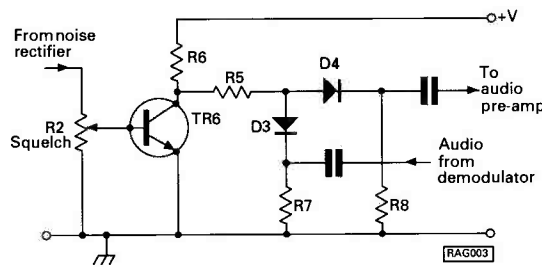


Fig. 3.

signal the d.c. potential from the noise rectifier will be more than adequate to turn TR6 hard on, consequently the voltage at the junction of R3, R4 will fall to zero. This results in a lack of forward bias on D3, D4, which mutes the receiver. When an incoming signal is present there will be a substantial reduction in receiver noise, consequently the output from the noise rectifier will be insufficient to drive TR6 into saturation. The forward bias applied to D3, D4 via R3, R4 will enable the demodulated audio to pass through the gate to the input of the pre-amplifier. Note that sufficient forward bias must be applied to the diodes in the gate to ensure that they are operating on the

linear portion of their characteristic, as silicon diodes have a non-linear characteristic close to their junction potential (0.6V) which would introduce distortion into the audio signal. □

Abbreviations

a.g.c.	automatic gain control
d.c.	direct current
i.f.	intermediate frequency
<i>n.p.n.</i>	negative-positive-negative
r.f.	radio frequency

Don't forget *RADIOLINE* for the latest in Radio

Dial 0898 654 676 for the latest news and information on the world of radio.

Calls charged at 38p per minute peak period and 25p per minute off peak.

SEEN & HEARD

AMATEUR BANDS ROUND-UP

Paul Essery GW3KFE

PO Box 4, Newtown, Powys SY16 1ZZ

For this month, my view of life has been biased-off by the absence of a rig with which to operate or listen; save when I was passed on an old KW2000A to repair while its owner was overseas. In fact, all it needed from the electrical point of view was a squirt of Lectrolube grease into the gain control pot; to solve the mechanical problem of insufficient friction on the tuning dial, thanks to some 30-years plus of continuous usage by several owners, wasn't quite so quick of solution! But - and this is the point of interest to impecunious s.w.l.s - when sorted, the old rig was still able to hear as well as ever.

If you think of an older receiver, think of the valves and the mechanical details. For example in an HRO you can change a leaky capacitor for a modern one at the drop of a hat - but you would need to be a good model engineer to repair a damaged HRO tuning drive. If the receiver has a 'string' drive, then, even if it is working perfectly, draw a sketch-map showing just how the string is threaded how many times it goes round its drum - and note down just how you think you would be able to re-string it should the drive break. It's a bit too late to think about this after the string has broken and sprung away from its proper route!

Often the old receiver is casually said to be 'deaf'; more often than not the action to make it 'not so deaf' merely succeeds in reducing the receiver's ability to cope with nearby, blocking, signals. For a simple check, remove the antenna connector and instead connect a resistor of appropriate value (usually 50Ω nominal, so use 47 or 51 or even 56Ω) between the antenna and earth terminals. Now set to receive s.s.b. signals; there will be some 'sharsh' audible from the speaker. Now tune the receiver front-end for a peak in the 'sharsh' - this may be a knob titled 'Preselector' or 'Antenna Tune' or you may even have to crank a preset trimmer inside. If you can hear the peak in the sharsh as you tune through resonance, and if with r.f., i.f. and a.f. gains all at full, the level of the sharsh in the speaker is not excessive then your receiver has enough (not too much) gain and sensitivity is also adequate. Be quite clear: every decibel of surplus gain over and above that needed is not just useless but is actively working against you.

Events

Don't forget about Wireless Line, for the very latest information on what's going on. Often an interesting event such as a DXpedition will be first noted in the specialist news-sheets, make it's appearance, and be over and done with, all between the time the copy leaves me and the issue reaching you!

Setting up a station

Obviously most people start with something pretty basic and, from then on, like Topsy it 'just grewed.' There comes a time when you begin to wonder whether you can't improve

things. Here then is a check-list of useful features.

It's not a bad idea to start by considering whether you are basically right or left-handed! With a conventional communications receiver, and a right-handed operator the vital thing is that the receiver be so placed that the main tuning knob falls just right to the left hand, while the right hand is allowed enough room to write in the log. This usually means jacking up the front of the receiver off the operating table, so that it slopes backwards. This has a dual function in that it lifts up the display or dial to where you don't have to move to read it clearly, and in addition puts the knob where it 'falls into the fingers' naturally. An inch or less either way may spoil things completely. You might also if you are tall or short investigate either raising the table level or lowering it until it falls just right for you and your chair. Before you take a saw to the table-legs, though, you can get a fair idea of the worth of the change by lifting your chair upwards on blocks. Aim to get the arm level to lie just nicely when you are sitting in your normal attitude. Look at the ventilation: most people nowadays are in centrally-heated houses, and as a result the air circulation is poorer than it used to be; if necessary, improve it. Look at the mains wiring; a multi-way distribution board can be screwed to the back of an operating desk, so mains leads for equipment can be plugged in and the surplus leads coiled-up neatly; this 'RF Choke' effect alone was enough to reduce TVI from the two-metre set-up here to acceptable proportions.

If you have more than one receiver, then arrange things so that you can switch from one to 't'other without disconnecting coaxial or mains leads. (a little box with a decent switch, and three coaxial connectors is simple enough to make and mighty useful!

Now you can have just one lead from the distribution board to the power mains socket. By switching-off at the socket, you knock everything in the shack off - you have the fabled Big Switch! By pulling out the plug at the socket you have total isolation of the equipment.

If you use a computer, or a TV set in the shack, do make great efforts to silence them electrically. The problem here is that we can filter all the leads fairly easily, but to stop radiation off the set itself is a bit more tricky. If you can't shut them up, switch 'em off! Seriously, the Amstrad 8000 series on which this copy is prepared puts a 59 signal into the two-metre rig, so if one uses a logging program with it, or W6EL's Miniprop, or whatever, one must make all the log entries and store them while not listening on the bands, unless you can shut the computer up.

On the antenna front, take a peak at the Great Circle Map, based on London. Clearly, if we take, say, a half-wave dipole, it will be a lot more use if it 'fires' E-W, than if it fires N-S. So we want our dipole's ends to be N-S for preference. You'd be surprised

how much difference you can make like this. Another approach might be a vertical; with this you get all-round pick up, but you must expect it to be 'equally poor all round' unless you are prepared to spend lots of time laying out radials or raise it up somewhat. While the radials should be of the specified lengths, it is quite important that on any given band they be the same length. If one is a bit over, and one a bit under, funny things can happen, arising from phase changes. And, incidentally note that verticals can be a pain-in-the-neck where noise pick-up is concerned; that old familiar S8 roar of rain static is always worse on a vertical, and so is most of the electrical noise for some reason. Alas it is only too true that almost every electrical gadget you can think of kicks out unwanted noise pollution on to our h.f. bands, right down to the fruit machine in the pub next door, or the central heating thermostat.

Letters

Dennis Sheppard (Earls Shilton) first; Dennis uses an inverted-vee of 40m, as his main interests are on 3.5 and 28MHz, heard on an RCA AR88D receiver. On 3.5MHz, Dennis found T77C, TL8WD, YB0WWP, VK6LK, HZ1AB, ZL1CCR, VK2AVA, VK4YB, VE1KQS, ZL2ANR, ZL4AP, and K4JDY; as for 28MHz, the crop included CX1BBC, CX4PA, PY1AQT, PY2GR, ZP5RG, 9J2FR, 9Q5SK, D68KB, J28DN, OD5SK, WD4OXT, VP8CDR, XT2BW, ZV7AZ, TA2EZ, JY4ZM, OD5RL, VP8ML, 5T5SR, 9K2DR, 9V1WW, 9V1YE, WZ6C/ST4, loads of JAs, EL7X, TJ1PD, VU2NTA and VU2OHZ.

A letter of support for the revival of the old HPX Ladder comes in from **John Doughty** (Cheslyn Hay); John used to play at HPX backalong, and he reckons that as his opportunities for contesting are limited, between work and family commitments, the HPX Ladder gave him something on which to vent his competitive instincts without too many late nights! So that's two people who have indicated a wish for it's return - a few more and we'll have to do something about it!

Now for a newcomer to the game; **Phil Cooper** is based in Guernsey, who uses a Sony ICF-7600DS with a random wire antenna some 30 metres long and run out in a N-S direction.

Phil has some interesting queries: first IK3ABY/IL3 wasn't in the Southern Hemisphere, but on one of the Italian offshore islands probably from memory Tremiti Is. ZS8MI is a DXCC country in its own right, Marion Island. W1FDA was operating in a violent hailstorm, and a query in 4XZSJ, Judy who sounded to be in London.

Alas, Phil that is a misreading of a call sign, but I'll lay long odds that the

call was more like 4X7SJ or 4X8SJ, in either case from Israel. GB4BKA was a special-event station for the Beekeepers Association. Otherwise it was largely European signals, as one expects until one masters the knack - and it is a knack - of copying the weaker signals. To sort out these questions of what prefix is what, perhaps the best buy in amateur radio at about a pound a time is a copy of Geoff Watts' Prefix List; get one by contacting Geoff at 62 Belmore Road, Norwich NR7 0PU. Geoff also does some other lists such as a list of Russian prefixes related to the oblasts for those who chase the Russian awards or want to know more accurately where a particular station is located, and which Zone or continent it counts as.

J. Heys (Hastings) looked on 28MHz to find UH8ABD, 4Z8C, 5B4YC, ZS200WOL, BY8AC, A41KM, 6W2EX, VP8CDR, G4WYG/ST2, C53GB, TZ6RC, FT5XH, VQ9IF, 9J2FR, HZ1AB, S79FT and VKs; on 21MHz there were VP5P, UA9LAC, JAs, YC2NFD, 4Z4UW, ER4L, KB6DDV/DU3, ZD8GT, 5N0SKO; while on 14 MHz UA1ZO, 3B9FR, TK/PA3DQW, EX1A, VK3EGN, UI1D/UI8IAY, VU2GR, and UA0/GB4ICE - nice to hear Morag on the key despite the auroral activity of late.

Vale

Long-time listeners to the DX bands and particularly Top Band will have been saddened to hear of the death of Stewart Perry W1BB, on May 5, at the age of 86. W1BB was, with a doubt, Mister Top Band. He was the first to reach the 100 countries on the band, and was the original instigator of the Transatlantics every winter, going back to the early thirties. W1BB was the first to realise the advantages of having a 'DX Window' on the band and the use of split frequency operation to give each end of the QSO the best segment for listening. In addition, Stew was the author of a Top Band Newsletter, lively and quirky, which for many years was sent out to Top Band enthusiasts licensed or s.w.l., everywhere. Thus W1BB disseminated know-how on all aspects of Top Band, technical and operating. However, he was stricken by illness several years ago, and although a station was always kept operational against the chance that he might be able to come home and get back on the band, it was, alas, not to be.

More Letters

Charles Wells (Mansfield) has been chasing after the oblasts since 1985, and so it has greatly pleased him to find Russian signals on the WARC bands. On a different tack, Charles mentions WZ6C/ST4 giving his QSL address as via W4FRU. Despite the

For the latest DXpedition news you can always ring Wireless Line (compiled by Practical Wireless) on 0893 654632

Calls charged at 35p peak, 25p off-peak

SEEN & HEARD

odd reference to this one in various publications, the Wells nose is still full of the aroma of fish.... time alone will show!!

Bob Alexander now, hailing from Ayrshire; Bob uses c.w. mainly, and seems to prefer 14MHz, though his log does show forays on to 21, 28, 7 and 144MHz bands. The five pages of logs don't include anything particularly splendid, but that having been said, all the continents were represented, and for Bob, there were new ones by way of KP2BL (St. Croix), VP5P (Turks & Caicos), KP4GC (Puerto Rico), FY5FO (French Guiana),

4S7WP (Sri Lanka), CE3WD (Chile) and OX3TW (Greenland)

Just about everyone should have heard the Spratly (1S0XV) which afterwards moved on to Vietnam as 3W1PZ, 3W6PY and 3W9CZ; not to mention the use of 3W1HCM and XV100HCM to commemorate the 100th anniversary of the birth of Ho Chi Minh. The Conway Reef 3D2AM has also stirred up the bands a little, and of course all these have entered the log of **P. Parmentier** (Kortrijk, Belgium). One has to comment that the Russians both at Spratly and in Vietnam have certainly put on a very

good show - one would think these two countries have been topped from the 'Most Wanted' lists in many a shack!

Andy Chadwick G4ZVJ, writes to say that QSLs for his ZD7VJ and ZD8VJ activities should be sent to him either through the Bureau system, or direct to Andy Chadwick G4ZVJ, 3 Park Villas, Monkhouse, Cheadle, Stoke-on-Trent ST10 1HZ. It seems that many people have sent cards to G4ZVT, or to an old address, so if you are one such, here's the chance to put things right!

Which brings me to the end for

another month. Comically enough, I started to write the piece with no rig with which to listen. At this precise moment there are three in the shack... *embarras de richesse* indeed! However, it will be rather fun to put them alongside each other and compare just the 'operability' of the three compare; one from the late 'fifties, one from a decade ago, and one recent; it'll be interesting to see how they look from an operators-eye view.

Meanwhile, note the deadlines; July 9, August 13 and September 10 to arrive with me, at the usual address.

DECODE

Mike Richards G4WNC

200 Christchurch Road, Ringwood, Hants BH24 3AS

Roy Bessant of Chester reports on his visit to the RSGB exhibition at the NEC. This was the first radio rally Roy had attended and he was very disappointed with what he found. What he really wanted was some advice on how to start FAX and satellite reception and a selection of equipment to choose from. His experience at the NEC has put him off rallies but I would suggest that he tries a few of the Northern rallies like the Leicester show in October. Incidentally I shall be attending that one so please come a see me for a chat if you can.

Anyway to get back to the point of Roy's letter of how to start in FAX and satellite reception. This is a pretty broad question and the answer depends on what equipment you currently have and how deep your interest is in such modes. It should also be remembered that it is not really appropriate to lump together h.f. FAX and satellite systems as they are completely different modes which need non-compatible decoding and receiving equipment. HF FAX uses an a.m. system and is used mainly for the transmission of weather charts with just a few press photos. The only exception to this being the re-broadcast satellite pictures that are transmitted by stations such as Offenbach Meteo on 134.2kHz. These pictures are very good quality and have been enhanced by the ground station to clarify the image and highlight the land masses.

Weather satellites on the other hand use an f.m. system and transmit mainly live pictures which are broadcast on v.h.f. and u.h.f.

With regard to the decoding equipment for h.f. FAX, if you have access to a computer then probably the easiest and cheapest way to start is by purchasing a FAX program for that computer. The majority of amateur computers are supported with some form of FAX software.

Satellite reception is a little more complicated with consequently far fewer computers supported. The best bet is to scan through the adverts in *Short Wave Magazine* and its sister magazine *Practical Wireless*. In addition to special decoding equipment you will also need a receiver that covers the v.h.f. and u.h.f. weather satellite frequencies.

Roy's existing set-up comprises a Yaesu FRG-8800 receiver, Datong AD-

270 active antenna and an ERA Microrreader RTTY and c.w. decoder. If you have an aversion to using computers in the shack an alternative is to look at stand alone FAX decoders such as the FAX-1 from ICS Electronics. This device takes the audio signal from the receiver and produces the FAX image on a computer printer. Another option would be to use one of the multi-mode decoders such as the Wavecom 4010 which just requires a monitor and a printer to resolve a vast array of modes. So you can see that there are many choices on the market and at the end of the day it's the depth of your pocket that is the main consideration.

For anyone with a particular interest in satellite images then I would recommend that you join the Remote Imaging Group as they can be a very useful source of advice and information.

Regular readers will have no doubt seen my recent review of the PC-HF-FAX program from Comar Electronics. **Robert Wilcox** of Bristol did and has written with details of his experiences. In addition to the FAX program Robert bought the new PC-SWL program which uses the same decoder but enables the reception of RTTY, c.w. and FEC. This program also features quite sophisticated signal analysis facilities which can prove very useful when trying to decode a new station. Robert certainly has a high regard for the PC-SWL

program and as I have now kindly been sent a review copy by Comar I will be giving my impressions in the near future.

John Higham of Dover writes with a thank you for my frequency list, which he found to be a great help with his decoding. John uses a Maplin TU-1000 decoder with some home brew decoding software, so he was anxious to find some reliable signals to prove that his system worked!

One point he did make was that he occasionally receives perfectly decoded gibberish from stations such as the MAP Rabat press agency. He has rightly concluded that this occurs when information in Arabic is being transmitted. Decoding of this information is possible, but not easy! Anyone who is interested would be well advised to get hold of the *Radioteletype Code Manual* by Klingenfuss which is available from the *Short Wave Magazine* Book Service. This book details most of the 'odd' alphabets and gives details of how they are encoded for transmission over a RTTY link. In addition the book includes a great deal of technical information on the operation of most of the utility modes.

S. Utili of London uses a Yaesu FRG-7700 receiver with a 25m long wire antenna and a FRT-7700 a.t.u. On the decoding front he has an ICS Electronics FAX-1 which has recently been complimented by the addition of a Pocom AFR-2010 all mode decoder. He reports very good results

from the Pocom that fully justify its fairly high price. Mr Utili is another listener who has invested in the Datong FL2 active filter to enhance utility reception under difficult conditions. Mr Utili included a photo of this impressive station but unfortunately the quality was not quite good enough for reproduction in the magazine.

Computer interference is the problem area for **Ken Quigg** of Belfast. Ken runs a BBC-B computer and wonders if I will be covering interference problems in the near future. I tend to cover the problems as they occur, using this column as the forum. With regard to the BBC-B, the problems are well known and usually centre on the monitor. The basic rules that should always be followed are as follows:

- 1: Use as large an antenna as possible and site it well clear of any sources of interference (i.e. TV antennas, electrical appliances, etc.)
- 2: Use one and only one good earth for all station equipment.

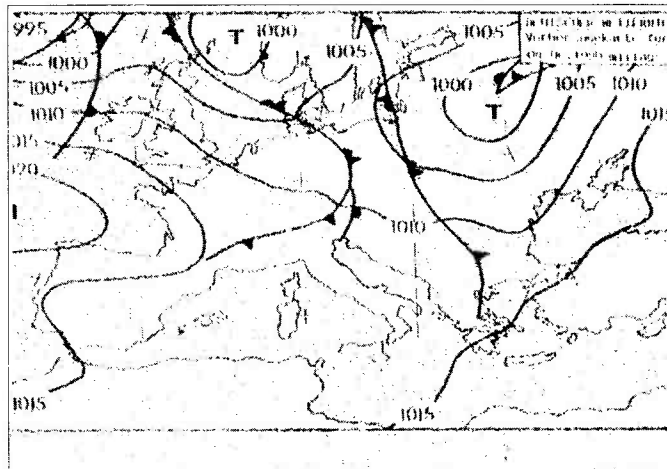
Once these conditions have been met you should find a reduction in interference levels. The most common source of interference with the BBC-B is the RGB video output which is incredibly noisy.

The best option is to use the composite video and forget about the RGB. Although this means a reduction in video quality the interference benefits are enormous. Associated with this is, of course, the video monitor itself which can often be very noisy. In my experience it is not normally necessary to go to such lengths as to spray the inside of the computer case with a radio screening material.

I have successfully run a station with my unmodified BBC sat right next to the receiver with no undue problems. The computer probably brings the h.f. noise floor up to about S-2 which is not particularly significant on the noisy h.f. bands. If you wanted to get rid of that residual interference you would be faced with a number of quite involved operations such as zinc plating the inside of the case.

Dragon Support

I recently made mention of the Dragon range of computers and the limited support available. The only source of



Fax picture using the Wavecomm W4100

ASK ELECTRONICS LTD.

248-250 TOTTENHAM COURT ROAD
LONDON W1P 9AD

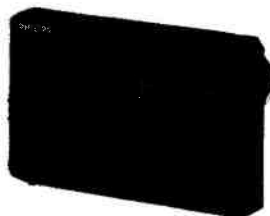
TEL: 071-637 0590/071-637 0353 TELEX: 27768
FAX: 071-637 2690



£119.95

D 2935

● All-electrical Digital World Receiver ● LW/MW/FM/13×SW ● Continuous tuning over total AM band ● Direct keyboard tuning ● 9 station memory ● Variable pitch BFD for CW/SSB reception ● Touch-panel switching ● LCD frequency display ● Mains/battery supply



D 1875

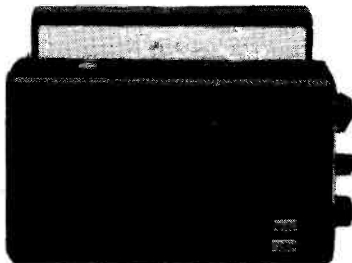
● Compact 12-Band Portable Radio ● LW/MW/FM/9 short wave ● Large tuning control ● Tuning LED indicator ● Telescopic and ferrocceptor aerials ● DC supply connection ● Earphone connection ● Wrist strap ● Attractive pouch

£49.95

PHILIPS

ALSO IN STOCK
PHILIPS D1835
SAME AS D1875
ONLY

£39.95



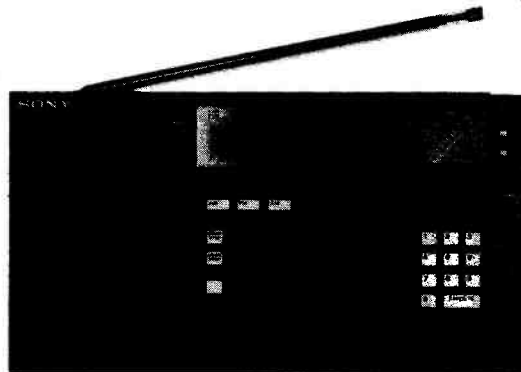
D 2345

● Portable Radio ● LW/MW/FM/2× SW ● Fine Tuning control ● Mains/battery supply

£24.95

WE ALSO STOCK A WIDE RANGE OF MULTI
STANDARD TV'S AND VIDEOS

ICF 2001D



SONY

FINEST ALL-ROUND PRO-RECEIVER IN THE BUSINESS

● FM/LW/MW/AIR multi-band reception ● 32 station preset memory ● Synchronous Detector Circuit ● PLL quartz-locked synthesizer circuit ● Digital/analog tuning ● 2-way scan modes (auto stop, 1.5 sec. hold) ● 2-position AM selectivity ● AM RF-gain control ● 3-way scan tuning (memory, broadcast, define) ● 3-position tone control ● Direct meter band access ● 4-event programmable timer ● AM attenuator ● SSB reception ● External antenna for AM, FM and AIR band ● 288 × 159 × 52mm (w/h/d) ● 1.7kg.

2001D SYSTEM — ICF-2001D with active antenna AN-1 in one complete package.

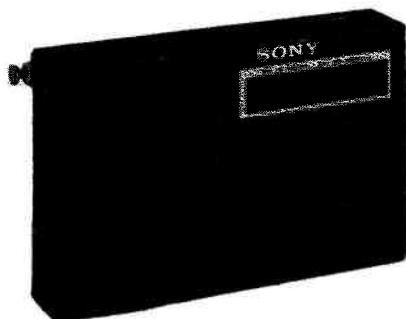
*** £319.95***



ICF 7600DS

● PLL synthesized multiband digital radio ● 4-way tuning ● Direct frequency LCD read out ● 10 memory presets ● 10 key auto and manual scan ● Full continuous waveband coverage 153-29995kHz; FM 76-108MHz ● Single side band and fine tune controls ● Tone control ● External aerial socket ● Record out socket ● 12/24 hour LCD clock ● 65-minute sleep timer ● Supplied with waveband manual, case and wrist strap

*** £139.95***



ICF SW1E **£145.00**

ICF SW1S KIT **£199.95**

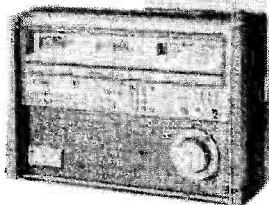
ICF SW1E AND CONVENIENT SUPPLIED ACCESSORIES: ACTIVE AERIALS, AUTOMATIC MULTIVOLTAGE MAINS ADAPTOR, HARD CARRYING CASE
THE WORLD'S SMALLEST SHORTWAVE RADIO

● FM stereo MW/LW/SW PLL synthesized tuner ● Dual conversion system ● LCD frequency read out ● Multiple tuning system ● 10 key/scan/memory ● 10 memory presets ● Cassette size case ● Clock/timer facility ● Supplied with stereo headphones, compact antenna

ALSO IN STOCK THE NEW *SONY ICF-7600 SW*

*** £149.95***

Panasonic RF-9000



FM 87.5-108MHz
LW/MW/SW (1.6110-2.9009MHz)
SW (2.9010-30.0000MHz)
Frequency Range: LW 150.0-420.0kHz
(2000-714.3m) MW 520.0-1610.9kHz
(576.9-186.2m) SW 1.6110-
2.9009MHz (186.2-103.4m)
Precision: Direct Readout to 100Hz for
SSB/CW/AM. Direct Readout to 10kHz for FM

£1800.00

Panasonic RF-B10..... £59.95
Panasonic FR-B20L..... £69.95
Panasonic RF-B40DL..... £124.95
Panasonic RF-B65 (Inc Mains adaptor). £169.95

Sony ICF SW20..... £64.95
Sony ICF PRO 80..... £289.95
Sony ICF AIR-7..... £209.95
Sony AN 1 (Antenna)..... £49.95

ALL MAJOR CREDIT CARDS ACCEPTED ALSO CHEQUES AND
POSTAL ORDERS

ALL SETS ARE GUARANTEED
PRICES INCLUDE V.A.T.
ALL GOODS DESPATCHED WITHIN 48 HOURS



WA 8800

SLIM STYLED TRAVELLERS SHORTWAVE MULTIBAND AND STEREO CASSETTE RECORDER

● FM/MW/SW × 8.0 band ● Dual conversion circuit (SW) ● Auto reverse stereo cassette deck ● LCD clock/alarm/timer/60 minute sleep timer ● Tape counter ● Auto shut off ● Stereo recording facility ● Built-in Stereo speaker ● Stereo mic supplied ● DC in socket ● Black finish

*** £199.95***

NEW ARRIVAL: — SONY CRF-V21

● FAX(RTTY)/Satellite/Weather FAX ● Frequency range 9kHz-29.9999MHz ● Sat. 137.62-141.12MHz ● Up to 1.691GHz/1.6945GHz using ANP1200 (optional antenna) FM-76MHz-108MHz

P.O.A.

SEEN & HEARD

radio related software being that from Grosvenor Software. One point that perhaps needs to be made clear is that there are a lot of similarities between the Dragon and the Tandy TRS-80 range of computers and a lot of the software is interchangeable.

As a result of my comments **Peter Brent** has sent me details of the National Dragon User Group or NDUG as they are known. This group provides a regular newsletter which is packed with lots of useful tips and information.

Judging by the number of articles the Dragon is far from dead! If you would like to join the group and keep the Dragon and TRS-80 alive, then the man to contact is Paul Grade, 6 Navarino Road, Worthing, Sussex.

If you have any details of user groups for computers which have some radio software available, please drop me a line and I will publicise them via this column.

Microreader Display

I have received several letters from readers asking for advice on how to utilise the RS-232 output of the ERA Microreader. This simple output actually opens up a whole new world to Microreader users.

The output comprises a 3.5mm jack socket on the rear panel which carries the decoded data in a standard format known as ASCII. This is an acronym for American Standard Code for Information Interchange.

We don't need to go into the complications of this here but suffice it to say that it is a standard way of communicating between computers and terminals.

So what can we do with this signal? There are two basic options the first is to connect it to a printer with a serial port so that you can have a printout of every thing that is displayed on the Microreader screen.

The second option is to connect the Microreader to a computer or v.d.t., visual display terminal so that the decoded signals can be displayed on a large screen for easier reading.

However before you can proceed you need a little understanding of how to set the system up.

The main variable in the system is the speed or baud rate at which the data is sent. The Microreader has a standard or default setting of 1200 baud, but this can be adjusted from the front panel between 600 baud and 4800 baud.

If you are connecting to a computer you will also need a serial port on the computer and some simple serial communications software.

If you don't have a computer the best option is to get yourself a surplus v.d.t. These can often be picked up at rallies very cheaply, though you will need to make sure that it can handle the baud rates of the Microreader. The best advice I can offer is that you take a friend along who knows a little about serial communications.

HOKA Code 3

A snippet of hot news for advanced utility listeners! HOKA Code 3 is a new utility decoding program from The Netherlands which is designed to run on IBM PCs and compatibles. I have just managed to get my hands on a review copy and it looks very impressive indeed. The range of modes covered is enormous and it also includes a very powerful set of signal analysis tools which are essential for identifying new stations. I will obviously be giving a full report in due course but, for those that are keen to get going, it looks as if its very good value for money.

Frequencies

I have received a very good selection of logs this month, so thanks to **Day Watson, Jan Neuwenhuis, Maurice Lloyd,**

One interesting comment came from **Ray Howgego** of Caterham who was monitoring TASS on 14.7MHz during the Eastern Europe earthquake on May 30. Shortly after, he heard the BBC news where they stated that the location of the quake was uncertain. Ray then contacted the BBC to inform them that TASS were giving the location within 10km. He was very pleased to hear that in subsequent reports the BBC were using this updated information! So it would appear that our hobby can in fact provide a useful service on

occasion!

Back to the frequencies for this month, I have used the usual format of frequency, mode, speed, shift, call sign, time and notes.

3.2532MHz, RTTY, 50, ?, LZFB, 1921UTC, Coded meteo
4.202MHz, FAX, 90, 576, RAT21, 1940UTC, Moscow meteo
4.268MHz, TOR, 100, 170, ?, 1948UTC, Goeteborg
5.020MHz, FAX, 90, 576, RWW74, 2008UTC, Moscow
5.274MHz, RTTY, 50, 425, MENA, 2127UTC
7.845MHz, RTTY, 50, 425, SOH2284, 2039UTC, PAP Warsaw - news
9.113MHz, RTTY, 50, 425R, MTIE, 1719UTC
12.856MHz, CW, -, -, XSG7, 2027UTC, Shabghai Radio
12.864MHz, CW, -, -, XSW, 2040UTC, Kaohsiung Radio
12.903MHz, RTTY, 50, ?, RBSL, 2052UTC, Bombay
14.794MHz, RTTY, 50, 425, ?, 1315UTC, XINHUA
15.633MHz, RTTY, 50, ?, HMF26, 1038UTC, KCNA Pyongyang news
16.347MHz, RTTY, 50R, 425, ?, 1306UTC, TASS
18.163MHz, RTTY, 50, 425, ?, 1317UTC, Khartoum air
18.362MHz, RTTY, 50, 425, ?, 1547UTC, Kinshasa air
19.528MHz, RTTY, 50, 850, JMG, 1238UTC, TOKYO MET
20.56MHz, RTTY, 50, ?, ?, 1652UTC, JANA TRIPOLI news

INFO IN ORBIT

Lawrence Harris

5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB

Many of us were able to tune into the recent shuttle transmissions on 21.394MHz u.s.b. and hear the astronauts discussing the deployment of the solar panels. **John Goodwin** of Plymouth is a regular listener to the short wave bands and reminded me of this broadcast frequency.

David Paget of Farnborough has also been a regular listener to shuttle broadcasts and has received QSL cards from NASA and the shuttle crew. He heard the *Columbia* crew discussing problems with ground control on 21.198MHz.

Satellites for Schools

I am keen to hear of schools using satellite systems for teaching purposes so it was nice to receive a letter from **Dave Allen** of Droitwich, a teacher at Chantry High School which operates the Maplin Mapsat satellite receiver and decoder.

His school is in a valley and so can only receive the higher elevation passes. He has had difficulty getting Kepler elements to keep his computer predictions accurate and wrote to ask whether either I or *SWM* could oblige?

Kepler Elements

Any reader who wishes to receive a list of Kepler elements for all weather satellites including currently

operational oceanographic ones can have one by sending me an s.a.e. Mine are updated every four weeks with the latest data, courtesy of **Des Watson** of the Remote Imaging Group.

Some contacts of mine are not only advising me of launchings but are keeping me fed with recent Kepler elements and so I am repaying the compliment by making copies of the data freely available to *SWM* readers.

Cassette Tapes

A second offer that seems to be popular is available for those readers who want to test framestores, computer programs or other decoders but don't have receivers to collect the original a.p.t. data. Just send me a post-paid package including an audio cassette and I will record some METEOSAT frames on it to help you to test your equipment.

R Miles of Rickmansworth is now retired and, having an interest in weather forecasts, he decided to build the Maplin decoder for his Amstrad computer. He sent me a tape for some satellite recordings and also wanted some Kepler elements. Both were despatched quite quickly because the holiday period let me get the recordings done.

Also requesting recorded satellite data was **Tony Branton G8VUS** of Worcester who has a BBC computer and has been writing his own FAX

program. I returned Tony's tape with several METEOSAT frames plus several minutes from NOAA 11. I hope that these recordings are of help to those setting up their systems.

Ian Wraith of Sheffield is another reader who sent me a tape for some a.p.t. data to test his Commodore 64 computer FAX systems. Software for decoding FAX signals is available from several sources and also for various computers including Ian's. As mentioned in a previous column I don't know of software for decoding weather satellite pictures on this computer but if any readers do know of such software and let me know I will include details in a future column.

Satellite Predictions

I am including another set of satellite predictions to allow those of you who are new to the subject but have receivers that can tune into the band to try your receivers out by tuning into the various frequencies used by the a.p.t. satellites. You should be able to receive signals even with hand-held portable units. Do allow for the possible frequency changes that the Russian controllers sometimes make. If you don't hear a Russian weather satellite that I have listed, remember that it might have been switched off or switched to a different frequency. The NOAA satellites are almost guaranteed to

be operating so they are a good test of your system.

I have picked Saturday June 30 for this list. The times given should be within a couple of minutes. As in last month's list, the format is satellite identification, approximate time of signal acquisition, time of signal loss, maximum elevation of satellite, whether easterly or westerly, and whether travelling north or southbound. The list will only be valid for the UK.

Beginners

Over recent months several *SWM* readers have told me of their interest in building up a satellite receiving system to decode pictures. **Leo Barr** of Sunderland decided to take the plunge and asked me whether I could forward a letter from him to Chris Spray whom I mentioned in a previous column. Both Leo and Chris have similar equipment, a Maplin decoder and an Electron computer.

Leo has successfully decoded both Morse and RTTY using an ERA Microreader, an SEM v.h.f. to h.f. converter, a Matsui MR-4099 receiver and an AOR 800 scanner.

These receivers will be able to pick up the powerful transmissions from the weather satellites though of course they will probably not have a suitable i.f. bandwidth that would allow them to receive the complete frequency spectrum of the a.p.t. signal

**IF YOU ARE
THINKING
OF BUYING
A NEW
SCANNER
MAKE
SURE YOU
RING US
FIRST FOR
THE BEST
DEAL**

**FAIRMATE HP100£?
AOR1000£?
JUPITER£?
BEARCAT£?**

Part Exchange Welcome.

S.R.P. TRADING

**Unit 20a, Nash Works,
Forge Lane, BELBROUGHTON, near
Stourbridge, Worcestershire.**

Tel: (0562) 730672

Fax: (0562) 731002



NEW

WEATHER SATELLITE RECEPTION

APT-1 decoding module enables all weather satellites to be received on any FAX system. Includes full AGC and signal-derived synchronisation for perfect pictures from any source. Plugs into RX-8 system direct. £59 or £39 if ordered with RX-8.

RX-8 for the BBC Computer

FAX charts & photos to screen and printer, HF & VHF **PACKET**, Colour **SSTV**, **RTTY**, **AMTOR**, **CW**, **ASCII**, **UoSAT**.

Receive them all with every possible feature, superb performance and ease of use. Full printer & disc support. Complete system of hardware interface, EPROM, handbook and all connecting leads only £259. **DISCOUNT** for RX-4 users. Send for full information. Reviewed in Oct '89 Ham Radio Today & March '90 Amateur Radio.

RX-4 RTTY/CW/SSTV/AMTOR RECEIVE

Performance, features and ease of use make this still a best-seller. Text and picture store, disc and printer support. Needs TIF1 interface. **BBC**, **CBM64** tape £25, disc £27. **VIC20** tape £25. **SPECTRUM** tape £40, + 3 disc £42 inc adapter board (needs TIF1 also) or software-only version £25. **TIF 1** INTERFACE Optimum HF and VHF performance with our software. 4-pole filtering and computer noise isolation for excellent reception. Kit £20, £25 from August, ready-made, boxed with all connections £40. Available only with software.

Also **MORSE TUTOR** £6, **LOGBOOK** £8, **RAE MATHS** £9 for **BBC**, **CBM64**, **VIC20** and **SPECTRUM**. **BBC LOCATOR** with UK, Europe, World maps £10. All available on disc £2 extra.



technical software



**Fron, Upper Llandwrog, Caernarfon LL54 7RF
Tel: 0286 881886**

RADIO BOOKS

Aeronautical Radio Communications - HF Edition **£18.95***
Maritime Radio Handbook - New Edition **£13.75***
Grove Shortwave Directory 1990 **£12.95**
Guide to Utility Stations 1990 **£18.75**
Passport to World Band Radio 1990 **£12.95**
Guide to Facsimile Stations **£12.25**
Radio Amateur Questions & Answers Reference Manual **£7.95**
Monitoring Times - SWL Magazine **£2.75***

World Broadcast Station Address Book **£2.95***
Shortwave Listening with the Experts our price only **£18.95**
Ninety Nine Nights on Medium Wave **£6.50**
Embassy Radio Communication **£9.95**
Time Signal Stations **£5.95**
Catalogue of TV Pictures Europe **£5.95**
Air Band Radio Handbook **£6.99**
Air Traffic Control **£6.99**
AERAD **£5.85**
A TV-DXers Handbook **£5.95**
Radio Beacon Handbook **£9.95**
Worldwide Marine Radio Facsimile **£9.95**
Communication Satellites **£13.75**
Introduction to Satellite Television **£5.95**
Uno, Dos, Cuatro - Guide to Number Stations **£9.75**
Limited Space Short Wave Antenna Solutions **£9.95**
Scanners **£7.95**
Scanners 2 **£9.95**
ITU List of Ship's Callsigns + supplements **£35.50** + £2.50 P&P
ITU List of Ship's Stations + supplements **£49.00** + £2.50 P&P
Air and Metro Code Manual **£14.50**
Radioteletype Code Manual, 10th edition **£8.75**
RTTY Today **£7.85**
Listeners Logsheets **£7.00** per pack of 5*
Confidential Frequency List **£12.95**
Wave Antenna Reception of MW/LW **£3.50**
Secrets of Successful QSL'ing **£6.50**

Postage: £1.00 UK or £2 overseas per order.
Books marked * post free UK only.

**INTERBOOKS, S690, 8 Abbot Street,
Perth PH2 0EB, Scotland
Tel: 0738-30707**



SEEN & HEARD

- that is why a purpose-built weather satellite receiver is a must for good quality pictures.

D McDonald wrote from Nuneaton to ask for Kepler elements for his satellite work. He has a Dragon 32 computer and is keen to know of companies supplying software for this machine.

Pictures

Both pictures are from **Bob Buttery** of Kettering who used his Amiga computer to process recent recordings of NOAA 11 data. Bob mentions that his computer provides a resolution of 640 by 256 with 16 grey levels.

Bob actually wrote the software himself and says that it requires a Maplin Electronics decoder, as well as the computer. His software is menu driven and of course written in assembly language for speed. Bob describes several features of his software which those of you with Amigas might well appreciate, including facilities to stretch the contrast of the satellite pictures and allow artificial colour to be added. The program has been tested with the Amiga A500 computer and requires a simple cable to connect the computer to the decoder.

Bob has offered to make his home-written software available for a rather modest price compared with the commercially available systems and he has very kindly offered to provide readers of this column with a demonstration if they care to send him a blank disk and return postage. Bob has spent over a year of his spare time to develop this software.

Those readers wishing to know more can write to Bob at 55 Northumberland Road, Kettering, Northants NN15 6LN.

Finally Bob's own satellite receiving equipment includes a Lindenblad antenna feeding a Dartcom receiver and he stores the data on a Denon tape recorder. Well done Bob!

OKEAN 2

This Russian oceanographic satellite has been busy during March and April and I have received several pictures from it, transmitted on 137.40MHz. I have heard that some stored pictures have also been transmitted but I'm afraid that I have missed those - despite all my recording sessions!

Until a year or two ago not very much was known about the equipment carried by the OKEAN

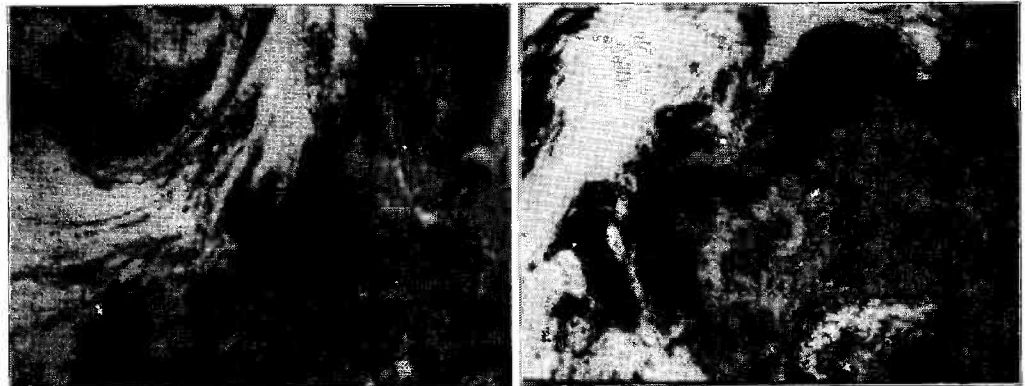
series of satellites but various articles have been appearing following the gradual release of information from the scientific authorities. This means that the various types of pictures that we can receive from OKEAN-2 can be interpreted properly.

Receiving transmissions from OKEAN-2 is a matter of both patience and checking out the most likely passes each day. Those occasions when the satellite is over Europe, and therefore to our east hold the most promise. The majority of transmissions that I have logged are from passes when the satellite is up to a maximum of about 30 degrees in the east.

There were two exceptions though, when I received transmissions without knowing where the satellite was. Later when I received Kepler elements I was astonished to find OKEAN-1 was over the Atlantic! The pass times fitted perfectly and no land was visible in the pictures. Presumably the Russians have ships able to receive oceanic satellite data directly.

NOAA satellites

While the Russian satellites underwent frequency and operational changes the American NOAA weather satellites carried on their regular transmissions. NOAAs 9 and 11 provide a.p.t. (picture) transmissions on 137.62MHz and NOAA 10 transmits on 137.50MHz. The only changes seen with these satellites occur when NOAA 9's pass times drift into conflict with NOAA 11, at which time the ground controllers switch off NOAA 9 for a couple of weeks or so, until the conflict ends. Occasionally the infra-red sensors are decontaminated for a few days and during that time the NOAAs don't transmit infra red.



NOAA 11 pictures of the UK and N. Europe from Bob Buttery, Kettering.

METEOSAT

The change-over from METEOSAT-3 operations back to METEOSAT-4 was announced in an administration message transmission and took place on April 19th at 0900UTC. Pictures seem to be very good so I hope that the problems have been identified. As at mid-May the re-transmissions received from GOES-E at Lannion (France) are still good.

GOES

In Britain we have had access to the American geostationary weather satellite GOES-E for a long time but when its manoeuvring fuel ran out the satellite started to drift and by mid-May it was about 76 degrees west. This has effectively stopped us from receiving good signals from it. I can just about hear a signal if I move one of my dishes away from the washing line but no pictures are identifiable.

The plan to allow a Meteosat to be drifted across the Atlantic to provide support before the next GOES launch seems to have hit an administrative problem of all things!

METEORS

During the last few weeks the frequencies of the Russian satellites seem to have settled down after a period of swopping around. It is quite possible that there will be more changes to come because according to the schedule of expected satellite launches that I received from **Geoffrey Falworth** of Penwortham, there is likely to be another METEOR launch soon. If it does happen by the time that SWM appears I would guess that it would transmit on 137.40MHz now only being used by OKEAN 2.

As of the second half of May there are two METEOR satellites in regular transmission, METEORS 2/16 and 3/3. Both seem to be having problems of one sort or another. METEOR 2/16 is transmitting very good pictures for most of its sunlight track but near the terminator its aperture controller seems to stick causing sudden changes in the picture brightness. This was quite marked in early May.

METEOR 3/3 continues to be unpredictable with its infra-red transmissions. For several nights there were no night-time pictures. Then overnight between May 17 and 18th I recorded a whole tape containing good quality infra-red pictures. Perhaps it's the unpredictability of the Russian METEORS that makes them so interesting! Will METEOR 2/19 be launched or will METEOR 2/17 or 2/18 be re-activated? Who knows!

Frequencies

METEOR 2/16 is on 137.85MHz
 METEOR 3/3 is on 137.30MHz
 OKEAN-2 is on 137.40MHz
 NOAA 9 and 11 are on 137.62MHz
 NOAA 10 is on 137.50MHz
 METEOSAT/GOES on 1691MHz

For Saturday 30 June 1990 Times in UTC (GMT)			
Satellite	AOS	LOS	Max El.
METEOR 2/18	0821	0836	42°W SB
NOAA 10	0853	0907	46°W SB
METEOR 3/3	0928	0942	10°W SB
METEOR 3/2	1020	1039	62°E SB
METEOR 2/16	1028	1043	31°E SB
NOAA 11	1201	1214	22°E NB
METEOR 2/16	1213	1229	79°W SB
NOAA 11	1341	1356	79°W NB
METEOR 2/17	1408	1423	24°E SB
NOAA 9	1550	1604	30°E NB
NOAA 9	1730	1745	52°W NB

BAND II DX

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

An Eye For Detail

"What impressed me most during the evening was the presence of many weaker local stations not normally heard either immediately adjacent to or on the same channels as higher powered local stations," wrote **Jeremy Morley** (Nottingham) after his Band II DXing on May 1. He added, "For example by moving my antenna

I was able to hear BBC Radio Bristol on 95.5MHz above BBC Radio Nottingham which has a Mansfield relay on the same channel."

This is what DXing is all about Jeremy and, like many other readers, he has used his equipment sensibly to find a few more stations during a spell of good conditions which had generally increased the range of v.h.f. signals.

Weather

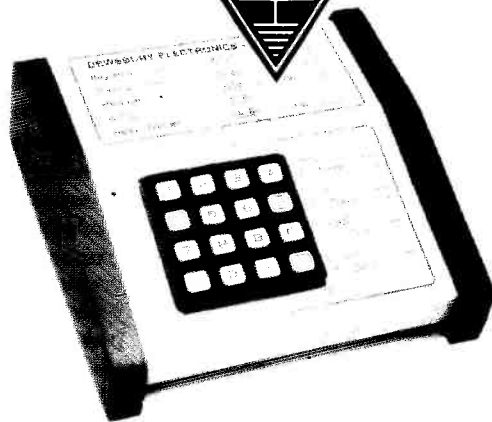
Jeremy reports that the pressure with him on May 1 was very high and that the evening was calm and warm. This was typical of the general weather pattern at that time and one national newspaper reported the "Hottest May 1st ever" with temperatures around 81°F.

Although the sun was shining

and the pressure was high (30.3in/1026mb) and rising on the 17th, I looked toward the west at midday and saw the leading clouds of a weather front. It was a fantastic sight and looked like a giant hand in the bright blue sky with a large single cloud forming the palm and long wispy clouds representing each of the five fingers. The 18th was mainly overcast and as the pressure began

DEWSBURY

ELECTRONICS



NEW!

The NEW DEWSBURY ELECTRONICS

SUPA TUNA

Remote Control unit for Kenwood equipment.

Features:

1. Keypad entry for frequency.
2. Up/down scan of frequency.
3. Up/down scan of memories.
4. Mode change from Keypad.
5. Select VFO.
6. Suitable for use with:
R5000, TS950, TS940, TS440,
TS140/680 TS711/811.

**Full information sent on receipt
of large s.a.e.**

FULL RANGE OF KENWOOD PRODUCTS STOCKED
We are also stockists of

**DAIWA - POCOM - JRC - TAR -
WAVECOM - VIBROPLEX - MICROWAVE
MODULES - B.N.O.S.**

DEWSBURY ELECTRONICS,

**176 Lower High Street, Stourbridge,
West Midlands DY8 1TG**

Telephone: Stourbridge (0384) 390063/371228

Fax: (0384) 371228



Instant finance available subject
to status. Written details on request.



PC GOES

**The PC GOES is a complete Weather
Satellite program and demodulator system
for the IBM PC™ family of computers.**

- * Processing of METEOSAT, GOES, NOAA and METEOR images.
- * Supports Hercules, CGA, EGA, VGA with up to 256 colours or grey levels.
- * Orbital Prediction and Realtime Plotting of tracks for up to 10 satellites.
- * Automatic Image Capture Scheduler for date, time and frames.
- * Storage and Retrieval of images from disk.
- * Image Zoom, Pan, Reversal and False Colourisation.
- * Slide Show Animation and Export to PCX files.
- * Greyscale Printer output to all popular printers.

PRICE ONLY £199.00 inc. VAT. P&P £2.75

PC HF FAX

**The PC HF Facsimile is a complete FAX
reception system for the IBM PC™
family of computers.**

- * Display in grey scale or colour.
- * Printer output in half tone.
- * Supports Hercules, CGA, EGA, VGA.
- * IOC rates 60, 90, 120, 180, 240 LPM
- * Storage/Retrieval from disk
- * Automatic Image Capture.
- * Image Zoom, Pan, Reversal, Export.
- * Slide Show Animation.
- * Menu Driven Software.

PRICE ONLY £99.00 inc. VAT. P&P £2.75

PC SWL

**The PC SWL is a complete package
allowing reception of MORSE CODE, RTTY,
and FEC.**

- * RTTY Baudot 45,50,57,75 and 100 Baud.
- * RTTY ASCII 75,110,150 and 300 Baud
- * CIR 476 Codes FEC, SELCAL and NAVTEX.
- * MORSE CODE 1 to 40 WPM.
- * Automatic Calibration and Code Recognition.
- * Unattended Capture and Printing.

PRICE ONLY £99.00 inc. VAT. P&P £2.75

To introduce our latest shortwave communication product we are offering a special package price.

Order PC HF FAX and PC SWL together for

ONLY £178.00 INC VAT, P & P £2.75

All units come complete with demodulator cable and comprehensive manual. They are simple to connect using no external power or expansion slots.

CALL TODAY FOR FULL DETAILS.

COMAR ELECTRONICS

1A Birmingham Road,
Cowes, Isle of Wight PO31 7BH
Tel: 0983 200308

SEEN & HEARD

to fall, late on the 20th, another tropospheric opening began and the number of broadcast stations soon multiplied in Band II.

The weather buffs among you may like to see how the amount of rain-fall that I recorded each month between May 1989 and April 1990, Fig. 1, reached the total of 30.48in for the year. Some while back I published a photograph in this column of the sundial on a tower at Chichester Cathedral and recently, while at Chiddingstone, a National Trust village in Kent, I spotted another interesting sundial above the church porch, Fig. 2, dated 1626.

Tropospheric

A quick tune with my elderly R216 v.h.f. communications receiver, fed by a chimney mounted horizontal dipole, at 1835 on March 16 located four very strong French stations between 98 and 100MHz, a Welsh language station around 96.8MHz and BBC Radios Wales and WM on 95.9 and 95.6MHz respectively.

I found at least a dozen very strong continental signals spread through Band II during the late evening of May 1 and the early morning of the 2nd. Between 2100 and 2315 on the 1st, Jeremy Morley, using his Saisho SW5000 receiver with its own rod antenna and a length of copper wire, heard faint 'warbles' from a couple of French stations around 100MHz, logged good signals, some in stereo, from BBC Radios Bristol, Sheffield, Wales and WM and ILRs Beacon

Radio (Wolverhampton and Shrewsbury relay), Capital Radio (London), Chiltern Radio (Luton), Fox FM (Oxford), Jazz FM (London), LBC (London), Radios Hallam (Sheffield & Rotherham), Wyvern (Hereford) and 210 (Basingstoke relay) and 'Viking Radio (Hull).

"Yesterday [May 1] I heard the Jazz station on 102.2MHz with 20 to 40dB of signal strength and partly in excellent stereo with low noise and the selectivity selector of my Accuphase T-107 switched on narrow," wrote **Ed Wieringa** from Zandvoort on May 2. Ed uses a three-element antenna and could not select the broad band on his receiver because this would have let in signals from Belgium's BRT Stad Brussel and Lelystad both on 102.1MHz. He also logged BBC Radio 1 on 99.3MHz at good strength.

Brian Renforth (Newcastle Upon Tyne) received programmes from BBC radio in Northern Ireland, an ILR station from Scotland (possibly Northsound Radio) and f.m. stereo transmissions from Belgium and Holland on April 30 and ILR Radio Broadland (Norwich on 102.4MHz), Fox FM (102.6MHz), The Hot FM (Milton Keynes on 103.3MHz), Invicta Radio (Bluebell Hill on 103.1MHz) and ultra strong signal from Metro FM (Fenham on 103.0MHz) and "the usual Yorkshire ILRs" on May 1. Brian received some of these signals by "careful orientation of the indoor copper dipole" feeding his Alba tuner.

On April 30 **George Garden** (Edinburgh) went DXing high on

Cairn O' Mounth and found Band II "quite active". He logged BBC Radio Cleveland, not often heard there, a fluctuating signal "coming in waves" which he thinks was from Manx Radio on the Isle of Man and BBC Radio York.

Simon Hamer (New Radnor) received BBC Radio Suffolk (Manningtree on 103.9MHz and Gt. Barton on 104.6MHz), Belgium (BRT1,2 & 4 between 95.7 and 102.1MHz), France (Caen on 99.6 and Lille on 88.7, 98.0 and 103.7), West Germany (BFBS on 96.5 and 103.0MHz, Deutschlandfunk on 101.8MHz, R-Hamburg on 103.6MHz and WDR1, 2 & 3 on 90.3, 99.2 and 97.0MHz respectively) and Holland (NOS 1, 2, 3 & 4 on many spots between 88.2 and 100.3MHz) on May 1 and 2 and BBC Radio Ulster, ILR Downtown Radio, Ireland's RTE FMI, II and III and the Irish Independents Capital Radio (Dublin on 104.4MHz), Century Radio (Dublin on 100.3 and 104.4MHz), Clare FM on 96.4MHz, County Sound (Cork on 103.7MHz), NWR Bray on 94.9MHz and LM-FM (Dundalk on 95.8MHz) on the 4th.

Band II was open again during the evening of the 5th, when I heard BBC Radios Shropshire and Wales to my west, Invicta Radio from Maidstone, Kent, in the east and from the north came Fox FM, Jazz FM, The Hot FM, 210 FM and BBC Radio WM in Birmingham. Band II was lively again during the evening of the 20th and the morning of the 21st, when I heard both French and German voices, plus many co-channel 'warbles' on about 15 spots between 87.8 and 103MHz.

Sporadic-E

Around 1820 on May 14 and 0815 and 1800 on the 15th. I counted about five very strong signals, with the typical deep and sharp fading which goes with Sporadic-E, from East European broadcast stations spread-out between 66 and 73MHz. When this lower f.m. band is open, try and get identents from stations in Albania, Bulgaria, Czechoslovakia, Hungary, Poland and Romania who, between them, transmit on many spots within this frequency range. An extensive Sporadic-E event can extend into Band II and here one may find Italian television sound, Ch. Ic on 87.5MHz, Russian sound for their Chs. R4 and 5 on 91.75MHz and 99.75MHz respectively and the vision pulses, a low fluctuating buzz, for Ch. R5 on 93.25MHz.

Under such conditions signals are likely to appear from Algeria (96.6MHz), Bahrain (96.5MHz), BFBS (Cyprus on 89.9, 92.1, 95.3 & 99.6MHz), Cyprus (94.8 & 97.2MHz), and UAE Dubai (92.0MHz)

Info

"I read in a local main Aberdeen paper, which is circulated over all east/west coast, that Meldrum v.h.f. transmitter is undergoing changes. By October 1990 Radio 4 v.h.f. will be transmitted from here," wrote George Garden, adding "This transmitter was the first one on v.h.f. serving Scotland, it serves Laurencekirk, although we have much stronger signals from the v.h.f. TV mast at Durris."

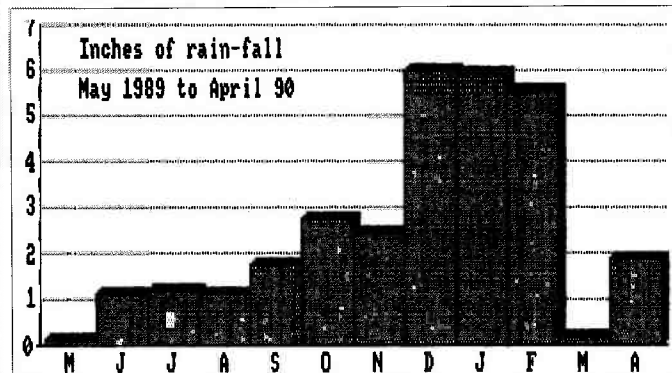


Fig. 1: Rainfall for April and May at Storrington.



Fig. 2: Sundial on Chiddington, Kent church..

TELEVISION

Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Les Jenkins (Godalming) has added a small compact vertical antenna called a Saturn to his 50MHz antenna farm. While Band I (48-68MHz) was quiet earlier in the year, Les found many of the 'Sporadic-E season regulars' such as Italy's RAI, and Spain's TVE, in good colour, via a multi-satellite system which he has been building and is currently developing. I would imagine that Les has also seen the test patterns from Germany (RTL-Plus), Fig. 1 and Holland (PTT-NL-AVVC), Fig. 2 received by **Edwina** and **Tony Mancini** in Derby. Also in Derby, **Garry Smith** has a new DX antenna

layout for bands I, II and III seen on the 8m high pole on the left of Fig. 3. His main mast on the right supports a TRIAX 92 beam for the u.h.f. band (top), an 11-element Yagi for Band III (centre) and at the bottom, a 4 element array for Band I which includes a dipole for Band II.

Picture Archives

Looking back to 1989, **Lt. Col. Rana Roy** (Meerut, India) received pictures from 'Delhi TV' on Chs. E2 (48.25MHz) and E3 (55.25MHz) with interference due to an 'F2' reflection on April 25, Fig. 4 and multiple images from

Bangkok, Fig. 5, on Ch. E3 via another 'F2' disturbance on the 27th.

In Arbroath, **David Glenday** watched 'Weather-view' on BBC2, from Chatton on Ch. E45, Fig. 6, showing the high pressure over the North-Sea at 1300 on July 4.

At that point in time the prevailing tropospheric opening was 41 hours old and among the countries David logged in the u.h.f. bands were Belgium, Denmark, West Germany (ZDF), Fig. 7 and Holland.

This event hung about for a few days and he received pictures from West Germany again at 0730 on the 7th, Fig. 8.

Band I

David logged a test card from Poland (TVP) via a minor Sporadic-E opening on Ch. R2 (59.25MHz) at 0940 on April 9 and a caption 'HEAD oOD' from Estonia followed by the test-card scribed 'EESTI TV TALLIN' at 2200 on the 10th. Earlier that evening he received pictures, "probably auroral" on Chs. E3, E4 (62.25MHz), R1 (49.75MHz), R2 (59.25MHz) and R3 (77.25MHz). He logged Spain's TVE-1 on Chs. E2 and E3 at times during the day on the 23rd.

I had my ex-military R216 receiver monitoring Ch. R1 between 0800 and

SEEN & HEARD



Fig. 1: W. Germany.



Fig. 2: Holland.



Fig. 3:



Fig. 4: Delhi.



Fig. 5: Bangkok.

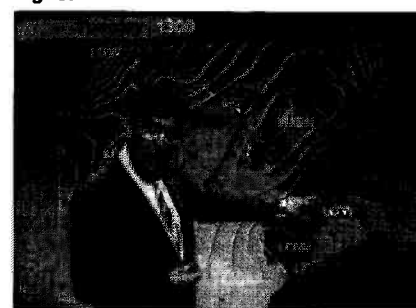


Fig. 6: England.

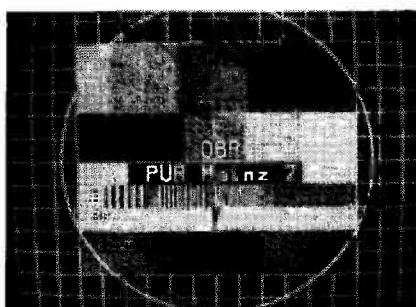


Fig. 7: W. Germany.

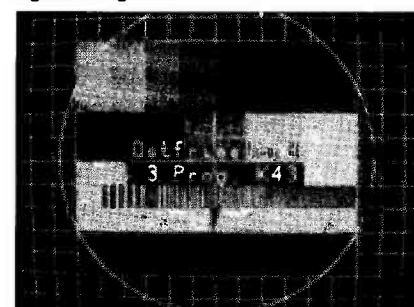


Fig. 8: W. Germany.

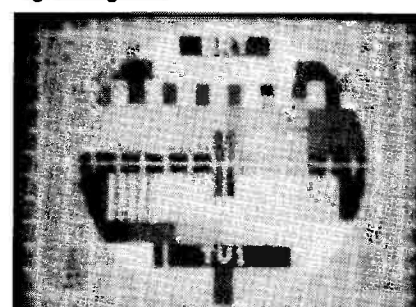


Fig. 9: Belgium.



Fig. 10: Hungary.

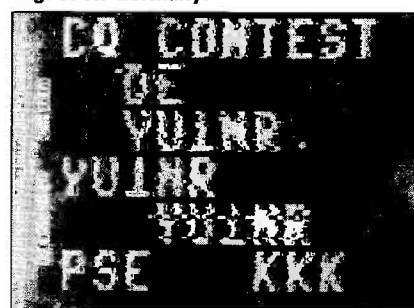


Fig. 11: Yugoslavia.

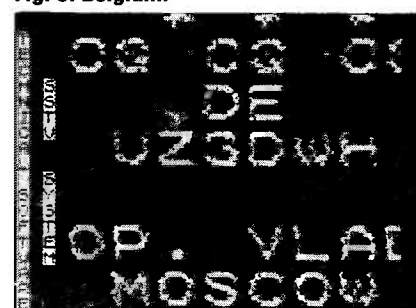


Fig. 12: Russia.

1000 on May 6 and heard numerous 'pings' of television synchronising-pulses which I believe were being reflected by an increased number of meteor particles while the earth, on its orbital path, was leaving one of the Aquarid meteor showers. The same pulses came up around 1800 on May 14, but this time the cause was Sporadic-E and I received weak pictures on Chs. E2 and R1 and at 1940 I saw the fading picture of a conductor and his orchestra on Ch. R2. The 1990 Sporadic-E season had begun because next morning, between 0900 and 1000, I received strong test cards from Iceland (RUV Island) and Sweden (Kanal 1 Sverige) and fading pictures of a helicopter on Ch. R1 and a programme with a TVE logo on Ch. E3. A sudden and short lived opening during the mid-morning of the 19th produced strong pictures on Ch. R1 of, what looked like a film with cyrillic captions, followed by a

discussion programme.

While parked in Chichester at midday on the 21st, I checked Band I with my Plustron TVR5D, using its own rod antenna and received test-cards, fading from just visible to very strong, from the Norwegian regional (Bagn) and Sweden's (Kanal 1 Sverige) on Ch. E3 and there were signs of the Soviet (TSS-Televidenie Sovietskovo Soiuza) Optical test-card trying to break through on Ch. R1 and/or R2. There was a classic Sporadic-E mix-up at the time.

Tropospheric

During the month prior to May 22, the atmospheric pressure averaged around 30.25in (1024mb) with me and my barograph recorded a peak of 30.5in (1032mb) from April 27 to May 3 and a low of 30.1in (1019mb) from May 10 to 15. With pressure at this level many of us expected more

tropospheric enhanced activity than there was and the openings that did occur seemed short lived and very directional.

"A lean month on the DXTV front," wrote **John Woodcock** (Basingstoke) on May 9, however, his consistent monitoring found weak signals from France, mainly 'Canal+', in Band III on April 10, 26, 28 and 29 and May 1 and 3.

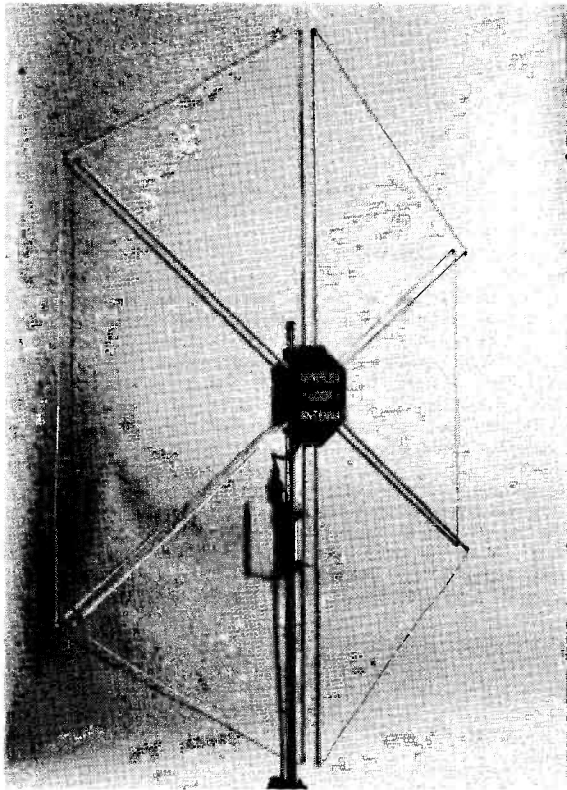
During the period April 28 to May 2, **Les Jenkins** was at his holiday home in Deal and took advantage of the high atmospheric pressure to make good use of his 934MHz transceiver in addition to his DXTV gear. The 11 element home-brew Yagi for 934MHz and a Triax BB grid feeding his Salora television receiver are both only 3m a.s.l., so Les has every right to be delighted to have a station in Darlington among his contacts on 934MHz and colour pictures from Belgium (BRT1), Fig. 9,

France (Antenna 2, FR3 & TF1) and Holland (NEDs 1,2 & 3) in his u.h.f. TV log.

Do keep in mind that a tropospheric opening is unlikely to effect just a tiny part of the v.h.f. or u.h.f. regions of the spectrum, because, as Les has shown, DX in one band can also mean DX in another close at hand. For instance, a good u.h.f. opening can bring great joy to the radio-amateurs who use the 432MHz band for communications by sound and vision, the television DXers on Bands IV (471-607MHz) and V (615-855MHz) and the operators on 934MHz.

I found weak pictures from Belgium and France in Band III and considerable co-channel interference on several stations in the u.h.f. band during the evening of May 1 and the early morning of the 2nd.

Andrew Jackson (Wirral) had a good haul of pictures in the u.h.f.



LINIPLEX

Loop Antenna

50kHz – 30MHz

- ★ Only 1 metre wide
- ★ Classic loop characteristics
- ★ Figure of eight directivity
- ★ Deep broadside nulls
- ★ Effective at ground level
- ★ Sensitive only to magnetic field
- ★ Rejects power line interference
- ★ Weatherproof and lightweight
- ★ Current driven push-pull amplifier
- ★ Patent pending

PHASE TRACK LTD., 16 Britten Road, Reading, RG2 0AU, England
Tel: 0734 752666



RADIO AMATEURS EXAM? PASS FIRST TIME!

**Before you enrol check the benefits of
RRC'S unique Home Tuition Service**

RRC has helped thousands of students to success in their examinations with this unique system of postal tuition, one which guides you, step-by-step, to qualify in the shortest possible time. Only The Rapid Results College offers you all these advantages:

- | | |
|---|--|
| <input type="checkbox"/> A qualified personal tutor | <input type="checkbox"/> Free advice before you enrol |
| <input type="checkbox"/> Study material prepared by specialists | <input type="checkbox"/> Telephone Helpline |
| <input type="checkbox"/> Completely self-contained courses | <input type="checkbox"/> Free 'How to Study' Guide |
| <input type="checkbox"/> Handy pocket-sized booklets | <input type="checkbox"/> Instalment Plan |
| <input type="checkbox"/> Personal study programme | <input type="checkbox"/> Free Postage on course material |
| <input type="checkbox"/> Regular marked tests | <input type="checkbox"/> Worldwide Airmail Service |
| <input type="checkbox"/> Courses regularly updated | <input type="checkbox"/> Extra tuition free if you don't pass first time |
| <input type="checkbox"/> 48 hour despatch | |

POST COUPON TODAY FOR FREE RADIO AMATEURS PROSPECTUS
Please send me my prospectus as quickly as possible.

Mr/Mrs/Miss/Ms _____

Address _____

Postcode _____

RRC The Rapid Results College 
Dept. JV19 Tuition House, London SW19 4DS. FREE ADVICE: 01-947 7272 (9am-5pm)
PROSPECTUS: 01-946 1102 (24 hour Recordcall Service quoting Dept. No. above.)



DATONG
ELECTRONICS LIMITED

Clayton Wood Close
West Park
Leeds LS16 6QE
Tel: 0532 744822
Fax: 0532 742872

**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.



— VISA AND ACCESS WELCOME —



SEEN & HEARD

band from BBC1 Northern Ireland (Divis) on Ch. 31, Border TV on Ch. 48 and Ireland's RTE-1 on Chs. 40 and 52 and RTE-2 on Chs. 43 and 56 on April 23 and France (Antenne 2 and TF1) and Holland (PTT NEDs 1 & 3) and from the UK he identified Anglia TV, Border TV, Central TV, HTV, Thames TV, TVS and Tyne Tees TV on May 1. "The pressure was 30.7 in (1039mb) and very hot about 77C I think," said Andrew.

In Newcastle Upon Tyne, **Brian Renforth** received test-cards from Belgium (BRT TV1) and Holland (PTT NED 3) and pictures from Yorkshire TV (Belmont on Ch. 25) on April 30, very strong signals from Belgium, France (system L, negative images, around Ch. 46) and Holland on May 1 and BBC North and BBC Midlands

from Emley Moor and Sutton Coldfield respectively on the 2nd.

Simon Hamer (New Radnor) received weak pictures from Belgium (BRT1 and RTBF1) on Ch. E8) in Band III on April 22 and on May 1 and 2 he logged pictures from Belgium (BRT1 and RTBF1), France (TDF), West Germany (ARD/WDR1 and RTL PLUS), Holland (NED 1) and Ireland (RTE1 and NETWORK 2) in Band III and Belgium (BRT1 & 2), France (TDF), West Germany (WEST3 and ZDF), Holland (NEDs 1,2 & 3) and Ireland (RTE 1 and NETWORK 2) on several spots in the u.h.f. bands.

In Scotland, David Glenday received u.h.f. pictures from Belgium (BRT2), Denmark (TV2), West Germany (NDR3 and ZDF) and Holland (Neds 1,2 & 3) on April 23 and

24, Ireland (RTE1) on their Ch. H (207.25MHz) in Band III on the 29th and again from Denmark (TV2), East Germany (DFF2), West Germany (ARD1 and ZDF) and Holland (NEDs 2 & 3) on the 30th.

During the first three days of May David logged pictures from Belgium (BRT & RTBF), Denmark and Holland in Band III and Belgium, Denmark, France, West Germany (AFN, ARD/BADN, BFBS, NDR3, SSV, SWF3, TELE-5, WDR3 and ZDF) and Holland on many of their respective channels Bands IV and V.

Among his highlight catches this time were the Teletext service from Denmark's TV2 and East Germany's DFF-2 called 'TECHNISCHER.....' and the American and British forces broadcasting services, 'EINS PLUS',

'RTL+', 'SAT 1', 'TELE 5' and '3-SAT' from West Germany.

SSTV

On April 21, **Ian Armstrong G7GVN** (Millom) received slow scan television pictures from stations in Hungary, Italy, Lithuania and Luxembourg and on the 28th copied a good selection of 8, 16 and 32 seconds pictures from HB9ANT in Switzerland. This increased his new countries score, mainly around 14.230MHz, to 14.

The captions that Ian received from Hungary, Fig. 10, Yugoslavia, Fig. 11 and the USSR, Fig. 12 are typical examples of the picture print-out available from an Alphacom 32 printer which Ian has attached to his Sinclair 'Spectrum' computer.

LONG MEDIUM & SHORT

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

Long Wave DX

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

In Javea, Spain **Jurgen Thiel** has been receiving the 600kW transmissions from Atlantic 252 in Clarkstown, S.Ireland. They rate as SINPO 22532 at 1020. In contrast, the BBC Radio 4 broadcasts on 198, shared by Droitwich (500kW), Burghead (50kW) and Westerglen (50kW), reach him at 55555 at 1220. His log included a 10kW transmission from Caltanissetta, Italy on 189, which he noted as 45554 at 1010.

For some time **Sheila Hughes** (Morden) has been trying to hear the broadcasts from Oslo, Norway on 216, but the 1400kW co-channel transmissions from Radio Monte Carlo via Roumoules have prevented her from doing so. After checking the transmission times in *Dial Search* (see below), Sheila waited for Roumoules to close down at 2305 and then heard Oslo for the first time at 34333. It is unfortunate that this technique cannot be used when checking all shared frequencies, as some of the broadcasters operate 24 hours a day.

In addition to transmission times, *Dial Search* contains a great deal of information about l.w./m.w. broadcasts. The two fold-out coloured maps in this 54-page guide book are unique, one shows station locations in the UK and S.Ireland and the other in Europe, E USSR and N.Africa. The 1990/91 (6th) edition is available from the *SWM* Bookservice.

MW Transatlantic DX

In Grimsby, **Jim Willett** checked the band during two nights, but the conditions proved to be rather poor. He heard eight broadcasts from Canada and the USA during the first night. The first signals reached him from St Johns, NF at 2350, they stemmed from CBN on 640, rated as SIO222 and CJYQ on 930, which peaked SIO322. Nothing was heard from the USA until 0220, when WCBS in New York became audible on 880

at SIO222. Later, WINS 1010 and WCAU 1220 were heard at SIO222. During the second night only the Caribbean Beacon, Anguilla 1610 was heard at 0212 (SIO222).

Whilst searching the band during three nights in Bristol, **Tim Shirley** also found the conditions favoured Canada and USA. Nothing could be identified on the first night until 0200 when the broadcasts from New York's WOR on 710 and WCBS on 880 became clearly audible, they peaked to SIO333. During the second night he picked up WNEW in New York on 1130, which he rated as SIO333 at 0230 and WKUU in Boston on 1510, SIO222 at 0330. Western and Country music from CFFX in Kingston, Ontario on 960 was heard at 0330 on the third night.

A holiday in St.Lucia enabled **Andy Cadier** (Folkestone) to hear some interesting stations in the Caribbean area, see chart.

Other MW DX

While checking the band in Dublin, **William Coughlan** picked up the 1000KW transmission from Jeddah, Saudi Arabia on 1512 at 0105, a distance of about 3025km! In New Radnor, **Simon Hamer** was able to hear the broadcasts from Tel Aviv, Israel 1287 at 2100, as the co-channel transmissions from Czechoslovakia were off the air. The sky wave signals from some of the broadcasters in N.Africa also reached the UK after dark, see chart.

MW Local Radio DX

The first reports on the new Isle of Wight Radio via Wootton on 1242 show that their ground wave signal reaches Bridgwater, Cambridge, Coventry, London, New Radnor and Winchester! It seems likely that the sky wave component of their 0.5kW transmission will be heard in more distant places after dark. The station welcomes reception reports, send them to IOW Radio, Dodnor Park, Newport, IOW PO30 5XE.

Another new one to add to your DX list is KCBC Kettering and Corby

on 1530. Simon Hamer has been hearing their transmission at SIO222 around 1200. Writing from Cambridge, **Mike Smith** informs me that BBC Radio Peterborough is on 1449kHz on a temporary basis via the BBC transmitter at Gunthorpe. At a later date their programmes will be radiated on v.h.f. only from Peterborough on 95.7MHz.

Short Wave DX

Although the effects of solar flares have disturbed the ionosphere and disrupted reception in the higher frequency bands during some days, many interesting broadcasts from all continents have reached the UK. The present high level of solar activity is likely to continue, so some disturbances can be expected in the weeks ahead.

The **25MHz (11m)** broadcasts from Radio RSA in Johannesburg, S.Africa on 25.790 have been sadly missed by UK DXers since their closure on May 1st. The excellent propagation conditions between the UK and Africa have enabled the BBC 300KW transmissions via Daventry 25.870 (Fr to Africa 1200-1245) to reach their target at remarkable strength. In his latest report from S.Africa, **Dick**

Moon rated their signal in George as SINPO 55555. He also quoted similar ratings for Radio DW via Julia, W.Germany 25.740 (Ger to SE Asia 1100-1355) and Radio Moscow, USSR 25.780 (Eng to E Africa, Middle East 0300-1300), but RFI via Issoudun, France 25.820 (Fr to E Africa 0600-1700) is usually 45544.

Good 11m reception was also noted by **Rhoderick Illman** in Thumrait, Oman. He logged SRI via Schwarzenburg, Switzerland 25.680 (Eng, Fr, Ger to S.Asia 1315-1500) as 44444 at 1345 and Radio Denmark via RNI Oslo 25.730 (Da to S.Asia 0730-?) as 44443 at 0753. In contrast, a marked decline in the 11m propagation conditions to Canada was observed

DXers:

- A: Kenneth Buck, Edinburgh.
- B: Scott Caldwell, Warrington.
- C: Robin Clark, Plymouth.
- D: Adrian Don, Whitley Bay.
- E: Simon Holland, Douglas, I.O.M.
- F: Sheila Hughes, Morden.
- G: Eddie McKeown, Co Down, N.Ireland.
- H: George Millmore, Wootton, I.O.W.
- I: Ike Odgom, Glasgow.
- J: Fred Pallant, Storrington.
- K: Alex Radulovic, Burton-upon-Trent.
- L: Chris Shorten, Norwich.
- M: John Stevens, Largs.
- N: Jurgen Thiel, Javea, Spain.
- O: Phil Townsend, London.
- P: Peter Walduck, Milton Keynes.

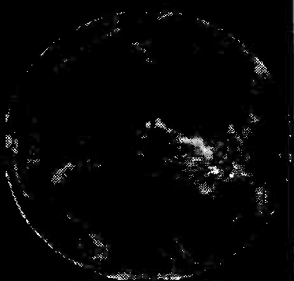
Long Wave DX Chart

Freq kHz	Station	Location	Power (W)	DXer
153	Bechar	Algeria	1000	N
153	DLF Donebach	Germany (W)	500	A,B,D,E,G*,H,I,J,K,N,O
153	Brasov	Romania	1200	A
162	Allouis	France	2000	A,B,D,E,G*,H,I,J,K,L,N,O
171	Kaliningrad	USSR	1000	A,B,G*,H,I
171	Moscow	USSR	500	J
177	Oranienburg	Germany (E)	750	J
183	Saarouis	Germany (W)	2000	A,D,I,J,N,O
189	Caltanissetta	Italy	10	A,E,G*,H,I,J,K,N,O
189	Motala	Sweden	300	N
189	Tbilisi	USSR	500	B*
198	Ouargla	Algeria	1000	N
198	BBC Droitwich	UK	500	G*,H,J,K,L,N,O
198	BBC Westerglen	UK	50	A,D,E,I
207	DLF Munich	Germany (W)	500	A,B,D,F*,G*,J,N,O
207	Azilal	Morocco	800	
216	Roumoules	Monaco	1400	A,D,E,G*,H,I,J,N,O
216	Oslo	Norway	200	A,F
225	Konstantinow	Poland	2000	A,D,E,F,G*,H,I,J*,N,O
234	Jundlinstor	Luxembourg	2000	A,D,E,G*,H,I,J,N,O
243	Kalundborg	Denmark	300	A,D,E,F,G*,H,I,J,O
252	Tipaza	Algeria	1500	A,E*,F*,G*,H,I,J
252	Lahit	Ireland	200	A
252	Atlantic 252	S.Ireland	500	A,B,C,D,E,G,H,I,J,K,M,N,O,P?
261	Bura (R.Volga)	Germany (E)	200	A,B,C,D,E,G,H,I,J,K,M,N,O,P?
261	Moscow	USSR	2000	A,E*,J,N
270	Topolna	Czechoslovakia	1500	A,B,D,E,F,G*,H,I,J*,N,O
279	Minsk	USSR	500	A,E*,J*,J*

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

THE WEATHER SATELLITE PODULE

At last, at an affordable price, a truly professional weather satellite image decoding and display package which matches and, in nearly all cases, exceeds the specification of the most sophisticated and expensive systems currently in use. The speed, flexibility, and raw processing power of the Archimedes are harnessed to give fully animated pictures from space with photographic clarity in colour or high resolution monochrome. Available now for all Archimedes systems.



WINNER OF THE EDUCATION TECHNOLOGY AWARD 1989 FOR SECONDARY EDUCATION.

Ask for a demo disc: *Interactive or animation*. £5.00 each refundable.

- Digital signal processing in hardware and software
- Automatic data capture
- Automatic receiver control
- Automatic printer dumping
- Automatic level settings from satellite calibration data
- Up to 200 compressed frame animation
- Up to 58 Hi-res frame animation
- Smooth fast pan and zoom to any level over entire image
- 256 colours or 84 grey levels at up to 512x640 resolution
- Advanced 'paint box' colour wash facility

See us at the
**16 BIT
Computer
Fair**
28 June -
1 July 90

spacetech

space science resources
21 West Wools
Portland Dorset
DT5 2EA



Tel: 0305
822753

Acorn
The choice of experience



FLIGHTDECK THE AIRBAND SHOP

192 Wilmslow Rd., Heald Green, Cheadle, Cheshire SK8 3BH
Telephone: 061-499 9350 Fax: 061-499 9349

JUST 26 OF THE MANY REASONS TO VISIT US:

AIRBAND MONITORS BOOKS CHARTS DISPLAY MODELS EUROPEAN SUPPLEMENT FREQUENCY LISTS GIFT IDEAS H.F. MONITORS IMC MODELS JP. FLEETS KENWOOD LOWES MAGAZINES N.O.A.A. CHARTS OPTICS POOLEYS QUALITY SERVICE REGISTERS SONY TOPO CHARTS UNIDEN SCANNERS VIDEOS WIN 108 X-STALS YEARS OF EXPERIENCE ZOOM SCOPES . . .

Opening Hours: Monday to Saturday 9.30 a.m. - 5.30 p.m.

PLEASE NOTE OUR NEW ADDRESS

We are now located on the A34 (Wilmslow Road), 2 miles South from the M63 Junction 10, just 3 miles from Manchester International Airport

Send 50p for illustrated Catalogue from Dept. SWM/2

gàribàl'di (gar-i-bòl'di, -bal'di)

Defined as-n. Type of biscuit with currants: Name of famous Italian general (1807-1882): Woman's loose blouse, coloured red: Kind of hat: Red pomacentrid fish from California: Recruitment agency specializing in RF & Microwave.

We are the specialist agency for 'Radio Frequency' Engineers working from 1MHz to light! We have hundreds of top positions in RF mobile comms, opto, satellite, mm-wave and microwave projects. Please contact our consultant Simon Luttrell MSc today.

Garibaldi
RF & Microwave

160 Bellingdon Road, Chesham,
Buckinghamshire. HP5 2HF

Tel: 0494 773918

JAVIATION VHF/UHF AIRBAND SPECIALISTS 0274-732146



MVT 5000



MVT 6000



AOR AR2515

With equipment from AOR, Fairmate, Yupiteru, Icom, Signal, Sony, Unidan Bearcat, Revco, Win, Black Jaguar, Tandy/Realistic and others we offer one of the widest ranges of receivers suitable to the airband enthusiast. For information or advice please give us a call and have a chat or send a large SAE for a catalogue.



AR 1000/HP 100



Frequency lists, Our UHF & VHF airband lists are produced and amended regularly, enabling us to keep them as up to date as possible. Our VHF list includes LATCC transmitter sites/frequency tie ups, squawk, codes, and the ICAO 3 letter airline decode. Our UHF list is probably one of the most comprehensive available and is updated regularly to keep pace with the changes. — How many have the new Eastern frequencies?



UHF — £2.00
VHF — £3.00

JAVIATION

AOR900 ACCESSORIES

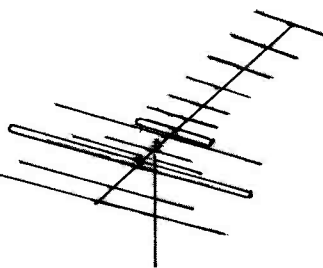
Spare battery packs £15.50
Robust leather carry cases £25.00

Second hand: Our secondhand equipment changes all the time, if you are after a particular set please give us a call — we might have what you are after.

JAVIATION

CARLTON WORKS, CARLTON STREET, BRADFORD.
WEST YORKSHIRE BD7 1DA
TELEPHONE: 0274-732146 FACSIMILE: 0274-722627

AERIAL TECHNIQUES



AT/1/2/3/DX WIDEBAND HIGH GAIN TV-DXING AERIAL

This is the new wideband VHF aerial designed by ROGER BUNNEY and produced exclusively for Aerial Techniques, intended originally for the export market into the Arabian Gulf. We can offer the system in a non-compromise version for general wideband TV reception and the TV-DXer.

Constructed in hard drawn seamless alloy throughout with a rugged square sided 1" boom ensuring great strength and no 'boom sag', elements are 1/2" diameter in all bands for full wideband operation over its design bandwidth. The Gulf version model AT/1/3/G covers Band 1 (47-70MHz) at 4dB, Band 3 (175-230MHz) at 9.5dB gain maximum. The TV-DXing variation type AT/1/2/3/DX is shown above and features additional elements to increase coverage within the Band 2 (TV) spectrum 75-100MHz at 3.5dB gain. Coaxial downfeeder connection allows individual 'Low' and 'High' band VHF downloads, or with a phasing harness for a single wideband downlead. A substantial plated aerial clamp maintains aerial alignment under the most extreme weather conditions. This aerial sets a new standard for high quality ruggedised construction.

AT/1/3/G Wideband VHF TV Aerial (Export/Gulf version).....£49.95
AT/1/2/3/DX Wideband VHF TV Aerial (TV-DXing complete coverage).....£57.80

Carriage & Insurance on either aerial is £5.95 ALL prices inclusive of VAT.

We supply aerial and receiving equipment for all types of domestic, TV-DXing, amateur and professional application. Our 29 page CATALOGUE at 75p is unrivalled in quantity, quality and sheer volume of content. Multi-standard TV's from 5" to 33" screen, also PAL/SECAM Multi-standard Video recorders are our speciality. UK and Overseas orders undertaken both retail and wholesale, ring or write with your query.

Available now from stock SECAM to PAL Transcoders, also Telecom IC Signal Decoders for CANAL + and CANAL J (SAE for leaflet).



ACCESS & VISA Mail & Telephone orders welcome.
Also American Express (24hr. service)



11, KENT ROAD, PARKSTONE, POOLE, DORSET BH12 2EH
Tel: 0202 738232

SEEN & HEARD

by **Alan Roberts** in Quebec. His daily ratings for RTBF Brussels 25.645 (Fr to Africa 0530-1755) and RFI 25.820 varied from 35555 to inaudible, whilst those from SRI 25.680, RNI Oslo 25.730 (Norw to Africa 1500-1530) and Radio DW 25.740 varied from 35444 to inaudible. At best, Radio Moscow 25.780, Radio Yugoslavia 25.795 (Eng to S. Asia 1200-1230) and the BBC 25.870 peaked 25333.

Some of Radio Australia broadcasts have been reaching our shores in the **21MHz (13m)** band. Their transmission to C.Pacific areas via Shepparton 21.740 (Eng 2200-0730) was rated as 24532 at 0640 by **David Edwardson** in Wallsend; to S.Asia via Darwin 21.775 (Eng 0630-1400) as 44444 at 1100 by **George Millmore** in Wootton, IOW; to S/SE Asia via Darwin 21.525 (Eng, Chin 1300-1430) as 33233 at 1300 by **Alan Smith** in Northampton.

Many of the broadcasts to Europe are also being received well. They include Radio Japan, Yamata 21.500 (Sw, It, Fr, Eng, Jap 0530-0830), rated as 33433 at 0716 by **Kenneth Reece** in Prenton; Radio Japan via Moyabi, Gabon 21.690 (Sw, It, Fr, Eng, Jap 0530-0830), 54344 at 0710 by **Chris Shorten** in Norwich; Voice of Israel, Jerusalem 21.780 (Eng, Fr 1000-1100), 44544 at 1022 by **Roy Spencer** in Coventry; Radio Pakistan, Islamabad 21.575 (Ur, Eng 0715-1120), SIO444 at 1100 by **Neil Wheatley** in Newcastle-upon-Tyne; Radio Peace and Progress, USSR 21.840 (Fr 1100-1159), 55544 at 1109 by **Jim Cash** in Swanwick; WCSN Scotts Corner, Maine 21.780 (Eng, Ger, Fr 1400-1555), SIO545 at 1430 by **Thomas Barnett** in Slough; RCI via Sackville, Canada 21.545 (Russ, UK, Fr, Eng, Pol, Ger 1330-1700), 33433 at 1450 by **Andy Cadier**; Radio Japan via Moyabi, Gabon 21.700 (Eng, Jap 1500-1700), heard at 1500 by **Julian Wood** in Elgin; Radio Sweden via Karlsborg 21.655 (Fr, Eng 1500-1600), 33433 at 1553 by **Darren Beasley** in Bridgewater; UAE Radio Dubai 21.605 (Ar, Eng 0600-1645), 54343 at 1600 by **John Sadler** in Bishops Stortford; Radio HCJB Quito, Ecuador 21.470 (Cz, Ger, Sw, Eng, Norw, Da, Fr 1800-2200), 43434 at 1928 by **Cliff Stapleton** in Torquay; WYFR via Okeechobee, Florida 21.615 (Ger, It, Eng 1600-2145), 44444 at 2000 by Sheila Hughes.

Some of the many broadcasts to other areas stem from Radio Austria Int, Vienna 21.490 (Ar, Ger, Fr, Eng to Middle East 0500-0800), logged as 25333 at 0736 by **David Wratten** in Cambridge; Radio Finland via Pori 21.550 (Fin, Sw, Eng to E Asia, Pacific areas 0830-0957), SIO233 at 0840 by **Brian Hallett** in Burgess Hill; Radio Moscow, USSR 21.800 (Eng, Fr, Ar to N.Africa 0800-1600), 55444 at 1100 by **Ken Whayman** in Bexleyheath; Radio DW via Trincomalee, Sri Lanka 21.640 (Ger to E Asia 0700-1200), SIO222 at 1117 by **Philip Rambaut** in Macclesfield; Vatican Radio, Rome 21.485 (Eng to Africa 1115-1130), 42453 at 1125 by **Eddie Mc Keown** in Co. Down; Radio Denmark via RNI Kvitsoy 21.710 (Da to S.Asia, Australia 1330-1355), 42432 at 1344 by Rhoderick Illman (Oman); Radio Finland, Helsinki 21.550 (Eng, Sw, Fin to E Africa, Middle East 1405-1557), heard at 1429 by Dick Moon (S.Africa);

Local Radio DX Chart

Freq kHz	Station	ILR BBC	Power (kW)	DXer	Freq kHz	Station	ILR BBC	Power (kW)	DXer
585	R.Solway	B	2.00	D.H.K.N.Q.X*Y	1161	R.Tay		1.40	N
603	Invicta Snd(Coast)	I	0.10	Q.S.T.V.WZ	1161	Viking R.(Gold)		0.35	EZ
603	R.Gloucester	B	0.10	E.J.M.Q.S.Y.Z	1170	R.Orwell		0.28	V.Y.Z
630	R.Bedfordshire	B	0.20	E.M.Q.S.T.V.W.Y.Z	1170	Signal R		0.20	D*.E.S
630	R.Cornwall	B	2.00	F.M.Q	1170	TfM Radio (GNR)		0.32	H.X*
657	R.Clywd	B	2.00	D*.E.F.H.L.M.N.Q.S.Y.Z	1170	Ocean Sound		0.12	LM
666	DevonAir R	I	0.34	M.Z	1242	Invicta Snd(Coast)		0.32	D.S.V.Z
666	R.York	B	0.80	E.H.P.S.X*.Y.Z	1242	Isle of Wight R		0.50	A*.C.G.I.M.S.V.Z
729	BBC Essex	B	0.20	E.M.S.T.V.Y.Z	1251	Saxon R		0.76	M.S.V.Y.Z
738	Hereford/Worcester	B	0.037	E.M.S.V.Y.Z	1260	GWR (Brunel R.)		1.60	M
756	R.Cumbria	B	1.00	H.K.N.X*	1260	Leicester (GEM-AM)		0.29	E.L.P.S.W.Z
756	R.Shropshire	B	0.63	E.M.S.Z	1260	R.York	B	0.50	H
765	BBC Essex	B	0.50	E.M.P.S.T.V.Z	1278	Pennine R.(C.Gold)		0.43	D
774	R.Kent	B	0.70	L.M.N.S.T.V.Z	1305	R.Hallam (C.Gold)		0.15	E.S
774	R.Leeds	B	0.50	D.E.H	1305	Red Dragon R		0.20	M.S
774	Severn Sound	I	0.14	M.S.Z	1323	R.Bristol S'set Snd	B	0.63	M.S.Z
792	Chiltern R	I	0.27	E.S.T.V.Y.Z	1323	Southern Sound		0.50	L.M.S.V.Z
792	R.Foyle	B	1.00	N	1332	Hereford R		0.60	E.S.V.Z
801	R.Devon	B	2.00	F.M.N.Q.S.Z	1332	Wiltshire Sound	B	0.30	M.S.Y.Z
819	Hereford/Worcester	B	0.037	E.S.Z	1359	Essex R.(Breeze)		0.28	L.V.Z
828	ZCR	I	0.27	M	1359	Mercia Snd(Xtra-AM)	B	0.27	E.S.W.Z
828	R.WM	B	0.20	S	1359	R.Solent	B	0.85	J.M
828	R.Aire	I	0.12	H	1368	R.Lincolnshire	B	2.00	E.Z
828	Chiltern R	I	0.20	N.S.T.V.Z	1368	R.Sussex	B	0.50	L*.M.V.Z
837	R.Cumbria	B	1.50	D.F*	1368	Wiltshire Sound	B	0.10	M
837	R.Furness	B	1.00	H.N.Y	1431	Essex R.(Breeze)		0.35	E.L.O.Z
837	R.Leicester	B	0.45	E.L.M.P.S.T.V.Z	1431	Radio 210	I	0.14	M
855	R.Devon	B	1.00	M	1449	R.Cambridgeshire	B	0.15	E.R.S.Z
855	R.Lancashire	B	1.50	E.H.K.S.X*	1458	R.Devon	B	2.00	M
855	R.Norfolk	B	1.50	E.H.L.S.T.V.Z	1458	GLR	B	50.00	M.U.Z
873	R.Norfolk	B	0.30	E.H.L.M.S.T.V.Z	1458	GMR	B	5.00	D.N
936	GWR (Brunel R.)	I	0.18	M.S.T.Z	1458	R.Newcastle	B	2.00	D.X*
945	R.Trent (GEM-AM)	I	0.20	D.E.H.P.S.T.W.Z	1458	Radio WM	B	5.00	E.P.S.U
954	DevonAir R	I	0.32	M	1476	County Sound(Gold)	I	0.50	E.L.M.S.Z
954	R.Wyvern	I	0.16	S.Y.Z	1485	R.Humberside	B	1.00	E.H.Z
990	R.Aberdeen	B	1.00	B.X*	1485	R.Merseyside	B	1.20	K.S
990	Beacon R. (WABC)	I	0.09	P.S.Z	1485	R.Oxford	B	0.50	M.W.Z
990	R.Devon	B	1.00	M	1485	R.Sussex	B	1.00	L.M.S
990	Hallam R.(C.Gold)	I	0.25	E.S	1503	R.Stoke-on-Trent	B	1.00	D*.E.F.K.M.P.S.Z
999	Red Rose R	I	0.80	F.H	1521	R.Mercury	I	0.64	L*.M.Z
999	R.Solent	B	1.00	LM.Z	1521	R.Notttingham	B	0.50	E.P.Z
999	R.Trent (GEM-AM)	I	0.25	E.S.Y.Z	1530	R.Essex	B	0.15	V.Z
1026	R.Cambridgeshire	B	0.50	E.P.S.V.Z	1530	KCBC Ket'ring/Corby	I	?	I
1026	Downtown R	I	1.70	N	1530	Pennine R.(C.Gold)	I	0.74	B.E
1026	R.Jersey	B	1.00	M	1530	R.Wyvern	I	0.52	S
1035	R.Kent	B	0.50	LM.V.Z	1548	R.Bristol	B	5.00	M.S.U
1035	NorthSound R	I	0.78	H.X*	1548	Capital R. (Gold)	I	97.50	L.M.S.U.W.Z
1035	R.Sheffield	B	1.00	E.P.S	1548	R.City	I	4.40	D.K
1035	West Sound	I	0.32	N	1548	R.Cleveland	B	1.00	H.X*
1107	R.Northampton	B	0.50	E.M.S.Z	1548	R.Forth (Max AM)	I	2.20	N
1116	R.Derby	B	1.20	E.S.Z	1548	R.Hallam	I	0.74	E
1116	R.Guernsey	B	0.50	LM	1557	R.Lancashire	B	0.25	K
1152	BRMB (Xtra-AM)	I	3.00	E.S	1557	Chiltern (Nthant96)	I	0.76	E.S.Z
1152	R.Broadland	I	0.83	K*.Z	1557	Ocean Sound	I	0.50	M.Y
1152	R.Clyde (Clyde 2)	I	3.60	N	1584	R.Notttingham	B	1.00	E.S.Z
1152	LBC (L.Talkback R.)	I	23.50	L*.M	1584	R.Shropshire	B	0.50	S
1152	Metro R. (GNR)	I	1.80	X*.Y	1584	R.Tay	I	0.21	F.N
1161	R.Bedfordshire	B	0.10	J.S.V.Z	1602	R.Kent	B	0.25	E.F.L.M.S.Y.Z
1161	GWR (Brunel R.)	I	0.16	M.S					
1161	R.Sussex	B	1.00	LM					

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

Radio Austria Int, Vienna 21.490 (Ger, Sp, Eng, Fr to W.Africa 1300-1700), SIO444 at 1615 by **John Coulter** in Winchester; Radio Pakistan, Islamabad 21.740 (Ur, Eng to Middle East 1545-1630), SIO322 at 1615 by **Kenneth Buck** in Edinburgh; WCSN Scotts Corner, Maine 21.640 (Eng, Fr to N/E Africa 1600-1955), 33343 at 1754 by **Robin Clark** in Plymouth; Vatican Radio, Rome 21.650 (It, Eng, Fr, Sp, Esp to Africa 1840-1910), 44444 at 1734 by **Leo Barr** in Sunderland.

Good long distance reception has also been noted in the **17MHz (16m)** band. During the early evening the broadcasts from Radio New Zealand International on 17.680 (Eng to Pacific areas 1800-2110) have been attracting the attention of many DXers. In London, **Phil Townsend** rated their 100kW transmission from Rangitaki as 25433 at 1940. In Spain, Jurgen Thiel logged them as 43534 at 1900. Much to the annoyance of DXers, Radio Moscow now leave their carrier running on 17.680 after their broadcast in Spanish to C.America has ended at 0500 and this obliterates the RNZI transmission. Presumably it is in readiness for their broadcast to Europe at 0600.

Some of Radio Australia's broadcasts have also been received here. Whilst checking the band during the early morning, **Kenneth Reece** logged their transmission to C.Pacific areas via Shepparton 17.790 (Eng, Fr 2100-0800) as 24322 at 0414. In Bristol, **Francis Hearne** picked up their

broadcast to SE Asia via Darwin 17.715 (Eng, Chin 0100-1400), which rated as SIO222 at 0700. Their transmission to C.Asia via Carnarvon 17.630 (Eng, Chin 0000-0900) was rated as 44344 at 0030 by **Chris Shorten**.

Quite a number of the broadcasts to other areas were noted in the reports: Radio Japan, Yamata 17.890 (Eng, Jap to SE Asia 0500-1000), rated as SIO443 at 0705 by **Brian Hallett**; Radio Finland via Pori 17.800 (Fin, Sw, Eng to SE Asia 0700-0825), 54444 at 0814 by **David Wratten**; AIR via Delhi 17.387 (Eng to E Asia 1000-1100), 32222 at 1050 by **Jim Cash**; Radio Peace and Progress, USSR 17.840 (Eng to SE Asia 1330-1350), 43433 at 1350 by **Rhoderick Illman** (Oman); RTM Tanger, Morocco 17.595 (Eng, Fr to N.Africa, Middle East 1400-1700), 53433 at 1415 by **Ken Whayman**; Radio Romania Int, Bucharest 17.745 (Eng, Fa to S.Asia 1500-1556), 43333 at 1510 by **Sheila Hughes**; Voice of Greece, Athens 17.535 (Gr, Eng to USA 1500-1550), SIO455 at 1530 by **Kenneth Buck**; VOA via Tinang, Philippines 17.790 (Chin to C.Asia 1000-1600), SIO444 at 1530 by **Thomas Barnett**; Radio Sweden via Horby 17.880 (Sw, Fr, Eng to USA 1430-1630), 33443 at 1542 by **Andy Cadier**; Radio Cairo, Egypt 17.745 (Hi, Ur 1500-1730), SIO444 at 1640 by **John Coulter**; BBC via Ascension Island 17.860 (Eng to C/E Africa 1515-1745), SIO322 at 1710 by

DXers:

- A: Thomas Barnett, Slough.
- B: Leo Barr, Sunderland.
- C: Darren Beasley, Bridgewater.
- D: Scott Caldwell, Warrington.
- E: Jim Cash, Derby.
- F: William Coughlan, Dublin.
- G: John Coulter, Winchester.
- H: Adrian Don, Whitley Bay.
- I: Simon Hamer, New Radnor.
- J: Geoff Harris, Sturminster Newton.
- K: Simon Holland, Douglas IOM.
- L: Sheila Hughes, Morden.
- M: George Millmore, Wootton, IOW.
- N: Ike Odoom, Glasgow.
- O: Roy Patrick, Derby.
- P: Alex Radulovic, Burton-upon-Trent.
- Q: Tim Shirley, Bristol.
- R: Mike Smith, Cambridge.
- S: Roy Spencer, Coventry.
- T: Darran Taplin, Tonbridge.
- U: Jurgen Thiel, Javea, Spain.
- V: Phil Townsend, London.
- W: Peter Waldock, Milton Keynes.
- X: Neil Wheatley, Newcastle-upon-Tyne.
- Y: Jim Willett, Grimsby.
- Z: David Wratten, Cambridge.

Philip Rambaut; Vatican Radio, Rome 17.710 (Port, It, Eng, Fr, Sp to W.Africa 1800-1900), 43433 at 1800 by **John Sadler**; Radio Moscow, USSR 17.585 (Eng to USA 1330-2100), 55555 at 1855 by **John Stevens** in Largs; Voice of Israel, Jerusalem 17.630 (Eng, Fr to Africa 1900-1955), 43434 at 1905 by **Cliff Stapleton**; VOA via Greenville, USA 17.785 (Eng to W.Africa 1600-2200), 22232 at 1910 by **Leo Barr**; WYFR via Okeechobee, Florida 17.612 (Eng, Ar, Fr, Port to W.Africa 1600-2245), 33333 at 2145 by **Robin Harvey** in Bourne.

In contrast, very few of the many broadcasts to Europe were noted; Voice of Israel, Jerusalem 17.575 (Eng, Fr 1000-1100), rated as 44544 at 1008

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 9.30-5.00pm
Sat 9.30-4.30pm
 24 HOUR MAIL ORDER SERVICE

ANTENNA RANGE

CUSHCRAFT	
A3 3 Element Tribander Beam	£329.00
A4 4 Element Tribander Beam	£353.35
10-3CD 3 Element 10m Monobander	£115.04
15-3CD 3 Element 15m Monobander	£139.70
20-3CD 3 Element 20m Monobander	£238.21
AP8 8 Band Vertical 25ft High	£164.35
AP5 5 Band Vertical 25ft High	£123.36
18 Element 2m Boomer Antenna	£106.59
15 Element 2m Boomer Antenna	£98.99
Ringo Ranger 2m Vertical	£42.98
New R5 5 Band half wave vertical	£259.00
DW 10, 18, 24 MHz Rotary dipole	£159.00
BUTTERNUT	
HF 6VX 6 Band vertical Antenna	£167.00
HF 2V 80/40 metre Vertical	£142.00
A 1824 HF6V 17/12m Add on kit	£34.99
20MRK HF2V 20m Kit	£33.39
HY-GAIN	
TH2 Mk3 3 Element Tribander	£249.00
18AVT 5 Band Vertical	£146.00
JAYBEAM	
TB3 Mk3 3 Element Tribander	£365.00
TB2 Mk3 2 Element Tribander	£246.00
TB1 Mk3 Rotary Triband dipole	£123.30
VR3 Mk3 Triband Vertical	£85.56
DB44 & 6m Element Beam	£139.37
4Y/4m 4m 4 Element Beam	£48.46
4Y/6m 6m 4 Element Beam	£58.05
LW5/2m 5 Element 2m	£22.53
LW8/2m 5 Element 2m	£28.28
PBM14/2m Parabeam	£83.05
5XY/2m 5 Element Crossed	£42.68
8XY/2m 8 Element Crossed	£54.60
HAND HELD SCANNING RECEIVERS	
WIN 108 Air band	£175.00
AR100 Handheld Receiver	£249.00
AR900UK	£235.00
Base station Receiver AR2002	£487.00
NEW HF 225 general coverage receiver	£395.00
NEW "Jupiter" Multi-Channel Handheld Receiver	£299.00
"Jupiter" Base Receiver	£345.00

KENWOOD RANGE

TS950SD HF Transceiver	£3,199.00
TS950S HF Transceiver	£2,499.00
SP950 Filtered Speaker	£87.50
TS940s HF Transceiver	£1995.00
AT940 Automatic Antenna tuner	£244.88
SP940 Speaker with filters	£87.55
TS440S HF Transceiver	£1138.81
AT440 Automatic Antenna tuner	£144.82
PS50 20 amp power supply	£222.49
TS140S HF Transceiver	£862.00
PS430 Power supply	£173.78
AT250 Automatic Antenna tuning unit	£366.00
AT230 Antenna tuning Unit	£208.67
SP230 Speaker with filters	£66.49
TL922 HF Linear amplifier	£1495.00
MC50 Base station microphone	£46.00
MC60A De Luxe desk microphone	£88.22
TR751E 2m Multimode Mobile Transceiver	£599.00
TR851E 70cm multimode transceiver	£699.00
TM231E 50watt 2m Transceiver	£289.00
TM431E 35watt 70cms Transceiver	£318.00
TM701E 25watt 2m/70cm Transceiver	£469.00
TS680S HF Transceiver + 6Metres	£995.00
TH25 2m FM Handheld Transceiver	£238.00
TH205E 2m FM Handheld Transceiver	£199.00
TH215E 2m Handheld FM Transceiver	£228.00
TH405E 70cm Handheld FM Transceiver	£245.00
RS000 General coverage receiver	£875.00
VC20 VHF Converter 108-174MHz	£167.21
R2000 General coverage receiver	£595.00
VC10 VHF Converter 118-174MHz	£161.95
HS5 De Luxe headphones	£37.54
TS790E Dual Bander Transceiver	£1495.00
LF30A Low Pass Filter	£32.26
SP50 Mobile Speaker Unit	£20.40
TH75E Handheld Dual Bander	£398.00
Full range of accessories stocked microphones. SWR meter, DC Leads, Antennas etc.	
Full size G5RV Antenna £18.00. Half size £16.00. High Power 7MHz Traps £19.50. Diopole Kits £25.00. 3.7MHz traps £12.00. 200 watt. 8MHz traps £12.00.	
AOR950 Base Station Receiver	£249.00

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 receiver facilities. **£1839.00**
 "Corsair" MKII HF Amateur Band Transceiver. **£1200.00**
 New Amateur Band only Transceiver "Omni V" **£1900.00**

FULL RANGE OF ACCESSORIES AVAILABLE SEND S.A.E. FOR DETAILS

MFJ ACCESSORIES RANGE

MFJ 1601 Random Wire Tuner	£45.00
MFJ 1701 6 way Antenna switch	£39.50
MFJ 949C Versatuner	£168.00
MFJ 941D Versatuner	£125.00
MFJ 901B Versatuner	£65.00
MFJ 300 watt dummy load	£33.50
MFJ RF Noise Bridge	£63.10
MFJ-931 Artificial Ground	£79.53
MFJ-962B 1kW Antenna Tuner	£291.95

ROTATORS

G400RC	£169.00
G6600RC	£219.00
T2 X Heavy duty rotator	£399.00
CDE AR40	£168.72
CD 451 1R	£237.00
EMOTATOR 1057SY	£159.00

POWER SUPPLIES

PS30M Heavy duty 30A, 22A cont	£129.50
PS120M 3-15V variable 12A max	£79.50

Postage/ carriage at cost.

We are also stockist for Global, Datong, and have a full range of publications by RSGB-ARRL and others. Our secondhand list is updated daily. Please send SAE for this or any information.

THE UP-TO-DATE NEWS & INFORMATION SERVICE FOR
 THE LISTENING ENTHUSIAST

0898 654676

UPDATED EVERY SATURDAY

Calls charged at 38p per minute peak,
 25p per minute off-peak.

RADIO LINE

**HAVING DIFFICULTY GETTING
 YOUR COPY OF SHORT WAVE
 MAGAZINE ?**

**Then place a
 regular order
 with your
 newsagent
 NOW !**

Dear Newsagent, Distributed by Seymour
 please reserve / deliver my monthly
 copy of SHORT WAVE MAGAZINE

NAME

ADDRESS

.....

Signed

SEEN & HEARD

Medium Wave DX Chart

Freq kHz	Station	Country	Power (kW)	DXer
520	Hof-Saale	Germany (W)	0.2	D*
531	Ain Beida	Algeria	600	A*,D*,R
531	Leipzig	Germany (E)	100	D*
531	Beromunster	Switzerland	500	R
540	BRT-2 Wavre	Belgium	150/50	C,E,G,J,O
540	Soit	Hungary	2000	N*
540	Sidi Bannour	Morocco	600	D*
549	Les Trembles	Algeria	600	A*,D*,G*,R
549	DLF Bayreuth	Germany (W)	200	E
558	Espoo	Finland	100	J
558	Valencia	Spain	20	B,D*,R
567	West Berlin	Germany (W)	100	D*
567	RTE-1 Tullamore	S.Ireland	500	B,C,D,E,G,J,K,M,O,P,S,T
567	Volgograd	USSR	250	D*,N*
576	Stuttgart	Germany (W)	300	D*,M,R
585	Orf Wien	Austria	600	R
585	FIP Paris	France	8	J
585	RNE-1 Madrid	Spain	200	C,D*,G*,R
585	BBC-R Scot Dumfries	UK	2	D
594	HRF Frankfurt	Germany (W)	400	A*,B,G*
594	Oujda-1	Morocco	100	D*
603	Lyon	France	300	R
603	BBC-R4 Newcastle	UK	2	D,J,K
612	RTE-2 Athlone	S.Ireland	100	C,D,G,K,M
612	Lerida	Spain	10	R
612	Sarajevo	Yugoslavia	600	R
621	RTBF-1 Wavre	Belgium	300	C,E,J
621	Barcelona	Spain	10	R
630	Vigra	Norway	100	D*
630	Timisoara	Romania	400	R
630	Tunis-Djedeida	Tunisia	600	R
639	Liblice	Czech*	1500	D*,E,R
639	RNE-1 Almeria	Spain	20	R
639	La Coruna	Spain	100	D*
648	Palma de Mallorca	Spain	10	D*,R
648	BBC Orfordness	UK	500	D*,E,G,H,M*,R
657	Napoli	Italy	120	R
657	RCE-2 Madrid	Spain	20	D*,R
657	BBC-R Wales Wrexham	UK	2	B,S
666	Podenseesender	Germany (W)	300/180	D*
666	Lisboa	Portugal	135	D*,R
666	Barcelona	Spain	20	L,R
675	Marseille	France	600	C*,D*,M*,R
675	Hilversum-3 Lopic	Holland	120	D*,E,H*,J,K*,R
684	RNE-1 Sevilla	Spain	250	A*,C,D*,H*,R
684	Beograd	Yugoslavia	2000	A*,R
693	Ain el Hamam	Algeria	5	R
693	BBC-R2 Droitwich	UK	150	D,R
702	Aachen/Flensburg	Germany (W)	5	D*
702	Monte Carlo	Monaco	300	G*
702	Zamora	Spain	5	R
702	Yerevan	USSR	100	N*
711	Rennes 1	France	300	D*,G*,J,R
711	Heidelberg	Germany (W)	5	R
711	Jeffren/Sebha/Ghadames	Libya	50	R
720	WDR-2 Langenberg	Germany (W)	200	O*
720	BBC-R4 Lisnagarvey	N.Ireland	10	D,E,K
720	Stax	Tunisia	200	R
720	BBC-R4 Lots Rd London	UK	0.5	J
729	RTE-1 Cork	S.Ireland	10	D
729	RNE-1 Alicante	Spain	10	R
729	Oviedo	Spain	50	A*,D*
738	In Amenas	Algeria	5	R
738	Paris	France	4	A*,J
738	Poznan	Poland	300	A*
738	RNE-1 Barcelona	Spain	250	A*,C,D*,R
747	Hilversum-2 Flevo	Holland	400	C,D*,E,H*,J,M,R
747	R.Cadena, Cadiz	Spain	10	D*
756	Brunswick	Germany (W)	800/200	B,D*,R
756	Lugoj	Romania	400	R
765	Sottens	Switzerland	500	R*
774	BBC-R4 Enniskillen	N.Ireland	1	D
774	RNE-1 Caceres	Spain	60	D*
774	RNE-1 San Sebastian	Spain	60	A*
774	RNE-1 Valencia	Spain	50	R
783	Burg	Germany (E)	1000	D*,E,J,R*
783	R Porto, Miramar	Portugal	100	D*
792	Sevilla	Spain	20	A*,D*,G*,R*
801	BRF via Munich	Germany (W)	420	D*,E,K*,M,R*
801	Castellon	Spain	5	A*,R*
810	SER Madrid	Spain	20	D*
810	BBC-Scot Westerglen	UK	100	B,D,E,K,M,P
819	Trieste	Italy	25	D*
819	Rabat	Morocco	25	L
819	Warsaw	Poland	300	D*
828	NDR Hannover	Germany (W)	100/5	D*
828	Sebha	Libya	300	R
828	Barcelona	Spain	20	A*,R
837	Nancy	France	200	A*,J
837	COPE Ibiza	Spain	1	R
837	R Popular, Sevilla	Spain	10	D*
846	Rome	Italy	540	D*,R
855	RAIS Berlin	Germany (W)	100	M*
855	Murcia	Spain	125	C,D*,R
864	Paris	France	300	A*,C,D*,J,R
873	AFN Frankfurt	Germany (W)	150	A*,C,D*,J,M
873	Lakihegy	Hungary	20	R
873	Zaragoza	Spain	20	R
882	COPE Alicante	Spain	2	R
882	R Sabadell	Spain	2	R
882	BBC-Wales Washford	UK	70	C,D,E,H,J,M,P
891	Algiers	Algeria	600/300	A*,D*,R
900	Milan	Italy	600	A*,D*,E,R
909	Palma de Mallorca	Spain	10	R
909	BBC-R2 Moorside Edge	UK	200	D
909	BBC-R2 Westerglen	UK	50	K
918	R Intercont. Madrid	Spain	20	D*,R
927	BRT-1 Wolvertem	Belgium	300	E,J,R
927	Leida	Spain	5	R
927	Izmir	Turkey	200	R*
936	Radio Bremen	Germany (W)	100	A*,B,D*,E
945	Toulouse	France	300	A*,B*,D*,R
954	RCE Madrid	Spain	20	D*,R

Freq kHz	Station	Country	Power (kW)	DXer
963	Pori	Finland	600	A*,D*,P*
963	Paris	France	8	J
972	NDR/WDR Hamburg	Germany (W)	300	A*,B*,D*,E,K*,R
981	Alger	Algeria	600/300	A*,D*,M,R
990	RIAS Berlin	Germany (W)	300	A*,B,R
990	SER R Bilbao	Spain	10	D*
990	BBC-Redmoss	UK	1	E
999	R Popular, Madrid	Spain	20	D*,R
1008	Hilversum-5 Flevo	Holland	400	D*,E,H*,J,M,R
1017	SWF Wolfsburg	Germany (W)	600	D*,H*,R
1026	SER Alicante	Spain	3	R
1026	SER Reus	Spain	10	R
1035	Milan	Italy	50	H*,R
1035	Prog.3 Lisbon	Portugal	120	D*
1044	DDR-1 Burg	Germany (E)	250	D*,H*
1044	Sebaa-Aioun	Morocco	300	D*
1053	Tripoli	Libya	50	R
1053	BBC-R1 Droitwich	UK	150	D,R
1062	Kalundborg	Denmark	250	D*,H*,M
1062	Cagliari	Italy	25	R
1071	Brest	France	20	J
1071	Lille	France	40	D*
1080	Katowice	Poland	1500	N*
1080	Palma de Mallorca	Spain	5	R
1089	BBC-R1 Brookmans Pk	UK	150	D,R
1098	RNE-5 Lugo	Spain	5	R
1107	AFN via Munich	Germany (W)	40	D*
1107	RNE-5 Barcelona	Spain	20	R
1107	BBC-R1 Wallasey	UK	0.5	D*
1116	Bari	Italy	150	D*,R
1125	La Louviere	Belgium	20	J
1125	BBC Llandrindod Wells	UK	1	D*
1125	Zagreb	Yugoslavia	200	D*,L
1134	R.Poo de Menorca	Spain	2	R
1134	Zadar	Yugoslavia	1200	N*
1143	AFN via Stuttgart	Germany (W)	10	E
1143	Messina	Italy	6	R
1143	Kaliningrad	USSR	150	M*
1152	Lerida	Spain	10	R
1152	RNE-5 Zamora	Spain	?	R
1161	Ajaccio	France	10	R
1161	Strasbourg (F.Int)	France	200	D*
1161	Toulouse	France	100	R
1179	SER Murcia	Spain	5	R
1179	Solvesborg	Sweden	600	C*,D*,E,H*,M*,P
1197	VOA via Munich	Germany (W)	300	M
1197	BBC-R3 Bournemouth	UK	0.5	J
1206	Wroclaw	Poland	200	D*,O*
1215	COPE Castellon	Spain	10	R
1215	BBC-R3 Moorside Edge	UK	100	D,R
1224	COPE Madrid	Spain	20	B,R
1233	Prague	Czech	400	D*
1242	Marseille	France	150	D*,R
1260	Valencia	Spain	20	R
1269	Neuminstern	Germany (W)	600	D*,E,J,L,O
1269	COPE Reus	Spain	2	R
1278	RTE-2 Dublin/Cork	Ireland (S)	10	P,U*
1287	Litomysl/Liblice	Czech	300/200	D*,O*
1287	Tel Aviv	Israel	100/50	F*
1296	COPE Valencia	Spain	10	R
1296	BBC Orfordness	UK	500	D*
1314	Kvitsoy	Norway	1200	C,D*,E,J,M*,R*
1314	RNE-5 Tarrega	Spain	2	R
1323	R.Moscow via Leipzig	Germany (E)	150	C,D*
1332	Rome	Italy	300	C,D*,S
1341	BBC-Ulster Lisnagarvey	N.Ireland	100	C,D,E,S
1341	SER Tarrasa	Spain	2	R
1350	Nancy/Nice	France	100	C*,D*,R
1359	RNE-1 Mellilla	Spain	5	R
1368	Manx Radio, Foxdale	I.O.M	20	B,D,K*,L*,P*
1368	Venice	Italy	20	R
1377	Lille	France	300	C,O*
1377	Kyiv	USSR	50	R
1386	Kaliningrad	USSR	500	M*
1395	R.Tirana via Lushnje	Albania	1000	D*
1395	Alicante	Spain	2	R
1395	RNE-5 Tortosa	Spain	2	R
1404	Ajaccio, Corsica	France	2	R
1404	Brest	France	20	C,J
1413	RNE-5 Castellon	Spain	5	R
1413	Pristina	Yugoslavia	1000	G*,M*,R
1422	Alger	Algeria	50/25	D*,R
1422	Heusweiler	Germany (W)	600	C*,R
1422	Saarbrücken	Germany (W)	1200/600	D*
1431	Bernburg	Germany (E)	20	D*
1431	Dresden	Germany (E)	250	R
1440	Marnach	Luxembourg	1200	B*,D*,J,R
1449	Squinanzo	Italy	50	R
1449	BBC-R4 Redmoss	UK	2	E
1458	R.Tirana, Lushnje	Albania	500	D*,R
1467	TWR Monte Carlo	Monaco	1000/400	B*,C*,D*,G*,H*,M*,R
1476	Wien-Bisamberg	Austria	600	C,R
1476	RCE Bilbao	Spain	20	D*
1494	Clermont-Ferrand	France	20	B,R
1503	Stargard	Poland	300	D*,H*,O*,R
1503	Pamplona	Spain	2	D*
1512	BRT Wolvertem	Belgium	600	C*,D*,J,O,R
1512	Jeddah	Saudi Arabia	1000	D*,R*
1521	Duba	Saudi Arabia	2000	R*
1521	Radio Manresa	Spain	2	R*
1530	Vatican Radio, Home	Italy	1500/450	C*,D*,R,S
1539	DLF Mainflingen	Germany (W)	700	D*,R
1548	Trincomalee (DW relay)	Sri Lanka	600	I
1548	Nice	France	300	D*,R
1566	Stax	Tunisia	1200	D*,R
1575	RBI via Burg	Germany (E)	250	D*,M
1575	Genoa	Italy	50	D*
1575	Villanueva y Geltru	Spain	2	R
1584	SER Gandia	Spain	2	R
1583	Langenberg	Germany (W)	400/800	D*,R
1602	Bolzano	Italy	2	D*
1602	SER Cartagena	Spain	2	R
1602	R.Onteniente	Spain	2	O*,R
1611	Vatican Radio, Rome	Italy	5	O*

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

DXers:

- A: Darren Beasley, Bridgwater.
- B: Scott Caldwell, Warrington.
- C: Jim Cash, Swanwick.
- D: William Coughlan, Dublin.
- E: Adrian Don, Whitley Bay.
- F: Simon Harmer, New Radnor.
- G: Geoff Harris, Sturminster Newton.
- H: Sheila Hughes, Morden.
- I: Rhoderick Illman, Thurrait, Oman.
- J: George Millmore, Wootton IOW.
- K: Ike Odom, Glasgow.
- L: Roy Patrick, Derby.
- M: Alex Radulovic, Burton-upon-Trent.
- N: Tim Shirley, Bristol.
- O: Chris Shorten, Norwich.
- P: Roy Spencer, Coventry.
- Q: John Stevens, Largs.
- R: Jürgen Thiel, Javea, Spain.
- S: Phil Townsend, London.
- T: Peter Walduck, Milton Keynes.
- U: Neil Wheatley, Newcastle-upon-Tyne.

by Roy Spencer; Radio Suriname Int via RNB Brasilia, Brazil 17.755 (Du, Eng 1700-1745), 32443 at 1700 by Darren Beasley; Radio HCJB Quito, Ecuador 17.790 (Cz, Ger, Eng, Sw, Norw, Da, Fr, Sp 1700-2230), 44444 at 1925 by **Ted Agombar** in Norwich; RCI via Sackville, E Canada 17.870 (Eng, Fr to Europe 2030-2200), 33434 at 2132 by Robin Clark.

Some of the **15MHz (19m)** broadcasts from Radio Australia have been received well in the UK. Those via Shepparton were on 15.130 (Eng to SE Asia 2030-0130), rated as 34343 at 2115 by Cliff Stapleton; 15.160 (Eng, Fr to S.Pacific 1930-1030), 32222 at 0830 by Alan Smith; 15.240 (Eng to S.Pacific 2200-1030), heard at 0800 by Tim Shirley; also 15.465 (Eng to E Asia 2030-2100, SIO333 at 2100 by John Stevens. Their transmission to S.Asia via Carnarvon 15.485 (Eng 1400-1630) was rated as SIO444 at 1430 by Thomas Barnett. An "English by Radio" programme in Chinese to C.Asia via Darwin 15.170 may be heard between 2200 and 2300. David Edwardson quoted 35553 at 2225.

Many of the broadcasts in this band are beamed towards Europe and most are potent signals. Those noted stemmed from Radio Sophia, Bulgaria 15.160 (Ger, Fr, Eng 0530-0700), rated as 54444 at 0630 by David Wratten; Radio HCJB Quito, Ecuador 15.270 (Cz, Sw, Norw, Da, Ger, Eng 0500-0830), 32333 at 0801 by Leo Barr; UAE Radio Dubai 15.435 (Ar, Eng 0600-2050), SIO544 at 1625 by Brian Hallett; Radio Korea, Seoul 15.575 (Ar, It, Eng, Ger, Sp 1645-2300), 44444 at 1700 by Mike Smith; Radio Bangladesh, Dacca 15.255 (Eng, Ben 1815-2000), 44444 at 1815 by **Alex Radulovic** in Burton-on-Trent; WWCR Nashville, USA 15.690 (Eng 1400-0200), 54555 at 1824 by Robin Clark; WYFR via Okeechobee, Florida 15.565 (Ger, It, Eng, Sp 1600-2245), SIO242 at 1940 by Kenneth Buck; WCSN Scotts Corner, Maine 15.610 (Eng 2000-2155), 45444 at 2000 by **Roy Patrick** in Derby; Voice of Vietnam, Hanoi 15.010 (Russ, Sp, Eng, Fr 1600-2130), 55544 at 2043 by **Darran Taplin** in Brenchley; Radio Yugoslavia, Belgrade 15.105 (Eng 2100-2145), SIO444 at 2115 by **Aif Gray** in Birmingham; RCI via Sackville, Canada 15.325 (Ger, Hung, Cz, UK, Russ, Pol, Eng, Fr 1630-2200), 33223 at 2128 by Robin Harvey; Voice of Israel, Jerusalem 15.640 (Fr, Eng, YI 2100-2225), 55444 at 2130 by Ken Whayman; RNE via Aganda, Spain 15.280 (Fr, Eng 1800-2157), 44454 at 2153 by Roy Spencer; VOFC Taipei

G2VF LOOP ANTENNAS WITH ATU FOR HF HAM BAND TRANSMISSION (SWR One to One 40, 15 and 10 One Point Five to One 80 and 20) **AND SWLs LONG AND MEDIUM WAVE FOR BCLs**. Loops 21 inches square or triangle. No special skills required. Circuits, Parts Lists sources of supply assembly data. **HIGH FREQUENCY LOOP 80 to 10Metres** £5. **LONG AND MEDIUM WAVE LOOP FOR BCLs** £3. **LONG MEDIUM SHORT WAVE LOOP 1500 to 10 METRES FOR BCL SWL** £8. **SHORT WAVE ATU LOOP OR LONG WIRE** £4. **PRE AMP LW MW S WAVE** £2. **PHOTO COPY HRO MANUAL** £4. **MW LOOP WITH PRE AMP ATU** £3. **PRE AMP FOR G2VF 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. **METAL DETECTOR** £2. **F. G. Rylands, 39 Parkside Avenue, Millbrook, Southampton SO1 9AF. Tel: (0703) 775064.**

VACANCIES

FOR SALESMEN
IN: Both AMATEUR & PMR Equipment
at our EALING SHOP

Good remuneration and
working conditions

ARE COMMUNICATIONS LTD

6 Royal Parade, Hanger Lane, EALING,
London W5A 1ET

Phone: 081-997 4476 Fax: 081-991 2565

Ask Bernie or Brenda for full details

HOLDINGS AMATEUR ELECTRONICS

G3LLL for ICOM & YAESU

CW filters FT101ZD, FT902, FT707, FT102 £40 P.P. - Valves & Mod kits
FT101MK1-E, PX commission sales.

45 JOHNSTON STREET, BLACKBURN BB2 1EF
5 Miles from Junc. 31, M6 Tel: (0254) 59595
BUT HOLS? PHONE FIRST.

LINK ELECTRONICS

THE MAJOR RETAILER OF

REALISTIC SCANNERS

Phone for latest prices

OUR BEST PRICE YET!

PRO 2005: AM/FM 25-520, 760-1300MHz
400 Memories 240VAC/12VDC
While stocks last!

New PRO 2022: 68-88, 108-136 (AM), 136-174
380-512, 806-960 MHz 200 Memories 240VAC/12VDC

New PRO 2024: 68-88, 108-136 (AM), 136-174
380-512MHz, 60 Memories 240VAC (12VDC on request)

PRO 34 Handheld: 68-88, 108-136 (AM), 136-174
380-512, 806-960MHz 200 Memories

PRO 38 Handheld: 68-88, 136-174
406-512MHz 10 Memories

All Scanners Include FREE P&P 12 months warranty

Link Electronics

(Authorised Tandy Dealer)
228 Lincoln Road,
Peterborough PE1 2NE
(0733-45731) SAE for leaflet



ALYNTRONICS

129 CHILLINGHAM ROAD, HEATON,
NEWCASTLE-UPON-TYNE NE6 5XL TEL: 091-2761002

THE ONLY AUTHORISED DEALER IN THE NORTH-EAST FOR

ICOM & YAESU

WE ALSO STOCK MANY OTHER ITEMS OF EQUIPMENT FROM

MFJ ★ BUTTERNUT ★ CUSHCRAFT TONNA ★ DIAMOND ★ AOR
BEARCAT ★ FAIRMATE ★ JUPITER ★ LOWE ★ TEAM

MIDLAND ★ NEVADA ★ CTE ★ WELZ

★ REVEX ★ BOOKS & MAPS ★



LICENSED CREDIT BROKER

OPEN 10am - 5.45pm TUES - FRI 10am - 4.45pm SAT

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 (your computer?) or several miles away, e.g. power lines, 1.5-30MHz. **£79.50**. Ex-stock.

S.E.M. VHF CONVERTER

Plugs into any h.f. 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 v.h.f. scanner aerial socket and converts its range to cover 100kHz to 60MHz. Gives you full l.f., m.f., h.f., v.h.f., u.h.f. coverage. **£55.00**.

VERY WIDE BAND PRE-AMPS

3MHz 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-20Hz, 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.

Short Wave Receivers & Scanners

Aerial
Accessories & Masts

ELLIOTT ELECTRONICS

for the Radio Enthusiast



Instant finance available
Written details on request.



RIGS, ANTENNAS, SWR BRIDGES,
POWER SUPPLIES, TEST GEAR,
COMPONENTS, MORSE KEYS,
COAXIAL CABLES, ROTATORS,
MICS, PLUGS AND SOCKETS,
SWITCHES.



Books for
radio amateurs

FAMOUS "Complete Guide
to VHF/UHF Frequencies
26-2250MHz"

JAYBEAM
AMATEUR
ANTENNAS
APPOINTED
DISTRIBUTOR



QSY
OLD
MAN TO

Call us on LEIC. 553293
OR COME AND LOOK AROUND
AT

26/28 Braunstone Gate,
Leicester.

SEEN & HEARD

via Okeechobee, Florida 15.440 (Chin, Ger, Fr, Eng 1900-2300), 33443 at 2235 by Sheila Hughes.

Throughout the day there are many broadcasts in a variety of languages to other areas. They include Radio Japan via Montsinery, Fr. Guiana 15.325 (Jap, Eng, Sp to C.America 0200-0400), noted as 34433 at 0215 by Kenneth Reece; RFO Papeete, Tahiti 15.170 (Fr, Tah to Oceania 1600-0930), SIO333 at 0500 by Simon Hamer; BRT via Wavre, Belgium 15.515 (Du to Africa 0500-0555), 53343 at 0500 by Chris Shorten; Radio Romania Int, Bucharest 15.340 (Eng to Africa 0530-0600), 34334 at 0530 by John Sadler; also to SE Asia 15.335 (Eng 0645-0715), SIO333 at 0700 by Francis Hearne; BBC via Mahe, Seychelles 15.420 (Eng, Swa to E.Africa 0300-1215), SIO211 at 0913 by Philip Rambaut; Voice of Greece, Athens 15.630 (Gr, Eng to E.Asia 1000-1050), 33222 at 1047 by Jim Cash; Radio Austria Int, Vienna 15.430 (Ger, Eng to E.Asia 1100-1400), 55555 at 1337 by Andy Cadier; Radio Finland via Pori 15.185 (Eng, Sw, Fin to Middle East 1405-1557), 43333 at 1425 by Rhoderick Illman (Oman); RBl via Nauen, GDR 15.145 (Fr, Swa, Ar, Eng to Middle East, E.Africa 1415-1815), 53554 at 1740 by Darren Beasley; Radio Kuwait, Sulaiyah 15.495 (Ar to N.Africa 0200-0000), SIO444 at 1835 by John Coulter; Radio Netherlands via Talata Volon, Madagascar 15.560 (Eng to Africa 1830-1925), 44434 at 1855 by Ted Agombar; Radio Portugal, Lisbon 15.250 (Porto to Africa 1400-2100), 45454 at 1910 by Eddie McKeown.

The broadcasters now using the 13MHz (22m) band include Radio Australia via Shepparton 13.700 (Eng to C.Pacific 0200-0800), rated as 43343 at 0702 by Alan Smith; Radio Korea, Seoul 13.670 (It, Fr, Ger, Eng to Europe 0800-0900), 33233 at 0805 by Chris Shorten in Norwich; SRI via Sottens, Switzerland 13.685 (It, Eng, Ger, Fr to Australia, Pacific areas 0745-1030), 44333 at 0830 by Sheila Hughes; BRT via Wavre 13.675 (Eng, Fr, Du to Africa, Europe 0900-1125), SIO333 at 0925 by Brian Hallett; Radio Australia via Brandon 13.740 (Eng to S.Asia, Europe 1530-1800), 44333 at 1700 by Derek Carter in Cambridge; Radio Pakistan, Islamabad 13.665 (Ur, Eng to N.Africa, Middle East 1315-1630), SIO333 at 1600 by Kenneth Buck; Radio Austria Int, Vienna 13.730 (Ger, Fr, Eng, Sp to Europe 0400-1700), 45554 at 1632 by David Edwardson; AWR Agat, Guam 13.720 (Hi, Tel to S.Asia 1600-1700), SIO322 at 1650 by Philip Rambaut; Radio Kuwait, Sulaiyah 13.610 (Eng, Ar to Europe, USA 1800-2100), 33333 at 1806 by Leo Barr; ISBS Reykjavik 13.855 (Ic to Europe 1855-1930), SIO444 at 1900 by Simon Hamer; Radio DW via Julich, W. Germany 13.790 (Ha, Eng to Africa 1800-1950), 44444 at 1950 by Rhoderick Illman (Oman); WHRI Noblesville, USA 13.760 (Eng, Sp, Port, Yu to EUSA, Europe 1700-0000), 43433 at 1952 by Roy Spencer; WSHB Cypress Creek, USA 13.770 (Eng, Ger, Fr to EUSA, Europe 2000-2155), heard at 2000 by Roy Patrick; WRNO New Orleans, USA 13.720 (Eng to EUSA, Europe 2100-0000), 34333 at 2145 by Mike Smith; Radio Netherlands via Flevo 13.700 (Fr, Ar, Eng to E/W.Africa 1830-2125), 24443 at 2055 by Andy

Transatlantic DX Chart

USA				
710	WOR	New York, NY	0200	B
880	WCBS	New York, NY	0200	B,D
1010	WINS	New York, NY	0305	D
1130	WNEW	New York, NY	0230	B
1210	WCAU	Philadelphia, PA	0257	D
1510	WKUU	Boston, MA	0330	B,C
CANADA				
590	VOCM	St. John's, NF	0100	D
640	CBN	St. John's, NF	2350	D
830	C.YQ	St. John's, NF	2350	D
960	CFX	Kingston, ON	0330	B
1220	KCKW	Moncton, NB	0200	O
1290	CHRM	Matane, PQ	0230	O
C.AMERICA & CARIBBEAN				
535	R Grenada	St George's, Grenada	1615	A
555	ZIZ	Basseterre, St.Kitts	2047	A
595	Dominica B.Corp	Roseau, Dominica	1240	A
610	R.Relej	Trinidad	0200	A
620	ABBS	St. Johns, Antigua	1234	A
660	R. St. Lucia	Castries, St. Lucia	1027	A
705	R. St. Vincent	Kingstown, St. Vincent	0209	A
730	Trinidad B.Corp	Trinidad	0215	A
790	Voice of Barbados	St. George, Barbados	1615	A
825	R Paradise	Basseterre, St. Kitts	0222	A
900	Caribbean BC	Bridgetown, Barbados	1615	A
1030	WOSO	San Juan, Puerto Rico	0644	A
1060	Voice of Life	Roseau, Dominica	1615	A
1090	R. Caribbean	St. Lucia	1615	A
1310	RFD Ft de France	Martinique	1500	A
1370	WIVV	Fuerto Rico	1300	A
1480	R. Disco	S Domingo, Dominica	1251	A
1505	R. Anguilla	Anguilla	1246	A
1610	Caribbean Beacon	The Valley, Anguilla	0212	A,D

DXers:

A: Andy Cadier, while in St. Lucia.
B: Tim Shirley, Bristol.

C: Jurgen Thiel, Javea, Spain.
D: Jim Willett, Grimsby.

Ted Agombar: Grundig Satellit 400 + 20m random wire.

Thomas Barnett: Kenwood R2000 + random wire.

Leo Barr: Matsui MR4099 + internal antenna.

Darren Beasley: Philips D2935 + Hexagon loop or ATU + 10m random wire.

Kenneth Buck: Lowe HF225 + random wire or home-built TRF set + loop.

Andy Cadier: Saisho SW500 + 40m random wire or Datong active antenna.

Scott Caldwell: Saisho 2000 + random wire.

Derek Carter: Matsui MR4099 + random wire.

Jim Cash: Kenwood R5000 + random wire or Sony ICF 2001D + AN-1.

Robin Clark: Saisho SW5000 + 20m random wire.

William Coughlan: Home built superhet + ferrite rod antenna.

John Coulter: Yaesu FRG-7 + random wire.

Adrian Don: Philips 752 digital car radio + whip antenna on car.

David Edwardson: Trio R600 + trap dipole 22m long.

Alf Gray: Codar CR70 + Codar ATU + Ex-Army rod antenna.

Bill Griffiths: Sony ICF 2002 + built-in whip.

Brian Hallett: Trio R2000 + 10m random wire.

Simon Hamer: Lafayette HE30 + "Sooper Loop" or Grundig S1400 + 19m wire.

Geoff Harris: Home built 3 transistor reflex receiver + ferrite rod.

Robin Harvey: Matsui MR 4099 + SW loop.

Francis Hearne: Sharp GFA3 + random wire.

Simon Holland: Philips 870 portable.

Sheila Hughes: Panasonic DR48 + 15m inverted L or Sony ICF 7600DS + whip.

Rhoderick Illman: Sony ICF 7600DS + 23m random wire.

Eddie McKeown: Tatung TMR 7602 portable.

George Millmore: Tatung TMR 7602 portable.

Dick Moon: Icom R-70

Ike Odoom: Philips D2935 portable.

Fred Pallant: Trio R2000 + random wire in loft.

Roy Patrick: Lowe HF 125 + 20m wire

Alex Radulovic: Matsui MR 4099 portable.

Philip Rambaut: Int. Marine Radio R.700M + random wire.

Kenneth Reece: Icom R9000 or Kenwood R5000 + delta loop.

Alan Roberts: Panasonic RF-B40 + built-in whip.

John Sadler: Omega 4020 or Omega 4022 + built-in whip.

Tim Shirley: Trio R600 + random wire.

Chris Shorten: Matsui MR 4099 portable.

Alan Smith: Matsui MR4099 + Mizuho KX-3 ATU + random wire.

Mike Smith: Lowe HF-225.

Roy Spencer: Realistic DX-200 + 0.5m loop or DX-400 + 5m wire.

Cliff Stapleton: Trio R1000 + dipole or 25m random wire.

John Stevens: Hammarlund HQ 180 or Icom R70 + random wire.

Darren Taplin: Lowe HF225 + Global ATU + 30m random wire.

Jurgens Thiel: Grundig Satellit 3000 + 2.2m hexagon spiral loop

Phil Townsend: Lowe SRX-30 + loop or ATU + random wire.

Peter Walduck: Saisho SW5000 + built-in whip.

Ken Whyman: Realistic DX-440 + 15m inverted L or Vega 206 + whip.

Neil Wheatley: Sangean ATS 803 + built-in whip.

Jim Willett: RCA AR77 + X dipole in loft or 4m loop.

Julian Wood: Trio R2000 + random wire.

David Wratten: Philips D2999 + loop or Trio R2000 + ATU + 30m random wire.



Scott Caldwell DXing in Warrington.

Cadier; VOA via Bethany, USA 13.740 (Sp to C.America 0100-0400), 23433 at 0316 by Kenneth Reece.

Amongst the many 11MHz (25m) broadcasts noted in the reports were the BBC via Masirah, Oman 11.760 (Eng to Middle East 0300-0815), rated as 33423 at 0330 by Kenneth Reece; Radio Korea via Sackville, Canada 11.715 (Eng to USA 1030-1100), 44444 at 1040 by Chris Shorten; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600), 33232 at 1405 by Andy Cadier; FEBC Boucau, Manila 11.850 (Eng 1300-1600), heard at 1410 by Dick Moon (S.Africa); FEBA Radio Seychelles 11.865 (Hi, Eng to S.Asia 1400-1625), 34333 at 1608 by Rhoderick Illman (Oman); TWR Agana, Guam 11.650 (Eng to S.Asia 1500-1636), 32232 at 1610 by Alan Smith; Radio Australia via Carnarvon 11.800 (Eng to SE Asia 2000-2200), SIO333 at 2115 by Francis Hearne; VOA via Tinang, Philippines 11.870 (Eng to E.Asia 2100-2200), heard at 2145 by Mike Smith; Radio Vilnius, Lithuania 11.770 (Eng to USA 2200-2230), 33333 at 2200 by Sheila Hughes.

Some of the numerous broadcasts to Europe were also mentioned: Radio Cairo, Egypt 12.050 (Ar 0600-2250), rated as 55555 at 0700 by Bill Griffith while in Krakow, Poland; TWR Monaco 11.655 (Eng 0855-1005), SIO544 at 0910 by Philip Rambaut; Voice of Greece, Kavala 11.645 (Gr, Eng 1500-1550), SIO555 at 1530 by Kenneth Buck; Radio Pakistan, Islamabad 11.570 (Eng 1715-1800), 33433 at 1727 by Leo Barr; AIR via Aligarh, India 11.620 (Eng 1845-2045), SIO544 at 1845 by Brian Hallett; Radio Afghanistan via USSR 11.830 (Ger, Eng, Fr 1700-2000), 33443 at 1845 by Robin Clark; Radio Portugal, Lisbon 11.740 (Eng, Fr, It, 1900-2030), SIO433 at 1920 by Alf Gray; Voice of Israel, Jerusalem 11.605 (Eng, Fr, Russ, Yi 1900-2225), 44544 at 1924 by Darren Taplin; RAI Rome 11.800 (Eng Da, Sw, Esp 1935-2020), 43333 at 1935 by Jim Cash; Radio Damascus, Syria 12.085 (Ger, Fr, Eng 1805-2105), 54454 at 2017 by Roy Spencer; Radio Beijing, China 11.500 (Russ, Ger, Eng 1700-2155), 54544 at 2022 by Darren Beasley; RNE Arganda, Spain 11.790 (Fr, Eng 1800-2157), 44434 at 2116 by Robin Harvey; Radio Moscow, USSR 11.630 (Eng 2200-2300), 54444 at 2200 by Ken Whyman; RHC Havana via USSR 11.705 (Fr, Eng 2100-2300), heard at 2218 by Scott Caldwell in Warrington; also RHC via USSR 11.930 (Fr, Eng 2100-2300), 45554 at 2235 by David Edwardson; Radio Japan via Moyabi, Gabon 11.835 (Jap, Eng 2200-0000), 43243 at 2300 by Eddie McKeown.

There are a great many broadcasts to Europe in the 9MHz (31m) too! A few that are seldom reported stem from TWR Monaco 9.480 (Eng 0640-0825) rated as 45444 at 0815 by Roy Patrick; AWR via Sines, Portugal 9.670 (Pol, Ger, Eng 0600-0900, Sun Only), heard at 0815 by Scott Caldwell; IRRS Milan, Italy 9.860 (Eng 1000-1230, Sun Only), 33333 at 1100 by Alex Radulovic; Radio Pyongyang, N.Korea 9.345 (Eng 2000-2050), SIO344 at 2000 by Neil Wheatley; Radio Finland via Pori 9.550 (Fin, Eng, Ger, Fr, Sw 1600-2055), 55545 at 1945 by Ted Agombar.

The 7MHz (41m) band is very

SPECTRUM OWNERS

No more waiting for programs to load, switch on and your program is ready to use!!

We are now able to supply our Spectrum programs on EPROM, together with a suitable EPROM loader board and all hardware housed in one unit.

The many advantages are too numerous to mention here. Please contact us for details. An SAE would be appreciated.

NOW available for all versions of the Spectrum.

J. & P. ELECTRONICS LTD.

VISA

Unit 45, Meadowmill Estate, Dixon Street,
Kidderminster DY10 1HH Tel: (0562)753893



VHF & UHF ENTHUSIASTS



Our Audio Switch Unit will link your RX & Tape Recorder to collect signals while you sleep or work. A boon to Airbanders
Requires 12V. DC @ 60mA.
SUPPLIED BUILT & TESTED COMPLETE WITH AUDIO LEADS.
ACCESS & VISA £48.95 inc P & P.
Or send S.A.E. for details to:- AEROTRONIC CONTROLS LTD.
HALESFIELD 22, TELFORD, SHROPSHIRE TF7 4QX. (0952) 586329

REALISTIC PRO-2004 OWNERS

KIT 1 All you need is a few minutes and a soldering iron to upgrade your scanner to *400 CHANNELS & SUPER FAST SCAN*

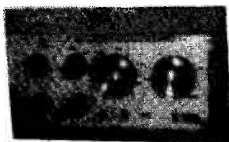
KIT 2 By demand - A further selection of simple low-cost modification ideas for the 2004 includes: 'Tune-up' 'S-meter' 'Turbo-Scan' & more.

★ Each kit only £5.00 incl. P&P ★

P. Beckett 3 Pasture Close, Whitmore, Staffs ST5 5DQ

D100 DX-TV CONVERTER SYSTEM

- ★ Covers ALL VHF/UHF DX - TV channels
- ★ Uses normal TV as monitor
- ★ Switchable IF bandwidths. Ultra-narrow ensures that weak DX is lifted out of the noise
- ★ Multi-system sound (via FM radio) irrespective of vision IF bandwidth (Inc. W.Eur, 5.5, USSR 6.5, USA 4.5MHz)
- ★ Suitable for SpE, F2, Tropo DX, etc



Upgrade your DX system NOW! "De-Luxe" version only £89.99 inc. UK P&P

- ★ DX-TV AERIALS - VHF and UHF ★ MASTHEAD AMPLIFIERS ★ DISTRIBUTION EQUIPMENT ★
- ★ TECHNICAL PUBLICATIONS - DX TV, SATELLITE TV, SW LISTENING, etc ★
- ★ ALLOY MASTS, BRACKETS & FITTINGS ★ DOMESTIC FM & TV AERIALS ★

We have over two decades of DX-TV experience and can offer you effective, yet affordable, specialist equipment to enable you to get the most from the hobby. Send two First Class stamps (or 3 IRC's) for our complete product range.

HS PUBLICATIONS

7 EPPING CLOSE, DERBY DE3 4HR, ENGLAND. Tel: 0332 381699

Items normally despatched within 7-10 days. Mail Order - callers by arrangement only.

AVIATION ENTHUSIASTS AVIATORS - LISTENERS

AIR TRAFFIC CONTROLLERS - on hand to help 'Guide' you towards an interesting & rewarding pastime.
AIR BAND RADIOS-SCANNERS etc.
Over 20 to choose from: AERIALS & ACCESSORIES: MAPS - BOOKS: CHARTS: CAA PUBLICATIONS: POSTCARDS: MODELS: TIE PINS & BADGES: AIRBAND TRANSCEIVERS: PHOTOS: PILOTS PRODUCTS

Information pack only 50p.



AIR SUPPLY

83b High Street, Yeadon,
Leeds LS19 7TA. TEL: 0532-509581
Shop just two minutes from Leeds Bradford Airport.
(Closed Wednesday & Sunday).

ALL VALVES & TRANSISTORS

Call or phone for a most courteous quotation
081-743 0899

We are one of the largest stockists of valves etc, in the U.K.

COLOMOR ELECTRONICS LTD.

170 GOLDHAWK ROAD
LONDON W12 8HJ

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 BH9 1DT.
STOP PRESS: Confidential Band Plan NOW OUT. Same Price £19.50 But this time loads more spot frequencies. Order yours today.

INDEX TO ADVERTISERS

Aerial Techniques	53	Datong	51	J. & P. Electronics	59	Rylands F G	57
Aerotron Controls	59	Dewsbury Electronics	28, 48	Javiation	53	S E M	57
Air Supply	59	Dressler Communications	27	Johnsons Shortwave Radio	32	SRP Trading	46
Alyntronics	57	Elliott Electronics	57	Lake Electronics	36	SSC	59
ARE	13, 57	EMP	23	Link Electronics	57	Solid State Electronics	36
ASK Electronics	44	ERA	32	Lowe Electronics	8, 9	South Midlands Communications	Cover iv
BBC	36	Flightdeck	53	Nevada Communications Cover iv	
Beckett. P	59	Garex Electronics	28 Cover ii, 18, 19, 39		Spacotech	53
Birkett J	46	Garibaldi	53	Phase Track	51	Stephens James	55
Bredhurst Electronics	27	HS Publications	59	Photo Acoustics	15	Technical Software	46
Circuit	23	Holdings Amateur Radio	57	Rapid Results College	51	Ward Reg & Co	36
Colomor Electronics	59	Icom (UK)	Cover iii	Raycom Communications Systems	21	Waters & Stanton	35
Comar	48	Interbooks	46				

SEEN & HEARD

Tropical Band Chart

Freq MHz	Station	County	UTC	DXer
2.560	Xinjiang	China	2254	D,L
3.200	TWR	Swaziland	0500	L
3.210	R.Mozambique	Mozambique	0545	L
3.215	R.Orange	S.Africa	0230	L
3.220	R.Togo, Lome	Togo	0510	P
3.230	R.Nepal	Kathmandu	0030	P
3.230	ELWA Monrovia	Liberia	2150	L,L
3.255	BBC via Maseru	Lesotho	0445	G
3.300	R.Cultural	Guatemala	0342	C
3.365	6BC Radio 2	Ghana	2010	P
3.915	BBC Kranji	Singapore	2005	O,P
3.955	BBC Daventry	England	2035	E
3.965	RFI Paris	France	1731	M,O
3.975	BBC Skelton	England	0348	C
3.980	VOA Munich	W.Germany	0455	M
3.985	R.Beijing, China	via SRI Berne	2105	E,M
3.985	SRI Berne	Switzerland	1745	F,M
3.995	DW Cologne (Julich)	W.Germany	2200	J
4.080	R.Ulan Bator	Mongolia	2250	L,P
4.330	PBS Xinjiang	China	2315	D
4.500	Xinjiang	China	2335	D,M
4.545	Alma Ata	USSR	2157	A
4.735	Xinjiang	China	0020	C,D,P
4.740	R.Afghanistan	via USSR	1930	E
4.755	Caracol Neiva	Columbia	0144	C
4.760	ELWA Monrovia	Liberia	2047	C,I
4.765	R.Moscow	via Cuba	0620	D
4.770	FRON Kaduna	Nigeria	1850	I
4.775	R.Gabon, Libreville	Gabon	2230	D,I
4.865	V of Cinaruco	Colombia	0518	D
4.870	R.Cotonou	Benin	2245	A,I
4.880	SABC Radio 5	S.Africa	2000	P
4.885	Voice of Kenya	Kenya	2025	I,P
4.900	V de la Rev.Conakry	Guinea	2035	I
4.905	R.Relogio, Rio	Brazil	0545	N
4.905	R.Nat.N'djamena	Chad	2100	B,I,J,P
4.915	R.Anhanguera	Brazil	0617	C
4.915	R.Ghana, Accra	Ghana	2155	E,I,J
4.915	Voice of Kenya	Kenya	2025	I
4.930	R.Moscow	USSR	2100	E
4.935	Voice of Kenya	Kenya	1950	C,I,K,O
4.940	R.Kiev 2	USSR	2005	C,I
4.945	Caracol, Neiva	Columbia	0558	C
4.958	R.Baku	USSR	2140	E,H
4.975	R.Uganda, Kampala	Uganda	2055	C,I
4.980	Ecos del Torbes	Venezuela	0250	C
4.985	R.Brazil Central	Brazil	0602	C,D,N
4.990	AIK via Madras	India	2356	O
4.990	FRON Lagos	Nigeria	2045	I
5.000	VYTO Caracas	Venezuela	0450	P
5.005	R.Nacional, Bata	Eq. Guinea	2003	C,E,I,J
5.015	R.Moskva 4 (Ashkhabad)	USSR	0001	O
5.025	R.Rebelde, Habana	Cuba	0145	P
5.035	R.Bangui	C.Africa	2025	C,I
5.035	R.Alma Ata	USSR	2358	C
5.047	R.Togo, Lome	Togo	2050	I
5.055	Faro del Caribe	Costa Rica	0547	C
5.055	RFO Cayenne(Matoury)	French Guiana	0602	N
5.080	PBS Xinjiang	China	2315	D
5.085	R.Candip, Bunia	Zaire	1830	I,J,P
5.075	Caracol Bogata	Colombia	0530	D,N,P
5.163	R.Beijing	China	2151	C
5.440	PBS Xinjiang	China	2315	D

DXers

A: Leo Barr, Sunderland.
 B: Darren Beasley, Bridgwater.
 C: Jim Cash, Swanwick.
 D: David Edwardson, Wallsend.
 E: Bill Griffith, while in Krakow, Poland.
 F: Brian Hallett, Burgess Hill.
 G: Rhoderick Illman, Thumrait, Oman.
 H: Dick Moon, George, Rep. S. Africa.
 I: Fred Pallant, Storrington.
 J: Roy Patrick, Derby.
 K: Alex Radulovic, Burton-on-Trent.
 L: Tim Shirley, Bristol.
 M: Chris Shorten, Norwich.
 N: Alan Smith, Northampton.
 O: Darran Taplin, Brechley.
 P: Jim Willett, Grimsby.

Abbreviations

Ar	Arabic
Beng	Bengali
Chin	Chinese
Cz	Czechoslovakian
Dan	Danish
Du	Dutch
Eng	English
Esp	Esperanto
Far	Farsi
Fin	Finnish
Fr	French
Ger	German
Gr	Greek
Ha	Hausa
Hi	Hindi
Hung	Hungarian
ic	Icelandic
It	Italian
Jap	Japanese
Kor	Korean
Norw	Norwegian
Pol	Polish
Port	Portuguese
Russ	Russian
Sp	Spanish
Sw	Swedish
Swa	Swahili
Tah	Tahitian
Tel	Telugu
Uk	Ukrainian
Ur	Urdu
Yi	Yiddish
Yu	Yugoslavian

congested with broadcasts to Europe from nearby stations, e.g. Radio Kiev, Ukraine 7.240 (Eng to Europe 1800-1830), heard by Julian Wood, but some have to travel much longer distances to reach us, e.g. WWCR in Nashville, USA 7.520 (Eng 0100-0530), rated as SIO454 at 0100 by Neil Wheatley; or WYFR via Okeechobee, Florida 7.350 (Russ, Ger, Eng 0400-0745), 55555 at 0700 by Bill Griffith.

Others, however, are relayed e.g. VOA via BBC Woofferton, UK 7.175 (Hung, Cz 1700-2100), SIO444 at 1815 by John Coulter, or RCI Montreal via BBC Daventry, UK 7.235 (Ger, Hung, Cz, Eng, Fr 1630-2200), 44444 at 1930 by Ted Agombar.

Many of the broadcasts to other areas are good signals here too e.g. Radio Korea, Seoul 7.550 (It, Fr, Kor, Ar, Ger, Eng, Sp, Port to Middle East, E Africa 1545-2345), noted as 44433 at 1815 by Darran Taplin; Voice of Nigeria, Lagos 7.255 (Eng, Fr, Ha to W. Africa 0500-2200), SIO444 at 2200 by Simon Hamer.

The broadcasters using the 6MHz (49m) band to reach listeners in Europe include BRT via Wavre, Belgium 6.035 (Du, Eng, Fr, Ger 0600-0800), SIO434 at 0600 by Ike Odoom; VOIRI Tehran, Iran 6.035 (Tur, Ger, Eng, Sp 1700-2130), 33433 at 1950

by David Edwardson; RBI Berlin 6.115 (Eng 1945-2030), 55555 at 1955 by Bill Griffith; King of Hope, Lebanon 6.280 (Eng 2000-2200), 34423 at 2200 by Darran Taplin.

Station Addresses

BBC Radio Scotland, Broadcasting House, Queen Margaret Drive, Glasgow G12 8DG.

ILR Plymouth Sound, Earl's Acre, Alma Road, Plymouth PL3 4HX.

Deutsche Welle, P.O.Box 100 444, D-5000 Cologne 1, West Germany.

Radio Canada International, P.O.Box 6000, Montreal, Canada H3C 3A8.

Radio Nederlands, P.O.Box 222, 1200 JG Hilversum, The Netherlands.

World Harvest Radio (WHRI), P.O.Box 12, South Bend, Indiana 46624, USA.

SWM SUBSCRIPTIONS

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) 665524.

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

SHORT WAVE MAGAZINE 1 YEAR

- £19.00 (UK)
 £21.00 (Europe)
 £22.00 (Rest of World)

PRACTICAL WIRELESS 1YEAR

- £19.00 (UK)
 £21.00 (Europe)
 £22.00 (Rest of World)

SPECIAL JOINT SUBSCRIPTION 1 YEAR

- £32.00 (UK)
 £35.00 (Europe)
 £37.00 (Rest of World)

Prices current at June 1990

To commence with issue dated.....

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 £.....

Card No.

Valid from to

Signature.....



ICOM are proud to introduce the IC-R72 Communications Base Receiver to complement the IC-R100 Mobile and IC-R1 Handheld receivers giving the enthusiastic listener a full choice.



Features:

- **Direct Frequency entry**
- **99 Memory Channels**
- **Built-in clock and timer**
- **AC/DC operation**
- **Noise Blanker**
- **Pre-amp and Attenuator**
- **ICOM's DDS system (direct digital synthesiser)**

IC-R72 Communications Receiver

ICOM's communication receivers have a reputation for reliability and quality. Building on this reputation the IC-R72 HF receiver is one of a new line of wideband receivers to satisfy listeners everywhere.

This compact receiver has continuous coverage from 100kHz – 30MHz, in SSB, AM and CW modes. An optional U1-8 adds FM reception. The easy to operate IC-R72 is superb for beginners or experienced DX'ers alike and is equipped with a variety of functions.

The IC-R72 boasts a unique internal storage battery which provides approx. one hours operation when an external supply is not available, making it ideal for portable use or during power failures. The IC-R72 joins ICOM's current line of quality receivers. For a free brochure on this or any other ICOM Amateur Radio product contact your local authorised ICOM dealer or ICOM (UK) Ltd.

Icom (UK) Ltd

Dept. SW, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 741741. Fax: 0227 360155.

Visa & Mastercards: Telephone orders taken by mail order, instant credit & interest-free HP. Despatch on same day whenever possible.



A high-performance HF rig . . . with a great receiver and full-power transmitter. Light in weight and low in price.

This is Yaesu's FT-747GX.

Whether you're a beginner or a veteran, it's a great way to start. And a great way to go.

DX ready. The 747 packs a full 100-watt RF punch on 160 to 10 meters, with continuous receive from 100 kHz to 30MHz.

And its control panel is refreshingly simple. So you can hop around the band fast to nail those DX stations. While other guys are warming up their amplifiers, you can be working the DX!

Multimode versatility. The FT-747GX is ready to go on LSB, USB, CW, and AM. With provision for the FM-747 FM unit.

You get 20 memories to store frequency and mode. Dual VFOs with split frequency operation for DX-pedition work. And manual band scan

plus auto-resume memory scan via the microphone up/down buttons.

Great receiver. Utilizing a directly-driven mixer, the FT-747GX receiver features superb overload protection. You also get factory-installed narrow CW and AM filters. A one-touch noise blanker. All-mode squelch. RIT. And a 20-dB attenuator for local QSOs.

Lightweight construction. Housed in a metallized high-impact plastic case, the FT-747GX weighs in at about 7½ pounds! With the loud-speaker mounted on the front panel for maximum audio transfer. And internal heatsinking for the transmitter, rated at full power for FM, packet, RTTY, SSTV, and AMTOR when used with a heavy-duty power supply.

Available options. FC-1000 or FC-757AT Automatic Antenna Tuners. FL-7000 500-watt Automatic, Solid-State Linear Amplifier. TCXO-747

Temperature-Compensated Crystal Oscillator. FAS 1 4R Remote Antenna Selector. FRB-757 Amplifier Relay Box. FP-700 Standard Power Supply. FP-757HD Heavy-Duty Power Supply. MMB-38 Mobile Mounting Bracket. MH-1B8 & MD-1B8 Microphones.

Discover the price / performance leader. Check out Yaesu's low-cost FT-747GX at your Yaesu dealer today. Because now, Yaesu puts priceless DX into your price range.

South Midlands Communications Ltd

S.M. House, School Close,
Chandlers Ford Industrial Estate,
Eastleigh, Hants SO5 3BY

Tel: (0703) 255111

UK Sole Distributor

YAESU

Fill your logbook.
Without emptying your pocket.

