Short Wave
Magazine
AUGUST 1989

ORP ON ICE
The Story of Ice Station GVPZ

PLANT A MAST THIS SUMMER
Tennamast Economy Plus Mast Extender

BUILD AN HE-VHF CONVERTER
For Your Scanner

For The Radio Listener
YOUR ONE STOP LISTENER GUIDE!
Huge stocks • Best prices • Good back-up • Free Securicor
Almost all items in this magazine from stock!

NEW PANSONIC RF-865D POCKET SSB/BM SW RECEIVER

We are pleased to be able to announce the new Pansonic RF-865D portable short wave receiver with AM & SSB. Measuring 198 x 118 x 33 mm it is highly compact, yet an excellent performer. Covering 2 to 20 MHz plus FM broadcast it is ideal for the traveller. Electronic or manual tuning in kHz steps with SSB fine tune is a first in a receiver of this size. 26 memories, clock, and auto-scan add to its attractions. Supplied with AC adapter, external antenna, case, etc., this is just the job for the bedroom, office or hotel.

£179 including free delivery

OTHER SONY PRODUCTS

- IFC7600DA Analogue SW receiver £129.00
- ICF S7050C Short wave receiver £245.00
- ICF MR655 SW/VHF receiver £299.00
- AN1 Active SW antenna £49.00
- AN2 Active VHF-AIR receiver £45.00
- BP33-1 call battery pack £16.95
- ACC14 mains PSU charger £19.95
- SCD17 VHF/UHF PSL £299.00

All our Sony stock carries UK cards and do not have serial numbers etc., removed from boxes!

£299 FREE SECURICOR

AOR 2022 SCANNER VHF/UHF MONITOR

From AOR the latest VHF/UHF monitor covers 26 to 1300 MHz. SWL highly compact 25x20x9 cm has LCD memories and scanning, ideal for the serious user. 4 wide range of switches and 250 SW & 12 VDC.

£475 FREE SECURICOR

VHF/UHF AIRBAND MONITOR SIGNAL R535 £249 Carr. Free

This latest receiver covers both civil and military bands. Coverage is 108-135 MHz & 220-350 MHz. Featuring a 20 channel memory, the receiver will enable you to monitor virtually any air traffic. The 12 volt requirement makes it ideal for base, mobile or portable work.

25MHz to 1300 MHz HANDHELD!

We don’t announce new products prior to their availability, but the MV7500 looks to be something rather special. It is likely to be available before the autumn, and is a true handheld monitor covering 25MHz to 1300MHz! There is one gap between 550 and 6000MHz (UK TV band). Covers the full military band, AM/FM, programmable steps 5 to 25kHz, 100 memories. 10 band scan memories, Battery saver, antenna, etc. We have not yet final specification yet, but price will be £299. If you want full details, then just send us an addressed envelope marked “MV75000”.

AVAILABLE AUGUST

AOR 900 SCANNER!

We are approved stockists of this latest model. Look at the range! AM/FM 108-174 MHz 220-290 MHz 300-3000 MHz 400-470MHz 850-950 MHz.

If you don’t normally need a dected monitor that covers military band!

£235 + £2 p&p

SHORT WAVE LISTENER’S CONFIDENTIAL FREQUENCY LIST

The 1989 Short Wave Listeners Confidential Frequency List (previous editions published under the title UK Listeners Confidential Frequency List) is now well established as the most up-to-date and price guide to general world short wave frequencies. Published in the UK it is totally suitable for use throughout all of Europe, unlike some of the American publications costing much more! Superbly produced and laid out, you will find endless use for this two 边装。The first section contains some useful editorial and the main body contains a complete, fully indexed list of frequencies. Large A4 format has been necessary to contain all the information, but it is still possible to get to 160 pages! It’s all there: broadcast, military, naval, air, shipping, press etc, with listings for CW, SSB, RTTY, TEL, FAC, Call-signs and time schedules are all included. Tremendous value even for the news media are purchasing it! In the unlikely event of you not being totally satisfied we offer a full refund if returned within 7 days of purchase. How’s that for confidence?

£7.95 plus £1 post & packing.

VHF/UHF AIRBAND FREQUENCY GUIDE

This is the third edition of the famous airband guide published by Spac Publications. Not the normal budget kind of publication produced by competitors on a home computer, this is professionally prepared and laid out. All the information is taken from official sources, both military and commercial, and is undoubtedly the most complete airband listing generally available for the UK enthusiast. There is plenty of editorial and explanations, photographs and of course very complete frequency listings. Entries are listed both alphabetically and numerically for cross checking. The list also includes company and airway frequencies. Essential reading for any airband enthusiast and a reference book that is great value. The news media and many sectors of the aircraft industry purchase it as a quick reference. What more recommendation! Now available from stock, this July 1989 edition is bang up to date.

£5.95 plus £1 Post & Packing.

NEW INSTANT “HP” BY MAIL ORDER

If you are unable to travel to us we can now offer excellent credit facilities by mail order. Simply write or telephone for application form and subject to acceptance, you will receive a “Walters & Stanton” instant credit card. After that you need only telephone your order for immediate despatch. Initial purchase is subject to 10% minimum deposit. From then on your repayments are flexible to suit your own pocket. And should you go into credit, then you will receive interest! Send for full details. Large SAIE please.

Published on the Fourth Thursday of each month by PW Publishing Limited, Enerco House, The Quay, Poole, Dorset BH15 1PP. Print in England by KSC Printers Ltd., Torridge Wells, Kent. Distributed by Seymour, Windsor House, 12/13 London Road, Notbury, London SW18 1AH, telephone 01/899 1899, FAX 01/8996977, Telex 8837745, Sales Agents for Australia and New Zealand – Gordon & Gordon (Aust) Ltd, 51-53 Summer St, North Sydney 2060. Sales Agents for South Africa – Central News Agency Ltd. Subscriptions INLAND £17, OVERSEAS (ex ASPI) £19, payable to SHORT WAVE MAGAZINE, Enerco House, The Quay, Poole, Dorset BH15 1PP. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not, without the written consent of the Publishers first having been given, be lent, rented, hired out or otherwise disposed of by way of Trading more than three recommended arrangements as shown on the cover, and that it shall not lend, rent, hire out or otherwise dispose of in any mutilated condition or in any unauthorised cover by way of trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

RETAIL & MAIL ORDER: 18-20, Main Road, Hockley, Essex SS9 4QS. Tel: (0702) 206835, 204965
RETAIL ONLY: 12, North Street, Hornchurch, Essex RM11 1QX. Tel: (0403) 44765
Visa and Access by telephone 24hr Answerphone Early Closing Wednesday
CONTENTS

AUGUST 1989

SEPTEMBER ISSUE ON SALE
AUGUST 24

111I

QRP On Ice

Cover Intrepid explorer Vaughan Purvis poses with his Arctic Wireless Station GVPZ. You can read about his exploits with QRP among the icebergs and polar bears. You can also enter our exciting listeners' contest by logging his radio progress on his next Arctic expedition in an open boat. Full details on page 5.

Antennas Part 8 by F. C. Judd has had to be held over and should appear in the next issue.

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

EDITORIAL & ADVERTISING
Emefco House, The Quay, Poole, Dorset BH15 1HR
Telephone 0202 676559(24hrs)
FAX 0202 676594
Prestel MBX 202671191

ADVERTISEMENT DEPARTMENT
ADVERTISEMENT MANAGER
Roger Hall GAT81
01 70 6229
Advert Manager, G4NXV
ADVERTISEMENT PRODUCTION
Marcia Brogan

© COPYRIGHT
PW Publishing Limited 1989
Copyright in all drawings, photographs and articles published in Short Wave Magazine is fully protected. 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.

Contents:

Arctic Power Boat — GVPZ 5
QRP On Ice 11
SWM Review 20
Liniplex F2 Receiver 22
The Story of Joan-Eleanor 24
Introduction to DX-TV Part 20 27
Versatile Receive Converter 30
Plant a Tennamast This Summer 35
DX Letter From America

REGULARS

A Word in Edgeways 2
What's New 2
Trading Post 7
Grassroots 6
Airband 10
Scanning 16
Listen Out For 33
Rallies 33
Starting Out 36
Advertisers' Index 57
Book Service 58

Good Listening

Amateur Bands Round-Up 39
Decode 40
Info in Orbit 41
Band II DX 43
Television 44
Long Medium & Short 47
LW Maritime Radio Beacons 55

Enter Our Listening Competition
Vaughan Purvis
Peter Shore
Chas E Miller
Keith Hamer & Garry Smith
Peter Rouse GU1DKD
Dick Ganderton
Gerry L. Dexter

Your Letters
Latest News & Products
Readers' Adverts
Club News
Aeronautical Radio News
For the Scanning Enthusiast
Special Event Stations
Where to Go
For the Beginner
Find that Advert
Order Your Technical Books

SEEN & HEARD

Paul Essery GW3KFE
Mike Richards G4WNC
Lawrence Harris
Ron Ham
Ron Ham
Brian Oddy G3FEX
Brian Oddy G3FEX
Sir

I have noted with interest a number of references in your “Airband” column over the last few issues, notably February 1989, regarding the reception of h.f. transmissions on the airband mode of the Sony ICF-2001D. I have experienced the same phenomenon and wondered if my findings might shed some light on the subject. First of all I have to point out that the sensitivity of my receiver seems to be impressively high and wonder if this may in itself be part of the problem. I find that throughout the airband I receive numerous a.m. broadcast transmissions mainly in the lower two thirds of the band. I had to conclude initially that there was some internal mixing taking place, possibly as a result of some deficient or faulty screening and to this end made enquiries of my local Sony Service Centre and Sony UK both of whom indicated that they were not aware of this problem. I am now wondering however if the problem may lie with the antenna switching (or is it matching) facility which is brought into action when external antennas are connected. I have discovered that plugging in an external antenna to the air/f.m. socket obviously makes an improvement on these frequencies but it also pulls up the signal level of the unwanted h.f. transmission. However, I have found that by shorting out the spare external antenna adapter and plugging it into the a.m. socket, this very nearly gets rid of the problem. This may offer a temporary solution for some of your readers as it has for me. Ideally of course one should surely be able to leave an external a.m. antenna and an f.m.airband antenna connected permanently but the effect of this renders the scanning facility on the airband totally useless.

In response to your question in the February issue I am certainly coming to the conclusion that this in not an uncommon problem with these receivers, and one which may not have been recognised by the less discerning newcomer to the hobby for whom being able to receive Vatican Radio as well as Heathrow Approach on the same bit of the dial, may indeed have been seen as an added bonus.

I await with interest any further developments in your enquiries and obviously will continue in the meantime to try and get to the bottom of it myself, starting with a good look at the service manual which I am intending to purchase.

Although my letter was initially directed towards your “Airband” column, on a higher plane (please excuse the pun) your readers may be interested to hear of my success in monitoring some of the NASA Shuttle/Mission Control voice transmissions during some of the latest launches since the Challenger disaster. NASA themselves relay these transmissions on various h.f. frequencies through a transmitter on Ascension Island and have included conversations with the crew and mission control, commentaries and press de-briefing during which technical aspects of the mission are outlined.

As I was completing this letter I received the May issue of SWM and noted Mr. R.A. Glassley of Dundee’s letter regarding these transmissions. He was listening to the proceedings of one of the March mission on one of the NASA relay frequencies which tend to be around 19-20 MHz (NB not always u.s.b.). The YL, that he refers to provided the aforementioned comment. Residents of the USA no doubt also benefit from the added pleasure of listening in to the various pursuit aircraft and rocket recovery vessels which transmit on v.h.f. and u.h.f. frequencies. As well as their own “official” transmissions, NASA’s Amateur Radio Organisation also relay these QSO’s and this information is part of an elaborate public relations exercise, from the Goddard Space Flight Center, Greenbelt, Maryland. Their station callsign is WA3NAN and they point out that further information can be obtained from them upon writing.

Frequencies used by both parties vary from mission to mission but on their last mission WA3NAN used 21.395MHz u.s.b. although propagation was not very satisfactory and suffered from QSB. I have obtained frequencies for each mission including the v.h.f/u.h.f. ones from various sources including Radio Sweden’s Sweden Calling DXers, Packet Radio and WA3NAN themselves.

I work in local education as a technology teacher, currently attached to Walis’s Computer Support Service and much of my work involves promoting the use of radio communication systems such as weather satellites, WEEFAX, RTTY, etc through our Information Technology courses. Monitoring these transmissions has added yet another fascinating dimension to this work and has generated a lot of interest amongst pupils and colleagues alike, many of whom are licensed radio amateurs. I would suggest that this might be an excellent stimulus for teachers who are contemplating promoting the RSGB’s Youth into Electronics via Amateur Radio - YEAR project in their schools or in any case any aspect of Science and Technology.

PHIL PEDLEY G1RLR
WALSALL

Sir

Many readers of SWM are owners of the Matsui MR-4099 receiver, which is sold under various brand names and type numbers. The price ranges from £99.99 to around £150. I bought mine for £99.99. It covers 150kHz to 30MHz and f.m. 87.5 to 108MHz, with b.f.o. for c.w/f.s.b.; digital frequency read-out and excellent clock. Mine was purchased as an everyday domestic portable, which would give access to the h.f. bands while on holiday. The l.w./m.w./f.m. bands perform excellently. On s.w., using the whip antenna, the performance left something to be desired. Furthermore, on c.w., using the b.f.o., the c.w. note can best be described as wishy-washy. So a few tests were run, and the results may interest other owners of this, and similar, receivers:

1. Plugging a 10m length of thin flex into the external antenna socket made h.f. reception very acceptable. This antenna, when not in use, is wound around a beer mat, for transit in a suitcase, when on holiday.
2. Connecting the RX to a station antenna, plus a.t.u., produces quite remarkable results. It seems a pity that the instruction booklet does not suggest using a good external antenna for serious h.f. listening.
3. A pair of small hi-fi phones were purchased with the RX. However, for use on the h.f. bands a pair of old communications-type phones were rewired, and are used in lieu of the hi-fi phones. This produces an excellent crisp c.w. signal.

In fact, with the above simple ideas a quite excellent low cost communications-type RX has been produced. So much so that I am contemplating a small TX to take along on holiday to partner the 4099 for c.w. holiday operation.

RICHARD C. MARRIS
SLOUGH

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.
**A WORD IN EDGEWAYS**

**Sir**

Sometime ago I wrote to Brian Oddy and among other things told him a little story of what happened to a friend and I. He thought your readers might be interested. A month or so ago I went to stay for a few days with a friend who is mildly interested in radio. My pal said his is a radio club in his town let’s go and have a look. We went to the venue and went in, no one took much notice of us, so I spoke to a gentleman who seemed to be an official. I said we were interested in radio and had thoughts of joining a club, could he please give us some information. So far so good. He did not seem very interested, but he did ask me what radio I used. I told him I have a Grundig Satellit 1400SL and a Grundig RR950 Super Stereo Radio Recorder. He said “Oh we don’t bother with rubbish like that” and walked away. We left feeling rather let down! I have been a short wave listener for over thirty years, ever since I left the RAF and I have always used Grundig radios. We are not all rich men and most of what we can afford. If all clubs are like this one - it shall remain nameless – we are not going to get many people and youngsters interested in our hobby. Thank you for a wonderful magazine.

C. S. WALDEN-VINCENT

---

**EDXC Club List**

The EDXC has announced that the 1989 version of the EDXC Club List is now available. This 16-page booklet gives details of each of the Member and Observer Clubs, together with information about the Association of North American Radio Clubs and the South Pacific Association of Radio Clubs. The booklet can be obtained from The European DX Council, PO Box 4, St Ives, Huntingdon, Cambs PE17 4FE and costs 75p or 3 IRCs worldwide.

**Spectrum Software from Triple S**

A range of new software is now available from Triple S, the Spectrum scanner specialists. Their software is available on tape and runs on both the Spectrum 48 and 128K computers.

VOR Beacons Listing: This gives the location and frequency of V.H.F. D.M.E. beacons in the UK in the 108 to 118MHz beacon band. The list also includes nearby European beacons that may be heard when reception conditions are good. Morse identification of any beacon can be heard by a simple input command. Cost £2.99

VHF Airband Listing: This program gives the frequency listing of the V.H.F. aircraft band from 118 to 137MHz in 25kHz steps. Simply input the frequency required for an instant readout. Cost £3.99

UHF Airband Listing: This is similar to the V.H.F. version but covers the 225 to 400MHz aircraft band in 5MHz segments. Cost £4.99. You can buy all the programs on the one tape for £8.49. Post and packing is £5.00 per order.

**Triple S, 98B Baker Road, Newthorpe, Nottingham NG16 2DP.**

**Sir**

I was very interested in your article on the MICROREADER. I have long been considering setting up to read RTTY, etc., but I have been put off by the price of gear such as the Pocom AFR100. This seems a reasonable solution, but no mention was made of any facility to feed out the data to a computer so that one may use a monitor screen or dump to disk or printer.

I have a good computer (Amstrad 1640), two communications receivers, Yaesu FRG-7 and Uniden CR-202.1. What I need is some software and perhaps an interface. Does any reader know from whom I might obtain the software? Given the input and output specification I could probably produce the interface.

I noted the advertisement from Technical Software in your magazine, but on enquiry they told me that their programs are only suitable for the simple computers such as the Spectrum and BBC, and they have nothing compatible with a PC. It strikes me that it would not be such a large task to adapt the program to run on DOS - surely this would enlarge the available market considerably.

My interest in radio goes back quite a few years. I was granted my first call in 1937, 2CUV Artificial Aerial, followed the next year with a full licence, (25 watts all-bands) with the call G4CA.

I would have watched your magazine with interest over the years and I think it has improved with age.

PATRICK WODEHOUSE ITALY

---

**WHAT'S NEW**

**Scouts ARG**

Scouts from Northampton are able to explore the world of amateur radio through their own District Scout Amateur Radio Group.

Based at Overstone Scout campsite on the outskirts of Northampton, the Group offers an annual programme of training courses including the Scout Communicator, Computer and Electronics Badges.

The well-equipped permanent station includes h.f. and v.h.f. facilities and an impressive array of antennas. As well as offering courses, the Group is able to provide demonstration facilities to the hundreds of Scouts and Cub Scouts at the site each year.

**Rare WOB Squares**

TR09 Essex square will be activated again, this time on 14, 7 and 3.5MHz. The dates to listen out on are September 8 and 9 from 0800 to 1900UTC. The callsign will be G0KYSR and G0JAR/P.

Penpals

George Aikins is a 17-year old with interests of football, table tennis, letter writing, music and art. He lives in Ghana and would like to correspond with UK readers. His address is: George Aikins, PO Box 61, Nkawkaw-Kwahu, Ghana, West Africa.
Radio Stations in the UK

The 8th edition of Radio Stations in the United Kingdom is now available from the British DX Club.

This 24-page guide lists all national, local and regional long wave, medium wave and v.h.f. f.m. transmitters in the UK, both those operated by the BBC and the IRA. As well as station details (including transmitter power and location) each entry is cross-referenced to help with identification and show any other channels that may operate in parallel. As usual, the list is right up-to-date (May 1989) and shows all the latest changes in frequency and power as well as new stations.

The booklet lists the full postal address and telephone number of each station together with background information about the broadcasters, advice on reception reports and details of major changes planned in UK broadcasting structure from 1990.

The guide is in frequency order throughout which makes it ideal for the DXer or listener interested in identifying British domestic radio stations.

Radio Stations in the United Kingdom is priced at £1.20, 4 IRCs or US$. and is available direct from British DX Club, 54 Birkhall Road, Catford, London SE6 1TE.

Snippets from Sweden

Bulgaria: 11.66MHz is used by Radio Sofia for its broadcasts in Italian at 1930.

Guam: KDIA's DX Asiawaves at 0230 uses 11.7MHz instead of 17.865MHz, 11.7MHz is also used for other programmes on Saturdays and Sundays.

Iraq: Radio Baghdad has moved from 11.8 to 11.81MHz in English at 0130-0340 to India to avoid interference from the Sri Lanka Broadcasting Corporation. Unfortunately, 11.81MHz is already used by Radio Amman which causes interference. Best to try 11.935MHz which is directed to North America.

Ireland: Dublin returned to the short waves on 6.912MHz on June 4.

Sierra Leone: The Sierra Leone Broadcasting Service was heard on 11.6MHz during the ascent. They also transmit equipment of the Government Communications Commission seen the aeronautical frequencies.

Unofficial Radio: The American Federal Communications Commission seized the transmitting equipment of the anti-Cuban government pirate station La Voce de Alfa-66 on May 22. An FCC spokesman interviewed on National Public Radio's Latin File programme said Alfa-66 was fined in 1982 and 1983. She said the station had returned to the air at the beginning of this year, causing interference on the aeronautical band.

Another famous clandestine broadcaster has gone off the air. According to Kazuya Harada in Japan, the Voice of Democratic Kampuchea suspended its broadcasts on June 8 for the first time in 10 years. The Chunichi Newspaper says that this station has a transmitter in Yunan (South China) and the interruption is due to the recent developments in Cambodia.

VHF AIRBAND LISTING

All frequencies 220 to 400 MHz

VHF AIRBAND LISTING

All frequencies 118 to 137 MHz

VHF AIRBAND LISTING

All frequencies 406 to 480 MHz

V.F.R. BEACONS LISTING

Frequencies 108 to 118 MHz

New Showroom

Nevada have opened new showrooms in Portsmouth. Now, amateur radio, scanner and short wave enthusiasts will be able to browse in comfort with full 'hands-on' facilities over their expanded range of products.

The new showrooms are housed in the 330m² building next door to the existing premises. Nevada, 189 London Road, North End, Portsmouth, Hampshire PO2 9AE.

Tel: (0705) 662145.

Satellit 500

Thanks to the extended short wave frequency range and programmable "intermix" channels, the Satellit 500 can tune in up to 82 worldwide stations at the touch of a button.

The Grundig Satellit 500 has 40 stations pre-programmed by the factory to receive the most important international transmitters on 156 frequencies. The user can programme a further 42 channels in the "intermix" to store all the other stations listened to most frequently. To find a frequency the user has the facility to scan through its entire memory, skipping any unused channel positions.

It's clock operates in two time zones, with two programmable switch-on and two switch-off times in each 24-hour period and has a snooze facility which is programmable up to 60 minutes. Its phase locked loop frequency synthesised tuner automatically scans the f.m., m.w. and l.w. bands, as well as a continuous s.w. range from 1.6 to 30MHz. Stereo f.m. can be heard through headphoens, or by connecting an external speaker to back up the built-in wideband speaker.

The illuminated i.e.d. display offers a host of vital information, including stations which can be programmed by name as well as frequency. Other features include an electronic lock, band-width selector, automatic gain control and a built-in s.s.b./f.m. section for receiving single sideband and unmodulated telegraph transmitters.

The price for this new Grundig RX should be around £299.95 from your nearest Grundig stockist.

ATV Expedition

Between August 16 and 23 there will be an ATV expedition at the top of Mont Blanc using the callsign TV7SMB. The frequencies to watch and listen are: 438.5MHz, 144.170 u.s.b. phone and 144.140 f.m. phone.

An ATV transponder will be installed at the top of the Aiguille du Midi (3800m), receiving TV signals from alpinists equipped with cameras and pocket 1.2GHz transmitters (solar powered), and transmitting TV pictures on u.f.h. with 100 watts into 4 x 21-element antenna arrays.

Several French and Belgians will climb on the top of the Alps (4807m) transmitting ATV during the ascent. They (F6ESH, F6BXG, F6GZ, FD1MKV, OAB9S) will be QRV for DX on 144.330, 432.210 u.s.b., 144.050, 432.050 c.w. and 145.525, 432.500MHz f.m.

Plan Ahead

If you've already got your 1990 diary then you can make a note of next year's Longleat Mobile Rally. The 33rd Longleat Amateur radio rally will take place on Sunday 24 June 1990, the venue being as usual Longleat Park, Warminster, Wilts.

Full details from: Shaun O'Sullivan, 15 Whitney Close, Saltford, Bristol BS18 3DX.
Crossing the Atlantic in small boats has become an almost routine affair. Seafarers, searching for adventure, have rowed and sailed their way across “The Pond” from Europe to the Americas in a variety of odd craft. Rowing boats, sailing dinghies, rigid and not-so-rigid inflatables, collapsible canoes and a number of historic craft have also had their days.

While no-one should underestimate the difficulty of these endeavours, it has become harder to work up much enthusiasm for any new variation on the old theme. There’s always the nagging doubt that each succeeding effort really adds very little to what has already been done.

Few have even considered that there might be a wholly new route from Europe to the Americas that remains unexplored, perhaps because the mere thought of an open boat journey through Arctic seas seems fraught with almost super-human difficulties.

Such a boat would have to make its way through the chilly waters of the North Sea, only to run the gauntlet of storms that rage incessantly in the Icelandic depression. It would have to find a way through the shifting jigsaw of ice floes on the Greenland Sea, and then make its way across the Davis Straits to the freezing coasts of Labrador. Even in August, the sea water temperature will remain below zero, and big seas breaking over the boat will be laden with ice. It is a voyage that requires no exaggeration to make it interesting, nor any justification to give it meaning. It is the ultimate voyage.

Arctic veterans Vaughan Purvis and Rupert Hadow will embark on just this challenge starting in London Dockland on 2 August 1989. Piloting a Suzuki-powered Delta-boat seven metres long with a top speed of forty knots, the two men will try to set two new world standards in a single go. If they succeed, not only will they have been the first to pioneer the 6880km Arctic Sea Route to the Americas in an open boat, but they will have completed the fastest open boat journey from Europe to the Americas ever made.

Vaughan Purvis is the author of our cover story in this issue and he will be reporting on his Arctic Power Boat voyage in a future issue.

---

**ENTER OUR ARCTIC POWER BOAT - GVPZ LISTENING COMPETITION**

A prize of a CM Howes Marine Band Direct Conversion RX Kit will be awarded to the reader who, in the opinion of the judges, Dick Ganderton and Vaughan Purvis, logs GVPZ the maximum number of times during the voyage. Prizes of one year subscriptions to *Short Wave Magazine* will also be awarded to the two runners up.

Special Arctic Power Boat - GVPZ QSL Cards will be sent to all entrants submitting the **Time (UTC)** and **Frequency** on which GVPZ was heard, together with the **Name of the Station** being called by the Power Boat.

<table>
<thead>
<tr>
<th>Date</th>
<th>Station/Callsign</th>
<th>Shore</th>
<th>Ship</th>
</tr>
</thead>
<tbody>
<tr>
<td>August</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>Wick Radio/GKR</td>
<td>1.706</td>
<td>2.104</td>
</tr>
<tr>
<td>4/5</td>
<td>Wick Radio/GKR</td>
<td>2.751</td>
<td>2.006</td>
</tr>
<tr>
<td>5/6</td>
<td>Torshavn/OXJ (Faeroes)</td>
<td>1.778</td>
<td>2.056</td>
</tr>
<tr>
<td>6/7</td>
<td>Isafjordur/TFZ (Iceland)</td>
<td>1.862</td>
<td>2.023</td>
</tr>
<tr>
<td>7/8</td>
<td>Reykjavik/TFA</td>
<td>1.250</td>
<td>2.049</td>
</tr>
<tr>
<td>9/10</td>
<td>Qaqortok/OXF (Greenland)</td>
<td>2.129</td>
<td>2.049</td>
</tr>
<tr>
<td>10/11</td>
<td>Labrador (Canada)</td>
<td>2.538</td>
<td>2.142</td>
</tr>
<tr>
<td>12/13</td>
<td>Sydney/VCO</td>
<td>2.530</td>
<td>2.815</td>
</tr>
<tr>
<td>13/14</td>
<td>Halifax/VCS</td>
<td>2.514</td>
<td>2.118</td>
</tr>
<tr>
<td>14/15</td>
<td>Yarmouth/VAU</td>
<td>2.538</td>
<td>2.142</td>
</tr>
<tr>
<td>15/16</td>
<td>Boston/WOU</td>
<td>2.506</td>
<td>2.406</td>
</tr>
</tbody>
</table>

In all cases Arctic Power Boat - GVPZ will first call the Maritime Coast Radio Stations above on 2182kHz before moving to the working frequency shown.

---

*Short Wave Magazine August 1989*
Biggin Hill ARC have an Operating Evening on August 18, 3rd Tuesdays, 7.30pm at the Victory Social Club, Kecchill Gdns, Hayes. Mr Geoff Mine G3UMI on 01-462 2689.

Holyhead & District ARS meet 2nd & 4th Sundays, 7.30pm at the Forrester Arms, Kingsland Rd, Holyhead, Gwynedd D. Richards, 5 Queens Park Court, Holyhead, Gwynedd LL65 1RB.

Dunstable Downs RC have a TV Treasure Hunt on July 28, Canada by G3WLM on August 18 and a d/f Treasure Hunt on the 20th. Room 3, Chews House, High Street South, 8pm, Fridays. Tony G3CQO on Luton 608259.

Wirral ARS have Magnetic Loop Antennas by Tony Johnston, Capco on August 2, 1st & 3rd Wednesdays, 7.45pm at Ivy Farm, Arrowe Park Rd, Birkenhead (opposite cathedral gates). ALEC Seed G3FQO on 051-644 6904.

Verulam ARS have an Informal on August 8 and Bring & Buy (8pm) on August 15, 1st & 3rd Tuesdays at the RAf Association HQ, New Kent Rd, St. Albans. George Christoffi G0JZK on 01-427 4860.

Todmorden & District ARS have a Diving film talk, on August 21. Meet in the Queen Hotel at 8pm. Mrs Esse Tyler G0AEC on Halifax 882038.

Yeovil ARC meet Thursdays, 7.30pm at The Recreation Centre, Chilton Grove. August 3 is Measurement of r.f. Power G3GC, the 10th is Greylie Propagation G3VMY, the 17th is talk on Water Waves and the 24th is a G3AVW talk. David Bailey G1NMN at 7 Thatcher Close, Yeovil BA21 3BS.

South Bristol ARC have Skin Diving G3OUK on August 2, 144MHz Activity Evening on the 9th, DX Broadcast TV Activity on the 16th and Top Band Activity on the 23rd. Further details from Len Baker G4RZY on Whitchurch 834229.

Wimbledon & District ARS meet 2nd & last Fridays, 7.30pm at St. Andrews Church Hall, Herbert Rd. July 28 is Camp Planning - last minute details, July 29-August 5 is the W&DARS annual camp, Chessington and August 11 is Data Transmission and Amateur Radio GBLWY. Nick Laviol G6A/Y on 01-330 2703.

Torbay ARS have Club Nights on July 28/August 4/11th and their monthly meeting on the 18th. Fridays, 7.30pm at the ECC Social Club, Highweek, Newton Abbot. Wait G3HTX on Paignton 526762.

Wyre ARS meet 1st & 3rd Wednesdays, 8pm at The Fleetwood Cricket Club, Broadwaters. Ian Broadhurst G0KNY on Fleetwood 75736.

The Radio Society of Harrow meet Fridays, 8pm at The Harrow Arts Centre, Uxbridge Rd, Hatch End, in the Roxeth Room. August 4/11th are Activity Evenings. Chris Friel G4AU on Ruislip 635522.

Halifax & District ARS have Martin G3ZXG on August 15, 1st & 3rd Mondays, 7.30pm at The Running Man Public House, Mellon Lane, 7.30pm. David Moss G0DML on Halifax 220236.

Ipswich RC have a Morse test at Ipswich on August 10 and the Ipswich Carnival on the 12th. Red Lion, 284 Bramford Rd, 8pm. Jack Tootill G4RF on Ipswich 464047.

Cheshunt & District ARC meet Wednesdays, 8pm in the Church Room, Church Lane, Womley. August 16 are Natter Nights, the 9th is Members Forum and the 23rd is Open Air Meeting - Baas Hill Common. Roger Frisby G4OAA on Hoddesdon 464795.

Farnborough & District ARS meet 2nd & 4th Wednesdays, 7.30pm at the Railway Enthusiasts Club Premises, off Havley Lane (by 3rd bridge). August 8 is NWGS Day and the 15th is Open Air Meeting - Baas Hill Common. Roger Frisby G4OAA on Hoddesdon 464795.

Reading ARS meet 2nd & 4th Thursdays at Caversham Conservative Club, Mill Rd, Caversham. Details from Jim Carter G0LHZ at 6 Beechwood Close, Goring Heath, Reading, RG8 7SG.

Sudbury & District RAs meet 1st Mondays and the 4th at the Five Bells, Bures Rd, Great Cornard. Colin S. Muddimer on Sudbury 77004 (home) or Sudbury 75131 Ext. 131 (work).

Darenth Valley RS meet 2nd & 4th Wednesdays, 8pm at Crocket Hill Village Hall, nr Swanley, Kent. August 9 is Video of recent club activity evening/G1XWW and the 23rd is Radio Amateur Invalid & Blind Club, talk by G1NMX. Mrs Sheila Hillman G1NMX on Orpington 26961.

Workshop A meet on regular Tuesday Social and Technical meeting as well as RAE and Morse classes on Thursdays. Details from John Huggins G0DZK at 59-61 West St, Workop, Notts NG2 3JY.

Dragon ARS meet 1st & 3rd Mondays, 7.30pm at the Four Crosses, Menai Bridge. August 7 is Open Forum - a chance for members to air their views and the 21st is Visit members to County Emergency Centre, Caernarfon. Tony Rees on Bethesda 600963.
FOR SALE Signal R532 airband scanner, mint condition, 18 months old, little used £160. Paul Waterhouse, 23 Winsford Rd, Birley Carr, Sheffield S6 1LA. Tel: (0742) 311923.

FOR SALE Icom R-70 receiver with instruction manual plus f.m. board and Datong FL2 filter £340. N. Barratt, 94 Patrixbrave Avenue, Gillingham, Kent. Tel: (0634) 399228.

FOR SALE Yaesu FRG-7 s.s.b. communications receiver unmarked in mint condition and in makers carton, £120 plus manual circuit plan. J. Hughes, 11 Derby Rd, Cleveleys, Lancashire FY5 1DE. Tel: Cleveleys 869925.

FOR SALE FT-290R 144MHz transceiver including multi-Tek front end, flexi-whip, NiCads, case, etc. Mint condition, original packing £260. 430MHz mobile collinear antenna £6. John Talbot. Tel: Coventry 465328.

FOR SALE Icom IC-R71E 100kHz-30MHz general coverage receiver, excellent condition with full service info, circuit diags, etc., £645, buyer collects. Tel: 01-445 5888 (Manchester).


WANTED JRC NRD-515 receiver, must be in mint condition with manual and unmodified, reasonable price considered. E. F. Chorley, 93 Berkeley Rd, London NW9 9DH. Tel: 01-204 7734.

FOR SALE Yaesu FRG-7700 general coverage receiver 150kHz-30MHz, plus Yaesu 770T tuner, plus v.h.f. 7700V converter 118-160MHz. All in very good condition. Buyer collects, £255 o.n.o. E. Stevens, 283 Fawcett Rd, Southsea, Hants PO4 0LB.

WANTED information, operating or service manuals, complete or incomplete, Regency Polaris direction finding units. Would like to hear from anyone using Doppler d.t. at v.h.f./u.h.f.. Bob Sayers. Tel: (0527) 64869 evenings.

FOR SALE Pocom AFR-210 with code expansion modules, 1, 2, 3, 4 - Moore, t.d.m. sub channels, bit inversions, FEC, SA, ARQ, EM, etc. £400. Sony PRO-80 boxed, a few weeks old £210 o.n.o. J. Whingrove, 114 Wakehurst Rd, SW11 6BT. Tel: 01-228 4858.

FOR SALE Drake R4245 g.c. RX mint £800. Drake R4C re- valued, BC xtal £250. Linplex F2 OSC1 sync a.m. RX £800. Hammarlund HQ180 £50. Stuart Senior, 78 Palace Rd, London SW2 3JX. Tel: 01-674 6452.

FOR SALE NRD-525 communications receiver with v.h.f./u.h.f. converter, £1400. AOR AR-2002 communications receiver 25-560, 800-1300MHz, £400. Teletext remote control CWR-880 c.w./RTTY decoder, £120. Peter Chalkley. Tel: Luton (0582) 422056.

FOR SALE Yaesu FRG-9600 v.h.f./u.h.f. receiver with box and manual, £250. Also MM-2001 RTTY decoder, £120. Peter Chalkley. Tel: Luton (0582) 422056.

FOR SALE Kenwood R5000, including optional 6kHz, 1.8kHz and 500Hz filters. Mint condition, £675. Buyer collects. Mrs A. M. Guard. Tel: (0227) 375656, after 6.30pm (Herne Bay).

FOR SALE Philips D2999 receiver 150kHz-29.99MHz, plus f.m. band, reviewed in June 89 SWM, brand new, purchased 2/5/89, with manuals and a.t.u., £225, will despatch or deliver locally. V. G. Tracey. Tel: 01-494 9043.

FOR SALE Realistic PRO-57, 10 channel programmable scanner, 68-88MHz, 136-174MHz, 380-512MHz, hardly used, still boxed, £80. K. H. Wright. Tel: (0403) 66228 Horsham, Sussex.

WANTED Icom R7000 plus discone, Aurex PXC86AD cassette deck, Philips N4520 reel-to-reel tape recorder. For SALE ERA Micoreader MKI, £89. Tel: (0903) 205531 Ext. 296 day or (0903) 429279 night. 7 Jersey Rd, Ferrum, Sussex.

FOR SALE AR88D, rack mounted, excellent condition. Collins T-Cs receiver, mint. Swap for WS18, WS19, WS22, WS46, WS58, w.h.y., with cash adjustment as required. J. E. Cookson. Tel: (0562) 823674 evenings (Kiddermister).

FOR SALE TRIO/Kenwood R2000 receiver, excellent condition, complete with VC10 v.h.f. converter and Global AT1000 a.t.u., £500 o.n.o. Also BBC “B” micro with two 100 Pace disc drives, Epsom RX80 printer and monochrome monitor, £250 with RX-4 RTTY software and adapater. Chris O’Neill. Tel: 01-491 1520 after 7.30pm please (Cheddle).

FOR SALE Yaesu FRG-8800 receiver in excellent condition with full documentation, £385. Will share postage or buyer collects from Guildford. Would consider Sony 20010 plus cash in exchange. S. D. Guettier. Tel: Guildford (0483) 36285 evenings.

WANTED Amateur Radio Callbook (International listings), fairly recent but not necessarily current, cost plus p&p. A. C. Stapleton, 130 Sherwell Valley Rd, Torquay, Devon. Tel: (0803) 650545.

FOR SALE Amstrad 8256 computer, printer, mouse, joystick, interfaces, software includes Locuscript, utilities, “Desktop” (adapted for up-to-date short wave listener’s program), “Atlast” database, “Cricket”, “Harrier” blank disks, back-ups. Immaculate condition, sell £210. M. R. Hall, 23 Whithouse Court, Ushaw Moor, Durham DH7 7NH. Tel: 091-373 5112.

FOR SALE Icom R7000, 25-2000MHz plus mods. “N” plugs, 12 metres of 10mm coaxial cable with log periodic or AH discase £65. Bob RNS90519, Witherage Wood Lodge, Knotty Green, Beaconsfield, Bucks. Tel: (0494) 812392.

WANTED Pye PF2 pocket phone, maintenance/service manual (or photocopy) required urgently by voluntary organisation (Revcom - Cheltenham team) using sets for charitable work. All costs paid. Arnold Hogg, “Ny Beril”, Old Reddings Road, Cheltenham, Glos GL5 1SA. Tel: (0452) 712720.

FOR SALE Placesey PR1553 h.f. communications receiver, solid state, digital. £300 o.n.o. F. E. Upstone. Tel: (0864) 73366 after 2pm (Tewkesbury).

FOR SALE AOR AR-2002 scanner and Ancast interface plus books Scanners and Scanners 2, £460 o.v.n.o. Taylor. Tel: 01-891 2820 (Twickenham) evenings.

FOR SALE PRO-31 scanning receiver, about one year old, £95. Wanted Trio or Kenwood VC10 v.h.f. converter, working order, offers around £80-£90. J. S. Wood, Sylvana Enzie, Buckie, Banffshire, Scotland AB5 2BN.

FOR SALE AR-900 hand-held scanner, excellent condition, C/V charger, v.h.f./u.h.f. aerials, boxed, £160. J. L. Tucker, 2 Lydene Rd, Ivybridge, Devon PL21 9BH. Tel: Plymouth (0752) 892175.
When you are ready to graduate to real listening
Look to Lowe

The NRD-525 from JRC

Those of you who have read about the NRD-525 will recall that I gave some background information about the JRC company. What I was trying to get across was the fact that a company with such a long history in the communications business can endow its products with a host of subtle details based on actual operating experience. JRC are in many ways similar to the Marconi Company (as it was), in that they can meet every possible need of their professional customers. Any owner of an NRD-525 will rejoice that a company such as JRC decided to bring their quality to the non-professional user.

But what of the NRD-525 itself? What will it do for you as a dedicated listener? In such a limited space as this page I cannot possibly cover all its outstanding features so I will draw some extracts from the Rainer Lichte review. Here's what he says about:

**Accuracy and stability.**

"The tuning accuracy and the matching display are impressive indeed. Still the more impressive is this receiver's frequency stability. Drift is virtually non-existent, it was measured at less than 5Hz/hour."

**And about dynamic range:**

"3CP 3rd order (3rd order intercept point) was measured at +17dBm at 7MHz and +14dBm at 25MHz. These are excellent values, and they are not the result of decreased sensitivity. The 'NRD-525 is amongst the most sensitive receivers I've measured so far. Dynamic range was computed to 102dB, an equally outstanding value."

All very well you may say, but what does this technical jargon mean in real life? Let me quote Rainer Lichte again:

"The signal quality under adverse conditions is remarkable, e.g. the 40 metre band here in Europe is fairly cluttered with high-power stations and most receivers just quit when you try to extract some intelligence from a weak radio amateur signal. The NRD-525 is unimpressed and functions in a truly professional manner."

In other words, there is virtually nothing you cannot resolve. If it cannot be received by the NRD-525, it cannot be received by anything. As a final quote from the review, let me give some conclusions:

"This receiver is a joy to operate and a joy to listen to."

"The new NRD-525 very impressively manifests itself as the No. 1 receiver outside the commercial/military bracket."

"Performance-wise, the NRD-525 is way ahead of the competition because this receiver delivers outstanding results in all modes of operation."

What you will find about the NRD-525 is that with all its undoubted performance, it is so very easy to use and never thrusts itself at you like a knob bedecked military receiver. If you want to use it as a high quality broadcast receiver, then that is what it will be. As you discover more and more about the art of listening you find that the NRD-525 contains every operating feature and convenience that you might need, and there is almost nothing you cannot hear with it even when listening conditions are really difficult.

If you want to extend the use of the receiver, you will find a range of optional accessories to broaden the horizons, including a VHF/UHF converter which extends the already impressive 90kHz-34MHz range to include 34-60MHz, 114-174MHz, and 423-456MHz. (And the converter fits inside the receiver.)

When you get deeper into the art, you may decide that specialised listening requires specialised receiver bandwidths, and a range of high performance filters is available for your choice.

One final comment from Rainer Lichte with which I totally agree is his remark that the internal speaker in the NRD-525 is really only suitable as a monitor, and does not do justice to the high quality available from the receiver. This being so, if voice communications are your forte I recommend the matching JRC loudspeaker the NVA-88. If however you really want to enjoy the audio from broadcast stations, we carried out a long series of tests and decided that the Wharfedale Diamond III loudspeaker produces the most excellent sound from this and many other receivers. Normally of course these loudspeakers are sold as pairs, but for stereo listening, but we split the pairs and can sell you a single Diamond III to enhance your listening pleasure.

Truly happy listening.

John Wilson

NRD-525 £1095 inc VAT
The New HF-225 Receiver

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

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

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

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

Unlike most HF receivers on the market, the HF-225 comes complete with all filters fitted for every mode:— 2.2kHz, 4kHz, 7kHz, and 10kHz. There is also a 22kHz audio filter for CW, and if the D-225 detector is fitted, a 12kHz filter for FM. The correct filter for each mode is automatically selected by the receiver mode switch, but further selection can be made by the user from the front panel and the receiver remembers which filter was last used. True versatility and all built in at no extra cost. When selecting filters in use, the filter bandwidth is shown on the main display.

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

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

The HF-225 is even better.

John Wilson

HF-225 £395
In Newbury, Berkshire, Roger Ryton would dearly like a Signal R535-especially after a would-be vendor changed his mind about selling his second-hand set due to its apparent virtues! Roger sends some stories he read about flying in Africa. If true, they are amusing-or worrying, depending on how you look at it. For example, operations aren't always as smooth as might be expected by European standards, so one pilot was really pleased when he was able to announce to the passengers that they would be landing on time. But after a pause, he added: "Damn it. Forgot to land in Harare!" Of course, with delays to holiday destinations from the UK becoming so common, perhaps the problems of flying in remote spots don't seem so bad! On one Soviet flight the cabin crew offered the loan of computer games to while away the time. There was a stampede. Such luxury toys are almost unknown behind the iron curtain. I hope all this clock oscillators in the games didn't upset the aircraft's a.d.f. receivers!

Now on to a more serious note about passenger flights. E. Dunlop (Prestwick, Ayrshire) is professionally involved with airline security and points out that many airports now examine checked baggage (to be loaded in the freight hold) by X-rays. Any mysterious shadows cause the bag to be singled out and the owner must satisfy the authorities about its safety - all this can lead to delays. The advice is to place any strange equipment (including radio receivers) in hand baggage where it is easier for a check to be made. Battery operated equipment must be demonstrably working (so as to prove that the batteries are real) and it might be an idea to loosen the back of equipment and carry a suitable screwdriver with you so that the inspector can look inside.

I experienced a radio problem myself when flying in a Piper PA-28 Cherokee recently. Sitting up front with the pilot I wore a headset for intercom purposes. I also had the cabin loudspeaker switched on so that Chris (taking photos in the back) could hear the radio, there being no third headset socket. Unfortunately, although the intercom still worked and the headset microphones still functioned when transmitting on the radio, the earphones no longer picked up the receiver's output, making it hard to hear the controller. Has anyone else noticed this?

Frequency and Operational News

Starting with changes to runway headings, it would appear from Civil Aviation Authority Aeronautical type V1505. Just looking at it I would guess it to be a fair-sized output tetrode, possibly good up to the h.f. bands. Any information would be gratefully received, such as pin connections, applications, specifications, etc. Send to me at the usual editorial address - if you require reimbursement for reasonable postage or copying expenses, please say so.

Information Sources

First, I must ask that all information sent for publication in this column is in the public domain. It is not the intention to transgress over sensitive issues in any way - I feel confident that so far I have successfully achieved this aim. However, if you are drawing attention to u.h.f. matters in particular then please from now on quote your source. Most u.h.f. information is available in the standard RAF Flight Information Publications which are on sale to the public. I'm sure that everybody will understand why it is necessary to be so careful in order to maintain the high standards that have so far been kept up.

Just available from the Short Wave Magazine Book Service is the latest edition of Flight Routes by T.T. Williams: £4.75 will have it winging its way to you by post. Alternatively, pick up a copy at the Woburn Mobile Rally this year; I am anticipating attending on the Short Wave Magazine stand. Form an orderly queue, please!

"A good source of information for Shanwick and h.f. goings-on is High in the Sky" in the opinion of M. Jackson (Invergordon, Scotland). Published by The Aviation Society, you could try calling the Manchester Airport Bookshop (061-499 0303) to order your copy.

Another book recommendation comes from Ken Gardiner (Doncaster) who borrowed Ground Studies for Pilots - Vol. 1, Radio Aids from his local library.

Shanwick Oceanic Control

Although living nearer to Kinloss and Lossiemouth, M. Jackson is also interested in the Shanwick Oceanic Control Centre. He hopes that the following will help Peter Finn (Milford Haven, Dyfed) who enquired about this in the June issue. The frequencies 123.95, 127.65 and 133.8MHz are mostly relayed from Davidslow Moor, Cornwall, and Dundonald Hill, Prestwick. On the west coast of Ireland are transmitters for an extended range 127.9MHz service.

N.A. Henderson (Mauchline, Scotland)
Digging out the wires and silicone rubber feeder cable half-buried by the latest blizzard, it was hard to believe that so little equipment could be the subject of so much paperwork. The Racal TRA921 Synca...
The Syncal TRA921 then would have been the feeder that took the synthesiser of a few problem at all was a length of Raychem silicone rubber coaxial feeder that took the r.f. out to the antenna, though I could never get a BNC plug to stay on the end of it for very long due to the cold.

All this, added to the nightly problem of guying-up an antenna, was an army of energeticantu, a mitten worn by a 5m whip, at the end of a hard day pulling the sledges, would have been a lot of trouble to go to to call somebody up - and even more trouble to contact no-one at all. During the first month of the expedition in March, the words “you are nil heard” became the station’s catch phrase. Never had I heard the bands so dead.

Total Silence

Skeds had been arranged with Portishead Radio GKA, Portishead Aeronautical Radio, Svalbard Radio LGS and Ward Hunt Island 2AZT, who was listening out for me on the 4.063MHz ship-to-ship frequency. 2AZT was being run by Flo Howell GM4DMA and his wife Morag GM1ILL to support Sir Ranulph Fiennes 1989 polar expedition with Dr. Mike Stroud. No matter how long and hard I flattened the batteries, no matter how many uncomplaining hours Rupert warmed them up again with his feet in the sleeping bag, we “couldn’t hear a sausage”. (Rupert was responsible for battery warming because his bag was warmer and I was in charge...) We were so cut off on our way across the sea ice to Barents Island and that we couldn’t hear the propogational forecasts telling us that there was bad propagation about: a great bunch of angry-looking sun spots bashing the ionosphere with protons and wiping out all communications on the lower h.f. bands and marginalising communications higher up.

I’d never tuned across the h.f. bands and heard nothing at all in 20 years on h.f., so I began to suspect our equipment. Bigger and better antennas were tried out, including a full-wave dipole on 2.182MHz, using about 250m of hook-up wire, but all to no avail.

More height and a better earth seemed like the best prospect. A large iceberg frozen into the pack ice towered 20m above our tent, and 20 minutes of careful climbing with ropes and ice axes found me erecting the 5m whip on its summit. I threw the drum of hook-up wire we used to make antennas down to Rupert, who secured it at an angle to a ski, rammed into the snow by the tent. The “Iceberg Special” was a sort of sloping Marconi about a quarter of a wavelength long at 2.182MHz. I reckoned its radiation resistance would be pretty low, so that I would risk losing most of my r.f. in ground losses unless I could organise a pretty potent earth. The sea represents the nearest to a perfect groundplane that we can know in this earthly life - but how to get at it through the pack ice?

Dramatic Remedies

The snow over the ice was about 1.25m thick near the foot of the berg where the Marconi terminated, and we spent a good hour getting down to the hard, rough surface of the sea ice. Another hour with ice axes had no practical effect on the ice, achieving only a miserable little depression half filled with snow that drifted in on the breeze almost as fast as we could dig it out.

I locked threateningly at the ice, “Right then, we’ll blast a hole in it,” I said, as we stood back from the hole to wipe the frost from our eyelashes. We carried a Mauser rifle and a Smith & Wesson 0.44 Magnum revolver for protection against polar bears and rabid foxes. Six bone-crunching blasts of the Magnum later, beautifully conducting sea water welled up in our hole. You could almost smell the mhos slopping about in it!

Ten metres of bare wire lowered down the hole, directly below the antenna lifted faint stations to loud faint volume from the hardest. The “Magnum Earth” was with us!

Contact At Last

After warming up the set and batteries in Rupert’s bag while I cooked our dinner, we decided to call our friendly local coast radio station on 2.182MHz just after the silence period when there ought to have been someone listening, even at midnight. Svalbard Radio was, and always remained, “nil heard” being just outside ground wave coverage about 190km to the south-west on the other side of Spitsbergen. We were just about to close down when a voice boomed in so loudly I nearly dropped the handset. It was GM4DMA operating as 2AZT on Ward Island 1500km away in Canada’s North West Territories.

We went up to a working frequency of 2.246MHz and exchanged the latest news. Flo was running about 50W into a directional rhombic beam cut for a higher frequency but coming in loud and clear. However, our signal was poor.

“Your frequency varies, Vaughan. You’ve got some frequency pulling on u.s.b. Can you go QRP in case it’s supply voltage regulation?” he asked me.

As we were using the Nitech X-Cells, which gave a combined total of only 15V, rather than the 18V needed to get full power, I supposed our QRO output can only have been about 15W p.e.p. And now Flo, 1500km away on another expedition, was asking me to go QRP. Bowing to Flo’s experience as the most talented polar operator around, I flicked the switch to low power.

“That’s much clearer,” said 2AZT.

“Now’s my signal strength,” I asked. “I didn’t really notice the difference,” was the amazing reply.

With only 15V on the p.a. transistors,
The very latest “2 in 1”
ICR7000HF Receiver 500kHz — 2GHz

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

Compare the price of an ICR71 E at £555 and an ICR7000 at £989!!
Available from stock, the new ICR7000HF.

EXCLUSIVE TO A.R.E. COMMUNICATIONS

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

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

Only £989.00 incl. VAT.

Phone 01-997 4476 for immediate delivery.
I reckoned the output on low power couldn't have been more than 3.5W, so we were getting about 480kW per watt, which seems a very creditable performance in the 2MHZ band. I'd always thought of 2MHZ as being very much an after-dark band for any kind of ionospheric propagation, but although it was midnight UTC at our QTH (about 78°30'N, 20°00'E) and late afternoon at 2AZT, there wasn't a scrap of darkness over the entire signal path, both stations basking in the midnight sun of the polar regions.

2AZT explained that inside the auroral belt around the poles, propagation on 2MHZ is completely different to our experience of the same frequencies in England. While thankful for the effects of "Polar'E'" on our otherwise diminishing little signal, I was sure that part of the reason for the success of our OSOs over the week that followed was due to the effectiveness of the Iceberg Specials and Magnum Earths, which we put up nightly at the nearest berg to our camp of the day. I reckoned that the good low angle radiation characteristics of the vertical were really proving themselves over the 1500km between the two stations, and vindicated my choice of the vertical for use in the expedition. (Having said that, I think very lucky to get such a low resistance as the Magnum Earth anywhere on tundra, and would be unable to get the kind of radiation efficiency that makes verticals pay off.)

A Bear Joins In

For six nights on the trot Flo's signal rolled into our little tent out on the ice on a rushing wave of QSB. We were just getting ready for another sked when a loud bang outside the tent told us that one of the bear alarms had gone off, this is a trip wire which fires a blank shotgun cartridge when a bear walks into it. I stuck my head out of the tent and saw, sure enough, a large she-bear with her head down the Magnum Earth hole as if looking for a seal. She looked up at us, and then started playfully yanking at the guy ropes of the vertical. Losing interest in the antenna, she started to take an interest in me and left her com as close as possible, taking photographs all the time, till I saw her getting ready for the charge. She lowered her head, growled, and tensed up her body in order to launch herself at GVPZ. Dropping the camera in the snow, I unhobbled my revolver and fired a warning shot above her head. She jumped sideways and ran off a few yards, hanging around the tent for a bit before slopping off. I could hear 2AZT calling us on 2.182MHz but couldn't answer while the bear was about. We got through the following night from Barent Island, still on QRP, and were able to pass messages to our loved ones in England.

Then the dreaded sun spots returned as the solar disc aligned them once more with our little sledge wireless station. The rolling QSB that had heralded the openings on 2MHZ vanished overnight and we were left with a dead hiss, completely cut off until our return to civilisation in May.

The polar bear among the antennas

<table>
<thead>
<tr>
<th>Abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.c.</td>
</tr>
<tr>
<td>Ah</td>
</tr>
<tr>
<td>BNC</td>
</tr>
<tr>
<td>d.c.</td>
</tr>
<tr>
<td>DTI</td>
</tr>
<tr>
<td>h.f.</td>
</tr>
<tr>
<td>kHz</td>
</tr>
<tr>
<td>km</td>
</tr>
<tr>
<td>l.p.</td>
</tr>
<tr>
<td>m</td>
</tr>
<tr>
<td>mho</td>
</tr>
<tr>
<td>MHz</td>
</tr>
<tr>
<td>NiCad</td>
</tr>
<tr>
<td>p.a.</td>
</tr>
<tr>
<td>p.e.p.</td>
</tr>
<tr>
<td>QRO</td>
</tr>
<tr>
<td>QRP</td>
</tr>
<tr>
<td>QSB</td>
</tr>
<tr>
<td>ORO</td>
</tr>
<tr>
<td>OTH</td>
</tr>
<tr>
<td>r.f.</td>
</tr>
<tr>
<td>s.s.b.</td>
</tr>
<tr>
<td>u.s.b.</td>
</tr>
<tr>
<td>UTC</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td>v.h.f.</td>
</tr>
<tr>
<td>W</td>
</tr>
<tr>
<td>°C</td>
</tr>
</tbody>
</table>

**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

Short Wave Magazine August 1989
GIVE THIS A QUICK SCAN!

YAESU FRG-9600

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRG-9600 (Std) 60-905MHz</td>
<td>£499.00</td>
</tr>
<tr>
<td>FRG-9600 Mk 2 60-950 MHz</td>
<td>£545.00</td>
</tr>
<tr>
<td>FRG-9600 Mk 5 0.1-950 MHz</td>
<td>£999.00</td>
</tr>
</tbody>
</table>

Please include £10 post/packing/insurance.

The standard model covers 60-905 MHz with AM/FM/SSB, and our Mk. 2 mod extends this to 950MHz and changes the SO239 for an 'N' type. Our Mk. 5 mod has an active front end converter, coverage from 100 kHz to 950 MHz and a display mod to give a correct frequency readout. These mods can also be fitted to your '9600'! Phone us for details.

SCANNER CORNER

Bearcat 100XLT £199.99
Bearcat 70XLT £139.99
Bearcat 55XLT £54.99
Challenger BJ200 £199.00
Sony AIR-7 £229.95
Sony PRO-80 £299.95
Sony SW1-S short wave kit £239.95
Sony ICF-7600DS £149.95
MARC II 0.15-950 MHz £375.00
AOR AR2002 £469.00
ROYAL 1300 discone (AH7000) £59.50

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

ICOM IC-R7000

Listen in on public and private radio communications: weather, fire, coastguard TV, airband and many, many more. Wideband frequency coverage provides you with all the channels you need to become a VHF and UHF listener. Turn on the infra-red remote control (optional) for 'armchair copy'.

COBRA SR-925

16 channel programmable search, the COBRA scanner covers 29.54MHz for 10m & 6m Amateur bands, 118-139MHz Airband, 136-145MHz for 2m Amateur band, 162-174MHz for Land Mobile Radio and 406-512MHz for 7cm Amateur band and UHF 'T band. With 16 memory channels, 2-speed search, high sensitivity (<0.3µV) and 1 watt of audio this scanner is ideal for beginner and enthusiast alike! RAYCOM SPECIAL PACKAGE includes the following: COBRA SR925 including mains adapter plus FREE - RAYCOM scanner antenna worth £14.95 covering 60-990MHz, 136-139MHz, 136-174MHz and 360-525MHz plus FREE - antenna adapter, +10 metres of coax and PL259 plug worth £15 - a ready-to-go special at only £159.99.

Raycom package deal including FREE Royal 1300 discone worth £39.50. £98.00 plus £10 post/packing.


Bearcat 200 XLT

The best VHF/UHF handheld scanner you can get!

Check out these features against any other handheld scanner available today and see for yourself if the 200XLT comes out head and shoulders above the rest. STOP PRESS - £10 off spare nics!

- 200 memory channels
- broadband helical nicad included
- mains charger
- display backlight
- fast scan - 15 ch/sec
- fast search - 25 ch/sec
- selective delay
- auto lockout
- auto priority channels
- track tuning
- keypad lock
- 12 band coverage
- direct channel access

FREQUENCY CHECKLIST

- LOWBAND PMR
- CIVIL AIRCRAFT
- VHF/UHF HAM RADIO
- PMR LAND MOBILE
- MARINE
- CELLULAR PHONES
- RADIO CONTROL MONITOR

£259.99

RAYCOM gives you more BUYING POWER.

ALL MAJOR CREDIT CARDS ACCEPTED.
ACCESS, DINERS, INSTANT CREDIT UP TO £1000 (SUBJECT TO STAT); WITH RAYCOM CREDIT CARD (APR 29.5%), FREE CREDIT ON CERTAIN ITEMS AT MRP.

FOR DELIVERY BY COURIER (£15.00 - OR £15.00 PLUS £10 POST/PACKING) PLEASE ALLOW TIME FOR CLEARANCE OF CUSTOMS. MANY OTHER ITEMS IN STOCK - PLEASE CALL FOR FURTHER INFORMATION.

RAYCOM CREDIT CARD (APR 29.5%) FREE CREDIT FOR DELIVERY BY COURIER (£15.00 - OR £15.00 PLUS £10 POST/PACKING. PLEASE ALLOW TIME FOR CLEARANCE OF CUSTOMS. MANY OTHER ITEMS IN STOCK - PLEASE CALL FOR FURTHER INFORMATION.

ORDERING INFORMATION

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

RAYCOM COMMUNICATIONS SYSTEMS LIMITED, INTERNATIONAL HOUSE, 93 WOLVERHAMPTON RD, OLD BURY, WEST MIDLANDS B69 4BZ. Tel: 021-544-5767, Fax: 021-544-7124, Telex: 334648 DENTI G.

FRG-9600 brought up to Mk 2 £40.00
FRG-9600 brought up to Mk 5 £129.00
Modification prices include return carriage.

FRG-9600 brought up to Mk 2 £40.00
FRG-9600 brought up to Mk 5 £129.00
Modification prices include return carriage.

FRG-9600 brought up to Mk 2 £40.00
FRG-9600 brought up to Mk 5 £129.00
Modification prices include return carriage.

FRG-9600 brought up to Mk 2 £40.00
FRG-9600 brought up to Mk 5 £129.00
Modification prices include return carriage.
New Tandy Scanner

For those of you awaiting further details of Tandy’s new flagship scanner - look no further the PRO-2005 is here (or soon will be!).

The specification is very similar to that of the current model the PRO-2004 - but with one or two improvements. Gone is the tilted, membrane keypad, replaced by a much smaller rubber, push button panel. The casing has been restyled and now looks much more rectangular, measuring 203(w) x 76(h) x 203mm(d). Still a little on the large side for installation in the average European car, but a lot more compact than its predecessor.

Frequency coverage is in two continuous frequency bands 25-520MHz and 760-1300MHz, with selectable search increments of 5, 12.5 or 50kHz. The unit is capable of receiving a.m., n.b.f.m. and wideband f.m. all of which are manually selectable. The Scan/Search rate is about the same as that of an unmodified PRO-2004 at around 15 or 8 channels per second, depending on the rate selected. Other new features include 400 user programmable memory channels and improved receive sensitivity.

Judging by the relatively small differences in features and performance between the new scanner and the very popular PRO-2004 it would seem that Tandy find it difficult to improve on their existing design. Whether this will be sufficient to attract buyers away from some of the more exotic scanners being offered by other manufacturers only time will tell. However, the large number of Tandy stores in the UK offering the receiver to the public must mean that it is likely to be very popular.

Even now I expect someone somewhere is thinking of a modification that will further enhance it’s performance - so why not share it with the rest of us? In the meantime keep an eye on SWM for a more detailed review of the scanner.

Future Trends

An interesting booklet has arrived on my desk entitled Report of the Civil Spectrum Review Committee. Stage 1: 470-3400MHz. With a title like that who else could have produced it other than a government body - in this case the Department of Trade and Industry Radiocommunications Division. Having said that, it is vastly more readable than previous offerings from the same department. Even a small amount of humour is detectable in some sections - perhaps the author has been taking notes from this column!

The report describes in detail the many different users of this chunk of the spectrum and at the back of the publication there are a number of charts showing the way each frequency band has been allocated.

As the title suggests the main body of the report deals with the various uses of the radio frequency spectrum between 470 and 3400MHz. This reaches well beyond the range of most current scanning receivers, but a lot can still be learnt about future trends in communications from the points raised in the document.

One of the main recommendations is that thought should be given to the creation of a 200MHz wide band somewhere between 1.7-2.3GHz for development of “Personal Communication” systems. These may take many different forms but one example could be the development of an enhanced cellular telephone system. By planning ahead it should be possible to use the same frequency allocations and signalling protocols throughout Europe, perhaps eventually setting a world standard. The choice of frequency has several advantages, one of which is that the propagation characteristics are such that signals only tend to travel over line of sight distances. This is very important in areas such as cities, where the bands have to be re-used many times, without causing interference between users. In addition it would allow for planned expansion - starting perhaps with a terrestrial based network and then, as new techniques and equipment are developed, they can be slotted into the existing framework, leading eventually to the goal of a pocket communicator utilising direct satellite links to provide global coverage and, perhaps by this stage beyond - beam me up Scotty!

The report also suggests that the emergency services should be encouraged to share communications resources. At present the Police, Fire and Ambulance services use separate communication systems. This often results in the duplication of radio sites and equipment, a situation that could be improved by the introduction of a single network for use by all three services. This has already happened in a few major cities in the US where interlinked or “Trunked” base stations provide communications for several separate agencies. This allows each service to communicate privately with its own staff - but in the case of a major incident can permit direct inter-service communication without messages having to be passed between control operators. Additionally, a trunked type of system would permit a greater number of messages to be passed over a given number of radio channels. This is because users are allocated a communications channel automatically from a “pool” of frequencies, rather than just having one or two dedicated to each service. When one channel is busy, another one may be quiet. In a conventional system where...
each user only has one channel available, when that channel is in use, no other message can be passed.

However, in a “Trunked” system, for example, if all of the channels normally used by the Fire Service were occupied - then any additional message being passed by the Fire Service would be re-routed automatically via one of the other spare channels, perhaps one that would normally only be used by the Police. In this way much more efficient use is made of the system and urgent messages can be passed much faster.

Another point raised is that it may be considered advantageous to mix emergency service communications with other systems. This would permit a cost saving to be made by allowing commercial grade equipment to be purchased “off the shelf” as opposed to the current practice of specifying especially produced items. In addition it would provide a greater degree of security against casual listening.

Altogether a most interesting publication - why not send for a free copy which is available from the Information & Library Service, Radiocommunications Division, Room 605, Waterloo Bridge House, Waterloo Bridge Road, London SE1 8UA.

What Can I Hear? (Part 6)

In this month's look at the radio spectrum we start at 156 MHz and the first portion of the v.h.f. marine band. Activity on these frequencies has increased dramatically over the past few years as more and more small craft take to the water, particularly at the week-end. A couple of decades ago most radio communication within coastal waters was carried out on the short wave bands around 1.8-3.0 MHz. At that time most of the traffic was of a commercial nature with various names being given to the communications by amateur radio operators who shared the 1.8 MHz or “Top Band” with the “Fish Phones” operating in the ‘Trawler Band’. As v.h.f. equipment improved and equipment prices fell many new operators discovered the joys of v.h.f. operation with clearer sounding signals and compact antenna systems. Operating a v.h.f. marine tranciever was much less involved than its short wave counterpart and so quickly gained popularity with owners of pleasure craft. Today a much smaller percentage of the radio traffic is of a commercial nature but many large marine companies still have private channels allocated to them in the band.

When the marine band was first planned it utilised a channel spacing of 50 kHz, but as the usage increased this was reduced to 25 kHz, with the new channels slotted in between the old ones. This is why the channel numbering scheme seems a little unusual at first glance.

The channels are used for a variety of different purposes and in order to give some sort of order to the band many of them are reserved for specific communications. These can range from basic ship-to-ship messages, ship-to-shore navigational information or telephone traffic. Much of the communication is on the same frequency with both ship and shore stations using simplex or single frequency working. However, the latter two types of communication generally use duplex operation with ships transmitting in the 156-158 MHz segment of the band, and the shore stations replying 4.6 MHz higher in frequency at 160-162 MHz. This arrangement permits normal telephone type conversations to be held without having to release the transmit button to hear a reply. I don’t intend to list all of the marine channels here, as there are plenty of publications giving the current allocations, but here are a few - 156 MHz is used exclusively by the coastguard and rescue services, 156.8 MHz is used as a general calling channel and 156.85 MHz is for use by yachts, for those who wish to communicate with birthing sites (marinas). Additionally, 161.425 MHz has just been allocated for this purpose.

Personally I like to try and get hold of the previous years copy of either Reed’s or The Silk Cut Nautical Almanac, as these are usually sold at a fraction of their original price in bargain book shops. As well as giving lots of information about radio communications and navigational aids they also include detailed maps of Britain’s coastline and ports, the ones in the Silk Cut Almanac being particularly clear. Additionally, emergency communications and protocols are also given. It is also useful if you want to follow the action. Failing that you could try your hand at some of the more exotic knots described within the pages.

Outside of coastal areas some of the channels are allocated to other services but this is generally done in a very controlled manner in order to prevent serious interference to the marine service. An example of this is the use of 161.0-161.125 MHz for low power transmitters built into paging receivers as a means of replying to a call. These only transmit with a power level of a few milliwatts and so are only audible over a short range, within a factory or hospital, for example.

Frequency Allocations 156-165.050 MHz

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Service</th>
<th>Frequency (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>156.000</td>
<td>Marine - mixture of both single and dual frequency working. Paired with shore stations</td>
<td>160.600</td>
</tr>
<tr>
<td>157.450</td>
<td>Marine Message Handling. Paired with</td>
<td>162.050</td>
</tr>
<tr>
<td>158.400</td>
<td>Marine - mixture of both single and dual frequency working. Paired with shore stations</td>
<td>163.000</td>
</tr>
<tr>
<td>158.525</td>
<td>BT System 4 Radiophone, Mobile Transmit. Paired with</td>
<td>163.025</td>
</tr>
<tr>
<td>159.925</td>
<td>Private Message Handling, Mobile Transmit. Paired with</td>
<td>164.425</td>
</tr>
<tr>
<td>160.600</td>
<td>Marine Shore Base transmitt. Paired with</td>
<td>165.050</td>
</tr>
<tr>
<td>161.000</td>
<td>Paging systems low power reply</td>
<td>156.000</td>
</tr>
<tr>
<td>161.1125</td>
<td>Marine Shore Base transmitt. Paired with</td>
<td>157.450</td>
</tr>
<tr>
<td>162.050</td>
<td>Marine Message Handling, Base Transmit. Paired with</td>
<td>158.525</td>
</tr>
<tr>
<td>163.025</td>
<td>BT System 4 Radiophone, Base Transmit. Paired with</td>
<td>159.925</td>
</tr>
<tr>
<td>164.425</td>
<td>Private Message Handling, Base Transmit. Paired with</td>
<td>160.550</td>
</tr>
</tbody>
</table>
Also lying in this part of the spectrum is the predecessor to the cellular telephone network. This is known as BT System 4 and is based on a number of paired, duplex channels. The mobile station transmitting in the region of 158-159MHz and the base stations 4.5MHz higher in frequency at 163-164MHz. Because of the choice of frequency and limited number of channels available the system was severely limited in the number of users it could accommodate at any one time. This was a major problem in large cities and limited the growth of the system. With the introduction of cellular telephones, many of the original System 4 users have changed to the new system, although in rural areas such as Mid-Wales and parts of Scotland, System 4 is still well used as it offers much greater coverage than that of the current cellular network.

In addition to BT, a few other companies were permitted to offer a limited Private Message Handling service with interconnection to the telephone network, but under operator control. These operate with the same transmit/receive frequency split as the BT service but have the mobiles transmitting at around 160MHz and the base stations at 164MHz.

Regular reader, Alister Matthews, demonstrating how to remain inconspicuous!

Although you may have thought that this sort of service had been superseded by the cellular telephone it still fulfils a useful role for people such as doctors who may spend a large proportion of their time away from the phone but require vital messages to be passed immediately.

More next time when we look at the v.h.f. Private Mobile Radio “HIGH” Band.

**SCANNING**

**AIRBAND**

10car

Ayrshire) is an air traffic control assistant at Shanwick and tells us exactly what each frequency is used for. Frequency 133.8MHz (from Dundonald Hill and Viniston Hill, near Cheltenham, in this case) broadcasts the latitude/longitude waypoints of the day’s organised track system; operational 1000-1900UTC. Clearance delivery is on 123.95MHz for air traffic operations west of 030°W and 127.65MHz for others. As an overflow frequency, 135.525MHz is available 1100-1600UTC for British Airways and Lufthansa aircraft. Before joining the North Atlantic tracks, aircraft call delivery for confirmation of clearance of their flight plan.

Just 65km from Waterford Airport, John Murphy (Wexford, Ireland) is experiencing plenty of summer Ryanair traffic. John notices that Gander and Shanwick share h.f. allocations and has correctly deduced that the pilot might hear both at once. Indeed at the mid-Atlantic handover point (030°W) the pilot needn’t even change frequency. The address of the Scottish and Oceanic Air Traffic Control Centre is Atlantic House, Sherwood Road, Prestwick, Ayrshire KA9 2NR.

**Follow-Ups**

Previous doubts about the West Malling Air Show have been dispelled by Dave Lawrence G6HRX (Snodland, Kent); it’s on August 28th and pre-show flight arrivals will be using the airfield frequency of 130.425MHz. Dave’s quick route: leave M20 J4, head south, cross A20, join new W. Malling bypass.

Recently this column has carried lots of advice on the Signal R555 after a reader said he was experiencing problems. Steve points out that the backlight can be switched off at the rear of his set. As for battery life, at least five hours is expected per charge; and it’s easy to make a spare battery pack using the sort of NiCads that terminate in a solder tag. I must point out that NiCads misbehave unless charged carefully; they should certainly never be trickle charged continuously. For a perceptive account of this problem let me refer you to Radio Communication June ’89, page 34: “NiCad Memory - Fact or Fiction?” which is part of the respected “Technical Topics” column by Pat Hawker G3VA.

On the same subject, F. Bates (Leeds) uses a 1.9Ah 12V sealed lead-acid battery. The helical antenna can be lead up the side of the receiver by using a pair of right-angle connectors, and the whole lot then slips neatly into a camera bag. I agree with the comments that the speaker is less important than the earpiece - manufacturers take note! When out and about with any radio, I hope all readers cut down on “noise pollution” by using an earpiece, but the ones supplied by the manufacturers are such poor quality.

As we “call finals” for another month I hope you’ve found something to think about in this column. I certainly learn a lot from reading your letters - keep them coming!

**Letters**

As I have said before, one of the most enjoyable parts about writing this column is receiving all of your letters. I thought I would take just a few lines to thank all of you who have written with your comments, questions and ideas relating to the subject of scanning. I do try and acknowledge all of your letters either in the column or by letter if you have enclosed an s.a.e. However, this can take some time as it has to be slotted in with 1001 other domestic and work commitments so please bear with me! As usual the address to send your letters to is: PO Box 1000, Eastleigh, Hants SO5 5HB. Until next month - good listening.

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.m.</td>
<td>amplitude modulation</td>
</tr>
<tr>
<td>f.m.</td>
<td>frequency modulation</td>
</tr>
<tr>
<td>GHz</td>
<td>gigahertz</td>
</tr>
<tr>
<td>kHz</td>
<td>kilohertz</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>mm</td>
<td>millimetre</td>
</tr>
<tr>
<td>n.b.f.m.</td>
<td>narrow band frequency</td>
</tr>
<tr>
<td>s.a.e.</td>
<td>stamped addressed</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
</tr>
</tbody>
</table>

**SCANNING**

**AIRBAND**

Letters

As I have said before, one of the most enjoyable parts about writing this column is receiving all of your letters. I thought I would take just a few lines to thank all of you who have written with your comments, questions and ideas relating to the subject of scanning. I do try and acknowledge all of your letters either in the column or by letter if you have enclosed an s.a.e. However, this can take some time as it has to be slotted in with 1001 other domestic and work commitments so please bear with me! As usual the address to send your letters to is: PO Box 1000, Eastleigh, Hants SO5 5HB. Until next month - good listening.

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.m.</td>
<td>amplitude modulation</td>
</tr>
<tr>
<td>f.m.</td>
<td>frequency modulation</td>
</tr>
<tr>
<td>GHz</td>
<td>gigahertz</td>
</tr>
<tr>
<td>kHz</td>
<td>kilohertz</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>mm</td>
<td>millimetre</td>
</tr>
<tr>
<td>n.b.f.m.</td>
<td>narrow band frequency</td>
</tr>
<tr>
<td>s.a.e.</td>
<td>stamped addressed</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
</tr>
</tbody>
</table>

**Follow-Ups**

Previous doubts about the West Malling Air Show have been dispelled by Dave Lawrence G6HRX (Snodland, Kent); it’s on August 28th and pre-show flight arrivals will be using the airfield frequency of 130.425MHz. Dave’s quick route: leave M20 J4, head south, cross A20, join new W. Malling bypass.

Recently this column has carried lots of advice on the Signal R555 after a reader said he was experiencing problems. Steve points out that the backlight can be switched off at the rear of his set. As for battery life, at least five hours is expected per charge; and it’s easy to make a spare battery pack using the sort of NiCads that terminate in a solder tag. I must point out that NiCads misbehave unless charged carefully; they should certainly never be trickle charged continuously. For a perceptive account of this problem let me refer you to Radio Communication June ’89, page 34: “NiCad Memory - Fact or Fiction?” which is part of the respected “Technical Topics” column by Pat Hawker G3VA.

On the same subject, F. Bates (Leeds) uses a 1.9Ah 12V sealed lead-acid battery. The helical antenna can be lead up the side of the receiver by using a pair of right-angle connectors, and the whole lot then slips neatly into a camera bag. I agree with the comments that the speaker is less important than the earpiece - manufacturers take note! When out and about with any radio, I hope all readers cut down on “noise pollution” by using an earpiece, but the ones supplied by the manufacturers are such poor quality.

As we “call finals” for another month I hope you’ve found something to think about in this column. I certainly learn a lot from reading your letters - keep them coming!
For products you can rely upon
to give amazing results

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

All our products are designed and made in Britain.

Orders can be despatched within 48 hours subject to availability.

---

**Reg Ward & Co. Ltd.**

**YAESU**

**YAESU FRG 8800** £639.00

- Super VHF/VHF receiver
- VHF option LCD
- Direct readout with 8-bit CPU function control
- 21-button keypad entry
- Full coverage
- 15kHz-29.999MHz, AM/FM, LSB, USB
- 15 memories
- With back up, 150, 100, 200, 240, plus 12V d.c. =
- FM/AM/FM direct read-out - plug in: FDVFM (£49.00)

**YAESU FRG 9600** £499.00

- All-mode scanning receiver providing features never offered before in the full 200MHz Military Band.
- FM, AM and AIR Band.
- With back up, 150, 100, 200, 240, plus 12V d.c.

**KENWOOD**

**ICF 7600DS** £198.00

- 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 are also scan or manual tuning with the up/down keys. A sensitivity select switch, from 153 to 2000kHz and 71 to 200kHz, plus SSB threshold reception, for both AM and AIR Band.

**AIR7** £299.00

- Direct scanning receiver
- Built-in AM/FM and AIR Band receiver
- Remote control
- Low noise level
- Easy operation

**AIRHANDY SKYVOICE REAL VALUE** £169.00 (carriage £3.00)

- VHF HANDY FAX
- A lightweight, but tough little monitor receiver
- 118-130MHz/AM/200 channels

**AIRHANDY HFX**

- New low price £119.00 (carriage £3.00)
- NewAirband VHF/HRB/HHD scanner £235.00 (carriage £3.00)
- New low price £235.00 (carriage £3.00)

- Coverage is continuous from 30kHz to 30 MHz and operating modes are AM, LSB, USB and CW

---

**YAESU**

**ICF PRO80** £298.00

- Super-wide coverage
- 15kHz-29.999MHz, AM/FM, LSB, USB
- 15 memories
- With back up, 150, 100, 200, 240, plus 12V d.c.

**ICF 2001D** £298.00

- Super-wide coverage
- 15kHz-29.999kHz, AM/FM, LSB, USB
- 15 memories
- With back up, 150, 100, 200, 240, plus 12V d.c.

---

**CHALLENGER BJ200 Pocket Scanner** £199.00

- The Challenger BJ200 Pocket Scanner covers CB and Amateur Band frequencies as well as the 200MHz Military Band. It has switchable AM/FM and the accessories which come standard include a hi-Cd battery pack built in and battery charger, carrying case, helical razor antenna, and location of (AM/FM) scanner.

**Carriage £3.00**

**SPECIFICATION:** Band A: 26.22-29.995MHz in 5kHz steps. Band B: VHF: 100-800MHz in 1kHz steps. Band C: VHF: 70-250MHz in 1kHz steps. Band D: VHF: 250-700MHz in 1kHz steps. Band E: UHF: 150-500MHz in 1kHz steps.

---

**STOCK ITEMS USUALLY DESPATCHED WITHIN 48 HOURS**

---

**SHORT WAVE MAGAZINE August 1989**
At first glance the Liniplex F2 receiver looks somewhat unimpressive, for it has but few of the multiplicity of knobs, buttons and switches which are usually found on semi-professional receivers of Japanese manufacture. It is contained in a pastel blue and silver cabinet, with an uncomplicated front panel from which all the functions are controlled. The synthesiser unit, which sits atop the h.f. receiver, is in a similar cabinet but with even fewer controls. Together, however, this team presents a formidable face to the outside world, with an ease of operation seen only rarely in communications equipment.

The set covers 2 to 22MHz in 5kHz steps, although it can receive signals of 2.5kHz, and with crystals on the eight fixed frequency channels the receiver frequency range is 150kHz to 26.1MHz.

Crystals...? Yes, that's right - for essentially the Liniplex F2 is a crystal-controlled receiver, designed primarily for listening on fixed frequencies and aimed at listeners to, and re-broadcasters of, the BBC World Service. Indeed the F2, and its predecessor the F1, is in use at many radio stations throughout the world which carry the news from London, including the BFBS station in Port Stanley and several stations in Africa.

Automatic Synchronisation

A 9-position knob on the front panel provides the choice of eight pre-set crystal-controlled frequencies, whilst the ninth position allows control of the receiver by an external synthesiser which we shall look at later. Unlike most conventional receivers, the F2 needs to synchronise itself precisely to the received signal. A local carrier frequency is generated inside the receiver which is then synchronised to the carrier of the incoming signal. This local carrier is then applied to an electronic circuit which multiplies it with the incoming composite signal enabling the sidebands, carrying the audio of the signal, to be translated back to the audio message which was originally input to the transmitter. This is carried out by a UK-patented “tracking phase-locked demodulator”.

If you are a professional broadcaster with a need to re-broadcast signals from h.f. transmissions, or simply an s.w.l. who requires high quality reception, the British-manufactured Liniplex F2 receiver with its associated OSC-1 synthesiser could be just what you require.

The bandwidth for a.m. reception is 3.4kHz, which is suitable for good voice audio intelligibility, and the set is designed to receive the double sideband a.m. signal which is 6.8kHz wide.

Signals may be received in double-sideband mode, or in upper or lower sideband modes. I.n.s.b. mode, allowing both sidebands to contribute to the audio signal some diversity action permits improvement to reception when one or both sidebands is impaired, perhaps through interference. When an adjacent channel sideband overlaps, the sound of the unwanted sideband is less disturbing than on a conventional receiver as it is completely unintelligible.

Circuitry

Technically speaking, the F2 is a double-superheterodyne with three translation stages. A high first i.f. of 35.4MHz allows the first image frequencies to be easily rejected with a low-pass filter at the receiver input, whilst the first translation stage uses a Schottky diode double-balanced mixer followed by a 10kHz bandwidth crystal filter to give extremely low intermodulation and cross-modulation effects. The majority of receiver gain is from the second i.f. where a crystal filter allows direct translation to 455kHz with good image rejection at the second filter. Single sideband uses a mixer system in the translation of signal to audio when two mixers are used, with an audio phase shifting device built specifically for the F2 in hybrid integrated circuit form. An active low-pass filter removes interfering noises as much as possible by shaping the audio response whilst maintaining sufficient bandwidth for good audio intelligibility. Quartz crystal oscillators are used to provide high stability.

A signal strength meter is provided on the front panel and provision is made for the connection of an external recorder. The meter is driven by a log amplifier to which a measure of the collector current of an i.f. amplifier in the a.g.c. loop is input. Measurement is of envelope voltage and not simply the carrier, with 100 per cent amplitude modulation resulting in a signal strength reading 6dB higher than with an unmodulated carrier.

Two a.g.c. positions are provided:
NORMAL is fast attack with slow decay, and FAST DECAY is suitable during thunderstorms and so forth.

For antenna connection, two coaxial inputs are available to give a choice of balanced screened coaxial or unbalanced coaxial cable runs to the antenna. A dipole antenna 4m long is provided with the receiver, the ends requiring a piece of metal foil of about 0.3m² to be connected, producing a broadband antenna. A loop antenna is also provided for m.f and i.f. reception and for signals up to about 7MHz; alternatively, a wire antenna 10m long can be used effectively with the F2, when an earth is required.

The F2 is powered by seven built-in rechargeable NiCad cells which, when fully charged, offer about 8 hours of operation, a red light glowing on the front panel when battery power becomes low; a battery charger is provided. Mains operation is also possible using the power adaptor, and in the event of a mains failure the internal batteries will take over.

OSC-1 Synthesiser

Clearly, with only eight pre-set frequencies the F2 is limited for those wishing to listen to many different stations, and it is for this reason that the Liniplex OSC-1 synthesiser has been brought on to the market. This is designed to have very low sideband phase noise, so that demodulated noise from this source does not affect reception quality - unlike some synthesised receivers. The synthesiser is operated by a bank of five digital thumbwheel switches, controlling the frequency in megahertz in 5kHz steps.

Tuning is achieved by setting the F2 to the EXT OSC position on the channel selector and then turning the thumbwheel switches until the desired frequency has been found, e.g. 13.730MHz. The SET button is then pressed and the receiver is instantly moved to the frequency. The synthesiser processor calculates the serial code and operates the components, then ceases work - thereby eliminating any further digital activity, which is often the source of r.f. interference with some sets. The tracking system may be used with the synthesiser, but manual operation is also possible, the choice depending on the operator's preference.

Thumbwheel operation is somewhat laborious and does not permit rapid bandscans to be made; however, in employing this technique performance quality has been maintained without the increase in cost necessary for keypad control. In practice, for an s.w.l., this method of tuning is reasonably satisfactory and increases the usefulness of the F2 receiver immeasurably.

Performance

The quality of reception from the F2 receiver is superb and far exceeds the performance of semi-professional receivers currently on the market. Sensitivity is excellent and selectivity is of a similar high standard, with sideband operation providing clear and high quality audio on broadcast signals. Even using an unmatched, short, outside wire antenna very good results are possible, and during tests, weak signals from the Pacific region were heard with good quality, proving the sensitivity of the set. Audio quality, whether through the extremely impressive optional Liniplex loudspeaker or headphones, is excellent and makes listening to the noisy h.f. bands more pleasurable.

It is also possible to receive amateur transmissions, although to do so requires somewhat complex operation, necessitating a mixture of thumbwheel control and fine tuning, but is nonetheless satisfactory.

The Liniplex F2 is certainly not the least expensive piece of short wave equipment on the market, but it is one of the most effective, being carefully constructed to an exacting standard. The manufacturer, Phase Track Ltd, is a small company who prove what can be achieved in receiver design today. The Liniplex F2 receiver, less crystals, costs £855.60, with the OSC-1 synthesiser a further £755.5.5. The matching loudspeaker is £46.00. Crystals, made to order cost £10.35 solder sealed and £13.80 welded package.

Our thanks go to Phase Track Ltd, 16 Britten Road, Robert Cort Industrial Estate, Reading RG2 2AU. Tel: (0734) 752666 for the loan of their equipment.
How highly directional, low power transmitters, came to the aid of hard-pressed agents deep behind enemy lines during the last war is recounted by well-known author, Chas E. Miller.

During the second world war, secret agents were working deep inside Nazi-occupied territories, seeking out information of vital importance to the Allies. Getting this back to Britain was both difficult and dangerous. Speed being of the essence, radio was the first choice for communication, but the Nazi counter-espionage service had at its disposal the most sophisticated listening and tracking devices then available. Conventional short wave transmissions could never be safe from detection, and it was to overcome this problem that Joan-Eleanor was born - to two fathers.

Until quite late in the war the standard radio equipment for secret agents was known as the "suitcase model" (for obvious reasons), but with the war going on in mode on ordinary short waves. The sets could be used with a fair chance of non-detection in, say, France, where they could be shifted rapidly from one "safe" house to another before Nazi tracking equipment could locate them, but even so danger was never far away.

For agents operating inside Germany the peril was much worse, as safe houses were few and far between: operating from one place for any length of time was almost certain to attract the tracking vans, which could detect an illicit transmitter from as much as 20 miles away and then pin-point its location to within a few yards. By 1944 the problem had become acute, but its solution already had been developing in the mind of one man for some years.

In peacetime, Stephen Simpson, had been one of the Radio Corporation of America’s team of scientists, with a special interest in transmitter design. One of the projects on which he had collaborated was the broadcasting of Big Ben at Christmastide to New York listeners over station WJZ via a short wave link. When war came Simpson became a Lieutenant Commander working for the American Co-ordinator of Information (COI), later renamed the Office of Strategic Services (OSS). His brief was to establish a communications system that would enable OSS to contact its agents without the Germans knowing what was going on. In September 1944, Simpson was in London discussing the detection problem with other officers of OSS. From what he had been envisaging since his early days at the department, he told his companions that, given suitable men and aircraft, he was confident he could furnish a fool-proof communications system within months.

Aircraft were included in the requirement because Simpson planned on using high-frequency, narrow beam transmissions that could be aimed upwards to aircraft circling the area in which an agent operated.[1] The way in which he presented his idea was persuasive enough for him to receive an official go-ahead within 24 hours. His first action was to call on the services of another RCA scientist, DeWitt R. Goddard, at that time working in the Company’s research laboratories at Riverhead, Long Island, on Long Island, New York. Simpson, produced some experimental radio equipment which Goddard - by that time himself inducted into the US Navy with a commission - brought over to Britain.

Tiny Transceiver

The Simpson-Goddard equipment worked on v.h.f. and consisted of a tiny transceiver for use by agents and a fairly large airborne unit. The ground set was astonishingly small for its period, being only 165 x 57 x 38mm; it weighed about 340g and was battery powered (‘layer’ types had come into use by that time, dramatically reducing the size of h.t. batteries). Although its transmitting power was low, the use of an upwardly directional antenna meant that the range need be no more than a few miles. The airborne set was less restricted in size, and in fact weighed some 18kg - about half as much again as an R-1155. To prevent errors being made in relaying messages from the agents to their home bases, the aircraft would also carry a wire recorder on which all conversations with the ground could be logged. As with almost all military equipment, a code name had to be allocated to the Simpson-Goddard gear, and Simpson came up with two girls' names. One was that of a friend of the family, Eleanor, the other was Joan. The code name for Goddard’s wife, ‘Joan’ was the ground set and “Eleanor” the airborne one.

Enter The Mosquito

The original intention had been to fit Eleanor into a B-17 “Flying Fortress” bomber, but around this time the Germans had developed a highly accurate, radar-directed, anti-aircraft gun which would have made short work of the relatively slow B-17. In the circumstances the US Air Force declined, reasonably enough, to expose its crews to what was considered the suicidal risk of “stooping around” whilst trying to contact the ground. Simpson, not being a man to give up easily, looked around for a smaller, faster aircraft to which Eleanor could be adapted. He found an ideal candidate.

It happened that the US Air Force had just one squadron of de Havilland Mosquitoes, the British, ‘wooden wonder’ plane which, even as a bomber, was able to fly without defensive armament because its speed alone was sufficient protection against enemy fighters. Many different variants of the original design were built, making it probably the most versatile aircraft of the Second World War. For the detection, both radio and visual, of enemy aircraft, the second world was the standard radio equipment for secret agents during the war. Speed being of the essence, radio was the first choice for communication, but the Nazi counter-espionage service had at its disposal the most sophisticated listening and tracking devices then available. Conventional short wave transmissions could never be safe from detection, and it was to overcome this problem that Joan-Eleanor was born - to two fathers.

Until quite late in the war the standard radio equipment for secret agents was known as the “suitcase model” (for obvious reasons), but with the war going on in mode on ordinary short waves. The sets could be used with a fair chance of non-detection in, say, France, where they could be shifted rapidly from one “safe” house to another before Nazi tracking equipment could locate them, but even so danger was never far away.

For agents operating inside Germany the peril was much worse, as safe houses were few and far between: operating from one place for any length of time was almost certain to attract the tracking vans, which could detect an illicit transmitter from as much as 20 miles away and then pin-point its location to within a few yards. By 1944 the problem had become acute, but its solution already had been developing in the mind of one man for some years.

In peacetime, Stephen Simpson, had been one of the Radio Corporation of America’s team of scientists, with a special interest in transmitter design. One of the projects on which he had collaborated was the broadcasting of Big Ben at Christmastide to New York listeners over station WJZ via a short wave link. When war came Simpson became a Lieutenant Commander working for the American Co-ordinator of Information (COI), later renamed the Office of Strategic Services (OSS). His brief was to establish a communications system that would enable OSS to contact its agents without the Germans knowing what was going on. In September 1944, Simpson was in London discussing the detection problem with other officers of OSS. From what he had been envisaging since his early days at the department, he told his companions that, given suitable men and aircraft, he was confident he could furnish a fool-proof communications system within months.

Aircraft were included in the requirement because Simpson planned on using high-frequency, narrow beam transmissions that could be aimed upwards to aircraft circling the area in which an agent operated.[1] The way in which he presented his idea was persuasive enough for him to receive an official go-ahead within 24 hours. His first action was to call on the services of another RCA scientist, DeWitt R. Goddard, at that time working in the Company’s research laboratories at Riverhead, Long Island, on Long Island, New York. Simpson, produced some experimental radio equipment which Goddard - by that time himself inducted into the US Navy with a commission - brought over to Britain.

Tiny Transceiver

The Simpson-Goddard equipment worked on v.h.f. and consisted of a tiny transceiver for use by agents and a fairly large airborne unit. The ground set was astonishingly small for its period, being only 165 x 57 x 38mm; it weighed about 340g and was battery powered (‘layer’ types had come into use by that time, dramatically reducing the size of h.t. batteries). Although its transmitting power was low, the use of an upwardly directional antenna meant that the range need be no more than a few miles. The airborne set was less restricted in size, and in fact weighed some 18kg - about half as much again as an R-1155. To prevent errors being made in relaying messages from the agents to their home bases, the aircraft would also carry a wire recorder on which all conversations with the ground could be logged. As with almost all military equipment, a code name had to be allocated to the Simpson-Goddard gear, and Simpson came up with two girls' names. One was that of a friend of the family, Eleanor, the other was Joan. The code name for Goddard’s wife, ‘Joan’ was the ground set and “Eleanor” the airborne one.

Enter The Mosquito

The original intention had been to fit Eleanor into a B-17 “Flying Fortress” bomber, but around this time the Germans had developed a highly accurate, radar-directed, anti-aircraft gun which would have made short work of the relatively slow B-17. In the circumstances the US Air Force declined, reasonably enough, to expose its crews to what was considered the suicidal risk of “stooping around” whilst trying to contact the ground. Simpson, not being a man to give up easily, looked around for a smaller, faster aircraft to which Eleanor could be adapted. He found an ideal candidate.

It happened that the US Air Force had just one squadron of de Havilland Mosquitoes, the British, ‘wooden wonder’ plane which, even as a bomber, was able to fly without defensive armament because its speed alone was sufficient protection against enemy fighters. Many different variants of the original design were built, making it probably the most versatile aircraft of the Second World War. For the detection, both radio and visual, of enemy aircraft, the second world was the standard radio equipment for secret agents during the war.
SCANNERS
WE'VE GOT THE LOT!
We Carry The Largest Stocks - With Comprehensive Service Backup

BEARCAT MARINE BAND H/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)
BC 70XLT (20 CH MEM.) ........................................ £149
(29-54 MHz, 136-174 MHz, 406-512 MHz)

SONY RADIOS

SONY ICF 2002 (130kHz-136MHz) ................................ £299.95
SONY ICF 7600 (53kHz-108MHz) ................................ £129.85

BEARCAT AM/FM H/HELDs

UBC 100XL (16 CH MEM.) ........................................ £179
(66-88 MHz, 118-174 MHz, 406-512 MHz)
BC 100 XLT (100 CH MEM.) ...................................... £199
(29-54, 118-174, 406-512 MHz)
UBC 200XLT (200 CH MEM.) ...................................... £229
(66-88, 118-174, 406-512, 806-956 MHz)

SPARE BATTERY PACKS FOR BEARCAT 100 AND 200 XLT IN STOCK

BLACK JAGUAR ACCESSORIES

(Suitable for all models, BJ200, Challenger etc.)
Mobile Mount ......................................................... £6.95
Base Mount ........................................................... £5.95
BJ1 Car Supply (Mk111 version only) ...................... £14.95
BCA6 Mains Slow/Fast Charger ............................... £14.95
Airband Rubber Duck Antenna .............................. £6.00
SA7 UHF Sub Antenna ............................................. £4.95
Telescopic Antenna (TNC) ....................................... £6.75

BEARCAT BASE/MOBILE

UBC145 XLT (16 CH MEM.) ....................................... £115
(66-88, 136-174, 406-512 MHz)
BC175 XLT (16 CH MEM.) ....................................... £169.99
(29-54, 118-174, 406-512 MHz)
BC210 XLW (40 CH MEM.) ....................................... £169
(29-54, 136-174, 406-512 MHz)
BC590 XLT (100 CH MEM.) ...................................... £199
(29-54, 118-174, 406-512 MHz)
BC800 XL (40 CH MEM.) ......................................... £229
(29-54 MHz, 118-174 MHz, 406-512 MHz)
BC950 XLT (100 CH MEM.) ...................................... £229
(29-54 MHz, 118-174 MHz, 406-512 MHz)

GLASS VENTILATION UNIT

SEND £2 FOR OUR NEW BUMPER CATALOGUE
INCL. £20's WORTH OF VOUCHERS

SONY ICF 7600 (53kHz-108MHz) ................................ £129.85

SCANNING RECEIVERS

AOR 3000 (call for details) ...................................... £765
AOR 2002 Base with Full Coverage. £487
AOR 900 Handheld with 900MHz £235
SONY AIR 7 Airband H/held £229
SONY PRO 80 Wideband H/held £299
SONY ANI Active Antenna £49

LOW NOISE PRE-AMPLIFIER

£79.95 NEW

* Covers 25-2100 MHz
* Low Noise GaAs FET
* Switchable Band Pass Filters
* Variable Gain Control

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

SCANNING ANTENNAS

NEVADA WB1300 Discane (25-1300MHz)
Stainless Steel top of the range ................................ £59.95
NEVADA DISCONE (50-700 MHz) ............................. £24
NEVADA PA 15 (100-960 MHz) ................................. £49.95
A new Colinear Ant with over 9dB gain at 900 MHz .... £49.95
NEVADA MOBILE ANT (50-1300 MHz) .................... £27.90
MAGNETIC MOUNT Complete ............................... £24.90
GUTTER MOUNT Complete .................................... £24.90
LOG PERIODIC (105-1300 MHz) ............................ £89
20 El. Beam with over 12dB gain ............................ £89

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

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 3 GHz.
MODEL 5D (8.1mm Dia) ................................................ £0.56 per MTR
MODEL 5D (11.1mm) .................................................. £1.40 per MTR
MODEL 10D (13.3mm Dia.) ......................................... £1.99 per MTR

SEND £2 FOR OUR NEW BUMPER CATALOGUE

VISA

NEVADA
189 LONDON ROAD NORTH END PORTSMOUTH PO2 9AE

HOTLINE (0705) 662145
INTRODUCTION TO DX-TV

Keith Hamer & Garry Smith
Part 20

In the near future, high-definition television will be introduced with the number of scanning lines in excess of 1000, yet 405 lines was once regarded as a high-definition.

into increasing his mechanical scanning from 30 to 240 lines with 25 frames per second, scanned sequentially to improve the definition.

When high-definition broadcasts began in November 1936, Baird had just managed to attain the "high-definition" category, as defined by the Government of the day, with his mechanical approach. However, Marconi-EMI had proudly come up with the famous 405-line system with 50 frames interlaced scanning, producing 25 complete frames per second. Both systems were used on alternate weeks for a short period, but the Government's decision finally came down in favour of the Marconi-EMI system.

Europe

Before World War II, France was using a 180-line system while the Germans and Italians had adopted a 441-line standard. The main Paris 180-line transmitter in the Eiffel Tower was actually taken over by the Germans towards the end of the war and converted to their 441-line standard, which employed negative modulation with the a.m. sound carrier spaced some 2.8MHz away from the vision frequency.

The surge in the number of television services appearing throughout the world after the war brought with it various alternative standards for sending TV picture and sound information. In the UK, transmissions using the 405-line system were resumed in 1946 but elsewhere things were different.

Super-Definition

The French, being different, decided upon a system with a much higher definition. In fact it had 819-line scanning and a super-wide video bandwidth of over 10MHz! This was known as System "E". The 441-line Paris transmissions continued into the early Fifties - we vaguely recall DX reception reports of this transmitter in some of the technical magazines of the period.

The extremely wide channel width of System "E" meant that, in theory, fewer channel allocations could be accommodated within Bands I and III compared with other systems. In Band II the French developed a clever way of interleaving the channels, which meant that some sound channels were above and some were below the vision carrier frequency!

A 625-line system with positive modulation, System "L", was later introduced at u.h.f. and nowadays it fully replaces the 819-line system which once occupied the v.h.f. channels. Belgium, Monaco, Luxembourg and Algeria all used an 819-line system at some stage during the Sixties. In early 1969, RTB, the French-language network in Belgium, changed to System "C" with positive modulation used on all its v.h.f. channels. This system was in use until 1977 when conversion to System "B" took place. Luxembourg changed to System "B" for its v.h.f. broadcasts in 1971, with an eventual conversion to System "B" in 1982/83, mainly because of its decision to broadcast to neighbouring West Germany and Belgium in the German language. It broadcasts in French at u.h.f. on both the System "L" SECAM and System "G" PAL standard. A similar situation exists in Monaco with transmissions in French and Italian in SECAM and PAL.

An 819-line system was used in Saarland until it came under the control of the Federal Republic of Germany in 1957. Algeria was still using 819 lines in 1969 although some transmitters were being converted for the System "B" standard. Togo, in south west Africa, continued to use the 819-line system until the mid-Seventies.

625 Lines

Most Western European countries decided upon a 625-line system (CCIR System "B" at v.h.f. and System "G/H" at u.h.f.). This was a West German development using negative-going vision modulation and f.m. intercarrier sound separated from the vision channel by 5.5MHz. This particular system was also adopted by Australasia, parts of the Far East, the Middle East and some African countries, but with differences in channel numbering and allocations in general.

In Russia and Eastern Europe a 625-line standard was also chosen but with a much wider vision bandwidth than the CCIR system and a 6.5MHz sound and vision spacing. This was known as the OIRT system and designated System "D" at v.h.f. and System "K" at u.h.f. There were a few exceptions, of course: Yugoslavia and East Germany eventually opted for the CCIR system.

The same technical characteristics of the OIRT system are now used by the many French-influenced colonies throughout the world. In Africa, for
instance, countries using System “K” are plentiful nowadays, although these are of little interest to the European TV DXer because only the Band III and u.h.f. channels are used at present.

UK Plans
Field tests using v.h.f. Band V took place as early as 11 November 1957 using the 405-line system from the Crystal Palace transmitter. Less than six months later more experimental transmissions took place at u.h.f., but this time using 625 lines. This was to become the standard that would be adopted for any future television networks in the UK. The system chosen was very similar to the CCIF and QIRT systems, but with a sound and vision frequency difference of 6.0 MHz. It was proposed that the 405-line system in Bands I and III would eventually be phased out and replaced by the higher definition broadcasts offered by the 625-line system. The main technical hitch was that fewer channels could be accommodated within the bands because of the wider channel bandwidth required by the new system. Originally, the phasing out of the 405-line network was to be a much swifter process than actually happened, and it is doubtful whether anyone would have envisaged the system lingering on until 1985! Unfortunately, the idea for a re-engineered network in Bands I and III was eventually ditched during the Eighties when the Government, with misguided loyalties, decided to hand it over to users other than the TV broadcasters.

The UK system is also used in Eire at both v.h.f. and u.h.f. In other parts of the world this system has also been adopted: Hong Kong uses it and so do a few African countries such as South Africa and Angola.

Colour Television
Throughout the world today there are three colour systems in use: PAL, SECAM and NTSC. They all have their merits and weaknesses; many were chosen because of political influences - or even a country’s topography. Some countries use variants of these systems in order to suit the technical requirements of a particular transmission system used. One example that readily springs to mind is the PAL system adopted by Brazil, where a subcarrier frequency lower than the usual 4.43 MHz has to be used because of the narrower vision bandwidth of the 525-line American system which is employed.

During the Fifties, colour television was introduced to the USA using the NTSC colour encoding system. NTSC was later adopted by most countries using the 525-line system “M”. This standard is used in the Caribbean area, Canada, Japan, certain countries in the Far East and South America. Some South American countries use System “N” which has 625 lines but retains the same channel arrangements and vision bandwidth of System “M”. The American Forces TV Network in Europe also uses the System “M” NTSC standard. Transmission standard changes have occurred in certain cases, for instance Aramco-TV (Dharan, Saudi Arabia) changed to System “B” PAL during the Seventies; fortunately it uses channel E3 and has been received in the UK only on rare occasions.

Unsuitable in Europe
The NTSC colour system was field-tested in Europe but eventually proved to be unsuitable, mainly because phase changes in the received signal had some considerable effect on the colour - it changed and so did a few African countries such as South Africa and Angola.

British Colour History
Experimental colour transmissions took place in the UK towards the end of 1955 when the NTSC system underwent field trials using 405-lines at v.h.f., but with a lower subcarrier frequency than in the original NTSC specification. There were also colour broadcasts at 625-lines during the early Sixties.

The new 625-line system at u.h.f. carried programmes for public viewing following the introduction of BBC2 in 1964. We might add that the official opening night on April 20 was somewhat jinxed: a power failure in the public mains supply meant that Television Centre was plunged into total darkness shortly before the service was to begin. The story goes that packets of candles were hurriedly opened to provide emergency lighting in the hope that power would soon be restored. It wasn’t - so the official opening had to be postponed until the following evening.

Strange Tests
It was on 2 December 1967 when BBC2 colour broadcasts officially began using the PAL system. Towards the end of 1969, BBC1 and ITV broadcasts were duplicated at u.h.f. to provide a colour service on all three channels. It is interesting to note that during the early Seventies a few strange test transmissions took place, outside normal programme hours, around 200 MHz in Band III using the 625-line system.

Encrypted Broadcasts
Encrypted, or scrambled, transmissions are usually associated with satellite broadcasting. However, over the past few years there has been an increasing interest by various broadcasters and governments in using encryption for existing terrestrial television networks. The aim of encryption is to ensure that the programmes can only be satisfactorily received with the aid of a special decoder unit. Although the encrypted programmes may be intended for a specialist audience only, most of us realise that such a system is really designed as a means of selective revenue raising for individual private broadcasters. On the other hand, should encryption eventually be used during certain prime-time popular programme slots, even when the station is already financed by an annual licence fee, then this is just a well thought-out way of relieving the public of yet more money!

In the Middle East during the early Seventies, one station was reputedly using a crude form of scrambling system to prohibit viewing unless a “descrambler” unit was purchased. Basically it was a notch filter connected to the antenna input to remove a jamming signal which was designed to create havoc with the transmitted picture. Nowadays, descrambling arrangements are slightly more sophisticated.

UK Experiments
Not so long ago, night-owls watching the BBC channels after close-down encountered some fuzzy-looking pictures accompanied by a very faint sound channel, best described as a combination of footsteps crunching gravel and jingling...
France was the first country in Europe to introduce a national terrestrial television network with encrypted broadcasts for the vast majority of its programmes. The service, Canal Plus, uses SECAM System "L" (625 lines scanning using positive video modulation and a.m. sound). Most transmissions take place in Bands I and III using re-engineered channels which were previously occupied by the 819-line broadcasts of "tf1" until the early Eighties. The majority of programmes aired by Canal Plus are encrypted, thus requiring a decoder (DISCRET 1) in order to view them. Canal Plus is a private organisation and it will supply decoders only to viewers in France. This means that in neighbouring countries such as Belgium, West Germany and Switzerland where signals are present, viewers are not allowed to subscribe to the network.

However, Canal Plus is expensive: the monthly subscription amounts to 140 French Francs (almost £14) and a deposit has to be paid for the initial installation of the decoder unit. A key or code number is required for the decoder to function and this is changed on a monthly basis. Provided the viewer has paid the latest subscription, Canal Plus sends via the mail a new code number. Since each decoder requires its own individual number, it is useless asking the next-door neighbour for theirs once the subscription expires. It's a simple case of no money, no viewing!

Customer resistance to this exorbitant monthly subscription rate had meant that many pirate decoders have been produced to satisfy public demand. Since Canal Plus commenced in 1984 the police have searched many homes belonging to electronic technicians, resulting in numerous arrests of pirate decoder designers and several court cases.

**Denmark and Iceland**

More recently a few Danish stations, mostly cable, have commenced broadcasts using such an encryption technique. The Minister of Culture (he's also in charge of the Danish PTT) has suggested that a nationwide movie channel may be introduced, financed from revenue from decoders. The existing direct reception network might be transferred to u.h.f. to make way for the movie channel at v.h.f., or the proposed movie channel may use the recently introduced TV-2 network when their programmes have ended; this later option is the most likely. In Iceland some encrypted broadcasts take place over the privately owned second network.

**And Finally...**

This brings us to the end of this series. We hope readers have found the articles of interest and perhaps provided the encouragement to become involved in the hobby of long distance television reception.

**Further Reading**

The 405-line newsletter called 405 Alive is available by subscription only with four issues per year. To subscribe send four A4 s.a.e.s, each with 28p stamps, and a cheque for £6 made out to A.N. Emmerson, 71 Falcutt Way, Northampton NN2 8PH.

TeleRadio News, a magazine devoted to the DX-TV hobby, is available for an annual subscription of £6 for six issues from HS Publications, 7 Epping Close, Derby DE3 4HR.

System standards and much useful information will be found in A TV DXers' Handbook, by Bernard Babani (Publishing) Ltd. From the SWM Bookservice.

---

**Abbreviations**

| a.m. | amplitude modulation |
| c.cir | Consultative Committee |
| c.R. | cathode ray tube |
| DX | long distance |
| f.m. | frequency modulation |
| Hz | hertz |
| m | metre |
| MHz | megahertz |
| NTSC | National Television Standards Committee |

| PAL | Phase Alternation Line |
| SECAM | Sequential with memory |
| (or Sequential colour and matrixing) | |
| TV | television |
| u.h.f. | ultra high frequency |
| v.h.f. | very high frequency |
| Band | |
| I | 45 - 68MHz |
| II | 87 - 108MHz |
| III | 175 - 230MHz |
| Band V | 615 - 856MHz |

---

**PRACTICAL WIRELESS AUGUST 1989 ISSUE**

The Navico AMR1000 Mobile Transceiver Reviewed

NEW SERIES Surface Mount Devices

AllAbout Variable Capacitors

Report on the Worlds Largest Amateur Radio Convention

ON SALE NOW

Short Wave Magazine August1989
VERSATILE RECEIVE CONVERTER

Peter Rouse GU1DKD

The circuit described here started life as a simple h.f. to v.h.f. converter to provide general h.f. coverage in the range 30-60MHz on a scanner. During the testing of several prototypes it was realised that the circuit, with an alternative input stage could be used to extend the v.h.f. coverage of "banded" scanners. When one realises that not only is there a signal mixed with the 30MHz local oscillator but also it's harmonics, then it can be seen that quite a bewildering selection of signals can be obtained from what is a very simple item of equipment.

Having said that, it must be stressed that h.f. reception is nowhere near acceptable communications standards; the circuit really was intended more for casual listening and the performance of the unit will be governed to a very large degree by the scanner with which it used. The governing factor is the i.f. bandwidth which on most scanners is around 12.5-15kHz. This means that on crowded h.f. bands it is possible to hear several stations simultaneously even though they are on adjacent channels. However, on scanners with narrow-band s.s.b. filters such as the Yaesu FRG-9800 and Icom IC-R7000, quite acceptable performance is available.

Accepting that however good the converter is the overall system performance will always be limited by the scanner's i.f. filters, it was decided that there was little point in aiming for high sensitivity and selectivity in the converter unit. Therefore the unit presented here probably represents the simplest possible arrangement in terms of component count. It works, but don't expect miracles and if like me you are a compulsive twiddler I guarantee you will have hours of fun getting your scanner to cover frequencies its mother never told it about. Treat it as a relatively inexpensive fun item and you will not be disappointed.

Turn your scanner into an h.f. receiver or fill-in some of those missing v.h.f. frequencies with this simple, but versatile, unit.

How it Ticks

The circuit (Fig. 1) consists of little more than an input filter, local oscillator and combined mixer/r.f. amplifier. Signals presented to the unit (in the h.f. version) are first processed through the low-pass filter unit comprising L1 and L2, C1, 2 and 3 which starts to roll-off at 30MHz. An alternative variable attenuator for the input is shown and its use is strongly recommended. The r.f. amplifier/mixer can be overloaded easily because with no bandpass filtering a large number of powerful signals will be present at gate 2 (G2) of the m.o.s.f.e.t.

The local oscillator uses a standard 30MHz crystal and the arrangement shown is without a doubt the simplest possible circuit that can be constructed for an overtone crystal. The correct frequency is selected by the transformer T1 which is a standard Toko type. The local oscillator output is then fed to G2 of the mixer transistor Tr2, the same gate

Fig. 1: Circuit diagram of h.f. to v.h.f. converter showing v.h.f. to v.h.f. options.
being biased via R4. The post-filtered r.f. signal is fed to gate 1 (G1) of the same transistor and the output for the scanner is taken from the drain via C12.

Virtually any j.f.e.t. will work in the oscillator circuit, as will several different types of dual-gate m.o.s.f.e.t. in the mixer/ampifier stage. It should be noted that transistor Tr2 is soldered directly to the pads on the lower side of the p.c.b.

Construction and Testing

The circuit should be built using the p.c.b. arrangement shown in Fig. 2. The use of other construction methods such as strip-board is not recommended in this instance because of the high frequencies involved. Referring to previous comment about Tr2 being soldered directly to the foil side of the p.c.b., the leads of Tr2 will need to be bent down slightly to neatly achieve this.

The circuit should be housed in a suitable screened enclosure and fitted with input/output coaxial sockets together with the input attenuator R8, if used, and on/off switch S1.

Once assembly is complete, the alignment is very simple. With power connected, tune the scanner to 30MHz (or harmonics such as 60 and 90MHz, etc.) and check that the local oscillator is pumping out a signal. Now connect an h.f. antenna and tune for a medium wave station (this is calculated by adding the frequency of the station to 30MHz and entering the nearest frequency to the total into the scanner). If all is well the station should be heard. Now tune up or down until a weaker station is found and peak the core of T1 for maximum signal (the setting is not critical and the core should be showing slightly above the top of the screening can).

That completes the alignment of the unit and it should now be possible to tune from the low frequency end of the radio spectrum right up to 30MHz.

Assuming you are using a 30MHz crystal, then simply add to the 30 to the frequency you require and enter the total into your scanner. It should be noted that the incoming h.f. signals will also be mixing with the local oscillator's harmonics and so if you have a scanner that does not cover 30-60MHz you can use 60-90, 90-120 or 120 to 150 instead.

In fact, although the signals get progressively weaker with each harmonic, they can be heard well up into the lower u.h.f. ranges.

Alternative Arrangements

It is this ability to provide signals on the harmonics that is put to use with the alternative circuit where we can perform v.h.f. to v.h.f. conversions to fill in some of those missing gaps that appear on some scanners. Again, I must stress that performance is limited and reception will not be up to the same sensitivity as the scanner working on its intended range.

Nevertheless, on my own set-up quite useful performance has been achieved with the following arrangement.

Replace L1 and L2, C1, 2 and 3 with the alternative filter components shown in Fig. 1 (provision has been made on the p.c.b. to accept the different arrangement). This filter is a high-pass type which cuts-off below 30MHz and it is necessary to try and eliminate these signals otherwise you will get simultaneous h.f. and v.h.f. reception and the resulting mishmash will be awful.

Even as it is, the filter probably will not cope with some high powered transmissions and so don’t be surprised to find the occasional h.f. station as you tune through the v.h.f. frequency ranges.

The mathematics for v.h.f. to v.h.f. conversion become a little more complicated but let us look first at the more straightforward case. We have a scanner made for the US which covers only 26-50MHz and we want to extend the range. Add thirty to the range and we get 56-80MHz so it is simply a case of entering the desired frequency plus 30.

The next highest range on the same scanner is 108 to 178MHz. Now we can not only use the additive output from the mixer Tr2 but also the subtractive output (remember a mixer always has signal plus oscillator and signal minus oscillator on it's output and it is this effect that leads to image problems in receivers). That means if we tune our
scanner to 108MHz we will not only be receiving on 138MHz (the product of 108+30) but also 78MHz (108-30).

So on this second band on the scanner we can tune in frequencies between 78 and 208MHz although in fact at any one given time we will be tuned to two frequencies. If you are not confused already, then let me throw another spanner in the works: There will also be signals present from the products of the harmonics, i.e. plus and minus 60MHz, etc.

Surprisingly none of this really causes any real problems unless you live in an area where virtually every segment of the v.h.f./u.h.f. spectrum is in constant use.

The crystal chosen for the local oscillator was a good round number to make adding and subtracting easy. Virtually any crystal in the range 20-40MHz will work in the circuit but if you choose an odd frequency then I suggest you keep a pocket calculator and some aspirins handy when tuning around. Obviously a crystal below 30MHz will mean that when tuning through the upper end of the h.f. spectrum you will also be simultaneously going through the second harmonic and tuning in stations at the lower end of the h.f. or m.f. as well. If you use a frequency higher than 30MHz then you may need to change T1 to a Toko KAN3335 (Pink).

Finally

There is of course nothing to stop you from fitting a simple 2-pole 2-way switch to select either filter bank so that you can use the converter either for h.f. or v.h.f. In this instance, fit the high-pass (v.h.f. version) components to the circuit board and use a small piece of strip-board to mount the components for the low-pass filter.

YOU WILL NEED

<table>
<thead>
<tr>
<th>Resistors</th>
<th>Capacitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25W 1% Carbon film</td>
<td>Ceramic plate</td>
</tr>
<tr>
<td>82pF 1 C3, 1,12</td>
<td>5.6pF 1 C3</td>
</tr>
<tr>
<td>1µ5 2 C2,6</td>
<td>6.8pF 1 C13</td>
</tr>
<tr>
<td>10µF 2 C2,6</td>
<td>10pF 1 C12</td>
</tr>
<tr>
<td>Disc ceramic</td>
<td>Disc ceramic</td>
</tr>
<tr>
<td>100µF 1 C8</td>
<td>10Nf 6 C4,5,7,9,10,11</td>
</tr>
<tr>
<td>100µF 1 C8</td>
<td>1µ5 2 C2,6</td>
</tr>
</tbody>
</table>

Inductors

L1, 2 3µ9 choke (Cirkit part no. 34-39904)
L3 47µH choke (Cirkit part no. 34-47114)
L4, 6 2µ7 choke (Cirkit part no. 34-27904)
L5 1µ5 choke (Cirkit part no. 34-19514)
T1 Toko KAN3334 yellow (Cirkit part no. 34-33340)

Semiconductors

BF244 1 Tr1 (Cricklewood)
BF981 1 Tr2

Miscellaneous

Alloy project box; p.c.b., SWM Editorial Offices, Price £5.22; SK1, 2 coaxial sockets; S1 on/off switch; connecting wire; XL1 HC18U 30MHz crystal (Cricklewood).

Suppliers

Cirkit Distribution Ltd, Park Lane, Broxbourne, Hertfordshire EN10 7NG
Tel: (0992) 441306

Cirkit Electronics Ltd, 40 Cricklewood Broadway, London NW2 3ET. Tel: 01-452 0995

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>h.f.</td>
<td>high frequency</td>
</tr>
<tr>
<td>i.f.</td>
<td>intermediate frequency</td>
</tr>
<tr>
<td>j-f.e.t.</td>
<td>junction field effect transistor</td>
</tr>
<tr>
<td>kHz</td>
<td>kilohertz</td>
</tr>
<tr>
<td>m.f.</td>
<td>medium frequency</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>m.o.s.f.e.t.</td>
<td>metal oxide silicon field effect transistor</td>
</tr>
<tr>
<td>p.c.b.</td>
<td>printed circuit board</td>
</tr>
<tr>
<td>r.f.</td>
<td>radio frequency</td>
</tr>
<tr>
<td>s.s.b.</td>
<td>single sideband</td>
</tr>
<tr>
<td>u.h.f.</td>
<td>ultra high frequency</td>
</tr>
<tr>
<td>US</td>
<td>United States</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
</tr>
</tbody>
</table>

Special Notice to Readers

Although the Proprietors and staff of Short Wave Magazine take reasonable precautions to protect the interests of readers by ensuring as far as practicable that advertisements in Short Wave Magazine are bona fide, the magazine and its Publishers cannot give any undertakings in respect of claims made by advertisers, whether these advertisements are printed a part of the magazine, or are in the form of inserts.

While the Publishers will give whatever assistance they can to readers having complaints, under no circumstances will the magazine accept liability for non-receipt of goods ordered, or for late delivery, or for faults in manufacture. Legal remedies are available in respect of these circumstances, and readers who have complaints should address them to the advertiser or should consult a local Trading Standards Office, a Citizen’s Advice Bureau, or their own solicitor.
Masts have several advantages over other means of getting your antennas up into clear air. They also have disadvantages which, in general, are outweighed by the advantages. I found that having to clamber up the roof and work on the ridge to change the antenna or carry out maintenance work had long since become a nuisance that I could no longer live with. So, when it was suggested that I “planted” a Tennamast Economy Plus mast in my garden, I jumped at the opportunity. This is Tennamast’s lowest priced, 7.6m mast but with the telescoping, upper pole left full-length to give an extra couple of metres height. It also has four bottom pulleys instead of the two fitted to the basic model so that it can cope with the increased load. The head load capacity is 18kg so that it can support v.h.f./u.h.f. or compact h.f. beams.

Construction

The mast is sturdily constructed from heavy gauge, steel tube and consists of a galvanised ground socket which is embedded in concrete 1m² x 0.5m deep, a ground post which is “plugged” into the socket and carries the winch and pulley system together with the pivot for the main, telescoping mast. The lower part of this is made from 70 x 70 x 3.6mm square-section steel tube with the safety latches and pulley bearings welded on.

If you are into DXing in a serious way or just need to get your antennas up into clearer air, then a mast is one answer. Dick Ganderton replaced the pole on the end of his house with a tiltover Tennamast.

while the upper section, which slides inside the square tube, is a galvanised, round steel tube 60.3mm outside diameter. The ground post and lower section of the main mast are welded using the MIG process and are primed and painted with two coats of Hammerite paint. The insides of the hollow sections are treated with Waxoyl to keep the rust at bay.

Operation

The mast is tilted and raised or lowered by a winch and pulley system with built-in safety features to prevent accidents. The actual raising of the mast from its horizontal resting position is a simple matter of winding the winch until the mast reaches the vertical position and the automatic bottom safety latch engages. The anti-telescoping latch is then released and held off while the winch is wound and the upper section starts to rise. When the upper section has extended to its fullest height the upper catch automatically engages and the winch can be backed off so that the strain is taken from the steel cable.

Lowering is simply a matter of raising the inner section to clear the upper catch, pulling the release cable to disengage the catch and lowering the inner section by winding the winch backwards against the friction brake. To tilt the mast requires the operator to back off the winch to give some slack to the cable, lift the spring-loaded bottom safety latch and then lift the bottom of the mast to start it tilting. It can then be lowered on the winch until it reaches the desired position. The anti-telescoping latch prevents the inner section from sliding uncontrollably out of the mast, which could be catastrophic.

Apart from the mast and rotator cage, you will need a fine weekend, 0.5m³ of 1/4, in ballast, two bags of cement and some muscle-power. The ground post requires a concrete base 1 x 1 x 0.5m, so get digging! Keep an eye open for any drains, underground cables or pipes and position the centre of the hole far enough away from your boundary to keep the antenna from overhanging your neighbour’s property and well clear of overhead lines.

Unless you want your mast to emulate the Leaning Tower of Pisa the ground socket must be vertical in all directions. Check with a good builder’s spirit level, wedge the socket with bits of rubble and recheck. When filling the hole with concrete put a polythene cover over the open end to keep the tube clear of concrete. Don’t forget to keep checking that it is vertical and carefully tamp the concrete to ensure that it is properly compacted.
The ground post plugs into the socket - provided that you have kept it clear of concrete. Don't be too impatient - the concrete needs several days to harden. Beware of frost in winter and protect the new concrete with a thick layer of sacking. In summer cover it with a polythene sheet to prevent it drying out too quickly. Before inserting the ground post into the socket smear thick grease all over the part of the post that will be in the socket.

With the mast tilted so that it is horizontal, the rotator and antenna system are so much easier to work on.

The Tennamast system allows you to unplug the entire mast from the ground socket if you want to - in other words the mast is not a permanent fixture - though, of course, the large concrete block is very permanent! This could be useful if you are in the habit of moving house frequently since you only need a new galvanised ground socket tube to enable you to install your Tennamast at the new site.

**Cost**

The Economy Plus mast is very well made, simple to install and easily raised and lowered. It looks neat and uncluttered when raised and is unobtrusive when lowered and tilted. There are other, larger, masts in the range, including trailer-mounted versions which would be ideal for the more affluent contest group. However, if you only need to get your antennas up to around 10m then the Economy Plus at £190 is a very good buy. The rotator housing will cost you an extra £35 while the friction-braked winch adds a further £35. Carriage is, unfortunately, extra at around £30 (dependent on where you live). To these prices you will need to add the cost of 0.5m³ of ballast and two bags of cement.

This is the DL800 Friction Braked Winch, which Tennamast recommend. It provides easier and safer control of the mast during raising and lowering. The winch is bolted onto the ground post, as shown here, using the three bolts and washers provided. The positions of the three holes means that you cannot get it upside down. The handle is wound onto the shaft and the spring and Nyloc nut fitted and tightened to retain it.

This is the bit that really needs an assistant (he had nipped off to take the picture). The main mast is lifted onto the ground post and the pivot bolt inserted. The instructions suggest that a temporary support is used to hold the top of the mast level while you are doing this. In my case the ground sloped upwards so I didn't bother. The assistant will probably need to move the mast around to allow the bolt to slip in easily.

The foot of the mast shown locked in the vertical position. The anti-telescoping latch is being held open to allow the winch to be operated and raise the upper section. Also visible are the spring-loaded bottom safety catch which automatically locks the mast to the ground post in the vertical position, the lifting handle and the steel wire and nylon pulley system for raising and lowering the mast.

The rotator is housed in a galvanised steel cage which clamps onto the top of the upper section of the mast. Tennamast can supply cages drilled to suit any of the popular rotators. I used the rotator which had seen eight years service at the top of my pole. If you are using your old rotator then I recommend that you service it before bolting it in place - I didn't and the main bearings had disintegrated!
The first flight there was trouble with the Mosquito's controls and the trip had to be aborted. On the second, the aircraft reached the scheduled area without difficulty, but no contact could be established with Bobbie - and when landing back at base the aircraft was badly damaged. The third attempt proved to be lucky, however: Simpson himself flew in a replacement Mosquito and conversed with Bobbie from a height of about 30,000ft. The wire recorder worked perfectly. Since the highly directional transmissions were virtually proof against interception, plain language could be used, making possible faster and more accurate reporting from the ground, since mistakes or misunderstandings could be queried and rectified at once. This was impossible with the old c.w. system in which messages had to be encoded and subsequently decoded, as well as being translated into Morse signals. It was estimated that as much information could be transferred by Joan-Eleanor in 20 minutes as would have taken some 72 hours by c.w.

**Success**

With Joan-Eleanor proven to be successful, further exploits by agents followed. One of the most notable was the fact that of two brave anti-Nazi Germans who had taken refuge in Britain and who parachuted back to Germany, close to Berlin, and were able to report back conditions in the capital itself. For all agents an unexpected bonus from Joan-Eleanor was the psychological benefit derived from actually being able to hear a friendly voice from the aircraft.

It is sad to relate that the full potential of Joan-Eleanor was not realised at first due to inter-departmental strife in the USAAF, if not sheer bloody-mindedness on the part of some of its officers. Certainly it was not the first occasion, nor would it be by any means the last, on which technical excellence has been frustrated by petty officialdom. Nevertheless Joan-Eleanor without doubt played an effective part in Hitler's downfall.

---

**THE STORY OF JOAN-ELEANOR**

22Ear

the first flight there was trouble with the Mosquito's controls and the trip had to be aborted. On the second, the aircraft reached the scheduled area without difficulty, but no contact could be established with Bobbie - and when landing back at base the aircraft was badly damaged. The third attempt proved to be lucky, however: Simpson himself flew in a replacement Mosquito and conversed with Bobbie from a height of about 30,000ft. The wire recorder worked perfectly. Since the highly directional transmissions were virtually proof against interception, plain language could be used, making possible faster and more accurate reporting from the ground, since mistakes or misunderstandings could be queried and rectified at once. This was impossible with the old c.w. system in which messages had to be encoded and subsequently decoded, as well as being translated into Morse signals. It was estimated that as much information could be transferred by Joan-Eleanor in 20 minutes as would have taken some 72 hours by c.w.

**Success**

With Joan-Eleanor proven to be successful, further exploits by agents followed. One of the most notable was the fact that of two brave anti-Nazi Germans who had taken refuge in Britain and who parachuted back to Germany, close to Berlin, and were able to report back conditions in the capital itself. For all agents an unexpected bonus from Joan-Eleanor was the psychological benefit derived from actually being able to hear a friendly voice from the aircraft.

It is sad to relate that the full potential of Joan-Eleanor was not realised at first due to inter-departmental strife in the USAAF, if not sheer bloody-mindedness on the part of some of its officers. Certainly it was not the first occasion, nor would it be by any means the last, on which technical excellence has been frustrated by petty officialdom. Nevertheless Joan-Eleanor without doubt played an effective part in Hitler's downfall.

---

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>h.f.</td>
<td>high frequency</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>m³</td>
<td>cubic metre</td>
</tr>
<tr>
<td>m²</td>
<td>square metre</td>
</tr>
<tr>
<td>mm</td>
<td>millimetre</td>
</tr>
<tr>
<td>u.h.f.</td>
<td>ultra high frequency</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
</tr>
</tbody>
</table>

---

**Notes**

[1] It is only fair to mention that British scientists working on directional radio had earlier devised a system on the lines of Joan-Eleanor, but unfortunately the agents' set was too large to be easily carried or concealed, and the upward range was limited to about 10,000ft - inside the range of anti-aircraft guns.
LISTEN OUT FOR

GB2NTS, GB2NTU, GB2NTW and GB2NTE: On July 29/30 four stations will be on the air from different National Trust properties, one each in Scotland, Ulster, England and Wales. Hopefully Ireland will make up a fifth country (EI). If you live overseas and can contact two of these stations, or if you live in the UK/Ireland and contact three stations there is a Commemoration Certificate available. Overseas the cost is $1 or equivalent return postage by Air Mail. UK/Ireland it requires a 19p s.a.e. You need to send QSL cards or log extracts to Scottish Tourist Board (Radio Amateur) Expedition Group, PO Box 59, Hamilton, Scotland ML3 6OB.

GB2WW & GB4BOB: During 1989, the Bedford & District Amateur Radio Club plan to commemorate the outbreak of the Second World War by operating several Special Event Stations. The locations will include a number of former RAF and USAAF stations in and around the Bedford areas which were in use during the hostilities.

GB2WW: This station will be on the air on August 19 from Kimbolton Airfield for the Remembrance Service of 379 Bomb Gp USAAF. Then, on September 3, it will be on the air from RAF Cardington for the 50th anniversary of the start of WWII. Further details can be obtained from

Special Events Manager: Ray GOEVM. 30 Cotswold Close, Putney, Bedford MK41 9LR. Tel: (0234) 244506.

GB4ATG: This is the talk-in station for the BARTG Rally on August 27 from Sandown Park Racecourse, Esher, Surrey. GB4VMR: This is the talk-in station for the Vange ARS 10th Annual Mobile Rally from Basildon on September 10.

GB1RLD: Three members of Radio Link - Derby Hospital Broadcasting will be operating from the outside broadcast caravan at the City Hospital, Derby on 144MHz. The dates will be September 30 from 1000-1600, October 1 from 1000-1600.

RALLIES

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

July 30: The Hilderstone Radio Society are holding their rally at Hilderstone College, St Peters Road, Broadstairs, Kent. There will be trade stands, a Bring & Buy, an entrance to buyers and bar, admission 50p, details contact: Alan on (0632) 593072 or Ron (0304) 817223.

*July 30: Scarborough ARS are holding their annual rally at the Spa, on the South Shore Seafront, Scarborough. This is close to the beach and all the entertainment, so there will be something for all the family. Doors open at 11am. There will be trade stands, bring & buy, refreshments and bar, with talk-in on S22. Details from: G4UPD on (0723) 376847.

July 30: The Rugby Amateur Transmitting Society are holding their Amateur Radio Car Boot Sale at Lodge Farm, Walton, South Lutterworth. Apparently, that’s less than 2 miles east from junction 20 of the M1. Talk-in will be on S22. Pitches are available for £5 and entry to buyers is 60p per car. The event opens at 10am. More details can be obtained from: Kevin GETWN. Tel: (0209) 441590 or David G4DOW. Tel: (0455) 552599.

*August 13: Hamfest ‘89 will be held at the Flight Refuelling Sports Ground, Wimborne, Dorset. Gates open at 10am, and there’s free car parking, as well as overnight camping facilities. The day will feature radio and electronics trade stands, field displays and a craft and gift fair. More details from: Rob G6DUN. Tel: (0202) 479368.

August 13: The annual Derby Radio Rally will again be held in the Lower Bemrose School, St Albans Road, Derby. All the usual attractions will be there including their Monster Junk Sale. More details from: Martin G5JZJ. Tel: (0202) 856875.

August 20: The West Manchester Radio Club's Red Rose Summer Rally will be held in the Sports & Leisure Centre, Silverwell Street, Bolton. Admission 60p (children free) with free cash draw on the programme. All the usual traders, bring & buy, snacks and meals available all day. More details from: D.R. Camac on (0202) 24104.

August 27: The Galashields & District ARS are holding their open day at the Focus Centre, Livingstone Place, Galashields at 11am. There will be trade stands, a bring and buy and all the usual activities. Light refreshments will be available. Talk-in will be on S22. For more details, contact: John Campbell GM0AMB. Tel: (0385) 226866.

August 27: The BARTG rally will be held at Sandown Park Racecourse, Esher, Surrey. Talk-in on S22 and SU22 by GB4ATG. Admission is £1 for adults and 50p for children and OAPs (babies are admitted free). Doors open at 1030 and close at 1700. Details from: Peter Nicolle GB1VX. Tel: 021 - 453 2676.

August 28: The Huntingdonshire ARS are holding a junk sale at The Medway Centre, Coneygeare Road, Huntingdon. Doors open from 10.30am to 5pm. Food and drink will be available all day and you can rent a table to get rid of all your junk for £5. The contacts for the day are: G1YVS on (0487) 830212 or GBLRS on (0480) 56772.

September 3: The Preston ARS 22nd Annual Mobile Rally will be held at Lancaster University, as in previous years. It will be in the Great Hall, Nuffield Theatre, Minor Hall and A35 (for the Bring & Buy). The licensed bar and snack bar will be located in the Great Hall foyer. A separate restaurant will be available at lunch time too. Contact: Godfrey Lancefield on (0722) 53810.

September 3: The Telford Amateur Radio Rally will be held in the Telford Exhibition Centre, Telford Centre, Shropshire. Doors open at 11am, 10.30am for the disabled. Usual facilities and attractions, plus specialist group stands. Catering & bar, talk-in via GB4TRG on S22. Contact: Martyn G3UKV (0952) 295416.

September 10: The 6th National Amateur Radio Car Boot Sale will be held at the Shuttleworth Collection, Old Warden Aerodrome, near Biggleswade. Trading starts at 10am. Fly-in is available and permission can be obtained on Northill 288. Further details on the boot sale can be obtained from: Tony Kelsey-Stead. Tel: (0562) 506299.

September 10: The Vange ARS Mobile Rally and Electronics Fair will be held at Nicholas School, Nicholas Road, Basildon, Essex. The rally is open from 10am to 5pm and the entrance fee is 50p, with a free raffle being held at the door. There is free parking and refreshments available as well as a bring & buy and raffle. Further details are available from: G4VNT. Tel: (0268) 43025 or Mrs D. Thompson. Tel: (0268) 552606.

*September 16: The 1989 Scottish National Radio Amateurs Convention will be held at the Fife Institute of Physical & Recreational Education, Glenrothes, Fife. Doors open at 10am. Features include amateur traders, RSGB bookstall, special interest groups, lectures, Morse tests, refreshments & bar, talk-in station as well as bring & buy. Further details from: John Hardwick GM4AAL. Tel: (0592) 747268.

September 24: The 5th North Wakefield RC Rally will be held at Outwood Grange School, Potovens Lane, Outwood. Admission is 50p at 10.30am, disabled 10am. Free entry to OAPs, disabled and children. There will be a fully licensed bar with real ale, hot and cold food, raffle, bring & buy, usual radio, electronic and computer traders and repeater groups. Details from: Richard G4GZL. Tel: (0562) 621219.

September 24: The 1989 Harlow Mobile Rally will be held in the Harlow Sports Centre. Doors open at 10am.

*Short Wave Magazine & Practical Wireless in attendance.

If you are organising a rally and would like it mentioned in Short Wave Magazine, then drop us a line, preferably as soon as you have fixed the date but no later than six weeks in advance (marking your envelope Rally Calendar) and we’ll do the rest. Please make sure that you include all essential details such as the venue, starting time, special features and a contact for further information.
NEW CATALOGUE OUT NOW!

Over 3,000 product lines feature in the Summer 1989 edition of the Cirkit Constructors' Catalogue, available from most larger newsagents or direct from the company priced at £1.50. The latest books, an RF frequency meter, two new PSU designs, a 3.5MHz converter and a 2 Watt stereo amplifier are among the innovative new kits this issue. In the test equipment section there's a whole new range of multimeters, a bench DVM and a triple output PSU.

For eagle-eyed readers there is the opportunity of winning an audio signal generator worth more than £180.00 in the latest fiendish competition. All prices now include VAT for quicker, easier ordering, and Cirkit's same-day despatch of all orders, combined with value-for-money discount vouchers, makes the line-up even more attractive.

Cirkit Distribution Ltd.
Park Lane, Broxbourne, Herts EN10 7NQ.
Telephone (0992) 444111.

BBC WORLD SERVICE SHOP

Waveguide SW Receiver Reviews Book (1986-1989)

Exclusive to the BBC World Service this book is a collection of reviews from the popular Waveguide programme. Models from Sony, Philips, Grundig, Lowe & Panasonic are reviewed with full specification listings.

Price £5 (including p&p)

World Service Slide Chart (April 1989-September 1989)

Ideal for holiday or business travel this pocket size slider will help you tune into BBC World Service in English broadcasts.

Price £1.50 (including p&p)

The BBC World Service Shop is probably the largest stockist of books on communications. Publishers include Newnes, Babani, TABS and many small publishers.

Shop hours 9.30–6.00 pm Monday to Friday (Thursday 7.00 pm)

BBC World Service Shop
Dept. SW, Bush House, Strand WC2
01-257 2575
The sudden appearance on short wave of station A3Z of the Tonga Broadcasting Commission surprised North American s.w.l.s and sent them rushing to their receivers, an experience probably shared by short wave DXers everywhere.

Nashville, Tennessee 37203.

A rather unusual situation has been noted a few times around 7.418-7.420MHz. The programme is called Radio Free America and is presented from the Kayla Satellite Broadcasting Network, based in the small town of Richland Center, Wisconsin and transmitted via the North America One Satellite. Someone with an earth station and a short wave transmitter has been relaying the programme - unannounced at first but, more recently, announcing itself as "Free Radio One" and requesting that reception reports be sent to 3434 North Pacific Highway, Bedford, Oregon 97501. Most receptions of this have been between 2200-0200 during the weekends.

Trans-World Radio

Trans-World Radio in Bonaire, Netherlands Antilles recently began airing a programme for short wave enthusiasts. Hosted by Chuck Roswell, the station's frequency co-ordinator, the programme is called Bonaire Wavelength and is heard on Saturdays at 1145 on 11.815 and 15.346MHz and Sundays at 0330 on 9.535 and 11.930MHz. Listeners are welcome to send in their comments and information for use on the programme.

In Venezuela, the still fairly new station Radio Continental on 4.940MHz has begun confirming reception reports with a QSL card, though the replies seem to require several months. The station's address is Avenida Marquez del Puma, Edificio Radio Continental, Barinas, 5021 Estado de Barinas, Venezuela. Long active Ecus del Torbes at San Cristobal has reactivated 9.640MHz in addition to the long-in-use 4.980MHz. La Voz de la Fe, Maracaibo, which has been active on an on-and-off basis on 3.375MHz over many years, has opened up again, though now in the 60 metre band on the rather unusual frequency of 5.0679MHz and was noted signing off at 0100.

Short wave news continues to come from Colombia. Two more stations once active, then silent, have come back on the air. Emissora Meridiano 70 at Aracata returned on 4.925MHz running to around 0300 close. This station is a member of the Todelar network and announces 15kW. Ecos del Atoro at Quibdo, also silent for some time, has reopened on 5.0197MHz variable.

Radio Sutatenza

Now, 5.095MHz (and sometimes 5.075MHz) - frequencies which were used by the cultural station Radio Sutatenza in Bogota - have Colombian signals again, but the announcements now mention only Caracol, the big Colombian radio network. So it appears that Radio Sutatenza has sold its short wave facilities (at least) to Caracol. Caracol seems to be making an effort to expand its coverage of Colombia and has added two or three other short wave outlets in the past months.

Still another bit of news out of that country was the very brief appearance of a station calling itself La Voz de la Cana which was active for just a day or two early in May. Apparently this was the former Radio Tropical m.w. station on 1500kHz in Cali. The station was first noted by a couple of European DXers and North Americans, including yours truly, must be a bit red in the face to have been scooped on something which is virtually in our own backyard. This station was heard on 5.068MHz - note how close that is to the just reactivated La Voz de la Fe.

KNOT, the "New Life Station" in Alaska has added four new languages to its schedule, although each one amounts to a mere 15 minutes per week. Together, they create a one hour block of between 1500 and 1600 on Mondays only. At 1500 Light of Life is aired in the Cubano language, 1515 has Quest For Truth in Ilocano and Bible Study in Cantonese runs at 1530 and in Vietnamese at 1545. The current frequency in use at this hour is 9.750MHz.

Finally

Radio Canada International's 250kW transmitter at Sackville has taken on the additional duty of relaying Radio Austria International. This, currently, is on from 0500-0700 in various half-hour language blocks on 6.015MHz.

That covers the news from the Americans for this time. Your comments are, of course, always welcome.

Good listening!
Such whistles can be largely eliminated with a sharply tuned filter and many modern communication receivers have a suitable filter built-in. The owners of less expensive sets can usually obtain adequate results by employing an add-on filter unit.

Although the tuned circuits in the intermediate frequency (i.f.) stages of a superhet receiver can be made highly selective, their bandwidth must be just adequate to ensure that all of the components of a wanted signal can pass through them - otherwise the demodulated signal will be distorted. The mode of transmission therefore determines the minimum bandwidth that can be used, and in the case of an a.m. transmission this will be equal to twice the highest modulating frequency. In view of these requirements an unwanted carrier which arises close to the carrier of a selected signal will also be able to pass through the i.f. passband and reach the detector, where it will beat with the wanted carrier and result in a heterodyne whistle in the demodulated audio output. The pitch of the whistle will equate to the difference in frequency between the two carriers.

**Notch Filters**

Fortunately these effects can be largely eliminated by either removing the interfering carrier at some point in the receiver i.f. chain with a variable frequency notch filter, or by using a very sharply tuned filter in the audio stages to notch out the resulting beat frequency causing the whistle.

Any interference to a broadcast can be annoying for the listener, the most objectional form being a heterodyne whistle. This type of interference is generally caused by weak signals from other broadcasters operating on or near the same frequency.

The circuit of a bridged-T filter, which is capable of providing a very sharp notch in the receiver i.f. response, is shown in Fig.1a. Such filters are ideally suited for use in a low frequency system, so they are usually installed at the input to the 100kHz (or 50kHz) i.f. stage(s) of a triple-conversion receiver. With care, however, satisfactory results can also be achieved in superhets using 465kHz i.f. systems.

The manner in which this type of filter affects the i.f. response of a receiver is shown in Fig.1b. Note that an extremely narrow band of frequencies within the i.f. passband is suppressed by the filter. By varying the position of a dust iron core, or slug, within the coil (L1) it is possible to move that narrow band of suppressed frequencies to any point within the i.f. passband. In practice the slug is usually mounted on a threaded brass shaft so that its position in L1 may be finely adjusted with a front panel control marked NOTCH FREQUENCY. A pre-set variable resistor, R1, enables the notch depth to be optimised, typically to -60dB below the peak i.f. response.

To ensure minimum distortion to the desired signal, some care must be exercised when adjusting the notch frequency for maximum suppression of an unwanted signal. Of course, it may be necessary to move the notch across the unwanted signal in order to reach the interfering signal. This type of filter is highly effective in removing an unmodulated carrier or a keyed carrier conveying Morse code, but the nature of the interfering signal can affect the end result. For example, if the frequency of the unwanted signal is unstable it may vary beyond the narrow suppression range of the filter and still cause interference. When there are two interfering carriers within the i.f. passband it will only be possible to notch out one of them if the are more than a few hundred hertz apart. Despite these problems, this type of filter can often make an otherwise useless signal into one that is perfectly readable and acceptable.

Unfortunately, it may not be a simple matter to add a bridged-T filter to the i.f. chain of an existing receiver since some changes to the original circuit will be required and realignment may then be necessary. A wiser approach may be to employ an audio notch filter, since they may be either home constructed or purchased as an external add-on unit.

Audio notch filters may be either passive or active. Inductors and capacitors are used to form sharply tuned resonant circuits in the passive type. Good attenuation can be achieved at the design frequency provided correct impedance matching is applied at the input and output of the filter, but losses are also introduced to the wanted signal. When a variable notch frequency is required these filters tend to be bulky, heavy and expensive. In contrast, active filters employ inexpensive resistors and capacitors in conjunction with the feedback circuit applied to an operational amplifier, usually abbreviated to op-amp.

A basic op-amp is basically a very high gain differential amplifier in which the output is directly proportional to the difference between the two voltages applied to its inputs. The stages are directly coupled, so they are capable of amplifying both d.c. and a.c. Initially op-amps were intended to perform mathematical operations such as summation, subtraction, integration and differentiation, but they are now used in many types of electronic equipment for other purposes.

Early op-amps used valves or transistors with discrete components, but modern technology has enabled a multiplicity of transistor elements to be included in a single integrated circuit (i.c.) and remarkably high gains can be...
achieved - typically 100dB, which corresponds to a voltage gain of 100 000 times. Such a high open-loop gain can rarely be used in practice, so a substantial part of the output can be applied to the input in the form of negative feedback, which has the effect of reducing the gain and increasing the bandwidth provided the feedback path is purely resistive. By introducing a reactive component into the feedback path it is possible to tailor the overall frequency response, and it is this factor which is exploited in active audio filters.

Although the complex internal circuits of an i.c. op-amp are fixed, their function can be changed by means of a few simple external components and connections. In addition to their role as a differential amplifier they are frequently used as an inverting or non-inverting amplifier. Both types form the basis of active audio filter designs. The triangle symbol used to denote an amplifier is also used for i.c. op-amp, but the two input ports are marked positive and negative. The positive port is non-inverting, which simply means that if a positive-going signal is applied to it and the negative port is held at 0 volts, the output will also be positive-going (non-inverted). Conversely, if a positive signal is applied to the negative port with the positive port held at 0 volts, the output will be negative-going (inverted).

The configuration required for a non-inverting amplifier is shown in Fig. 2a. Note that both positive and negative voltages relative to 0 volts must be provided by the power supply - a requirement in most i.c. op-amp designs. In this circuit the output voltage always remains exactly in phase with the voltage applied to the non-inverting port, consequently it is sometimes called a voltage follower. Part of the output is applied to the inverting port via a divider formed by resistors R3 and R2, which sets the feedback ratio. The value of R2 should be made equal to the input resistor, R1. The closed loop gain, which is the gain with feedback applied, is given by the ratio (R3 + R2)/R2.

The configuration required for an inverting amplifier is shown in Fig. 2b. In this circuit the output is the inverse or "mirror image" of the input in shape. Part of the output signal is applied in anti-phase to the input via the feedback resistor, R2. The closed loop gain is set by the values of R2 and the input resistor, R1. Since the open-loop gain of the device is very high, this is equal to R2/R1. Adding a capacitor in shunt with the feedback resistor, R2, will result in an increase in feedback and a reduction in gain at high frequencies, consequently the circuit will behave as an active low-pass filter. A high-pass filter will pass all frequencies from d.c. to some cut-off frequency (fc), but beyond that point the response will roll-off at 6dB/octave until some point is reached where it becomes asymptotic to zero - see Fig. 3a. If the capacitor is connected in shunt with the input resistor, R1, it will reduce the feedback and increase the gain at high frequencies, and the circuit will act as an active high-pass filter. All frequencies above the cut-off frequency (fc) will be bypassed by the filter, but it will attenuate frequencies between fc and d.c. at the rate of 6dB/octave - see Fig. 3b. (Note: An octave is a 2:1 change in frequency.)

A much sharper roll-off of 12dB/octave can be obtained in either type of filter by making both the input circuit and the ratio divider frequency dependent, since each will introduce a 6dB/octave roll-off. The manner in which feedback may be applied to a non-inverting amplifier so that it behaves as an active low-pass filter with a 12dB/octave roll-off is shown in Fig. 4a, and as an active high pass filter with a 12dB/octave roll-off in Fig. 4b.

The configuration required to produce an active band-pass filter is shown in Fig. 5a. By carefully selecting the components a high Q filter with a very sharply peaked response can be obtained, see Fig. 5c. This can be transformed into a very sharp notch by applying the input signal and the output from the filter to the summing input of an inverting amplifier, see Fig. 5b. When the variable resistor, R4, is adjusted so that the notch frequency coincides with an interfering beat note it will be attenuated by about 40dB.

**Abbreviations**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.c.</td>
<td>alternating current</td>
</tr>
<tr>
<td>a.m.</td>
<td>amplitude modulation</td>
</tr>
<tr>
<td>dB</td>
<td>decibel</td>
</tr>
<tr>
<td>d.c.</td>
<td>direct current</td>
</tr>
<tr>
<td>i.c.</td>
<td>integrated circuit</td>
</tr>
<tr>
<td>i.f.</td>
<td>intermediate frequency</td>
</tr>
<tr>
<td>kHz</td>
<td>kilohertz</td>
</tr>
</tbody>
</table>
REVCO

WHEN QUALITY COUNTS

REVCONETM

The UK’s favourite discone composed of traditional British quality engineering.

The REVCONETM works well without exaggerated advertising claims. It is designed to cover 50k Ohm, and thousands of satisfied users will testify to its efficiency. Unlike some manufacturers we do not claim a wider frequency coverage, and we do not quote inflated figures for gain. A gain figure is meaningless unless the reference point is stated.

Optional vertical whip feature: It is possible to fit a vertical whip section to a discone. We do not want to give you the “hard sell” where this vertical element is concerned, but there is some evidence that it may improve the performance of the antenna around the resonant frequency of the whip. That’s why we make in an optional feature.

Another option is the N-type connector instead of the popular 50Ohm N-type. Gives a better UHF performance, but they cost a bit more. The choice is yours.

Because the REVCONETM is British-made by a Company which has been in business for 30 years, you buy with confidence, knowing that there is back-up should anything go wrong.

REVCO also make feeder cable. Installed: £64.95 PANASONIC

ON GLASS ANTENNAS

This type of antenna mount has been around for a long time, but they are very difficult to produce successfully at UHF. The Cellular Radio Industry has popularised the glass-mount, but there are fewer design problems at 240MHz, because the coupling assemblies are small. REVCO’s extensive experience in making the UK’s best Cellular On-glass has led to the production of superior quality UHF and VHF models. Here are a few facts which you should know:

Coupling efficiency: apart from the question of effective power transfer to the outside world, you don’t want too much RF floating around inside the case, do you? Not healthy for vehicle electronic systems, and possibly not safe for humans either. REVCO glass mounts feature very efficient power transfer.

Sticking power: no good if they fall off half way home. A properly installed REVCO stays on. Should you change your car, or sell it? A refit kit is available.

Weather resistance: some of the competition has a multitude of loose components: the REVCO has 2 assembled parts: inside and outside. What could be simpler?

Contact your local Dealer or in case of difficulty write, phone or fax. Trade enquiries welcome.

Revco Electronics Ltd, Old Station Yard, South Brent, S Devon TQ10 9AL Tel: 0364 73394 Fax: 0364 72007

SOUND ELECTRONICS LTD.

248-250 TOTTENHAM COURT ROAD LONDON WIP 9AD

TEL: 01-637 06901-637 0353 TELEX: 27768 FOR: 01-637 2690

NEW ARRIVALS

ALSO IN STOCK

GRUNDIG SATELLITE MODEL NO. 650

FAX/RTTY/ satellite FAX

Circuit system LW/MW/SW: Dual conversion superheterodyne FM: Single conversion superheterodyne Frequency range LW/MW/SW: 9kHz - 29,99999MHz FM: 50kHz – 10.055MHz (European countries) 75kHz – 106.7MHz (Other countries)

SAT: 137.62/141.12MHz (when the AN-F200 is connected: 1391GHz/1.65GHz)

Detection mode AM WIDE, AM NARROW, SYNC-USB, SYNC-LSB, SSB-USB, SS8-LSB/CW, N/F, FM £2599.96 (OPTIONAL)

SONY RADIOS

ALL SONY RADIOS ARE ON SPECIAL OFFER

ALL SETS GUARANTEED. PRICES INCL VAT. ALL MAJOR CREDIT CARDS ACCEPTED ALSO CHEQUES AND POSTAL ORDERS ALL GOODS DESPATCHED WITHIN 48 HOURS

PANASONIC RADIOS

RF-810... £59.95
RF-20L... £69.95
RF-840... £124.95
RF-8600D (BNC Head adaptor) ... £129.95 (SPECIAL OFFER)
TOSHIBA RP-FII (IF Band Radios) ... £79.95
PHILIPS 0299... £189.95

£1800.00

£59.95

£69.95

£124.95

£129.95

£79.95

£189.95

Short Wave Magazine August 1989

REVCO WIDE BAND PRE-AMPLIFIERS

The problem with omni-directional wide band antennas is their lack of gain.

The REVCO PA3 range of wide-band pre-amplifiers complement the antennas and compensate for their shortcomings.

The basic specification of the products is similar: coverage 20MHz-1GHz, at 10GHz: minimum gain 13dB, noise factor 5.6dB. Choose from a masthead version (PA3M) or a standard die-cast box style (PA3B). Best results are normally obtained from the masthead model which gives a boost to weak signals which would otherwise have been lost in the feeder cable. Also feeder cable noise is not amplified which is the case if the amplifier is mounted at the base of the feeder. On the other hand, the die-cast box version requires no special installation and is readily taken out of circuit. The masthead model is supplied with a special power unit which feeds the DC supply into the antenna feeder. No psu is provided for the PA3M, as any 9-15v DC source is suitable (current requirement about 25mA).

The PA3B finds application in instrument work, e.g. input spectrum analysers, boosting the output from signal generators to give a low-power Tx.

The standard version of the PA3M has BNC sockets and is designated “PA3B/S” available special order; 50Ohm “PA3N” or SO239 “PA3S”. A special feature of the PA3 series is a high-pass filter to attenuate frequencies below 20MHz: high-power HF & MF broadcast stations can be very troublesome!

£2599.96 (OPTIONAL)

REVCO PAK range of wide-band pre-amplifiers complement the antennas and compensate for their shortcomings. This Wide-band antenna offers an interesting alternative to the discone. It is simply an array of dipoles, but the clever bit involves changing the dipoles to maximise bandwidth and minimise interaction. The RADAC can be set up for a range of frequencies from 2MHz to 900 MHz, and because very good impedance matches can be obtained the user can specify any six frequency bands in this range for optimum performance, either for receiving, or more useful, for transmitting. For example, all the Amateur Bands from 10m to 70m can be covered in one antenna. If you are in the PMR business, the RADAC can be customised for your needs. Aircraft listening enthusiasts can specify VHF & UHF Airband coverage.

SONY RADIOS

RF-810... £59.95
RF-20L... £69.95
RF-840... £124.95
RF-8600D (BNC Head adaptor) ... £129.95 (SPECIAL OFFER)
TOSHIBA RP-FII (IF Band Radios) ... £79.95
PHILIPS 0299... £189.95
Last time we talked about v.h.f. propagation so this time let’s turn to the h.f. bands.

First, make no mistake about it, the sort of propagation modes that occur on 80m are often very different from those on at least the higher h.f. bands. For example, those of you with beams may be able to note auroral signals, or marked that signals on the case, a signal heard simultaneously by aurora and direct propagation.

Let us consider the terms, and taking of the intercontinental stuff, we may say that the lower frequency bands, from Top Band to around 3MHz are not active at night; on the other hand, on 14MHz and above, the bands are best regarded as active in daylight. On all the bands we may make a basic observation - a ground wave - signal whenever it is active. For a given signal, then, such as my own, one may say it will be audible for a few kilometres all round, then there will be an area when the signal will be inaudible - the skip zone - and marked that signals on the case, a signal heard simultaneously by aurora and direct propagation.

The latter, refracting, instead of being audible from one hop, one would expect alternate areas of signal and silence. Occasionally one may find the skip zone is shortened (short skip) and is full of signals normally just out of ground-wave range. The effect may even be so great that DX propagation on the outer bands of the ground-wave range are audible simultaneously by direct and sky-wave propagation, and the rest of things, you may say, as to when and how the skip zone occurs is just the average. We’ll continue the story another month.

**Set Listening Period**

As things turned out, I was away from a receiver on June 11, sampling the delights of Orkney, fortunately others were on the air.

Comfortably ahead in first place was A. C. Brown (Barnet) who used a TR6005, Realistic DX-40 and TRS950; on the antenna side, a half-size G5R in the garden, a 28MHz half-wave vertical on the roof and a rapid listen in the loft. Of course an elevated dipole is always great, but in real terms eleven years is just the average. We’ll continue the story another month.

**Letters**

First a card from Ron Pearce (Bungay) who writes that he has been a little bit lower, overall success, noting some 22 countries. The KG4KSLJ logged as being a query from Colorado, but since my friend has a station in EA-land I have put down to either a mis-hearing or possibly our old friend Slim at work again! Of course, no matter what, he was always a problem on crowded bands, between the QRM on the one hand and the need for very heavy processing late in the receiver chain; the ideal form of selectivity would be a crystal filter in the antenna lead! The reason for this is that one ANY stage overloads and so by definition distorts, it acts then as a mixer, to mix all the signals appearing at its input. The result of course is mainly noise. An attenuator helps greatly, particularly on the low bands. For example on the local 3.5MHz Sunday morning nett the noise level is enough to totally smother some of the stations around the other bands, but by using an attenuator of a suitable size and processed image, we can even out the distinction on the antenna circuit, and wind in some more a.f. gain to compensate, and they become weak, but capable.

B. Greer of Burton-on-Trent has moved from Stafford recently, and his antenna problems have defeated the restart. However, operation is now by way of a Butternut H56F which is a bandpass, and recently has some 82 radials each of about 2-1/2 metres length; the operating area is the end of 2m garage; this picked up the crop month end (14MHz) JX7DAF, 4J1FS, JY6RS, T6GG, (21MHz) S01DX, HZ1AB, PK6HSsor, 5N0GR, OAE4D, HK4HHG, KMPKFP2, (28MHz) CX3VB, 9J2WS and CP6XX.

**Another SLP**

So many of you seem to want this sort of thing... so for this time try the weekend August 12/13. Up to three hours of SB logging is possible, plus the normal v.h.f. listening time of six hours in the two days. For a change, any old(AMateur) bands you like for a confident 10GHz? One point per logging on 14/18/21/24/28GHz, two points per logging on 1.8, 3.5, 7 and 10MHz. One point per logging on 14MHz, three points per 50, 70 and 432MHz, 10 points per on each of the bands above 432MHz. Contacts logged on c.w., RTTY, AMTOR, SSTV counted double points, as will contacts logged on home-brew receiving gear or antennas. For a multiplier, add up the number of contacts on each band, and multiply by the total number of bands. Final score is the sum of the logging points times the multiplier. We recommend a bucket of water to keep the calibrator cool! Entries to me arrive by SEPTMBER 18, to include the log itself, a quick run-down on the gear itself, and comments, plus any other comments on conditions, problems or whatever.
Readers Letters
Ray Webster, Chesterfield uses a Yaesu FRG-4800 receiver with a Datong FL3 audio filter, the RTTY signals being decoded by a Dragon 32 microcomputer system. When on the go Ray uses the Datong AD370 active antenna which, although an outdoor model, is currently located in the loft. Despite this restriction, Ray reports very good performance from this compact antenna. In addition to his station details, Ray has sent me a very comprehensive log which I will include in my main database.

Another point Ray makes is that of identifying the station callsign. I'm sure that any of you who have tried to positively identify a station from it's transmitted very long periods between callsigns been sent. Ray has a tip for those of you who like to monitor press transmissions like TASS and ADN. These stations usually end their news reports with "ENDCAST." The trick is to stay tuned after that message and the callsign is usually sent during the following hour. An added bonus for your persistence is that you will often find that the callsign direction and frequency of other transmissions from the same agency are also sent. This is obviously a good way of obtaining up-to-date info on yet more press stations. My thanks to Ray for this tip.

Final point from Ray concerns the shift measurement of RTTY signals by the Datong FL3 audio filter very useful, as it has a i.e.d. bargraph display which shows the audio spectrum usage of the signal. It is the first time I have read the shift from the scale next to the display. Of course the main use of this filter is to let the wanted signal through unhindered whilst interfering signals are filtered out.

Peter Trayner, Selkirk has written asking for one of my frequency lists, but in his letter he has given some brief details of his station. The receiver is the Icom IC-R-15, from the JRC and this feeds a Codemaster decoder. The antenna is a simple long wire, which Peter says is quite happy with the performance. His location in the Scottish Borders perhaps doesn't help but nevertheless he should be getting very good results with that line-up. I would suggest that he checks his antenna, it might even be worth experimenting at a.t.

Colin Perkins, Nottingham has a different problem in that he would like to use a v.f.f. (very low frequency) converter with his Sangean ATS-803A receiver. This will enable him to monitor the interesting FAX, RTTY and other stations that operate below 150kHz. If you would like to try your hand at some home construction our sister magazine, Practical Wireless, published a design called the PW "TAW" in the November '86 issue. This converter frequency shifts the i.f. band and allows the emergency or choose between 10MHz and 20MHz thus allowing reception of v.f.f. frequencies or your standard h.f. receiver. For those interested in this project, reprints can be obtained by sending £1.40 to the editorial offices.

If any readers, using a v.f.f. converters, perhaps you would like to drop me line and let me know how you are getting on.

The rest of Colin's station comprises a Spectrum computer running J & P Electronics software, though he is currently having a few problems with computer interference. Colin reports very high levels of interference with their delivery and after sales service. In addition to h.f. band monitoring by Ian Mason he has also selected a selection of v.f.f.'s.h.f. scanners.

Iain Mason has been developing his monitoring station with some rather interesting additions. One of these was a Pocom FTU-2100 which is a RTTY selective filter terminal unit. Rather than run it at a expensive oscilloscope to be used as a training aid, Ian reports that he is very pleased with the FTU-2100.

On the FAX side, he has just received the latest dedicated M-900 decoder from Universal Shortwave Radio. The M-900 supersedes the M-800 model I have mentioned before in this column. One of the enhancements of the new model is that it simple RTTY and SSTOR decoder has been built in. As with the previous model, received pictures are displayed on an Epson compatible printer and in Ian's case is a Brother model 1209.

Having set himself up with a very nice station, this is now not a problem at all the new modes that are available to him. I shall of course be expecting to see some pretty interesting logs from Ian!

Malcolm Rivers from Maidstone has just re-discovered short wave listening after a gap of several years. His question is quite simple - what is RTTY and what do I need to receive it? Please could you answer this question so that I would take rather more space than I have at the moment so for a simple explanation of what RTTY is the bookie RTTY The Easy Way which is available from BARTG(1) price £2.50 (members) or £2.75 (non-members). Although this publication is obviously heavily biased towards amateur equipment it should be worth the money. A handbook for transmitters that may be the same for commercial RTTY. As far as equipment is concerned, the Sony 2001 that Malcolm is using at the moment should be OK, but he will need something to decode the RTTY output from the receiver. One of the simple solutions is possible to use the ERA Microreader, which seems to be popular with quite a few readers. The only snag here is that the display is quite small so I would recommend that you try before you buy. The next alternative is to go for a computer i.e. a Spectralink and the input is straightforward. If your pocket is deep enough then one of the fully automatic decoders like the Wavecom or Pocomor range make life very easy.

The other alternative is to check out the readers letters in this column and you will soon see what set-ups are popular.

Utility Listening in South Africa
I have had several contacts with listeners in South Africa, the latest being from Francois Steyn, Hillbrow, S.A. Francois is the Editor of the official magazine of the South African DXClub titled The South African Short Wave Listener. His station the transmission details you will see in the next column.

If you are interested in FAX reception you will find that these stations will occasionally send a test chart and the usually include the QSL address and ask you to send a copy of the chart to the station.

If you would like to QSL with a station the transmission details you need to include are:

- Frequency, mode, time, date, sign-on, location and receiving equipment.

There are several sources of station addresses and the most useful is the Klingenfuss Guide to Utility Stations there is quite a good selection there. One of the problems of course is keeping these details up-to-date and there isn't really an easy answer, though as you will see in the next section I try to publish any updates I receive.

Jan Nieuwenhuis has sent me some revised QSL addresses for stations that he has received QSLs from over the past month.

NOAA, National Weather Service Office, PO Box 29373, Honolulu, Hawaii 96820. c/o Andrew K. T. Chun (Deputy Meteorologist)

Klappe Radio, c/o Vitas Krasnickas, PO Box 673, SU-23651 Klaipeda, Lithuania, USSR.

A note from Vitas Krasnickas on this topic - most QSLs from commercial stations do not officially verify reception reports. However, he is willing to verify reports privately, if you do include some Western stamps for his collection!


US Naval Oceanography Command Centre, NOCC, Box 31, FPO, New York 09540, USA.

One final word on QSLs, you will need to be patient as some commercial stations are very slow with their replies - a bill/me mailbag really!

Station Schedules
More schedules again this month from Jan Nieuwenhuis and J. W. Carter.

The first is the Moroccan press agency Maghreb Arabic Press (MAP) which transmits a number of reports in French and English using 59 baud RTTY.

- 5.124 MHZ, CMN20151
- 10.213 MHZ, CMN201000UTC
- 1130UTC and 1530UTC-1700UTC

News in French. 1200UTC-1400UTC news in English. 10.5952 MHZ, CMN36SX9

- 1530UTC-1700UTC News in French.
- 10.6341 MHZ, CMN371530UTC-

Short Wave Magazine August 1989
SEEN & HEARD

1700UTC News in French. 14.547MHz CNM59/X9 1200UTC-1500UTC News in English. 14.760MHz CNM61 1000UTC-1130UTC News in French. 1200UTC-1400UTC News in English. 15.752MHz CNM66 1000UTC-1130UTC and 1530UTC-1700UTC News in French. 1200UTC-1400UTC News in English. 15.999MHz CNM69/1X 1000UTC-1130UTC and 1530UTC-1700UTC News in English. 1200UTC-1400UTC News in English. 16.141MHz CNM71/9X 1100UTC-1200UTC News in French. 1200UTC-1400UTC News in English. 18.229MHz CNM76/X9 1000UTC-1130UTC News in French. The second schedule is for Royal Navy Oceangraphic Centre Northwood. This station transmits weather FAX chart to the following general schedule.

12.8385MHz 1630UTC-0730UTC September 30 to March 31
2.4745MHz 1900UTC-0800UTC April 1 to September 29 and 1530UTC to 0830UTC for the rest of the year.
6.43685MHz continuous.
8.49485MHz continuous.
2.74185MHz continuous April 1 to September 29 and 0730UTC-1630UTC for the rest of the year.
16.998SMHz 0400UTC-1900UTC August 14 to September 29 and 0400UTC-1530UTC for the rest of the year.

Local Frequency List

2.4745MHz 1900UTC-0800UTC April to September 29 and 1530UTC to 0830UTC for the rest of the year.
6.43685MHz continuous.
8.49485MHz continuous.
2.74185MHz continuous April 1 to September 29 and 0730UTC-1630UTC for the rest of the year.

As usual I have a few frequencies for you to watch out for. The format used is: frequency, mode, speed, shift, callsign, time and notes.

Beginners

Maarten Hoogeest is a mechanical engineer who lives in Australia and sent a letter (addressed to me at Plymouth, UK)-well done the PO. He is very interested in receiving and tracking weather satellites over Australia but only "has" an IBM PC and wonders where to start. I think that the best places to start for someone who has a computer is to purchase satellite tracking software from one of the various suppliers and then simply follow the directions of the software that caters for this interest.

Running such software and trying out the options will give you a feeling for the different types of satellite orbit. Experiment by changing the orbital inclination, starting the program and increasing it towards 90 degrees and you will see that satellites in orbits with low inclination (near equatorial) will never pass near the UK, which has a latitude of around 52 degrees. The satellites with higher inclinations, including the Meteor and the CNM66/X11 1200-1400UTC News in English.

There are several events to consider this month including good news on the Meteor 4 front, news of the GOES satellites, continuing operations on the polar orbiting weather satellites and some requests for advice.

INFO IN ORBIT

Lawrence Harris
5 Burnham Park Road, Perivale, Devon PL3 5OB

Des Watson G3XYO is the membership secretary of the Remote Imaging Group which publishes a quarterly magazine on weather satellite operations. He can be contacted at "Norton", Gote Lane, Ringmer, Nr Lewes, East Sussex.

Voyager 2 Encounter

Some exciting news from Pat G Owen G3IOR who writes that when Voyager encounters its Neptune fly-by on August 25 it will be relaying pictures to the Jet Propulsion Laboratory in Pasadena, California which will be re-transmitted on amateur slow-scan television by W6VIO, the club station of the JPL. Before, during and after the time of closest approach (TCA) they will transmit standard amateur SSTV on a frequency of 14.253MHz. Pat comments that if solar activity permits, the Californian-Europe path should be good at the TCA time and good pictures are possible.

MIR

An article written by Soviet scientist Yuri Semenov points out that during the 3 year long flight of MIR, some 5000 scientific study sessions have been held using more than 60 kinds of research equipment, involving many disciplines from astrophysics to biology and biochemistry. MIR is expected to have about 890 days out of the 1170 days so that it has been in flight. In September, a module is scheduled to be launched carrying a new videoscopic complex to be controlled by radio from earth. It will be part of a permanent environmental monitoring service. Thanks to APN for this information.

Listeners to the 143.625MHz MIR voice communication link will know that while MIR remains crewless the link is absent. Pat G Owen reminds us that MIR can still be tracked both visibly and by listening for the transponder beacon on 166.000MHz ±125kHz when MIR is within range of the USSR command.

Weather Satellites

We currently have all 7 polar orbiting weather satellites in operation with just minor changes taking place from time to time.

Those listening to NOAA 10 on 137.50MHz, in late May will have noticed that it sounded different compared to its normal sounds. It was outgassing its infra-red sensors and so transmitting adjacent visible pictures instead, and this could be clearly heard. NOAA 9 took its turn to transmit 2 visible pictures on June 12. Meteosat also undergoes periodic decontamination of its sensors.

NOAAs 9 and 11 which normally both transmit on 137.625MHz are once more coinciding by a few minutes, leading to some mutual interference when 9 is left on.

Mets 2/16 and 2/17 continue to transmit on 137.40MHz with some slow scan infra-red transmissions being heard on several occasions when the craft is in eclipse. For those simply listening to the satellites it may help to know that in early August, Met 2/16 will be passing northern over the UK during mid-afternoon and Met 2/17 will pass southwest during the morning. Met 2/18 will pass northern during the morning, and Met 3/2 will also travel northbound around that time. Expect Okean, the oceanographic satellite, will be passing on our eastern side during the morning, travelling northwards.

Mets 2/18 was apparently off for several days during early June but I feared it on the 14th as soon as I switched on the scanner for a quick look before supper - there it was on 137.30MHz at 2112UTC. I checked my predictions to confirm that it was 2/18 and not a new launch.

Talking of new launches, for some years many enthusiasts have put up a new oceanographic satellite each July/August period so we may shortly hear a new transmission from one. I haven't heard Okean for months now despite regular recording checkings and I am not aware of anyone else having heard it. This series usually transmits near 137.40MHz but with 2 Mets both using that frequency I would expect it will have to be used, or perhaps the Mets frequencies may all be swapped around.

Frequency Summary

NOAAs 9 and 11 on 137.62MHz
NOAA 10 on 137.50MHz
Met 2/16 and 2/17 on 137.40MHz
Met 2/18 on 137.30MHz
Met 3/2 on 137.85MHz
Okean, when transmitting, on 137.40MHz.

Pictures

A picture of the Peru region from a GOES-E south-east format visible-light scan is shown in Fig. 1. It shows clouds and surface material off the western coastline. A Meteosat-3 picture, format C3D which includes Armenfigs in Fig. 2, Fig. 3 is a NOAA 9 picture showing the UK, taken last summer and Fig. 4 is a close-up of the southwest UK, also from NOAA 9 last summer. Remember to send in any pictures that you would like published in this section or I may have to keep on using my own!

GOES Operations

The GOES-E satellite carries a bulletin board which gives the latest status of each NOAA satellite. If you can't receive GOES then you can get a summary of their status by ringing Weatherwatch on 025-883-448 during the weekend or evenings.

GOES-E is the east relay satellite that you can tune into if you point your dish, or equivalent antenna for 1691MHz, towards the western
RX-8 for the BBC Computer

Receives screen and printer FAX charts & photos, HF and VHF PACKET, Colour SSTV, RTTY, AMTOR, CW, ASCII, UoSAT 1 & 2.

Receive them all with every possible feature, superb performance and ease of use. Full printer and disc support. The best receive system ever. Complete system of EPROM, hardware interface with 2 demodulators and tuning display, comprehensive handbook and all connecting leads, only £259. FREE Klingenfuss Utility Guide for 1st 50 purchasers.

DISCOUNT for RX-4 users. We can't begin to list all the features here so send for full Information.

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, ready-made, boxed with all connections £40. Available only with software.

Also MORSE TUTOR £5, 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

EX-MILITARY COMMUNICATIONS RECEIVER R210. Frequency 2 to 16MHz in 7 switched bands AM, CW, SSB, FCO. Aerial inputs 800hm balanced line, long wire or whip. CW filter, BFO. Noise blanker, complete with 240 volt AC power pack, loudspeaker, headphone jack and pair of lightweight headphones.

Price £79.80 carr. Mainland only £80.00.

EX-MILITARY COMMUNICATION RECEIVERS TYPE R210 unconverted £50 (carr £60).

Special receiver type GP040A, Battery/mains covering 133kHz-33MHz. Callers only £195.00.

Pye Westminster W15FM, 80-110MHz. 10 channel £15.00 (carriage £3.00).

Dymar 25W. 16 channel FM 80-110MHz £15.00 (carriage £3.00).

ACCESS AND BARCLAY CARDS ACCEPTED.
horizon and up a few degrees. It is positioned at 65 degrees west longitude and broadcasting wexaf and other pictures including its own timetable at 1055UTC. Its signal strength is rather variable!

The next GOES is currently scheduled to be launched in March 1990 but it is likely to be delayed until the July. It will be three axis stabilised rather than the current spin stabilised. This column will publish more details about GOES data and operations at a later time.

Meteosat

I received a call from George of Arminex (sorry, I didn’t catch your surname) on June 6 asking whether Meteosat-3 was operating. In fact there have been regular tests on both Meteosat 3 and 4 for several weeks and on occasions both have been off, though not for very long. George was considering dismantling parts of his equipment to fault find so I was glad to help.

I also once spent quite some time trying to trace a “fault” when suddenly the signal returned and I realised that tests were in progress. Met-3 also had problems with some of its transmitting dipoles.

The new Meteosat-4 came into full operation on Monday June 19 giving a good, steady signal strength, and with a new transmission schedule. In common with the other geostationary weather satellites Meteosat wexaf and DCP data is now broadcast on 1691MHz, called channel A1. Digital transmissions - the high resolution images, are broadcast on channel A2 on 1694.5MHz as are the GOES relay pictures that are received at CMS Lannion. These relayed images are also increased in number.

With the good signal from Meteosat and the clear skies of recent days I have obtained some very good images of the whole earth and hope to include one in a future column.

Main Changes

There are several changes to the schedule of transmissions but the following will be of particular interest.

DTOT - the whole earth infra-red pictures are now transmitted every 3 hours starting at 0030UTC.

CTOT - the whole earth visible pictures are increased to 3 per day at 0938, 1238 and 1538UTC.

ETOT - the water vapour whole earth pictures are transmitted every 3 hours starting at 0038UTC but switching to CTOT during the day as given above.

My thanks to Mrs Valerie Newell of Weatherwatch at Lasham Ground Station for the Meteosat data and also to the National Oceanic and Atmospheric Administration for details of GOES operations.

Teletext Space News

Space and satellite enthusiasts will be aware that until recently both Oracle and Ceefax have run space news pages carrying summaries of space activities. Oracle continues to provide this service at the weekend on page 568. Sadly Ceefax stopped their coverage some weeks ago, so I enquired about their reasons and was surprised to receive a letter from Ceefax describing the removal of these pages as leading to “...a more effective News and information service”. Remembering how many pages are available I am disappointed that the enthusiasm for space information is apparently to be ignored. Black mark Ceefax.

Fig. 1

For those of you with modern scanners, ex-military v.h.f. communications receivers like the Hallicrafters S36 or the R216 or the civilian Eddystone 77R may wish to check the East European f.m. broadcast band (86-73MHz) during the current Sporadic-E season. Various programme networks can be found between each megahertz from transmitters in Bulgaria, Czechoslovakia, Hungary, Poland and Romania. In addition, programmes are transmitted from Albania on 67.8 and 70.1MHz and Bulgaria, Poland and Romania have transmissions just outside this range on 65.84MHz, 65.99MHz and 65.96MHz respectively.

Between 1730 and 1800 on May 30, I logged 7 such signals, at amazing strength, with the typical deep and sharp fading produced at the beginning or toward the end of a Sporadic-E disturbance. During the evening of June 5, I counted 18 of these stations plus weak television sync. pulses on Ch. R3 (vision 77.25MHz-sound 83.75MHz) and 13, plus Ch. R3 sync. at 1830 on the 11th. However, the first really big event was still to come and it began around 1530 on the 12th when 16 East Europeans came up and, two hours later, I found 56 of them within this range, overlapping each other and exceptionally strong. In addition, there were television pictures and sound from the USSR on Ch. R3, pictures partly obliterated by co-channel interference and sound on Ch. R4 (vision 85.25MHz-sound 91.75MHz), and sound on Ch. R6 (vision 93.25MHz-sound 99.75MHz). Similar openings, but with 59 and 71 East Europeans being counted respectively, plus the
**Report**

May 19 was a fine hot and sunny day, the pressure was high around 30.2in (1022mb) and while enroute to Hartfield, Sussex, we stopped at a high point, some 200m a.s.l., in Ashdown Forest for a coffee and a spot of DXing with the Plustron TVRS. Apart from a weak French station near 100MHz both Bands II and III were normal. However, during the afternoon, while in the grounds of Standen, a National Trust House in East Grinstead, Joan and I observed that some long wispy clouds were gathering in the sky. "Bad weather to come," said Joan, "yes and with luck a trop-opening," I replied. At 0830 next morning, Band II was open and I counted 17 very strong continents, plus co-channel "warbles" at 90.9, 91.0 and 93.1MHz and Invicta FM and Radio WM, in a single sweep, with the R216, from 87.5 to 103MHz. By 1530, a few very clear continental voices could still be heard between 99 and 103MHz.

In addition to a strong BBC Radio Bristol, various Dutch and French stations occurred among several stations between 87.5 and 98MHz at 0930 on the 28th. At 0915 on the 27th, I found at least 20 continental voices scattered throughout the band.

In New Radnor Simon Hamer heard the Berlin relay of the BBC World Service (90.2MHz) on the 20th, Radio Denmark's Programme 1 News In English on the 27th and FM Radio 4 from Limavady, BBC Radio Cornwall, Devon,Lincolnshire, Norfolk, Scotland and Ulster, Manx Radio from the Isle of Man, ILR Broadlands, Downtown Radio (Belfast) and RTE's FM 2, 3 and on the 20th.

At the pressure on 0800 on June 9 was 30.1in (1019mb) and although the day was bright, clouds were beginning to form up and, as we left home at 1100, Joan and I saw a rather special solar halo of which two thirds was covered by individual clouds and the remainder was in clear sky.

**Band I**

From his home in Meerut, India, Lt. Col. Rana Roy received weak, flutty, smearly and/or multiple image pictures (typical F2 propagation) from the west around Ch. E1, at 1930 on March 14, 1700 on the 19th and 17th, 1650 on the 20th, 2345 on the 21st, 1500 on the 28th and 1400 on May 2. Similar propagated signals were received from Malaysia, which he indentified by the figure 3 superimposed at the bottom of the picture, on March 10, 12, 15, 24, 26, 29, 30, 31, April 1, 2, 9 and 10. Among the items seen were adverts, films, news, views and sport. At 0840 on April 8, on Ch. E3, he noted a rolling picture and after stabilising it with the hold controls Rana thinks it was 525-line and probably a Ch. A2 station coming from Canada or the USA. These pictures faded away at 2115 and were not reported again around Ch. E3 between 1700 and 1730 on May 1. In his letter of May 31, Rana said, "There has been much too much DX in May. There has hardly been any Sporadic-E. Whatever we have had has been weak and for not much more than 30min or so. F2 reception has reduced considerably though we are still getting some from SE Asia." Prior to mid June Rana, we too had only limited outbursts at the start of the 1989 Sporadic-E season. Although, Bob Brooks (Great Sutton) saw a film from Italy, Breakfast TV, Atorn Spain and news from the USSR on the 18th, a cowboy film from Italy on the 22nd, news from Italy and the USSR on the 25th, Breakfast TV from Italy and Spain and test cards from Finland and Sweden on the 26th, programmes from Italy and Spain on the 29th and the Prague log from Czechoslovakia and a Russian clock caption, showing 2100, around 1800 on the 30th. In Basingstoke, John Woodcock received pictures from Italy and Spain on most days between May 18 and June 14 and writes, "During the early part of the month pictures were strong for short durations fading to noise with regularity, but, in the last week, signals persisted for longer periods." Neil Purling (Hull) logged test-cards from Finland (YLE TV1) on Chs. E5/E4 in May and June, respectively. At 0840 on May 26, Sweden (Kanal 1 Sverige) on Ch. E2 at 1533 and 1255 on the 24th and 30th. He saw images from Italy (RAI) and Yugoslavia (RTV Ljubljana) on Chs. la and E3 between 1900 and 2003 on the 20th and the opening titles of Santa Bbara, a soap opera from Spain's TVE, on Ch. E2 at 1030 on the 28th. In addition, Neil found the Russian news caption BPEMR on Ch. R1 around 1915 on the 25th and 1545 and 1801 on the 30th, plus CNOPT (sport) and a clock showing 3 hours ahead of UTC (Moscow area) on the 29th and 30th. Neil reminds us that the Soviet news captions BPEMR is Vremennye and HOCBCTN is Novosti. On the 30th he saw Mr. Gorbachev's speech to the Supreme Soviet via Sporadic-E on Ch. R1 and later on BBC TV news. Like Edwina and Tony Mancini (Belper), I also received strong pictures and sound of Mr. Gorbachev's speech, followed by a music programme with a group of people playing harps. I saw news about China, possibly from the USSR, on Chs. P1/P2 at 1930 on June 5 and the TSS UEIT test pattern, with deep and slow fading, during a brief period of signal reception. On the 29th I heard the Ch. R1 sound, by tuning the R216 to 56.25MHz. I saw part of a Danny Kaye film from Spain, with the TVC logo in the bottom right hand corner, at 1520 on the 10th.

Pictures, often in colour, were predominant on Chs. E3/24 between

---

**TELEVISION**

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

Aerial Techniques proudly announce their NEW 1989 CATALOGUE

We’ve got some surprises for you. We’ve retained all of the well established and popular products, but have taken this opportunity to introduce lots of exciting new items for you the enthusiast. Our extensive listings cover domestic, fringe and DXing installations within Bands I to V inclusive. Aerial Techniques provide a complete and comprehensive consultancy service for all reception queries and problems. Send 75p for your copy today. Please include an SAE with any other enquiries.

For a speedy dispatch, ACCESS and VISA mail and telephone orders may be placed for any of the items listed in the comprehensive Catalogue. Whether your need is for local or fringe reception, alternative channels, TV/FM, or for a distribution system Aerial Techniques is the 'one stop' address for all equipment.

ACCESS & VISA Mail and Telephone orders welcome.

11 KENT ROAD, PARKSTONE, POOLE, DORSET BH12 2EH
Tel: 0202 738232

RYEALDE SATELLITE SYSTEMS

SUPERB QUALITY AT AN UNBEATABLE PRICE

THE MASPRO SRE 89R

FIXED SYSTEM

MASPRO SRE 89R 50 CHANNEL RECEIVER + TRAC 65cm DISH INCLUDING INTEGRAL FEEDHORN AND FERRITE POLARISER • MASPRO SCE 975 HEMT 1.6dB max HEMT LNB £292

ECHOSTAR SR4500 RECOVERY ANTENNA POSITIONER £559

Motorised System comes complete with 90cm Offset Dish, Offset Feed with Magnetic Polarisar, 1.3dB LNB Actuator Arm.

FREE — DIY INSTALLATION VIDEO SAVE ££! ALL PRICES EXC VAT

SKYSCAN K1 MODIFIED

Motorised System comes complete with 90cm Offset Dish, Offset Feed with Magnetic Polarisar, 1.3dB LNB Actuator Arm.

£445

245 CASTLEGATE, MALTON, N. YORKSHIRE, Y017 OEA.

MAIL/TELEPHONE ORDERS. CHEQUE/PO £10 P&P Tel (0653) 697989. 48HR DESPATCH

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

70CMS TRANSCIEVERS

DATONG & P&P

ANTENNA RANGE

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

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

Short Wave Magazine August 1989
1930 and 1930 on the 11th and at 1900 I saw the caption Uppdraget Kanal 1/Noje 10903 Stockholm. This was followed by an American film with, I assume, Norwegian subtitles.

Mike Bennett (Slough) received test-cards and/or programmes from Finland on May 26; Italy on the 10th and 27th (opera) and June 5 (weather) and 6 (pop music); Spain (dancing, films, Madrid news, pop-music, quiz and tennis) on May 26 and 27 and June 5, 6 and 11 and Sweden on the 28th.

Among the DX gathered by the Mansinis was Czechoslovakia's CST Praha TV1 logo, the Norwegian regional Bremanger, adverts from Eesti TV and Hungary, cartoons, children's programmes, a regional news followed by a Falcon Crest sport and a variety of entertainment from Spain and the Eesti TV and Free Eesti logos news and sport from the USSR. They reported, "We have seen our first advert on Eesti TV, it looked like a potted meat one. It came over after BPEMR at 1900 tonight (12th). Also they were pushing the Free Eesti message. Their logo is also changed to ETV Tallina."

From New Radnor Simon Hamer sent an extensive log covering the Sporadic-E openings on May 16, 18, 20, 26, 28, 30, June 3, 8, 10, 11 and 12. This included pictures from Albania (RTSH), Austria (ORF on Ch. E5A 49.75MHz and E3 [relay?]), Czechoslovakia (CST), Finland, France (TDF Canal), Greece (ETP), Hungary (MTV), Iceland (RUV), Italy (RTE), Poland (TPV), Portugal (RTP), Romania (TVR), Spain, Sweden (SVT), Switzerland (PTT/SSR1 and +PTT SR6-1), USSR and Yugoslavia (JRT). Highlights for Simon came on the latter two days. On the 11th, the prevailing Sporadic-E extended its influence suddenly, for about 25 minutes, into the lower end of Band III when he saw Arabic programmes with captions on Chs. E5/6/7, testcards from Algeria (RTA), Libya with a clock caption on lower part, Morocco (RTM) and Tunisia (RTT) with Arabic script. Simon checked this band when he heard Arabic and Italian voices in Band II. On the 12th he logged JTV Suweileh, from Jordan, on Ch. E3. Sporadic-E fluctuated for most of the 16th and 17th when I saw testcards from Finland, Sweden and the USSR and frequently observed chaos on the television channels in Bands I and II. While "having a brew" in Wakehurst Place car-park, Arlingham, Sussex, the Plustron TVR3D using its own rod antenna revealed a mixture of pictures plus a test card with the inscription SIR-P in a pannel to the right of the circle on Ch. E2. Any ideas readers? Another typical sight around 1000 on the 17th was a cartoon film frequently changing places with a strong colour test card from Sweden. More about these events next time.

Tropospheric

"On May 22 a large high pressure area of 1036mb (30.6in) was situated over Denmark and over much of northern Germany," wrote George Garden (Edinburgh) from his home near Laurencekirk. About 1700 he transported his TV gear to his favourite DXing site on Cairn O'Mouth. "It was a great opening in UK as well but a very extensive one from Europe lasting from about 2000 till late evening," said George. By
changing his antenna polarity from horizontal to vertical around 1800 he logged colour pictures on Ch. 29 from Bordel TV's, Edinburgh and Tyne Tees from Bilsdale. By 2000 George noted interference on most channels so he turned his beam toward the continent and received very strong colour pictures from Germany and Holland. Many Dutch transmitters were coming up and among the programmes he saw during this memorable DXpedition was the excellent "Hulp de niking" followed by Postbus 51, Fig. 3; news on the Veronica Channel, Fig. 4, which is part of Nederland 3 and the news ident of the Journal, Fig. 8, and Den Hag Vandaag, Fig. 6. This opening continued throughout the following days, 9076, David Glenlyon (Aberroth) received a Nederland 3 caption, Fig. 7, on Ch. E30; a teletext page, Fig. 8a from the Irishside transmitter of Nederland 2 at 1545 on Ch. 4E7; news (Hete), Fig. 9, from West Germany's ZDF at 1500 on Ch. E33 and weather from their NDR network, Fig. 10, at 1700 on Ch. E51. Edward and Tony investigated various pictures, including a cowboy film, from France (Canal +) in Band III on May 27, 28 and June 6 and 7. Around 0900 on May 26, I received a programme, followed by a logo and a test card, from Belgium (RTBF) on Ch. E8 and a test card and later programme from BRT on Ch. E10. Overnight some u.h.f. channels suffered from French-channel interference and at 0330 I received strong colour pictures from Central TV on Chs. 24 and 29. As the high pressure varied toward the east of Britain in mid-June, I made frequent checks on Bands III, IV and V and often found programmes and test cards from Belgium and Holland in the v.h.f. band. At 0400 on the 28th, the sun was rising and co-channel interference began overpowering LWT on Ch. 21. So, during the following hour, I carefully tuned the u.h.f. band with the D01R ahead of a Panasonic v.c.r. and realised that this is a good time for DXing because most "local" stations are off air and the u.h.f. band is relatively clear. However, armed with the Daily Mirror's programme guide, I saw bits of Greek, Portuguese, Italian and French films on Chs. E9 and L5 and a test-card from Belgium on Ch. E8. I saw negative faces and text to a publication such as the WART Handbooks or had contact to engage in "list logging" signals.

Other MW DX

Although a distance of about 2744km separates Quarryway in Studio Arabia and Grimby, their 100kW transmission on 900 was rated as SIO 230 at 0100 and the broadcasts from N.Africa were heard by Tim Shirley and Mark Thompson. When higher power broadcasts from the Continent were logged by Lez Chipperfield in Goldhanger, but he also heard several of the lower power transmissions from Spain. Some of the BBC Radio-4 low power relays were heard by "Lao" Barr (Sunderland), Chris Nykiel (Leeds) and George Millmore in Hamilton. Whilst touring, George drove to the BBC Westerglen transmitter near Falkirk and photographed the antenna masts - see Fig. 1.

MW Local Radio DX

Writing from Seaford, George Butcher says that the numerous broadcasts from France and local TV interference make local radio DXing almost impossible at night, so he complied his first list for the chart between 1000 and 1300. Another first report came from Darren Beasley in Brislington. He has just built the Hexagon Loop detailed in the April '89 SWM and he says it has made a fantastic improvement to reception. As it is very directional, it is possible to separate many of the stations which operate on shared frequencies.

Leo Bert from a new rectangular former for his "Sooper Loop" - it has a perimeter of 1524mm. The main loop of PVC covered hook-up wire is tuned to a 1000pF (twin gang 500pF) variable capacitor. A simple turn couples the loop into the original amplifier. The performance has proved to be even better than expected - some south coast stations which were virtually inaccessible with the original loop now peak S3 or better!
Short Wave DX

The generally excellent conditions prevailing in the 25 MHz (11m) band have attracted two more broadcasters: Radio Moscow, USSR and Radio Yugoslavia, Belgrade. They are also being exploited by RTB Brussels; RNI Oslo; Radio DW Cologne; BBC London; Radio RSA Johannesburg; RTF Paris; R, Denmark, Copenhagen: The Voice of the UAE in Abu Dhabi/Radio Peace Int., Costa Ricta; BRT External Service, Brussels.

At the time of going to press the full details of radio Moscow’s World Service transmissions on 25.780 (Eng 0500-1300) have been noted which suggests that several beam headings may be involved. During the early morning

Kenneth Reece has been monitoring their transmissions in Pretoria and he noted that they varied from just audible to SINPO 55555.

The transmissions from Radio Yugoslavia 25.795 (Eng 1200-1300) were noted as 3533 by Roy Patrick in Derby - a fairly typical UK rating. In a very welcome first report from Oman, Rhoderick Illman quotes their signal as 44444. Writing from Canada, Alan Roberts says he received their broadcasts in Quebec during ten successive days, but they then became inaudible due to a deterioration in reception conditions.

The Voice of the UAE in Abu Dhabi are now using two frequencies in this band: 25.670 and 25.900 (Ar 0800-1600). Listening in Edinburgh and Kennedy Buck rated them at 1430 as 35433 and 45454 respectively. Alan

Short Wave Magazine August 1989
### New Receiver

_—Catch the DX on 10, 12 & 15 Metres!_

Now that the sun’s activity is high, propagation on the highest frequency shortwave bands is becoming excellent, with many DX stations, and much intercontinental working.

A brand new HOWES receiver, the DXR10 has been developed to give the home constructor the opportunity to get in on the action. This is a three band receiver covering 10, 12 and 15 Metres. The prototype I have been using certainly pulls in the stations in a most impressive manner!

Like our very popular DCRx single band receivers, the DXR10 is designed to be easy to build and within the scope of the beginner, whilst offering an amazingly good level of performance for a simple set. Technical features include a double balanced mixer, bandpass input filtering (which requires no tuning or set up adjustment), active AF filter, and plenty of audio output to drive a loudspeaker or headphones. Suitable for hobby, portable and home station use.

**DXR10 Kit** £24.90  **Assembled PCB**: £36.90

---

<table>
<thead>
<tr>
<th>TATUNG HITECH</th>
<th>SATELLIT</th>
<th>GRUNDIG</th>
<th>WORLD RADIO</th>
<th>PHILIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TMR7602</strong></td>
<td><strong>GRUNDIG</strong></td>
<td><strong>WORLD RADIO</strong></td>
<td><strong>PHILIPS</strong></td>
<td></td>
</tr>
<tr>
<td>150kHz – 30MHz (no gaps)</td>
<td>THE 'MERCEDES'</td>
<td>AIR * PRO 80</td>
<td>D2999 TABLE TOP RECEIVER</td>
<td></td>
</tr>
<tr>
<td>BFO/SSB, 3 speed tuning, mains/battery, digital frequency display, stereo</td>
<td>IN QUALITY RADIO</td>
<td>ICF/7600DS/SW1E</td>
<td>D2935 HANDY PORTABLE</td>
<td></td>
</tr>
<tr>
<td>VHF, phone jack</td>
<td>IN STOCK!</td>
<td>ACTIVE AERIALS</td>
<td>D1835 12 BAND POCKET RADIO</td>
<td></td>
</tr>
<tr>
<td>£99.99</td>
<td>* 400</td>
<td>AN-1 aerial now in stock (at last) first come/first served.</td>
<td>THE PIONEERS IN SHORT WAVE ARE BACK AGAIN WITH A GREAT RANGE OF RADIOS. JUST READ THE REVIEWS ON THE D2999 AND SEE WHY!</td>
<td></td>
</tr>
<tr>
<td>checked/tested/carriage £8.00</td>
<td>* 600</td>
<td>007's back From Russia with</td>
<td>STEEPLETONE</td>
<td></td>
</tr>
<tr>
<td>Similar to Sony ICF2003D in size * shape * weight. This must be</td>
<td>* 660</td>
<td>love with Worldmaster 215 &quot;latest</td>
<td>MBR7 Mk II EX STOCK</td>
<td></td>
</tr>
<tr>
<td>surely the very best value in radio anywhere! BBC &quot;Worldservice&quot; gave</td>
<td>* 960</td>
<td>edition&quot;</td>
<td>AIR, MARINE, POLICE, FIRE, HAMS, P.S.T., PLUS OTHER STEEPLETONE PORTABLES.</td>
<td></td>
</tr>
<tr>
<td>it top marks. Radio Nederlands 4 marks out of 51 Please, oh please, do not confuse my model with any other lookalike.</td>
<td>A TRULY GREAT RADIO!</td>
<td><strong>SELENA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional mains power supply £10.</td>
<td><strong>RFB60DL</strong></td>
<td>BACK IN STOCK.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>ITC-R610</th>
<th>JOHNSONS SHORTWAVE RADIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 BAND</td>
<td>43 FRIAR STREET, WORCESTER WR1 2NA</td>
</tr>
<tr>
<td>RADIO</td>
<td>0905-25740</td>
</tr>
<tr>
<td>Mains/battery. This radio is much sought after by various broadcasting authorities. Real honest value for money at £44.95 + £4 carriage and truly a world-receiver.</td>
<td><strong>WE ARE RIGHT BY THE CATHEDRAL BY THE NCP MULTI-STOREY CAR PARK.</strong></td>
</tr>
</tbody>
</table>

---

Some other HOWES KITS:

- **ASLS Dual Bandwidth Filter** – worthwhile extra filtering and selectivity for virtually any receiver. Simply connects in line with external speaker or headphones.
  - **Kit**: £14.90  **Assembled PCB**: £22.50
- **CSL4 Dual Bandwidth Filter** – the same excellent filtering as the ASLS, but designed for internal fitment with our receiver kits. Really sharp selectivity for CW or SSB.
  - **Kit**: £9.90  **Assembled PCB**: £15.90
- **CTU30 Antenna Matching Unit** – an ATU for use on all HF bands and 6M for receiving or transmitting at up to 30W RF. High quality performance at a sensible price.
  - **Kit**: £27.90  **Assembled PCB**: £33.90
- **DGS2 Relative Signal Strength Indicator** – or "S meter" in common parlance! Special HOWES custom made meter (see picture), with a two chip driver circuit for use with all our receiver kits. Adds a touch of "class!"
  - **Kit**: £7.90  **Assembled PCB + meter**: £11.90

There are over thirty different kits in our range. We have **receivers from £14.80, and QRP transmitters from £13.80. HOWES KITS interlink, so that you can start with, say, a simple receiver and if you wish, expand it into a full transceiver at a later date. Most kits are suitable for the inexperienced constructor, as well as the "old hand!"

If you would like more information on any item, or a copy of our catalogue showing our whole range of kits, simply drop us a line enclosing an SAE.

Technical advice and sales are normally available by phone during office hours. All HOWES KITS come with full, clear instructions, good quality PCB (drilled, tinned and screen printed with the parts locations), and all board mounted components. Delivery is normally within 7 days.

**PLEASE ADD £1.00 P&P to your total order value.**

73 from Dave G4KQH, Technical Manager.
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

50

 ENTERPRISE RADIO APPLICATIONS LTD.

THE MIKKI MICROREADER
A COMPLETE MORSE/RTTY DECORDER WITH TUTOR
PRICE £139.95 includes VAT & Postage

TO ORDER OR FOR MORE INFORMATION ON THIS OR ANY OF OUR
OTHER PRODUCTS:—
ERA LTD
20 CLARENDON COURT
WREKETON QUIK
WARRANTING WA2 8QP
Tel: (0925) 573118

WHAT IS A MICROREADER?
The Microreader is a small compact unit that allows anyone,
equipped with a suitable SW receiver, to read Morse and radio
telegraphy signals simply and without fuss. No computers,
interfaces or program tapes are needed. Just connect
the Microreader into the ear or speaker socket and switch on.
It really is that easy. The decoded words appear on the built in 16
character LCD display.

The Microreader has all the necessary filtering and noise
blanking included to allow reception even under bad
conditions. This makes it suitable for use where lower cost
receivers have been made. Receivers such as the Lowe HF125/225
with their smooth tuning are ideal. Even the SONY 2001D
with its 100Hz step size will still give very good results. A three colour
bargraph tuning indicator makes precise station tuning simple,
while shift indicators take the guess work out of RTTY.

The main processor in the Microreader is an Intel 8032
running at 12MHz. This makes it fast enough to not only
decode and display the text but also to measure and display
the frequency a few thousand times each second. Its even
fast enough to use its own dictionary to check and correct
the text even down to punctuation. The RS232 port in the
Microreader can if you wish be used to send decoded messages
directly to the screen of a terminal unit or suitable computer.
If a permanent record (hard copy) is needed, then just connect it
directly to a compatible serial printer.

The Morse tutor can send and receive Morse. No more
guessing what was sent at which speed. You see exactly
what is being sent as its keyed and you may repeat it as many
times as you like. The random characters are sent as ten
groups of five characters with precise digital control over
speed, spacing and type. Printed in a legible key, and as
your reading is really like. Even experienced CW operators find
this feature extremely useful for showing up embarrassing
keystroke faults (especially own name and callsign).

ERA Ltd. is a manufacturing facility and, as such has no
showroom. We do however accept personal callers who may
like to find out more about the Microreader or try one on your
own equipment without obligation. Due to limited parking
during the week we must restrict this to Saturdays only, but
please do ring us first.

THE MMK2 MICROREADER
A COMPLETE MORSE/RTTY DECORDER WITH TUTOR
PRICE £139.95 includes VAT & Postage

TO ORDER OR FOR MORE INFORMATION ON THIS OR ANY OF OUR
OTHER PRODUCTS:—
ERA LTD
20 CLARENDON COURT
WREKETON QUIK
WARRANTING WA2 8QP
Tel: (0925) 573118

ALSO AVAILABLE FROM

CRT: ST HELIER JERSEY
ELECTROMACT: NEATH
HOWES KITS: DAVENTRY.
RAS: NOTTINGHAM.
ST: FAYNE & W 3.
WATERS & STANTON
ESSEX.

THE MIKKI MICROREADER
A COMPLETE MORSE/RTTY DECORDER WITH TUTOR
PRICE £139.95 includes VAT & Postage

TO ORDER OR FOR MORE INFORMATION ON THIS OR ANY OF OUR
OTHER PRODUCTS:—
ERA LTD
20 CLARENDON COURT
WREKETON QUIK
WARRANTING WA2 8QP
Tel: (0925) 573118

WHAT IS A MICROREADER?
The Microreader is a small compact unit that allows anyone,
equipped with a suitable SW receiver, to read Morse and radio
telegraphy signals simply and without fuss. No computers,
interfaces or program tapes are needed. Just connect
the Microreader into the ear or speaker socket and switch on.
It really is that easy. The decoded words appear on the built in 16
character LCD display.

The Microreader has all the necessary filtering and noise
blanking included to allow reception even under bad
conditions. This makes it suitable for use where lower cost
receivers have been made. Receivers such as the Lowe HF125/225
with their smooth tuning are ideal. Even the SONY 2001D
with its 100Hz step size will still give very good results. A three colour
bargraph tuning indicator makes precise station tuning simple,
while shift indicators take the guess work out of RTTY.

The main processor in the Microreader is an Intel 8032
running at 12MHz. This makes it fast enough to not only
decode and display the text but also to measure and display
the frequency a few thousand times each second. Its even
fast enough to use its own dictionary to check and correct
the text even down to punctuation. The RS232 port in the
Microreader can if you wish be used to send decoded messages
directly to the screen of a terminal unit or suitable computer.
If a permanent record (hard copy) is needed, then just connect it
directly to a compatible serial printer.

The Morse tutor can send and receive Morse. No more
guessing what was sent at which speed. You see exactly
what is being sent as its keyed and you may repeat it as many
times as you like. The random characters are sent as ten
groups of five characters with precise digital control over
speed, spacing and type. Printed in a legible key, and as
your reading is really like. Even experienced CW operators find
this feature extremely useful for showing up embarrassing
keystroke faults (especially own name and callsign).

ERA Ltd. is a manufacturing facility and, as such has no
showroom. We do however accept personal callers who may
like to find out more about the Microreader or try one on your
own equipment without obligation. Due to limited parking
during the week we must restrict this to Saturdays only, but
please do ring us first.

THE MIKKI MICROREADER
A COMPLETE MORSE/RTTY DECORDER WITH TUTOR
PRICE £139.95 includes VAT & Postage

TO ORDER OR FOR MORE INFORMATION ON THIS OR ANY OF OUR
OTHER PRODUCTS:—
ERA LTD
20 CLARENDON COURT
WREKETON QUIK
WARRANTING WA2 8QP
Tel: (0925) 573118

WHAT IS A MICROREADER?
The Microreader is a small compact unit that allows anyone,
equipped with a suitable SW receiver, to read Morse and radio
telegraphy signals simply and without fuss. No computers,
interfaces or program tapes are needed. Just connect
the Microreader into the ear or speaker socket and switch on.
It really is that easy. The decoded words appear on the built in 16
character LCD display.

The Microreader has all the necessary filtering and noise
blanking included to allow reception even under bad
conditions. This makes it suitable for use where lower cost
receivers have been made. Receivers such as the Lowe HF125/225
with their smooth tuning are ideal. Even the SONY 2001D
with its 100Hz step size will still give very good results. A three colour
bargraph tuning indicator makes precise station tuning simple,
while shift indicators take the guess work out of RTTY.

The main processor in the Microreader is an Intel 8032
running at 12MHz. This makes it fast enough to not only
decode and display the text but also to measure and display
the frequency a few thousand times each second. Its even
fast enough to use its own dictionary to check and correct
the text even down to punctuation. The RS232 port in the
Microreader can if you wish be used to send decoded messages
directly to the screen of a terminal unit or suitable computer.
If a permanent record (hard copy) is needed, then just connect it
directly to a compatible serial printer.

The Morse tutor can send and receive Morse. No more
guessing what was sent at which speed. You see exactly
what is being sent as its keyed and you may repeat it as many
times as you like. The random characters are sent as ten
groups of five characters with precise digital control over
speed, spacing and type. Printed in a legible key, and as
your reading is really like. Even experienced CW operators find
this feature extremely useful for showing up embarrassing
keystroke faults (especially own name and callsign).

ERA Ltd. is a manufacturing facility and, as such has no
showroom. We do however accept personal callers who may
like to find out more about the Microreader or try one on your
own equipment without obligation. Due to limited parking
during the week we must restrict this to Saturdays only, but
please do ring us first.
Island 21.660 (Sw, Eng, Sawa to Africa 1430-1615) 54344 at 1525 by P.R.Guruprasad; Radio Pakistan, Islamabad 21.740 (Eng to Middle East 1900-1600) 55555 at 1600 by Chris Shorten in Norwich; Radio DW via Cyclops, Malta 21.680 (Ur, Hi, Eng to S.Africa; 1430-1500) 44444 at 1455 by John Evans in Shefrover; Radio Nacional de Espania 21.450 (Sp to USA 1930-2310) 55555 at 1930 by Joel Nash and Brian.

Many programmes in a variety of languages are beamed towards Europe and the Near East. They stem from Radio Japan via Moyo, Gabon 21.640 (Eng, Jap 0700-0900) SIO 333 at 0846 by Philip Rambaut; Radio Africanas 21.600 (Eng 0900-1000) 44444 at 0906 by David Wratten in Cambridge; Voice of Israel, Jerusalem 21.660 (Eng 1000-1030) SIO 444 at 1005 by Neil Wheatley in Newcastle-upon-Tyne; WCSC Scots Corner, Maine 21.760 (Eng 1400-1600) SIO 433 at 1457 by Alan Smith in Northampton; Radio Japan via Moyo, Gabon 21.700 (Eng, Jap 1500-1700) SIO 433 at 1630 by Terry Roy in Gateshead; Radio RSA Johannesburg, S.Africa 21.590 (Eng 1400-1600) SIO 343 at 1540 by John Sadrzi in Shropshire; WAB South Bend, USA 21.840 (Eng 1500-1700) SIO 444 at 1600 by Kenneth Buck; Radio France via Oskeshoben, Fr, 21.615 (Eng, Ger, it 1600-1845) at 1607 by Ron Pearce in Bungay; UAE Radio Dubai 21.710 (Ar (Eng, 0615-1730) 43334 at 1730 by D. Carter in Cambridge; RCI Montreal, Canada 21.675 (Eng, Fr, 1800-2130) 43334 at 1845 by W.Warman in Bexleyheath; HCJB Quito, Ecuador 21.470 (Cz, Eng, Sw, Norw, Dan, Fr, Sp 1800-2230) SIO 1338 by Mal Tedds in Rotterdam; Radio For Peace Int., Costa Rica 21.655 (Eng 1600-0000) heard at 2245 by Roy Patrick.

No transmissions have also been noted in the 17MHz (16m) band during most days, but there have been some distorted signals from Radio Australia’s broadcasts to S.Africa via Carnarvon 17.715 (Eng 0100-0915) were noted in many of the logs of UK listeners. David Smith noted “No DX” in 0330 Easter 1995. Their broadcasts to E.Africa via Darwin 17.750 (Eng, Chin, Fr 0100-0800) were also logged by some DXers Garry Judd (Hayes) who noted them at 2322 & 0523. Between 2200 and 0800 their programmes are beamed to the C.Pacific area via Shepparton on 17.795 and they have also been reaching the UK. David Edwardson noted them at 2332 at 0245. The Pacific Service from Radio New Zealand, Wellington 17.775 (Eng to Pacific areas 2345-0145; 0145-0330 (Sat/Sun only); 0330-0730 has seldom reached the UK, Alan Smith heard it briefly at 0454 and noted SIO 323, but by 0500 it was obliterated by a potent carrier.

Quite a number of the broadcasts to Australia are those of overseas stations including BBC via Tsang Tsui, Hong Kong 17.817 (Eng to C.A sia 0300-0455) 24222 at 0034 by Kenneth Reeves; Radio Phoenix, Calcutta 17.840 (Eng, Cz to SE Asia 0730-0930) 32232 at 0741 by Leo Barr; Radio Finland via Port 17.795 (Fr, Cz to Sweden 0700-1000) 55555 at 0800 by Chris Shorten; Africa No.1, Gabon 17.630 (Fr to W.Africa 0800-1600) SIO 333 at 1055 by Philip Rambaut; Voice of Turkey, Ankara 17.785 (Eng, Ur, Far to SW Asia 1330-1650) 45544 at 1340 by Ole Granne; Radio Moscow 17.665 (Eng to Africa 0600-1600) 55533 at 1400 by Ken Whayman; RTM Tanger, Morocco 17.595 (Fr, Eng to Middle East, N.Africa 1400-1700) SIO 444 at 1500 by Terry Roy; Radio Nacional de Espana via Nobili 17.809 (Ipto Africa 1300-2230) heard at 1613 by John Couter; WSHB Cypress Creek, USA 17.555 (Eng, Sp to S.America 2000-0000) SIO 534 at 2000 by Neil Wheatley; VOA via Greenville, USA 17.785 (Eng, US to 1600-2200) SIO 333 at 2015 by Ted Walden-Vincent in Great Yarmouth; VOA via Timang, Philippines 17.735 (Eng to SE Asia 1600-0000) SIO 433 at 2200 by Alan Smith.

In contrast, only a few of the broadcasts to Europe were noted: RCI via Sackville, Canada 17.875 (Hung, Cz, Uk, Russ, Eng 1800-2030) SIO 454 at 1835 by Kenneth Reeves; Radio BBC World Service 17.575 (Eng 2120-2200) SIO 434 at 2130 by Mal Tedds; Radio HCJB Quito, Ecuador 17.450 (Eng, Cz to South America 2200-0000) SIO 433 at 2130 by Alf Gray in Birmingham.

From time to time the 15MHz (19m) broadcasts from Radio New Zealand, Wellington 15.175 (Eng to Australia, Papua New Guinea 2345-1600) SIO 455 at 1630 by Roy Patrick; their transmissions have been audible in the UK. Simon Hamer (New Radar) has been heard there of late.

The 19m broadcasts from Radio Australia have also been attracting the attention of listeners in the UK. Their transmissions via Shepparton to the C.Pacific area on 15.160 (Eng 2100-0700) were rated as “good” at 2100 by Tim Shirley and to the S.Pacific area on 15.240 (Eng 2000-0700) at 0535 by Roy Patrick. Their station in Carnarvon beams programmes in English and Chinese to E.Asia on 15.395 (0100-0900) and they were rated as 33433 at 0588 by Kenneth Reeves. Listening at 1756, Jim Cash (Swanwick, Derbyshire) picked up their broadcast to SE Asia on 15.480 (Eng 1900-2100) and noted it as 345.

Some of the broadcasts to Europe were noted in the logs of VOIRI Tehran, Iran 0834 (Fr, Tah to Oceania 1600-0930), noted as SIO 444 at 0420 by John Evans; Radio Moscow, Germany 15.185 (Eng, Fr to W.Africa 0600-0750) SIO 433 at 0625 by Alf Grey; BBC via Kranji, Singapore 15.360 (Eng to E.Asia, Australia 0600-1130) SIO 111

UKs:
A. John Couter, Winchester.
B. R. Hay, Glossop.
C. Bill Griffl, while in Tuxala, Mexico.
D. P.R.Guruprasad, Batemani.
E. Sheila Hughes, Morden.

F. Fred Pellant, Storrington.
G. Roy Patrick, Dorking.
H. Ron Pearson, Burpyn.
I. Kenneth Reeves, Preston.
J. Tim Shirley, Shirley

Short Wave Magazine August/1989
<table>
<thead>
<tr>
<th>Station</th>
<th>Country</th>
<th>Power (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hof Saale</td>
<td>Germany (W)</td>
<td>6.2</td>
</tr>
<tr>
<td>Air Bedo</td>
<td>Algeria</td>
<td>600</td>
</tr>
<tr>
<td>BRT-2 Wavre</td>
<td>Belgium</td>
<td>100/500</td>
</tr>
<tr>
<td>DJI Flamnitz</td>
<td>Germany (W)</td>
<td>200</td>
</tr>
<tr>
<td>RTE 1 Tallenrohe</td>
<td>Switzerland</td>
<td>18</td>
</tr>
<tr>
<td>Stuttgart</td>
<td>Germany</td>
<td>300</td>
</tr>
<tr>
<td>Ofren Wien</td>
<td>Germany</td>
<td>600</td>
</tr>
<tr>
<td>RNE 1 Madrid</td>
<td>Spain</td>
<td>200</td>
</tr>
<tr>
<td>DDR Frankfurt</td>
<td>Germany</td>
<td>400</td>
</tr>
<tr>
<td>BBC RT Newcastle</td>
<td>UK</td>
<td>2</td>
</tr>
<tr>
<td>RTE 2 Athens</td>
<td>Greece</td>
<td>180</td>
</tr>
<tr>
<td>Sebastian Anon</td>
<td>France</td>
<td>500</td>
</tr>
<tr>
<td>RTB 1 Wavre</td>
<td>Belgium</td>
<td>300</td>
</tr>
<tr>
<td>Barry</td>
<td>Egypt</td>
<td>2000</td>
</tr>
<tr>
<td>Vagar</td>
<td>Norway</td>
<td>100</td>
</tr>
<tr>
<td>La Coruna</td>
<td>Spain</td>
<td>500</td>
</tr>
<tr>
<td>BBC Orfordness</td>
<td>UK</td>
<td>500</td>
</tr>
<tr>
<td>RTLutus Marburg</td>
<td>Germany</td>
<td>200</td>
</tr>
<tr>
<td>Bodenassernder</td>
<td>Germany</td>
<td>300/180</td>
</tr>
<tr>
<td>Hesivver 3 Liptow</td>
<td>Holland</td>
<td>120</td>
</tr>
<tr>
<td>RNE 1 Svaltva</td>
<td>Spain</td>
<td>250</td>
</tr>
<tr>
<td>Boogerd</td>
<td>Yugoslavia</td>
<td>2000</td>
</tr>
<tr>
<td>BBC R3 Postwick</td>
<td>UK</td>
<td>18</td>
</tr>
<tr>
<td>Monte Carlo</td>
<td>Monaco</td>
<td>300</td>
</tr>
<tr>
<td>Rennes 1 France</td>
<td>France</td>
<td>100</td>
</tr>
<tr>
<td>BBC R4 Langleure</td>
<td>Netherlands</td>
<td>10</td>
</tr>
<tr>
<td>RTE 1 Sion</td>
<td>Switzerland</td>
<td>150</td>
</tr>
<tr>
<td>RNE 1 Barcelona</td>
<td>Spain</td>
<td>250</td>
</tr>
<tr>
<td>Hesivver 2-2 Flovo</td>
<td>Finland</td>
<td>400</td>
</tr>
<tr>
<td>Brunswick</td>
<td>Switzerland</td>
<td>800</td>
</tr>
<tr>
<td>Santess</td>
<td>Switzerland</td>
<td>500</td>
</tr>
<tr>
<td>BBC R4 Einseinikl</td>
<td>Netherlands</td>
<td>1000</td>
</tr>
<tr>
<td>Jug2</td>
<td>Germany</td>
<td>1000</td>
</tr>
<tr>
<td>Limoges</td>
<td>France</td>
<td>300</td>
</tr>
<tr>
<td>BWF Munich</td>
<td>Germany</td>
<td>420</td>
</tr>
<tr>
<td>BBC Scot-Western</td>
<td>UK</td>
<td>100</td>
</tr>
<tr>
<td>Ramba, Lubaka</td>
<td>Zambja</td>
<td>150</td>
</tr>
<tr>
<td>R-Populak, Sovpla</td>
<td>Spain</td>
<td>10</td>
</tr>
<tr>
<td>Rome</td>
<td>Italy</td>
<td>540</td>
</tr>
<tr>
<td>Muscat</td>
<td>Spain</td>
<td>128</td>
</tr>
<tr>
<td>Paris</td>
<td>France</td>
<td>300</td>
</tr>
<tr>
<td>AFN FeniMurt</td>
<td>Germany</td>
<td>150</td>
</tr>
<tr>
<td>R-Borket, Einsein</td>
<td>UK</td>
<td>7</td>
</tr>
<tr>
<td>BBC Weiss Washford</td>
<td>Sweden</td>
<td>70, 50, 7, 150</td>
</tr>
<tr>
<td>Algiers</td>
<td>Algeria</td>
<td>600, 500</td>
</tr>
<tr>
<td>Guraish</td>
<td>Saudi Arabia</td>
<td>1000</td>
</tr>
<tr>
<td>R-Intemir Derbit</td>
<td>Spain</td>
<td>20</td>
</tr>
<tr>
<td>BRT 1 Wavreman</td>
<td>Belgium</td>
<td>300</td>
</tr>
<tr>
<td>BBC Dresden</td>
<td>Germany</td>
<td>100</td>
</tr>
<tr>
<td>Toolseese</td>
<td>France</td>
<td>300</td>
</tr>
<tr>
<td>TZE Madrid</td>
<td>Spain</td>
<td>300</td>
</tr>
<tr>
<td>R-Szwedlend</td>
<td>Switzerland</td>
<td>500</td>
</tr>
<tr>
<td>R-Wobenm, Darbon</td>
<td>Belgium</td>
<td>500</td>
</tr>
<tr>
<td>NDR WOB Hamburg</td>
<td>Germany</td>
<td>350</td>
</tr>
<tr>
<td>Alger</td>
<td>Algeria</td>
<td>600, 700</td>
</tr>
<tr>
<td>RG1 Berlin</td>
<td>Germany</td>
<td>360</td>
</tr>
<tr>
<td>SER RBjiboe</td>
<td>Germany</td>
<td>100</td>
</tr>
<tr>
<td>BBC Redcos</td>
<td>UK</td>
<td>1</td>
</tr>
<tr>
<td>POP-Register Pop</td>
<td>Finland</td>
<td>20</td>
</tr>
<tr>
<td>Hesivver 5-5 Flovo</td>
<td>Holland</td>
<td>400</td>
</tr>
<tr>
<td>Wolfheim</td>
<td>Germany</td>
<td>100</td>
</tr>
<tr>
<td>Gra-Qua</td>
<td>Austria</td>
<td>500</td>
</tr>
<tr>
<td>Milan</td>
<td>Italy</td>
<td>50</td>
</tr>
<tr>
<td>Odense-Aukon</td>
<td>Morocco</td>
<td>500</td>
</tr>
<tr>
<td>BBC RT Postwick</td>
<td>UK</td>
<td>10</td>
</tr>
<tr>
<td>Kalundborg</td>
<td>Denmark</td>
<td></td>
</tr>
</tbody>
</table>

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

DEWSBURY ELECTRONICS

IF IT'S KENWOOD IT MUST BE DEWSBURY

A FULL RANGE ALWAYS IN STOCK

FRG 8800 £639

KENWOOD R5000 £875

NRD 525 £1,095

KENWOOD R2000 £595

IC — R 71E £825

WAVECOM W4010

THE FINEST DECODER IN THE WORLD NOW WITH FAX. FROM £895 — SAE DETAILS

DEWSBURY ELECTRONICS ARE ABLE TO OFFER THE SHORT WAVE LISTENER A FULL RANGE OF RECEIVERS, RTTY, TOR, FAX, ASCII, DECODERS, PRINTERS AND MONITORS.

AERIALS ARE AVAILABLE FOR ANY SIZE OF INSTALLATION.

A STAMPED ADDRESSED ENVELOPE WILL BRING YOU DETAILS OF ANY OF THESE PRODUCTS.

REPAIR FACILITIES AVAILABLE FOR ALL TYPES OF RECEIVER — 7DAY TURN-AROUND, COLLECTION AND DELIVERY ARRANGED. PHONE FOR DETAILS.

Stockists of DAIWA — TEN TEC — ICOM — YAESU — WAVECOM BENCHERS

VIBROPLEX — MICROWAVE MODULES — JRC

Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands.

Telephone: Stourbridge (0384) 390063/371228 Fax: (0384) 371228

Telex: 336712 SHELTN G

Instant finance available subject to status. Written details on request.
POPULAR SCANNERS

AOR900UK inc UHF Airband
BJ200 MKII wide coverage
Cobra 95 Economy Base
Uniden 200XL inc 900MHz
Uniden 50X FM handy

£235
£199
£149
£249
£99

REVOE RS-3000

- Size only 6"x2"x8"
- Covers: 26-32MHz, 60-90MHz, 118-180MHz, 380-512MHz
- AM & FM on all bands
- Liquid crystal display
- 50 memories
- Scan, search, priority

£225

JIL SX-200N

- The choice of the professionals
- Proven reliability
- Covers: 26-88MHz, 106-180MHz, 380-514MHz
- AM & FM on all bands
- Positive action keyboard
- 16 memories
- 12V dc & 240V ac

£325

GAREX ELECTRONICS
MAIN DISTRIBUTOR OF REVOE PRODUCTS. PRICES INCLUDE UK P&P and 15% VAT. Ask for our secondhand scanner bargain list.

AVIATION ENTHUSIASTS-AVIATORS-LISTENERS
AIR SUPPLY
838 High Street, Yeadon,
Leeds LS19 7TA. TEL: 0532-599581.


ALL VALVES
& TRANSISTORS

COLOMOR ELECTRONICS LTD.

Call or phone for a most courteous quotation
01-743 0899
We are one of the largest stockists of valves etc. in the U.K.
170 GOLDHAWK ROAD
LONDON W12

FAX FOR YOUR SPECTRUM
RECEIVE FAX PICTURES ON YOUR SPECTRUM, WEATHER MAPS, ETC.
REAL TIME CLOCK, CONTRAST CONTROL, WIDTH CONTROL, SCREEN STORE ETC.
S A V E R E C E D D A T A T O TAPE OR DUMP TO YOUR PRINTER
THE PROGRAM NEEDS AN EXTERNAL DRUM SPEED GENERATOR
PROGRAM ONLY £9.00
DRUM SPEED GENERATOR £24.00
S.A.E. for details of all our products

J. & J. ELECTRONICS LTD.
Unit 45, Meadowmill Estate, Kidderminster DY10 1NH
Tel: (0962)753893

GAREX THE SCANNER SPECIALISTS

AOR 2002
- Covers: 25-550MHz, 800MHz-1.3GHz
- AM & NFM & WMF on all bands
- Computer interface socket
- 20 memories
- Contact size
- 12V dc operation
- Up-down step control knob

£487

AOR 800E
- Covers: 75-106MHz, 118-175MHz, 406-496MHz, 820-950MHz
- AM & NFM programmable on all bands
- Full scan & search functions are available
- 20 memories
- Measures only 2.5" x 5.5" x 2"
- Niacid, charger & BNC whip antenna included in the price

£199

NEW IMPROVED REVOE

The British made REVCO already renowned throughout the world has now been improved with a new exclusive feature. The addition of a vertical element to a device has been shown to improve the performance on a selected band.

Now the REVCO offers YOU the choice of beam. All new REVCOs supplied by us now incorporates a rain shield for the band of YOUR choice. When may be chosen for any frequency from 27 to 960MHz from the standard REVCO range. Base REVCO, excellent value in, £35.95.

REVCO with flyover socket, £73.95
Add receiver, lor e a £84.95 to £104.75
Remember our best purchase comes at our normal rate or import duty.

BROADBAND PREAmplIFIERS
REVCO PA3 radio backrest model, with switchable DC. (1000kHz - 1.36GHz)
£35.95
PAK instrument or back of set version for 12V dc operation, DC connectors (£5.00 or B-type option) £28.00

7 NORVIC ROAD, MARSWORTH, TRING, HERTS. HP23 4LS. Phone 0296 668686. Callers by appointment only. Ask for details of our interest free credit.

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

THE SPACETECH ARCHIMEDES WEATHER SATELLITE PODULE

- Moving Pictures from Space with photographic clarity and Colour
- If you are looking to upgrade from your existing transmitter or computer based system, the Spacetech expansion card for the Archimedes offers an unbeatable specification. At last for an affordable price the amateur or enthusiast can install a truly professional system. Here are a few of the main features that you may like to compare with existing packages:
  - 256 colours on screen at the same time.
  - 84 grey levels on screen at the same time.
  - Smooth and fast pan and scroll over entire image in the maximum resolution.
  - Automatic calibration from satellite data.
  - Maximum memory usage of available machine configuration up to 3.7Mb.
  - Animation of up to 300 compressed frames.
  - Animation of up to 300 Hi resolution frames.
  - Analogue zoom feature.
  - Entirely new digital signal processing techniques in software and hardware utilise the new RISC technology to its full capability.
  - Automatic data collection and upload of animated sequence.
  - Hands off system - all hardware including receiver, fully software controlled.
  - Mono and colour printer dumps.
  - Data may be exported to utilities and art packages, e.g. Artizen.
  - Introductory price only £259.95

The package sets an entirely new standard both for Weather Satellite decoding and for real time data handling. If you know of any system that comes anywhere near the Spacetech specification, or any less than twenty times the price - we would certainly like to hear about it!

DEMO DISCS £5.00. Interactive, animation or carousel (all 3 £10).

Our Atari ST system will soon be on line; a picture is worth a thousand words - write or phone for our interactive demo: £5.00 refundable.

Systems also for the BBC
And for the I.C.S. Amigafax
DEMO £3.00

Please write or phone for spec. sheets on our ENTIRELY NEW receivers
- WX1990 METEOSAT Receiver with remote control option
- WX1 137 VHF Satellite receiver with decoding

We have a large range of space-science resources and publications: books, satellite atlases, prints, videos, slides, posters, SWL equipment, etc.

Write or phone for lists.

Spacetech: The space-science and remote sensing specialists
Call us to discuss your requirements.
### SEEN & HEARD

There are many broadcasts to other areas, including Radio Nac. Angola, 11.955 (Port to SW Africa 0530-1600) noted as 54444 at 0740 by P.R Guruprasad; KLN Anchor Point, Alaska 11.715 (Eng, Russ, Jap to E Asia 0800-0800) SIO 232 at 0800 by John Evans; RFI via Nauen, GDR 11.890 (Eng, to E USA, E Canada 0800-0900) 44444 at 0900 by Sheila Hughes in Morden; Voice of Mediterranean, via Cyclops, Malta 11.925 (Eng, Ar to N Africa, E Africa 1130-1200) 44444 heard at 1300 by John Coulter; Radio Jordan, Amman 9.560 (Eng 1420-2200) 44444 at 1754 by Darran Taplin; Radio Yugoslavija, Belgrade 9.650 (Eng 1830-1900) heard at 1845 by Simon Hamer; ORI: Tehran 9.022 (Russ, Far, Tur, Ger, Fr, Sp, Es, to 1530-2300) heard at 1507 by John Coulter; Radio Tirana via Lushnje, Albania 9.480 (Fr, Russ, Eng, 1800-2300) SIO 2322 heard at 2322 by John Coulter; Radio Cairo, Egypt 9.475 (Ar 1800-2350) SIO 33333 at 2145 by Max Wustrau; AIR via Delhi, India 9.910 (Eng 2000-2230) 43333 at 2200 by David Wratien.

As checking the 7MHz (41m) band Alan Smith noted WRHR South Br, USA 7.365 as SIO 44444 at 0500; Eddie McKown noted WYFR via Okeechobee, FL 7.365 as 54444 at 0600; Sheila Hughes logged the Int Red Cross via Schwarzenburg 7.210 as 44444 at 1100; Ted Walden-Vincent noted WRF via Fort 7.257 as SIO 233 at 1444; Darran Taplin logged Radio Beijing, China 7.420 as 23322 at 1810; Terry Roy noted Radio Australia via Carnegie 7.205 as SIO 433 at 1930; David Wratien logged RAJ Rome 7.275 as 44444 at 1940; Francis Hearne heard Radio Budapest, Hungary 7.220 at 2025; Julian Wood heard Radio Korea, Seoul 7.550 at 2035; Mal Tedd noted ORI via Delhi 7.412 as SIO 322 at 2134; Ken Whayman noted radio Vietn, Vilinus, USSR 7.400 as 43344 at 2200; Garry Judd noted Radio Polonia, Warsaw 7.175 as 45444 at 2332.

In the 5MHz (31m) band stem from Moscow, USSR 9.765 (Eng 0400-0800) heard at 0500 by Francis Hearne in Bristol; WCSSN Scotts Corner, Maine 9.840 (Eng 0600-0800) 55444 at 0600 by Ken Whayman; Radio Finland via Pont 9.560, Fin, Ger, Sw, Eng (0516-0700) SIO 322 at 0645 by Alf Gray; WRHR South Bend, USA 9.620 (Eng 0600-0800) 44444 at 0750 by Eddie McKown in Co.Down; AVR via Sines, Portugal 9.670 (Eng 0800-0900 Sundays) 44444 at 0803 by Sheila Hughes; Radio Australia via Shepparton 9.955 (Eng 0700-1030) 44444 at 0730 by John Nas; Radio Pyongyang, N Korea 9.325 (Eng, Fr, Russ, Kor, Sp, Ger 1300-1600) 33333 at 1630 by Chris Shorten; Radio Jordan, Amman 9.560 (Eng 1420-2200) 44444 at 1754 by Darran Taplin; Radio Yugoslavia, Belgrade 9.650 (Eng 1830-1900) heard at 1845 by Simon Hamer; ORI: Tehran 9.022 (Russ, Far, Tur, Ger, Fr, Sp, Es, to 1530-2300) heard at 1507 by John Coulter; Radio Tirana via Lushnje, Albania 9.480 (Fr, Russ, Eng, 1800-2300) SIO 2322 heard at 2322 by Julian Wood; Radio Cairo, Egypt 9.475 (Ar 1800-2350) SIO 33333 at 2145 by Max Wustrau; AIR via Delhi, India 9.910 (Eng 2000-2230) 43333 at 2200 by David Wratien.

### Abbreviations

<table>
<thead>
<tr>
<th>Abbrev</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ar</td>
<td>Arabic</td>
</tr>
<tr>
<td>Chn</td>
<td>Chinese</td>
</tr>
<tr>
<td>Cz</td>
<td>Czechoslovakian</td>
</tr>
<tr>
<td>Dan</td>
<td>Danish</td>
</tr>
<tr>
<td>Du</td>
<td>Dutch</td>
</tr>
<tr>
<td>Eng</td>
<td>English</td>
</tr>
<tr>
<td>Fas</td>
<td>Farsi</td>
</tr>
<tr>
<td>Fin</td>
<td>Finnish</td>
</tr>
<tr>
<td>Fr</td>
<td>French</td>
</tr>
<tr>
<td>Ger</td>
<td>German</td>
</tr>
</tbody>
</table>

### Equipment Used

Leo Barr: Matsui MR4099 + internal antenna.

Darran Taplin: Edystones 680X + 25m random wire.

Chris Bek: Matsui MR4099 + 25m random wire.

Mark Thompson: JRC NRD25 + 1m loop or 20m random wire.

Ben Willett: Trinity 5R-950S + V dipole.

Some of the latest contributors are newcomers to this aspect of our hobby and their reports indicate that they found it to be a great deal more interesting than they had expected! The fact that the beacons identify themselves by keying their callsign in Morse code has, for the majority of the newcomers, not proved to be the obstacle they first envisaged. For those who are having difficulty, a simple solution may be to jot down the dots and dashes of each callsign along with the frequency of reception and then decode them later. Newcomers should note that most
of the Maritime Radio beacons around our shores operate in groups on shared frequencies. The beacons in a group transmit sequentially during a six minute period. At the end of the six minute period the sequence is repeated. Where there are six beacons in a group, each will transmit a Morse ident for 20 seconds, a single tone for 25 seconds and a final ident in Morse for 20 seconds during the cycle. When there are fewer beacons in a group each may transmit more than once during the cycle. As far as the DXer is concerned this means that it should be possible to log more than one beacon without altering the tuning of the receiver, so having logged a beacon do remember to listen for the other beacons in the group on the same frequency.

Most of the beacon groups operate continuously 24 hours a day, but a few beacons outside a group may only be active during a period of six minutes twice, or four times, an hour. A certain number only operate during fog. Another point to bear in mind when searching for new beacons is that most of the Maritime Radio beacons have a two letter callsign—the beacons with three letter callsigns are generally associated with aircraft navigation and are outside the scope of this series.

**THE NEXT THREE DEADLINES ARE AUGUST 21, SEPTEMBER 18 & OCTOBER 17**
**QRP KITS AT QRP PRICES!**

A 3-BAND RECEIVER KIT FOR £63!

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

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

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

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

Or ring Alan G4DVM on (0602) 382509 (callers by appointment only).

---

**INDEX TO ADVERTISERS**

- Aerial Techniques .................................................. 45
- Air Supply .......................................................... 54
- ARE Electronics ..................................................... 13
- ASK Electronics .................................................... 38
- BBC ........................................................................ 34
- Birkett J ................................................................. 42
- Brodhurst Electronics ............................................... 45
- Ciritik Distribution .................................................. 34
- Colomer Electronics ................................................ 54
- Component Centre ................................................... 42
- Datong Electronics .................................................. 42
- Dewsbury Electronics .............................................. 53
- Dressler Communications ........................................ 34
- Elliott Electronics ................................................... 57
- ERA .......................................................................... 50
- Flightdeck .............................................................. 42
- Garex Electronics .................................................... 54
- Hamgear .................................................................. 57
- Howes, C M ............................................................. 57
- Icom (UK) ................................................................. Cover iii
- Interbooks .................................................................. 57
- J. & P. Electronics .................................................... 54
- Javiation ................................................................. 58
- Johnsons Shortwave Radio ........................................ 49
- Lake Electronics ...................................................... 57
- Lowe Electronics ..................................................... 6, 8
- Nevada Communications .......................................... 23
- Practical Wireless ..................................................... 26
- Raycom Communications Systems ........................... 15
- Revco Electronics .................................................... 38
- Ryedale Satellite Systems ......................................... 57
- Rylands F G ............................................................. 57
- S E M ................................................................. 57
- South Midlands Communications ............................. Cover iv
- Spacetech ............................................................... 54
- Stephens James ....................................................... 50
- Technical Software .................................................. 42
- Ward Reg & Co ....................................................... 19
- Waters & Stanton .................................................... Cover ii

---

**WORLD BROADCASTING STATION ADDRESS BOOK**

PLUS FREE UPDATE!

At last! A complete book, which will give you the station addresses you have been looking for to enable you to obtain programme schedules, comment on the programmes, request QSL cards, or to get technical information from a broadcasting station. The largest to the smallest stations worldwide are listed.

Chapters on the best way of obtaining QSL cards, compiling reception reports, SINFO codes, etc., are also included.

INTERBOOKS, S89, 8 Abbey Street, Perth PH2 0EB, SCOTLAND.
Tel: (0738) 30707.
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.

**HOW TO ORDER**

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

* 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 in VHF and UHF meteor stations, and its usage format with decoding examples. Also detailed description of the Australian Tropical Telecommunication Network amongst others. 286 pages £14.00

**BETTER RADIO/TV RECEIPT**
Arthur Miller, T. T. Williams 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. £3.95

**BETTER SHORTWAVE RECEIPTION (USA)**
W. S. Orr and William S. and B. D. Cowen WILX
Receivers, antennas, propagation, DX listening techniques for the short waves and VHF. 158 pages. £5.90

**NEW LOW PRICE**

**PASPORT TO WORLD BAND RADIO 1989**
This book gives 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. 286 pages. £10.95

**SCANNERS (updated)**
Peter Rouss GU10KD
A quick user's guide to scanners, receivers, covering hardware, antennas, accessories, frequency allocations and operating procedures. 177 pages. £7.95

**SCANNERS 2**
Peter Rouss GU10KD
The companion to Scanners, this provides even more information on 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 gives the reader through the mysteries of amateur, broadcast and CB transmissions. 207 pages. £6.99

**RADIOETYETYPE 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 EXPERIMENTS' HANDBOOK (II)**
Edited by Heny Laver
A guide to understanding and using amateur radio, weather and TV broadcast services. 207 pages. £9.25

**1934 OFFICIAL SHORT WAVE RADIO MANUAL**
Edited by Hugo Gernsback
A complete guide to the early age with a directory of all 1934 s.w. receivers, servicing information, constructional projects, circuits and ideas on building vintage sets with modern parts. 286 pages. £9.75

**HIGH POWER WIRELESS EQUIPMENT**
*Articles from Practical Electricity 1910-11*
Edited by Henry Laver
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
Gorden J. King
Radio signals, transmitters, receivers, antennas, components, valves and semiconductors, CB and amateur radio are all dealt with here. 266 pages. £6.95

**ELECTRONICS SIMPLIFIED - CRYSTAL SET CONSTRUCTION (BP52)**
F. A. Wilson
Essential reading for those who wish to take part in basic radio building. All the sets in this edition are new designs updated with modern components. 72 pages. £1.75

**QUESTIONS & ANSWERS RADIO**
Eugene Cushen and R. H. Hughes
Basics of electrical theory, radio and semiconductors, receivers, antennas and CB radio, and test equipment. 110 pages. £3.95

**THE SIMPLE ELECTRONICS CIRCUIT AND COMPONENT HANDBOOK**
The aim of this book is to provide an inexpensive as well as comprehensive introduction to modern electronics. 209 pages. £3.50

**TELEVISION**

**AN INTRODUCTION TO SATELLITE TELEVISION (BP195)**
F. A. Wilson
Answers all your 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 and tables. 104 pages. £5.95

**A TV-DXERS HANDBOOK (BP170)**
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**
Keith Heath & Garry Smith
Completely revised and expanded, this is a handy reference book for the DXVW enthusiast. It includes photographs of Test Cards, logos, etc., worldwide. 60 pages.

**SATELLITE TELEVISION INSTALLATION GUIDE**
2nd Edition
John Breckinridge
A practical guide to satellite television. Detailed guidelines on installing satellite dish systems based on practical experience. 56 pages. £11.55

**THEORY**

**COMMUNICATION (BP98)**
Electronic Circuits Book 5
F. A. Wilson
Fundamentals of line, microwave, submarine, satellite, digital, multiplex, radio and television systems are covered, with the more complicated theory or mathematics. 256 pages. £2.95

**FROM ATOMS TO AMPERES (BP106)**
F. A. Wilson
Explains in simple terms the absolute fundamentals behind electricity and electronics. 244 pages. £3.80

**LEVEL II RADIO & ELECTRONICS THEORY (BP84)**
Ian Ridgeway
A sequel to Amateur Radio & Electronics Study Course, covers advanced theory to a level for most technician courses. The handwritten format aims to make the student feel as if he owns the entire text. 266 pages.

**PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE (BP53)**
F. A. Wilson
This book 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 W2Z0I 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. 266 pages. £8.95

**LISTENING GUIDES**

**AIR BAND RADIO HANDBOOK**
Douglas Smith
Listen to conversations between aircraft and ground control. The author, a professional air traffic controller, explains more about this listening hobby. 174 pages. £5.99

**AERIAL TRAFFIC CONTROL**
Douglas Smith
A guide to air traffic control with maps, drawings and photographs compiled and written guided through crowded airspace. 176 pages. £6.99

**DIAL SEARCH** 5th Edition 1986/87
George Wilcox
The listener's check list and guide to European broadcasting stations. Covers m.w., l.w., v.h.f. and s.w., including two special maps. 46 pages. £3.25

**FLIGHT ROUTINGS 1989**
T.T.Williams
Identifies the flights of airlines, schedule, charter, cargo, mail, and to and from the UK and Eire and overflights between Europe and Africa. 104 pages. £4.00

**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 FORMER UTILITY TRANSMISSIONS**
3rd Edition
Joerg Klingenfuss
Built on continuous monitoring of the radio spectrum for the last 40 years until the recent past. A useful summary of former activities of utilities stations providing information in classifications and identification of radio signals. 126 pages. £6.00

**GUIDE TO UTILITY STATIONS**
7th Edition
Joerg Klingenfuss
This book covers the complete short wave range from 3 to 30MHz plus the adjacent frequency bands from 6 to 19000MHz and from 1.6 to 3MHz. It includes details on all types of utility stations including PAX and RTTY. There are 15802 entries in the frequency list and 3123 in the alphabetical call sign list of frequencies and meteorological stations. 494 pages. £19.00

**HF OCEANIC AIRBAND COMMUNICATIONS**
3rd Edition
Bill Laver
Aircraft channels by frequency and band, main ground radio stations, European I.F. networks, North Atlantic control frequencies. 29 pages. £3.50

**INTERNATIONAL RADIO STATIONS GUIDE (BP255)**
Read and updated in this 1989 addition, it includes 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

**NEWTES SHORT WAVE LISTENING HANDBOOK**
Joe Fitchard G1UOW
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. 256 pages. £12.95

**THE COMPLETE VHFA/FM FREQUENCY GUIDE**
Updated 1988
This book provides a complete US frequency band with no gaps and who uses what. Recently updated, there are chapters on equipment requirements as well as antennas, etc. 89 pages. £5.95

**THE INTERNATIONAL VHFM GUIDE**
7th Edition
Julian Baldwin G3UNK and Kris Partridge G3AUA
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 HFT AND TAX STATION CALLS
A handy reference book listing RTTY and FAX stations, together with information on how to obtain it.
Reference book. 16 pages. £2.25

SHORT WAVE LISTENERS CONFIDENTIAL FREQUENCY LIST
Covering the services and transmission modes that can be heard on the bands between 1.635 and 29.7MHz. £7.95

VFHF/UHF AIRBAND FREQUENCY GUIDE (Updated)
A detailed guide to all the airways frequencies and the types of airwave communications used. 170 pages. £12.95

INTERFERENCE
INTERFERENCE HANDBOOK (USA)
Written by R. Nelson Raspop
How to locate and cure interference. £12.95.

RADIO FREQUENCY INTERFERENCE (USA)
What causes it? How to avoid it. £12.95.

TELEVISION INTERFERENCE MANUAL (RSGB)
By C. G. Judd
A practical guide to the causes and cures of interference. 236 pages. £15.95.

AMATEUR RADIO
AMATEUR RADIO CALL BOOK (RSGB)
Winter 88/89 Edition
Now incorporates an A5 page section of useful information for amateur radio enthusiasts. 310 pages. £7.00

AMATEUR RADIO LOGBOOK
Scarcely used, blank pages, transmitting amateur in horizontal A4 format. 25 lines per page. 96 pages. £2.30

AMATEUR RADIO OPERATING MANUAL (RSGB)
A compact book on just about every aspect of amateur radio. 150 pages. £4.95

AMATEUR RADIO SATELLITES
The first 25 years Arthur C. G. GIBU
This book covers all the successful amateur satellite experiments. 204 pages. £11.95

SATELLITE COMMUNICATIONS
The practice and theory of amateur radio satellite systems. 68 pages. £7.95

AMATEUR RADIO INVESTIGATIONS
G. R. Jessop
A comprehensive guide to the theory and operation of amateur radio satellite communications. 320 pages. £9.95

DATA AND REFERENCE
DIGITAL EQUIVALENTS AND PIN CONNECTIONS
By C. C. Judd (BP140)
A. Michaelides
A manual for electronics enthusiasts. 144 pages. £2.25

INTERNATIONAL TRANSISTOR EQUIVALENTS GUIDE
By E. Hood, M. S. Lime, and D. F. B. Jones (BP108)
Provides a large selection of many different types of transistor equivalents. 144 pages. £2.25

NEWNES AUDIO & HI-FI ENGINEER'S POCKET BOOK
Vicente Gelab
This is a concise collection of practical and relevant data for everyone working on sound systems. The topics covered include microphones, gramophones, CD's to name a few. 190 pages. Hardcover £9.95

NEWNES COMPUTER ENGINEER'S POCKET BOOK
By R. A. Penfold
This is an invaluable compilation of practical facts and data and is indispensable to the designer, student, service engineer and technician. It is written in simple, clear English and is illustrated with reference to microprocessor systems. 207 pages. £6.95

NEWNES ELECTRONICS POCKET BOOK
By A. Michaelides
This is a comprehensive reference guide with tables and data and is indispensable to the designer, student, service engineer and technician. The book is written in simple, clear English and is illustrated with reference to microprocessor systems. 207 pages. £6.95

NEWNES AMATEUR RADIO AND LISTENER'S POCKET BOOK
By Steve Morgan
This book is a useful and intriguing data for the enthusiast of shortwave radio amateurs as well as shortwave listeners. Topics such as AMTOR, packet radio, SSTV, digital communications, aviation, public service, and maritime communications are all covered. 160 pages. £6.95

NEWNES RADIOTELEGRAPHY AND ELECTRONIC ENGINEER'S POCKET BOOK
By Keith Brindley
Useful data on Morse, abbreviations, codes, symbols, frequency bands/allocations, UK broadcasting stations, semi-conductors, components, etc. 201 pages. Hardcover £9.95

NEWNES TELEVISION AND VIDEO ENGINEER'S POCKET BOOK
By Eugene Trudel
This is a valuable reference source for practicioners in "entertainment" electronic equipment. It covers all television from V.H.F. to H.F. display tubes, colour camera technology, video recorder and broadcasting equipment, video and hi-fi. 323 pages. Hardback £9.95

POWER SUPPLY PROJECTS (BP871)
R. A. Penfold
The book gives a number of power supply designs including simple unregulated types, fixed voltage regulated types and variable voltage stabilised designs. 94 pages. £2.95

PROJECT CONSTRUCTION
HOW TO DESIGN AND MAKE YOUR OWN P.C.B.
By R. A. Penfold
Designing or copying printed circuit board designs from magazines, including photographic methods. 80 pages. £2.95

INTRODUCING ORP
Collective articles from WP 1983-85
An introduction to low-power transmission, including constructional details of designs by Rev. George Dobbs G2BCX, the transmitter and transmitters from Trevor Trundle G4FAI to 14MHz, and test equipment by Tony Smith G4FAI. 84 pages. £1.50

FAULT FINDING
ARE THE VOLTAGES CORRECT?
Reprinted from WP 1982-83
How to use a multimeter to check the operating voltage on electronic and radio equipment, from simple resistive dividers through circuits using diodes, transistors, I.C.s and valves. 40 pages. £1.95

GETTING THE MOST FROM YOUR MULTIMETER (BP239)
R. A. Penfold
This book is primarily aimed at beginners. It covers all aspects of the use of modern digital multimeters, and their testing limitations. All kinds of testing is explained too. No previous knowledge is required or assumed. 102 pages. £2.95

OSCILLOSCOPES, HOW TO USE THEM, HOW THEY WORK
By Ian Nicman
This book describes oscilloscopes ranging from basic to advanced models and the accessories to go with them. 133 pages. £7.95

PRACTICAL HANDBOOK OF VALVE RADIO
By Dr. Cha E. Miller
A unique reference work that is particularly useful to the maker of homemade radio equipment. Covering the selection and use of valves and their uses. 330 pages. Hardback £20.00

SERVICING RADIO, HI-FI AND TV EQUIPMENT
By Gordon J. King
A very practical looking book at semiconductor circuit design, and signal tests, fault-finding techniques for audio, video, r.f. and oscillator circuits and their application to transistors radio and hi-fi. 205 pages. £10.95

TRANSISTOR RADIO FAULT FINDING CHART (BP70)
C. E. Miller
Useful, should enable most faults to be traced reasonably quickly. Selecting the appropriate fault description on the chart at the head of the chart, the reader is led through a sequence of suggested checks until the fault is cleared. £35 x 450mm (landscape) £0.95

PROJECT CONSTRUCTION
HOW TO DESIGN AND MAKE YOUR OWN P.C.B.
By R. A. Penfold
Designing or copying printed circuit board designs from magazines, including photographic methods. 80 pages. £2.95

INTRODUCING ORP
Collective articles from WP 1983-85
An introduction to low-power transmission, including constructional details of designs by Rev. George Dobbs G2BCX, the transmitter and transmitters from Trevor Trundle G4FAI to 14MHz, and test equipment by Tony Smith G4FAI. 84 pages. £1.50

MORE ADVANCED POWER SUPPLY PROJECTS (BP871)
R. A. Penfold
The book gives a number of power supply designs including simple unregulated types, fixed voltage regulated types and variable voltage stabilised designs. 94 pages. £2.95

POWER SUPPLY PROJECTS (BP871)
R. A. Penfold
The book gives a number of power supply designs including simple unregulated types, fixed voltage regulated types and variable voltage stabilised designs. 94 pages. £2.95
PRACTICAL POWER SUPPLIES
Collected articles from PW 1978-1985
Characteristics of batteries, transformers, rectifiers, fuses and heatinks, plus designs for a variety of mains driven power supplies, including the PW "Marchwood" giving a fully stabilised and protected 12V 20A d.c.
48 pages. £1.25

ORP NOTEBOOK
Doug DeMaw W1FIF
This book deals with the building and operating of a successful ORP station. Lots of advice is given by the author who has spent years as an ardent ORPer. All the test 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

SO (FET) FIELD EFFECT TRANSISTOR PROJECTS
F.R. Goody
50 circuits for the s.w.l., radio amateur, experimenter or audio enthusiast using f.e.t.s. 104 pages. £2.95

AUDIO (BP111) Elements of Electronics Book 6
F. A. Wilson
This book studies sound and hearing, and the operation of microphones, loudspeakers, amplifiers, oscillators and both disc and magnetic recording. 320 pages. £3.50

ANTENNAS (AERIALS) AERIAL PROJECTS (BP105)
Practical designs including active, loop and ferrite aerials plus accessory units. 96 pages. £2.50

ALL ABOUT CUABLE QUAD ANTENNAS (USA)
W. L. Orr W5SAS & S. D. Cowan W2LX
Theory, design, construction, adjustment and operation of quads. Quads vs. Yagis. Gain figures. 109 pages. £2.95

ALL ABOUT VERTICAL ANTENNAS (USA)
W. L. Orr W5SAS & 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

BEAM ANTENNA HANDBOOK (USA)
W. L. Orr W5SAS & S. D. Cowan W2LX
Design, construction, adjustment and installation of h.f. beam antennas. 198 pages. £6.75

HF ANTENNAS FOR ALL LOCATIONS (RSGB)
L. S. Pearson
Taking a new look at how h.f. antennas work, and putting theory into practice. 260 pages. £5.19

NOVICE ANTENNA NOTEBOOK
Doug DeMaw W1FIF
Another book from the pen of W1FIF, 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 "BXC 16" element beam for 2m, and the famous "Slim Jim", designed by Fred Judd GB2CX. Also features systems for Top Band, medium wave/day wave loop designs and a v.h.f. direction finding loop. Plus items on propagation, accessories and antenna design. 80 pages. £1.90

SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS (USA)
W. L. Orr W5SAS & S. D. Cowan W2LX
Efficient antennas for Top Band to 2m, including "invisible" antennas for difficult station locations. 197 pages. £2.50

NEW LOW PRICE
THE ARR L 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.
£7.95

THE ARR L 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. £9.25

WIR E & 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. sets and polariometers and a noise bridge. Dealing with VHF. 160 pages. £3.90

W1FIF'S ANTENNA NOTEBOOK
Doug DeMaw W1FIF
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 aerials, from a simple dipole to a beam, and triangle designs to a mini-rombo. Dimensions for specific frequency spots including the WARC bands. 80 pages. £1.99

25 SIMPLE INDOOR AND WINDOW AERIALS (BP130)
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 (BP129)
E. M. Noll
Designs for 25 different aerials, from a simple dipole through helical designs to a multi-band umbrella. 80 pages. £2.95

25 SIMPLE TROPICAL AND MEDIUM WAVE BAND AERIALS (BP145)
E. M. Noll
Simple and inexpensive aerials for the broadcast bands from medium wave to 49m. 64 pages. £1.75

THE RADIO AMATEUR ANTENNA HANDBOOK
William L. Orr W5SAS & Stuart. D. Cowan W2LX
Yagi, quad, quagi, l.p., vertical, horizontal and "super-antennas" are all covered. Also lowers, grounds and rotors. 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 (BP176)
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 different types of standards. 80 pages. £2.50

MICROPROCESSING SYSTEMS AND CIRCUITS (BP168)
£1.95
Elements of Electronics Book 4
F. A. Wilson
A comprehensive guide to the elements of microprocessing systems, which are becoming increasingly important in radio system and equipment. 250 pages. £2.95

MORSE
INTRODUCING MORSE
Collected Articles from PW 1982-1985
With the learning of Morse code followed by constructional details of a variety of keys including lambic, Trapeze, and an Electronic Bug with a 928-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

SUBSCRIPTIONS

Fill in the Order form below and post it to: PW Publishing Ltd., FREEPOST, Subscriptions Dept., Eneclo House, The Quay, Poole, Dorset BH1 1PP (no stamp required). Credit Card Orders taken on (0202) 678558.

Overseas subscriptions outside Europe are now despatched by Accelerated Surface Post for faster delivery.
If you already have a subscription you can fill in the order form, but you must quote your subscription number.

Please indicate the type of subscription required:

SHORT WAVE MAGAZINE 1 YEAR
£17.00 (UK) £19.00 (Overseas)

PRACTICAL WIRELESS 1 YEAR
£15.50 (UK) £18.00 (Europe) £19.00 (Overseas)

PRACTICAL WIRELESS 3 YEAR
£40.00 (UK)

SPECIAL JOINT SUBSCRIPTION 1 YEAR ONLY
£28.00 (UK) £32.00 (Overseas)

Prices current at July 1989
To commence with issue dated...
IC-R7000, 25-2000 MHz
Commercial quality scanning receiver

With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz.

The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto-M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-colour fluorescent display. Other features include dial-lock, noise blanker, attenuator, display dimmer and S-meter and optional RC-12 infra-red remote controller, voice synthesizer and HP 1 headphones.

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

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

Datapost: Despatch on same day whenever possible.
Access & Barclaycard: Telephone orders taken by our mail order dept., instant credit & interest-free H.P.
HF performance you can have a real field day with.

With Yaesu's FT-757GX/II, you can enjoy full-featured HF performance just about anywhere.

On vacation. During field day. On the road. Or in your shack.

Because the FT-757GX/II packs all its HF performance into one highly compact, action-ready case. A case so small, it even fits under airplane seats.

Of course, you've probably noticed a similarity to its predecessor, the FT-757GX. That's purely intentional. And now its performance is even better.

With new features like memory storage of operating mode. Slow/fast tuning selection. Automatic step-change according to mode. IF notch-filter. 10 memories. And VFO to VFO scan.

Plus you get an iambic electronic keyer. Woodpecker noise blanker. 600-Hz CW filter. AM and FM modes. AF speech processor. And 25-kHz marker generator. All at no extra cost.

Three microprocessors. Dual VFOs. Single-button VFO/memory swap. Receive coverage from 500 kHz to 30 MHz. Transmit coverage from 10 to 160 metres, including WARC bands. All-mode coverage (LSB, USB, CW, AM and FM). 100-watt RF output.

QSK operation. Massive heatsink and duct-flow cooling system for continuous RTTY operation for up to 30 minutes.

Computer Aided Transceiver (CAT) System for computer control via optional interface.

Of course, the FT-757GX/II offers the kind of options you'd expect from Yaesu, too. Including standard and heavy-duty power supplies, automatic antenna tuner, hand and desk microphones.

So no matter where you work the DX, take along Yaesu's FT-757GX/II. The full-featured HF rig you'll have a real field day with.