AMATEUR RADIO RECEIVING STATION G-13038

Regular Features
Airband, Scanning, Junior Listeners, SSB Utility Listening, Propagation and Broadcast Enthusiasts

RELIGIOUS BROADCAST SPECIAL

FEBA BROADCASTS IN YAO TO MALAWI
The Ultimate in Mobile Scanners

1,000 Channel Wideband Scanner

Frequency Range: 50kHz – 600MHz
800 MHz – 1310 MHz

Receiving Modes: AM – FM – Wideband FM

Search Steps 5kHz to 995kHz

Selectable 10dB Attenuator

Tape Recorder Output Socket

Automatic Tape Recorder Switching Circuit

Keypad or Rotary Tune Control

Switchable Audio Switching

All Metal Case For Improved EMC Compatibility

AVAILABLE FROM YOUR LOCAL DEALER
OR DIRECT FROM

NEVADA COMMUNICATIONS
189 LONDON ROAD, NORTH END,
PORTSMOUTH PO2 9AE

USE YOUR CREDIT CARD FOR SAME
DAY DESPATCH

ORDER HOTLINE
(0705) 662145

£279

Wideband Scanning Receiver MS 1000
Cover:
The story behind our main cover picture this month is told on page 15. The inset picture shows the 'people of the dance' - the Yao Muslims from Malawi and was kindly supplied by FEBA Radio to go with our Religious Broadcasters feature. FEBA Radio's Programming Director Tony Ford is interviewed by Trevor Barnes on page 39.

CONTENTS

ICS FAX-2 Review
Mike Richards

Peter G. Rayer G-13038

A Novel 3.5MHz Receiver with Reaction - Part 1
Ian Hickman

An IF Output - the Easy Way
John Wells

Retuning hi-fi Headphones for Short Wave Listening
Richard Q. Marris

Special Book Offer - Ferrell's Confidential Frequency List

Religious Broadcasters - an Overview
Andrew Steele

Broadcasting The Gospel
Dick Ganderton

World by 2000
FEBA Radio Interview

Sony ICF-SW77 World Band Receiver Review
Peter Shore

REGULARS

Airband
Amateur Bands Round-up
Bandscan N. America
Book Service
Decode
DXTV Round-up
Editorial
First Aid
Grassroots
Info in Orbit
Index to Advertisers
Junior Listener
Letters
Listen With Grandad

Long Medium & Short
Watching Brief
News
Airband
PCB Service
RadioLine
Rallies
Satellite TV News
Scanning
Services
SSB Utility Listening
SWM Subscribers' Club
Trading Post

BOOK SPECIAL OFFER
TRADING POST
COUPON SWM MAY 1992
COUPON SWM MAY 1992
The choice of Religious Broadcasters as the special subject this month, was made, not because of any pious beliefs on my part, but rather because these stations are very popular with short wave listeners throughout the world. They broadcast on regular schedules with recognisable programmes, so it is relatively easy to listen to them. Their programmes, particularly those aimed at the DXer, can also be very interesting. Obviously it is not possible to mention every single religious broadcaster and station in the space allocated in this issue. The omission of any station does not imply that they do not merit the attentions of readers or that they are in some way beyond the pale. So far the choice of special subjects seems to have been popular with you, the readers and we have more lined up during the rest of this year.

Dear Sir
Being a reader of Short Wave Magazine for a great number of years (I have copies going back to 1963 priced 2/9), I have noticed quite a few changes in the style of your magazine over that period. However, I must congratulate you on February's edition, the colour and format. The airband special was of particular interest to me as I live between two airports. By the way, I am 63 years old and my first non-commercial reception was in 1954, Cullercoates Radio on a Bush receiver. My present station is a Trio R2000 with a Global a.t.u. and random wire, I also have a Realistic scanner. Your magazine suites all interests in s.w.l.

John Devine
Co. Durham

Dear Sir
As an active member of Radio Polonia's DX Club, I am writing to bring the following to your attention.

In connection with your feature on this station on page 6 of December 1991 issue of SWM, I sent them a photocopy. On two separate DX Club programmes they have referred to this and said how pleased and grateful they are to Short Wave Magazine for this write up, and they have wondered who sent you the information.

On Monday January 13, this station changed its name from Radio Polonia to Polish Radio, Warsaw and also altered the schedule:
0630-0730 9.525, 7.270 & 6.135MHz
1600-1700 11.840 & 9.525MHz
2000-2100 9.525, 7.270 & 7.145MHz
2200-2300 7.270, 6.135, 5.955 & 1.503MHz

Also in view of the piece about Radio Prague Monitor Club on page 5 - 'Junior Listener' - of the December issue, I wonder if Jon Jones might be interested in mentioning Polish Radio, Warsaw DX Club, new members very welcome, ten reception reports to join, attractive QSL cards, free schedules and DX diploma awards.

I would like to take this opportunity of thanking you for the very interesting and informative Short Wave Magazine each month.

Sheila Hughes Morden

Dear Sir
At least two of the recently released hostages have praised the positive effect of BBC overseas radio services during their captivity but from time to time governments of all political hues are tempted to threaten the continuous of such broadcasts on the grounds that people of friendly nations don't need any cultivating and that they ought to be listening in English anyway.

The hostages' positive opinions of the BBC should perhaps be used by DXers and s.w.l.s world-wide as the basis for a QSL- and letter-writing-campaign to support and encourage broadcasts from the stations which they listen to in the languages they want. Many UK s.w.l.s will be able to confirm, for example, that even when a non-British station simply announces its title in English and other languages between its callsigns, a very positive bond with listeners speaking that language is formed. This must be even more so for listeners in smaller world language groups, so this is really not a question of huge expense so much as a desire to reach out more widely and to avoid using radio as war propaganda by keeping tension down beforehand - a policy which short wave radio is a very attractive and cost-effective option.

Edward Turnbull
Northumberland
Dear Sir
Recently, it was the 10th anniversary of the Argentinian invasion of the Falkland Islands, which took place on 2 April 1982.

In the many books that have subsequently dealt with that historic event, several state that with the words, "we have lots of new friends." Port Stanley's telex operator broke the news to a stunned and disbeliefing Britain. At least one of those books reproduces a photostat of that teleprinter exchange and shows the time of that message to have been 4pm BST on 2 April 1982.

I am wondering if this was indeed the first confirmation from the Falklands that the invasion had actually taken place. Whilst I was recently in Port Stanley, I learned that an amateur radio operator may have been even earlier with the news. Unfortunately, I was not there long enough to pursue the matter further. Perhaps a reader may have received the transmission, and may even have a tape recording of that historic signal.

In view of the coming anniversary, it would be interesting to be able to set the record straight. How, and precisely at what time, did news of the invasion first reach the UK from the Falklands?

Peter Cox, Plymouth

Dear Sir
I am almost sure to be the first DXers from Russia submitting a letter to the SWM. June 1991 copy was the first in my life accidentally received from my friend Arma Aksland, living in Colorado Springs (USA). While reading your magazine I realised that I am doomed to stay an endless beginner in radio monitoring. Though I was a professional radioman during my army service.

DXing is a rare hobby in our country because, for the first, we have a lack of good receivers available here, and for another, having a shortage of information sources. In fact, from your magazine, from the only copy of it I received much more information about 'Tropical Short Wave' stations, for example, than I could gather by myself for a year period!

Because of these reasons, there is not even a small DX club in our city (Kazan), though its population is a little less than 1.5 million. Taking an opportunity of getting familiar with Short Wave Magazine I would like very much to start post monitoring. Though I was a professional radioman during my work, I couldn't believe the stations that were coming in. Anyway, I was looking in W.H. Smith one day and came across Short Wave Magazine. I am sure to answer all of your letters in English. Here is my address:

Russia (Pocca) 420080
Kazan - 80
PO Box 96
Dmitri Souslov, Kazan

Dear Sir
Over the last few months I have read with interest the letters dealing with the receiving or otherwise of QSL cards from amateurs.

When I first started collecting these many years ago, I seem to recall it was done on a one for one basis, all very friendly. I bought some specially printed cards from PW, (1979 as shown here), and used the call books to send one of these direct to the amateur as a short wave listener.

Using the bureau took far too long, one could die of old age waiting for a return card by that method. By using the mail I could collect foreign stamps as well. Sometimes I got a card back, sometimes I did not, usually I did. Even as an s.w.l., my cards were favourably received.

Why should amateurs expect a listener to send IRCs, addressed envelopes, bagging letters, etc., which would all add to the cost, over a pound I should imagine with postage from this end, to operators who are not interested today in getting reports from short wave listeners anyway.

Cliff Stapleton
Torquay

Dear Sir
Being mainly a broadcast band listener, I was curious about visiting the London Amateur Radio & Computer Show on Saturday March 7. However, I am very pleased that I did. Rather than catering solely for licensed amateurs and computer buffs, there was much of interest to short wave listeners and indeed for any kind of radio enthusiast.

Apart from a wide selection of new and second-hand receivers, I saw several suitable a.t.u.s, antennas, kits and lots of bits. There was a good range of useful books and magazines, with some very tempting special offers, particularly on the SWMPW stand.

My desire for an extension speaker was easily satisfied as there were plenty to choose from, some at discontinued prices. In fact, the three halls were filled with stands offering an amazing variety of items, from antenna masts to Zener diodes. I was even able to buy a Mothers' Day card!

So whether you are interested in amateur radio, broadcast bands, utilities, scanning or even CB, these shows are well worth visiting.

Keith Mellor, Cheltenham

Dear Sir
Since playing with a strange radio called an Edystone at work, I couldn't believe the stations that where coming in. Anyway, I was looking in W.H. Smith one day and came across Short Wave Magazine and I thought, what a good magazine this is. It really is an outstanding read. From reading your magazine I have purchased a Sony SW7600 radio and it is smashing. This is the first time I have come across anything like Short Wave Magazine. The magazine and the short wave listening is incredible. I now look forward to reading you magazine and s.w.l.ing for many years to come.

David Crookes
Plymouth

Dear Sir
Congratulations on a fine December issue. I must report to you my reception, in mid-October at 2015UTC on approximately 13.75MHz (my Phillips D1875 won't allow a greater degree of accuracy), in the 22m band, of what your 'SSB Utility Listening' author Peter Rouse calls the 'numbers station'.

My SINPO on the 'numbers station' was 35533. I can not confirm hearing a male voice, I received a female voice, speaking English, reading a string of 3 to 5 character numeric strings. Sometimes there was only one number spoken.

During the course of reception of the 'numbers station' that I observed for 20 minutes I received no station identification and heard only a female voice. Please note that my reception report was received on a.m. not s.s.b.

Extrapolating the issue in my mind it would reasonably appear that someone is attempting to place at least one format of broadcast on the air and may be operating a low power (<50kW) transmitter in the Midlands or in Scotland.

I hope my report helps in the 'numbers station' mystery. Please let me know.

Bruce Graham, Argyll
May 3: The National Vintage Communications Fair will be held at the NEC. It's a one-day event for specialist collectors and others interested in buying and selling vintage radios, telephones, televisions, jukeboxes, gramophones, records and other related mechanical-music items, ancient or modern.

May 4: Dartmouth RC Rally will be held at St Paul's Church Hall, Yelverton. Doors open at 10.30am. Free parking; usual traders, refreshments, Bring & Buy, George Spray. Tel: (0288) 853685.

May 10: The 8th Yeovil ORP Convention will be held at the Preston Centre, Monks Dale, Yeovil. Doors open at 9am with admission £1.50 including a lucky draw programme. 10.15am - Chordal Hop to VK, 11.30am - An 80m Construction Project, 2pm - HF Antennas to Match Your Garden, 3.30pm - Watch the Birdies. The convention closes at 5pm.

May 17: The annual Pankanour Amateur Radio Rally will be held in the SJ wood, Lurgan, Co. Armagh. The rally will be open from 12 noon. Proceeds from the rally go to the Stanley Eakins Memorial Fund. Jim Lappin. Tel: (0762) 851179.

May 4: Dartmouth RC Rally will be held at St Paul's Church Hall, Yelverton. Doors open at 10.30am. Free parking; usual traders, refreshments, Bring & Buy, George Spray. Tel: (0288) 853685.

May 17: The 16th Annual East Midlands Amateur Radio Rally will be held in the SJ wood, Lurgan, Co. Armagh. The rally will be open from 12 noon. Proceeds from the rally go to the Stanley Eakins Memorial Fund. Jim Lappin. Tel: (0762) 851179.

May 24: The 17th Northern Mobile Radio Rally will take place in the Flower Show Hall at the Great Yorkshire Showground Haslingden, north Yorkshire. The Showground opens 10am, doors open 10.45am. Talk-in on S2Z, Bring & Buy, bar and cafeteria. Free parking and loads of stands. Entry and parking off Wetherby to Harrogate Road. Separate arrangements for disabled visitors off Hockstone Wood Road. Mike. Tel: (0423) 564353/507653.

May 24: The 18th Annual East Suffolk Wireless Revival will be held at the Maidenhead Sports Centre, Maidenhead Approach, Ipswich. Doors open at 10am. There will be a massive Bring & Buy, car boot sale, antenna measurements and all the usual traders. Syd Mason. Tel: (0473) 748515.

*May 30/31: RSGB National Rally at NEC Birmingham. The RSGB's annual showpiece. Almost every major retailer/supplier in attendance, plus all the specialist amateur radio groups will be there too. Note that the date has been changed from that published before so as not to coincide with the Dayton Ohio event in the USA. Free parking is provided with a shuttle bus to the front of Hall 7.

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. May 19 - My Feedline Tunes My Antenna by G3IFM. Paul Truit G4WQG. 071-938 2561.

Barnsley & DARC: Mondays, 7.15pm. Darton Hotel, Station Road, Barnsley. April 27 - Getting Started on Satellites by G4JJJ. May 4 - Open Talk on 1982 Rally, 11th - The RSGB by G4LPJ. 18th - Amateur Radio Observation Service by G3STG. 25th - The Novice Licence by GONMJ. Ernie G4LUE. (0242) 716339.

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kellch Gardens, Hayes. May 19 - Talk by Ian Daniels, Geoffrey M. 081- 2689.

Conway Valley RC: 1st Thursdays, 7.15pm. The Studio, Penrhos Road, Colwyn Bay, Clwyd. May 7 - Talk by Dr Paul Last, 14th - Visit to Pantir National Power Switching Station. Merlyn Jones GW4NUL. 72b Princes Drive, Colwyn Bay. (0492) 530725.


Dronfield & DARC: 1st & 4th Mondays, 7.30pm. Room 3. Gladys Buxton School, Dronfield Road. Dronfield. Other Mondays, socials at the Fleur-de-lis, Main Road, Unstone. May 4 - No Meeting, 18th - Fox Hunt. Piers Oldham. Tel: (0246) 294444.

Edgware & DRS: 8pm. Waiting Community Centre, 145 Orange Hill Road, Edgware & DRS: 8pm. Watling Community Centre, 145 Orange Hill Road, Edgware. Tel: (0923) 554577.

Huddersford RC: 1st & 3rd Thursdays, 8pm. Conservative Club (side entrance), Rye Road, Huddersford. April 30 & May 14 - Social, 28th - EMC by G3KKE. Roy G4UNL. 081- 504 5643.


North Ferrry United ARS: Fridays, 8pm. North Ferrry United Football Social Club, Church Road, North Ferrry, May 1 - Way Ahead Meeting by G4VYK, 8th - QSO or QFH - What Are They Talking About by G4VYK, 28th - Surplus Equipment Sale. Frank Lee. (0482) 650410.

ARC of Nottingham: Thursdays, 7.30pm. Sherwood Amateur Radio Centres, Mansfield Road, Nottingham. April 30 - Electromagnetic Compatibility by G8SOZ, May 7 - Discussion on Summer Fox Hunts, 14th - Talk by Regional Liaison Officer, 21st - 144MHz Foxhunt & WAB Activity, 28th - RAYNET by G3YUT. Rex Bealson. (0802) 733740.

Preston ARS: Alternate Thursdays, The Londsdale Sports & Social Club, Fulwood Hall Lane, Fulwood, April 30 - Windmill Land by Mr Dunkerley, May 14 - Pageant of Lancashire Priory by Mrs Tomlinson, 28th - Prep Night for HF NFD. Eric Eastwood GW1CQL. (0722) 668708.

RSGB City of Bristol Group: last Mondays, 7pm. The Small Lecture Theatre, Queens Building, University of Bristol, University Walk, Bristol. April 27 - RSGB Morse Testing System by G3ZJH, May 18 - 1st British Amateur Radio Operation From Uzbekistan (U18), 25th - Picnic at Ashton Court at 2pm. Dave Coxon G0GGM. (0275) 655123.


South Notts ARC: Fridays, 7pm. Highbank Community Centre or Fairham Community College, Farmborough Road, Clifton Estate, Nottingham. May 1 - Open Forum, 8th & 22nd - Construction (Fairham College), 15th - OSCAR & FLUJI Videos, 28th - On Air. Ray G7ENK. (0602) 841940.

Stuckport RS: 2nd & 4th Wednesdays, 7.45pm. Room 14, Dialstone Community Centre, Liphook, Hants. May 6 - British Nuclear Fuels Ltd, Their Operations & The Environment, 20th - UoSAT, The Management & Equipment Needed To Run The Ground Station. Dave G4VLC.

TAR 4A: Tuesdays, 7.30pm. Either Ernest Bailey Community Centre, New Street, Matlock or Duke of Wellington, Chesterfield Road, Matlock. May 7 - Buffet & Get-together at Duke of Wellington. Vincent Shirley. (0773) 826747.


West of Scotland ARS: Fridays, 6pm. Scout Shop, 21 Elmbank Street, Glasgow. May 6 - WAB, 25 Years On! by G4OAFM. Tel: (0624) 1523.


Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. May 6 - General Activity Evening, 29th - Cable TV by G3OPW. Chris Frost. 081-397 0427.

Club Secretaries: Send all details of your club's up-and-coming events to; "Grassroots", Lorna Mower

Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP
Young Amateur of the Year

If you’re under 18 and interested in radio, then perhaps you qualify for the title of Young Amateur of the Year. You need to be either involved in d.i.y. amateur radio construction, operate radios concerned with community radio (e.g. emergency communications networks) or encourage other to become interested or be involved in school projects. The closing date for entries is 31 July 1992 and you must be under 18 at that time.

Again this year, the award is being sponsored by the RSGB and The Radiocommunications Agency. The winner collects a cash prize, an RSGB amateur radio log book and a visit to the Agency’s Radio Monitoring Station at Baldock, Hertfordshire.

All applications or nominations for the award must be sent to: Young Amateur of the Year Award 1992, Radio Society of Great Britain, Lambda House, Cranbourne Road, Potters Bar, Herts EN6 3JE.

Best of luck if you decide to have a go.

New Scouts Badge

I’m sure most of you have heard of the Scout movement, many may belong. But there is a new and interesting Badge you can try for called The Scouts Radio Technicians Badge, which has been sponsored by Adam Leisure Group plc.

The idea of the badge is to introduce Scouts to radio technology. Over a period of six weeks, Scouts build radio equipment and learn how to communicate with it. In the photo you can see the six Northampton Scouts who were first to gain the new badge with their leader and the headquarters technology adviser.

If any of you obtain the new badge, drop me a line with some details of the project you completed, I’m sure others would be interested to know. That applies to Guides and Brownies doing their Communicator Badge too.

More Young Engineers Needed

I’ve heard some interesting news from the DTI regarding young people wishing to become engineers and scientists. They want to encourage more of the brightest and best young people to choose careers in science and engineering. Peter Lilley (he’s the Trade & Industry Secretary - well he was at the time I wrote this, the General Election is still three weeks away) launched a series of videos as part of ‘Innovation Wealth from Science & Engineering’. A complicated way of saying that they want to encourage science and engineering among school-children!

The videos use real examples to demonstrate how scientific ideas are turned into commercial technology in area such as telecommunications, biotechnology and the environment.

The video series forms a part of a full programme that includes a series of local events bringing together schools and industry. So hopefully you may be seeing these videos at school soon and if you think that science and technology is something you’d like to go into for a career, TELL YOUR TEACHER. You’ll be surprised how much they’ll encourage you.

Historic Radio

An exhibition that might interest you is one on HMS Warrior 1860 in the HM Naval base at Portsmouth. Between June 20 and 28, there will be an exhibition of Historic Radio equipment circa 1890-1939. Whilst you’re there you can always go and visit all the other historic sights in Portsmouth and make it a really good day out. If any of you go, don’t forget to tell me about it.

Transformers

I came across the photograph above from Cirkit, advertising their toroidal mains transformers and wondered how I could work such a brilliant photo into the column! Well, we’ve never discussed transformers, so here goes.

So, just what does a transformer do? Rather than get involved with lots of technicalities, I’ll try and stick to simple language. The main feature of a transformer is its ability to change the impedance of a.c. power. Many transformers also have the characteristic of passing a.c. power but not d.c. What do I mean when I talk about impedance changes? If we go back to basics all electrical sources consist of two key parameters - voltage and current. It’s the ratio between these two that defines the impedance. The formula is impedance in Ohms(Z) = Volts(V)/Amps(A). At this point I ought to add a warning that this is a very simplified view and the calculation of impedance in real circuits is somewhat more complex.

Let’s now look at a simple transformer and its effect on signals passing through it. A simple transformer would consist of a magnetic core and two windings called the primary and secondary. For the sake of this example we’ll assume that the secondary has twice as many turns as the primary. Let’s see what happens if we connect an a.c. power source of 100V at 1A. From this we can calculate that the impedance of the power source is 100/1 or 100Ω.

Because the secondary has double the turns of the primary, the voltage is stepped-up to twice its original value, i.e. 200V. But what happens to the available current? If the current available remained the same we would have effectively made a power gain which can’t be right. The answer is that the current is halved to 0.5A. All is reasonably straightforward so far, but what happens to the impedance? Let’s work it out - we know the secondary voltage is 200V and the current is 0.5A. Using the formula I gave earlier, the secondary impedance becomes 200/0.5 = 400Ω.

The important point to note is that although the primary to secondary turns ratio is 1:2, the impedance ratio is the turns ratio squared.

We have demonstrated three important parameters of a typical transformer which are:

1. The voltage is changed in direct proportion to the turns ratio.
2. The current is changed by the inverse of the turns ratio.
3. The impedance changes by the square of the turns ratio.
**Weather Monitoring**

ICS Electronics have introduced a new range of equipment for the climatologist.

The Perception II details barometric pressure, temperature and humidity as well as highs and lows, alarms and a barometric trend arrow. There is an option for a PC interface for graphing data. This unit costs £169.95 including VAT.

The second unit is more complex, the Weather Wizard II features temperature, humidity, barometric pressure, wind speed and direction, highs and lows, alarms and much more. Options for this unit include a rain collector and a PC interface. This unit costs £229.95 including VAT.

Finally, the Weather Monitor II features temperature, wind direction, wind speed, wind chill, barometric pressure, humidity, all highs and lows recorded with time and date, barometric trend alarm for change greater than 0.02, 0.04 or 0.06in of mercury in an hour, a 12 or 24 hour clock and date. Options include, rain collector, external temperature/humidity sensor and computer storage, analysis and graphing package. This unit costs £319.95 including VAT.

ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex.

**Radio Exhibition**

The Fareham & District ARC will be holding an exhibition of historic radio equipment circa 1890-1939 between June 5-7 from the special event station GB2FRA will be operational on all h.f. bands.

The Society was initially formed in an effort to bring together like-minded v.h.f. amateurs, but over the ensuing years activities have expanded to encompass all aspects of amateur radio.

From an initial 16 members the Society now has over 100, including 46% Class A, 31% Class B, 5% Novice and 16% s.w.l., of whom most are currently studying for the RAE.

In May 1987, the Society completed the construction of a purpose designed HQ Complex, which is currently the venue for RAE, c.w. and four Novice training courses, as well as being open for use 7 days a week.

For further details of FRARS, please contact the Hon. Sec, Ian G2BDV, QTHR.

**Telethon '92**

The ITV Telethon is upon us once again and, in support of the HTV Region Appeal, Swindon & District ARC members are to spend 48 hours coaxing the world's radio amateurs out of the woodwork to make as many contacts with the station as possible over the period.

The Special Event Station, GB4SRC, will be on the air 'promotionally' from May 14, the main event starting at 1800 on Friday, May 29 until 1800 on Sunday 31st.

The station will be located at the club shack at South Marston, Swindon and a Telethon QSL card will be sent to all contacts.

Sponsorship will be on a 'per call' basis or by donation. There will be an opportunity to help swell the funds at the Swindon Rally on Saturday May 16 at the Oasis Centre, Swindon. Just call in at the club stand and have your arm twisted!

The same call will be on the air again during June 5-7 from the Lydiard Park Nostalgia Weekend where a great collection of steam engines, both stationary and mobile, classic vehicles and many other artifacts of bygone days will be gathered together. This is well worth a family visit if you can make it. Talk-in will be on the 144MHz band, if required.

**Receive Converters**

muTek Ltd have a new range of receive converters for 144, 70, 50 and 28MHz. These converters are available in both kit and built forms, with optional box kits. The range will initially comprise six models, with either 144 or 28MHz f.s., and receive frequencies for 144, 70, 50 and 28MHz. The first of these models is the RXC 50c, a 50MHz receive converter with a 144MHz i.f. The specification for the completed converter gives a conversion gain of 6.5dB, a noise figure of 1.5dB and an input intercept of 0dBm. Full instructions for construction and alignment are provided. The cost of the kit is £27.50 plus £2.75 P&P, with built models available at £37.50 plus P&P.

Full details on this and other products from muTek Ltd., PO Box 24, Long Eaton, Nottingham NG10 4NQ.

**Special Event Station**

Bideford Bay ARC will be operating GB2DVN from Bideford North Devon to commemorate the end of the first stage of the Milk Race on Monday May 25. There will be cards for all contacts and s.w.l. reports.

For more information, contact: Mike Hammond G3PGA. Tel: (0271) 860930.

**Time Pieces**

AMDAT have a wide range of Junghans clocks in stock. Two examples are the radio-controlled mantel clock, which is 150 x 200mm with an ABS case, stock number, 364/7101 and the solid oak case wall clock, stock number 368/7525.

The mantel clock is battery operated and has an integrated radio receiver, a ferrite rod antenna, a transmitter call key for optimum reception control and a 32kHz quartz time base.

For more details, contact: AMDAT, 4 Northville Road, Northville, Bristol BS7 0RG. Tel: (0272) 699352.
**SRI on Astra**

On March 19, Swiss Radio International started round-the-clock transmission to the entire European continent on the Astra 1A satellite using a sub-carrier of the Swiss Teleclub (7.2MHz). Now all SRI programmes can be heard under the best reception conditions from Finland to Morocco and Britain to Moscow.

For the moment, only a few individual listeners have access to this service. It’s designed primarily for radio stations, resorts hotels, embassies and consulates. Up to now, numerous European radio stations, notably in France, Spain and Italy, have received SRI programmes by line or through their cassette service.

Now, with the installation of a parabolic antenna of between 400 and 1200mm, you can receive information, documentary and music programmes from Switzerland at any time of day or night. These SRI programmes are already heard in Switzerland on the cable radio network and digital radio. Now they can be also received in Switzerland via Astra satellite free of charge.

SRI programmes on Astra include about five hours of broadcasts in English and French respectively, three hours in German and Italian, one and a half hours in Spanish and 45 minutes in Arabic. Added to this are music programmes produced by SRI itself or in collaboration with other stations.

At the moment, SRI programmes on Astra are primarily conceived as a special service, but in the coming months they will gradually be developed into a fully-fledged European-wide broadcasting outlet. With this aim, they are counting a lot on synergy within the Swiss Broadcasting Corporation and co-operation within Europe.

---

**Open Day**

Waters & Stanton will be holding their annual open day on Sunday May 10 from 10am to 5pm. Last year was so successful they are aiming for something even bigger this year. There will be free food and free drink for everyone plus a prize draw. Those needing talk-in should initially call GOPEP on 145.5MHz.

They will be offering some fantastic bargain and clearance lines on a wide variety of amateur radio equipment covering two floors of their premises.

Waters & Stanton Electronics, 22 main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835.

---

**DX TV News**

Despite the monopoly of the Austrian air waves that the ORF enjoys, several ‘pirate operators’ successfully provide radio entertainment from neighbouring countries within the v.h.f. f.m. band 88-108MHz. About 6 transmitters operate currently amongst these being C-D International from Bratislava (Slovakia); MM2 - Moribor (Slovenia); Radio Zirog - Brenner (Italy); Antenne Austria - Sopron (Hungary). The pirate operators are hoping that independent radio may be legalised in Austria during 1992, which will allow them to go ‘inland’ onto Austrian soil.

The ORF however are expanding their own FM radio services with Big City Radio in Vienna, and the Blue Danube Radio service which operates in English in main towns such as Vienna, Fraz, Linz, Innsbruck and Salzburg is being re-launched as Euradio running 18 hours a day and expanding into a 4th national network. The ‘pirates’ suspect this will remove all free f.m. channels and effectively block the pirates aspirations as well!

With the on-going changes in Russia (or CIS, Commonwealth of Independent States) so the radio/TV service administration have also changed. The Russian State Television now operates as ‘Ostankino’, after the main TV production centre and transmitting base in Moscow.

Ostankino will continue to be state financed during 1992 but from next year it is hoped that it will become a privatised commercial operation with a 50% public share ownership. The Central TV First Channel will be passed to the CIS with each state having programme input allocations (as will happen with the Central Radio). The 2nd channel will be for ‘Russia’, the 3rd for Moscow and the 4th channel for education. Ostankino will continue to provide programme and technical services for the TV channels both Moscow and time shifted for the several time zones across the Soviet land mass.

My Gib contact advises that TVE Spain are now using NICAM for stereo enhancement on certain programmes but when a foreign language film is shown one track remains as the original language whilst the other track is used for a Spanish dubbed sound track which TVE call ‘Dual’ transmission.

Australian TVDxer Robert Copeman advises that the two Ch. A0 TV transmitters (46.25MHz nominal vision carrier) which have been received during appropriate F2 layer conditions recently are: RTQ-0 (formerly DDQ-0) located at Toowoomba, Queensland running 150kW at 46.171MHz carrier; and AMBN-0 (ABC) located at Wagga, New South Wales running 100kW e.r.p. at 46.240MHz. (Note the actual vision carrier offset can be received on a scanner and measured, thus confirming transmitter being received. During February 1992 a UK DXer received 3 separate New Zealand TV Ch. 1 transmissions by measuring the incoming vision carrier and noting the offset relative to the 45.25MHz nominal carrier).

---

**Stolen**

Stolen from the Siskin stand at the Blackpool rally on March 15 was a Fairmate HP2000E scanner. The serial number was 19429. It was unboxed, without instructions and accessories. If you can help Siskin trace this equipment, contact them:

Siskin Electronics, 2 South Street, Hockley, Southampton SO4 6EB. Tel: (0703) 207155.

**New from Grundig**

The Satellit 700 is similar in design to the popular Satellit 500, with even more to offer the short wave listener. Features include f.m., m.w., i.w. and 1.6-30MHz s.w. coverage, automatic station search or manual tuning, direct frequency input, 64 memory positions featuring 8 alternative frequencies each, ROS and built-in b.f.o.

It also has a data monitor with indication of frequency, waveform, memory position, metre band, stereo, field strength, battery check, station name (8 digits), RDS, external antenna, mode, etc. You can program the station names for your favourite stations.

The radio costs £349.99 from your local Grundig stockist.

---

Roger Bunney

Short Wave Magazine, May 1992
Aerial Systems for serious listeners

Look to Lowe

DX-One Electronic Antenna

£249 inc VAT

The World Radio TV Handbook said of the DX-One "... the best of its type available anywhere in the world." It has a frequency range of 50kHz - 50MHz (*3dB) and 10kHz - 75MHz (*6dB); it is both horizontally and vertically polarised, so low-angle (DX) signals suffer less selective fading. The output level from the antenna is adjustable in steps from +6dB to -40dB for optimum matching. The extremely high intercept point (+66dBm 2nd order, +40dBm 3rd order) and a very low noise figure (12.8 dB) ensure optimum performance. The indoor unit contains a mains power supply, a step-wise attenuator and a very effective medium wave suppression filter. It also has two receiver outputs for feeding two receivers without mutual interference.

SP-2 Antenna Splitter

£152 inc VAT

A growing number of radio enthusiasts have two receivers, but no space for two separate antennas. The SP-2 is the answer for connecting two receivers to one antenna (be it active or passive). The SP-2 offers a very high degree of isolation between the two receivers (<30 dB). The SP-2 ensures that, within the frequency range of 50kHz - 50MHz, no unwanted mutual interference, heterodynes or signal loss will occur as a result of connecting a second receiver.

With a single receiver, the SP-2 offers a precision step-attenuator (0 - 40 dB) which helps to reduce receiver inter-modulation. Included is a very effective switchable medium wave suppression filter.

For those with space for a second antenna (e.g. one horizontal, one vertical), the SP-2 offers a simple way to switch between the two for comparison purposes.

Magnetic Longwire Balun

£36 inc VAT

This balun has been described in the trade press as the "most revolutionary development for shortwave listeners in the last 25 years". Quite a claim! But this antenna device does solve one of the most severe problems associated with random long wires; the input cable. An MLB allows you to use highly screened co-axial cable between the antenna and receiver WITHOUT energy loss due to impedance mismatch. Computers, light-dimmers, televisions, and fluorescent lights no longer cause interference problems. We recommend RG58/u 50ohm co-axial cable.

The MLB has been designed so that a very short length of antenna wire can be used and still be perfectly matched to the 50ohm antenna input of the receiver. Even an antenna of just 12.5 metres (41 feet) provides good results from 100kHz - 40MHz without the need for an antenna tuner. Static build-up on the antenna is allowed to leak away to earth potential - excellent for protecting receivers with FET front end circuitry. Static noise levels on long, medium, and the tropical short wave bands of 60 & 90 metres are considerably lower. The MLB is easy to mount on existing longwire or "T" antennas.

MLB Antenna: Mark I

£56 inc VAT

A complete passive wire antenna with a built-in MLB, the MLB Antenna: Mark I has excellent performance on long, medium, and short waves. It is 12.5 metres in length and can be mounted vertically or horizontally. Frequency range 100kHz - 40MHz.

The MLB Antenna: Mark I offers all the advantages of the Magnetic Longwire Balun like: coaxial feeder, broadband performance without an antenna tuner and static decoupling. Heavy duty and completely water-proof, it comes complete with nylon support cord, heavy-duty insulator, high-quality plastic covered antenna wire, PL 259 connector and a water-tight rubber sleeve to cover co-axial/MLB connection.

MLB Antenna: Mark II

£67 inc VAT

Similar to the Mark I, but 20 metres long. The MLB Antenna: Mark II offers improved performance at medium and long wave frequencies, although the high frequency performance above 30MHz is reduced.

THE LISTENERS' BOOK OF THE YEAR GETS EVEN BETTER

The new 1992 issue of 'Passport to World Band Radio' is now with us and it's even better than before. The 200 pages have risen to almost 400 and every section carries the unmistakable authority of the world's best short wave companion.

Broadcasts are listed as before; not only in frequency order but also by language, country of origin AND the times of broadcasts. There are no less than 56 pages of receiver reviews, including the latest NRD-535 and Drake R-8, together with news, views and general information.

If you own a short wave radio, you MUST have the 'Passport' by its side. The price last year was £12.95, we have kept the price the same this year at £12.95 (plus £1.55 p&p.). Send off today.

LOWE ELECTRONICS LIMITED

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone: 0629 580800 Fax: 0629 580020

Short Wave Magazine, May 1992
Communications Receivers from KENWOOD

R-2000

- 150kHz - 30MHz
- 118MHz - 174MHz (optional)
- LSB, USB, CW, AM, FM
- Digital VFO with excellent stability
- Dual 24hr quartz clocks
- 10 memories (tunable by VFO)
- Memory/band scans
- 3 built-in IF filters
- Quality audio with 4in. speaker
- 375mm(W) x 115mm(H) x 210mm(D)
- Optional accessories
- On demonstration at all Lowe Regional Centres

R-2000 £549 inc VAT

R-5000

- 100kHz - 30MHz
- 108MHz - 174MHz (optional)
- USB, LSB, CW, AM, FM & FSK
- 10Hz step Dual Digital VFOs
- Superb Interference Reduction
- 100 memories with full data storage
- Dual 24-hour quartz clocks
- Keyboard frequency selection
- RS-232C interface for use with ‘CONTROL’ software

R-5000 £925.00 inc VAT

The NRD-535 General Coverage Receiver

Latest in the line of NRD receivers, the NRD-535 is a triumph for JRC and represents a true step forward in features, performance and facilities for the dedicated listening enthusiast.

The smooth tuning is the first thing you notice and JRC has developed a direct digital synthesiser (DDS) system which tunes in 1Hz steps. The accuracy and stability are of laboratory standard. There is of course the front panel keypad for swift frequency setting.

All mode reception covers AM, USB, LSB, CW, FM, RTTY and even FAX with IF filter bandwidths to suit the modes.

For the keen broadcast DXer, there is also an optional plug-in ECSS board for locking on to an incoming AM signal and then picking off either sideband.

For the advanced user, the NRD-535 is fitted with a RS-232C interface for computer controlled receiver functions. Available for demonstration at Matlock and the regional centres.

There are 200 memory channels, each of which stores frequency, mode, bandwidth, attenuator and AGC settings, comprehensive frequency sweep facilities and no less than 16 different functions which can be programmed from the front panel by the user.

For winkling out the weak stations, the NRD-535 excels. Pass band shift enables you to slide the IF filter around the signal so as to eliminate the adjacent signal and a totally new notch system gives tunable rejection with a 40dB notch depth. There is also an optional Bandwidth Control board.

LNRD-535 HF Receiver ........................................ £1,195 inc VAT
CMF-78 ECSS option ........................................ £229 inc VAT
CFL-243 BWC option ........................................ £359 inc VAT

LARGE STOCKS ready for shipment NOW!
Telephone us today for delivery tomorrow.
Mail order welcomed at all our centres
The first point to note about the FAX-2 is that this is no amateur toy, but a professional unit designed to be used at sea. You can see from the photograph that the styling is quite different to that used for many of the other products from ICS Electronics. In addition to receiving and printing FAX charts, the FAX-2 can be used for standard RTTY and FEC transmissions.

Having whetted your appetite, let's move on to take a detailed look at the FAX-2.

Overview

As the FAX-2 has been designed primarily for use on-board ship, weather-proofing and ruggedness is critical. The FAX-2 features a purpose-built die-cast aluminium case to protect the electronics from the hostile marine environment. To minimise control problems the FAX-2 uses a very effective eight-button membrane unit. This controls all the user settable options and provides good protection from a salt atmosphere. These buttons also had a very positive action.

The only area where extreme care needed to be taken was the paper loading door on the front panel. Despite all this protection it's important to note that the FAX-2 must be mounted in a dry area.

Moving on to the external connections, these were all accessed via a fifteen-pin connector on the rear panel. A plug for this connector was supplied with the FAX-2 and connections to the plug were made via screw terminals. This proved to be a very flexible connection system that was rather better than a multitude of different sockets for the various functions.

The power demands of the FAX-2 had been very well thought out with a voltage range of 8-34V d.c. This enable standard 12 or 24V supplies to be used without any alteration to straps or switches. The power consumption was also very modest at 0.01W when at power down standby and 2.5W with power on. The peak current demand was 4A and that was only achieved during printing.

For FAX, RTTY and FEC reception, an external receiver is required. This needs to be a good quality communications receiver or marine h.f. transceiver. The FAX-2 requires an audio signal and can either accept a signal from the external speaker connection or the auxiliary output. To make this operation as simple as possible, a lead fitted with a standard 3.5mm jack was provided.

One of the plus points about the FAX-2, was that it was able to simultaneously receive Navtex and Marine Page transmissions. This was achieved by connecting optional external receivers to the rear panel.

The handbook for the FAX-2 was presented in spiral bound A4 format with about 50 pages. The manual was very well set out covering all the key operational features in simple language. There was also good use of diagrams to explain the display and inter-connection detail. This was supplemented by some useful reference sections that included a frequency list and examples of FAX charts.

Smart Keypad

The front panel keypad that controls the operation of the FAX-2 is well worth spending some time on. ICS have clearly put a lot of thought into developing a simple to operate system of control for the FAX-2. The result is that FAX, Navtex, RTTY, FEC and Marine Page can all be controlled by an eight button keypad. When you consider that timer operation is included, this is quite a feat.

The keypad is set out in two rows, and its the top row that controls the main functions. These keys are marked as up arrow, down arrow, left arrow and right arrow. The up and down arrows are used to scroll through the various modes, are shown on the well light liquid crystal display. Once the required mode has been selected, the right arrow is used to select the parameter setting. Once the selection is complete the new parameters can be stored by pressing the left arrow button. So you can see that most of the features are in fact controlled by just four buttons. The secret, of course, is in the use of a well thought out menu system.

The lower set of four buttons are used to control miscellaneous features i.e. power on/off, start/stop, dimmer and paper feed.

FAX Reception

Although the FAX-2 features RTTY and FEC modes, I suspect that the prime reason for choosing this unit would be
be its FAX reception. This mode was also one of the simplest to use.

Once the FAX mode had been selected, the FAX-2 automatically put itself in to standby mode. All that remains is to tune the receiver to a suitable FAX frequency. Anyone who’s tried FAX reception will know that accurate tuning is critical for good quality results. The FAX-2 features a very effective tuning indicator to help with the tuning. This indicator takes the form of a simple spectrum analyser type display within the l.c.d. unit. This results in pair of bars that move across the display as the tuning is altered. The optimum tuning point is when the two bars straddle the centre point.

When set to the FAX standby mode, the FAX-2 is ready for fully automatic reception. The software is able to detect the standard range of start and stop tones and automatically sets the Index Of Co-operation (IOC) drum speed. This is great for maritime operation as once a station has been tuned in you can continue with other tasks and let the FAX-2 gets on with the business of FAX reception.

One of the other special attractions of the FAX-2 is its built-in printer. This was a thermal unit that produced very good quality charts. I’ve included a few examples in this review. Perhaps the only snag was its small print size due to a paper width of 111mm. ICS have considered this and you have the option to print the chart in two strips one after the other. These two strip can then be glued together, so giving a chart with twice the normal width. They even supplied a tube of Pritt Stick! This option was particularly useful when receiving some of the more complex charts. As a further refinement, you could choose only the left, right or centre parts of the image. With all these modes the printing doesn’t start until the whole image has been received. For occasions where you want to observe the chart as it arrives, you could choose to print line by line as it’s received.

The modes available for automatic reception were IOCs of 288 or 576 and drum speeds of 60, 90, 120 and 240 r.p.m. This covers all the common FAX standards.

When selecting a FAX station to receive it’s useful to be able to start a print part way through a transmission. By doing this you can quickly check that the signal quality is good. This function is provided on the FAX-2 by pressing the $ (store) button on the front panel while in standby mode - printing then starts line by line. One other parameter that can be set is the polarity of the received signal. This performs basically the same function as changing from upper to lower sideband.

**Navtex**

The FAX-2 featured two methods of receiving the vital Navtex information system. The first was to use the main receiver in much the same way as with FAX reception. All you had to do was tune to 518kHz and fine tune using the tuning display. One of the features of the Navtex system is that all the transmissions are coded to indicate the transmitting station and the message type. By using the arrow buttons on the front panel you could set the FAX-2 to selectively receive these messages and stations.

For a more sophisticated system, the optional ICS external FAX receiver can be used. With this connected, the FAX-2 can resolve FAX and Navtex simultaneously. This adds considerably to the power and versatility of the FAX-2. By using this system the sailor can be sure that vital navigation messages are received, regardless of what the main receiver is being used for.

**Marine Page**

The FAX-2 supports the Marine Page experimental service being operated by BT.

The service is designed to enable paging messages to be sent to any ship in UK waters. The system employs a variant of FEC that includes a Selcal. The FAX-2 provides this support in much the same way as with Navtex using an external receiver. This results in the same advantages, i.e., the message is received even during FAX reception.

**RTTY Reception**

The FAX-2 includes the facility to receive standard RTTY transmissions. This can be very useful for plain language weather reports and news from press stations.

All the standard modes were supported i.e., 45, 50, 75 and 100 baud. There was no requirement to set the shift separately and the FAX-2 was able to handle shifts from 170Hz up with no problems. However, it’s worth noting that the narrower the shift, the more critical the tuning becomes. In addition to being able to reverse the polarity of the signal, the FAX-2 included an Unshift-on-space facility. One of the weaknesses of RTTY as a communications system is the way in which a shift character has to be sent to switch between figures and letters. Under good conditions this is not a problem. However, if the signal suffers interference you may well find that the received text turns to gibberish! The Unshift-on-space facility on the FAX-2 goes a long way towards overcoming this problem.

The final reception mode included in the FAX-2 is FEC. This is virtually identical to the Navtex system except that it’s used for general communications. Probably the most common usage is the transmission of traffic lists from coastal stations.

**Built-in Printer**

As I’ve already mentioned the FAX-2 includes a built-in thermal printer. In order to make maximum use of the printer ICS have made it available for use by external devices. The connection is via the rear panel and the printer accepts data at 1200 baud. To ensure compatibility with other systems the printer width is user programmable between 40 and 80 columns.

**In Use**

Setting-up the FAX-2 proved to be very simple thanks to the clear menu driven display. One of the most critical areas for automatic FAX reception is the reliability of the start and stop tone detection. The FAX-2 turned in excellent performance in this area and was able to pull out the appropriate tones even in very noisy conditions. The only occasions when it missed a tone the interference was so bad that the image wasn’t worth receiving anyway!

When I first saw the size of the printer I was concerned about the readability of the dual tone.
resultant image. My fears proved unfounded as the definition of the thermal printer is excellent and perfectly readable with normal eye sight. The only time I did have problems was when receiving four panel charts. However, the solution was to print these charts in two halves. All the other modes worked just as successfully with no problems at all.

The FAX-2 currently costs £750.00 plus VAT, with the optional external Navtex receiver costing £175.00 plus VAT.

My thanks to ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford, Arundel West Sussex BN18 0BD. Tel: (0903) 731101 for the loan of the review model.

**Specification**

**Reception Modes:** Facsimile, Navtex, RTTY, FEC, BT Marine Page

**FAX Modes:** Auto, 60, 90, 120 and 240 r.p.m.

**Navtex:** Auto, 576 and 288 I/O

**Print Modes:** Normal, Double size (both halves), Double size (left half), Double size (right half), Double size (centre portion)

**Printer:** 40 or 80 column text

**Timer:** 6 programmes/day plus external frequency control

**Temperature Range:** 0 - 40°C

**Power:** 8 - 34V d.c.

- <0.01W standby (off)
- <2.5W standby (on)

**Mounting:** 1A average, 4A peak while printing

**Weight:** Shelf or Panel mount

3kg

**Conclusion**

The FAX-2 has certainly been very well thought out and provides a wide range of features designed to simplify the reception process. Key features for the mariner are the fully automatic reception plus the ability to simultaneously receive Navtex messages. The construction of the FAX-2 is also worthy of note and well up to the standard required for maritime operation. The FAX-2 is clearly designed for use in a marine environment, but I'm sure it will also appeal to some short wave listeners.

**Listen With Grandad**

*By Leon Balen and David Leverett*

Enjoy the antics of our newest addition to the Short Wave Magazine staff. 'Grandad' and his family will be appearing regularly from now on.

Do you relate to any of the situations the old chap gets into? If so then why don't you let the Editor know, there must be loads of strange and funny experiences you could share with our readers. £5 SWM Gift Vouchers for any published.

Once upon a time there were three programmes: Light, Home and Third...then along came Radio Luxembourg....
LISTEN OUT
with
SONY at SMC

YSNU
JRC
AOR
SONY
KOM
KENWOOD
AOR
FAIRMATE
BEARCAT
YUPITERU

A COMPREHENSIVE RANGE OF RECEIVERS AVAILABLE AT MOST BRANCHES

The FR89600, a premium scan-ning receiver covering 60-500MHz, SSB, CW, AM & FM modes, 99 memories, 6, 10, 12.5 & 100kHz scanning steps. Keyboard frequency entry. Optional converters to extend coverage from 0.15-30MHz and 800-1300MHz.

NRD535 from JRC

The new NRD535 epitomises the very best in communications receiver design. This high technology product is based on the abundant technical experience gained by JRC in the professional communications receivers field. This means that the NRD535 is arguably one of the best receivers available to meet the demanding listeners needs. Brief specifications are as follows.

- Continuous coverage from 0.15-30MHz optional VHF coverage from 118 to 174MHz, SSB, CW, AM & FM modes.
- Direct frequency entry.
- 5, 10, 25 & 100kHz frequency entry.
- 800-1300MHz.
- SSB, CW, AM & FM modes.
- 99 memory memories.
- 5, 10, 25 & 100kHz frequency entry.
- 800-1300MHz.

DRAKE R8E

Now available from SMC the new DRAKE R8E communications receiver. These receivers utilise the very latest in technology to meet the demanding requirements of today's listeners. Conveniently located front panel controls allow for rapid operator programming and ease of use. The R8E receiver covers 0.15-300MHz and with the optional VHF converter will extend range from 0.15-30MHz and 118-174MHz. The large clear LCD display gives the operator full information about the current receiver status.

- Free Finance on selected items, subject to status. Details available on request.
- Up to £1000 instant credit, a quotation in writing is available on request, subject to status. Free Finance on selected items, subject to status. Details available on request.
- up to £1000 instant credit, a quotation in writing is available on request, subject to status. Free Finance on selected items, subject to status. Details available on request.
- Same day despatch whenever possible.

Short Wave Magazine, May 1992
KW Communications is back in business! After a brief "rest" and under new ownership and management that understands the needs of the listener, KW will be offering the shortwave listener and scanning enthusiast a wider range of equipment and accessories, carefully hand picked to ensure quality and value for money. Whatever your interests are, be it chasing tropical DX on the shortwave broadcast bands or checking the progress of Concorde over the Atlantic, we have the receiver for you – from the fabulous new Lowe HF150 to the truly superb JRC NRD-535. We also stock an enormous range of scanning receivers for monitoring air band, marine, amateur radio and other local VHF and UHF frequencies. We've got hand held, mobile and base station scanners from Signal's R537S airband receiver to the sophisticated Icom R7100. We stock a wide range of accessories including antennas, preamps, books and frequency guides and of course our experience to help you get the best from your equipment. Call in and see the widest range of equipment in the largest shortwave centre in the south east.

### SCANNING RECEIVERS

- **ALINCO**
  - DJX1 New! £269.00
- **ICOM**
  - R1 Micro size scanner £389.00
  - R100 Excellent mobile £510.00
  - R7100E £1120.00
  - R9000E £4080.00
- **AOR**
  - AR3000A New improved £765.00
  - AR2500 Ask about software! £419.00
  - AR2000 £269.00
  - AR1500 Handheld inc. SS £299.00
- **SIGNAL**
  - R537S Tuneable airband RX £59.95
  - R550 40 ch airband £129.00
  - R555 VHF, UHF airband £254.00
- **WIN**
  - WIN108 Free binoculars! £179.00
- **YUPITERU**
  - MV77000 Great handheld £289.00
  - VT125UK Airband scanner £179.00
- **FAIRMATE**
  - HP2000 Same spec AR2000 £259.00
- **SONY**
  - AIR7 Airband, AM/FM PSB £299.00.
- **YAESU**
  - FRG9600 Old faithful with SSB £520.00

### ACCESSORIES

**NEW FROM MALDOL**

- "ACTION HUNTER" series of wide band set top and mobile antennas to suit most scanners. Also TX on ham and cellphone! Call for details.

### SHORTWAVE RECEIVERS

- **KENWOOD**
  - R2000 £549.00
  - R5000 £895.00
- **ICOM**
  - R72E £659.00
  - R71E £875.00
- **YAESU**
  - FRG8800 £649.00
- **SONY**
  - SW1E £149.95
  - SW7600 £149.95
  - 201D £379.95
  - SW77E £539.95
- **JRC**
  - NRD35S £1099.00
- **LOWE**
  - HF150 £329.00
  - HF225 £429.00

**OPENING HOURS:**

**MONDAY-SATURDAY**

9.30am-6pm

(MON open 10am, SAT close 5pm)
Peter G Rayer G-13038

This month’s cover picture is interesting as it shows the receiving station of one of Short Wave Magazine’s regular readers, Peter G Rayer.

Peter Rayer’s interest in radio started in 1963, when he joined the Wootton Bassett Air Training Corps and started to learn the Morse code under the watchful eye of Dick Rugg (G2BRR). The Radio Room had the R1154/1155 aircraft radios and the exotic Eddystone 358, which could be used, under very close supervision, to hear all the strange noises of short-wave radio.

Peter continued this interest throughout his subsequent service in the Royal Air Force and was licensed in 1970/71 as MP4BIM whilst stationed at Muharraq in Bahrain. He was also active with the callsigns MP4BB and MP4BS (the JAOTA Station).

Like many of the older short-wave listeners, Peter can read Morse at speeds in excess of 25 w.p.m., but has no interest in transmitting himself. He prefers to spend up to 70 hours a week listening on all the amateur frequencies. He is best known for his reports on h.f. RTTY, and sends out about 3000 QSL cards each year!

Peter is active with many of the UK radio organisations and is currently a Council Member and World Treasurer of the International Short Wave League. Although partially disabled himself, he is often seen helping the Bournemouth Radio Amateurs Invalid and Blind Club at their various functions. He was pleased to become a member of the Radio Amateur Old Timers Association in June 1991.

Radios

The main radios in the picture are: The Kenwood R-5000 used for general h.f. listening and linked to a PC-286 via a Kantronics KAM, the antennas are Datong AD-370 N-S and AD-270 E-W. A Kenwood R-2000 is linked to an Atari 520stfm via his second KAM for amateur FAX, etc. The antenna in this instance is another Datong AD-370 N-S. A Yaesu FRG-9600 is linked to both Kams to monitor the packet DX clusters, so that any DX window can be spotted. The antenna is a Dressler ARA-500.

Peter uses a Lowe HF-225 to listen to the short wave broadcast bands, although he is not a broadcast band DXer. The antenna used for this is a Dressler ARA-30.

VHF and UHF Listening

The v.h.f./u.h.f. listening is done via various antennas, linked to an AOR AR-3000 and the AOR AR-3000A. All the sets have squelch-controlled tape backup, using Sony TCM-818 tape recorders.

An interesting point regarding Receiving Station G-13038 is that all the antennas, including the v.h.f. and 1296MHz beams, are internally situated in the roofspace of his house, only about 6 metres above ground level and just 33 metres above sea level.

Be sure of getting your copy of SWM each month. Place this regular order form with your newsagent... today

If you can't see SWM on the bookshelf at your local outlet, please call the Editorial Office in Poole and we will talk to our distributors to find out why!

Short Wave Magazine, May 1992
YUPITERU
MVT 7000 HANDHELD PROBABLY THE UK'S MOST POPULAR HANDHELD SCANNER!
- Receives 8 to 1300MHz
- 100kHz to 1300MHz (at reduced sensitivity)
- 200 Memory channels
- Rotary or keypad freq control
- AM/FM/NBFM
- Large display with signal strength meter

EACH SET IS SUPPLIED COMPLETE WITH:
- Full set of high power NiCads, AC charger, DC power lead and carry strap

MVT 6000 HANDHELD/BASE
An economy version of the MVT 7000 above.
- Receives 25-550MHz
- 100 Memory channels

SPECIAL PRICE...

SCANNERS
ALINCO DJ-X1 HANDHELD SCANNER
- Covers 500kHz to 1300MHz
- 100 Memories
- AM/FM/WFM
- Scanning speeds PLEASE NOTE:
- ALINCO DO NOT INCLUDE BATTERIES AND CHARGER AT THIS PRICE...

ALINCO ACCESSORIES
Set of high power NiCads...

AR3000A NEW MULTIMODE SCANNER
- Covers 500kHz - 1300MHz
- 100 Memories
- AM/FM/WFM
- Scanning speeds

NEW FROM SONY
SW55 MULTIBAND RADIO
Complete with hard case and all accessories, antenna, earphones, mains adaptor. Probably the very best from Sony. This radio is a real winner, with dual conversion receiver and a host of features:
- 150-300MHz
- 76-108MHz
- AM
- 125 memories
- Digital world time clock/alarm
- World map display
- Four channel tuning system
- 125 memory presets, Manual tuning
- Auto scan
- 10 key direct tuning

Now in stock for immediate shipment at just...

ALINCO DJ-X1 HANDHELD SCANNER
- Covers 500kHz to 1300MHz
- 100 Memories
- AM/FM/WFM

NEW FROM SONY
SW55 MULTIBAND RADIO
Complete with hard case and all accessories, antenna, earphones, mains adaptor. Probably the very best from Sony. This radio is a real winner, with dual conversion receiver and a host of features:
- 150-300MHz
- 76-108MHz
- AM
- 125 memories
- Digital world time clock/alarm
- World map display
- Four channel tuning system
- 125 memory presets, Manual tuning
- Auto scan
- 10 key direct tuning

Now in stock for immediate shipment at just...

AR2800
- Covers 500kHz - 1300MHz
- AM, FM, WFM, SSB compatibility
- 1000 Memory

HIGH POWER NICADS
700 mAh long life (1.2V Pen Cells)
- £19

SOFTWARE
SEND IN £2 FOR OUR NEW 72 PAGE COLOUR CATALOGUE (INCLUDES A £2 VOUCHER)
USE YOUR CREDIT CARDS FOR SAME DAY DESPATCH

SONY
As a Sony Shortwave Centre we stock the complete range of Sony Shortwave products - here is a selection of the popular models.

ICF2001D
A full coverage shortwave, VHF, and airband radio (150kHz to 1300MHz).

SW77
One of the new additions to the Sony range, the SW77 covers 150kHz to 300MHz plus 76-108MHz.

SW7600
One of Sony's most popular VHF and Shortwave radios, 76-108MHz, 150kHz - 300MHz. Shortwave covers AM, FM, SSB...

AIR 7
Very popular, sensitive Airband handheld radio - lovely audio quality & large easy to use key board...

ANNOUNCED
Combined Shortwave VHF Handheld. Complete with add on converter for UHF Airband. This model comes with the usual Handy Frequency Guide Booklet. Excellent S/Wave Results...

AN1
An external active antenna with builtin pre-amp, covers 150kHz - 300MHz. Fully portable with easy to mount fixing brackets...

AN3
Active antenna for Aircraft and VHF reception, suitable for Sony Air 7 and others.

INTRODUCTORY OFFER
SUPPLIED WITH FREE WIDE BAND DESCRIBE WORTH £49.95
Note: This is a UK version from AOR and not a foreign grey import.

© 1992 Short Wave Magazine.
LOG PERIODIC BEAM
(105 - 1300MHz)
20-element wideband beam - can be used for transmission on VHF/UHF amateur bands. 12dBd. 14/2. gain. ...£135.00

DIAMOND D707
(500kHz - 1500MHz)
A broad band antenna with 20dBd. gain. 3.5ft long fiberglass with mounting kit. Requires 12V DC supply. ...£90.00

DIAMOND D505
(500kHz - 1500MHz)
Mobile version of the D707 super antenna. ...£69.00

TELESCOPIC SCANNER ANTENNA
(BNC) ...£5.75

RUBBER DUCK SCANNER ANTENNA
VHF/UHF (BNC) ...£11.93

KENWOOD
R2000 RECEIVER
A good ‘Middle of The Road’ Receiver giving general coverage receive from 150kHz to 30MHz. Built in clock and
time facility. Ten user programmable memories Optional VHF Converter. (Secondhand models usually available). ...£ CALL

R5000 RECEIVER
Based on the receive section of the TM405 HF Transceiver both in looks and design this model covers 100kHz to 30MHz all mode, 100 memories and facility for optional filtering. RECOMMENDED. ...£ CALL

SHORTWAVE RECEIVERS
LOWE HF-225
Receiver (300kHz. - 30MHz) Optional extras inc FM/AM detector, Nickards, Speaker, Case & Active Antenna. ...£439.00

LOWE HF-150
Receiver Economy model but with an excellent set of ‘EARS’, LCD display. Portable or Mains Power ...£329.00

NRD-535
Support of the range general coverage receiver, 0.1 - 30MHz. Lots of Options available ...£1115

DRAKE R8E
New American top class receiver, 100kHz - 30MHz, supplied with all filters as standard. Really outstanding performance - see recent reviews. ...£565

DRAKE R8 VHF CONVERTER
(33 - 54MHz) (108 - 17MHz) £195

GRUNDIG SATELLITE 500
A full coverage receiver with 42 memories, receives LW, MW, FM and SW bands. ...£299

SANGEAN ATS503A
Full short wave coverage portable receiver with FM stereo, 14 memory channels, 12 shortwave broadcast bands. ...£109.95

PHILIPS D1875
Shortwave receiver covering all the major shortwave broadcast bands. SPECIAL PRICE ...£49.95

STEETLIEE MINIBAND
Multi-band Radio. This radio will appeal to both Aircraft Enthusiasts and the Marine Monitors. The multi-band ‘jumbo’ radio has almost everything you need to monitor these bands. BW, 8 & SW plus the Marine and Aircraft Bands.....Good Starter .....£69.95

TRADING POST
GASH, GASH, cash got a ‘RG’ want a scanner? give PAUL a ring for details or a ‘Buy-It’.

Telex PE101 Receiver & 4W Exp. Horn Bands materials £275.00

Marc 9200 Receiver 150KHz to 500MHz all-mode boxed V.O.C £215.00

Tri-R 9100V Receiver. Digital Tracking with twin V. Clean. £350.00

Trio R2500 etc. Good middle of the road receiver. £450.00

icom IR2. Cox. CR. RX stereo new set £999.00

Nevado MS1000 Base/Mobile Scanner. £299

Kenwood’s most popular pocket-sized marine radio, Headphones & intro ...£299

Fairbanks HP3000 ‘the ultimate’ in handheld scanners £1400.00. etc. §1000 memories, v.g.c. but tiny box.

AOE ASB000A The best base station scanner money can buy. All mode 150KHz - 2.4GHz in

Tabula MV7000 £49.95 + VAT. PAUL £50 supply/stand. Argos-.co.uk 100%-fully tested ...£290.00

Allen & Heath X-1 The latest model in excellent condition with box and all manuals inc. Factory book. Condition boxed ...£250.00

WHY NOT UPGRADE YOUR OLD Q7000 FOR THE TOP OF THE RANGE R9000i IN LIMITED QUANTITY WE CAN OFFER SPECIAL P/X DEALS, CALL PAUL FOR ALL THE INFO...

BOOKS...BOOKS...BOOKS...
Shortwave Conditional Frequency List. ...£8.95

Lists de 07000 Receiver. New! Varie the coil kit book! ...£4.55

VHF/UHF Frequency Guide A real must for serious owners. ...£5.95

Marine Frequency Guide. ...£5.95

Marine Frequency Guide. ...£5.95

Marine Frequency Guide. ...£5.95

Sangean 21 Cassette list 200 Channel H/Held Scanner special ...£19.95

Steetlione 3rd Edition...

Short Wave Communications.

Steetlione 3rd Edition.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.

Short Wave Communications.
In the early days of radio, or of 'wireless' as it was universally known, stations were few in number and of relatively low power by current standards. For cheapness, receivers were usually entirely passive, only the rich being able to afford a costly and power-hungry set with one or more bright emitter valves. The favoured receiver for the man in the street was a crystal set and this was usually fed by 100 feet (30m) of 'aerial wire' strung from gutter or chimney level to the apple tree at the end of the garden, or some other support, aided by an efficient earth that needed watering in dry weather. The only power available to produce an audible output was the received r.f. energy itself, and most of the energy was in the carrier at that. Even at the comparatively rare instants of 100% modulation, the useful information power in an amplitude modulated wave is only equal to one half of the carrier power or one third of the total power. Thus listening was confined to headphones, unless one lived very near the transmitter. The crystal detector, usually galena - an ore containing lead sulphide, was an inefficient detector compared to a modern diode. But even so it imposed rather heavy damping on the tuned circuit, giving crystal sets a reputation for poor selectivity. As an increasing number of more powerful stations came on the air, the limitations of the crystal set became painfully obvious.

The development of the dull emitter triode, with its 2V filament drawing only a fraction of the current consumed by the 6V filament of a bright emitter valve, brought wireless sets with better sensitivity and selectivity within the reach of many for the first time. The improved sensitivity enabled more stations, including foreign ones such as the popular Radio Normandy, to be received, whilst the improved selectivity enabled one to hear the wanted station without hearing a station on an adjacent frequency in the background at the same time. But the greatly improved selectivity and sensitivity were not just due to the reduced loading of the triode's grid on the tuned circuit and its modest degree of amplification respectively. The key to the improvement was reaction, also known as regeneration and, in America, as "tickling". The application of reaction simply involves the feedback from the output of the amplifier triode of some of the amplified rf signal to the input, where it further reinforces the weak incoming signal. Typical circuits were as in Fig. 1.1, a very popular simple cheap arrangement, and Fig. 1.2 where the more expensive differential reaction condenser was claimed to give smoother control and reduced "hand capacity" effect; this was often a problem in sets with a Bakelite or plywood front panel. I don't know who first thought of the brilliantly effective idea of reaction, but it must surely have been in use long before the appearance of the dull emitter valve. Its use continued long after their departure as well, being incorporated in many small t.r.f. mains table radio sets which were popular till well after the Second World War. It was also occasionally used to increase the gain and selectivity of the i.f. stage of a superhet communications receiver and even to do away with the i.f. stage altogether, as in the "Sobelette" small mains medium and long wave table radio, which had a frequency changer and i.f. transformer feeding directly into a leaky grid detector with a fixed degree of reaction. Extremely effective as reaction was when properly applied, it was over-sold by some writers of the period, one self-styled expert explaining that it could increase the stage's gain to the wanted signal 'right up to infinity!' But I certainly found it of enormous use as a lad when building sets using 2V battery valves with components handed down to me by good folk who had bought an 'all mains set'. I also incorporated it in a near-lethal mains set I later built using three pensioned-off American UX-based valves and sundry salvaged linecords thrown out by the local radio repair man. The set was about 5.5 x 5.5 x 6.5in high, just large enough to become a."
For the man in the street, a simple crystal set with as much ‘aerial wire’ as possible down the garden was the usual means of listening to early wireless stations - valves were too costly.

For this project, Ian Hickman has delved into his past and come up with an interesting design for a single band receiver with the mystical ‘reaction’ to improve both sensitivity and selectivity.

enough to use a Goodmans 5in round loudspeaker, and the line-up was a 77 r.f. pentode as leaky grid detector with reaction, a 43 output pentode and a 25Z3 rectifier. It was before the days of ferrite rod antennas, but the set gave good loudspeaker volume reception on all the local stations, and many foreign ones after dark, on a home made 600mm telescopic antenna. Many years later I incorporated reaction in a transistorised three-waveband receiver (Ref. 1) with excellent results. But although the general principle is plausible enough, in all that time I never came across a convincing explanation of exactly how reaction improves reception. Some time ago therefore I set out to explore the arrangement more thoroughly, using the design of an 3.5MHz (80m) receiver as the vehicle for the investigation. The result was a receiver of surprising performance, which will be described shortly. Firstly let’s look at this second delibration concerning reaction, and how it can be so effective in some cases and so disappointing in others.

How the Circuit Developed

To begin with, we need to look at the operation of an r.f. oscillator - a tuned amplifier with feedback from its output to the input. Fig. 1.3 shows an amplifier fed with a small external input A and complete with an arrangement to bleed off a portion B of the output, ready to be fed back to the input. If the portion B is exactly in phase with the input signal A, and moreover is exactly in phase with it, then (if we were nimble enough to do it instantaneously) we could substitute the feedback signal B for the external input A. The circuit would simply carry on exactly as before for evermore, the amplitude of the output neither increasing nor decreasing - after all why should it, since the amplifier sees exactly the same input as previously? Of course, in the practical world of engineering, as distinct from the abstractions of mathematics, two physical quantities are never exactly equal, or if they were, they won’t remain so indefinitely, so in practice when B is substituted for A, the oscillations will either die away or build up until they can’t get any larger.

Let’s look at this second possibility in more detail. Fig. 1.4 shows a tuned amplifier which is nice and linear for small amplitude signals, but which limits symmetrically as the input increases. For small inputs the output is simply G times as large, G being the gain of the amplifier. For larger signals, the peaks of the input run into the non-linear region, resulting in clipping of the waveform as shown. The resultant waveform is no longer a pure sinewave, harmonic distortion is introduced. However, assuming that the tuned circuit comes after the amplifier as shown and that it operates at a reasonably high Q, only the fundamental frequency component will appear at the output; moreover, due to the limiting, its amplitude will be less than G times the input - the effective gain has fallen as the input amplitude increased beyond the amplifier’s linear signal handling range. The signal B which we will assume is in phase with the input A if the latter is exactly on tune with the amplifier’s tuned circuit) will likewise no longer increase in proportion to the input as the output signal increases beyond the linear range, and this is what stabilises the amplitude of an oscillator’s output.

The gain from A to B is called the loop gain and if it exceeds unity at the frequency where B is in phase with A, then the circuit will start to oscillate when B is connected to A. Fig. 1.5 shows various possible ways in which the loop gain at the fundamental frequency can vary with input amplitude. A characteristic such as (d) is ideal for a high stability oscillator such as the v.c.o. of a synthesiser, or the local oscillator of a superhet receiver. The very rapid change of loop gain with amplitude in the region where the loop gain is unity will result in a very stable amplitude of oscillation - low
Deals of the decade

Ten years...that's how long we've been supplying you

Stockists of DIAWA - VIBROPLEX - ICOM

DEWSBURY ELECTRONICS

176 LOWER HIGH STREET
WEST MIDLANDS

Tel: (0384) 390063/371

EASY READER DM-1000

Introducing the all new ‘EASY READER DM-1000’ RTTY/CW DECODER.
In our opinion “the most simple to use decoder ever seen”.

- RTTY BAUDOT 46/50/75 BAUD
- CW SPEED 2-99 WPM
- RTTY ASCII 110 AND 200 BAUD
- AUTOMATIC OR MANUAL SPEED SELECTION
- STATUS LINE ON SCREEN GIVING MODE, SPEED IN USE AND PRINTER ON/OFF

Price: £199.95 inc VAT  P&P £5.00

SAE for full details

UNIVERSAL RADIO INC.

UNIVERSAL M-900

A compact easy to use decoder for Baudot, RTTY, Sitor A and B, Morse Code and FAX. Output is to video monitor and parallel printer port. Baudot speeds are 45, 50 and 74 Baud, FAX speeds are 60, 120 and 240 LPM, 288 or 576 IOC. Advanced features include UOS, OPI, squelch, automatic or manual FAX. Video is 40 or 80 character, 16 or 22 lines, 50 or 60Hz refresh. FAX output to screen. FEC-A-96 Baud, FEC-A 144 Baud, FEC-A 192 Baud.
NO COMPUTER REQUIRED.

Requires: 12 VDC at 800 mA
Dimensions: 9" wide × 3.75" high × 13.25" deep
Weight: 2.5kg

Price: £590.00 inc VAT  P&P £10.00

SAE for full details
WAVECOM W-4010 VERSIONS 4&5

Professional grade high performance decoder/analyser, easy to use and at an affordable price. Decodes up to 27 commercial codes including Packet and FAX. Both serial and centronics output, as well as output to composite video monitor. Powered from 13.8 volt supply (option).

**Dimensions:**
7.75" wide x 3.25" high x 10" deep

Can be supplied in Standard 19" rack together with Video Screen and integral power supply. NO COMPUTER REQUIRED.


---

UNIVERSAL M-7000 DECODER

Advanced decoder which will decode up to 17 different RTTY codes, including Packet and FAX. Outputs to printer and to composite video monitor. FAX to both screen and printer. Features real time clock output for scope, needs NO COMPUTER for operation. However external computer may be used for controlling M-7000 if required.

**Dimensions:** 16.4" wide x 3.5" high x 12.75" deep
**Weight:** 9lbs


**Price:** £1030.00 inc VAT  P&P £10.00

SAE for full details
amplitude of a.m. noise sidebands. This is typical of the Vakar type of oscillator in (a) - where the active devices could be transistors, f.e.t.s or valves - when the resistors R are zero or low in value. And if the operating Q of the tank circuit is very high then the magnitude of the phase noise sidebands will also be very low. Characteristic (b) is commonly encountered and adequate, but inferior to (d), whilst one sometimes comes across an infuriating oscillator with a characteristic such as (c). This oscillator sometimes starts and sometimes doesn't, depending upon whether the switch-on transient shock excites the tuned circuit to ring with an amplitude at which the loop gain exceeds unity: if so, then the amplitude rapidly builds up to the higher of the two unity gain points.

Characteristic (e) would be very unsuitable for a high stability oscillator; the very gradual change in gain with amplitude around the unity gain point would result in poor amplitude stability, rendering the oscillator's amplitude very susceptible to outside influences such as hum on the supply rails etc. However, it is just what is wanted for a receiver using reaction, since the amplitude of oscillation is exceedingly susceptible to influence by r.f. energy at the frequency of the tuned circuit, coupled in from an external source, via an antenna. Having reached this conclusion, I designed a tuned r.f. amplifier stage which had only a modest gain but which was very linear. Tests showed that its amplitude of oscillation, when the feedback was adjusted so that the loop gain just barely exceeded unity, was indeed very sensitive to external r.f. signals and this is the basis of the remarkable performance of the final version of the receiver described below, the block diagram of which is shown in Fig. 1.6.

Unlike the leaky grid detectors with reaction shown in Figs. 1.1 & 1.2, the reaction is applied around an r.f. stage, which is coupled to a separate detector. The detector output passes through a single pole lowpass filter and then through a 35dB amplification stage. It then passes through two two-pole lowpass filter stages which, with the earlier single pole stage, form a 5-pole elliptic lowpass filter. This passes audio frequencies up to 3kHz but provides 57dB of attenuation at 4.5kHz and all higher frequencies. This provides additional selectivity at audio, to augment the high selectivity at r.f. provided by the use of reaction. The signal is then routed to an output stage providing a further 35dB amplification, either direct or via a tunable audio frequency filter for use with c.w. signals. This state-variable narrow bandpass filter can be tuned over the range 350Hz to 3kHz approx. and provides a further 22dB of attenuation at frequencies one octave above and below the tuned frequency and beyond.

In Part 2 we will deal with the final circuit diagram and start construction of this interesting receiver.

PAY A VISIT TO

SUPER HAMSTORES

AVAILABLE AT SUPER HAMSTORES THIS MONTH;
A FULL RANGE OF WIDEBAND, HF, VHF, UHF, BASE-STATION,
MOBILE & HANDPORTABLE RECEIVERS.
Whatever your requirements we will help you make the right choice.

### WIDEBAND RECEIVERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
<th>Mode</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>R9000</td>
<td>100kHz - 2GHz</td>
<td>All Mode</td>
<td>£4080.00</td>
</tr>
<tr>
<td>R100</td>
<td>100kHz - 1856MHz</td>
<td>AM/FM</td>
<td>£510.00</td>
</tr>
<tr>
<td>R1</td>
<td>100kHz - 1300MHz</td>
<td>AM/FM</td>
<td>£349.00</td>
</tr>
<tr>
<td>AR3000A</td>
<td>100kHz - 2036MHz</td>
<td>All mode</td>
<td>£765.00</td>
</tr>
<tr>
<td>AR2000</td>
<td>500kHz - 1300MHz</td>
<td>AM/FM</td>
<td>£269.00</td>
</tr>
<tr>
<td>MVT7000</td>
<td>8MHz - 1300MHz</td>
<td>AM/FM</td>
<td>£289.00</td>
</tr>
<tr>
<td>DJX1</td>
<td>500kHz - 1300MHz</td>
<td>AM/FM</td>
<td>£269.00</td>
</tr>
</tbody>
</table>

### HF RECEIVERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
<th>Mode</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>R5000</td>
<td>100kHz - 30MHz</td>
<td>All mode</td>
<td>£925.00</td>
</tr>
<tr>
<td>R71</td>
<td>100kHz - 30MHz</td>
<td>All mode</td>
<td>£375.00</td>
</tr>
<tr>
<td>R72</td>
<td>30kHz - 30MHz</td>
<td>All mode</td>
<td>£659.00</td>
</tr>
</tbody>
</table>

### VHF/UHF RECEIVERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
<th>Mode</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2000</td>
<td>150kHz - 30MHz</td>
<td>All mode</td>
<td>£549.00</td>
</tr>
<tr>
<td>R225</td>
<td>30kHz - 30MHz</td>
<td>All mode</td>
<td>£429.00</td>
</tr>
<tr>
<td>R150</td>
<td>30kHz - 30MHz</td>
<td>SSR/AM/CW</td>
<td>£329.00</td>
</tr>
<tr>
<td>R7000</td>
<td>25MHz - 2GHz</td>
<td>All mode</td>
<td>£1012.00</td>
</tr>
<tr>
<td>R7100</td>
<td>25MHz - 2GHz</td>
<td>All mode</td>
<td>£1100.00</td>
</tr>
<tr>
<td>FR9600</td>
<td>60MHz - 905MHz</td>
<td>All mode</td>
<td>£520.00</td>
</tr>
</tbody>
</table>

In addition, HAMSTORES stock a wide range of new transceivers plus a large selection of second-hand and ex-demo gear including; BARENCO, DIAMOND, COMET, SONY, AOR, LOWE, DRAE, CUSHCRAFT, AKD, KANGA KITS, MFJ, DEECOMM, CDR, ALLGON, TOYO, AEA, MET, ICOM, YAESU, KENWOOD, ALINCO, JRC ETC. Watch this space for more news.

73's, Chris G8GKC, Gordon G3LEQ and John G8VIQ.

Opening times for both stores: 09:00 - 17:00 Tuesdays to Saturdays

---

**HERNE BAY**

Unit 8, Herne Bay West Industrial Estate, Sea Street, Herne Bay, Kent CT6 8LD
Telephone: (0227) 741555, Fax: (0227) 741742

**BIRMINGHAM**

International House, 963 Wolverhampton Rd, Oldbury, West Midlands B69 4RJ
Telephone: 021 552 0073, Fax: 021 552 0051

---

Short Wave Magazine, May 1992
GUIDE TO UTILITY STATIONS 1992
10th edition • 534 pages • £26 or DEM 70
7500 new coastal and fixed station frequencies!

Our bestseller covers the complete frequency range between 0 and 30 MHz. We are the very first to publish all new maritime frequencies worldwide in use since the gigantic global frequency transfer in July 1991! Latest military and political events such as the impacts of the Gulf War and of the recent and current revolutions in Eastern Europe are covered exclusively by our UTILITY GUIDE. Sophisticated operating methods and regular overseas monitoring missions (1991 for months in India, Malaysia, Mauritius, Reunion, Surinam and Venezuela) complete this unique book.

The completely revised new edition includes a frequency list with 19136 frequencies, and a call sign list with 3514 call signs. Up-to-date schedules of FAX meteo stations and RTTY press services are listed both alphabetically and chronologically. Abbreviations, addresses, codes, definitions, explanations, frequency band plans, international regulations, modulation types, NAVTEX schedules, O and Z codes, station classes, telex codes, etc. – this reference book list everything. Thus, it is the ideal addition to the World Radio TV Handbook for the "special" stations on SW!

Further publications available are Guide to Facsimile Stations, Radio-teletype Code Manual (11th editions) and Air and Meteo Code Manual (new 12th edition). We have published our international radio books for 23 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For a recent Shortwave Magazine book review see Ian Chard in issue 2/91.

All manuals are published in the handy 17 x 24 cm format, and of course written in English.

Do you want to get the total information immediately? For the special price of £88/DEM 245 (you save £15/DEM 40) you will receive all our manuals and supplements (altogether more than 1700 pages!) plus our Cassette Tape Recording of Modulation Types.

Our prices include airmail postage to everywhere in the world. Payment can be by £ or DEM cheque, cash, International Money Order, or postgiro (account Stuttgart 2093 75-709). Dealer inquiries welcome – discount rates on request.

Please mail your order to:
KLINGENFUSS PUBLICATIONS
Hagenloher Str. 14, D-7400 Tuebingen, Germany
Tel. +49 7071 62830

SKYVIEW
SYNOP

£99.00 INC VAT
NEW CONCEPT IN WEATHER IMAGING
• Includes full RTTY/NAVTEX System & Hardware interface.
• Plot detailed Weather Maps.
• Uses RTTY met data.
• Supports VGA, EGA.
• Pictorial and Synop plot facilities.

£199.00 INC VAT
NEW INTERGRATED SAT/FAX SYSTEM
• Modes FAX, METEOSAT, NOAA (APT).
• Timetable - Automatic Switching.
• Supports VGA, EGA, CGA, + HERC.
• 640 x 800 Resolution, 16 Grey Scales.
• Includes S/ware & H/ware interface.

Enterprise Radio Applications Ltd.
5 Clarendon Court
Winwick Quay
Warrington
WA2 8Q0
Tel: (0925) 573118

BP34 Audio Filter
Someone once said that this filter is too good for amateur radio use. We, along with hundreds of BP34 users would disagree. The BP34 combines ease of use with a degree of performance not found in any other filter. Exceptionally sharp cut off and guaranteed 80dB stopband attenuation make this filter a must for the more serious user. £195.00.

RS232 Display
Don't tie up your computer while monitoring. This new unit will display, store and print messages sent via the RS232 output from the MICROREADER or PACKET TNC. Text is stored in memory and at the same time displayed on the large 160 character backlit screen. A unique scrolling facility allows you at any time to scroll back and forth through over fifty screens of text messages while still receiving data. The display incorporates a PARALLEL PORT that allows printing of all or selected sections of text at the touch of a button. £185.00.

All products are guaranteed for two years and all prices include VAT and postage and packing.
An IF output - the easy way

Now that single sideband, reduced carrier broadcast transmissions have started, some owners of valved receivers may be wondering how to tap off some i.f. signal for a phase-lock detector. John Wells offers a solution in this short article.

There can't be a simpler way of tapping off some i.f. signal than that shown in Fig. 1. The last (or only) i.f. amplifier will usually have a cathode resistor and capacitor as shown in (a). All that is needed is to disconnect the earthy end of the capacitor and insert a 47Ω resistor in series as shown in (b). In some receivers the cathode capacitor is part of a multiple block, in which case it can simply be disconnected and another capacitor of the same value fitted at the valve socket. The output is taken by a length of coaxial cable to a socket, which could be fitted at the rear of the receiver, or anywhere else if required. The socket can be mounted on a bracket attached by an existing screw to avoid the need to drill holes in the chassis. The only precaution needed is to keep the cable away from the other i.f. stages, since the braid, even on good quality cable, is leaky enough to cause unwanted coupling.

This modification has no noticeable effect on either i.f. gain or alignment, whether shorted, open, or correctly terminated. In the case of my AR88 it provides about 10-20mV of signal - ample for an outboard phase-lock detector. The output can also be used as an input - for example to insert a high level b.f.o. signal for s.s.b. if one is not provided - don't forget to turn off the a.g.c. - or for a modulated signal generator to test the detector and audio stages.

**Moral**

The moral here is not to forget the cathodes when considering 'add-ons'. An S-meter can be connected in the earthy end of the cathode resistor of any a.g.c.-controlled stage. If the local oscillator is of the type with an earthed cathode, a small resistor here will give an output to a frequency counter, although some small realignment may be required. If the b.f.o. has an earthed cathode, then a small resistor, transistor, or both in parallel can be inserted in the cathode lead, and fed with a 'sniff' of i.f. signal, to give an injection-locked oscillator to feed the more exotic of detector. All of these suggestions are cheap to carry out, and make no serious alterations to the receiver wiring - so they can easily be removed if required at a later date if you want to sell the set.

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.g.c.</td>
<td>automatic gain control</td>
</tr>
<tr>
<td>b.f.o.</td>
<td>beat frequency oscillator</td>
</tr>
<tr>
<td>i.f.</td>
<td>intermediate frequency</td>
</tr>
<tr>
<td>mV</td>
<td>millivolts</td>
</tr>
<tr>
<td>s.s.b.</td>
<td>single sideband</td>
</tr>
<tr>
<td>Ω</td>
<td>ohms</td>
</tr>
</tbody>
</table>

**First Aid**

As a newcomer to this fascinating hobby, I have just acquired a second-hand communications receiver - namely a SMC-73, mainly for u.s.b. listening particularly to aircraft.

Having hastily connected a temporary makeshift antenna, a 7m wire hanging from the bedroom window to a tree, I can receive good quality signals of conversations between aircraft and ground controllers on New York Oceanic at around 8.95MHz.

I wonder if anyone could enlighten me with regards to the origin and age of this receiver.

Richard Foster, 25 Bodmin Close, Scunthorpe, South Humberside DN17 1TW.

I own a Realistic PRO 2021 scanner. I would be grateful if anyone knows of a way of having 'switchable a.m.'.

Now you only have a.m. for the airband, this can be tiresome.

G.P. Jones, 74 Joseph Luckman Road, Bedworth, Warwickshire CV12 8BQ.

I am looking for a manual for the Prinzsound R999 solid-state 26 band radio. I will pay any costs, etc. I.N. Solly. 32 The Centre, Newington, Ramsgate, Kent CT12 6LE. Tel: (0843) 598574.
ICF-SW1E ........................................... £134.95

MULTI-BAND RADIOS/SCANNERS/TRANCEIVERS

AM attenuator, dual conversion system RF gain control Record out External aerial sockets Supplied with AC adaptar: Rechargeable battery pack, battery charger, active antenna with bracket and cable kit, dust cover, printer paper, shortwave guide, fax guide and operation table Power: NP22 battery pack External active antenna AF filter Digital quartz clock large 1CD display with contrast control Squelch control Key using 110mm paper with horizontal resolution of 860 dots Printer with enlargement capability Dual power supply - AC adaptor/rechargeable Programme/I week timer TCXO (Temperature Compensated Crystal Oscillator) for ultimate stability of the reception frequency Active search 131.62/141.12 MHz Synchronised detection system Auto memory input for easy automatic storage of up to 10 stations Priority reception 8 of signal strength), manual turning with jog dial, 10 key direct tuning Continuous tuning AM 9.29999.99 KHz, FM 87.5, -108 MHz, SAT Multi-band Full digital p/sets World time zones SSB

ROBERTS

R727 5 bands - FM/AM/SW/TV4 - £79.95
R747 3 bands ........................................ £92.95
RF-M3 3y ........................................ £59.95
RP-26 FM/SW ..................................... £81.95
RP-14 Car tape radio X FM ........................ £60.95
RC-30 Mono cassette radio ........................ £51.95

AWARD WINNERS

071-637-0353/0590

AN AWARD WINNING MASTERPIECE

ICF-2001D is ..................... £39.95 only

FULL RANGE KENWOOD COMMUNICATIONS EQUIPMENT

AN P1200 Offset Portable antenna and frequency converter = Designed to suppress the CW/SSB = Capable of receiving fax broadcasts from meteorological satellites = Size: 1.25m x 2m x 3m (w/h/d) ........................................ £159.99

YUPITERU AIR-Power at your fingertips

VT-125 II ........................................... £169.95
MVT-7000 ........................................... £289.95

SALE

PANASONIC

RF-810 World band receiver - pocket size .................. £59.95
RF-865 S/w Single multiband digital radio - manneuvers preset £169.95
RF-845 Digital ni/w/band receiver .................. £129.95
071-637-0353/0590

GRUNDIG

SATELLITE 650 ................................ £459.00
SATELLITE 500 ................................ £275.00
SATELLITE Cosmopilot .................. £91.90
YACHT BOY 220 .................. £56.99
YACHT BOY 230 .................. £73.00
CONCERT BOY 225 .................. £36.70

PLEASE MAKE ALL CHEQUES PAYABLE TO ASK ELECTRONICS AT:
248-250 TOTTENHAM COURT ROAD, LONDON, W1P 9AD, UK

DAT

digital audio tape

Sony TC63 ........................................... £425
Casio DA7 ........................................... £575
Casio DA100 ....................................... £390

PHILIPS

D2345 Portable Radio U/V/ KN/MW/SW FM Fine tuning Control = Mains/battery supply .................. £24.95
D1875 Compact 12 band Portable Radio U/V/ KN/MW/SW Shortwave = Large tuning control = Tuning LED indicator = Telecopic and Inverigator control = DC supply connection = Earphone connection = Wrist strap = Attractive pouch ........................................ £49.95

SONY SPECIALISTS 071-637-03531 071-637-0590 Fax: 071-637-2690

SOLID STATE LONGWAVE RADIO WITH FM/AM/SW/TV4/SAT reception = PLL synthesizer circuitry = AM stereo = Continuous AM frequency coverage = 4 way tuning: 10 memory presets, auto scan, manual tuning, 10 key direct tuning = Programmeable times = Sleep function = Digital clock = LED display with light function = Dual conversion system = Supplied with compact antenna, stereo earphones and AC power adapter = Power: 4- AA size battery. ICF-SW600 ........................................... £134.95

SOE SPECIALISTS 071-637-03531 071-637-0590 Fax: 071-637-2690

ICF-SW55 "SUPERADIO"

- World time zones = SSB
- Full digital p/sets
- Multiband

£249 only

FULL RANGE STOCKED

LONDON'S PREMIER COMMUNICATION EQUIPMENT BARGAIN CENTRE
071-637-0590/0353

"FULL RANGE KENWOOD COMMUNICATIONS EQUIPMENT"
Short wave listeners, as well as transmitting amateurs, need to be able to receive a.m., s.s.b., or c.w. signals. Each is different in terms of bandwidth! While our headphones should ideally produce the maximum intelligibility and sensitivity in each mode, this must be with minimum interference. Telecommunications (W. Fraser 1957) tells us that, "Telephony is, by international recommendation, made sensibly uniform over the range 300-3400Hz". This is sometimes known as 'speech of commercial quality'. In other words, with this frequency range we will get maximum speech intelligibility - surely this is what we need.

The Radio Designers Handbook by F. Langford-Smith reproduces the following interesting table for Speech:

<table>
<thead>
<tr>
<th>Application</th>
<th>Articulation (%)</th>
<th>Freq range (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High fidelity reproduction</td>
<td>98</td>
<td>62 - 8000</td>
</tr>
<tr>
<td>Good fidelity</td>
<td>98</td>
<td>150 - 7000</td>
</tr>
<tr>
<td>Fair fidelity (public address)</td>
<td>96</td>
<td>200 - 5000</td>
</tr>
<tr>
<td>Restricted bass* unbalanced</td>
<td>96</td>
<td>500 - 5000*</td>
</tr>
<tr>
<td>Restricted bass &amp; treble*</td>
<td>95</td>
<td>500 - 4000**</td>
</tr>
<tr>
<td>Very restricted*</td>
<td>90</td>
<td>500 - 3000**</td>
</tr>
<tr>
<td>Telephone</td>
<td></td>
<td>300 - 3400**</td>
</tr>
</tbody>
</table>

*for noisy locations    ** response may be peaked

However for hi-fi reproduction of music he suggests the extremes of 30Hz -20kHz. Of course we are looking for a much narrower bandwidth for c.w. reception.

With modern day hi-fi phones we have, in fact, frequency ranges anything between 15Hz and 30kHz, which are ideal for f.m. and stereo entertainment reception - but - use them with a communications RX, and we will probably encounter wide band interference/noise, for a narrow band requirement, with resultant low audible sensitivity, and a lack of 'crispness' with s.s.b. and c.w.

Those lucky enthusiasts who have a good pair of S.G. Brown, Teleonics (USA), or similar good quality bipolar magnetic phones, will appreciate their excellence. Alas, they are now somewhat difficult to find; though there is, on the junk market, US Army Signal Corps phones 'R-14' by Radio Speakers Inc. They can be purchased sometimes for pennies, 'non-working', which usually means that the cord is defective or missing. The cord is easily replaceable, with twin loudspeaker wire. A pair of such phones is excellent for a.m. and s.s.b. communications speech; though the headband is a little like a vice! Put some pressure, externally, on the diaphragm, with a wafer of paper, thus reducing the gap with the bipolar magnets and, bingo, you can peak it quite sharply for c.w. reception only. This does take a little trial and error, plus patience! And there we have the basis of more efficient headphone reception by retuning. Try retuning hi-fi, or other, phones for the required mode whether a.m., s.s.b. or c.w.- a.m. is included as it is used by h.f. broadcast stations, and some amateur stations on Top Band.

The modern, lower cost, hi-fi phones usually consist of a dynamic, or Mylar, sound unit (yes - there are other types!) built into an earcup fastened to the headband. The front is often cemented onto the cup and fitted with ear cushions. The front, or inner, surface is widely vented to provide wide frequency sound to the ear; and the earcup rear is usually decoratively vented to improve the base frequencies.

The frequency response, of these phones, depends on the type and efficiency of the built sound unit; the size of the earcup which forms a sound chamber; and the front and rear venting. This is an over simplification, as there are other factors which do not concern retuning the phones.

Several pairs of low cost hi-fi phones have been experimentally retuned at this QTH, and two typical examples will be discussed:

---

Short Wave Magazine, May 1992
Experiment No 1

For this experiment a large Mylar insert type (Soundlab 600 MST Mono) was purchased. A Mylar insert is used. The quoted frequency response is 40Hz - 15kHz. The quoted impedance is 600Ω, though, in practice, it seemed to make little difference whether they are used on the 8 or 600Ω audio RX outputs! A suspicion exists that these phones also appear in another guise and type number, for hi-fi performance. The sensitivity was judged as hi-fi performance. The bandwidth was greatly increased, in audible sensitivity. They were used. These weigh in at around 85g and are comfortable and excellent for hi-fi reception. They were much more sensitive than the previous phones. A mono plug was then fitted with the earpieces in series.

From Fig. 2 it will be seen that the rear venting consists of three rows of five-pin holes in a rectangular pattern. The inner venting is just a very thin black piece of fabric gauze, covering the sound unit, surrounded by the ear cushions.

Modifications for retuning were remarkably simple:

1. On one earpiece the outer venting was sealed off with a piece of white pvc tape. There was an immediate increase in audible sensitivity.
2. To seal off the inner venting, several pieces of stiff card (beer mats!) discs were cut using a 10p piece as a template. These discs can be slipped under the ear cushions, which are stuck to the earpiece.
3. The sensitivity and selectivity results, though the sealing of the outer venting was tricky.
4. For c.w. a peak of around 400Hz was required, and the centre 3mm diameter hole was gradually reduced, in size, to pin hole size. This was achieved with small pieces of pierced stiff card, held in place, with double sided sticky tape. The difference between the modified, and unmodified, earpieces was very noticeable. The bandwidth was greatly reduced, and the sensitivity was up, but this and selectivity were still lower than required. The unmodified earpiece was modified in a similar was, and the results sounded better when using both ears, but still not up to the requirements for c.w. reception.

Experiment No 2

For this experiment a pair of more expensive, small, light-weight Sony MDR-CD5 dynamic stereo headphones were used. These weigh in at around 85g and are comfortable and excellent for hi-fi reception. They were much more sensitive than the previous phones. A mono plug was then fitted with the earpieces in series.

Conclusions

The step by step experiments, described, could form the guidelines for other experimenters to try retuning hi-fi and other headphones for a selected mode. The outer venting should always be sealed off first, followed by reducing the inner venting to small dimensions, which can only be found by trial and error experiments. The results with some phones should be excellent and others poor. The initial price, of the hi-fi phones, seems to have no bearing on the results.

It should be stressed that individual modifications, to headphones, will differ from type to type; and from person to person, due to differences in intial performance and individual hearing response. For example, experiments with several types of headphones seems to indicate that better retuning results can be obtained with the smaller lightweight dynamic phones, such as the Sony MDR-CD5.

Lowest Cost

Amazingly enough, a final experiment, in this series, with the lowest cost/smallest size hi-fi headphones (£3.45!) produced really excellent c.w. results, though the sealing of the outer venting was tricky. The sensitivity and selectivity was very acceptable; and the lightweight made them comfortable to wear over longish periods. The phones were Realistic Nova-34, weighing in at 57g and were obtained from Tandy.
**Link Electronics**

**THE REALISTIC SPECIALISTS**

**SPRING SALE**

**PRO-2006**

With hyperscan - 400 memories
AM/FM 25-520, 760-1300MHz, 240V A.C./12V D.C.

* only £299.95 * List price £329.95 *

**PRO-2022**

200 memories, 240V A.C./12V D.C.

* only £179.95 * List price £199.95 *

**PRO-9200**

16 memories, 240V A.C./12V D.C.

* only £119.95 * List price £129.95 *

**PRO-2025**

Superb compact mobile - 16 memories
68-88, 136-174, 406-512MHz

* only £89.95 * List price £99.95 *

**PRO-35**

Hand-held - 100 memories
68-88, 108-137 (AM), 137-174, 380-512MHz

* only £159.95 * List price £179.95 *

**PRO-37**

Hand-held - 200 memories
68-88, 108-137 (AM), 137-174, 380-512, 806-960MHz

* only £199.95 * List price £229.95 *

All scanners include FREE p&p in the UK. 12 months warranty

**Link Electronics**

GOCVZ

228 Lincoln Road, Peterborough PE1 2NE

(0733-345731) SAE for leaflet.

---

**SSE**

**HIGH QUALITY ACCESSORIES**

**FOR SCANNING MONITOR RECEIVERS**

1. **JIM PSU-101 MkIV.** A high quality UK manufactured fully regulated 220-240V AC power supply with RADIO BASE HOLDER combined. For use with FAIRMATE HP-100E/200E/2000/1000AB, AOR-1000/2000, YUPITERU MVT-500/700/125, VT225, REALISTIC PRO-35/38, ICOM-R1, UNIDEN UBC/50XL, RC5/5XL, UBC7/0XL, ALINCO DJ-X1, UBC100/5XL. New unique features include 2 DC output sockets one for radio and the other for accessories. A bracket for BNC socket for antenna connection. Separate DC leads included.

PRICE £29.95.


3. **JIM CH-A4.** Car mounting holder for handheld scanners-transceivers with BNC-clip support. Safe and convenient use of scanner etc in car, truck, boat etc. PRICE £7.95.


5. **JIM SM-1A.** High quality S meter for scanners CB. PRICE £26.95.

Payment by postal order or cheque. Prices include postage

Further information on SSE products, send A4 SAE to:

**SOLID STATE ELECTRONICS (UK)**

8 The Orchard, Bassett Green Village, Southampton SO2 3NA

Tel: (0703) 769596

---

**Martin Lynch**

**G4HKS**

THE AMATEUR RADIO EXCHANGE CENTRE

286 Northfield Avenue, Ealing, London W5 4UB. Tel: 081 566 1120 Fax: 081 566 1207

ANNOUNCING THE NEW ICOM**

**ICR-7100HF**

FROM CHRIS PARNELL, THE SKILLED DEVELOPMENT ENGINEER WHO ORIGINATED THE ICOM ICR-7000HF, MARTIN LYNCH CAN NOW OFFER THE NEW ICR-7000HF.

After months of specialist engineering, I can now offer the receiver with a frequency range of 50kHz to 20000MHz. By pressing the original dimmer button on the front panel, the ICR-7100 transforms into a high performance HF receiver in addition to its VHF/UHF capabilities. You do not have to guess at the display, simply press one button, and you have total peace of mind.

AT ONLY £1120 INCLUDING VAT, THE NEW ICR-7100HF IS AVAILABLE FROM STOCK.

PART EXCHANGE WELCOME.

081-566 1120

---

**DEALER AND OVERSEAS ENQUIRIES WELCOME**

**BUYING OR SELLING...**

**DIAL**

081-566 1120 NOW!

**ALINCO**

**YAESU**

**KENWOOD**

**ICOM**

**AOR**

**STANDARD**

Price list on request. Typical APR 32.9%

**PHONE 081-566 1120**

For fast mail order Tel: 081-566 1120. Please add £10.50 for 48 hour delivery.

SHOP OPENING HOURS: Tuesday-Sunday 10 - 6pm.

24 hour Sales HOT LINE 0860 339 339 (after hours only.)

FAX order line open 24 hours.

Martin Lynch is a Licensed Credit Broker.

Full written details upon request. Typical APR 32.9%

PHONE 081-566 1120
The Eighth Edition of the popular *Ferrell's Confidential Frequency List* has been extensively revised to take account of the many changes that have taken place in the last few years. Many of these changes result from the recent political events that have so dramatically changed the maps of Eastern Europe and the former Soviet Union. There has also been a big change round in the marine frequency allocations. Ferrell’s has also changed its format dramatically to ensure that it keeps up with events and to meet the demands of its users.

The most noticeable change has been to the overall presentation, switching from the original perfect bound, soft-covered book to a much easier to use spiral bound format that allows any of the 544 pages to lay flat open on the desk or be turned under to present a single page to view.

Complete coverage of the h.f. spectrum from 1.605 to 28.000MHz is now provided with only broadcast, amateur bands and unidentifiable c.w. stations, using irregular or no callsigns at all, left out. A reverse frequency listing is also now provided showing every known frequency against each callsign.

This is a book that the listener cannot afford to be without and our Special Offer will enable you to get your copy, not only early, but at an advantageous price.

**HOW TO ORDER**

Complete both coupons, in ink, giving your name and address clearly in block capitals. Coupon (2) will be used as the address label to despatch your antenna to you. Send the coupons, with your cheque, to: SWM Special Offer (May), FREEPOST, Enefco House, The Quay, Poole, Dorset BH15 1PP.

If you wish to pay by credit card (Access, Mastercard, Eurocard or Visa only), please fill in your card details and sign the coupon where indicated.

If you do not want to cut your copy of SWM, you must send the Book Special Offer flash from the foot of the Contents Page of this issue.


PW Publishing Ltd., Poole, Dorset
(Reg. No. 1980539, England)
Religious Broadcasters-
an Overview

1931 was an auspicious year in the world of international broadcasting! It was then that missionary broadcaster HCJB began transmissions in Spanish and English from the South American republic of Ecuador. But, in fact, HCJB's small start had been preceded by religious broadcasters in a number of other countries including Ireland and, of course, the United States.

In fact, religious broadcasting is as old as radio. Not surprising really when you realise that Christians have been communicating for centuries.

However, when HCJB's founders first fired up their tiny transmitter and called the parent organisation the World Radio Missionary Fellowship they could hardly have imagined how things would develop from then on. Today, hundreds of stations exist around the world which have, as their main objective, the communication of the Christian gospel. The way each one approaches that task varies enormously but the aim is similar.

Although HCJB may have been the first of the major international Christian broadcasters it is by no means the biggest. Today, organisations like Trans World Radio and Far East Broadcasting Company have more stations to their name than the pioneers.

Trans World Radio now transmits from seven sites around the world. Unlike some of the other organisation, TWR rents much of its air time from other broadcasters, although it owns its stations on Bonaire in the Netherlands Antilles (in the Caribbean), Guam in the Pacific and in Swaziland. The Scandinavian based IBRA Radio have also taken the decision to rent transmitter time - sometimes from the other Christian broadcasters and sometimes from stations such as Radio Trans Europe in Portugal and Radio Mediterran in Malta.

Sharing Resources

It would probably be true to say that the various Protestant Christian broadcasters have broadly focused their activities in specific regions and there is an increasing emphasis on sharing resources so that duplication of service is avoided. Increasingly, too, the missionary stations are focusing their efforts and attention of what might be considered to be minority languages. In the past ten years some 40 new language services have been added to the combined schedules of the stations in languages such as Uzbek, Azeri and Georgian. Other languages are being actively planned.

Technical Developments

The fact that the stations are broadly religious in their activities doesn’t mean that they are technological backwaters. HCJB, for example, operates a research and development team which designs and builds new transmitters for both the h.f. and v.h.f. bands. These developments are made available to their partner organisations.

SIM’s Radio ELWA in Monrovia, Liberia, went back on the air in January using an HCJB-designed and built portable f.m. transmitter. Its signals can be heard within a 50 mile radius around Monrovia.

ELWA was a powerful gospel voice in West Africa when it was caught in the crossfire of Liberia’s civil war in August 1990; the international transmission site was levelled. SIM officials decided to replace the station using HCJB’s portable f.m. transmitter, which is small enough to fit in a suitcase.

The broadcasters have also been active in investigating the use of satellite delivery techniques.

As the end of the Millennium approaches the international christian broadcasters are adjusting their approach to the task of broadcasting so that the new techniques and the latest technology are used with the aim of sharing the message of God’s love world wide.

Andrew Steele has many years of experience with HCJB, both in Ecuador and as the Executive Director of HCJB-UK in Bradford. He is also Chairman of the Evangelical Missionary Radio Committee. Here he gives us a brief overview of what religious broadcasting is about.
MVT-5000 scanner £229
25-550MHz & 600-1300MHz AM/FM
The MVT-5000 is a superb budget priced scanner with amazing sensitivity added to which it is very simple to use. The only gap in its range is the TV broadcast band and if you can live with 100 memories it offers incredible value! Hundreds are in use, many by professional users and like all Yupiteru equipment it has proved to have unsurpassed reliability. Available from stock with our 12 month parts and labour warranty.

SONY SW-7600 £149
200kHz-30MHz + FM BROADCAST
SSB/CW/AM
Includes free AC supply aerial and case!
The classic portable for those on the move who want to keep in touch with the world of broadcasts. In addition it gives good reception of SSB and is a travellers joy! All our stocks are genuine UK Sony.

SONY ICF-2001D £289
150kHz-30MHz + FM + airband
USB/LSB/CW/AM (sync)
Includes free universal AC adaptor
If you want a truly portable communications receiver that performs as well as base station models yet fits into the domestic scene, look no further. At £289 it would be good value. At £299 it’s an absolute bargain.

YUPITERU VT-225 Military & Civil Airband Monitor
The VT-225 is the new exciting monitor from Yupiteru. It covers the full VHF and UHF airbands with a sensitivity that leaves its competitors standing! This dedicated receiver is surely going to become the reference from which all others will be judged. Our stocks are direct from the factory with English handbooks and of course an officially backed factory warranty. Phone or write today for the full information on the new "industry standard" receiver.

SONY ICF SW77 £349
150kHz-30MHz + stereo FM
AM/SSB/CW
The SW-77 is the latest short wave portable from Sony. It integrates computer technology to provide a programmable data base of station names in its memory bank. Also included are 5 different timers and 162 preset stations. Fabulous!

Lowe HF-150 £329
USB/LSB/CW/AM (sync)
30kHz-30MHz 12vDC/230V AC
The HF-150 receiver is a high performance short wave receiver that we can recommend for those on a budget. Make no mistake, this receiver really does perform. Give us a call for more information.

YUPITERU MVT-7000 £289
1MHz-1300MHz FM/AM/SSB
Includes ni-cad pack and charger
The Yupiteru MVT-7000 is the very latest scanning receiver to leave the factory, being a complete update of the MVT-500. Its sensitivity is unsurpassed and its logical controls and beautiful design make it one of the smartest and slimmest scanners around. Our professional customers love it and you will too when you try it. Fully featured it has 200 memories, extensive scanning features, is fully programmable and even has an adjustable contrast control on the LCD. To try it is to buy it, so be warned!

NEW!
VT-225 VHF/UHF airband monitor
AM/FM 108-142/222-291MHz. Superb sensitivity, 100 memories - Phone! (see above)

AR-1500 £299
2MHz-1300MHz FM/AM/SSB/CW
Yes it's true, a hand held scanner that gives you SSB and CW reception. We are hoping to have supplies available by March of this self contained all mode receiver. New from AOR, this promises to be the most comprehensive scanner yet. If you want full details, phone or write for the full specification. And remember as the UK's largest stockest of receivers, we can offer you the kind of back-up service that such an advanced product needs.
"Professional Grade" Scanner
DJ-X1. 500kHz-1.3GHz

"A Scanner of Unrivalled Performance"

**Specification:**

- **Modes:** AM/Narrow FM/Wide FM
- **Steps:** 5, 9, 10, 12.5, 20, 25, 30, 50, 100kHz
- **Antenna:** 50Ω BNC
- **Supply:** 6-15V DC (Internal 9V AA) 24mA (Battery save.)
- **Dimensions:** 110 x 53 x 37mm
- **Weight:** 370g
- **Configuration:** AM/FM Triple conversion
- **Sensitivity:** NBFM -8dB (12dB SINAD) AM -2dB (10dB S/N)
- **Memories:** 100 in banks.

Up until now most handheld scanners have been large and cumbersome with low grade plastic cases using technology that has been around for several years. The arrival of the ALINCO DJ-X1 has changed all that. This brand new receiver is ruggedly built, compact, and above all, ultra sensitive. ALINCO are the first major manufacturer of communications equipment to produce a new generation of scanning receiver. All of a sudden its competitors seem drab, old fashioned and lacking in sparkle and performance.

The new exciting DJ-X1 should be available now at your local dealer. Try it out for yourself, experience the superior design and performance. Compare it with "yesterday's" models and find out just how far advanced the new ALINCO scanner is! But just to whet your appetite, here's a few of its features:

- 3 scanning speeds
- 3 scanning modes
- 100 memories in 3 banks
- Auto memory loading
- Priority channel
- Dual rate battery saver
- Large battery pack
- Rotary frequency control
- Illuminated key pad
- Auto illumination mode
- Dual antennas
- 5 programmable bands
- Widest range of frequency steps
- Super front end sensitivity
- Memory lockout
- Mode scanning
- Auto power off
- Wide range of accessories
- Intelligent mode programme
- Rapid tuning rates of 1MHz/10MHz.

*Each unit now comes with the UK Gold Seal Warranty. Look for the sign on the box!*

**ALINCO STOCKISTS:**

AVON: G4TJB (0934) 512757 : Uppington Tele-Radio Ltd (0272) 557732 : Amdai (0272) 693352

BUCKINGHAMSHIRE: Photo Acoustics Ltd (0908) 610263 CAMBRIDGESHIRE: Link Electronics (0733) 346790

CHESHIRE: CB7 Communications (0730) 589640 : Flightdeck Ltd 061-499 9350 CORK WALL: RV Heming (0677) 872191 : Marine Instruments (0352) 312414 COUNTY DURHAM: Border Communications 091-406 6699 DORSET: Poole Logic (0203) 603093 FIRE: Etronics 010-33231 61007

UPCOMING MARCH 1992: Long Comms 010 353737152 ESSEX: Waters & Stanton (0702) 206835 : Selectronics (0268) 691481


The religious broadcast stations offer the listener a wide variety of programmes in a wide range of different languages. Although their primary aim is to spread the Gospel as widely as possible throughout the world, they also offer programmes aimed specifically at the DXer. Here Dick Ganderton looks at some of these stations.

Radio Vatican's transmitting centre at Santa Maria di Galeria. The statue of the Archangel Gabriel with the appropriately shaped antenna pylon supporting some of the station's antennas.

Broadcasting
The Gospel

The oldest religious broadcasters have been on the air for just over sixty years. Marconi himself was asked by Pope Pius XI to build a radio station within the then new Vatican State as far back as 1929. The station was inaugurated in 1931 with a speech, by the Pope, in Latin that was heard all over the world. One of the first programmes broadcast was a scientific news programme, again in Latin, about the Pontifical Academy of Sciences! In 1939 new studios were set up in the Palazzina Leone XIII, originally the Vatican Observatory and the ceremony and coronation of Pope Pius XII broadcast, in nine languages. Throughout World War II Vatican Radio remained an important source of information.

By the end of the war it was decided that more powerful transmitters and antennas were required and in October 1957 the new station at Santa Maria di Galeria, 30km north of Rome, was inaugurated. By 1958 Vatican Radio was broadcasting some 20 hours a day in 32 different languages. Now this has risen to 48 hours daily in 34 languages, requiring a staff of over 400 people.

Marconi's original transmitter for the Vatican was located in a little building, which is still in use, on the top of the Vatican hill. The Santa Maria di Galeria site is some ten times the size of the entire Vatican State and for short wave broadcasting has two 500kW Telefunken transmitters feeding into two rotating antennas. One of these is 76m high and 85m in diameter while the other is 106 by 87m, turning on rails. There are also two ASEA Brown Boveri 250kW automatic transmitters and five 100kW transmitters feeding into 25 fixed horizontal curtain antennas. There are also medium wave transmitters on the same site.

Way of Life

Also tracing its origins back to 1931 is La Voz de los Andes otherwise HCJB broadcasting from Quito, Ecuador. HCJB is not just a radio station, it is a way of life for the Ecuadorians, running hospitals, operating mobile medical clinics and flying missionaries, nurses and doctors into the Amazon jungle.

I covered HCJB in a series of articles written after we returned from the Short Wave Magazine/HCJB DXpedition to Ecuador last year. Technically, the radio operation is fascinating and highly efficient and organised. The sheer scale of the short wave antennas sited high up in the Andes is awe inspiring, the organisation needed to produce the current programming output in so many different languages mind-blowing and the dedication of the English Language Department to short wave radio amazing.

HCJB is one of the religious broadcasters who really appreciate the DXer. Send them a genuine report, with IRCs, of course, and not only will you get back a QSL card, but if your report contains something of interest about yourself then you are likely to hear Ken MacHarg reading it out on his Soludas Amigos programme! John Beck runs a weekly programme, Ham Radio Today, aimed at the radio amateur while Rich MacVicar host the weekly DX Partyline programme.

HCJB is also one of the pioneering short wave broadcast stations experimenting with s.s.b. transmissions. Try listening on 21.455 and 25.950MHz u.s.b. if your set has s.s.b. capabilities. If not then you can still receive it as they inject some 30% of the carrier for this very purpose.

QSL Cards and Newsletters

QSL cards from the religious broadcasters are often of technical interest and show various aspects of their installations. Antenna farms are a favourite subject, probably because not only are the locations spectacular, but the amount of metal and wire up in the sky is amazing as well. I suppose that these huge antenna arrays are like a modern technological cathedral of the airwaves! The QSL cards are also a way of showing the broadcasters' sponsors something of what they are doing with their donations.

As well as QSL cards many of the stations publish regular newsletters and magazines. Monitor Month is a Newsletter about The Christian Science Monitor and carries news items and short articles.
about the activities of the World Service of The Christian Science Monitor and The Herald of Christian Science. For example, in the September 91 edition there was an interesting article about how American schools are using short wave broadcasts such as the World Service of The Christian Science Monitor to enhance their lessons. World Service of The Christian Science Monitor broadcasts news Monday through Friday transmitted from WCSN, WSHB and KHBI.

HCJB is another broadcaster running a club for DXers. Membership of these clubs is not free, but is not very expensive either. If you are interested then I suggest that you write to the station concerned, asking for information on membership. Equally, you should not expect to receive the various goodies offered, such as QSL cards, badges, stickers and pennants for nothing. The cost of running a short wave station such as HCJB is very expensive and is carried by donations and volunteer activity. The very least you can do is send a couple of IRCs for the postage. You can also obtain copies of the current broadcasting schedules by writing. It is essential that you have the current schedules as these change during the year and, although reference books such as World Radio Television Handbook give you a wealth of information they can only give you the schedules available at the time of publication. WRTH does offer a regular update service, but there is nothing like the genuine schedule from the station itself. Don't get me wrong, you should have your own up-to-date copy of WRTH by your logbook, but supplement it with information from as many sources as you possibly can.

Partnership

Several of the religious broadcasters work together in partnerships so as to share the high cost of developing the technology needed to continue with their work. For instance HCJB works closely with FEBC, FEBA Radio and SIM (Radio ELWA). HCJB has its own design and development centre in the USA that designs and builds its own high power short wave transmitters as well as v.h.f. f.m. ones. It is the latter that they have recently used to get Radio Elwa back on the air after the civil war in Liberia.

Another well-known partnership is that of Trans World Radio. Trans World radio operates high-power, short wave transmitters from Monte Carlo, Cypress, Swaziland, Sri Lanka, Guam and Bonaire. These transmitters carry programmes on behalf of a variety of religious broadcasters. Evangeliums-Rundfunk, an international organisation consisting of ERF Germany (Wetzlar), ERF Austria (Vienna) and ERF Switzerland (Zurich), is one of these partners. Others in Europe are ICM in Italy, Mecovan in Spain, The Messengers in Finland, Koren Radio in Denmark, Radio Evangile in France, Trans World Radio in Holland and Trans World Radio in the UK.

America

The United States has a large number of religious broadcasters. In fact, it is probably true to say that a large proportion of the world's evangelical stations are in some way connected with the various churches in the USA, be it personnel, technology or simply funding. Although many of the stations are sited outside the US, there are still some interesting ones that can be heard in Europe broadcasting their message from various parts of the States. One of the best known is probably WYFR, otherwise known as Family Radio, based in Oakland, California, but with their transmitter sited at Okeechobee, Florida and a relay via Taiwan. KNLS is the call sign of the station operated at Anchor point, Alaska by World Christian Broadcasting. It beams its broadcasts towards Asia, but it can be heard in Europe, as well as the rest of the world. KNLS tries to express their message without preaching or begging and they are fully financed by donations from individuals and churches who are interested in reaching out to others.

Another broadcaster that doesn't own its own transmitters is IBRA Radio, based in Sweden. IBRA buys its airtime on about 80 transmitters of all types around the world. On short wave it uses Radio Trans Europe in Portugal, Radio Mediterrane on Malta, FEBA on the Seychelles and FESC in the Philippines and broadcasts in 30 languages to about 100 countries.

The old Spanish Bridge, Southern Guam. Transworld Radio Station KTWR is on Guam.
The new f.m. antenna in the Vatican Gardens.

around the world with their message. The station receives mail from all over the world.

Of course, there are also hundreds of local stations, both a.m. and f.m., in the US, which you would not expect to hear over this side of the Atlantic except under exceptional conditions. Back to the Bible operates a wide network of such stations as well as using short wave transmitters around the world such as TWR in Monte Carlo, KTWG on Guam, FEBG on Manila, and HCJB in Quito, Ecuador amongst others.

WACRAL

Not strictly a religious broadcaster, WACRAL - the World Association of Christian Radio Amateurs and Listeners, was formed by a Methodist minister, the late Rev. Arthur Shepherd G3NGF, in 1957. The main aim of WACRAL is to promote Christian friendship and fellowship world-wide through amateur radio. Membership is spread around the world and all members receive a quarterly newsletter. I heard that, as I was preparing this article they had enrolled member number 1000. You do not need to be a licensed radio amateur to join WACRAL, although you do need a Christian commitment and an interest in the hobby, including, of course, short wave listening. Many members specialise in receiving and listening to the many Christian broadcast stations active around the world, some of which I have mentioned in this article. Others may be found by looking in WRTH.

Addresses

Back to the Bible: Bawtry Hall, South Parade, Bawtry, Doncaster DN10 6JH. or Box 82808, Lincoln, NE 68501 USA.

Evangeliums-Rundfunk: PO Box 1444, W-6330, Wetzlar, Germany.

FEBA Radio: Ivy Arch Road, Worthing, West Sussex BN14 8BX.

HCJB: La Voz de los Andes, HCJB, Cassila 691, Quito, Ecuador, S. America.

HCJB:UK: 131 Grattan Road, Bradford, W. Yorkshire BD1 2HS.


International Lutheran Laymen's League: 2185 Hampton Avenue, St. Louis, Mo 63139-2983 USA.

KNLS: PO Box 473, Anchor Point, Alaska 99556.

SIM (Radio ELWA): PO Box 192, Monrovia, Liberia.

Trans World Radio: PO Box 2020, NL-1200 CA, Hilversum, Netherlands.

Vatican Radio: Vatican City.

WACRAL: Garth Martin, General Secretary, 88 Tennyson Road, Cheltenham GL51 7DB.

World Association for Christian Communication: 37 Kennington Lane, London SE11 5QY.

World Christian Broadcasting: 3303 North Third Street, Suite H, Abilene, Texas 79603 USA.

World Service of The Christian Science Monitor: PO Box 860, Boston, Massachusetts 02123 USA.

WYFR: Family Radio, Oakland, California 94621 USA.
Why not pay us a visit and watch the aeroplanes at the same time. We have two shops, one on the first floor by Mag-Lev (have a free ride to BR station and back) and one in the airport's viewing gallery (viewing gallery open everyday - admission 30p).

Airband radios from £9.95 and scanners from £149 plus a variable selection of good secondhand and part exchange models.

We stock radios by Fairmate, Jupiter, Icom, Steepleton, Texet etc., models and prices to suit you.

Come and see the finest range of books on aircraft and associated subjects there is; by publishers such as Ian Allan, Airlife, Pulman, PSL, Haynes, MCP and many more. Air maps, frequency charts, books on ATC, even books on how to fly a Cessna or a Jumbo Jet, we stock 'em all. Books for the student pilot and PPL, checklists, flight cases, current topo charts always in stock, nav-flight computers and much more. We also stock aviation postcards, posters and badges (callers only). Can't visit? Then send £1 for our mail order catalogue or telephone us on:

021 782 2112 or Fax: 021 782 6423

We accept all major credit cards and cheques with bankers caru

GAREX ELECTRONICS

WIDEBAND SCANNERS

At major brands available, with all the important service back-up. AOR, BLACK JAGUAR J2L, REVOED, ICOM: YUPITERU. Also good stock of secondhand sets. Ask for list.

"SCANMASTER" Scanner Controller, versions for AOR5000, REGENCY MX5000, ICOM ICR7000, VESSEL FR5000. Built in software expands the scanner to over 700 memories, with automatic logging and a host of features. Operates with a dumb terminal or any computer in terminal mode. £153.25

WIDEBAND ANTENNAS

"REVECOMM" quality British VHF-UHF, Dcoo guaranteed free from exaggerated claims! 50239 connector...

£37.75

N type connector for improved UHF performance...

£39.80

Optional vertical whip feature for experiments.

"RADAC" nests of dipoles, intact but not equalled. Guaranteed Tx capability over customer specified 6 bands in the range 27-470MHz, with excellent wideband Rx performance.

£88.99

S0239 conn: £86.85 N-type: £88.99 Special VHF-UHF Airband RADAC, 108-199MHz and 220-400MHz Top quality cable and connectors also available.

WIDEBAND PRE AMPLIFIERS

NEW GAREX GA-4 SERIES. 20MHz - 1GHz, instrument grade, amplifier precision stripline construction for exceptional stability. 9db gain at 1GHz with filter to reduce HF breakthrough problems. GA-4AVN in-line Headset Amplifier COMPLETE with stripline DC supply unit, requires 12v DC at 30mA. N connectors...

£48.50

GA-4NS, in stave, for Perno connections, reduced performance...

£48.50

' localize issues, various size DC packa... for 12v DC operation...

£19.45


Mainly adaptor for use with any of the above preamps...

£9.05

DC Supply Block: a precision device for powering handheld amplifiers via Co-ax, suitable for 25MHz - 250MHz with SWR better than 1.31, insertion loss less than 0.05dB. N connectors...

£33.95

Also with S0239 sockets (reduced performance)...

£28.35

MOBILE ANTENNAS

REVO super Mag-munt £5 8-30MHz...

£25.75

Mag-munt 4 x 45dB 70cm...

£25.75

Body-mount 1/2 or 3/4 wave (103characters)...

£20.35

3/4 wave mount + 70cm cable (4.5dB)...

£20.35

Mag mount with 3/4 600MHz who improves the performance of your cell phone or 900MHz scanner, in the car or on the office filing cabinet...

£27.75

REVO wideband gain with the tuned matching unit for peak efficiency; 2M or 1200; standard model (46.95). Deluxe hi-gain who model: £47.95. 4MHz with 4KW feeder. Rugs on request.

Write, phone or fax for prices. Regular prices, components and bargains for callers. Open 10am - 5pm Mon - Fri (occasional Sat). ALL PRICES INCLUDE UK CARRIAGE AND VAT AT 17.5%.

THE AVIATION HOBBY CENTRE
1st FLOOR, MAIN TERMINAL BUILDING.
BIRMINGHAM INTERNATIONAL AIRPORT
BIRMINGHAM B36 3QJ
Telephone: 021 782 2132 - 782 6560

OPEN 7 DAYS A WEEK (including bank holidays)

Why not pay us a visit and watch the aeroplanes at the same time. We have two shops, one on the first floor by Mag-Lev (have a free ride to BR station and back) and one in the airport's viewing gallery (viewing gallery open everyday - admission 30p).

Airband radios from £9.95 and scanners from £149 plus a variable selection of good secondhand and part exchange models.

We stock radios by Fairmate, Jupiter, Icom, Steepleton, Texet etc., models and prices to suit you.

Come and see the finest range of books on aircraft and associated subjects there is; by publishers such as Ian Allan, Airlife, Pulman, PSL, Haynes, MCP and many more. Air maps, frequency charts, books on ATC, even books on how to fly a Cessna or a Jumbo Jet, we stock 'em all. Books for the student pilot and PPL, checklists, flight cases, current topo charts always in stock, nav-flight computers and much more. We also stock aviation postcards, posters and badges (callers only). Can't visit? Then send £1 for our mail order catalogue or telephone us on:

021 782 2112 or Fax: 021 782 6423

We accept all major credit cards and cheques with bankers caru

practical Wireless

M O R S E - W E E K E N D

Worry about the Morse test? Are you all 'keyed up' about Morse? Does the prospect of getting an 'A' licence 'bug' you? Do you want to put that final 'polish' on your 'keying'? And do you then want to have the opportunity to take your test, while you’re enjoying a 'short break' weekend holiday?

If so, why don’t you put your name down for the Practical Wireless Morse Weekend? For around the £160 mark, we’re planning to provide meals and accommodation in a good quality, comfortable Hotel. The weekend will start on the Friday evening, and finish after lunch on the Sunday. You will have the opportunity to have some Morse tuition, before you take the Morse test itself. You’ll also have the chance to see and try all the latest aids for c.w. working in amateur radio, meet the experts, other 'key' enthusiasts and have fun at the same time.

OTHER ATTRACTIONS

Originally planned for the late spring, we’re now looking at a weekend in September. There will be other attractions for friends and family members not joining in with the amateur radio events. Don’t forget that we’re very close to the delights of the New Forest, the Hampshire and Dorset sea-side resorts and some delightful ‘Stately Home’ attractions. With that in mind, we plan to organise some coach trips so that the weekend will have something for everyone.

EXCELLENT COMMUNICATIONS

Communications to this part of the UK are excellent. We’ve got superb train services from the north and Scotland and even abroad if need be! If you’re interested, please send a fully refundable deposit of £25 per person to:

PW Morse Weekend, Enefco House, The Quay, Poole, Dorset BH15 1PP. Tel: (0202) 678558.

Alternatively, if you want to hear more about the Morse Weekend, why not call Bob Mannion G3XFD to talk about it? (Between 3 and 4pm please!)
The Easy Wire Antenna Handbook
by Dave Ingram G4TJW

What's the least expensive and most effective way to equip your new transceiver, QRP rig or classic transmitter and receiver setup for world wide radio communications? Use a homemade wire antenna naturally! This book is dedicated to fulfilling that exact purpose, and it's chock full of ready-to-use designs and dimensions on both "basic" and "gain" antennas. There is information on hidden and disguised antennas, tuner and baluns, SWR meters, noise bridges, converting any antenna's dimensions to your favourite HF-band and more - much more!

Whether you are anxious to join the action on a recently acquired band, seeking a better radiator for your favourite HF band, or getting ready to put your very first signal on the air this book is your guiding source of information. Its contents are "user orientated" rather than technical. It features large diagrams and easy to read text.

£6.99 plus £1 post - overseas £2.50

Write or phone for our free catalogue

AXDON BOOKS
Ref: SWM92, 32 Atholl Street, Perth PH1 5NP, Scotland UK
Sales line 0783 30707

The RTTY Listener
edited by Fred Osterman

A compilation of the RTTY Listener Newsletters
issues 1-25 this book is primarily aimed at owners of the Info-Tech M-606 frequency division multiplex demodulator, and later models such as M-6000, M-800 fax converter and the universal radio M-7000. It is full of information on where to look for signals and how to connect to your equipment.

The book also includes details on: • Baudot • TDM (Moore) ARO M-2 • ARO-E and ARO-E3 • Packet • Slot A/B • FDM (VFT) • Facsimile (FAX) • Morse code • ASCII • Bit inversion. This book is a must for the serious RTTY listener.

£16.95 plus £1.75 post - overseas £3.25

"Word's 25th Anniversary Year will see the release of new albums from Adrian Snell, Iona, Marilyn Baker - the introduction of the "Praise-Him" series, a special 25th Anniversary series, more from the "Adventures in Odyssey", and, in September - the launch of the NCV Youth Bible.
World by 2000

'World by 2000' is the name given to an ambitious project that was initiated by the presidents of the major international Christian broadcasting organisations back in 1985. Its aim is to add to existing foreign language services, so that by the year 2000, every country in the world can be made aware of the gospel message.

FEBA Radio, broadcasting from the Seychelles, answered the call and over the past few years has added 11 new languages to its radio output. In the current round, three more have just made their way on to the schedules and FEBA's Programming Director, Tony Ford, has been telling Trevor Barnes about the specific problems of introducing Hindko broadcasts to the people of northern Pakistan.

Tony Ford

Hindko is probably one of the easy ones at least to get the first step going because there is a group called Team working in Pakistan. An American-based mission organisation, they've had a medical worker in the area where Hindko is spoken for many years. So we've had contacts with and they had people who were able to get this medical radio programme on the air for us, as well as the general magazine programme that looks at Hindko culture and so on.

Trevor Barnes

When you talk about a language, of course, you're not just talking about it in isolation, it is intimately bound up to a particular culture. How do you begin to get foreign ideas like Christian ethics, the Biblical story, Christian values across to a totally different culture?

Tony Ford

The first thing is to find people from that culture. This is one of the peculiarities of FEBA radio that we have a policy of wanting to use people who are born to that language, it's their mother tongue. Therefore, they bring a lot of their culture. The difference between the culture in these areas where we've been broadcasting to and the Bible is far less than you might imagine. The Bible is agricultural, it talks about very simple life styles and very often that matches much more the lifestyle of the people we're broadcasting to than our own lifestyles here in the West. It's when you get to the theological meaning behind the Bible Stories that there are differences especially if you're broadcasting into an area with its own religion already.

Trevor Barnes

Now this, of course, is the situation in Azeri, one of the other new languages you're introducing. Now you're talking about 17 million people in Northern Iraq, another seven million people in Azerbaijan itself. There must have been particular difficulties introducing this (a) at a time of civil and political unrest and (b) in an area which contains, presumably, the most committed Muslim population anywhere on earth?

Tony Ford

The solution with Azeri broadcasting is like others where we're broadcasting to strongly Islamic regions where it would be very difficult for any Christian activity to take place there. We're actually using an Azeri by birth, now living in the West who has become a Christian. So that, yes, making the programmes is one thing, but actually holding an audience is another and making the programme relevant to the people in that part of the world is a continuing challenge day by day.

Trevor Barnes

Do you meet any official Islamic opposition along the way?

Tony Ford

No. I think I'm fairly sure in saying that. We're always aware of the tension between certain elements in Islamic life and Christianity, but officially, no. We've never had any official opposition.

Trevor Barnes

Moving next to the final language you're introducing in this current round, namely Yezidi, being broadcast to the unevangelised of Malawi. In this case you presumably have to have more than just a language programme? The wireless won't do things - I mean if people find it uninteresting or unpenetrable they merely switch off. Presumably you have to have people on the ground, back-up teams and so forth?

Tony Ford

Yes, and our broadcasting is a very good example because groups in Malawi that are involved in this radio project are quite wide. We've got denominational groups, as well as Bible Society and various mission groups in different parts of the world. As well as Malawi and Evangelistic groups, we have people on the ground going and talking to people in the market places and so on. So we are all aware of one another's activities and we're planning together. We have the Bible Society, for example, printing scripture portions and literature, which will help the radio programmes and then the people in the market places would be talking about the radio programmes. Radio plays a particular part - to use an agricultural metaphor, softening up the ground and then sowing the seed - and other people then come along and nurture and tend and working together we sow fruit for the gospel.

Further information about FEBA Radio can be obtained by sending an s.a.e. to:

FEBA Radio, Ivy Arch Road, Worthing, West Sussex BN14 8BX.
The Japanese Sony Corporation is the world’s largest manufacturer of portable short wave radio receivers and has recently updated the top end of its range with two new sophisticated sets. The SW77 is described as having the most advanced technology in world band receivers. Peter Shore has tried the new set and tells us what it offers to the short wave listener.

As market leader in world band radios the Sony Corporation invests a tremendous amount of research and development into new models. The new SW77 is the result of many years work and follows the successful ICF-2001D (or 2010 in North America) which has been the top of the Sony range since 1985.

One of the aims of the Sony engineers has been to make short wave listening easier for people who are neither dedicated DXers nor enthusiasts. This has been achieved to a great extent by allowing 162 frequencies to be stored in the receiver along with a six-digit station identification. This does away with need to remember a large number of frequencies used by different stations and will prove a boon for travellers as well as for occasional listeners to the short wave bands. We’ll look at the memory facilities in greater detail shortly.

The new receiver is a similar size to its predecessor (276 x 172.5 x 46.5mm) but more attractively styled with the square edges of the 2001D giving way to curves and corners. It runs on four large ‘C’ size batteries or a 6V d.c. supply using the adaptor which is included with the set.

**Principle Facilities**

In the UK version the SW77 offers coverage from 150kHz through to 29.999MHz continuously together with v.h.f. f.m. from 76.0 to 108.0MHz and stereo listening is possible through headphones. Unlike its predecessor air band is not covered. Single sideband reception on a.m. is available with switchable upper and lower sideband switches and wide and narrow filters are also selectable during a.m. reception. The synchronous detection mode first offered by Sony on the 2001D has been enhanced and is included in the SW77 - of which more later. The loudspeaker takes up the left hand third of the front of the set with the main controls and the digital displays on the right hand side. One of these two liquid crystal displays provides visual operating data and another a clock and multi-function timing device. Both the displays have backlighting for night-time use as well as adjustable contrast. On the left hand panel are the sockets for connecting an external antenna, headphones, line out to a recorder or amplifier and an external power supply. On the right hand panel are the usual volume and tone controls: volume is adjusted by a slide control and separate bass and treble knobs allow tone adjustment. On top of the set in a pop-up panel is a world time slide device giving speedy time conversions from local time to UTC or to another time zone. The receiver has a sleep function and a sophisticated timer and alarm to provide automatic switch on and off as well as offering remote recording possibilities.

**Operating the Receiver**

At first glance the receiver looks rather complicated, and indeed for all but the main functions it is necessary to read the comprehensive handbook which runs to some 34 pages. The set is powered up by means of a push button switch which can be locked off to prevent accidental switch-on in transit. The last tuned station is selected and the frequency is displayed on the larger of the two displays in either kilohertz for long, medium or short wave or in megahertz for f.m. frequencies. A vertical signal meter calibrated in ten units gives an indication of the received signal strength and in practice offers a reasonably accurate indication.

Frequencies can be entered direct using the numeric keypad: to call up WCSN using 13.615MHz for example, select a.m. and then enter 1 3 6 1 5 followed by EXE for execute and the frequency is immediately selected. Should an invalid frequency be entered (outside the set’s coverage for example) TRY AGAIN is flashed across the display panel. Frequencies on the f.m. band such as 102.2MHz do not need the decimal point entered so the entry order is FM and then 1 0 2 2 followed by EXE. The

Short Wave Magazine, May 1992
Band Receiver

reception mode is indicated in the display panel: whether WIDE, NARROW, USB, LSB, SYNCH U or SYNCH L. For manual tuning, the rotary tuning knob—or jogger, as it has been christened by Sony—is used. This is on the front panel and is therefore turned on its surface and not, as is more usual, on the edge of the knob. The SW77 has adjustable tuning rates down as far as 50Hz on a.m. frequencies although the digital frequency display only shows frequencies to 100Hz. A FAST/SLOW button allows tuning steps to be increased to 1kHz to enable rapid tuning across the bands. Unlike the 2001D, if fast tuning is selected, the frequency step automatically assumes a round 0 or 5kHz instead of, say, 15.515.6kHz. Tuning steps in f.m. mode are 50kHz. The tuning knob (or jogger) can be locked or alternatively all the operating keys can be disabled using the KEY PROTECT button. Scanning is available but on short wave it is only possible within the limits of the broadcast bands in 5kHz steps and once the upper limit is reached, the set bleeps and starts scanning again from the lowest frequency in the band.

The most significant feature of the SW77 as far as tuning is concerned is the provision of pre-programmed memories. Some 82 of the 162 memories have been pre-programmed into pages with frequencies and names of the major international broadcasters, from the BBC to Radio Luxembourg to Radio Australia. Each of the 20 pages of the electronic memory is divided into five sub-sections assigned to different stations. Each sub-section holds ten different frequencies. In addition to storing the frequency, the times of operation of each channel have been recorded and provided that the set’s main clock has been correctly set to Greenwich Mean Time (or UTC) an indicator on the i.c.d. shows whether the channel is ON AUR. When frequencies or times of operation change it is possible to write new data to the memories. Whilst most of the pre-programmed frequencies are accurate, some stations have received short shift from Tokyo: Radio Beijing for example benefits from just one pre-programmed frequency. There are also two ‘quick pages’ which can be used for most often listened to stations—those which broadcast news regularly, perhaps, or programmes of a particular interest—and one timer page used for memorising stations to be tuned at particular times. The number of memories should be sufficient for even the most ardent listener and the provision of factory-programmed frequencies and the easy to read digital display is of particular help to people who do not listen regularly to short wave broadcasters.

A feature first introduced by Sony on the 2001D and included in the SW77 is synchronous detection. This should reduce distortion or fading of broadcast features. A pure carrier is generated in the synchronous detector circuit and mixed with the received signal to compensate for attenuations in the signal caused by fading, reducing distortion. If interference is caused by stations on adjacent channels, the circuitry chooses the sideband clear of adjacent channel interference allowing improved reception. On the sample used for this test, the synchronous detector performed reasonably well, reducing distortion or interference, but when the detector locks, much of the bass of the audio signal is removed leaving somewhat watery and unpleasant audio. This is something which needs to be considered by Sony’s engineers. Sensitivity and selectivity can be altered on the receiver: a wide and narrow filter switch and a three position control offers DX, NORMAL or LOCAL sensitivity.

Performance

The SW77 offers average performance and certainly the model tested placed alongside other Sony receivers including a five year old 7600DA and a 2001D did not seem to perform significantly better. Indeed, sensitivity was not as good as the two older sets. Test measurements with the filter set to WIDE suggest that sensitivity ranges from around -90 to -75dBm for 15dB signal to noise ratio which suggests only average sensitivity. Selectivity rates somewhat better, though, with 38dB down at 6kHz and >70dB down at 10kHz. Image rejection is good at around 73dB. Overall, performance was disappointing and did not offer any real improvement over the SW77’s predecessors. Battery consumption is high at 172mA and means that a set of alkaline batteries will last for a little over 20 hours. It is therefore cheaper to use the mains adaptor supplied with the set.

Conclusions

The new ICF-SW77 is a well thought out short wave receiver and one which is designed to make listening as simple as possible for the man in the street as well as appealing to DXers and enthusiasts. The large number of memories makes tuning easy and the sophisticated timer and remote record connection are very useful. It takes time to master all the set’s facilities and the operating instructions are not as easy to follow as perhaps they might be. A separate chart is included with the instruction book showing what frequencies have been pre-programmed in the factory. The pre-programming differs according to the market the set is to be sold in, so beware if purchasing from a ‘grey market’ dealer who may have bought his stocks in the Far East, as frequencies beamed to that region are likely to be programmed into the set! Audio quality is good and stereo reception is offered through headphones on f.m.

The operating controls are easy to use, with each button having a positive action, but there is no raised ‘bip’ on the 5-button on the numeric keypad which may cause difficulty to visually handicapped users of the set. There appear to be some teething troubles with the SW77 at present, such as the appalling audio when synchronous detection is selected. It may be worth postponing a purchase for a few months until a new batch of sets comes onto the market. However, its detractions are far outweighed by the plus points in terms of value for money, although prospective purchasers must be prepared to pay some £330 for this new Sony receiver.

Abbreviations

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.m.</td>
<td>amplitude modulation</td>
</tr>
<tr>
<td>d.c.</td>
<td>direct current</td>
</tr>
<tr>
<td>dB</td>
<td>decibels</td>
</tr>
<tr>
<td>dBm</td>
<td>decibels reference one millivolt</td>
</tr>
<tr>
<td>DXer</td>
<td>listener who looks for ‘long distance’ stations</td>
</tr>
<tr>
<td>f.m.</td>
<td>frequency modulation</td>
</tr>
<tr>
<td>Hz</td>
<td>hertz</td>
</tr>
<tr>
<td>kHz</td>
<td>kilohertz</td>
</tr>
<tr>
<td>l.c.d.</td>
<td>liquid crystal display</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>mm</td>
<td>millimetres</td>
</tr>
<tr>
<td>UTC</td>
<td>Universal Co-ordinated Time (=GMT)</td>
</tr>
<tr>
<td>V</td>
<td>volts</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
</tr>
</tbody>
</table>

Short Wave Magazine, May 1992
This month, pride of place goes to the beacon section of this column in memory of Alan Taylor who died on January 9. Alan was well known for the important work he did to promote, and encourage, the use of radio beacons for the study of propagation.

For the past 20 years, he was the Co-ordinator of the International Beacon Project for the International Amateur Radio Union (IARU Region 1). Although he will be sadly missed, his work will live on each time a radio enthusiast checks a band by first listening for the signals from the world-wide network of beacons that he helped to provide. We extend our deepest sympathy to Alan’s family and his multitude of friends.

**Propagation Beacons**

I know that Alan appreciated the dedicated work of the beacon monitoring team, Gordon Foote (Didcot), Henry Hatfield (Sevenoaks), Ted Owen (Maiden), Fred Pallant (Storrington), Ted Waring (Bristol), Erm Wereick (Plymouth) and Ford White (Portland). Each month their combined logs enable me to produce the regular monthly chart, Fig. 1, which readers around the world can compare with their own findings.

Apart from providing information about the condition of the 28MHz band at a given time, the importance of these observations is shown again this time by highlighting the almost total radio-blackout on February 9. Auroral warnings were also transmitted by the German beacon DK0WCY on 101.4MHz and heard by Gordon Foote on February 2 & 10.

**Solar**

Because the sun has so much influence over the ionosphere, and consequently the paths of terrestrial radio signals, the cause of any abnormal behaviour is often found in the reports from our solar observers. For instance, in January, Ron Livesey (Edinburgh), using a 2.5m refractor and 4m projection screen, located 5 active areas on the sun’s disc on days 4, 5, 7, 9, 22, 25 & 26, on the 11th, 12th & 18th and 7 on the 10th & 31st. After several days of fog and overcast skies, Ford White saw two very large sunspots on the disc on February 26. Ted Waring counted 28 sunspots on the 7th and 31 on the 24th. Richard Gosnell (Swindon) reported, “one very large sunspot near edge”, at 1600 on the 8th and Tony Hopwood (Upton On Severn) noted solar flares on the 1st & 27th.

You can see the giant sunspot group observed by Patrick Moore at his observatory on Selsey at 0940 on February 16 in Fig. 2.

**Auroral**

Streams of particles, ejected by the sun, often cause an aurora to manifest in the earth’s polar atmosphere. Briefly, an aurora is a region of random ionization that conveniently has a strange effect on the tone of radio signals reflected from it. Because of this, wireless operators know of its existence, during the hours of daylight, when it can’t be seen anyway, or when the night sky is overcast. However, a visible aurora, depending on the amount of solar activity, displays many colourful forms and is truly a magnificent sight.

My main source of such information is Ron Livesey, the auroral co-ordinator for the British Astronomical Association who received reports of ‘glows’ overnight on January 1, 3, 4, 7 & 8, ‘quiet arc or band’ on the 13th, ‘ray bundles’ on the 11th, 29th & 30th and ‘active, moving, pulsating’ on the 3rd, 13th & 26th, from observers mainly in Scotland and aboard the Ocean Weather Ship *Camulus*. Doug Smillie (Wishaw) told Ron that he heard weak auroral reflected radio signals on the 144MHz band on the 8th, 29th & 30th and Tony Hopwood logged these, tone-A, signals on February 1, 2, 3, 26 & 29.

**Magnetic**

The various magnetometers used by Tony Hopwood, Ron Livesey, Karl Lewis (Saltash), David Pettitt (Carlisle) and Doug Smillie, between them, recorded some magnetic activity on January 1, 3-5, 10-16 & 26-30. Tony also reports disturbed conditions on February 1, 4, 27 & 28 and magnetic storms on the 2nd, 3rd & 26th. While the storm was in progress on the 2nd, Tony observed an auroral glow behind the cloud to the north between 2230 and 2300.

**Ionospheric**

Maximum Useable Frequencies (m.u.f.), which vary with the time of year, are being studied by Richard Gosnell who uses the upper h.f. and lower v.h.f. bands. He monitors the Eastern European Citizen’s Band (33-43MHz) and the Ch. R1 (49.75MHz) vision frequency to assess the morning conditions. Richard heard the pulses on 49.75MHz around 0815 on February 1, 8 & 16, echoes from D W(25.740MHz) at 1340 on the 8th & 1220 on the 15th, signals from the USA on 33.9MHz during the early evenings of the 12th, 13th, 15th, 19th, 22nd, 28th & 29th. He also heard multiple echoes from Radio Norway (25.730MHz) at 0830 on the 15th.

Fred Pallant found the 28MHz band ‘quiet’ on the 9th, 20th & 21st and reports, ‘not a single W or VE beacon all day’, on the 25th. Beacons are super indicators because their tiny transmitters are on the air, 24 hours a day, every day and their signals are subject to any change in ionospheric conditions.

**Tropospheric**

The slightly rounded atmospheric pressure readings for the period January 26 to February 25, recorded at my home in Sussex, can be seen in my ‘DX Television’ column elsewhere in this issue. While George Garden (Edinburgh) was DXing with his car radio, high on Cairn O’ Mount, on February 29, he received weak test-transmissions from a new station, Classic FM, operating in the Edinburgh area on 101.6MHz. Andrew Jackson reports hearing a new station, Linx FM, broadcasting mainly to Lincolnshire and South Humberside on 102.2MHz. It is well worth looking for DX in Band II throughout the forthcoming Sporadic-E season (May to September) and at any time during a tropospheric opening.
A few months ago Keith Elgin mentioned the intriguing Mystic Star network, used by the 89th AW (the USAF VIP transport unit) for worldwide VHF communications. I also hear a lot of these transmissions and have some additional information, which I have gathered over the years from various sources. This is also supplemented by another extensive letter from Paul H of Middlesex, which informed me of the USAF GCCS stations and operated by the White House Communications Agency. All the USAF GCCS stations and SAC 'Giant Talk' stations world-wide act in support of the USAF. Anyone wishing to use the network usually makes an initial contact with 'Andrews VIP' (callsign 'Andy'), via a phone patch, using one of the published USAF GCCS FCC call signs. The ground station will then usually tell them to QSY to a 'channel', for example '118 upper'. The 'upper' refers to a frequency pair, for example '460 lower'. Both the aircraft and 'Andy' will QSY to the frequency that corresponds with the channel and they will immediately communicate, using voice scrambling equipment.

**Scrambled!**

Obviously, the plain voice transmissions are easy to copy if you know where they have QSY'd, but understanding the nature of the scrambled transmissions is a different matter. The exact method of encoding and decoding is a closely-guarded secret, it's doubtful that even the aircraft crews know exactly how it works. What can be determined from the signals monitored so far is that the whole set-up appears to be based upon a simplex system, i.e., only one radio transmits at any one time. The scrambled signals are quite difficult to explain, they sound like a high-pitched bubbling voice which doesn't quite make sense. At the start of each 'over', there is a 1 second (approx.) high-frequency timing tone which allows both the transmitter and receiver at either end of the link to synchronise with each other; the tone is immediately followed by the scrambled 'voice'; it is sometimes followed by another two-second tone to indicate the end of the 'over'. The synchronisation is necessary so that the decoding equipment attached to the receiver can un-scramble the coded 'voice' in the right order to make it intelligible again at the receiving end.

Occasionally you will hear the radio operators mention which kind of cryptographic equipment in use, such as 'KY-3', 'VP-100' and 'KY-27', the latter is also known as 'Parkhill'. I remember a conversation with a crew-member of a C-20B Gulfstream III aircraft a few years ago; he said that they entered the channel number given by 'Andy', and the comm equipment did the tuning of the radio and a.t.u. One disadvantage with this set-up is that every time the channel and frequency pairings change, somebody has to re-enter all the new pairings into each aircraft and set of equipment. Another source claims that not all the channel/frequency pairings are locked; some may be paired with u.h.f. satellite frequencies. The frequencies are not only used for voice contacts, they can also be used RTTY (a similar system) and other computer communications.

There are many frequencies in the Mystic Star network, and only relatively few are known; confirmed channel/frequency tie-ups are quite rare (see the list in the January column, and later). Although there are a possible 999 channel and frequency pairings, many of the frequencies have more than one channel number. The channel number given by 'Andy' indicates which particular frequency and transmitting site are being used for the contact, and when you combine the channel/transmitter site or channel/frequency or frequency/transmitter site, you are into the realms of classified material. Over the past six months I have heard many contacts between SAC aircraft and 'Andy', but I have never managed to find their transmissions amongst the published frequencies. During the past 6 months 'Andrews' has frequently used 6.680MHz, and this is known to be both channel 529 and channel 1519. One recent tie-up was heard by Paul H in Newbury during late January, when 'SAM 683' was heard working 'Andy' on 11.159MHz and mentioned they were using channel 954. Keith Elgin has provided some more frequencies to try when listening to the network, and offers the following:

- 11.210 11.228 11.266 13.247 15.048
- 18.003 18.057 20.016

Not all the Mystic Star communications are scrambled, on 9/11 Keith Elgin heard SAM 29000 on its way from Amsterdam to the USA; many phonepatches were made from this aircraft by military personnel to their families and much of the conversation was about being on board Air Force 1 with the President.

*Note that the US Drug Enforcement Agency (DEA) and US Navy are also users of similar voice encryption systems, so some of the frequencies noted by me may be DEA frequencies. The DEA system was shown to good effect in the BBC-TV series 'Spooks' and in the episodes that dealt with DEA operations in Bolivia. For the record, the 89th AW are based at Andrews AFB just outside Washington DC, and they have the following aircraft:

- 2 x Boeing 747-200 (VC-25A) serials 28000, 29000
- 10 x Gulfstream III (C-20/B) serials 50049, 50050, 60200 - 60207
- 9 x Boeing 707 (C-135B/C-137B/C) serials 24126, 24127, 24130, 86970 - 86972, 56973, 56974, 26000, 27000
- 3 x DC-9 (C-9C) serials 31681 - 31683

*These usually use either their full serial, or just the 'last three', as part of their callsign. The VC-25As are the 'Air Force 1' aircraft replacing the C-137's 26000 and 27000; whichever aircraft carries the President uses the 'Air Force 1' callsign. The DC-9 aircraft are used for short range trips and are very rarely heard on f.h., however one (31683/SAM 683) visited Europe during late November, 1991, and again during late January '92.

**Kabbeef!**

In the February magazine I mentioned some new receivers, and asked if anyone had any comments on them. A letter from David R in Kent mentions the problems that he had with a new Sony SW-77. After a few days use some of the memories became unusable, so the unit was returned to the shop. It was replaced without question, even though the assistant admitted his lack of knowledge of the particular model. The replacement worked fine for a few days, and then started to suffer the same problem as the first. This unit was also returned to the shop, and has now been sent off to Sony for repair. Other than the memory problem, David says that the set performed very well, particularly on s.s.b. Fortunately David was dealing with a reputable manufacturer and dealer, so is quite likely to get a 'working radio' eventually. This is quite a new model of radio, so maybe the type has to have a while to 'settle down'. The moral is; buy from a reputable dealer.

*Mike Powell in London mentions that his new Lowe HF-150 is a great improvement on his previous Phillips D-293S. Using either a Sony active antenna or 12m long wire, he reports that he can now hear many more stations that the Phillips just didn't hear. (Thanks for the list Mike).*

Paul W in Cumbria comments on the USCG notes, also in the February magazine. Back in August '91 he heard 'Rescue 100' (an HC-130 Hercules aircraft) on a rescue operation working with 'Commsta Boston'. He wrote to the crew of the aircraft and received a computer printout of their mission. Later on, he received a letter and phone-call from the aircraft radio operator while the aircraft was on a short tour of Europe and the UK, and he was invited up to Prestwick to visit the crew. Now's that for a 'SSB Utility' QSL!
As always seems to be the case, there's a lot to catch up on in the way of short wave news from the Western Hemisphere. An unending parade of new stations, plans for new stations, new calls, new programming and so on keeps marching past.

**Eternal Word**

Around October we should be noting the initial tests of station WEVN - the short wave voice of the Eternal Word Network, which is installing a station near Birmingham, Alabama. Whenuhilly completed it will use four 50kW transmitters. Regular programming is expected to start by Christmas and all four Continental Electronics transmitters are expected to be functional by March 1993. Eternal Word is a Catholic organisation that has its own cable TV network.

The producers of the Prayertime programme on WWCR short wave, mentioned last time, have gotten the go-ahead from the US Federal Communications Commission to construct a short wave station. It's expected the station will use WWCR as its call (it already owns WJCR-FM, 90.1MHz). Plans are to convert two 50kW a.m. band transmitters for use on short wave, either separately or in combination. The station will be located at Millertown, Kentucky, about 50 miles slightly south-west of Louisville.

**Radio Miami**

The FCC has given go-ahead-and-build approval to yet another station - Radio Miami International, which will operate a 50kW station beaming mostly to the Caribbean area from Miami, Florida. The completion deadline is 18 May 1993, but a spokesman for the station says they expect to be on the air well before that date. Radio Miami International currently airs its own programmes via WRNO, New Orleans. Most of RMF's programming is and will continue to be in Spanish but they expect to have an English segment on WRNO by now - scheduled for 0430 daily on 7.465MHz. Radio Miami International may be contacted at 8500 SW 9th Street, Suite 252, Miami, Florida 33144, USA.

The same organization owns Radio Coyan International in Honduras which, as of this writing, had not yet started regular broadcasting. At least one test broadcast has been aired, however, so perhaps we can expect to hear signals from this one soon. The station will use 9.950 and 15.670MHz with 1kW.

**High Adventure Update**

The long-expected High Adventure Ministries station intended largely to beam to mainland China has, after two false starts, finally settled on a location. It will be built on the Pacific island of Palau. I don't have any kind of an on-the-air target date yet, however.

**Clandestines go Legitimate**

Political changes and peace agreements have brought two former anti-government, secret broadcasters in Central America into the ranks of legitimate operations. Anumber of years ago Radio Miskut was an anti-Sandinista station purporting to speak for the Miskito indians. It was off the air during the last several years of the Contra war but has now returned - or at least a station using the same name has. North American DXers began hearing the station a couple of months ago on 4.560MHz but it has since appeared on 5.560MHz (and announces itself as the Voice of Spanish National Radio) and runs from 0200-0500. The latter is not heard here and the former is actually 11.825 and 17.865MHz. The latter is not heard here and the former is actually 11.825 and 17.865MHz. It continues to be heard on short wave, either separately or in combination. The station will use 9.950 and 15.670MHz with 1kW.

**Spanish National Radio**

Spanish National Radio should fill in a few of the blanks in their coverage area where their powerful relay goes on the air from Costa Rica.

Speaking of clandestine stations, the anti-Castro station La Voz de la Federacion Mundial de Expresos a Politico de Cubanos, which transmitted on 7.080 a few times last year and was subsequently located and closed down by the FCC has now returned. It has been heard on a limited schedule - seemingly Fridays only, from 0130-0145 on 7.147MHz with an anti-Castro speech in Spanish and many station identification announcements.

**Colombia**

Radio Nacional de Colombia has begun an English language DX programme Colombia DX, airing Saturdays from 2300-0000. The show is hosted by Juan Carlos Paro and Jaime Molina and may be contacted at PO Box 94321, Bogota. Announced frequencies are 11.825 and 17.865MHz. The latter is not heard here and the former is actually 11.825 and 17.865MHz.

A fairly new Colombian station is La Voz de Guanana, located in Puerto Inirida, in north-west Colombia near the Venezuelan and Brazilian borders. The station uses 1kW on 3.500MHz and is heard well on some mornings around 0600. Another new station, perhaps unlicensed, is Radio Catolica on 3.580MHz. Its location is unknown.

**Ecuador**

There are two fairly new stations here, too. Radio Cumando is sometimes heard on 3.305MHz at around 0930. Radio Tucaban, thought to be in or near the town of Onya, is reported on 4.212MHz.

**RCA QSLs**

Radio Canada International may be only a shell of its former self, but their cumbersome QSL policy has been a definite turn for the better. QSLs for RCA are now handled by the well-known Canadian International DX Club, which should mean a happy end to waiting for the once-a-year blank QSL to come with your programme schedule, filling it out yourself, sending it back and waiting for it to be signed and returned. You still send your reports to RCA (at PO Box 6900, Montreal, PQ H3C 3A8, Canada). RCA sends them on to CIDX.

**WWV Info**

The US government standard frequency and time stations WWV, WWVH and WWVB are known around the world. Many, though, don't know of the many types of information WWW broadcasts through the course of an hour. Now the stations have issued a new 27-page booklet detailing the services available. You can obtain a copy by writing to NIST, Mail Station 847, 325 Broadway, Boulder, Colorado 80303, USA and asking for a copy of Special Publications 432. I'll have more news from the Americas in three months' time. Until then, good listening!
Computer aided listening

The new AR3000A receiver is an evolutionary step onward from the highly acclaimed AR3000 and many major improvements have been implemented at the request of enthusiasts. The tuning control is now "free running" to provide a smooth feel for SSB/CW, x10 Band activity and Frequency Watch (SPW) facility allows statistics about signal activity on a single frequency to be monitored both as sweep display and as an 'X' axis table format with squelch opening percentage recorded for each frequency. This is useful to indicate 'how active' the frequencies are in the programmed search range. In addition to the graphic display, ACEPAC-3A can produce a detailed numerical list from the graphical information which may be printed on an Epson compatible printer.

Offset Simplex Reconstruction (OSR) allows both sides of a simplex transmission that are on different bands to be monitored at the same time. The frequency of reports may be determined by the user.

A comprehensive listeners logbook is incorporated allowing the activity of stations to be manually recorded on disk. Print outs of logbook information can be produced and sent to your printer if connected. It is possible to add logbook entries while scanning using a single key press.

ACEPAC-3A is a new and exclusively developed multi-function IBM-PC based program to further increase the flexibility of the AR3000A and AR3000 receivers. No additional hardware is required other than an AR3000A, IBM-PC compatible computer and a standard serial lead.

The software package is designed to run in conjunction with the AR3000A which is an extremely versatile start-of-the-art receiver featuring all mode reception with coverage from 100 kHz to 2036 MHz without gaps. An RS232C port is provided ready for connection to any 'reasonably priced' PC compatible computer using a standard serial cable, the software ACEPAC-3A is menu driven for ease of operation and has basic on screen help at the touch of a button, a comprehensive printed operating manual is also supplied as part of the ACEPAC-3A package. Two disks are supplied, one 3.5 inch 720 kB format and the other 5.25 inch 360 kB. Of course you may install one copy onto the hard drive of your computer.

ACEPAC-3A can produce a detailed numerical list from the graphical information which may be printed on an Epson compatible printer.

Dear Sirs,

We have a fast mail order service.

Please send a large S.S.A.E. (34p) for further details.

AR3000A Receiver £765.00 inc. VAT
ACEPAC-3A Computer software £119.00 inc. VAT
AORSC Computer software £75.00 inc. VAT
DA3000 discone aerial £69.00 inc. VAT
WA3000 wide band aerial £150.00 inc. VAT
CR400 tape recording lead £9.99 inc. VAT

AOR \nAOR (UK) Ltd.
Room 2, Adam Bede High Tech Centre, Derby Road, Wirksworth, Derby, DE4 4BG.
Tel: 0629 - 825926 Fax: 0629 - 825927
A subsidiary of AOR Ltd. Japan

WA5000 wide band aerial £150.00 inc. VAT
DA3000 discone aerial £69.00 inc. VAT
from the longest of long wave to the top of the short wave spectrum, the HF-150 is designed to give you everything you need in a real radio receiver. There has quite literally never before been a receiver like the HF-150, because only now have technology and entrepreneurship combined in such an effective package. This is innovation at its best.

- The HF-150 is designed to be a survivor. No model before it has survived to this day. Or even to operate in many parts of the world where the HF-150 operates; and operates equally well at home and abroad. In aircraft wending their lonely way across the oceans of the sea, or travelling through the skies above your fireside or travelling with you wherever you are. Listening to radio can mean many things; news to keep you informed, weather reports to keep you safe, and music to keep you entertained.

- In electrical terms, the HF-150 is designed to give you everything you need. The specification comprehensive, covering ranges from 30kHz to 30MHz, with wideband tuning rate according to the speed of the main tuning knob. For large, high frequency shifts, a single press on the "STOP" button gives tuning in 100kHz steps; a second press returning you to the normal ultra fine tuning rate. Reception modes are Upper Sideband (USB), Lower Sideband (LSB), CW, and SSB, but also included is an all new phase locked loop system which allows selection of either synchronous or asynchronous lower sideband and synchronous double sideband. This is the arrangement for tuning the best from poor short wave broadcasts. and can virtually eliminate the effects of selective fading.

- Specifications:
  - Reception modes: AM, NFM, WFM, USB, LSB & CW
  - Dual rate battery saver * Large battery pack * Rotary knob.
  - Auto control: 3 scanning modes * 100 memories
  - 3 scanning speeds * 3 scanning modes
  - 100 memories
  - Dual band memory lock * Priority channel
  - Dual watch: 2 tuned to monitor
  - Auto S.A.R.L.
  - Complete Performance guide

- THE NEW MVT-7000 1MHz-1300MHz
  - AM-NBFM-WBFM
  - Multiple steps
  - Better than 0.5µV
  - 200 Memories
  - Rotary Dial
  - S-meter
  - Fast Scan Speed
  - Lockout/Priority
  - NiCads
  - Charger/AC PSU
  - 12V Lead

- MORE BEST SELLING RECEIVERS

- ICOM IC-C100 100kHz-280MHz
  - Sensitivity: Better than 0.1µV
  - Adjustable: 20kHz
  - Memory: 100 memories
  - Lockout/Priority
  - Price: £210

- Standard Horizon DX-1000 300MHz-1300MHz
  - Sensitivity: Better than 0.1µV
  - Adjustable: 20kHz
  - Memory: 100 memories
  - Lockout/Priority
  - Price: £425

- NEW AR2000 Hand-held wide band scanning receiver
  - Improved spectrum. The coverage is 500kHz - 1300MHz with no gaps. Modes are AM, FM (narrow) and FM (wide). The AR2000 features 1000 memories for spot frequencies and 10 search banks. The receiver is powered from its supplied internal lead batteries but these may be removed and dry batteries substituted to allow extended operation in the field. The AR2000 will also be charged and powered from the car cigarette lighter socket using the supplied lead. Also supplied as standard are the DAKAR wide band aerial, soft case with strap and AC charger.

- R&R plus VAT £269 (p&p £15.00)

- AUTHORISED AGENTS FOR KENWOOD, ICOM, YAESU & ALINCO. FULL SERVICE FACILITIES AVAILABLE. Please call your local dealer for full information.

- TWO-WAY RADIO • AMATEUR RADIO • AUDIO VISUAL • SALES & SERVICE
58 High Street, Newport Pagnell, Bucks MK16 8AQ. Tel: (0908) 610625 FAX: (0908) 216373

- Communications Centre (Photo Acoustics Ltd.)
The Winter Olympic Games produced a flurry of activity on many satellites during the period up to February 23.1992 when the games closed. The French Telecom 2a bird temporarily slotted at 3°E worked full time on all transponders (I counted 9 one day though another enthusiast made 12 sightings) carrying various skiing, bob sleigh and related winter sports activities from the remote event sites to the main switching centre at Moutiers. Outgoing feeds to Europe and were carried on several Eutelsat birds in Ku band with international circuits onwards in C Band via Intelsat, etc. Interestingly that the Alpine location uplinks to Moutiers used a CAM and NTSC depending on event originator and eventual destination of the pictures. The Telecom 2a signals were extremely strong. At the time of writing only the Alpine location uplinks into Moutiers generated a flurry of activity on many small sites in Europe and US cable channels.

Keith Watkins from Cornwall rang in great excitement to tell of HDTV tests being carried over Eutelsat II F3 16°E on February 23. Keith is using a modified BSB receiver to receive the D2 MAC transponders which are in the clear. Incidentally the satellite supply firm Trac are selling modified BSB receivers that will enable DMAC and D2MAC signals to be resolved via this tuner. (Trac Satellite Systems on (0642) 452555)

Orbital News

Canal Plus are again in controversy over their projected Telecom 2a services. CP had intended to operate in SECAM encrypted Nagravision but the French government pushed for adoption of D2MAC and Eurocrypt.

Meanwhile Filmnet are gradually changing transponders and intend going down the MAC path + Eurocrypt during 1992. Scandinavian channel Svecekanalen however have gained the sole Scandinavian rights for Eurocrypt and Filmnet reacted by transmitting in D2MAC in the clear over Astra. Svecekanalen transmit D2MAC Eurocrypt and as a result Filmnet were seen free by all D2MAC satellite receivers in Scandinav, hopefully the free sampler of Filmnet will then enable subscribers when it eventually scrambles. The Filmnet service over Eutelsat II F11 13 East will be D2MAC Eurocrypt which is their Benelux service.

Eurowhites, the EBU/Eurovision news service now being established at Lyon and seen on a D2MAC satellite news channel is being squeezed into 2MHz bandwidth thus 3 channels can be fitted into a standard 6MHz channel. Known as a 'Spectrum Saver' it uses a 'Discrete Cosine Transform' based (DCT) algorithm and enables use of smaller aerials than a conventional analogue TV system (it says in the report)

News of the border, the Canadian Satellite Communications (Cancom) group is seeking own service to transmit from 1995 hopefully in a Telesat Canada slot at 115°W. The Canadian government currently controls all satellite activity and Cancoms attempt if successful would make it the first privately owned Canadian satellite group.

More News

The Unicom Satellite Corporation have obtained agreement with Tonga to operate two Ku band satellites from mid 1994 and 1995 respectively, one slotted over the Pacific and the other over Asia. Meanwhile the nearby Friendly Islands are proving less than friendly since their satellite allocations overlap that of Tonga - discussions continue. Singapore is to allow a PAY TV subscription service, operated by the SBC and available from the Summer 92. Other than SBC, international broadcasters such as CNN and BBC World TV that are satellite carried will be available on a PAY basis.

Test card from the new German cable channel.

The Fininvest Group advising cable operators of changes to downlink transmision.

Short Wave Magazine, May 1992
F

first we turn to Matt Spencer (Redhill), who tried every band other than 10MHz. On 18MHz BLDL, UABBLU, U8Y88D, UBUVCR and YQ2DQK were booked in, while on 3.5MHz yielded EAGTH, K2MAF, NPAJ, OA7YJ, YZ4AE, PYSK, SV5TV, STS86W, UF6FAL, UF6FIX, ZSUTL, ZS7BA, ZK2HG, East Coast Ws, YL2XH, KDB3 & VE1-2. On 7MHz the scalps included C2U2DX (E Miguel Is), H8A, N3BF8, P57KM, PT6ZK, U8ADF7 & YS5MRK; a flip of the switch to 14MHz for CI4JPP, K4SSD, l2Ll8G & 912K9; and 28MHz were he received KC4KZA, ZD8LII, TK5CW, EA9VKR; concluding on 10MHz the scalps included JA2DWA, VK3AQW, N9V7V, SVOVOA, EA8/GOKPW, UA9YMF, JK9CNP, JA9CNP, JA9AA, JA9KZA / KP4, JA9SB, JA9SB / KP4, JA9SB, TK5CW, EA9VKR; a 'special' on 20MHz and 912K9. Melilla by way of East Intl was noted on 18MHz along with V7DTP, 7XVRR, X1RDE & WZ5I. 21MHz again featured Melilla, this time by way of EAGT, as well as K2A3D, K2M1B, W8BT & W6BYN. On 21MHz Matt found AR9BE, XE1/DX6L, S7CM, W1, W9, V02 & VCKXN. Finally 28MHz were the list included A61AC, EA9DF, H8A, K8NGD, P2JH, PY2HIS, T2CZ, DX2C, H91D9, CE6CM, K9YCT, WA1HMMF/P in Arizona, all W call areas, including W2D in S. Dakota, W1HTV/VOA, SVVDOA, WA5IBW & VQ5XVOA, all on a QSO net, plus VE1-2.

Congratulations

Nice to hear again from Harold Wood, who noted: 3MHz 4J4GJ, 14MHz IV3USU & V01TU; on 24MHz AV1AD, Z1HJH, T2UYH; & on 10M VE3MGO, VO1KK, V3FSC, F3PJWJJ, VY7BS, AG1J, A2ZLJ, VO5J, W0LIVX for a 'special' on 20MHz, ZD4AH & ZAI7F. All were logged with a Philips 235S and a random wire fed by way of an a.t. wire. When he got home, says Simon Griggs (Chelmsford), he took for four years to hear 69 countries; but since he came back in October last, he has already noted 71 countries! A coup of DXs on Top Band, W02CW on 80m, EA9UL, EB8GP, an SV & VY2PE were landed on 7MHz & on 14MHz we note V44KG, K4GSO, P43LJP, VOOXC for a 'special' on 20MHz. Now we turn to Mike Birch, who re-

Nantucket Activity

A group comprising WI4GDZC, KC1YR, KAIUSL & N1BRM will be active from Nantucket island (ITA4 NA 50) the weekend May 29-31. Activity will be mainly on the h.f. bands (including 144MHz) and the DX window of 50.110 to 50.130MHz. Note the following: Callsigns, RSTI, membership number if given and Maidenhead Locator. One point per contact, plus one extra if the station is a member of UKMSG. Multiplier is the total number of countries heard plus the total number of Squares heard (one contact may count for both a country and a square multiplier). Logs go to Maureen Wright, GW8ZCP, 6 CwI EtIhn, Wrexham Clwyd, LL12 8JY, to be postmarked no later than July 8.

Halcyon Years

Now we turn to Mike Birch, who re-

More Letters

Gerald Bramwell in Swinton had his listening confined to the late evenings, 2200 onwards. On the other hand, Gerald makes the best of it by also checking the c.w. end. Hence on Top Band, he found OK1DWS, OK3TZW & G3LPN on the key, plus A02BE, RASSX, W6RF, LY1X, YL2QD, LY1EA, vari-

Conclusion

How about a Set Listening Period, covering any amateur band over the weekend May 2-3, using any such simple gear and your normal skywires? If we say G3 is one prefix, GW3 another, GM3 a third, you will have at least 700 contacts, but in addition we will have heard some 700 countries in the same period. If you wish to see a mention of MD5D0 from the Canal Zone, who became a friend while on the 14MHz band, you will have to have at least 700 contacts with MD5D0. We have 50MHz privileges is acceptable, but we would like to see some 28MHz contact, plus one extra if the station is a member of UKMSG. Multiplier is the total number of Squares heard (one contact may count for both a country and a square multiplier). Logs go to Maureen Wright, GW8ZCP, 6 CwI EtIhn, Wrexham Clwyd, LL12 8JY, to be postmarked no later than July 8.

More Letters

Gerald Bramwell in Swinton had his listening confined to the late evenings, 2200 onwards. On the other hand, Gerald makes the best of it by also checking the c.w. end. Hence on Top Band, he found OK1DWS, OK3TZW & G3LPN on the key, plus A02BE, RASSX, W6RF, LY1X, YL2QD, LY1EA, vari-

Conclusion

How about a Set Listening Period, covering any amateur band over the weekend May 2-3, using any such simple gear and your normal skywires? If we say G3 is one prefix, GW3 another, GM3 a third, you should be able to find 500 prefixes in a weekend if conditions are at all reasonable. List 'em and send the list with your normal report.

That's our lot for this time. The deadline for next time is Monday, May 8, 1992.

50 Essex Street G3XKE, PO Box 4, Newtwon, Powys SY16 1ZZ

QSL card given to Practical Wireless editor, Rob Mannion G3XFD, at Dayton in 1991.

48 Short Wave Magazine, May 1992
Y ou can never be entirely certain what will happen, wrote Clive Grey (West Kirby) in his DXTV report. Those are very true words Clive, especially this month when we take a look at the tropospheric openings in January and February, in the upper ‘F2’ region of the ionosphere, and talk more about the tropospheric openings in January and February. The former provided some interesting DX in Band I (40-68MHz) and the latter produced good colour pictures, from Europe and Scandinavia, for long periods in Bands III (175-230MHz), IV (471-508MHz) and V (615-802MHz).

**Band I**

"Here’s February’s log with Dubai and Iran putting in a daily appearance on Ch. E2 (48.25MHz) via ‘F2’ propagation around lunchtime”, said Simon Hamer (New Radnor) at the end of the month. In addition he saw weak, fluttering and fading video from New Zealand on Ch. E2. He also heard what sounded like South American and Arabic voices on Ch. E2. He also heard what sounded like South American and Arabic voices below Ch. E2 on the 8th.

**Sporadic-E**

Simon Hamer and Bob Brooks logged test-patterns from Iceland (RUV) on Ch. E4 (82.25MHz) on February 20, the Norwegian regional Steigen, on Ch. E2, on the 20th and Denmark (OR DANMARK) on Ch. E3 (55.25MHz) on the 24th respectively. During the month, Russ Burke (Northampton) received test-cards from the Norwegian regionals Bagan and Melhus and identity while similar events were in progress around noon on the 20th & 23rd. Carl Bowen (Streley) reports an F2 opening with activity, at varying strengths, on the 7th, 8th, 15th, 16th, 22nd & 23rd around Chs. E2, R1 (49.75MHz) & R2 (59.25MHz). Although he could not make any positive identifications on these days, Carl managed to make out an Asian announcer on the 8th, a programme with a lot of skiing on the 16th, an Arabic broadcast which looked like Dubai (UAE) on the 22nd and a ‘smeary ghosting signal’ from the Far East, possibly Malaysia, on the 23rd.

**Tropospheric**

"Plenty of F2”, wrote Bob Brooks (Great Sutton) who logged such events almost daily from February 5 to 24. From the multitude of distorted pictures, on Ch. E2, he saw an announcer, sub-titles and a caption early on the 11th, a ‘crescent and star’ logo at 1020 on the 17th and 1355 on the 18th, a ‘chess board’ pattern at 1235 and Arabic captions at 1340 on the 20th. At midday on the 7th, Andrew Jackson (Birkenhead) received a test-card from Iran Television, on Ch. E2, which he identified by, “the large white digital clock in the lower left hand corner”.

**Weather**

Here’s February’s log with Dubai and Iran putting in a daily appearance on Chs. E2, R1 and possibly AO at 0925 the 11th. Between 0955 and 1130 on the 22nd, Andrew noted, without identity, pictures on Ch. R1 and caught glimpses of a quiz show with Arabic writing, a children’s piece and a test-card with that large white digital clock again on Ch. E2. He also heard what sounded like South American and Arabic voices below Ch. E2 on the 8th.

"Here’s February’s log with Dubai and Iran putting in a daily appearance on Ch. E2 (48.25MHz) via ‘F2’ propagation around lunchtime”, said Simon Hamer (New Radnor) at the end of the month. In addition he saw weak, fluttering and fading video from New Zealand on Ch. E2. He also heard what sounded like South American and Arabic voices on Ch. E2. He also heard what sounded like South American and Arabic voices below Ch. E2 on the 8th.

---

**Picture Archives**

Satellite TV enthusiast, Peter De Jong (Leiden, Holland) received a test-card from Spain, Fig. 1 and a British Aerospace logo, Fig. 2, via Eutelsat 1 F4, last October 29 & 30 respectively as well as captions from Holland (Fig. 3) and Croatian TV (Fig. 4) via Eutelsat 1 F2 around 1600 last December 8.

**Weather**

The slightly rounded atmospheric pressure readings for the period January 26 to February 25, Fig. 13, were taken daily, at noon and midnight, from the Short and Mason barograph installed at my home in Sussex. Apart from days 11 to 14, the pressure remained high, above 1030mb (1015mb) and often around 305in (1002mb), for several days at a time.

From past experience none of us were surprised to see a number of tropospheric openings when the barometer fluctuated toward the upper end of its range. George Garden (Edinburgh) found it “persistingly cold” while he was DXing, high up, on Cairn ‘O Mount on February 29. Back down south, I noted frosts, sometimes down to 22 and 29°F in the early hours on days 1, 2, 8, 17, 19 & 20. The month was generally dry with only 1.94in of rain and most of that fell between the 11th and 15th inclusive.

When you look at Fig. 5, don’t think that I have discovered a new type of vertical Yagi, in fact, it was frozen fog on the twigs of a young tree on the South Downs. The fog was so dense, sometimes down to 22 and 29°F in the early hours on days 1, 2, 8, 17, 19 & 20. The month was generally dry with only 1.94in of rain and most of that fell between the 11th and 15th inclusive.

"What a weekend the 31st - 1/2 wasl,” remarked John Woodcock (Basingstoke) who used his TC-930F receiver to give him positive image pictures from French stations and his D100 converter to copy test-cards from Belgium (RTBF1) and Holland (PPT NED1) in Band III. He logged pictures from France again during the afternoon of the 8th.

"The atmospheric pressure stood at 1040mb here”, wrote Clive Grey (West Kirby) about January 29 when he received unusually strong pictures, in colour, with Teletext from Ireland’s RT1 & 2 on Chs. 40 & 46 in the u.h.f. band, adding, "Pictures were so good..."
that we watched for a full half hour a housewives' cookery programme starting at 2000 on RTE1 with only slight fading. Clive also found the benefit of a directional antenna especially during the following evening when signals from RTE were rather poor and Sutton Coldfield came up when he rotated his beam. Also at that time he logged Yorkshire TV, from Emley Moor on Ch. 47. Clive checked the band again from 1930 on the 31st and found BBC North and Yorkshire TV from Emley Moor and watched the news from BBC Leeds at 2125. "As the high pressure centre shifted East signals seemed to come from the East more than the West", said Clive, who it a very entertaining period for the DXer.

At 1645 on the 30th, Tony McDonald (Derby), using a domestic u.h.f. set with a 10-element antenna, received strong colour pictures from the UK transmitters at Belhmont (Yorkshire TV), Crystal Palace (Thames TV), Ridge Hill (Central TV) and Anglia TV from Sandy Heath, Sunbury and Tacolneston. Although weak he logged TVS from Belgium, France and Holland. Also found the u.h.f. band open on Holland. Like John Woodcock, Tony many and 'TROS T2' possibly from Belgium, 'WEST3' and 'ZOE' from Germany and 'ARD' from Denmark, Sweden and ZDF most prominent as shown by a couple of Dutch captions, Figs. 11 and 12 that he logged.

While checking for maximum usable frequencies (m.u.f.) during the early winter months of 1992, Richard Gosnell (Swindon) received Band III signals from Belgium, France and Ireland on the 14th and 18th, Germany and Ireland on the 15th, Ireland on the 26th and 28th and Belgium, France and Holland on the 31st. In February he logged Belgium, Germany and ZDF and Holland’s PTT NED 1 & 3 most prominent as shown by a couple of Dutch captions, Figs. 11 and 12 that he logged.

Andrew Jackson took advantage of the opening on the 8th when he logged stations from Belgium, France and Holland. "As good tropospheric opening was the agenda for the end of January," wrote Carl Bowen on February 17. On the 26th & 27th, he reports that French television (A2, FR3 & TDF) had established themselves for long periods of time, on the u.h.f. band as CANAL+ had done on Band III.

Carl spent most of the evening of the 30th watching Sport Studio from Holland (NEO) and on the 31st and while the opening declined on February 1, he added Holland (NEO1) on Ch. E4 in Band I, Belgium (BRT1 and RTBF) on Ch. E8 in Band III. On February 1, Clive logged Belgium and Holland in Band III.

Mike and Wendy Evans (Buckhurst Hill) emptied their camera after the event and sent along photographs of the idents that they received from Germany Hessen 3, Fig. 7, on Ch. 37, MDR Fernsehen, Fig. 8, on Ch. 34, Wieringermeer, Fig. 9, on Ch. 39 and Holland Nederland 2, Fig. 10, on Ch. 45. Simon Hamer received strong pictures from France in Bands III, IV and V during the evening of February 24 and weaker signals from Denmark (DR and TV2), Germany (ARD1 and MDR1) and Sweden (SVT1 & 2) in those bands on the 25th.

Andrew Jackson took advantage of the opening on the 8th when he logged pictures in Band III from Belgium (BRT1 and RTBF1) and France (CANAL+) and Belgium (RTBF TELE21, France (Antenne2) and Holland (NOS3) on the u.h.f. bands. Periodically, Russ Burke found tropo conditions so good that he stopped taking photographs and committed Bands III, IV and V signals to his video recorder for later analysis. He found Germany's ARD and ZDF and Holland's PTT NED 1 & 3 most prominent as shown by a couple of Dutch captions, Figs. 11 and 12 that he logged.

While checking for maximum usable frequencies (m.u.f.) during the early winter months of 1992, Richard Gosnell (Swindon) received Band III signals from Belgium, France and Ireland on January 12, France and Ireland on the 14th and 18th, Germany and Ireland on the 15th, Ireland on the 26th and 28th and Belgium, France and Holland on the 31st. In February he logged Belgium, France, Germany and Ireland on the 1st, Ireland on the 2nd and 7th, France and Ireland on the 8th, France on the 15th, 16th and 29th and France and Ireland on the 22nd. David Glenday received u.h.f. pictures from Belgium (BRT1 & 2), Germany (WDR1 and ZDF) and Holland (NEO 1 & 3) throughout the evening of the 8th.

SSTV

In addition to an amusing demo caption, Fig. 14, John Scott (Glasgow) copied slow-scan television pictures during February, around 14.00MHz, from stations in France, Poland, Russia, Spain and Wales Fig. 15. David Glenday recently installed a couple of long wire antennas to feed his SSTV receiver and reports that the, "performance has improved dramatically and computer noise is greatly reduced". He also suggests that by passing those faded screen-dumps through a photocopier "with the contrast cranked up a little bit soon rejuvenates the prints".

Fig. 10: Holland.

Fig. 11: Netherlands.

Fig. 12: Netherlands.

Fig. 13:

Fig. 14: SSTV.

Fig. 15: SSTV.
The only strings attached —

When buying from Martin Lynch...

OK so I'll admit — there are strings attached when you buy from Martin Lynch. But I don't think you'll complain. New or Secondhand — the "MONEY BACK GUARANTEE" applies. If the equipment is not as described, you can have your money back! No Quibble, no arguments. Nobody offers this kind of deal. Either visiting the shop or Mail Order, the rule still applies. You can't lose.

As an INDEPENDENT RETAILER I can continue to offer you unrivalled personal service. Backed up by the Authorised U.K. Distributors, you have total piece of mind. Phone today for your requirements, or call in at the shop in West London. I'm easy to find — just across the road from NORTHFIELDS UNDERGROUND on the Piccadilly line, (closest Ham Store to Heathrow by Tube) — only a few minutes from the M4/M1/M25.

AOR
AR5000 NEW the only handy analyser with factory fit SSB £299.00
AR6000 the favourite 6-1300MHz § £399.00
AR6000S for computer control, base scanner... § £399.00
AR8000 best all round base/mobile, includes SSB § £399.00
AR8000A NEW — the latest version — remarkable price... § £199.00
ACWRPC 3 computer control for 3000 § £119.00

YUPITERU
VT150 NEW — latest 142-170MHz handle § £159.00
VT150S the best standard handle scanner § £119.00
MPP7500 the favourite all band handle § £299.00

LATEST EQUIPMENT IN STOCK!

ALINCO
DA-38E the smallest miniature pocket scanner § £299.00

ICOM
IC-25E the world's smallest receiver § £259.00
IC-28E the best mobile scanner § £499.00
IC-718, 11800 MHz RX, many use examples... § £799.00
IC-720, economy version of above... § £599.00
IC-7600 NEW... § £499.00
IC-7100HF SSB, 2000MHz... § £699.00
IC-7900 special deals on the world's best receiver...

KENWOOD
IC-9000 general coverage SW RX... § £589.00
H-3000 Kenwood's top RX, special deals... § PHONE

LOWE
HF-100 NEW... § £129.00
HF-225 on best of British receivers... § £249.00

DRAKE
JRC MVT7000 the favourite all band handle... § £279.00

ICR I still the world's smallest scanner... § £399.00
ICR9000 special deals on the world's best receiver... § £329.00

ICR10000 special deals on the world's best receiver... § £429.00

JRC
ND-55S commercial build and performance... § £1099.00

73 MARTIN G4HKS

MARTIN LYNCH

MARTIN G4HKS

THE AMATEUR RADIO EXCHANGE CENTRE

286 Northfield Avenue, Ealing, London W5 4UB. Tel: 081 566 1120. Fax (24 hr): 081 566 1207

Tel: 081 566 1120 • SALES • SERVICE • MAIL ORDER

Please add £10.50 for 48 hr delivery.

SHOP OPENING HOURS: Tuesday - Saturday 10am-6pm.

24 Hour Sales HOT LINE 0860 339339 (after hours only).

Martin Lynch is a licensed Credit Broker — full written details on request. Typical APR 36.8%
THE KITS WITH ALL THE BITS!

Guaranteed complete to the last nut!

COMPACT 80m CW QRP Tx/Rx
Kits - £31.50 P&P £3.30 Ready Built - £44.00
- Dials VFO • Sidetone • Audio Filter
- Requires 12/4 VDC • Very detailed instructions • Drop tail case
- Printed panel
- 45W & TOP BAND VERSIONS ALSO AVAILABLE

ANTENNA TUNING UNITS
TU1 Kit - £41.25 Ready Built - £51.50
TU2 Kit - £51.00 Ready Built - £72.00 P&P £3.30
- Large dis. coil • High grade capacitor • Built in balun • Circuits to match your antenna • Up to 30 Watts of CW • TU2 has sensitive QRP/SWR meter
- TU1 is ideal for SWL

QRP SWR METER
- Specially designed for QRP • HF 1-30MHz
- Can be set down to ½ watt for P4O
- Ideal for milliwattting • Low insertion loss 0.2dB
TU1 Kit - complete with ease & meter £18.00 P&P £1.00
TU2 Kit - £51.00
TU3 Kit - £21.50 Ready Built - £29.50
- Ideal for small QRP
- Can be set down to, watt for FSD
- Stable VFO • Sidetone • Audio Filler
- 12-14 volt battery operated • Printed facia
- Built-in Perital/Scart socket allows connection of a variety of other AV equipment
- PSU 15 REGULATED
- Ready built • Mains input • 13.8V @ 1.5A output • Ideal for DTR3 & 'Carlton' • Fully protected
- Supplied ready built - £51.00 P&P £4.00
Send SAE for brochure or call Alan G4DVW on 0602 382509

LAKE ELECTRONICS
7 Middleton Close, Nuthall, Nottingham NG16 1BX
(callers by appointment only)

AERIAL TECHNIQUES

STAG CTV-9400
PAL/SECAM MULTI-STANDARD COLOUR TV
- 10" Picture tube
- PAL/SECAM compatibility, together with 5.5, 6.0 and 6.5MHz automatic sound switching, enables this set to be used in FRANCE, UK, Western Europe and the Middle East.
- 12V DC or 220/240V AC operation from mains or battery.
- 32 Programme storage tuning
- Full function remote control.

PRICE £299 - £100 overnight delivery by insured courier (inclusive of VAT)
- Features on screen graphics showing the various modes.
- Interactive 2 digit LED display.
- Built-in Perital/Scart socket allows connection of a variety of other AV equipment.
- Built-in whip aerial • 75ohm aerial input at the rear.
- Covers band 1, 3 & UHF plus all cable channels.
- Compact dimensions: Height 255mm (10.03in); Width 266mm (10.4in); Depth 323mm (12.6in); Weight 8.7kg.
We stock a large range of equipment for all types of aerial and satellite installation, all detailed in our 29 page Catalogue at 75p, send for your copy today. We also have available Multi-standard TV's and Video recorders for all systems, PAL, SECAM & NTSC. Most makes of Satellite equipment carried, together with decoders for Canal Plus, RAI UNO, RAI DUE, PAL/02-MAC satellite receivers now in stock, also SECAM to PAL transcoders (SAE for details).

Special Offer!! Uniden UST-92 D2-MAC to PAL decoder with built-in Eurocrypt card reader £299.00-00-00-00
Access, Visa and American Express
Mail and Telephone orders welcome
(24 hour service)

11 KENT ROAD, PARKSTONE, POOLE, DORSET BH12 2EH TEL: 0202 738232 FAX: 0202 716951

NEW FOR 1992
ONE STOP SHOPPING AT LAST!

WE ARE PLEASED TO ANNOUNCE THAT THE FINAL PIECE OF THE JIGSAW WENT INTO PLACE ON 2nd MARCH, WHEN WE BECAME THE ONLY APPROVED KENWOOD DEALER FOR THE NORTHWEST & NORTH WALES

It's been a long time coming but now anything you require in ham radio equipment is available at 38 BRIDGE STREET. What more could anyone ask for? We offer a service second to none, a friendly atmosphere, expert advice, excellent back-up (by one of the top engineers in the country, Frank), plus the usual humorous banter from Peter and Richard and even more important a cup of MY coffee or tea. 73 Elaine

ARC IS A LICENSED CREDIT BROKER
INSTANT FINANCE AVAILABLE SUBJECT TO STATUS
ALWAYS A LARGE SELECTION OF COMMISSION AND SECONDHAND ITEMS IN STOCK

Please send a S.A.E. for details on new or used equipment required.
MAIL ORDERS RECEIVED BEFORE 3 O'CLOCK SAME DAY DESPATCH PROVIDING EX STOCK.

OUR AIM IS 100% SATISFACTION

AMBASSADOR OF COMMUNICATIONS
COMMUNICATIONS LTD
38 BRIDGE STREET
EARLESTOW
NEWTON-LE-WILLOWS
MERSEYSIDE
WA12 9BA.

WE WILL BE EXHIBITING AT THE NEC SHOW THIS YEAR, SO WHY NOT PAY US A VISIT ON STAND A23, WHERE NOT ONLY WILL WE HAVE AN EXTENSIVE DISPLAY OF NEW EQUIPMENT BUT ALSO A LARGE RANGE OF SECOND HAND AND COMMISSION GOODS, ALL THOROUGHLY CHECKED OUT BY OUR ENGINEERS BEFORE BEING DESPATCHED FOR NEC AND EACH WITH ITS OWN ENGINEER'S REPORT.

ARC'S INTENTION IS TO REFUSE TO ALLOW THE CURRENT RECESSION TO BEAT US! WE WILL CONTINUE TO OPERATE OUR POLICY OF FAIR PRICES WITH REASONABLE DISCOUNTS, AFTER SALES CARE, IN-HOUSE SERVICING AND NO O.T.T. EXPENDITURE.
PETER G4KKN

We know why — he doesn't pay us any wages...
... Elaine, Frank & Richard

SHORT WAVE MAGAZINE, MAY 1992

1 MILE FROM J23, M6 AND 4½ MILES OFF J9, M62

52
A

As I'm often asked about my Museum, another mention here would be a good idea. Visits are by prior appointment. Individuals or groups of no more than four are accepted. The tours can be arranged by phone 081-994 5113, preferably timing your call between 1800-2200 local on a weekday. It comes as a surprise to many that admission is free, since I run the Museum as a hobby and not as a commercial venture. In these days of distorted values many people are suspicious that anything offered for free has no worth. Here at least is one place where old-fashioned standards still apply. All you are asked to contribute is your genuine interest and enthusiasm.

Help!

How can A.W. Guy's receiver (March, Cambridgeshire) pick up signals on the wrong frequency? This is called a spurious response and is very variable, depending on how it can happen. One explanation could be that the signal is an image (second channel), being twice the i.f. away from the frequency the wrong frequency? This is called a spurious response. All values many people are suspicious my receiver is designed for a.m. and your receiver is designed for f.m. only, thus suggesting the spurious signal is a.m. and your receiver is getting straight in to the receiver at some stage in the radio circuit and possibly overloading one of the circuits. The effect isn't harmful, just annoying. It is quite simple to prove and to correct by fitting a filter and the effect is removed.

A simple aircraft fitted with just one i.l.s. indicator. Turn and slip is less than 100 ft. If you have two indicators you can fly the i.l.s. but instead fly a dog-leg whilst losing height. The aircraft seen by Chris Black (Heathrow) was flying towards you!

Follow-Ups

Peter Nicholson (Huddersfield) also enjoys the overflights observed by Chris Haig RS94162 (same box) and reported in March. Peter has seen traffic for 24 at Manchester arriving at high altitude. Airlines are limited in their rate of descent and travel many track miles in the process of losing height. In this case, they can't just join the i.l.s. but instead fly a dog-leg whilst losing height. The aircraft seen by Chris might have been descending as well as flying a triangle. This routing is also sometimes needed to increase separation between aircraft in the inbound stream. I've noticed a similar technique used for arrivals from the south when 23 is the landing runway at Heathrow. Although the idea of a pleasure flight had to be cancelled through lack of support, thus disappointing Simon Whitehouse (Leicester), Bob Ramshaw (Northampton) and Nick Dalton (Knivington), Nick points out Air Atlantique's classic DC-3 trips from Coventry. As well as flights to view Cowes Week and the Tall Ships Race, there are round trips to enable you to visit various airshows without getting caught in traffic jams. Call Kerry or Val initially on (0203) 370966.

Frequency and Operational News

The 2/92 GASU from the CAA introduces a new n.d.b. (RLD, 3434kHz) at Redhill. With low power, this beacon should be reliable over a 10nm range and is intended for finding the airfield at the end of a flight. It is not powerful enough for en-route navigation.

Local knowledge from Pat Martindale (Bridlington) tells us that Leconfield has moved frequency to 123.05MHz, same as Linley Hill, now base for 'Beaufox' (Bognor Regis). A full listing of both sets of codes is in the En Route Supplement for the appropriate part of the world and obtainable by post from Aerod Customer Services, Building 294, PO Box 66, London Heathrow Airport, Harmondsworth, Middlesex TW6 2JA. Tel: 081-5620795.

Your Experiences

Mrs. B. (Lo.M.) can now fly the A320 whenever she likes - as long as it remains on her Amiga computer. Airbus A320 seems good value with excellent graphics and the need to really plan your flight in advance. It's unreal that got less than tops marks in a magazine review. The reviewer was hoping for a simpler arcade game and instead got something approaching a real flight simulator for just £29.99! I don't see any comments on the speed and smoothness of the responses which is normally where such simulations are deficient when run on hobby computers. The software, by Thallon, comes complete with radio navigation charts! Mrs. B. is clearly a 'total aviation person' but still acknowledges having much to learn. Well, we can all say that about ourselves - let's share information through this column and that way my education will be improved too!

The flight simulation demonstration at the London Amateur Radio Show in March was definitely smooth and responsive. It put you in charge of a radio-controlled model aeroplane or helicopter. Unlike real flying where you see the world from the cockpit window, radio controllers watch their aircraft from a distance. This gives a feeling that the controls are being operated in the reverse sense when the machine is flying towards you!

Military Dakota Variant at North Weald, (Godfrey Manning).

Thanks Ted Crease (Bradford) for unearthing a teleprinter copy of Sheila Scott's record attempt flight plan from about 1966. The Single Comanche's route from Lupa, Malta, to London is listed on the plan. The call sign given is G-ATOM (actually a Cherokee) which I'm sure is a misprint for G-ATOY. Hope you make it to the Museum soon, Ted. Most visits are weekdays (including evenings) at present, but do let me know your possible weekends and I might be able to oblige.

V. Prier (Colyton) found a two-pointer instrument that sounds like an old i.f. indicator. Turn and slip is less likely owing to the perpendicularly situated (rather than collinear) disposition of the two pointers. I'd be grateful to take your offer to send it to my Museum, and if you do so then I will happily refund your postage costs.

Martin Gerrard G60DC (Broughton) doesn't quite understand everything in this column and so, as I often remark, do please write in and demand an explanation! If readers don't write in, I assume that everybody understands everything - can that really be possible? Living close to Hawarden Aerodrome, Martin often hears the 'beautiful, distinctive sound' of the restored Mosquito. Despite reverting to wood at a time when the trend was towards all-metal construction, the Mosquito was a success and could be knocked out in large numbers by skilled pilots and rifle manufacturers during the war. With luck, the restored example will appear on this year's display circuit.

CONTINUED ON PAGE 55.
that many people were put off the original modification because it involved identifying and cutting a very fine track on the printed circuit board, however, the new method makes this part much easier - my thanks to Mr Mohammed for this information. The only remaining question is where to fit the switch without having to drill too many holes in the case - has anyone found a neat solution to this problem?

Utility Monitoring

Mr Mohammed also asks if he could use his Tandy PRO-2006 for receiving and decoding shortwave utility stations by adding an external h.f. converter, the purpose of which is to convert signals in the range 0-30MHz up to a higher frequency band which can be received on a scanner. Although it is possible to receive utility stations in this way, I would not recommend it, mainly because of the difficulties involved in resolving the special types of transmissions used by such stations with a receiver not equipped for s.s.b. reception.

Most h.f. utility stations use some form of frequency shift keying to transmit a binary representation of the original text, picture or information. In order to recover this information the receiver needs to be fitted with a carrier re-insertion oscillator or b.f.o. This is usually a standard item in a shortwave receiver, but is only fitted to some scanners that have the ability to receive s.s.b. signals.

You can add a b.f.o. to a scanner, but an additional problem may be the i.f. filter bandwidth which is usually too wide for satisfactory s.s.b. reception. Even if you could overcome these problems by extensive modifications you may still find that the frequency stability of the combined receiver/converter and b.f.o. circuit is not good enough for prolonged periods of monitoring without the need to keep tuning the receiver.

The best option may be to consider buying a cheap short wave receiver such as the Matsui MR4959 or Sangean ATS-803, many of which are available second-hand. These are perfectly good designs for the price and will give much better results than those obtainable with a scanner/converter set-up.

One final suggestion if you have a short wave receiver that is capable of s.s.b. reception at 455kHz or 10.7MHz, is to use the scanner as a converter. In this way you can resolve s.s.b. signals on the v.h.f. amateur bands by tuning the scanner to the actual receive frequency and the short wave receiver to the scanner i.f. Any fine tuning can be performed by adjusting the short wave receiver. The only tricky part is obtaining an i.f. signal from the scanner. With a PRO-2006 this can be obtained in two different ways. A 455kHz output can be obtained in the a.m. mode from the junction of T5 and C157, or with w.b.f.m. selected, a 10.7MHz output can be obtained from the junction of T3 and C209. Both sets of components are located near the middle of the linear p.c.b. As a precaution the signal should be taken from the circuit board via a screened lead with a 1kΩ resistor and 100pF capacitor in series mounted at the board end in order to prevent any loading of the scanner circuits.

I have mentioned converters before, so if you would like a more detailed explanation try and take a look at the July 1988 column which explained the technique in more detail.

Splitting Signals

Don Jackson of Essex has written with a question which highlights several different problems that can occur when splitting signals from an antenna to feed different receivers or locations. Don has an antenna mounted on a pole at the bottom of his garden, he then feeds the signal to the house with a 25m length of coaxial cable via two 'T' connections, one to feed the signal to the garden shed the other to provide a feed to his conservatory. He is mainly interested in airband monitoring and has recently changed his antenna from a dipole to a 'Slim Jim'. This has not made much difference and he wonders if I can suggest any improvements to the system.

Let's start with the antena, in some respects a dipole may be more suitable for airband reception than a 'Slim Jim'. This is because the 'Slim Jim' is designed to receive more gain by having a lower angle of radiation, that is to say it concentrates its gain towards the horizon rather up towards the sky. A low angle of radiation is ideal for terrestrial communications but it may produce poor results when the signals are originating from aircraft. However, a 'Slim Jim' may be more suitable if you are just interested in improving the reception of ground based air traffic control stations.

The solution to this problem is to either use a low-loss TV antenna splitter of the type sold by Maplin or Tandy or to loop the coaxial cable feed to the house via the shed and conservatory with an in-line plug and socket. The scanner can then be connected in circuit wherever it is required. The big advantage in using this method is that there is no signal loss, unlike the splitter method where up to half of the incoming signal may be lost.

Don is also concerned about protection against lightning - this is particularly important if you tend to leave your scanner connected to an external antenna for any length of time. Although we don't have to worry about lighting storms in this country it is quite surprising how much of a static charge can build up on an external antenna. With the increasing sophistication of

Fig. 1.
modern receivers it is a good idea to consider some form of simple precautions before you are faced with expensive repair bills.

The first step should be to bond the braids of the coaxial cable to a good earth point before it enters any property. This is best achieved at the base of the mast by means of a large earth spike driven into the ground. A short thick lead or braid then needs to be connected to the outer of the coaxial cable. One way to do this is to use a coaxial 'T' connector to join the cable. The earth lead is then hard soldered to the outer of an old coaxial connector which is attached to the spare port of the 'tee' connector. This will provide some protection but does not provide a static discharge path for the inner of the cable. This can be done in several ways. The first is to choose an antenna with a d.c. ground connection. A folded dipole or 'Slim Jim' antenna should already provide a d.c. path between the inner and the outer of the coaxial cable, but other antennas such as discomes may not. A quick check with a multimeter on its resistance range will tell you if your antenna has a d.c. static discharge path, if it doesn't then you may have to provide one. Connecting an r.f. choke between the inner and the outer of the cable is one solution. This can be made by winding several turns of enamelled wire through a ferrite bead, the two ends of the wire being connected in circuit at a suitable point if the choke is fitted inside a coaxial connector it can be connected into a 'T' junction as described previously. If you want to spend more money you can obtain special lightning protection devices which fit in-line with the coaxial cable and provide a discharge path for static before it can build up to a dangerous level, although these tend to be more suitable for use with larger antennae such as those designed for the short wave bands.

I hope that these suggestions will be of use to you Don, and I will be interested to hear the results of your experiments.

Low Band VHF

Several readers have now written in with their comments on the 38.65MHz mystery signals heard by Tim Anderson, which I mentioned in the March column. The general consensus is that they are likely to be the Pakistani Police force who have also been monitored on 38.675, 38.725 and 38.75MHz.

February brought a whole bunch of very strong signals from North American ambulance services around 33.8, 33.96 and 33.9MHz and several Spanish speaking South American paging systems around 32.960MHz.

Towards the end of February I was amazed at the number of pulsed meteor scatter communication systems I could hear, many of which were fading up and down in strength during the course of the monitoring period. Signals were logged on 32.505, 32.55, 35.575, 35.605, 36.63, 36.75, 36.89, 37.7, 37.75, 38.7, 38.8, 38.845, 40.925, 42.99, 45.02, 45.04, 45.08, 45.125, 45.16, 45.069, 45.14, 45.185, 47.115, 47.14, 47.165, 47.185, 47.235, 47.255 and 47.275MHz.

One other interesting signal logged by a reader was a repetitive message stating that it was a feed for British Satellite Broadcasting, this was heard on 48.08MHz. That's all for this month, I would be interested in receiving more of your low band v.h.f. loggings particularly the more unusual ones, so why not drop me a line.

Until next month. Good listening.
There haven't been any recent dramas amongst the WXSAT group but one or two interesting events have occurred. METEORS 2-9 and 2-19 exchanged operations in early February; this was expected because 2-20 was approaching the terminator (the boundary between night and day), at which time I suspect the solar panels are not being efficiently illuminated. To my surprise (even if nobody else's) METEOR 3-4 has continued in normal operations throughout its passage across the terminator.

For those recent recruits to monitoring the Russian METEOR satellites, a study of their orbits shows that, unlike the sun-synchronous NOAA wxsats, the METEORS constantly change their orbital planes. These slowly move towards the next (or previous) terminator, whether morning or evening. For several days at the terminator they are not well illuminated by the sun, and so their power systems may be put under a strain. Consequently the Russians usually swap from one METEOR to another.

MAGION 3

In mid-February, while METEOR 2-19 was coming southbound from over the North Pole, there was a strange effect, during the morning pass, on its 137.85MHz signal. At first I suspected a problem with the transmitter. The following pass was perfect, but then the next day's pass was a repeat performance with the early pass. I checked out some recent launches and found one satellite - MAGION 3 - which was simultaneously passing over the UK. By checking each time MAGION 3 coincided with METEOR 2-19 the interference was obvious. When MAGION had drifted away some days later, 2-19 was then alright. Two satellites on 137.85MHz!

METEOSAT 3

This geostationary WXSAT presently at 50°W is easily heard from the UK, but a recent press announcement from the Information Division of EUMETSAT states that it will be drifted further along the Clarke belt to about longitude 100°W. This is to help the Americans who are not yet able to replace GOES-west. I am not sure of the date of this change, but I suspect that it may not be until 1993.

METEOSAT 4

During mid February, imaging of our side of the earth was done by METEOSAT 5 but the picture data was transmitted on channel 2. Possibly as a result of this, the "country outlines" (added by the ground computer) were often displaced. Peter de Jong of Leiden in Holland is a regular monitor of METEOSAT and he reported the faulty east edge image seen on the 03 and 06 formats (infra-red and water vapour). Peter tells me that he is re-training his METEOSAT system because 'of the plans for digital WXFAX and a.p.t.' I have received recent information from EUMETSAT which advises that some meteorological transmissions will be encrypted (coded) but these are not our WXFAX ones. Similarly, the digital transmissions should remain un-encrypted. I am trusting that they won't be coded because I have just ordered a PDUS (Primary Data User System)! Mind you, Peter only lives along the road from EUMETSAT so I hope that he will keep me up-to-date with any new plans!

FENGYUN 1-2

This Chinese polar orbiting WXSAT ceased normal a.p.t broadcasts several months ago, but occasionally my scanner stops on 137.80MHz. At first I suspected interference referred to is the use of frequencies very close to our weather satellite band of 137.137.9MHz. The WXSAT's transmit using powers of around 5W. The authorities allocated a number of frequencies, including one inside the WXSAT band (1) to transmitters that are used to trigger personal paging units. Their output power is enormous and so we have seen severe interference on normal WXSAT receivers. Some manufacturers have gone to considerable efforts to make their receivers resistant to this (and other) interference.

Cirkit Receiver

Tony Branton GB8VUS of Malvern Link recently purchased the Cirkit receiver kit and uses it in conjunction with a Tonna 10-element beam which, Tony comments, greatly reduces the local 'pager' break-through. I wondered whether Tony might need to track the satellites with such a directional beam, but he doesn't mention doing so. He is now working on improvements to his other equipment. For people new to WXSAT monitoring, the 'pager' interference referred to is the use of frequencies very close to 'our' weather satellite band of 137 - 137.9MHz. The WXSAT's transmit using powers of around 5W. The authorities allocated a number of frequencies, including one inside the WXSAT band (1) to transmitters that are used to trigger personal paging units. Their output power is enormous and so we have seen severe interference on normal WXSAT receivers. Some manufacturers have gone to considerable efforts to make their receivers resistant to this (and other) interference.

Gerard Meila of Stockport also uses a Cirkit receiver feeding his Amstrad 486 computer for picture production. He says that good pictures can be obtained with a lot of practice, and is considering buying the Maplin METEOSAT antenna and built-in pre-amp. I have seen their advertisement and I wrote to them over a year ago requesting more information.

Portsmouth uses the Maplin receiver and decoder plus his Amstrad 486 computer for picture production. He says that good pictures can be obtained with a lot of practice, and is considering buying the Maplin METEOSAT antenna and built-in pre-amp. I have seen their advertisement and I wrote to them over a year ago requesting more information.

Fig. 1: Denmark and region, NOAA 11 from Matt Taylor.

tracking. Ken Reece G8UYB has recently bought a PC in addition to his Amiga 500 which runs AmigaSat and tells me that he is now also running Prosat 2. A number of correspondents are now operating two separate systems! John Hancock of Coventry also uses AmigaSat, and told me that he had some problems with his framerate. The Remote Imaging Group (RIG) have made boards available for the framerate, but the components do need to be purchased and mounted separately. Even with expert help, it was some four months or so before I got mine working - it's a major project.

Pre-amp?

Another welcome recruit to the world of WXSATs is John Knox of Wimborne who has worked in the field of terrestrial communications for many years. He is currently using a home-made crossed dipole and Yaesu FRG-8800 receiver to hear the satellites, but proposes to upgrade his receiver to a 137MHz pre-amp and Prosat 2 software on an Amstrad 2860. John wonders whether this combination of equipments is OK. It John is receiving signals, then he should not need to buy a pre-amp. Generally speaking, if you use up to 20m of good quality cable (e.g., UR47, UR67 or H100) then your receiver should be sensitive enough to hear signals without fitting a pre-amp. The computer should be suitable, particularly if if has a VGA (or better) screen. Do check equipment compatibility with the manufacturer before purchase though.

Roger Ray of Telford is proposing to upgrade his 100MHz equipment and asks me whether I have any experience of the Proscan receiver (previously mentioned). I haven't seen the receiver myself though I believe that I might be reviewing it this year. I understand that it is immune to pager interference, but again this needs to be checked with the supplier.

Manoeuvres

B Berman of Burton-on-Trent sent me an interesting note saying that NOAA 12 appeared to have slowed early in December while METEOR 3-4 and 2-20 speeded up. Looking back at my log book I had 'flu at that time but logged METEOR 2-19 as being the operational METEOR as well as 3-4. It is worth pointing out that METEOR 3-4 has been manoeuvred to some extent because they are fitted with propulsion units. In order to spot this you need to either check the times as he did, or plot the mean motion (or similar parameter) using the Kepler elements. I did this a year or two back and was quite surprised to see how one could spot the manoeuvre dates. The NOAA 12 ea-
THE TIME IS RIGHT
Buy a Junghans Radio Controlled Clock today and you will always know that the time is right.
On March 29th when British Summer Time began how many of your other clocks automatically
changed to show the correct time? Here are just a few of the many styles available.

- Digital alarm clock – black or white £46.50
- Wood mantel clock in walnut or cherry £165.00
- Wood mantel clock in light or dark oak £125.00
- Solid brass case carriage clock £149.00
- Digital wrist watch still available from £164.00
- Analogue radio controlled wrist watch from £355.00
- Mantel clock available in white, black and grey £67.50
- Large white 32cm dia wall clock £76.50
- Coloured kitchen wall clocks 22cm dia peaches, vegetables or chickens motif £69.00
- Walnut or oak case wall clock 27.6cm £129.00
- Walnut, oak or cherry wood square cased £117.00

Any Junghans clock will make an ideal gift for all occasions. Send a SAE for our full list of
Junghans Radio Controlled Clocks and Watches.

** **
NOW IN STOCK – ALINCO DJ-X1 – only £269 **
This new "Professional Grade" scanner is compact, ruggedly built and very sensitive. It features 3 scanning
speeds, 3 scanning modes, and 100 memories in 3 banks. Frequency control from the keyboard or the
rotary frequency control. A wide range of accessories are available.

- Coverage: 500kHz - 1.3GHz • AM/narrow FM/wide FM • Size: 100 × 53 × 37mm • Weight: 370g •

AMDAT stocks a wide selection of radio equipment and accessories at our Bristol shop.
We display the latest digital receiving equipment and provide professional advice on its use.
New and used radio equipment available for ICOM YAESU AOR ALINCO.

Wide range of books and magazines available.
Computers and accessories in stock

Prices subject to change. Prices shown include VAT. Carriage extra

AMDAT
4 Northville Road, Northville
Bristol, BS7 0RG
0272 699352

Do you need a scanner or receiver?
Do you need amateur radio equipment?

"Kenwood, Icom, Yaesu, Alinco, Yupiter, Aor etc"
But most of all do you need equipment serviced?
We have up to date test equipment, fully equipped
workshop for all types of radio equipment.
TEL: OR FAX: 0603 788281
New Shop Open Now!
"Phone Us Now for Best Prices"

Prop: P. Gunther G4XBT, 95 Colindeep Lane, Sprowston, Norwich, Norfolk NR7 8EQ. VAT No. 595 1239 21

Short Wave Magazine, May 1992
servation might be an error in the Kepler elements - I'm not sure.

From Caterham in Surrey came a letter from Ray Howgego G4DTC who has recently acquired weather satellite receiving equipment and says he is both 'thoroughly addicted' to it, and finds it 'compulsive'! He is using a Multiplex 386SX Genius computer fitted with a 105Mb hard disk which is rapidly filling up with picture files! He uses PCGOES software, but with an Icom R7000 receiver and a discone! The Icom is used with a 250kHz bandwidth and Ray says, is far from ideal! For optimum WXSAT use it is essential to use a dedicated WXSAT receiver which will have a bandwidth of about 50kHz. Ray also monitors the h.f. and v.l.f. bands and tells me that his most stunning images are those from GOES relayed by the USN station at Norfolk, Virginia on 10885, 16410 and 20015kHz. Ray has also monitored 'poorer quality images' from Prague Meteo on 111.8kHz at 30 minutes past the hour. There have been some interesting changes in the direction of earth's polar axis, (called precession, this 'First Point of Aries' and the celestial equator) - and right ascension (RA). This RA is actually a simple measurement. It is the angle (measured in degrees) between a place in the sky called the 'First Point of Aries' and the object. As the earth rotates on its axis each day, the stars appear to move eastwards) between a place in the sky called the 'First Point of Aries' and the object. As the earth rotates on its axis each day, the stars appear to move eastwards (using 24 hours equals 360) or simply degrees.

In one case it crosses the equator while going north (ascending!) and the other node crosses while going south (descending). We always use the ascending node for Kepler elements. Next month we'll continue with these parameters.

**Global Positioning System**

Some readers have asked for more information on the satellites used in the Global Positioning System (GPS). This is a satellite-based radio positioning and navigation system which is not yet fully operational. Using 1575.42 and 1227.6MHz, it will consist of 21 satellites grouped in six different orbital planes, with some spares. These orbits have periods of 12 hours and are inclined at 55 to the equator, so their average height will be 20,000m. This means that at least four will always be visible to any given user at any given time. Each satellite transmits on both frequencies, but only the first may be accessed by civilian users. The telemetry contains information on the satellite clock, navigation and system data. Military users will be able to achieve an accuracy of within 30m but civilian users will 'only' obtain about 200m, due to the lower efficiency of the civilian system. The satellites carry atomic clocks for accuracy. If anyone requires more information on software for navigation they can contact Andy Hancock of PC Maritime Ltd in Plymouth; Tel (0752)- 556041.

**Beginners - Kepler Elements Part 2**

As mentioned last month, many readers have asked for an explanation of Kepler elements - those parameters which enable computer programs to predict the position of a satellite at a future time. This month we continue, with RAAN!

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADS</td>
<td>Acquisition of signal</td>
</tr>
<tr>
<td>a.p.t.</td>
<td>automatic picture transmission</td>
</tr>
<tr>
<td>AVHRR</td>
<td>Advanced Very High Resolution Radiometer</td>
</tr>
<tr>
<td>BBS</td>
<td>Bulletin board service</td>
</tr>
<tr>
<td>CGA</td>
<td>Colour Graphics Adapter</td>
</tr>
<tr>
<td>DOS</td>
<td>Disc Operating System</td>
</tr>
<tr>
<td>EMS</td>
<td>Expanded (or extended) memory</td>
</tr>
<tr>
<td>ESA</td>
<td>European Space Agency</td>
</tr>
<tr>
<td>GOES</td>
<td>Geostationary Operational Environmental Satellite</td>
</tr>
<tr>
<td>GOMS</td>
<td>Geostationary Operational Meteorological Satellite</td>
</tr>
<tr>
<td>h.r.p.t.</td>
<td>high resolution picture transmission</td>
</tr>
<tr>
<td>LOS</td>
<td>Loss of signal</td>
</tr>
<tr>
<td>NASA</td>
<td>National Aeronautics and Space Administration</td>
</tr>
<tr>
<td>PDUS</td>
<td>Primary Data User Station</td>
</tr>
<tr>
<td>VGA</td>
<td>Video Graphics Array</td>
</tr>
</tbody>
</table>

**Fig. 2: METEOSAT 4 water-vapour image (E1) from Pete Beardmore**

If you draw a diagram showing the satellite's orbit at an angle of perhaps 82 to the equator (METEORs have this inclination), you will realise that this orbit can be drawn in an infinite number of positions - anywhere around the earth. Now join a line between the two places where the orbit crosses the earth's equator and we have two positions - called the nodes. We are getting closer! Thinking about the satellite's movement along this orbit, you will notice that at one node it crosses the equator while going north (ascending!) and the other node crosses while going south (descending.)
Paul Charlton of Ilford has written asking if there is anything he can do to improve the stability of his receiver. He currently uses a Yaesu FRG-7700 receiver with decoding software from Grosvenor Software (G4BMK). Before looking at the solution, let's look at the cause. The first point to appreciate is that the temperature variations are the prime cause of frequency drift. This is because as the temperature rises so components in the receiver tend to expand. It's this physical change that causes the frequency to change. Although receiver designers go to great lengths to minimise the drift, perfection has yet to be achieved. With most modern receivers having synthesiser control, the overall stability is usually defined by a crystal controlled reference oscillator. One way to improve the performance of your receiver is to see if the manufacturers can supply an external frequency standard. These normally comprise a crystal controlled oscillator housed in a temperature controlled oven. They tend to be expensive, but often provide a tenfold improvement in stability.

Before you rush out to buy an external standard, there are a few points you can check. Remembering that temperature is the key component, you need to ensure that your receiver is kept away from any draughts. Ideally you should keep the receiver in a temperature controlled oven. They tend to be expensive, but often provide a tenfold improvement in stability.

Another important point is to ensure that the receiver is well ventilated. If you restrict the air flow around the receiver you'll find that the internal temperature takes longer to settle. This will both increase drift and may even shorten the life of the receiver.

If any readers have experienced drift problems and found cures, I'd be very interested to hear the details.

Tim Strickland of St Leonards on Sea asks for details of the Marine Page system that operates on 441kHz. All I know at the moment is that it's an experimental paging system operated by British Telecom. As far as I'm aware the transmission mode is an FEC variant, but I don't have any further details. If anyone can help, I'd be pleased to hear from you.

It's always gratifying to get letters from satisfied customers and it seems Les Gibson of Bristol is well pleased. Les wrote to me some months ago enclosing a tape and asking if the recorded signal was that of Offenbach. I was able to confirm this and give him some advice on a suitable decoding system. Just to prove that he succeeded, Les sent me a few photographs of Meteosat images. You should see a sample or two of his results in the column.

Peter Court of Birmingham is thinking of supplementing his v.h.f. equipment with a Lowe HF-225 (an excellent choice). He'd like to use this for RTTY, c.w. and FAX receiving.

If you restrict the air flow around the receiver you'll find that the internal temperature takes longer to settle. This will both increase drift and may even shorten the life of the receiver. If any readers have experienced drift problems and found cures, I'd be very interested to hear the details.

Mike Richards G4WNC
200 Christchurch Road, Ringwood, Hants BH24 3AS.
FAX chart received by Alan Jarvis using PC HF FAX.

had to be used to switch between letters and figures. These two codes are known as letter and figure shift characters. The addition of these codes means that we end up with a total of sixty codes available for letters, numbers and punctuation. This is clearly more than enough, but, create another problem. The snag is that the figure and letter shift characters become extremely important. With any of the other characters bursts of interference only corrupts single characters. However, if a shift character is lost or an additional shift inserted, the following text turns into gibberish. This is one of the major failings of the ITA2 as an encoding system. From a commercial point of view the solution has been to design new robust codes that not only reduce the chance of error but enable error correction to take place. Perhaps the most common example of this is the CCIR 476-4 alphabet used by the SITOR ARQ systems.

Despite the seemingly bleak picture I've painted, there are several ways that significant improvements can be made.

One system adopted by some press and telegraph agencies was to only use the letters character set and completely ignore the figure set. The problem, of course, is that you have to spell out punctuation and figures. This is the reason why so many telegrams included the word STOP at the end of each sentence. The advantage with this technique was that it significantly reduced the errors on important commercial messages.

**Simple Solution**

A simpler solution came with the advent of computer based decoding systems in the form of Unshift-on-Space. This is a simple system that forces a return to letter shift after every space character. The theory is simple - numbers within a message are normally followed by a space then letters. By forcing the return to letters, the facility can greatly reduce the number of errors received. However, as it is a compromise, it can't be used all the time. A classic example of this is the coded weather stations that have become popular with many readers. These stations send their data in a significant quality loss when the result is directed to the printer. As mentioned in last month's Decode, the most versatile packages are those that allow the image to be stored in a standard format such as PCX. If you have this option, you'll find that some of the graphics packages have excellent print utilities.

For those that use the Hoka Code-3 program, I'll repeat the tip I gave some months ago. To get the best printer output you need to run INSCODE3 and change the screenshot to CGA. When in the FAX module you then need to set the screen IOC to 176. Although this is a rather cumbersome fix, the results are well worth it.

To help those who have yet to find a solution, I'd very much like to hear from readers who are getting good printouts. Please send full details of both the FAX and graphics packages involved. I'd also like to see some examples of good quality FAX images.

**Frequency List**

Now on to the list for this month which has been compiled from the following readers: Ted Rickett, Day Watson, Ken Whayman, Jan Nieuwenhuis and Paul Charleton.

If you'd like a copy of my full list, just send three first or second class stamps to the address at the head of the column.

This month's list follows the normal format, i.e. Frequency, mode, speed, shift, callsign, time and notes.

**FAX Printing**

Several people have written to me asking how they can improve the print quality from their FAX decoding packages. The problem stems from the fact that many of the computer based FAX programs are optimised for viewing on a computer screen. This often results in a significant quality loss when the result is directed to the printer. As mentioned in last month's Decode, the most versatile packages are those that allow the image to be stored in a standard format such as PCX. If you have this option, you'll find that some of the graphics packages have excellent print utilities.

For those that use the Hoka Code-3 program, I'll repeat the tip I gave some months ago. To get the best printer output you need to run INSCODE3 and change the screenshot to CGA. When in the FAX module you then need to set the screen IOC to 176. Although this is a rather cumbersome fix, the results are well worth it.

To help those who have yet to find a solution, I'd very much like to hear from readers who are getting good printouts. Please send full details of both the FAX and graphics packages involved. I'd also like to see some examples of good quality FAX images.

**Frequency List**

Now on to the list for this month which has been compiled from the following readers: Ted Rickett, Day Watson, Ken Whayman, Jan Nieuwenhuis and Paul Charleton.

If you'd like a copy of my full list, just send three first or second class stamps to the address at the head of the column.

This month's list follows the normal format, i.e. Frequency, mode, speed, shift, callsign, time and notes.

**FAX Printing**

Several people have written to me asking how they can improve the print quality from their FAX decoding packages. The problem stems from the fact that many of the computer based FAX programs are optimised for viewing on a computer screen. This often results in a significant quality loss when the result is directed to the printer. As mentioned in last month's Decode, the most versatile packages are those that allow the image to be stored in a standard format such as PCX. If you have this option, you'll find that some of the graphics packages have excellent print utilities.

For those that use the Hoka Code-3 program, I'll repeat the tip I gave some months ago. To get the best printer output you need to run INSCODE3 and change the screenshot to CGA. When in the FAX module you then need to set the screen IOC to 176. Although this is a rather cumbersome fix, the results are well worth it.

To help those who have yet to find a solution, I'd very much like to hear from readers who are getting good printouts. Please send full details of both the FAX and graphics packages involved. I'd also like to see some examples of good quality FAX images.

Now on to the list for this month which has been compiled from the following readers: Ted Rickett, Day Watson, Ken Whayman, Jan Nieuwenhuis and Paul Charleton.

If you'd like a copy of my full list, just send three first or second class stamps to the address at the head of the column.

This month's list follows the normal format, i.e. Frequency, mode, speed, shift, callsign, time and notes.

**FAX Printing**

Several people have written to me asking how they can improve the print quality from their FAX decoding packages. The problem stems from the fact that many of the computer based FAX programs are optimised for viewing on a computer screen. This often results in a significant quality loss when the result is directed to the printer. As mentioned in last month's Decode, the most versatile packages are those that allow the image to be stored in a standard format such as PCX. If you have this option, you'll find that some of the graphics packages have excellent print utilities.

For those that use the Hoka Code-3 program, I'll repeat the tip I gave some months ago. To get the best printer output you need to run INSCODE3 and change the screenshot to CGA. When in the FAX module you then need to set the screen IOC to 176. Although this is a rather cumbersome fix, the results are well worth it.

To help those who have yet to find a solution, I'd very much like to hear from readers who are getting good printouts. Please send full details of both the FAX and graphics packages involved. I'd also like to see some examples of good quality FAX images.

Now on to the list for this month which has been compiled from the following readers: Ted Rickett, Day Watson, Ken Whayman, Jan Nieuwenhuis and Paul Charleton.

If you'd like a copy of my full list, just send three first or second class stamps to the address at the head of the column.

This month's list follows the normal format, i.e. Frequency, mode, speed, shift, callsign, time and notes.

**FAX Printing**

Several people have written to me asking how they can improve the print quality from their FAX decoding packages. The problem stems from the fact that many of the computer based FAX programs are optimised for viewing on a computer screen. This often results in a significant quality loss when the result is directed to the printer. As mentioned in last month's Decode, the most versatile packages are those that allow the image to be stored in a standard format such as PCX. If you have this option, you'll find that some of the graphics packages have excellent print utilities.

For those that use the Hoka Code-3 program, I'll repeat the tip I gave some months ago. To get the best printer output you need to run INSCODE3 and change the screenshot to CGA. When in the FAX module you then need to set the screen IOC to 176. Although this is a rather cumbersome fix, the results are well worth it.

To help those who have yet to find a solution, I'd very much like to hear from readers who are getting good printouts. Please send full details of both the FAX and graphics packages involved. I'd also like to see some examples of good quality FAX images.
ICS pioneered computerised amateur data reception in the UK. Our experience and expertise are second to none. Today we have the finest range of data and facsimile receiving equipment available and we pride ourselves on its superior performance, reliability and excellent value for money.

**PK-232 MBX Multi-Mode Terminal Unit £339.95**

The most popular terminal unit...ever. Receive and transmit Fax, RTTY, Amtor, Sitor, CW, ASCII, Morse, Navtex and Packet on your IBM-PC. Unique Signal Identification and Acquisition (SIAM) mode plus the best HF demodulator there is. Very easy to use. Supplied complete with all cables and software.

**MET-2 Satellite Receive System £939.95**

Receive Meteostat weather satellite pictures live on your own PC. New, very advanced version with super VGA support, 3D display effect, 100 frame animation, NOAA option with gridding and much more... Exceptional value for money.

**ICS-FAX II £129.95**

Displays superb weather fax images on an IBM-PC. Also includes Navtex, RTTY and FEC as standard. Cheaper and easier to use than similar products. Connects to any HF SSB receiver. 9 to 25 pin interface adaptor included. Colour Upgrade £49.95.

**SONY ICF-SW55 Communication Receiver £249.99**

Perfect for use with ICS-FAX II. Displays station name and up to 5 channels for each station. 150kHz to 30MHz plus FM stereo. USB, LSB, AM. 50Hz tuning resolution. 125 memories.

Prices include VAT at 17.5%. Add £6.00 Postage & Packing. Please contact us for free catalogue and price list. Our products are available direct and from dealers throughout Europe. Callers by appointment.

ICS Electronics Ltd. Unit V, Rudford Industrial Estate, Arundel, West Sussex BN18 0BD
Tel: (0903) 731101 Fax: (0903) 731105

---

**Cirkit TESTING**

**TM SERIES MULTIMETERS**

**D-MM Good Value!**

The TM series of low cost meters, with 3½ digit LCDs, full overload protection, strong ABS case and packed with features. Supplied with test leads, battery and manual.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM5315</td>
<td>DC current (10A) continuity and diode test</td>
<td>£159.99</td>
</tr>
<tr>
<td>TM5365</td>
<td>Capacitance and frequency (200kHz) ranges</td>
<td>£199.99</td>
</tr>
<tr>
<td>TM5375</td>
<td>Frequency range (20MHz) and HF test</td>
<td>£219.99</td>
</tr>
<tr>
<td>TM115</td>
<td>AC &amp; DC current (10A), HFE and contigency test</td>
<td>£219.99</td>
</tr>
<tr>
<td>TM135</td>
<td>Capacitance and temp. ranges (inc. probe)</td>
<td>£229.99</td>
</tr>
<tr>
<td>TM175</td>
<td>Frequency (15MHz), capacitance ranges with HFE, diode, continuity and LED test</td>
<td>£239.99</td>
</tr>
<tr>
<td>TM6020</td>
<td>3½ digit display, frequency (4MHz), capacitance (40µF), AC + DC current to 20A</td>
<td>£249.99</td>
</tr>
<tr>
<td>TM6030</td>
<td>3½ digit display, frequency (4MHz), temperature (inc. probe), AC + DC current to 20A</td>
<td>£259.99</td>
</tr>
<tr>
<td>7705</td>
<td>Capacitance meter, 1pf to 20,000µF</td>
<td>£269.99</td>
</tr>
</tbody>
</table>

**BLACK STAR**

Top quality. UK made. frequency counters and generators.

- **Jupiter 2010** 2MHz function generator plus 20MHz freq. counter £223.00
- **Orion** PAL TV pattern generator £226.00
- **1410** Video Monitor Tester £229.00
- **Meteor 100** 100MHz counter £126.00
- **Meteor 600** 600MHz counter £158.60
- **Meteor 1000** 1000MHz counter £208.00
- **Apollo 100** 100MHz counter/timer £381.00
- **Noua 2400** 2-4GHz counter £351.30
- **Jupiter 500** 500MHz function generator £179.25
- **Jupiter 2000** 2MHz function generator £175.05

**HAMEG 'SCOPES**

All Hameg scopes are supplied with two x 10 probes, mains lead, manual and 2 year warranty.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM203-7</td>
<td>Dual channel. 20MHz</td>
<td>£397.15</td>
</tr>
<tr>
<td>HM255-5</td>
<td>Digital storage. 20MHz sampling</td>
<td>£457.50</td>
</tr>
<tr>
<td>HM604</td>
<td>Dual channel. 60MHz</td>
<td>£716.75</td>
</tr>
<tr>
<td>HM1005</td>
<td>Triple channel. 100MHz</td>
<td>£830.60</td>
</tr>
</tbody>
</table>

Full details of all the above are included in our comprehensive catalogue, £1.70 (Inc. P&P). All the above are currently in stock and available for immediate delivery. Standard P&P £1.20, next day delivery £4.60.

---

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

Timestep have been producing inexpensive weather satellite equipment for 7 years. Following our success in both the UK and North American education market, we are now bringing our expertise to the amateur satellite user. All of our equipment is designed, built and fully supported in Britain, by Timestep engineers.

Lawrence Harris uses Timestep equipment for his column in Short Wave Magazine. Les Currington who received the first Chinese Feng Yun image and presented it to Chinese Diplomats, also uses Timestep equipment.

PCSAT III
This innovative package will receive NOAA, METEOR, OKEAN, FENG YUN, METEOSAT, GOES and GMS. All images are received automatically on any PC with CGA, EGA, VGA or SVGA display.

Zoom, Pan, Contrast Stretch, False Colour, and Laser Print are automatically on any PC with CGA, EGA, VGA or SVGA display.

Full Satellite Resolution is received and stored by the system in a massive 512kb file. This enables the stunning image quality and image processing.

Only £199.00 inc VAT & postage
Upgrade for £99.00 and your PC GOES in exchange.

Meteosat Receivers
Meteosat Yagi £124.95
Meteosat Preamp £92.00
20m Meteosat cable £16.00
Meteosat receiver £199.00
PCSAT III cable £9.95
PCSAT III system £199.00

Complete Meteosat system as above only £640.00 inc.

Polar Systems
We produce a professional scanning receiver for NOAA, METEOR, OKEAN and FENG YUN; and low cost antenna systems. INSTANT TRACK is the ultimate Polar tracking program for up to 200 satellites at £24.95 inc.

Computers
We can supply PCs to any specification at really good prices. Call us if you need details or if you want to purchase a complete "turnkey" solution.

Call or write for a full catalogue.

Timestep Weather Systems
Wickhambrook Newmarket
CB8 8QA England
Tel 0440 820040 Fax 0440 820281

RADIO SHACK

AR3000A
The latest full coverage receiver/scanner covering all frequencies from 100 kHz to 2036 MHz. Available from stock £765.00

SCANNERS FROM RADIO SHACK

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR-950</td>
<td>Base/mobile scanner</td>
<td>£199.95</td>
</tr>
<tr>
<td>AR-2000</td>
<td>Series II 0.5-1300MHz, 1000 memories</td>
<td>£269.00</td>
</tr>
<tr>
<td>AR-1500</td>
<td>NEW - as above, with SSB</td>
<td>£299.00</td>
</tr>
<tr>
<td>AR-2002</td>
<td>25-550 &amp; 800-1300MHz</td>
<td>£399.00</td>
</tr>
<tr>
<td>AR-2500</td>
<td>Base/Mobile 5-550 &amp; 800-1300MHz RS232</td>
<td>£419.00</td>
</tr>
<tr>
<td>AR-2800</td>
<td>Base/Mobile 0-650 &amp; 800-1300MHz</td>
<td>£395.00</td>
</tr>
</tbody>
</table>

ALL AOR PRODUCTS STOCKED

PRO-38  | 10 Channel handy scanner                    | £79.95  |
PRO-232 | 200 Channel search & scan                   | £199.95 |
PRO-282 | 60 Channel search & scan                    | £199.95 |
PRO-37  | 200 Channel SPECIAL PRICE UNTIL JANUARY 31  | £169.95 |
PRO-2006| 400 Channel 25-560 & 720-1300 MHz           | £329.95 |
IC-R-1  | Icon’s min.100kHz-1300 MHz 100 Ch. scanner  | £369.00 |
IC-R-100| High performance base/mobile                | £485.00 |
IC-R7100| 25-2000MHz high performance receiver/scanner| £1120.00|
BJ MK3  | Black Jaguar                               | £179.00 |
DX-X1   | Alico’s latest                             | £269.00 |
UBC-200XL| 200 Channel Handy Bearcat                   | £229.00 |
MVT-8000| Jupiter base/mobile station                 | £249.00 |
MVT-7000| Latest hand-held Jupiter                   | £279.00 |
HP-200E | From Fairmate 1000 memories                | £269.00 |
MS-1000 | Nevada Base receiver                       | £279.00 |
R-535   | Signal Airband Receiver                    | £199.00 |

DRAKE R8 RECEIVER £965.00

HF-225  | Low high performance compact receiver       | £429.00 |
R-2000  | Kenwood’s HF receiver, 10 memories          | £549.00 |
VC-10   | VHF converter for above                     | £165.00 |
R-5000  | Kenwood’s De-luxe HF set                    | £895.00 |
VC-20   | VHF converter of RS5000                    | £170.00 |
FRG-8000| Yaesu HF Receiver                          | £469.00 |
FRV-8000| VHF converter for above                     | £100.00 |
NRD-535 | JRC-HF receiver                            | £570.00 |
IC-R71E | Icom HF receiver                           | £875.00 |
IC-R72E | Latest set, mains with internal battery pack| £589.00 |
IC-9000 | The ultimate radio                         | £4080.00|

Carriage free in U.K. Call us for our tax free export prices.

We will be pleased to quote you for anything you require in the communications and computer field. We are pleased to hear from you and see you. We aim to give you the attention you deserve, so please call before you come along.

73s Terry Edwards G3STS

RADIO SHACK LTD
188 Broadhurst Gardens, LONDON NW6 3AY
Tel: 071-624 7174 Fax: 071-328 5066

(Just around the corner from West Hampstead Station on the Jubilee Line)
frequencies by a few kilohertz, but this usually results in co-channel interference and tends to be counter-seasonal changes. No doubt some will move their operating programme or frequency guide - just 'Hello' and 'Goodbye'. He does originate from CJYQ. At 2340 he logged it as 11221.

Speech and music from a station on 930kHz, which he heard WOSO in San Juan, Puerto Rico on 1030, R.Anguilla, WOR on 750, before switching off at 0250.

NF on 930 and VOCM, also in St. John's, before Kingston, ON. This was soon followed by CJYQ in St. John's, transmitter in Motala on 189kHz, Philip Rambaut.

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

Further to the closure of the m.w. outlets of some local broadcasters, the following reception of transatlantic i.w. signals from (G) George Millmore, Wootton I.O.W. (M) Tom Smyth, Co.Fermanagh.

Note: Entries marked * were logged during darkness. All other entries were taken during daylight or at dawn/dusk.
Most days 25MHz (11m) broadcasts have reached their targets well, but outside those areas reception has often been poor or non-existent. A few months ago Alan Roberts could receive almost all of the 11m broadcasts in Quebec, often at good strength, but since then he has observed a gradual deterioration and only three could be heard during February, R.Denmark via R25.730(Dato S.Am 1310-1150)35333 at 1140, DW via Julich 25.740 (Ger to E.Asia 1200-1355)94444 at 1325, also RFI via Isoudun 25.620 (Fr to E.Asia 0700-1500)25322 at 1455. Most 11m broadcasts can be heard in here via backscatter, but reception is often marred by flutter fading and echoes. Seldom mentioned is the church service broadcast on Sunday mornings by R.Netherlands via Flavo. This is on two frequencies: 25.940 (Du to Asia? 1030-1125)16144 at 1100 by John Stevens in Largs, also 25.970 (Du to Asia 1030-1235)33333 at 1050 by Kenneth Buck in Edinburgh.

In the 21MHz (13m) band very good reception of R.Australia's Darwin broadcasts has been noted in the UK around noon. They are beamed to S.Asia and the M.East 2120 (Eng 1100-1430) and often peak 54444, as noted by Ren Damp in Worthing. Earlier, their signals to Asia via Carriacou on 21.775 (Eng 0900-1000) have been reaching here. At best they were SI0433 at 0830 by Cyril Kellam in Sheffield.

Also heard in the morning were R.Japan via Moylab 21.575 (Eng, Japan to Europe 0700-0830)44334 at 0700 by Philip Lee in Huntingdon, Voice of the UAE in Abu Dhabi 21.735 (Ar to Europe 0600-0800)44333 at 0835 by Ren Galliers in N.London; R.Portugal via S.Gabriel 21.700 (Portico Africa 1000-1200)54544 at 1000 by A. Henry in Eastbourne; AIR via Algian 21.735 (Eng to NE.Asia 1000-1100), Th to Thailand 1115-1200 (heard at 1000) by Don Philips in Bridlington and SI0434 at 1145 by John Coulter in Winchester; BRT Brussels 21.815 (Eng to Africa 1000-1230)45433 at 1000 by Sheila Hughes in Morden; R.Pakistan, Islamabad 21.520 (Eng to Europe 1100-1200)54344 at 1105 by Chris Shorten in Worcester; Voice of the UAE in Abu Dhabi 21.510 (Ar to East Asia 1200-1500)53333 at 1215 in Macclesfield; RFI via Isoudun 21.615 (Eng to Cam 1200-1300)54454 at 1200 by Darren Beasley in Bridgwater; UAE R.Dubai 21.605 (Eng to Europe 1400-1455)53450 at 1200 by Eddie McKeeown in Co.Down; SRI via Schwarzenburg 21.695 (Eng to Asia, Pacific 1300-1400)53033 at 1330 by David Christian in Bridgwater.

Later, R.Iraq, Rami 21.690 (Iraq to Africa 1400-1730, Sun only) was 45554 at 1442 and 1600 by Bernard Curtis in St Albans and 44445 at 1705 by Jana Arunachalam in Thrall, Oman; VOA via Tangier 21.625 (Eng to Africa 1600-2000)51333 at 1625 by Ted Walden-Victor in Gt.Yarmouth; R.Austria int. via Moosbrunn 21.490 (Eng to Africa 1500-1600)51444 at 1560 by Bryan Kimber in Hereford; WCSS, Maine 21.840 (Eng to Africa, M.East 1600-2000)51333 at 1630 in Roverey Regis and 55344 at 1900 by P. Grupuradad in Madikive, S.Africa; HCBJ, Ecuador 21.455 (Eng p.c.a. p.c. 24hrs) SI0333 at 1704 by Bill Clark in Rotherham; R.Netherlands via Bonaire 21.685 (Eng to C.Africa 1300-1405)45444 at 1450 by Chris Haigh in Huddersfield, WYFR, Florida 21.615 (Eng to Europe, Afr 1900-2000)54545 at 1900 in Edlington, also 21.525 (Engto Europe, Africa 2000-2200)53333 at 2115 by Charles Bealander in Grimsby.

Good 17MHz (16m) DX reception has been noted. During the early morning the signals from R.New Zealand int. via Kaapen on 17.770 (Eng to Pacific areas 1230-0800) have often been reached here. Signal readings ranged from 55544 at 0559 in Norwichto SI021 at 0720 in Macclesfield. R.Australia is a strong 17.740 signal worldwide. A beacon is heard to SE Asia on 17.750 (Eng to SE Asia 0830-1400) and has also been received here. In Warsaw they was 24522 at 0554. Some signals in this band are intended for Europe. Those noted came from the Voice of Israel 17.545 (Eng to M.East) SI0333 at 1725 in Edinburgh; HCBJ, Ecuador 17.790 (Eng 1900-2000)33333 at 1956 in N.London; RCVia Sackville 17.875 (Eng 1900-2000)44342 at 2000 in Richmond. In addition, R.Pakistan, Islamabad 17.502 (Eng 1100-1200) 55544 at 1117 in Bridgwater; RCVia Sackville 17.820 (Eng 1700-1729) SI0555 at 1725 in Edinburgh; HCBJ, Ecuador 17.790 (Eng 1900-2000)33333 1956 in N.London; RCVia Sackville 17.875 (Eng 1900-2000)44342 at 2000 in Richmond. In addition, R.Pakistan, Islamabad 17.502 (Eng 1100-1200) 55544 at 1117 in Bridgwater; RCVia Sackville 17.820 (Eng 1700-1729) SI0555 at 1725 in Edinburgh; HCBJ, Ecuador 17.790 (Eng 1900-2000)33333 1956 in N.London; RCVia Sackville 17.875 (Eng 1900-2000)44342 at 2000 in Richmond. In addition, R.Pakistan, Islamabad 17.502 (Eng 1100-1200) 55544 at 1117 in Bridgwater; RCVia Sackville 17.820 (Eng 1700-1729) SI0555 at 1725 in Edinburgh; HCBJ, Ecuador 17.790 (Eng 1900-2000)33333 1956 in N.London.

Long Wave Chart

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency</th>
<th>Country</th>
<th>Power</th>
<th>Listener</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>Dunbarton</td>
<td>Germany</td>
<td>2.00</td>
<td>A,B,C,D,E,F,G,L*</td>
</tr>
<tr>
<td>160</td>
<td>Almora</td>
<td>Russia</td>
<td>3.00</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>170</td>
<td>Almora</td>
<td>Russia</td>
<td>1.00</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>180</td>
<td>Almora</td>
<td>Russia</td>
<td>0.25</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>190</td>
<td>Almora</td>
<td>Russia</td>
<td>0.27</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>200</td>
<td>Almora</td>
<td>Russia</td>
<td>0.29</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>210</td>
<td>Almora</td>
<td>Russia</td>
<td>0.30</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>220</td>
<td>Almora</td>
<td>Russia</td>
<td>0.32</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>230</td>
<td>Almora</td>
<td>Russia</td>
<td>0.35</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>240</td>
<td>Almora</td>
<td>Russia</td>
<td>0.37</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>250</td>
<td>Almora</td>
<td>Russia</td>
<td>0.39</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>260</td>
<td>Almora</td>
<td>Russia</td>
<td>0.40</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
<tr>
<td>270</td>
<td>Almora</td>
<td>Russia</td>
<td>0.42</td>
<td>A,B,C,D,E,F,G,L</td>
</tr>
</tbody>
</table>

Note: Entries marked * were logged during darkness.
All other entries were logged during daylight or at dawn/dusk.

Listeners:
A: Tim Bucknall, Congleton.
B: Bob Worrall, Plymouth.
C: Frank Heavey in N.Bristol, England.
D: Sheila Hughes, Mansfield.
E: Rodbrick Illias, Gediz.
F: Cyril Kellam, Sheffield.
G: Eddie McKeanon, Co.Down.
H: Jacques Mermage, Wotton, 10W.
I: Stuart Morris, Rowley Regis.
J: Hugh Quinn, Co.Kildare.
L: J.Karlsson, E.London.
M: John Weils, East Grinstead.

**KHB!** N.Mariana Is 17.555 (Eng to NE Asia; Russ 0800-1200; SI0343 at 1120 in Hereford; N.Africa 1:00, Gabon 17.530 [Fr, Eng to W Africa 0700-1000] SI0333 at 1520 in Grimbsy; R.Netherlands via Telata Volon 17.580 (Diu to S.Asia 1500-1600) SI0222 at 1530 in Macclesfield; R.Pakistan, Islamabad 17.555 (Eng to M East 1600-1630) 43443 at 1600 in Oman; RTM Tangier, Morocco 17.5900 after Signals to Eng; M East, N. Africa 1400-1700) SI0544 at 1606 in Rowley Regis; BBC via Ascension Is 17.860 (Eng to C/W.Africa 1600-1745) SI0333 at 1700 in Rotherham; also 17.880 (Eng to S Africa 1745-2030) 43433 at 1842 in S Africa; RCI via Sackville 17.820 (Eng to Africa in Macclesfield; R.Pakistan, Islamabad (Duto S.Asia 1530-1625) S10222 at 1530 in Rotherham; RSA, S Africa 15.160 (Eng at 1615 in S Africa and S10433 at 1742 in Transkei) to S10222 at 1915 in Norwich.

**Radio Signals:**

- UK listeners have also noted good 1520 kHz reception in the west of England. The signals from Australia have often reached the UK during their Darwin transmission to C Asia on 15.70 (Eng, Chn 0900-1400). They were logged in M.East 1525 (Eng to W Africa 1830-1859, Sat/Sun only) 34444 at 1843 in Huddersfield; R.Netherlands via Bonaire 17.805 (Eng to W Africa 1840-2345) SI03444 at 2314 in Gibraltar.

- A number of broadcasts to outside Europe were logged: U.AE R.Dubai 15.260 (Eng to S.America 2000-0330) 43444 at 2347-2345 noted as 'quite good' at 2314 in Winchester; BBC via Maseru 1859-2110-2210)43333 at 2121 in Oxted; VOA Europe were logged: UAE R.Dubai 1915 in Norwich.

**DXers:**

- (X) Darran Taplin, Brenchley.
- (WI Chris Shorten, Norwich.
- (RI Fred Pallant, Storrington.
- (Q) John Nash, Brighton.
- (L) A.G. Henry, Eastbourne.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
- (E) Bill Clark, Rotherham.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
- (DI Kenneth Buck, Edinburgh.
Good 13MHz (23m) reception from many areas has been evident. The occupants include DIVA Juljia 6.13 (Eng to W.Africa 0600-0650) 54344 at 0645 in Norwich; SRI via Sottens 13.685 in Derby; King of Hope, Lebanon 11.530 (Eng to W.Africa 0600-0650) 54344 at 2112 in Rotherham and SI0222 at 2155 in Canada; R.Nacional da Amazonia, Brazil 11.760 (Port 0800-2200) SI0333 at 2150 in Large; R.Diff.Nagota, Bogota, Colombia 11.790 (Eng to South America 0900-2300) SI0333 at 2315 in N.Bristol; R.Sofia, Bulgaria 11.870 (Eng to Latin Am 2245-0100), noted as "very good" at 2315 in Rugby; R.CI via Sackville 11.940 (Eng to Latin Am 2300-2330) SI0333 at 2315 in N.Bristol; R.Globo, Rio de Janeiro 11.905 (Port 0900-3000) SI0333 at 2345 in Evesham; BBC via Ascension 11.750 (Eng to S.Am 2200-0330) "fair" at 0330 in Stalbridge; R.GBC, Dubuque, Iowa 11.915 (Eng to USA 0000-0600) SI0333 at 0200 in Morden.

Good reception of R.New Zealand's 5MHz (130m) broadcast has been noted here. In Basingstoke their 100kW transmission from Rangitaiki, N.Island on 9.700 (Eng 0800-1200) peaked 44444 at 0659, but deteriorated to 34432 by 0900. Potential signals from R.Australia via Carnarvon on 9.850 (Eng to South America 0400-2300) have also reached here. At 2030 they were 55344 in Norwich. They have also been received well in Oman, rating 44444 at 1610. The ABC's domestic service from Brisbane on 9.660 was SI0333 at 1620 in New Radnor.

Some of the numerous 31m broadcasts to Europe stem from R.Australia via Lenk 9.535 (Fr, Ger, It, Eng 0600-20:00) VGCN 44444 at 2015 in Worthing; R.Japan via Moyabi 11.735 (Jap, Eng 1930-2000, also to M.East, Africa) noted as 'very good' at 2145 in Sheffield; VORC via Geeskoebo 9.852 (Eng 2200-2300) SI0333 at 2245 in London.

The 7MHz (41m) logs included GBS Doha, Qatar 7.160 (Am to E.Most 1930-2130) SI0333 at 1840 in Hereford; AIR via Aligah 7.142 (Eng to Europe 1845-1945) 44434 at 1900 in Bridgewater; Voice of the UAE in 0000) noted as good at 2307 in Rugby. In the 5MHz (29m) band CFRA Canada 6.070 (Eng 24hrs) was SI0222 at 0700 in New Radnor; CKZN, NF 6.160 (Eng 0930-0500) SI0333 at 2330 in Gregorys; CBC, Colombia 15.0Sp (24hrs) SI0355 at 0255 in Evesham.

---

Station Addresses

BBC Radio Furness, Harrington Street, Barrow-In-Furness, Cumbria LA14 5FH.
ILR Great North Radio, House, Long Rig, Swalwell, Newcastle-Upon-Tyne NE39 1BS.

• The Americas & Caribbean.

Radio CFFX, C.America & Caribbean.

Long medium & short

---

Equipment Used

Jana Anrachucham, Thurmail, Oman: Panasonic RF-845 or Sony ICF-7600D + 6m wire.
Charles Beelamond, Gibraltar: Sangean ATS-803 + r.w. or Howes A2L.
Darren Taplin, Brenchley: Yaesu FRG-7700 + FRT-7700 or FRT-7700 + 30m wire.

---

Transatlantic DX Chart

Freq Station Location Time

USA

1710 WOR New York 0120 BC
1720 WINS New York 0120 BC
1210 WOGL Philadelphia 0120 BC
590 VDCM St.John's, NF 0115 BC
830 CJSY St.John's, NF 0140 A.B.C
805 WACI Kingston, ON 0145 A.B.C
1200 WAHC P.Ramulu Arabipilla 0130 C
1150 RA790 Anguilla 0135 C
1010 Caribbean B'n con Anguilla 0145 C

---

T
his time we consider the future of amateur television. That's if it has one. If you think that's a strange thing for me to say, read on.

One of the clearest trends of the amateur radio hobby in general is its growing complexity and the move to commercial equipment. You have only to look at the sophistication of radio bulletin boards, techniques like AMTOR or some of the newer modes of colour slow-scan television. Amateurs, too, are exploiting all manner of highly technical surplus gear to achieve high-tech solutions on pocket money budgets, and while they may not be self-training in the art of wireless telegraphy, I think it can be argued that this is in the 'ham' spirit. I know some of the old-timers don't call this amateur radio as they knew it, and even I get suspicious when I see a shack that consists entirely of expensive commercial equipment. But let's leave that argument for another time.

Changing ATV

What is clear is that amateur radio and amateur television is changing. ATV has hitched a ride aboard the American space shuttle and it is only a question of time before ATV sympathisers in industry give ATV a transponder or two on board or a growing number of satellites in the sky. Again in the States, Henry Ruh KB8FG is petitioning the Federal Communications Commission to relax the rule on 'prohibited transmitters', i.e. music. Henry would like the authorities to change the rules on music to permit non-commercial television of educational films on ATV which may contain incidental music. And whereas music is absolutely taboo, should not a musician be allowed to demonstrate a new MIDI device he or she has built over the air without risking losing his or her licence?

Inevitably, then, ATV is changing, but will licence relaxations and the possibility of continental-wide coverage courtesy of a satellite-borne TV repeater make ATV more interesting? There are those who think not, which means 'serious' ATV users have some problems to solve. First listen to Bill WA8ITF. I think he sums up the problem most succinctly.

"Long ago, back when I was still a W2, I had a short-lived interest in ATV. I built a station out of some old RCA land mobile gear, home-brewed a converter and put 46-elements on my seven-storey apartment house. Then I spent three glorious weeks being bored stiff! After seeing Paul's Dog for the 44th time and 'Mike's slides of Borneo' for the 70th time, I disconnected it all and packed it away in W2INM's basement, where it probably sits rusting and rotting to this day. If ATV is ever to succeed and become even one tenth as popular as f.m. or s.s.b., then it has to offer something more than Fred and Joe sitting in their shorts, drinking a Coor's lager and looking at one another. With the relatively low cost of quality home video gear and a lot of imagination, the programming content of ATV could become something that would make people want to stay in ATV - not just pass through it.

Professional ATV

"There are two sides to television, the technical and the creative. Currently the vast majority of ATVers are technocrats - they give no thought whatever to the content of the communications they are transmitting. It is r.f. purely for the sake of transmitting r.f. and nothing more.

"What professional broadcasting has and ATV desperately needs is a corps of creative talent. We need hams who are willing to be writers, producers, directors and on-camera talent to go out, dream up some truly innovative programming ideas and carry these ideas to a logical conclusion.

"Sufficient to say that ATV can be made interesting to a lot more hams if it offers a bit more than Pete's parakeet and Mary's sewing box. Until it does, I am afraid that I and a lot of others will watch satellite TV instead."

Strong words, but would you disagree? And now here's Hans HB9SVW from Switzerland adding his thoughts on the malaise and disappointment of the ATV mode, as he puts it.

Few Restrictions

"We hams are in an unusually liberal situation. If we read about some new technology we can try it out straightaway - on the air! No exams, no certificate of competence, no type approval necessary. What would other radio users give for this privilege?"

"Well, so far so good. But what do we do with this technical knowledge we have gained? And this is where the connection with ATV comes in, though it's really a stab in the back. We ATVers have very few restrictions. There are limitations on the content of our transmissions but this still leaves countless themes from which we can all profit within the definition of amateur radio and self-education, namely the study of technology and its applications. But do we use it?"

"After a brief period being active on packet, I have seen how considerable the interest is in collecting useful data. The system is highly functional and I have access to databases and hook-ups throughout Europe and via short wave, the whole world. "But this information is silent and only in black and white. With a bit more technology and time I can transmit moving colour pictures. And then it amazes me to reflect that television is the most powerful medium in the world; just think how it is used for politics, informing and advertising. What's more, it has taken over from the printed word in books and newspapers as the prime medium for information.

"Only radio amateurs, who have advanced television facilities at their disposal, would give up an interactive, real-time sound and vision medium and go back to the written word. We used to talk about casting pearls before swine..."

Well said, Hans. Who can argue with that? So why don't ATVers shoot themselves in the foot? Who is going to change all this? Or should we pick up our ATV gear and admit defeat now? Write in with your views. A stamp won't cost you much and your view is vital!
EASY TO BUILD KITS!

Building your own equipment is not only interesting and fun, but enables you to build up your station facilities without having to spend a fortune. You could update an older receiver with our new DFD4 Digital Read-out, or build yourself an excellent little rig for holiday and portable use. All our amateur band receivers have matching transmitter kits, so you can start with a simple receiver and build up your station in easy stages.

DFD4 ADD-ON DIGITAL READ-OUT

The HOWES DFD4 enables you to add modern digital read-out accuracy to analogue type receivers and transceivers. The 100Hz resolution will enable you to find stations accurately on the right frequency ready to catch those brief messages that you would otherwise miss whilst tuning randomly. The DFD4 can accommodate any IF frequency offset, and VFOs that tune normally or "backwards". We have designed this kit to be as versatile as possible. Why not give me a ring to discuss its use with your radio?

DFD4 Kit: £39-90
Assembled PCB module: £39-90

ASLS5 DUAL BANDWIDTH FILTER

Add extra selectivity to your receiver with the HOWES ASLS5. The dual filters provide a narrow (300Hz) CW filter and sharper roll-off than crystal filters on SSB or other speech modes. A great addition to reduce noise and interference with all the popular general coverage receivers. No mods are required to the set, the ASLS5 connects in-line with the external speaker or headphone socket.

ASLS5 Kit: £15-90
Assembled PCB Module: £24-60

Some ALLY ACCESSORY KITS

ICF SW77
Top specification multi-band receiver with PLL synthesizer circuitry, station name tuning and continuous AM frequency coverage

IWF 77777
349.99
IWF 2001D
299.99
IWF 8000
249.99
IWF 8000
229.99
IWF SW1E
149.99
IWF SW600
149.99
IWF SW600A
129.99
IWF SW600
99.99
IWF SW601E
89.99
IWF SW20
69.99

Receivers

SONY

ICF SW77
Top specification multi-band receiver with PLL synthesizer circuitry, station name tuning and continuous AM frequency coverage

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICF SW77</td>
<td>349.99</td>
</tr>
<tr>
<td>ICF 2001D</td>
<td>299.99</td>
</tr>
<tr>
<td>AIR 7</td>
<td>249.99</td>
</tr>
<tr>
<td>WA 8800</td>
<td>229.99</td>
</tr>
<tr>
<td>ICF SW1E</td>
<td>149.99</td>
</tr>
<tr>
<td>ICF SW600</td>
<td>149.99</td>
</tr>
<tr>
<td>ICF SW600A</td>
<td>129.99</td>
</tr>
<tr>
<td>ICF SW800</td>
<td>99.99</td>
</tr>
<tr>
<td>ICF SW601E</td>
<td>89.99</td>
</tr>
<tr>
<td>ICF SW20</td>
<td>69.99</td>
</tr>
</tbody>
</table>

BREDHURST ELECTRONICS LTD.
High Street, Handcross, W. Sussex RH17 6BW
Tel: (0444) 400786. 400124
Fax: (0444) 400604

Mail Order to:
Eydon, Daventry, Northants NN11 6PT
Tel: 0327 60178

Short Wave Magazine, May 1992
When it comes to SONY
Look to Lowe

ICF-SW1E
Amazing is the only word to describe this ultra-compact radio. Measuring less than 5" x 3" x 1", yet packed with features and performance of a full-size portable, it covers long wave, medium wave and ALL of the short wave spectrum from 150kHz to 30MHz. It even covers FM stereo using the supplied earphones. You get keypad frequency entry, manual tuning and scan tuning for easy operation; whilst clear LCD digital readout (5kHz on SW) ensures accurate tuning. To keep your favourite stations, ten memories are provided and other features include dial lamp, Local/DX attenuator, keyboard lock, tone control and record output jack. To complete this total package there is even a built-in digital clock and alarm. A host of accessories including aerial, carrying case, manuals and others.

List price: £172 Lowe price: £149

ICF-SW7600
This new SONY portable is a microprocessor controlled general coverage receiver with many advanced features packed into its 7.5" x 4.75" x 1.25" case. Direct access tuning from a clear keypad, manual tuning with UP/DOWN keys, 150kHz to 30MHz coverage plus FM broadcast (FM in stereo through supplied earphones), AM/FM/SSB modes, ten memory channels, auto scanning, tilt stand, keypad lock, 24 hour digital clock with timer and full facilities for tape recording.

List price: £172 Lowe price: £149

ICF-2001D
Top of the SONY range and a firm favourite. I use one myself at home. The 2001D is a full-feature portable receiver giving you coverage from 150kHz to 30MHz with USB/LSB/AM modes, 116Mhz to 136MHz for the airband enthusiast and full coverage of the VHF FM broadcast band. Dual PLL frequency synthesis ensures accuracy and stability and the readout on short wave is to 100Hz. Features include keypad frequency access on all bands plus manual tuning control, built-in ferrite bar for LW & MW plus whip for SW and VHF, 12/24 hour clock and timer, wide/narrow IF filters, SONY synchronous AM detector with selectable sidebands, 32 channel memory with direct keypad access and memory scanning. Every possible feature is provided. The 2001D comes complete with many useful accessories.

List price: £345 Lowe price: £279

AIR-7
An unusual airband portable and truly showing the SONY individual approach to design. The AIR-7 is easy to use and the audio quality is excellent; not only on airband but on broadcasts as well since it covers the 108-136MHz airband, the VHF high band from 144-174MHz and, believe it or not, the LW/MW and low SW bands from 150-2194kHz. Ten memory channels, memory scan, keypad lock and priority channel. A truly comprehensive package. Complete with accessories. List price: £287 Lowe price: £229

SONY has brought Short Wave Radio operating convenience to new dimensions with the new ICF-SW77 through the exclusive combination of quick access tuning, synchronous detection, pre-set station tuning, auto scan and more!

ICF-SW77
Try it at any of our centres!

LOWE ELECTRONICS LTD
Chesterfield Road, Matlock, Derbyshire DE4 5LE
Tel: 0629 580800 Fax: 0629 580020

*Loughborough (Leicester): 0253 742331 Bristol: 0272 771770 Cambridge: 0223 311230

Short Wave Magazine, May 1992
Professional WEATHER MONITORING at low cost

FEATURES (depending on model)
- Wind Direction
- Outside Temperature
- Wind Speed
- Gust Alarm
- Gust Speed
- Rainfall
- Sunshine
- Min-Max Temperature
- Barometric Pressure
- Wooden Cabinet
- Mains & 12-24V DC

* * All main readings at a glance * *

SEND FOR COLOUR BROCHURE
Prices from only £179 inc. VAT

R&D ELECTRONICS, UNIT 19, THE ST JOHN WORKSHOPS,
MARGATE KENT CT9 1TE. TEL: (0843) 221622

Used amateur radio equipment bought, sold and exchanged - receivers a speciality - mail order no problem. Send SAE for lists.
Phone Dave on 0206 564134.
Anytime. Callers by appointment.

G4TNY Amateur Radio
70 BOX 1900, COLCHESTER CO2 8TY

DATONG ELECTRONICS LIMITED
Clayton Wood Close
West Park
Leeds LS16 6QE
Tel: 0532 744822
Fax: 0532 742872

For products you can rely upon
to give amazing results

For information on Active Antennas, RF Amplifiers, Converters, Audio Filters, the Morse Tutor and Speech Processors send or telephone for a free catalogue and selective data sheets as required.
All our products are designed and made in Britain. Orders can be despatched within 48 hours subject to availability.

RADIO AMATEURS EXAM?
PASS FIRST TIME!
Before you enrol check the benefits of RRC's unique Home Tuition Service

RRC has helped thousands of students to success in their examinations with this unique system of postal tuition, one which guides you, step-by-step, to qualify in the shortest possible time. Only The Rapid Results College offers you all these advantages:
- A qualified personal tutor
- Study material prepared by specialists
- Completely self-contained courses
- Handy pocket-size booklets
- Personal study programme
- Regular marked tests
- Courses regularly updated
- 48 hour despatch
- Fast advice before you enrol
- Telephone Helpline
- Free 'How to Study' Guide
- Insultent Plan
- Free Postage on course material
- Worldwide Airmail Service
- Extra tuition free if you don't pass first time

POST COUPON TODAY FOR FREE RADIO AMATEURS PROSPECTUS
Please send me my prospectus as quickly as possible.
Mr/Mrs/Miss/Ms __________________________
Address __________________________________
Postcode _________________________________

The Rapid Results College
Dept IV 122, Talbot House. London SW19 4DS. FREE ADVICE: 081 947 7272 19am 5pm
PROSPECTUS: 081 946 1102 24 hour Recordacall Service quoting Dept No. above.

80 Short Wave Magazine, May 1992
SANGEAN ATS 803A

(Direct key-in world receiver with quartz alarm clock timer)

Specifications and features:
- 155-29.9999 continuous tuning with no gaps
- Phase locked loop-double conversion
- Superhet/het/AM/SSB 150-29999Hz no gaps: FM87.5-108
- Five tuning functions: Direct press button frequency input auto scanning, manual scanning memory recall and manual tuning knob
- Built-in clock and alarm. Radio turns on automatically at preset time and frequency
- Large digital frequency display
- Fourteen memories - nine memory channels for your favourite station frequencies
- Indication of station name in the display
- Sixty station memory positions with 8 alternative frequencies (included)
- Built-in clock and alarm. Radio turns on automatically at preset time and frequency
- Large digital frequency display
- Fourteen memories - nine memory channels for your favourite station frequencies
- Last setting of mode and waveband stored in five memories
- Direct press-button access to all 12 shortwave broadcast bands
- Two power sources - battery or AC mains adaptor
- General coverage of all AM bands in LW/MW/SW (dedicated broadcast bands: coverage on all versions), plus of course the FM band for quality sound broadcasts in headphone stereo
- SL56M function turns the radio on or off after an adjustable time of 10-90 minutes
- Separate BASS and TREBLE controls for maximum listening pleasure
- External antenna jack for better reception
- Adjustable RF GAIN control to prevent overloading when listening close to other strong stations or if there is interference
- Now improved wide/narrow filter (6/2.7kHz)
- BFO control (Beat Frequency Oscillator) enables reception of SSB/USB/LSB/CW transmissions
- Illuminated display to facilitate night-time use
- Designed for both portable and desk top use
- Five dot LED signal strength indicator
- Dimensions: 29.2cmx16.0cm (11.5inx6.3inx2.36in)
- Output: 1200mW (10%THD)
- Weight: 1.7kg (3.75lbs) without batteries
- Wide/narrow filter switch

£109.95 + £5 check, test and p&p.

SKY SCAN

Desk Top Antenna Model Desk 1300
Built and designed for use with scanners. Coverage 25 to 1300MHz. Total height - 36ins - 9ins at widest point. Comes complete with 4 metres of RG58 coax cable and BNC connector fitted. Ideal indoor - high performance antenna and can also be used as a car antenna when your car is static. REMEMBER YOUR SCANNER IS ONLY AS GOOD AS YOUR ANTENNA SYSTEM!

£49.00 + £3.00 p&p

SKY SCAN

V1300 Antenna
Most discones only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

£49.95 + £3.00 p&p

SKY SCAN

Magmount MKII
For improved performance, wide band reception, 25 to 1300MHz. Comes complete with protective rubber base, 4m RG58 coax cable and BNC connector. Built and designed for use with scanners.

£24.95 + £3.00 p&p

S.R.P. TRADING

Manufacturers and distributors of communications equipment
Unit 20, Nash Works, Forge Lane, Belbroughton, Near Stourbridge, Worcestershire.
Telephone: (0562) 730672 Fax: (0562) 731002
Showroom opening times: Monday - Friday 9.00 - 5.30pm Saturday 9.00 - 1.00pm. Callers welcome.
Many Radio Amateurs and SWLs are puzzled. Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you'll know – but what about the many other signals?

HOKA ELECTRONICS HAVE THE ANSWER! There are some well-known CW/RTTY decoders with limited facilities and high prices, complete with expensive PROMS for upgrading etc., but then there is CODE3 from Hoka Electronics! It's up to you to make the choice – but it will be easy once you know more about Code3. Code3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 640k of RAM. The Code3 hardware includes a digital FSK Converter unit with built-in 230V AC power supply and RS232 cable, ready to use. You'll also get the best software ever made to decode all kinds of data transmissions. Code3 is the most sophisticated decoder available and the best news of all is that it only costs £299!

All the above modes are pre-set with the most commonly seen baudrate and number of channels which can be easily changed at will whilst decoding. Multi-channel systems display ALL channels on screen at the same time. Split screen with one window continually displaying channel control signal status e.g. idle, Alphas/Beta/RO's etc, along with all system parameter settings e.g. unshift on space, Shift on Space, multiple carriage returns inhibit, auto receiver drift compensation, printer on, system sub-mode. Any transmitted error correction information is used to minimise received errors. Baudot and Sitor both react correctly to third shift signals (e.g. Cyrillic) to generate ungarbled text unlike some other decoders which get 'stuck' in figures mode!

Six options are currently available extra to the above specification as follows: 1) Oscilloscope. Displays frequency against time. Split screen storage/real time. Great for tuning and analysis. £29. 2) Piccolo Mk 6. British multi-tone system that only we can decode with a PC! £59. 3) Ascii Storage - Six options are currently available extra to the above specification as follows: 1) Oscilloscope. Displays frequency against time. Split screen storage/real time. Great for tuning and analysis. £29. 2) Piccolo Mk 6. British multi-tone system that only we can decode with a PC! £59. 3) Ascii Storage -

NEW VERSION 4.00 JUST RELEASED – with improved user interface and even more features! Please add £5 to the above prices for carriage by fully insured First Class Postal delivery (default method).

Call or write for our comprehensive information leaflet – there is just not enough room here to tell you everything about Code3!

Professional users – please ask about our new CODE30 DSP unit available soon! (Piccolo down to -12dB SN/R!) Prices start from £1250.

THE VINTAGE WIRELESS BOOK LISTING

Published regularly containing 100s of out-of-print, old and collectable wireless, TV and amateur radio books/magazines etc. Send four first class stamps for next issue or £2.50 for next four issues.

WANTED: Pre 1960 Wireless, amateur radio and TV books and magazines.

NEW PUBLICATIONS:
- U.S.A. RADIO SURPLUS CONVERSION HANDBOOK – Facsimile reprint. Includes data, circuits and conversion details for most American transmitters and receivers including the command series and BC348, BC221 etc. £16.95 including postage.
- THE AUTHORISED BIOGRAPHY OF SIR BERNARD LOVELL – By Dudley Saward. The man responsible for Jodrell Bank. Contains detailed chapters on the development of wartime radar including X25 and various centimetric equipment. 320 large format pages. £29.95 including postage.

Send large SAE (33p stamp) for details of all our products.

CHEVET BOOKS (Dept SW)
157 Dickson Road, BLACKPOOL FY1 2BZ. Tel: (0253) 751858.

RAMS IV
MULTIMODE Rx PROGRAM FOR YOUR SPECTRUM
RTTY 5 Baud rates
AMTOR (SITOR) To 250 wpm or more
MORSE To 250 wpm or more
SSTV Large picture and multi speed
All this with generous
QSO Review and picture store £25.00
RMS III users upgrade for £12.50
Send large SAE (33p stamp) for details of all our products.
**ALAN HOOKER**

**SLIMLINE**

**£24.95 + £2.50 p&p**

**HEAVY DUTY**

**£29.95 + £2.50 p&p**

Allows you to safely mount your hand-held or mobile radio where you can see the controls...

Mounts any single flat surface.

Adaptable to any vehicle or station use.

Construction made of high quality aluminium.

---

**MODULATIONS COMMUNICATIONS**

62 Wootton Road, Abingdon, Oxon. Tel & Fax: (0225) 521490

**W1T 7000**

Handheld in a carry pouch...

- Frequency coverage: 300Hz-30MHz (10kHz-20MHz for satellite communications)
- £160 Channels of memory
- Rain or rotary
- 10Watt
- FM modes - Switch Style
- 100/800/1200/2400bps

Set exchange welcome/Wall order:
Call John @ F1KFX or Val @ H1QBD

---

**AIR SUPPLY**

838 HIGH STREET, YEADON, LEEDS LS19 7TA. Tel: (0532) 509581

Shop just two minutes from Leeds Bradford Airport.

**AIR TRAFFIC CONTROLLERS**

On hand to help you towards an interesting and rewarding pastime. Specialists in AIR BAND RADIOS AND SCANNERS. Hand held, mobile or base – AOR, Signal, Black Jaguar, Yupiteru, Icom, Uniden, Sony, Nevada: HF receivers from Sony, Icom, Lowe, Yaesu, Kenwood: wide range of accessories, aerials, plus CAA publications, maps, books, models from IMC, Wooster, Schabak, photos, souvenir products from British Airways and British Midland Airways. Large range of pilots products. Agents for Transair, AFE and Airtour. Plus lots more.

**PLEASE MENTION SHORTWAVE MAGAZINE** when replying to advertisements.

---

**PC HF FAX 6.0**

RECEIVE and TRANSMIT FAX IMAGES

This latest version of PC HF FAX not only enables you to receive weather charts, retrocast satellite pictures, ambulance and press transmissions on your PC computer but also has the ability to transmit your own fax messages.

NEW FEATURES INCLUDE:

- 230 page manual with worldwide fax frequency and schedule list
- Integrated online fax broadcast schedules with multiple search fields
- Support for Super VQA displays as well as Hercules, CGA, EGA, VGA, LCD
- Standard capture resolution 640x800 with 16 grey levels, with VGA, and EMS memory images are saved at 1280x800 with 256 grey levels.
- True colour press and satellite rebroadcast images in EGA, VQA and SVGA.
- Printer support for 14" wide printers plus Epson compatible colour printers.
- File compression, Image cropping, Digital noise reduction, Pixel photometry, and Contrast control.
- Import of ASCII text files for conversion and transmission as fax files.
- Installation is simple, both the demodulator and modulator plug into the serial port of the PC and are powered by the computer. Upgrade for existing PC HF FAX users £26.50 p&p £3.00

**£116.33 incl VAT p&p £3.35**

Optional Transmit Modulator £59.80

---

**PC GOES/WEFAX**

PC GOES/WEFAX enables you to receive both FAX and SATELLITE images on your PC computer in FAX mode it will display weather charts, retrocast satellite images, general and press transmissions, in SATELLITE mode it will capture images from both METEOSAT and at Polar orbiting satellites. Some of its many advanced features include: image resolution (600x480) to standard, 1280x1024 with VGA and HAX EMI - Super VGA support - Display in black-and-white, monochrome or full colour. Supports all known FAX and satellite transmission modes. Start, stop, phase delay and tuning. Possibility to capture RF images of satellite signals, exchange and store images. Perfect for use in marine, aviation or scientific applications.

Price only £199 inc VAT p&p £3.25

---

**PC SWL 3.0**

PC SWL is a complete package allowing decoding of data sent over radio.

New features include the following:

- RTTY bauds 45, 10, 75 and 100, in use selectable rates (AGC) 25, 110, 150 and 300, or user selectable rate (FLASH) including AMTOR/ICK and 100 baud - MORSE CODE with automatic or manual speed control - NAVTEX marine transmission - Weather Weather - Default settings - Automatic identification - Automatic TOY/FOY calibration - Full automatic signal analysis - Integrated shuttle screen location, to enable search, sort and store options - New drop down menus, integration with PC HF FAX.

Upgrade for existing PC SWL users £39.95 p&p £1.50

£99 inc VAT p&p £3.25

Order PC SWL and PC HF FAX together for only £178 p&p £3.25
SHORT WAVE LISTENERS CONFIDENTIAL

This book covers the complete short wave range from 3 to 30MHz together with the adjacent frequency bands from 3 to 30kHz and from 1.8 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 1913 entries in the frequency list and 3014 the alphabetical callign plus press services and meteorological stations. 102 pages. £20.00

HF OCEANIC AIRBORNE COMMUNICATIONS

3rd Edition. Bill Laver

HF aircraft channels by frequency and band, main civil and military radio by station, European M/F networks and North Atlantic control frequencies. 37 pages. £2.95

MARINE UK RADIO FREQUENCY GUIDE

Bill Laver

A complete guide to the UK s.w. and h.f. marine radio networks. Useful information, frequency listings and the World Marine Coastal Phone Stations. 67 pages. £4.95

NEWNES SHORT WAVE LISTENING HAND BOOK

Joe Pitchett G7UOH

A technical guide for all short wave listeners. Covers construction and use of sets for the s.w. who wants to explore the bands up to 30MHz. 266 pages. £14.95

RADIO LISTENER'S GUIDE 1992


This is the foundation of the essential radio listener's guide. Simple-to-use maps and charts show the frequencies for all the radio stations in the UK. Where travelling or at home, the guide gives you all the frequencies you'll ever need. 56 pages. £2.95


This book gives details of frequencies from 26-2250MHz with no gaps and who uses what. Recently updated, there are chapters on equipment requirements as well as antennas etc. 68 pages. £3.95

THE INTERNATIONAL VHF FM GUIDE


This latest edition of this useful book gives complete details of repeaters and beacons worldwide plus coverage maps and further information on UK repeaters. 75 pages. £2.95

THE POCKET GUIDE TO RTTY AND FAX STATIONS

Bill Laver

A handy reference book listing RTTY and FAX stations that can be heard with nodes and other essential information. The listing is in ascending frequency order, from 1.6 to 27.14MHz. 60 pages. £3.95

SHORT WAVE LISTENERS CONFIDENTIAL FREQUENCY LIST

Bill Laver

Covering the services and transmission modes stations can be heard on the bands between 1.605 and 29.1MHz. £3.95

WORLD RADIO TV HANDBOOK 1992

Country-by-country listings of i.f., m.w. & s.w. broadcast and TV stations. Receivers tuned to English language broadcasts. The s.w. "tilib", 576 pages. £16.95

ANTENNAS (AERIALS)

ALL ABOUT GICAL QUAD ANTENNAS

DWL1. 1 OR WLS 1 and Stuart. D. Cowen W1LX

The antenna came into being, and popularity, over 50 years ago. This book shows you how to design and build this versatile antenna. If you just want to build one or two, there are ready-to-go designs for bands between 7 and 50MHz. 122 pages. £6.75

THE ANTENNA ENGINEER'S GUIDE

Peter Dodd GDLO

Although written for Radio Amateurs this book will be of interest to anyone who enjoys experimenting with antennas. It only goes as far as a very basic knowledge of radio & electronics to get most from this book. 107 pages. £8.90

AN INTRODUCTION TO ANTENNA THEORY

H. C. Wright

A useful book for radio and TV enthusiasts with the basic concepts relevant to receiving and transmitting antennas. Lots of diagrams reduce the amount of mathematics involved. 66 pages. £2.95

ANTENNA IMPEDANCE MATCHING

Willard N. Caven

Proper impedance matching of an antenna to a transmission line is important in the design of antennas for the various bands and received at the antenna system. Power is fed to such a line without the need for a matching network at the input. There is no myopic interest involved in designing even the most complex multielement networks for broadband coverage. Logical step-by-step procedure is followed in this book to help the radio amateur with this task. 192 pages. £11.95

WORLD RADIO TV HANDBOOK 1992

Doug DeMaw W1FHE

This book provides lists of designs, in simple and easy to read terms, for simple wire and multiband antennas. All drawings are large and clear making construction much easier. 124 pages. £6.95

Wires & Waves

Collected Articles Antennas from PW 1990-1991

Antenna and propagation theory, including how to receive antennas from simple wire to medium waves to microsees, plus antennas that can possibly be published in OST. Those papers referred to are published in PW 1990-1991. £14.50

THE ARRIL ANTENNA BOOK (USA) 10th Edition

A station is only as effective as its antenna system. This book covers propagation, practical constructional details of antennas and receiver performance with antennas of every type, antenna equipment and formulas and programs for beam heading calculations. £14.50

THE ARRIL ANTENNA COMPENDIUM (USA)

Volume I

Because antennas are a topic of great interest among radio amateurs, ARRL continues to receive many requests for antenna information that can possibly be published in OST. Those papers referred to are published in PW 1990-1991. £14.50

THE RADIO AMATEUR ANTENNA HANDBOOK

William 1. OR W1SL & Stuart. D. Cowen W1LX

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

W1FHE'S NOTEBOOK

Doug DeMaw W1FHE

This book provides lists of designs, in simple and easy to read terms, for simple wire and multiband antennas. All drawings are large and clear making construction much easier. 124 pages. £6.95

25 SIMPLE AMATEUR BAND AERIALS (BP125)

E. M. Noll

How to build 25 simple and inexpensive aerials, from a simple dipole through beam and triangular designs to a 600-ohm, Dimensions for specific spot frequencies including the WARC bands. 80 pages. £1.95

25 SIMPLE INDOOR AND WINDOW AERIALS (BP131)

E. M. Noll

Special antenna designs for windows and through glass windows to a 600-ohm, Dimensions for specific spot frequencies including the WARC bands. 80 pages. £1.95

25 SIMPLE SHORT WAVE BROADCAST BAND AERIALS (BP132)

E. M. Noll

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

25 SIMPLE TROPICAL AND MW BAND AERIALS (BP145)

E. M. Noll

Simple and inexpensive aerials for the broadcast bands from medium wave to 850kHz. 64 pages. £1.75

DATA REFERENCE

DIGITAL IC EQUIVALENTS AND PIN CONNECTIONS (BP166)

E. M. Noll

Electronic circuits and pin connections for digital ICs.
A. Michaels  
Epidemiological and psychiatric research on a popular section of European, American and Japanese digital. 
[358 pages. £15.95]

INTERNATIONAL TRANSISTOR EQUIVALENTS  
A. Michaels  
Possible substitutes for a popular section of European, American and Japanese transistors. 
[230 pages. £13.95]

NEWNES AUDIO & HI-FI ENGINEER'S POCKET BOOK  
Vivian Capel  
This is a concise collection of practical and relevant data for anyone working on sound systems. 
[203 pages. £17.95]

NEWNES ELECTRONICS POCKET BOOK  
R.A. Penfold  
This book will provide you with all the essential theory of electronic circuits, but it also deals with a wide range of practical electronic applications. 
[250 pages. £12.95]

FILTER HANDBOOK  
A practical design guide  
Stefan Niewiadomski  
A practical book, describing the design process as applied to all types of filters. Includes practical examples and basic programs. 
[195 pages. £25.00]

FROM ATOMS TO AMPLIFIERS  
W.F. 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 wherever possible. 
[248 pages. £25.95]

SOLID STATE DESIGN FOR THE RADIO AMATEUR  
Les Hayward W2OZJ and Doug DeMahy W8WFB  
Back in print by popular demand. A revised and expanded edition of this useful reference book covering all aspects of solid-state design. 
[206 pages. £10.95]

THE ARRL ELECTRONICS DATA BOOK  
Doug DeMahy W8WFB  
Back in popular demand, completely revised and expanded, this is a handy reference book for the technician, designer, technician and amateur. 
[280 pages. £19.95]

TRANSMISSION LINE TRANSFORMERS  
I. D. Poole  
This is a notable addition to an already comprehensive selection of ARRL books. 
[164 pages. £3.95]

AMATEUR RADIO  
AN INTRODUCTION TO RADIO WAVE PROPAGATION (BP33)  
J. L. Lee  
The focus of this book is the sun and sunspots affect the propagation of the radio waves which are the basis of our hobby. 
[110 pages. £19.95]

WIFI'S DESIGN NOTEBOOK  
Doug DeMahy W8WFB  
This book is aimed at the radio amateur who wants to build up projects of a basic understanding of amateur electronics. 
[213 pages. £8.95]

ORP CLASSICS  
Edited by Charles L. Hutchinson and David Newick  
A collection of practical ideas gleaned from the pages of QST magazine. 
[244 pages. £3.50]

KEEPING THE AMATEUR RADIO LICENSE  
Arthur C. Gee G2UK  
The how and why of the mechanism and variations of Propagation in the H.F. bands. 
[144 pages. £15.00]

THE ARRL HANDBOOK FOR RADIO AMATEURS 1997  
This handbook contains much new material. Packed with information, it is one of the most useful books available for the modern radio amateur. 
[1000 pages. £19.95]

THE ARRL OPERATING MANUAL  
Another very useful ARRL book. 
Although written for the American amateur, this book will also be of use and interest to the UK amateur. 
[604 pages. £13.95]

THE ARRL SATELLITE ANTHOLOGY  
The history of the Amateur Satellite News column and articles and one of the best-selling books ever written. 
[15 pages. £37.95]

THE ARRL UHF/MICROWAVE EXPERIMENTS MANUAL  
Vivian Capel  
A truly excellent manual for the keen microwave enthusiast and the budding 'microwaver'. 
With contributions from over 20 specialist authors. 
[446 pages. £14.50]

THE COMPLETE DX'ER  
Bob Lane W4EB  
Now back in print, this book covers equipment and operating techniques for the beginner, from a basic understanding of the RF used to advanced operating. 
[120 pages. £7.95]

R. E. Gell G3BCJ  
This book has been compiled especially for students of the City and Guilds of London Institute. 
[140 pages. £7.95]

THE AMATEUR RADIO CALLBOOK NORTH AMERICA 1995 70th Edition  
AMERICAN LISTINGS 1992 70th Edition  
Radio amateur callbooks containing standard time chart, census of amateur licences of the world, world-wide QSL bureau and much more. Over 1400 pages. 
[116 pages. £15.95]

AMATEUR RADIO'S GUIDE TO RADIO WAVE PROPAGATION (BP31)  
F. C. Judd G2ZCX  
This is only a small selection of our Book Service selected as being of particular interest to SWR readers. See last month's issue for further titles. 
Our sister publication, Practical Wireless, carries titles for the radio amateur. 
[152 pages. £5.95]

SHORT WAVE COMMUNICATIONS  
Peter Reuse G0TUR  
A new book from the word-processor of this best-selling author. Covers a wide field of interest and provides an introduction to the hobby of radio communications. 
[187 pages. £8.95]
ALYONTRONICS

129 CHILLINGHAM ROAD, HEATON,
NEWCASTLE-UPON-TYNE NE5 3XJ. TEL: 091-2761002

THE ONLY AUTHORISED DEALER IN THE NORTH-EAST FOR

ICOM & YAESU

WE ALSO STOCK MANY OTHER ITEMS OF EQUIPMENT FROM

MFJ • BUTTENUT • CUSCHKRAFT TONNA • DIAMOND • AOR

BEARCAT • FAIRMATE • JUPITER • LOWE • TEAM

MIDLAND • NEVADA • CTE • WELZ

• REVEX • BOOKS & MAPS •

LICENSED CREDIT BROKER

OPEN 10am - 5.45pm TUES - FRI 10am - 4.45pm SAT

IBM PC SOFTWARE

RTTY, AMTOR, CW (Tx and Rx) BY G4BMK

SSTV, FAX, Audio Analyser (RX only). See review PW June 1990 Page 66. A high performance multimode program for IBM PC compatibles, £80 complete. Any mix of modes to your choice – send SAE for details and prices.

ATARI ST

RTTY, AMTOR, CW and Analyser for Atari ST/STE works with hires or medium res display, £49. Printed manual £5. Use with ST5 Versatext etc., or our matching built T.U. £35. State callsign, if any, and disk size with order. Add £1 P&P.

GROSVENOR SOFTWARE (SWM)

2 Beacon Close, SEAFORD, East Sussex, BN25 2JZ. Tel: (0323) 893378

Yorkshire

Alan Hooker Radio Communications

42 Netherhall Road, Doncaster.

Tel: (0302) 325690 Open: Mon-Sat 10-5pm

Closed Thursdays.

Kenwood

YAESU

Index to Advertisers

Aerial Techniques

Air Supply

Alan Hooker

Alyontronics

Amateur Radio Communications

Amrad

AOR (UK) Limited

ARE Communications

ASK Electronics

Aviation Hobby Centre

Axdon Books

Billington Export

Bredhurst Electronics

Chevet Books

Cirkit

CM Howes

CM Leslie

Color Electronics

Comar Electronics

Datong

Deewbury Electronics

Dressler

ERA

F G Rylands

Flight Deck

GEINV Amateur Radio

Garex Electronics

Grosvenor Software

Hoka Electronics

ICOM

ICS Electronics

Interproducts

J & J Enterprises

J & E Packets

Javitation

Klingenfuss

KW Communications

Lake Electronics

Link Electronics

Lowe Electronics

Martin Lynch

Modulations Comms

Nevada

OBA Electronics (Sony Centre)

Photo Acoustics

Practical Wireless

R & D Electronics

Radio Research

Radio Shack

Rapid Results College

Short Wave Centre, The

Sigma Euro Comm

Sky View

SMC

Solid State Electronics

SRP Trading

Technical Software

Timestep

WACRAL

Waters and Stanton

Word (UK)

Yorkshire

Scottish

THE UK SCANNING DIRECTORY

Here is the book that every scanner owner has been waiting for! It is filled with the parts that other books leave blank.

Listed over 5000 spot UK frequencies nationwide from 30kHz to 10GHz, gives the band plan, covers public utilities, security, telephone, military and lots more.

Price £14.95 incl. UK postage.

Overseas post add £2 for EEC and airmail or £5 airmail.

AUDIO GUIDE TO THE SOUNDS OF SHORTWAVE

This tape contains over 30 of the most commonly heard transmission sounds on the Shortwave bands. They include RTTY, CW, SSTV, FAX, encryption systems etc., which will help the listener to identify the various transmissions. It is indispensable for new Shortwave listeners and will serve as a reference guide to the older ones.

Price £8.25 incl. UK postage. Overseas post add £1 airmai worldwide.

INTERPRODUCTS

552, 8 Abbots Street, Perth PH2 0EB, Scotland

Tel & Fax: 0738-441199

Published on the fourth Thursday of each month by PW Publishing Ltd., Enefco House, The Quay, Poole, Dorset BH15 1PP. Printed in England by Southprint (Web Offset), Factory Road, Upson Industrial Estate, Poole, Dorset BH16 5SN. Tel: (0202) 622226. Distributed by Seymour, Windsor House, 1270 London Road, Norbury, London SW16 4DH. Tel: 081-679 1899, Fax: 081-6798907, Telex: 881245. Sole Agents for Australia and New Zealand – Gordon and Gotch (Asia) Ltd.; South Africa – Central News Agency Ltd. Subscriptions INLAND £21, EUROPE £23, OVERSEAS (by Airmail) £35. Payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Enefco 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 that having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or offered to or as part of any publication or advertising, literary or pictorial matter whatsoever.

76 Short Wave Magazine, May 1992
FOR SALE Superstar 360 multi-mode with Zetagi 100W main linear, good working order, other bits. £150. WANTED C64 disk drives. Tel: (0482) 619589.

FOR SALE Racal RAt7 with manual, £50. Buyer collects. Datong ASP automatic r.f. speech processor. Tel: (0633) 893769 Gwent.

FOR SALE mostly WWII collectable items. HRMXX, HRCC3, RX102, RX203 complex, RX208 Mk1, 12 mc calibrator, TC157 TX/RX receiver, RX155, radio trans, marine RX DX/E/2DXRX (boxed), etc. Com 6209V. 18 Oakly Banks, Althing, Northumberland NE6 2EE. Tel: (0665) 24027.

FOR SALE Icom ICR1 boxed, extras include mains lead, charger, ear/lighter attachment, battery pack, battery case, plus Raycom modification. £25. Tel: 01929 421759. Runcorn.

FOR SALE AEA Pakratt PK232MBX multi-mode terminal unit, with manual and all documentation, driver provides for either IBM or AIM PC included. £230. Post paid (£1). Tel: 01-495 8931.

FOR SALE mostly WW1 collectable items. RX600X, RX203 complex, RX208 Mk1, 12 mc calibrator, TC157 TX/RX receiver, RX155, radio trans, marine RX DX/E/2DXRX (boxed), etc. Com 6209V. 18 Oakly Banks, Althing, Northumberland NE6 2EE. Tel: (0665) 24027.

FOR SALE Bearcat 50XL scanner (pristine condition) include accessories, manual, external supply. £40. Tel: 0121-389 8999 evenings.

FOR SALE R.F.C. Owen. Tel: (0293) 520172 ext 242 office hours or 24356 anytime. Be sure of your copy every month and qualify for the SWM Subscribers' Club as well. Special offers and competitions with some really useful prizes to be won.

This month we are offering SWM Subscribers' Club Members a copy of the Short Wave Magazine Radio Information Cassette - 1.

This offer closes on 31 May 1992.

Be sure of your copy every month and enjoy all the special offers and discounts normally available to all members, including those abroad.

SWM SUBSCRIBERS' CLUB

If you have a subscription then you will know all about the Short Wave Magazine Subscribers' Club. If you don't then read on. Membership is free and automatic for all subscribers to this magazine and is our way of saying thank you to all those who have had to pay for it to 'pose'. This means that Special offers and competitions with really useful prizes to be won.

The SWM Radio Information Cassette - 1 was produced to enable listeners to identify the various strange sounds that can be heard on short wave and v.h.f. and u.h.f. radio. Side A has tracks with amateur space and satellite monitoring, 50MHz, the more esoteric 144MHz modes such as meteor burst, aurora, sporadic E & moonbounce. Side B has samples of the different modes - Morse, Baudot, RTTY, AMTOR, FAX, DSC, etc.

As a member of the SWM Subscribers' Club you can buy your copy of the SWM Radio Information Cassette for just £3.00 inc. P & P.

This offer closes on 31 May 1992.

More Trading Post on Page 80

Short Wave Magazine, May 1992
PRE-OWNED UNITS

**FRG9600 x 2**
- each £375
**ICR7000HF**
- £750
**ICR71**
- £675
**LOWE 225 + accessories**
- £425
**FRG7700**
- £295
**AOR2001**
- £199
**MX6000**
- £275

**Phone for latest prices and offers**

**PRE-OWNED UNITS**

**FRG9600**
- £375
**ICR7000**
- £1000 inc ARA1500
**ICR7100 inc HF or ARA1500**
- £1120

**Price correct at time of going to press. Please phone for latest quotation or contact your local agent any time on the following numbers:**

- **Terry (Biggleswade, Beds.)** 0767 316 431
- **Stuart (Bromley, Kent)** 081-313 9186

**TRANSAX**

**JRC**
- **NRD535D+ECSS+BWC+1 kHz filter inc. ARA60**
- £1699
**NRD535 only**
- £975
**NRD535 inc ARA60**
- £1095

**AOR2000**
- £249
**AOR2800**
- £329

**SHINWA SR001**
- Remote control full feature receiver. Still only £299!

**SHINWA SR001**
- Remote control full feature receiver. Still only £299!

**SHORTWAVE ACTIVE ANTENNA**
- 940mm High 64mm diameter complete with cable + PSU and interface £163

**ALINCO**
- **DJX-1**
- £259

**KENWOOD**
- **R5000inc ARA60**
- £925
**R2000**
- £429
**LOWE 150**
- £329

**AOR3000A**
- £249
**AOR2800**
- £329

**YUPITERU**
- **MVT7000**
- £279

**SIGMA**

**SIGMA SE1300**
- 20-1300 MHz Receive
- Transmit 50. 144, 430, 900, 1200 MHz input
- Power rating: 200 watts
- Impedance: 50 ohms.
- £49.00 + p&p

**SIGMA SE700**
- 70-700 MHz Receive
- Transmit 70-900 MHz
- Power rating: 50 watts
- Impedance: 50 ohms.
- £22.00 + p&p

Mail Order: Cheques and P.O. made payable to Sigma Euro-Comm.

**TRADE ENQUIRIES WELCOME**

**ANORAK MONTHLY**

Is a new monthly publication featuring news of Radio Caroline, Satellite Radio, Local Radio, Short Wave, International Radio and more.

For the latest issue send 50p plus a SAE (or £1.00 plus two SAE's for two issues) to:

CM LEISURE SALES, DEPT. SW, P.O. BOX 46, ROMFORD RM11 2QE

Trade enquiries welcome.

We are one of the largest stockists of valves etc. in the U.K.

**ELECTRONICS VALVES & TRANSISTORS**

**COLOMOR (ELECTRONICS) LTD.**

Phone for a most courteous quotation

081-743 0899

We are one of the largest stockists of valves etc. in the U.K.

170 GOLDHAWK ROAD
LONDON W12 8UJ
Our new combined VHF/UHF frequency listing running to over 100 pages is now available. The new publication is in the same format as our previous individual lists and is updated with the same regularity. Not only have we joined both lists together but added some extra information as well. Compiled by enthusiasts for enthusiasts (sorry about the cliche!) - The best available or so we would like to think.

VHF/UHF Frequency Listing: £6.50 + £1p&p

AR-2000
In stock, £269.00 supplied with FREE leather carry case worth £14.99

MVT-7000
Excellent performance, easy to use, supplied with all accessories – £289.00

ICOM IC-R1
The smallest hand-held available. Special offer until end of March – £330.00

AOR AR-2500
We have a small number of units available at a special price of £399.00 including IBM PC software

Carlton Works, Carlton Street, BRADFORD, West Yorkshire, BD7 1DA
Telephone: 0274-732146  Facsimile: 0274-722627
For sale Mk11 microreader in good condition with instruction or EXCHANGE Hallicrafters SX111 h.f. receiver in good way. The Railway Cottage, Joan Croft Crossing, mode base station with accessories. Cash either for quality receiving system or v.h.f Ju h.f. multi-EXCHANGE Trio 930S auto atex. perfect condition collects. Tel: (0695) 28945.

WANTED 1920s crystal set. Tel: (0628) 27350.

Stereo system CX-800E, £300. Good condition, £200. Tel: (0792) 433300 ext 3318 offer 7pm, York.

FOR SALE Yaesu FRG-7700 plus FR-7700 and FR-7700, good condition, manuals, £250 o.n.o. Buyer collects or will deliver £250.

FOR SALE RCA 9700 as new. Excellent condition, £50 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7000 continuous tuning 0-25-28.3MHz, £250. Tel: (0276) 21694 evenings and weekends (answering machine, return call within 24 hours if out).

FOR SALE Kenwood R5000 as new, in mint and perfect condition, based on manuals, £125. Also Kenwood FRG-7700 handheld complete with BP-95 battery pack plus NiCad and fitted case, condition £250. Tel: (0170) 632284, Ripon, North Yorkshire.

WANTED Yaesu FRG-7700 plus FRV-7700 and FRT-7700 a.t.u., £25 o.n.o. Tel: 051-371166 Reading.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, £250. Tel: (0765) 205214 anytime, Swansea.

WANTED Sony ICF-SW71T (best model), replaces the old ICF-160. Tel: (0342) 317863.

FOR SALE Yaesu FRG-7000 continuous tuning 0-25-28.3MHz, £250. Tel: (0276) 21694 evenings and weekends (answering machine, return call within 24 hours if out).

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, £250. Tel: (0765) 205214 evenings & weekends.

Exchanges Turbox 7300 four channel storage receiver £295. Tel: (0792) 464186.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, £250. Tel: (0765) 205214 evenings & weekends.

FOR SALE Yaesu FRG-7000 continuous tuning 0-25-28.3MHz, £250. Tel: (0276) 21694 evenings and weekends (answering machine, return call within 24 hours if out).

WANTED Sony ICF-SW71T (best model), replaces the old ICF-160. Tel: (0342) 317863.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, £250. Tel: (0765) 205214 evenings & weekends.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, £250. Tel: (0765) 205214 evenings & weekends.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-770 I 00, good condition, £250. Tel: (0765) 205214 evenings & weekends.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

FOR SALE Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.

WANTED Yaesu FRG-7700 plus FRV-7700 and FRT-7700, good condition, manuals, £250 o.n.o. Buyer collects.
IC-R100 Mobile/Base Receiver.
On the road or at home the IC-R100 is the ideal solution to receiving stations in the 500kHz - 1800MHz frequency range. For listening convenience a 24-hour system clock with timer functions, 100 memory channels, direct keypad entry and handy scan functions are featured.

- AM, FM and FM-wide modes.
- 10 programmed scan ranges.
- Priority scan.
- Memory scan.
- Auto memory write scan.
- AFC function.
- Variety of tuning steps.
- Built-in preamp and attenuator.
- 150(W)x50(H)x181(D)mm.

IC-R1 Handheld Receiver.
Tune into the world around you on the IC-R1, one of the smallest receivers ever made. With continuous coverage from 2MHz - 1300MHz, AM, FM and FM-wide reception right into the palm of your hand.

- Ultra compact size.
- 100 memory channels.
- Direct keyboard entry.
- 10 programmed scan ranges.
- Auto power saver.
- 24-hour system clock with timer functions.
- Advanced scan functions.
- Built-in S-meter.
- Built-in nicad batteries.
- 49(W)x102(H)x35(D)mm.
Kenwood's New FM Dual Bander Sets the Pace

One glance at ergonomic design of Kenwood's TH-78E is enough to tell you that this is far from an ordinary handheld transceiver. You're looking at the smallest dual bander in the world, packed with the finest communications technology: built-in DTSS and paging functions, alphanumeric memory and message paging, dual-frequency receive (including VHF+VHF & UHF+UHF) and double-band scan. Plus much more. Compact and confident, the TH-78E is truly going places.

- Built-in DTSS & paging functions
- Alphanumeric memory function (max. 6 characters)
- Alphanumeric message paging (max. 6 characters)
- Dual-frequency receive
- Full-duplex cross-band operation
- ABC (automatic band change)
- Double-band scan
- 50 non-volatile memory channels expandable to 250 channels with optional memory module
- ME-114-position output power control (High/Mid/Low/Economy low)
- CTSS operation with TSU-7 tone decoder (opt.)
- Sliding keypad cover
- Auto power-off
- Auto battery saver
- 10-minute transmission time-out timer (TOT)
- 2m automatic repeater offset

FM DUAL BANDER TH-78E

Distributed in the UK by

LOWE ELECTRONICS LIMITED
Chesterfield Road, Matlock, Derbyshire DE4 5LE
Tel: 0629 580800 Fax: 0629 580020