REVIEWED THIS MONTH

PHILIPS DC777 SHORT WAVE CAR RADIO

FREE PULL-OUT WEATHER WATCHING MAGAZINE INSIDE THIS ISSUE

Also A Great Feature On The US Coastguards

★ JUNIOR LISTENER ★ STARTING OUT
★ BANDSCAN EUROPE
★ SATELLITE TELEVISION
★ SSB UTILITY LISTENING
★ PROPAGATION

Plus
Regular Features for Airband, Broadcast & Scanning Enthusiasts
Extra Wideband Scanning Power

New Models With Even More Facilities!

**NEW HP200 Handheld Scanner**
Following the outstanding success of its predecessor the HP100 this new model boasts improved performance
- Extra wideband coverage: 500KHz – 600MHz, 805MHz – 1300MHz
- 1,000 channel memory
- Receives AM - FM - Wideband FM
- Search steps selectable from 5KHz to 995KHz
- Keypad or rotary tune controls
- Switchable 10dB attenuator

Each set is supplied with:
- Full set of high power NiCad rechargeable batteries
- UK spec. charger
- Three antennas - VHF, UHF, short wave telescopic
- Carrying case, belt clip, shoulder strap
- Dc cable for car cigar adaptor supply
- Earpiece for private listening............................£269

**NEW Nevada MS1000 Mobile/Base Scanner**
An exciting new scanner with all the specifications of the HP200 above plus:
- Switchable audio squelch
- Tape recorder output socket
- Automatic tape recorder switching circuit switches tape recorder on when a signal is present
- All metal case for improved EMC compatibility......£279

Available From Authorised Dealers Throughout The UK.
Nevada Communications, 189 London Road, North End, Portsmouth. PO2 9AE
Send in £2 now for our LATEST CATALOGUE with full details of our complete product range (includes a £2 voucher).
Contents

10 The US Coast Guard
Bill Black

12 Starting Out
Brian Oddy G3FEX

15 Educational Software for Basic Electronics Part 4
J.T. Beaumont G3NGD

19 A Small Power Supply for Valved Receivers
Chas. E. Miller

20 Wordsearch Competition
Prizes by Maplin Electronics

23 Ladies on the Key
Stan Crabtree G3OXC

27 Phillips DC777 SW Car Radio Reviewed
John Waite

Regulars

45 Airband
38 Amateur Bands Round-up
36 Bandscan - Europe
62 Book Service
51 Decode
41 DXTV Round-up
2 Editorial
49 Errata
49 First Aid
46 For Your Bookshelf
4 Grassroots
53 Info in Orbit
5 Junior Listener

1 Letters
2 Services
55 PCB Service
33 Propagation
35 RadioLine
4 Rallies
37 Satellite TV News
48 Scanning
35 SSB Utility Listening
30 SWM Subscribers' Club
64 Trading Post

Good Listening
You will have noticed that this issue has cost you £1.75 instead of the £1.60 you paid last month. Like most other things in life, the cost of producing magazines has risen over the past year and Short Wave Magazine is no exception. Our investment in the technology needed to allow us to produce the magazine to the high standards which you expect, together with the inexorable increases in the cost of paper in the 20 issues since the price last went up, means that we have had to bow to the inevitable and increase the cover price.

From your letters, I know that you like the new look and the new features. I believe that SWM still represents remarkable value for money. There is one way in which you can beat the price increase, however. I am informed by Kathy, who runs the Subscription Department, that the price of a 12-month subscription will stay at £19 until August 1 this year. A three-year subscription represents even greater value at £50 (UK only). Subscribers get free membership of the SWM Subscribers’ Club with its special offers and competitions, as well as receiving their copies of the magazine through their letterbox two or three days before it appears in the shops. Fill in the form on page 30 now and save your money.

Weather Watching

Inside this issue you will find your free, pull-out copy of Weather Watching. Aimed at introducing you to this fascinating branch of the listening hobby, you will find it full of interesting facts and ideas to get you ‘listening’ to weather satellites, weather FAX transmissions and ‘voice’ weather forecasts. I hope that you enjoy reading it and I know that Lawrence Harris (Info in Orbit) and Mike Richards (Decode) both look forward to receiving your reports and pictures.

letters

On the subject of Pirates...

Dear Sir

After reading your March 1991 edition, I feel I have to write concerning Mr Read’s letter on your letters page. I must agree with him entirely on the point he made concerning the reporting of all short wave radio stations, as a short wave magazine I feel that it should be your responsibility to keep your readers well informed on all short wave stations.

Being a member of the British DX Club, I enclose an article from the February 1991 edition of the club magazine in reply to Mr Read’s point about Radio Caroline. “As reported last month, Caroline’s crew were allowed to reboard and make safe the Ross Revenge on condition that there were no immediate plans to resume transmissions. Although initially non-broadcast supplies were allowed to reach the ship, reports are now that the DTI is warning boat owners against supplying the ship - although according to Caroline’s lawyers, Richard Butler, no offence is being committed. A film crew filming for Bob Geldof’s documentary on Caroline thus had to make you think more on whether you should report such stations. Obviously some stations such as ours in your pages. But, whether or not to publish reports of pirate stations. Tom Read’s letter in particular! Tom has written to us in the past.

Our station broadcasts on Sunday mornings on a frequency of 6.275MHz for an average of two hours per broadcast. Since November 1990 we have received, and answered, over 150 letters from people who have heard our broadcasts! Now I feel that for a station using only 20W of r.f. output to receive QSL every week!

I think the answer should be yes, you should report the existence of stations such as ours in your pages. But,
Dear Sir
With reference to Mr Carrington’s letter in the February issue of SWMregarding the authenticity of contributions made to ‘Seen & Heard’.

I submit to Brian Oddy, at the end of each month, a genuine list of loggings made, along with everyone else who do this all the year round. Admittedly, I do possess copies of WRTHand Reports to World Band Radio, which are referred to, but the only way to hear stations is to listen to your receiver. This is time consuming but very enjoyable day and night.

Most stations announce who they are and in a lot of cases frequency and transmission times are given. If Mr Carrington wrote to some of these stations I am sure, as in my case when I first started, they would be only too pleased to send him their guide.

My suggestion to Mr Carrington and his friend is ‘don’t knock it before you try it’. Perhaps we may then see some of his contributions in future issues.

C M SHORTEN
NORFOLK

Dear Sir
I have followed with interest the letters about reports in ‘Seen & Heard’. Before contributing to the column I made use of it to try out a new and fairly inexpensive mini-portable. My main interest was in DX, the column became my guide to receiver sensitivity. I was able to compare the new set to similar portables, checking my set’s performance against their results. ‘Seen & Heard’ gives the details I needed. Information such as frequencies, times, antennas, etc., even the towns where the items were heard. The set failed miserably on all tests and was returned to the shop as unsuitable for my purpose.

I ordered the new Sony ICF-7600SW as a replacement and I had a three-months wait for delivery. This portable passed all the tests and I use it for my submissions to the column. I hope these and others’ contributions prove useful to readers. They certainly helped me avoid an ‘expensive’ lemon, thanks to Brian Oddy and SWM.

W N CLARK
ROtherHAM

Dear Sir
I was pleased to read the letters in SWM March from readers who have obviously learned to make intelligent use of the WRTHand.

The subject under debate used to be described as ‘list logging’ - the ‘identification’ of a station purely by matching the details of what was heard with a published listing. This can lead to disaster - such as the case a few years ago when a DXer ‘identified’ the Voice of America’s French service to Africa as a 4kW regional station in Senegal.

As Editor of the most widely used reference, I am naturally very concerned about the misuse of our publication in this way. I am pleased that SWM has drawn attention to this subject.

Your readers may be interested to know that Downlink is only one of the ways we try to keep our readers informed. We are also actively contributing media news to various computer bulletin boards, and this is freely available for use by individuals and DX clubs.

We also help behind the scenes in researching material for the Radio Netherlands Media Network programme and we have our own WRTHand news report on that programme every few weeks.

As a short wave listener myself, I always stress to our readers that, while we try to be as up-to-date as possible at the time of printing, changes are occurring every day and the active listener needs to have regular sources of information. That obviously includes SWM.

Notwithstanding the above, we do sometimes make genuine mistakes in WRTHand, of course, we always welcome corrections from readers.

ANDY Sennitt
EDITOR WRTHand

Thanks to all readers who wrote to me about this topic. Your comments helped enormously in reshaping the ‘Seen & Heard’ section of the magazine by letting me know exactly how you used the information and what you wanted.

This topic is now closed, Editor.

Letters must be original and not have been submitted to other magazines. The views expressed in letters published in this magazine are not necessarily those of Short Wave Magazine.

Dave Martin
Station Manager WNKR KENT

Dear Sir
I notice you are still requesting comments from readers regarding the inclusion of clandestine stations in SWM. The opinion of the present readership is, of course, important, but the decision also has to include an estimate of the number of new readers the subject will attract. There are a small number of semi-underground news sheets that cater for this area of the market, but these are distributed by subscription, and not available in book shops. My own personal belief is that one should exercise one’s freedom of speech right up to the legal limit if necessary, but at the same time retain a responsible professional attitude.

Andy Cadier
Folkestone

Dear Sir
I am writing in response to a letter printed in the March issue of SWM, from Mr Tom Reid suggesting that SWMlists ‘unofficial’ radio stations. This would be a worthwhile investment as you would gain a lot of readership.

As you are aware from the heading on my letter, I am myself such an operator. I would ask that you would consider this idea with an open mind.

Andy Craig
The Northern Ireland Relay Service

As I have said in the past, I listen to what my readers say and as a result of your replies I am arranging a regular column on Pirate Radio Stations. The new column will report on activity but will have to be careful not to promote or encourage pirate activity. It will appear as part of a three-monthly cycle of columns that will include Brian Oddy’s Long Wave Maritime Beacons and a new column, covering the fascinating subject of amateur TV, written by Andy Emmerson.

Dear Comradik
Much thank yous to Meester Judd (G2BCX) for his excellent theesis on ze Rooshan Voodpeker, (March edition). But sorry ze Professori Judd is rong agane.

It is, how does you Engleesh say, a rudey beeg skocking coil, fecated at ze Popofski Institut for reetired Radio Amoroti. It was maid to cuure ze aiking joints. However, not mooch gud for ze joints, but eet sure makes de eyes vater.

As a speesial fayvoor ve vill let Meester Judd pay next month elektrecity bill. Keep up ze exceellente werk Short Wave Magazine.

Alexi Roosti
Direktoor Popofski Instituut
Chester
rallies
March 31: The Centre of England Amateur Radio Rally will be held at the National Motorcycle Museum, Bicknall, near the NEC Birmingham. Admission £1, DAPS 50p and children free. Concessionary rates to visit the museum, Bring & Buy, Talk-in on S22, bar and restaurant available. The traders have decided to have a competition amongst the stalls to see who can come up with the most outrageous and funniest Easter hat that you could see. Very odd, drams walking about. Frank (0952) 588173.

April 7: Lough Erne Amateur Radio Club will be holding their 10th Annual Mobile Rally in the Killyhevlin Hotel, Enniskillen. Doors open at 12 noon, talk-in on S21. Special guest Louis Varney G5VHU. Alwyn Magee G5JFD QTHR. Tel: (0365) 233802.

April 7: Cambridgeshire Repeater Group Amateur Radio Rally will be held at Philips Radio Communications Catering Centre, St Andrews Road, Chesterton, Cambridge. Doors open 10.30am, admission 50p. GOHEM (0793) 23689.

April 7: The 24th White Rose Rally will be held at The Refectory, University of Leeds. Doors open 11am. All the usual attractions, talk-in on S22, extensive FREE parking and food and drinks available. Entrance £1 by numbered programme, free monster prize draw, no raffle. Senior citizens, bored workers and kiddies free of charge. Tony G4DXA, PO Box 73, Leeds, LS1 5AR.

April 7: The 5th Launceston Amateur Radio Rally will be held at Launceston College. There will be a large Bring & Buy section including Ham and CB, hot dogs and an array of give-a-ways. Visit to the National Remote Sensing Centre. Paul G4TXQ, 10454) 616267.

April 7: The 5th Launceston Amateur Radio Rally will be held at Launceston College. There will be a large Bring & Buy section including Ham and CB, hot dogs and an array of give-a-ways. Visit to the National Remote Sensing Centre. Paul G4TXQ, 10454) 616267.

April 7: The 24th White Rose Rally will be held at The Refectory, University of Leeds. Doors open 11am. All the usual attractions, talk-in on S22, extensive FREE parking and food and drinks available. Entrance £1 by numbered programme, free monster prize draw, no raffle. Senior citizens, bored workers and kiddies free of charge. Tony G4DXA, PO Box 73, Leeds, LS1 5AR.

April 7: The 24th White Rose Rally will be held at The Refectory, University of Leeds. Doors open 11am. All the usual attractions, talk-in on S22, extensive FREE parking and food and drinks available. Entrance £1 by numbered programme, free monster prize draw, no raffle. Senior citizens, bored workers and kiddies free of charge. Tony G4DXA, PO Box 73, Leeds, LS1 5AR.

April 7: The 24th White Rose Rally will be held at The Refectory, University of Leeds. Doors open 11am. All the usual attractions, talk-in on S22, extensive FREE parking and food and drinks available. Entrance £1 by numbered programme, free monster prize draw, no raffle. Senior citizens, bored workers and kiddies free of charge. Tony G4DXA, PO Box 73, Leeds, LS1 5AR.

April 7: The 24th White Rose Rally will be held at The Refectory, University of Leeds. Doors open 11am. All the usual attractions, talk-in on S22, extensive FREE parking and food and drinks available. Entrance £1 by numbered programme, free monster prize draw, no raffle. Senior citizens, bored workers and kiddies free of charge. Tony G4DXA, PO Box 73, Leeds, LS1 5AR.

April 7: The 24th White Rose Rally will be held at The Refectory, University of Leeds. Doors open 11am. All the usual attractions, talk-in on S22, extensive FREE parking and food and drinks available. Entrance £1 by numbered programme, free monster prize draw, no raffle. Senior citizens, bored workers and kiddies free of charge. Tony G4DXA, PO Box 73, Leeds, LS1 5AR.
Reader's Station

Colin Martin (14) of Newcastle-upon-Tyne wrote with details of his listening station. Colin has been interested in radio for about three years now and is fortunate in being able to share his Dad’s station. His interest started when his Dad bought a PRO-2021 scanner and progressed with a portable short wave radio. The current station comprises ex-MoD R210 and Yaesu FRG-7 receivers that are fed by a whip antenna and a 30m long wire. An added bonus is an ERA Microradiator that enables utility stations to be decoded and displayed.

Although they share the same equipment, Colin’s interest centres around s.a.b. and utilities whilst his Dad prefers to listen to broadcast stations. Colin’s best DX to date was JA6XMM (Japan) on the 3.5MHz amateur band at night. His favourite utility station is the IRNA news agency in Tehran. He has also received many QSL cards and letters from far away as Australia and New Zealand. He has even had a letter read out on Radio Israel.

So keep up the good work Colin and I look forward to receiving more reports like yours.

International Reply Coupons

My first enquiry comes from Mr Davis on the Isle of Wight, who although not actually under sixteen has only been in the hobby a short time. As he asks a question that puzzles youngsters, I think that justifies me answering! The question is very simple - what are IRCs? I expect you’ve seen these mentioned in the magazine from time to time. As you may have guessed from the name, they are designed to be exchangeable for postage stamps in a wide range of countries. If you are requesting information from someone in another country and want to pay for the return postage then it’s not much use including a UK stamp as it won’t be valid abroad.

The answer is to go to the Post Office and buy an International Reply Coupon. These coupons can be exchanged for stamps in most countries. To save you having to work out the postage costs, each IRC can be exchanged for the cost of a basic letter to a foreign country. So you can see this is a very handy system. When sending for QSLs (see last month’s column), include an IRC and you are more likely to receive a reply.

Sometimes, you can buy things with IRCs too. Items such as certificates or awards or frequency guides can often be purchased with IRCs too. Those letters justifying me answering! The question is very simple - what are IRCs? I expect you’ve seen these mentioned in the magazine from time to time.

Medium Wave Long Distance (DX)

Jamie Tullett (15) of Coleraine has been interested in radio listening for about eighteen months. His main interest is broadcast stations from i.f. right through to the h.f. bands. For this he uses a Realistic DX-440 receiver and a 100m random wire connected to an a.t.u. He has made many good contacts with this station including CKLM (Canada) on 1570kHz.

Jamie is now looking to experiment with medium wave loop antennas to improve transatlantic DXing. There have been several designs published in the magazine over the years but two you might like to take a closer look at are the Long Arm Loop and the Hexagonal Loop. Of these, the Hexagonal Loop is the largest being 610mm wide and 1200mm high. If you would like to try one of these a photocopy of the Hexagonal Loop (April ’89) will cost 85p and a back issue of the Long Arm Loop (September ’87) costs £1.85.

There were some mods to the Long Arm Loop in the February ’91 issue. Some of you may be new to medium wave and wonder why the loop antenna is so popular. The reason is tied up with the comparatively low frequencies used on medium wave. You may remember a couple of months ago I explained about long wire antennas and the very long antenna lengths required on m.w. Because it’s not possible for most people to have antennas this long other types have to be used. Another important reason for the loop is its directional properties. If you’ve tried listening on m.w. in the evening you will have noticed how very busy and noisy it is. This is probably the main problem facing the DX enthusiast. The loop antenna helps to cut through some of this noise by reducing the level of all signals except those coming from the desired direction. By rotating the antenna you can choose the point where the wanted signal is strongest and the interfering signal weakest.

Another attractive feature is that loop antennas are generally cheap and quite easy to build. There’s lots of opportunity to experiment with different types. If you’ve had success experimenting with antennas drop me a line with the details and I’ll pass on your experiences.

Mark Farr of Cheshire. He’s very interested in home construction and is currently building a one-valve short wave receiver that was featured in the September ’90 issue of Short Wave Magazine. This design used Denco Green Range coils that, sadly, are no longer manufactured. Mark needs the range 3, 4 and 5 coils and would very much like Nos 1 and 2 as well. If anyone can help, please send the details to the address at the head of the column - I’ll then pass the details on to Mark.

Pen Pal

My first request for a Pen Pal comes from Mark Farr of Cheshire. He’s very interested in home construction and is currently building a one-valve receiver. He also has a very generous grandfather who has just given him a Grundig 650 receiver. If you would like to write to Mark just drop me a line and I will pass your letters on.

If anyone else would like to enter this section just send me the following details:
Name, Address, Age and Interests.
Don’t forget to enclose a large s.a.e. for the replies!

That’s it for this month but please keep those letters coming.
DUBUS Subscribers

We have heard from the UK distributor of the very useful amateur radio publication DUBUS, that the first issue of the new year will be published this month. Several subscribers have overlooked the fact and the dead-line for subscriptions is 1 April 1991.

New Tools

Ungar have announced their own line of high-performance, quality hand-tools manufactured in California.

All Ungar EPA cutters have been designed with a shear-cutting action to minimise operator force and component shock. Soft, chunky handles reduce the concentration of force in the hand. Less than half the operator force of crush-cutting is required and the blade design ensures a neat, square cut with minimal acceleration.

The Economy, Super and ESD series have a line-up of five flush cutters. Two of these have a permanently-mounted safety-clip and one has a 75° angle which results in a more natural hand/arm position when cutting. Similarly, each series includes both smooth and serrated jaw pliers.

The Economy Series comprise well-made, durable, general-purpose hand-tools aimed at cost and quality conscious users. The Super Series features special heat treatment for extra toughness and durability and plating for corrosion protection.

The ESD-Safe Series is identical to the Super selection, but with static-dissipative hand-grips for safe cutting of even the toughest and durable and plating for corrosion protection.

All hand-tool parts, including rivet, springs and cutting edges are life cycle tested.

Ungar, Eldon Industries UK Ltd., Clifton Road, Sheffield, Beds SG17 5AB. Tel: (0462) 814914.

Stolen

An AOR2002 scanning receiver, serial number 09A23, was stolen from Derby between February 23 at 1600 and February 24 at 0845. Any information to John Arnold G4NPH. Tel: (0353) 741354.

TVDX News

Problems continue at Gibraltar Broadcasting, but the end of March '91 sees the end of the financial year and changes are likely in the structure of the station. The government props up GBC with an annual £600 000 grant (frozen at that level), but additional funding is necessary to maintain/improve programming. RTL, London Film (part of Central TV), two Spanish groups and Video Time Spa from Italy are all interested in commercial involvement, the latter has promised both English and Spanish language programming and is a favoured runner. The Gib. government will make a decision for GBS’s future shortly. CLT Luxembourg is interested in a major stake with the Irish TV3 commercial TV network which hopes to be on-air mid/late 91.

Discussions have continued over the amalgamation of the West European EBU and East European OIRT in both technical, legal and programme matters. Both the EBU and OIRT organise international broadcasting in their respective areas. In the North, MTV Finland is producing a weekend breakfast TV programme over YLE-3 0430-0640UTC, it’s called Huomenta Soumi (Good morning, Finland).

The Studio Zagreb 1st TV programme is transmitting an Albanian language news programme at 2230. Also in Yugoslavia,’TV Koper-Capodistria’ has now ceased her Italian language service, it’s now ’TV Koper’ with only Slovene programming. Another change is that ’RTV Skopje’ will be renamed ’RTV Makedonija’ or ’Makedonska RTV’. Another new Italian TV network, ’TV-7 Pathe’, will feature at least 30 local stations throughout major population centres. With large studios in Rome, TV-7 will make good use of the Pathe association with MGM.

It looks like Antenna 3 is now operating in the Canary Islands on Ch.34 Teneriffe, Ch.36 Las Palmas. Canal + and Tele 5 will also be transmitting shortly...if you were using a scanner in the London area at 47.645MHz f.m. and heard, ’This is a test transmission from the East Tower’, we think this originated from the BBC TV Centre, the signals were heard early February and audible in Southampton!

Not good news for TVDXers is that the French LA 5, M6 and the Canal J (children’s channel) - these will be featured space permitting. Canal J will transmit 0700-2000 local, Mons/Sat and school holidays 0700-2130 local.

Not good news for TVDXers is that the Spanish PTT have agreed in principal for 50MHz radio amateur operation, details on spectrum, powers, times, etc., are likely to be finalised. And in Greece, the PTT will allow 50MHz operations outside of the capital - Athens - area. In Eire, Class B licence holders will be allowed access to the 50MHz band outside of TV hours (approx 2400-0900).

GBC-TV Ghana is now receiving CNN at its Accra a HQ and transmitting certain CNN material in her programmes. Rwanda has changed to the PAL standard from the earlier SECAM since most of the bought in programme recording are in PAL. Network upgrading is currently being discussed. A new regional u.h.f. station ’Canterbury TV’ is about to open from studios in Christchurch, New Zealand, financed from local advertising.

Finally the Norwegian government has given agreement for a 2nd terrestrial network, based regionally - Bergen the most likely - to operate commercially on a 10-year licence. Allowing up to 10% of transmitted time for advertising, the channel must provide a new service. There is no indication of when it could be on-air, though it will operate at u.h.f. Roger Bunney.
Special Event Stations

The weekend of May 11/12 will see the 10th Anniversary of the Southern Electric Museum, which is located in the Old Power Station, Bargates, Christchurch, Dorset.

The Museum, which is dedicated to the supply and use of electrical energy and equipment through the ages, is a unique collection and will be open to visitors from 11am to 4pm on both days.

The members and reps of the Bournemouth & District RAIBC Group will be operating the Special Event Callsign GB3SEM from the museum. A colour QSL card will be available for all reports and QSOs via the RSGB QSL Bureau or direct to G6DUN, sending an s.a.e. to 40 Fairmile Road, Christchurch, Dorset BH23 2LL.

The station will be active on 80 and 40m in the mornings and on 20/15/10m in the afternoons. Contacts and talk-in will be also available on 144MHz f.m.

The town of Scarborough has adopted the warship HMS Fearless and to celebrate the first visit to the resort of this newly commissioned veteran of the Falklands War, the Scarborough Special Events Group will be on the air as GBORN from May 9 - 13 whilst the warship is at anchor in the bay.

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

Starter Tool Kit

Maplin Electronics have introduced a value for money starter tool kit into their range of products. The cloth tool roll contains a snip cutter, a pair of long-nose pliers, a light-duty flat blade 75mm long screwdriver, a No.1 crosspoint 75mm long screwdriver, a desoldering tool and a soldering kit containing a CS iron, a stand and a 5m pack of 18 s.w.g. solder.

The tool kit, order number SK01B, is available for £19.95 including VAT.

Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR.

Peter Brownbridge

Peter Brownbridge, the ebullient proprietor of Johnsons Shortwave Radio in Worcester died at home on Saturday, March 9 after a long illness.

Peter was one of those rare individuals who put his customers first. He would rather give them sound advice, even if it meant making less profit from the deal. Being partial to a long chat, he would always drop in at the SWM Editorial Offices when he was taking his annual holidays in Weymouth!

The business will be carried on, for the time being, by Anita, helped by Lara the dog.

Condolances to Peter's family from the staff at Short Wave Magazine.

NT Diamond Jubilee Award

The National Trust for Scotland Diamond Jubilee Award will be available during 1991 to either radio amateurs on a worked basis or s.w.l. on a heard basis. You need to contact GB60NTS and any four special event stations that will be held at various National Trust Properties throughout the year. To claim, forward log extracts only to The Awards Manager, PO Box 59, Hamilton, ML3 6QB. The cost will be £2 for the UK and Ireland or $6 or equivalent for overseas. There will be 12 National Trust stations on over the weekend of August 31/September 1 including GB60NTS.

A full list of all awards, events and an information pack on the Scottish Tourist Board Radio Group, can be had on application to Paddy GM3MTH, 9 Ramsay Place, Coatbridge, Strathclyde, enclosing $1 or 2 second class stamps.

Batteries & Chargers

A range of electrical and electronic accessories has been launched by NAMEX, a newly formed specialist division within the NAM International organisation. The product range to be distributed exclusively by NAMEX includes rechargeable batteries and chargers, together with universal mains adaptors and torches.

NiCad batteries available at very competitive prices and packaged on point of sale display cards under the new NAMEX registered brand name include AAA, AA, C, D and PP3 sizes. NAMEX is also launching four new domestic battery chargers. The NC5004M and NC5004P fast chargers will fully charge two or four standard size rechargeable batteries in just five hours and either one or two PP3 size batteries in 14/16 hours. Both feature reverse charge polarity protection and i.e.d. charge indicators.

NAMEX, NAM House, 22/26 Spencer Street, Hockley, Birmingham B18 6DS. Tel: 021-236 8628.
The NRD-535. JRC do it again.

JRC have triumphed again with the introduction of their new NRD-535. Latest in the line of NRD receivers, the NRD-535 represents a true step forward in features, performance, and facilities for the dedicated listening enthusiast.

Apart from looking quite stunning in appearance, the NRD-535 is equally impressive in use. The smooth tuning is the first thing you notice and JRC have developed a direct digital synthesiser (DDS) system which tunes in 1Hz steps. This means that you simply cannot tell that you are tuning a synthesised radio except for the fact that the accuracy and stability are of laboratory standard. Whatever the frequency readout says, you can believe; and what's more the readout itself is absolutely brilliant in its clarity. There is of course the front panel keypad for swift frequency setting, so you can browse around with the tuning knob or go direct to frequency if you wish.

All mode reception covers AM, USB, LSB, CW, FM, RTTY, and even FAX, and there are IF filter bandwidths to suit the modes. Using the same range of accessory filters as the NRD-525 means that if you want to trade-up you can keep your existing filters and transfer them to your new 535.

When it comes to wriggling out the weak stations from the noise, the NRD-535 excels. Pass band shift is provided so that you can slide the IF filter around the signal so as to eliminate the adjacent interference, whilst a totally new notch system gives tunable rejection with a 40dB notch depth, 10dB better than even the legendary NRD-525. Both of these features are included in the standard spec. but if you want to have full control over IF bandwidth, a Bandwidth Control board is available as an option.

For the keen broadcast DX-er, JRC offer an optional plug-in ECSS board which has to be used to be appreciated. The ability to "lock-on" to an incoming AM signal and then pick off either sideband makes the NRD-535 the only choice for the serious listener.

The serious listener will also be impressed by the 200 memory channels, each of which stores frequency, mode, bandwidth, attenuator setting, and AGC setting (that's what I call comprehensive). The memories can be scanned of course and there are also comprehensive frequency sweep facilities under complete user control.

When it comes to user control, the NRD-535 is almost unique, because there are no less than 16 different functions which can be programmed from the front panel by the user, to "tailor" the receiver to suit their own particular needs. These cover everything from tuning rates to the precise BFO offset on CW, so everyone can have the receiver of his choice.

For the advanced user, the NRD-535 is fitted with computer control facilities, and an RS-232C interface is provided as a standard feature. The user manual contains comprehensive details on the 28 different receiver operations which can be computer controlled. You will need a computer or dumb terminal of course, but given a modicum of computer literacy, there is almost nothing which cannot be done by remote computer control.

All in all the NRD-535 is a truly excellent advance on the 525, and is worthy of carrying the JRC banner forward into the future. When you see that the price is the same as that of the NRD-525, you can only marvel at what JRC have done. See it soon.
When it comes to scanners

Look to Lowe

The new WIN-108

The finest handheld airband receiver in the world

The new WIN-108 is the latest version of this world beating air band radio, which has been acknowledged all over the world as the best hand held VHF radio available.

Now covering 108 to 143MHz, and with all UK and European channels covered in the now standard 25kHz spacing giving 1400 channels for your use, the WIN-108 will give you total listening satisfaction, at home or out on the airfield.

Everything you need is provided by the WIN-108; 20 memory channels, memory scanning, frequency searching between your chosen limits, a priority channel which you can programme to any frequency in the airband, direct frequency entry from a simple keypad, up/down tuning, and so on and so on.

Best of all, the WIN-108 comes from a respected manufacturer and is backed by the best service in the business from Lowe Electronics.

Airband radios are getting quite complex, and many people are confused by the increasing numbers of apparently similar radios on the market. To help you choose, here is a check list of absolutely essential features you must have in an airband radio. If the radio you are going to buy has any of these features missing, DON'T BUY IT, because you will be disappointed.

THE QUESTIONS

1) Does it have frequency coverage from at least 108MHz to 137MHz for all new channels?
   (The WIN-108 covers from 108 to 143MHz.)

2) Does it have channel spacing of 25kHz?
   This is crucial, because all important frequencies are now using 25kHz channels. The old standard of 50kHz is totally useless. (The WIN-108 has 25kHz channels.)

3) Can you use ordinary pencils if you want to?
   Having re-chargeable batteries is all very well, but it doesn't help you at an air show when they run flat. You can always get a set of Duracells from somewhere. (The WIN-108 uses easy to obtain batteries.)

4) Can you search for new signals between user-programmed limits?
   If you have to search the entire Nav and Coms band all the time, it wastes valuable searching time when signals can be lost. (The WIN-108 has programmable search limits.)

So - four simple questions which you MUST ASK. For full details on the WIN-108 and all the other radios from our exciting range, simply ask for our airband information pack, which includes a free copy of our ever popular "Airband Guide".

Happy listening. (It will be with a WIN-108.)

WIN-108 £175 inc. vat.
Available from good dealers everywhere.

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

Last summer, the United States Coast Guard celebrated its 200th anniversary. Bill Black gives us some interesting facts about one of the ships operating in the service.

US Eagle

That ship is the US Coast Guard Eagle, a floating academy for cadets and new officers. The vessel has an overall length of 90m and, at its widest part, a beam of 12m. Its three masts reach more that 40m into the air and are rigged with sails that have a total area of more than 1800 square metres. Normally, the crew consists of some 175 cadets and instructors from the Coast Guard Academy in New London, Connecticut.

The German Navy built the ship in 1936 to serve as a training school for its cadets as that nation built up its military capability before World War II. After the War, the United States took the vessel as a war prize, renamed it, and commissioned it into the US Coast Guard in 1946.

The Eagle might look like something out of the last century, but a visit last summer found its radio room filled with equipment very similar to that seen on many other coast guard or naval vessels - and even more modern gear was to be installed during a refitting being carried out over the winter.

Among the existing units were two 100W h.f. transmitters, a 1kW linear amplifier and three h.f. receivers. There were also other transmitter and receiver units used for the marine frequencies in the 400-500kHz range. One special 'auto-alarm' receiver was tuned just to the marine distress frequency of 500kHz. The radioman could select from five m.f. and h.f. antennas, one whip and four long wires ranging from 30 to 45m in length.

Radioteletype

The vessel is equipped with v.h.f. transceivers, but they are handled by the ship's officers, instead of the radioman.

While the vessel does use s.s.b. voice comms at times, the bulk of the official traffic is sent with other modes, reported Anthony McCullough, who was serving as the ship's radioman during its 1990 sailing season. Like the other radiomen who have been assigned to the Eagle, McCullough was to be on the vessel for less than a year, and then would rotate to a position on another Coast Guard ship or at a shore station.

While the bulk of his work was done with RTTY, McCullough also occasionally used c.w. "It's my personal favourite," he commented, but admitted it isn't as efficient as teletype. "The traffic load is too great to rely on Morse code," he reported. "At 40 words per minute, I'd be in here (the radio room) all day."

With this winter's dry dock renovations, the sending of routine traffic will be even more efficient on the next voyage of the Eagle. The old RTTY unit is to be replaced with a new computer-based SITOR system. Also to be installed is a satellite communications unit that will use the INMARSAT system. Another receiver being added to the radio room is a NAVTEX unit, for navigation and weather bulletins and other maritime notices. "They're trying to get us in line with the rest of the Coast Guard,"
The US Coast Guard celebrated its 200th anniversary in August 1990.

Because the Eagle does not have law enforcement duties like other US Coast Guard ships, none of the messages to and from the vessel is classified.

While serving on the Eagle, McCullough stood watch in the radio room from 8am to 12 noon local time, any two hours between 6pm and 10pm and any other two hours of his choice. He handled routine traffic in the mornings and the evenings. When not tied up with that, he often contacted amateur radio operators through their Military Affiliate Radio System (MARS), to carry telephone calls from crew members to their relatives and friends. "That makes me a popular man," McCullough commented.

On when the MARS frequencies, the ship uses the callsign NNNONCJ. For other voice traffic, the vessel identifies itself as the Eagle. On other non-voice modes, it is NRCB.

Most of the radio traffic handled by the US Eagle is via RTTY, but c.w. and s.s.b. are also used.

arrive back in the US in early August.

A good time to catch the Eagle on short wave will be while it is sailing between those sites. When near the US, its communications are carried in the duplex US Coast Guard frequencies in the 4, 6, 8 and 12MHz bands, while travelling around Europe, the vessel is more likely to be in contact with the same marine shore stations that other ocean-going ships use. Specific frequencies to monitor are listed in a number of directories of marine and utility radio communications.

Also worth checking are the MARS frequencies. The Eagle uses the same ones as the US Navy and Marines. Many of these channels are located just outside the amateur bands. One frequency noted in the past is 13.974MHz.

Although the Eagle was handling most if its radio traffic on short wave, at various times during the summer of 1990 the ship utilised some very unusual v.h.f. frequencies - the cellular phone channels. While the ship was travelling up and down the East Coast of the US, there were a few occasions when solar flares knocked out h.f. communications. Nevertheless, the ship was close enough to shore to use its cellular phone equipment.

QSLing

Regardless of the frequency on which you hear the Eagle, its radio operators have made it a practice to respond to all reception reports. Send yours to: USCG Barque Eagle (WIX327), FPO New York, NY 09568-3906, USA. In reply, you might receive a card stamped with a special commemorative seal in honour of the Coast Guard’s 200th anniversary, or one of the souvenir ‘coins’ given to tourists who visit the ship.

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>h.f.</td>
<td>high frequency</td>
</tr>
<tr>
<td>INMARSAT</td>
<td>International MARitime SATellite</td>
</tr>
<tr>
<td>m.</td>
<td>metre</td>
</tr>
<tr>
<td>m.f.</td>
<td>medium frequency</td>
</tr>
<tr>
<td>MARS</td>
<td>Military Affiliate Radio System</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>RTTY</td>
<td>Radio TeleType</td>
</tr>
<tr>
<td>s.s.b.</td>
<td>single sideband</td>
</tr>
<tr>
<td>s.w.</td>
<td>short wave</td>
</tr>
<tr>
<td>SITOR</td>
<td>SImplex Telegraphy On Radio</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
</tr>
<tr>
<td>W</td>
<td>watt</td>
</tr>
</tbody>
</table>

Sailing Log

The Eagle generally travels away from its home port of New London only during the summer. During 1991, it will leave the US at the end of April on its way to the Azores, with arrival there scheduled for May 22. During June, it will visit Cherbourg, France and Lisbon, Portugal. Around July 5, the Eagle will stop in the Madeira Islands and, on July 27, Bermuda. The ship will

200 Years of Service

The radio room of the US Eagle with the Morse key and two of the h.f. receivers in the rack.
Starting Out

It is four years since Brian Oddy G3FEX started writing this series explaining the ins and outs of radio. Starting Out now takes a break and concludes with a complete index to the series.

1987

APRIL: What are radio waves?
MAY: Long and medium wave propagation. Ionosphere.
AUGUST: Characteristics of s.w. transmissions. Sunspots. Schedules.
NOVEMBER: Logging s.w. signals. Relay stations.

1988

JANUARY: Reception of a.m. Tuned circuits. Simple superheterodyne receiver explained.
FEBRUARY: Important aspects of receiver specification.
MARCH: Advanced receiver designs.
APRIL: Local oscillator stability.
MAY: Design of a frequency synthesiser reference oscillator. Simplified v.c.o. block diagram. Block diagram of counter with l.e.d. display.
SEPTEMBER: Carrier insertion. Use of b.f.o. Product detectors. Carrier insertion oscillators.
OCTOBER: Music via s.s.b. systems. Reception of d.s.b. & i.s.b. signals. Synchronous a.m. detection.
NOVEMBER: Manual and automatic r.f. gain control. Forward & reverse a.g.c. systems.

1989

FEBRUARY: Simple tuning indicators.
MARCH: Signal strength meters. The RST and SINPO codes and S-meter calibration.
JUNE: Extending the range of simple receivers. Up & down converters.
JULY: Operating close to a local transmitting station. Installing wave traps. Attenuators.
AUGUST: Filters.
SEPTEMBER: Reception of c.w. Beat frequency oscillator. Audio c.w. filters.
DECEMBER: Batteries.

1990

JANUARY: Expense of dry cells. Add-on power supply unit.
APRIL: Common emitter; common base; common collector (emitter follower). Darlington pair. Characteristics of bi-polar transistor when in common emitter, base and collector (emitter follower) mode.

1991

APRIL: Index.
The FRG6000, a premium scanning receiver covering 80-995kHz, SSB, CW, AM & FM modes. 99 memories, 5, 10, 12.5, 25 & 100kHz scanning steps. Keyboard entry. Optional converters to extend range from 0.15-30MHz and 800-1300MHz.

SMMC are pleased to be able to offer the SONY range of Multiband Receivers. They illustrate cover VHF broadcast, SW broadcast, and some models cover other bands as well.

The ICFSW7600 is a sophisticated portable receiver that combines power and flexibility with one-touch convenience. Freq. range AM 150-29995kHz and FM 76-108MHz.

The ICFPRO80 is a hand held professional receiver with air band capability and an 8-way tuning system. Frequency coverage 150kHz-108MHz and 115.15kHz to 223MHz with FRQ 80 frequency converter.

The HP100E MkII is a 1000 channel, programmable, handheld scanner. AM, FM and FM wide for commercial channels covering 8-600MHz and 830-1300MHz. Supplied complete with NiCad, antenna, shoulder carry case and earpiece.

RECEIVING O.K.? IF NOT, WHY NOT CONTACT SMC FOR INFORMATION ON OUR COMPLETE RANGE OF RECEIVERS AND SCANNERS.

Yaesu's serious about giving you better ways to tune in to the world around you. And whether it's for local action or world-wide DX, you'll find our HF/VHF/UFH receivers are the superior match for all your listening needs. When you want more from your receivers, just look to Yaesu. We take your listening seriously.
ICOM

IC-R100 - WITH SSB!

IC-R100 Mobile/Base Receiver now with SSB!
WHY SETTLE FOR ANYTHING LESS!
For the enthusiast who prefers a more permanent installation the IC-R100 is ideal giving full frequency coverage of 500kHz-1800MHz and AM/FM, FM wide modes of operation. The IC-R100 boasts 100 memory channels to store your favourite stations and has features similar to the little pocket receiver.

ONLY FROM US - WITH SSB!

SPECIAL SHOW OFFER!
BONUS VOUCHERS ON ALL STAR ITEMS SHOWN AND MORE!

STANDARD C528
Probably the most versatile dual band hand hold available!
Packed with so many features that we haven’t the room to list them all. But we will try a few:
- Full Duplex
- Dual Receive
- Extend Cover
- Programmable Offsets
- DTMF
- 5 TONE PAGER
- RECEIVE 130-175
  - 330-470
  - 820-960

OPTIONS: CTCSS

PHONE FOR OUR PRICE

PHONE 081-997 4476

ARE at NEC and Sandown Park
As always we will be there with superb deals. Whether it’s part exchange, terms, credit card or cheque, we will offer prices that cannot easily be beaten. If our prices at the recent London Show made our competitors cry - then wear raincoats and Wellington boots when you come to NEC and Sandown Park.

A DREAM COME TRUE
Bored with two metres? Then why not turn that 2m rig onto the HF bands

ITCOM IC-725 or 726 HF
Transceivers for both mobile or base - the 726 HAS 6 meters inc.

PHONE FOR OUR PRICE
YOU WILL BE AMAZED

ARE COMMUNICATIONS
BREAK THE PRICE BARRIER!
Now a 2 Metre Hand Held transceiver made by Kenpro.
Model KT22E for £139 inc. VAT
Package includes NICAD pack charger and antenna.
- Fully synthesised
- Thumbwheel tuning
- 10MHz cover on RX
- 1750kHz tone burst
- 600kHz shift for repeater operation
- Low and high power switch

PHONE FOR OUR PRICE

PHONE 081-997 4476

12 Monthly Payments of £13.55

All Easy Terms are based on an APR of 34.4%
Educational Software for Basic Electronics - Part 4

These two programs, by J.T. Beaumont G3NGD, demonstrate the principles of frequency modulation and logic gates.

The first program (P6) shows the principles of frequency modulation. It could be used together with Program P4 (Part 2, February 91) to show the difference between amplitude and frequency modulation.

When the program is RUN, a 'screen menu' lists three options:
1. A demonstration of frequency modulation,
2. An explanation of modulation index,
3. Exit from the program.

At the start of the demonstration, a radio frequency carrier wave is drawn on the screen, followed by an audio frequency waveform. These two waveforms are then mixed together and the resultant waveform is plotted on the screen. This is shown in the screen example Fig. 4.1.

It will be seen that the frequency of the carrier wave slows down during the negative half-cycles of modulation and speeds up during positive half-cycles.

Logic Gates
A logic gate is a circuit which allows a signal to pass through when it is open but stops the signal when it is closed. The gates in this program are the simplest types and have only two inputs.

When the program is RUN a menu of options is listed on the screen:
1. Introduction.
2. The AND gate.
3. The OR gate.
4. The NOT gate.
5. The NAND gate.
6. The NOR gate.
7. The exclusive OR gate.
8. The exclusive NOR gate.
9. Exit the program.

The program is designed as a self-learning tutor and the student can open and close the gates directly from the keyboard. On pressing the letter 'T', a 'Truth Table' is printed on the screen so that students can check their answers (Fig. 4.2).

It should be noted that the logic symbols used in this program are drawn the BS3939. This is as called for in the CGLI Electronics Servicing Course 224 syllabus. It is also important that students learn the US MIL-Specification symbols as, although not used by City & Guilds in their examinations, are used by industry.

To obtain the programs described in Part 4, send a 5.25in disk and mailer, together with two 1st class stamps, to the Editorial Offices. We will copy the relevant programs onto your disk and return it. Later on this year a set of disks will be available containing all the programs described in this series. However, if you cannot wait then send your disk now. Please note that we are only able to provide programs for the BBC computer.
BEARCAT SCANNERS
Recently appointed as the UK distributors for this high quality product range — we offer the complete selection of mobile and base scanners with full service back up.

BEARCAT 760XLT
New Model with 900MHz Coverage
With 100 memory channels and coverage of the UHF band, the 760XLT is ideal at home or in the car. Pre-programming of preset bands is possible for fast access. Freq Coverage 66-88, 136-174, 406-512 MHz
£235

BEARCAT UBC 175 XLT

BEARCAT UBC 200 XLT
Handheld. Top of the range handheld easy to use and very sensitive. Features 200 memory channels, ideal for civil airband, marine, pmr and 900 MHz. UHF band. (Coverage 66-88, 118-174, 406-512, 806-956 MHz) £229

BEARCAT UBC 100 XLT
Baby brother of the 200XLT with the same performance but only 100 channels of memory — ideal for civil airband reception. Coverage 66-88, 118-174, 406-512 MHz £199

BEARCAT 7000XLT
500-600 MHz, 805-1800 MHz All modes available shortly. Call for details!

SONY RADIOS
We are the main short wave stockist

Sony ICF SW10E Short Wave + VHF, world’s smallest s/wave radio £149.95

Sony ICF 2020 D (150kHz-136MHz) £275
Sony ICF 7000D Pocket s/wave s/hand. £99
Sony Air 7 airband s/hand £229
Sony Pre 80 wideband s/hand £299
Sony ANT active antenna £49

COMMUNICATIONS RECEIVERS
Low HF225 (30kHz-30MHz) £29
Kenwood R2000 (30kHz-30MHz) 10 memories £99
Kenwood R5000 (100kHz-30MHz) 100 memories £875
ICOM R71E (100kHz-30MHz) 32 memories £855
ICOM R9000 (100kHz-2GHz) 1000 memories £3995

LOW NOISE PRE-AMPLIFIERS
MODEL M75
For base and handheld scanners.
• 25—2100 MHz
• Low noise GaAs FET
• Selectable filters for improved performance
• Variable Gain Control £69.95

These new Pre-Amplifiers are a must for the scanner enthusiast and will allow reception of signals that were inaudible without them.

MODEL M100
Same spec as M75 but with full RF switching, may be used with transceivers on transmit up to 5 watt O/P power £79.95

MODEL M50
A new low cost pre-amp without filters or gain control. Offers low noise GaAs FET at 20 dB fixed gain £49.95

AOR SCANNERS
AR 3000 wideband scanner 100 kHz to 2036 MHz with no gaps Now available £765

AR 2002 popular base scanner with coverage 25-560 MHz, 80-1300 MHz and 20 memory channels £487

AR 2800 NEW MODEL
500–600 MHz, 805–1800 MHz All modes available shortly. Call for details!
**BLACK JAGUAR MkIII**
Independently tested by a European magazine, the Black Jaguar was found to be the most sensitive handheld scanner on the market! That probably explains why it is still so popular. Features include 16 channel memories, selectable AM/FM and the facility to power the set from the mains/car using one of the many accessories now available. Covers civil and military airbands plus lots more! Frequencies: 28-30, 50-88 MHz, 115-178 MHz, 200-280 MHz, 360-520 MHz, 50-88 MHz, 115-178 MHz, 200-280 MHz, 360-520 MHz, 50-88 MHz, 115-178 MHz, more! Frequencies: 28-30, 50-88 MHz, 115-178 MHz, more. Prices and introduce new models for the UK!

**NEW MVT 7000 HANDHELD**
This handheld has received many rave reviews. We found it particularly sensitive at 900 MHz. Features include 100 memory channels, coverage of AM/FM, WFM, 200 channel memory, very sensitive. S meter. 

**NEW MVT 7000 HANDHELD**
This handheld has received many rave reviews. We found it particularly sensitive at 900 MHz. Features include 100 memory channels, coverage of AM/FM, WFM, 200 channel memory, very sensitive. S meter.

**LOW LOSS JAPANESE COAX**
Essential for optimum performance with wideband UHF scanners. We have directly imported this cable which has exceptional low loss and is good for frequencies up to 3 GHz. Loss at 1 GHz for 10 mtrs is 1.3 dB. 

---

**NEVADA MS1000**
The worlds first, 1000 channel mobile scanning receiver. Modes:- AM – FM – Wide FM 
Freq Range: 500 kHz – 600 MHz 
805 MHz - 1300 MHz 
NEW FEATURES 
* Switchable Audio 
* Squelch 
* Tape Recorder 
* Output Socket 
* Auto Signal Operated 
* Tape Recorder Switching 
* All metal case for improved EMC compatibility. 
All this and more for just......

---

**Fairmate HP200**
As the UK distributor for Fairmate we are constantly working with them to update and produce new features and models. This month we can announce the arrival of the new Fairmate HP200, 1,000 CH Scanner exclusive to Nevada dealers! 
Freq Range: 500 kHz – 600 MHz 
805 MHz - 1300 MHz 
Modes: - AM – FM – Wide FM 
A improved version of the HP100E 
The new HP 200 has superior performance and stability. 
Accessories included as standard are:- 
* VHF Antenna 
* UHF Antenna 
* Telescopic Antenna 
* Control Box 
* DC charger/adaptor 
* Earphone * Carrying case 

---

**NEVADA MS1000**
The worlds first, 1000 channel mobile scanning receiver. Modes:- AM – FM – Wide FM 
Freq Range: 500 kHz – 600 MHz 
805 MHz - 1300 MHz 
NEW FEATURES 
* Switchable Audio 
* Squelch 
* Tape Recorder 
* Output Socket 
* Auto Signal Operated 
* Tape Recorder Switching 
* All metal case for improved EMC compatibility. 
All this and more for just......

---

**NEW 1991 CATALOGUE**
JUST RELEASED
SEND IN £2
FOR YOUR COPY
(Includes £2 Voucher)
Monitoring the Iraq/Kuwait Conflict
3rd Edition
In spite of the ceasefire the bands are alive with activity, this book continues to provide all the information needed to hear the action as it happens, from U.S. diplomatic flights to troop manoeuvres: information that will remain relevant long after the armed forces have left. Still the largest source of US Presidential frequency designators outside of the Pentagon.

Price £4.75 + 65p UK P&P. Overseas post £1 Europe & sea or £2 airmail.

★ NEW BOOKS ★
Soviet Maritime RTTY Dictionary
Soviet maritime fleet is the largest SW RTTY user. With this book you will be able to find, decode and understand their traffic.
Price £9.95 + 0p & p. Overseas post £1.50

THE WORLD BELOW 500 KILOGERTZ
A handy introduction to longwave listener. Covers VLF, Loran, Omega, Lowfere, frequency use, receiver and antenna information and more.
Price £5.25+75p p&p. Overseas post £1

Each
Aeronautical Communications Handbook – HF £18.95 £1.50 £2.20
Catalogue of TV Pictures £15.95 £7.75 £2.25
Guide to Utility Stations 1991 £18.95 £1.50 £2.25
Maritime Radio Handbook £18.95 £1.50 £2.25
Passport to World Band Radio £13.50 £1.50 £2.25
Shortwave Directory 1991 £9.95 £1.50 £2.25
Marine Radio Fascimile £9.95 £1.50 £2.25
Communication Satellites £13.75 £1.50 £2.25
US Military Radio Communications Pt. 1 £12.50 £1.50 £2.25

Ask for our 1991 FREE Catalogue detailing all books.

INTERBOOKS I.K.8, 8 Abbot Street, Perth, PH2 0EB, Scotland
Telephone Fax: (0738) 30707

AMDAT is now able to supply the complete range of equipment required for the transmission and reception of voice and data communication.

RECEIVERS AND SCANNERS:
IC R1 POCKET RECEIVER/SCANNER
IC R100 MOBILE WIDEBAND RECEIVER
AOR 1000 HANDHELD SCANNER

IC 72 GENERAL COVERAGE RECEIVER
IC 7000 MULTIMODE RECEIVER
HF 225 GENERAL COVERAGE RECEIVER

A wide range of mobile and base station antennas, ATUs, power supplies and other accessories available from stock

PACKET TNCs AND DATA TERMINAL UNITS

TINY 2 VHF PACKET .........................................................£129.00
PK88 VHF/HF PACKET ...................................................£129.00
KPC4 DUAL VHF PACKET ..............................................£242.00
DRSI PACKET PC CARD ...........................................from £139.00

A large selection of books and magazines always in stock.

JUNGHANS RUGBY MSF CLOCKS
WE STOCK A WIDE RANGE OF JUNGHANS MSF CLOCKS INCLUDING
BLACK OR WHITE DIGITAL WITH ALARM ....................£42.95
ANALOGUE MANTEL CLOCK ............................................£63.95

Just some of our many products are listed above. Send an SAE to receive our latest catalogue.
**Project**

**A Small Power Supply for Valved Receivers**

Chas Miller needed a small power supply unit to provide the high tension and low tension voltages for his simple valved receivers. This is the design that he came up with.

His small power supply unit provides around 50V - 60V high tension and various low tension voltages for a number of simple one or two-valve receivers I have built in the recent past. It is designed around a mains transformer of the type used in hybrid, colour TV receivers to provide a 25 - 30V source for the transistors and perhaps 6.3V for the c.r.t. heater as well. Such transformers are widely obtainable from scrap sets. The 25V or 30V secondary is used with a voltage doubling rectifier and smoothed by the conventional resistance-capacity method. For my own units I use a valve rectifier but the circuit diagram shows a couple of BY127s solid-state diodes instead. The reservoir and smoothing capacitors need to be rated at no more than 100V d.c.

**Voltage Doubler**

The action of the voltage doubling rectifier is quite simple although it may appear unorthodox. The positive-going swings of the secondary voltage will charge C1 through D1, then the negative-going swings will charge C2 through D2. As these two capacitors are in series the voltages developed across them are effectively added together. The output voltage is taken off from the positive side of C1 and the negative side of C2. Whether or not the output is truly double that of the secondary voltage depends on a number of factors - especially the load placed on the output. But in general, using solid-state rectifiers it will be around, or even a little above, the nominal.

**Heater Supply**

If the transformer possesses a 6.3V winding, originally used for the c.r.t. heater, this can be used to power the filaments of the valves. Otherwise they are connected across points A and B in conjunction with a suitable dropping resistor. For the 955 valve, which requires 6.3V at 0.15A the resistor is found by taking the difference between 6.3V and the voltage across points A & B and dividing the result by 0.15. (Ohms Law states that V/I = R.) For instance, for a 25V secondary the resistor needs to be 18.7/0.15 = 125Ω. The power rating (wattage) of the resistor is found by multiplying the voltage across it by the current passing through, so that in our example 18.7 x 0.15 = 2.8. In practice a 3W resistor would be used.

**Construction**

The type of construction used will depend to a large extent on the components used. The diodes, capacitors and resistor could be mounted on a tagboard which, together with the transformer, should then be fitted into a suitable box.

---

**YOU WILL NEED**

- **Resistors**
  - Carbon film, 0.25W, 5%
  - 1kΩ 1 R1

- **Capacitors**
  - Electrolytic, 100V axial leads
  - 47µF 2 C1, 2
  - 100µF 1 C3

- **Semiconductors**
  - Diodes
  - BY127 2 D1, 2

- **Miscellaneous**
  - Mains transformer (see text); Tagboard; Box.

**Abbreviations**

- A amperes
- c.r.t. cathode ray tube
- d.c. direct current
- V volts
- W watts
- Ω ohms
- µF microfarads
- % per cent

---

Chas. E. Miller edits and publishes The Radiophile for the vintage radio enthusiast. This article is typical of the useful information to be found in The Radiophile. Tel: 0785 74 696.
PLEASE NOTE THAT FROM NOW ON WE WILL ACCEPT PHOTOCOPIES FOR COMPETITION ENTRIES BUT YOU MUST ENCLOSE THE CORNER FLASH AT THE BOTTOM OF THIS PAGE, CUT FROM YOUR ISSUE, AS PROOF OF PURCHASE.

WIN ONE OF THESE!
AN EASY STEP BY STEP VIDEO CONSTRUCTION GUIDE TO ELECTRONICS, KINDLY DONATED BY MAPLIN ELECTRONICS.

WORDSEARCH COMPETITION

V A R I A B L E L V C I Z S G B O
Z J C C M Z B F W I R U C K C Z G
T P O F R Q U A R A N I R O A N G
U F N M G Y T C D K N E M R I C R
W C S W T C U I B O K P E R A D R
N E T A H I O J R A O T E P E L T
I Z R M T K I T E N S D A D U B R
L J U S J V C P E E L C W L D B A
P O B E M E S N Y O I R T I X B N
A O T W L D T L S T K S U U G E S
M E O E F U S O N O H S I K B A U I
M D R O J P C R A N F W S N B L S
D I L H C I T Y L O R T C E L E T
A V T O U N B R E C E I V E R A O
S R O T S I S E R V N P A L T I R
O N E W H J S C U D C G L Y E A A
E S C E R A M I C B L K L Q Y L U

This month we have one of our occasional competitions open to all readers. As prizes we have two of the latest Electronics Starter Kits kindly donated by Maplin Electronics. These normally retail at £11.95 each, so they are well worth trying to win.

The Maplin Electronics Starter Instruction Kit is a complete educational 'build-it-yourself' kit with step-by-step instructions on a VHS video cassette. Designed to assist the inexperienced hobbyist and school classes to construct a working radio receiver which can power a loudspeaker, the kits are complete with all the parts needed to build a medium wave t.r.f. (tuned radio frequency) reflex loudspeaker radio. All you need in addition to the kit are tools and a PP3 battery. If you do not have the necessary tools then Maplin's Electronics Starter Tool Kit, containing cutters, pliers, screwdrivers, desoldering tool, soldering iron with a stand and 5m of solder, is available from Maplin Electronics for £19.95.

To enter the Competition all you have to do is mark the twenty different ‘radio’ words which have been hidden in the letter grid. They have been printed across (forwards or backwards), up and down or diagonally, but they are always in a straight line without odd letters in between. You can use the letters in the grid more than once for different words, and they’re not all used. Once you have found all Twenty words, mark them on the grid and send in your answers.

Send your entry to PW Publishing Ltd., April 1991 Wordsearch Competition, Enefco House, The Quay, Poole, Dorset BH15 1PP. Closing Date last post received Tuesday 30 April 1991. The Editor’s decision on the winner is final, no correspondence will be entered into.

Name
Address
Postcode

SWM WORDSEARCH COMPETITION APRIL ‘91
**A UNIQUE SCANNER TAKES A MASSIVE LEAP FORWARD**

As the appointed U.K. Distributor for SHINWA SCANNERS, MARTIN LYNCH is proud to present the **SR001**. Take a look at these advanced features:

- Full infrared remote control/programmer
- Continuous tuning 25 to 999.95MHz
- Multi-colour high luminance LCD display
- 200 channels of programmable memory
- Two remote switched antenna inputs
- Multi step channel increments - 5/10/12.5/20/25/50/100kHz
- AM/NBFM+FM wide receiving modes
- Mega-fast scanning - 30ch/sec.
- Multi function scanning modes
- Multi mode squelch options
-_channel lock-out facility
- Internal lithium back-up
- Unique strength meter
- Switchable attenuator
- RS232C port available
- Remote power on/off
- Programmable delay
- 13.8V DC operation
- Priority watch
- Alarm facility
- Mute facility
- Din size - ideal for base or mobile installation
- Built on die-cast chassis to commercial specification
- Dimensions 50(H) x 178(W) x 150(D)
- 12 Months parts and labour guarantee

The **NEW SHINWA SR001 Scanning/Surveillance Receiver**.

Mr Chris Lorek, G4HCL recently reviewed the SR001 in HRT and said, “The set is a unique departure from the “normal”, it’s very smart appearance combined with remote control features I’m sure will appeal to scanner enthusiasts”.

Available from MARTIN LYNCH and other appointed dealers, the SR001 is only £399.95 including VAT.

DEALER ENQUIRIES WELCOME.
New Yupiteru Scanner!

1 - 1300MHz No Gaps!
AM - FM - WBFM 200 Memories

Yupiteru Scanners have the reputation of being both ultra reliable and extremely sensitive. Factors that have persuaded many customers that paying a little extra gives you a lot more! We are therefore proud to introduce the "blockbuster" for 1991. The MVT-7000 is a scanner that is built to professional standards, easy to use and more reliable than its competitors. It has all the features that you would expect of a top line scanner plus little extras like a variable contrast LCD display. A channel switch has been added as has an attenuator switch for improved performance. Send today for the latest information.

UK Main Distributors

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

All Major Brands stocked Largest in South East

Waters & Stanton
BEST PRICES! FAST MAIL ORDER

Order today and get FREE Gulf News Report

Order by Phone
0702 206835

7th Edition
Short Wave Listener's Confidential Frequency List
£8.95 Post & Packing £1

AR - 1000 Hand Scanner

500kHz - 1300MHz AM/FM/WFM
You get the AC mains supply, an extended frequency coverage down to 50MHz, and UK programmed bands. The receiver has been specially produced for the UK and European band plans and makes for easier operation. Of course you still get your 1000 memories and all the extras such as case, DC lead, auxilliary, etc. You also get the advantage of our after sales service!

Our Price £249 FREE Post & Insurance

OTHER RECEIVERS

MVT-5000 25-550MHz + 800-1300MHz Handheld £249
MVT-6000 25-550MHz + 800-1300MHz Base Unit 240v/12v £299
AOR-1000 500kHz-600MHz + 800-1300MHz Handheld £249
HP-200E 500kHz-600MHz + 800-1300MHz Handheld £269
R2000 Kenwood super short wave receiver £295
R5000 Kenwood top range super sensitive receiver £375
FRG8800 Yaesu short wave receiver £349
ICR71E Icom super top performer £385
ICR72E Icom's budget short wave receiver. Lovely £450
HP225 LOWE Not pretty but does it perform? Great £425
ICF2001D SONY No other portable can touch it £275
SW7600D SONY The smallest truly portable SSB/AM £149

MVT-7000

Yupiteru Scanners have the reputation of being both ultra reliable and extremely sensitive. Factors that have persuaded many customers that paying a little extra gives you a lot more! We are therefore proud to introduce the "blockbuster" for 1991. The MVT-7000 is a scanner that is built to professional standards, easy to use and more reliable than its competitors. It has all the features that you would expect of a top line scanner plus little extras like a variable contrast LCD display. A channel switch has been added as has an attenuator switch for improved performance. Send today for the latest information.

UK Main Distributors

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

Retail and Mail Order: 22, Main Road, Hockley, Essex SS5 4QS. Tel: (0702) 206835/204965
Retail Only: 12 North Street, Hornchurch, Essex. Tel: (04024) 44765
VISA & ACCESS MAIL ORDER, 24 Hour Answerphone. Open 6 Days a Week 9am-5.30pm
Rail: Liverpool St./Hockley or District Line/Hornchurch

ALL MAJOR BRANDS STOCKED LARGEST IN SOUTH EAST

Short Wave Magazine, April 1991
Ladies on the Key
The idea of a female hand on a Morse key seems remote nowadays, the gentle sex were well represented in the early days of telegraphy. Stan Crabtree G3OXC looks at the part played in the development of telegraphy.

Training telegraph operators on the buzzer. From The Wireless World February 1916 courtesy GEC - Marconi Ltd.

Western Union was also the source of what was probably the first lady sea-going wireless operator. Miss Graynellia Packer had two years experience on land line telegraphy behind her when she joined the United Wireless Company in 1910 at the age of 22. There were no licence requirements in force at this time, but a seven-week course at the Company’s New York training school was sufficient for her to grasp the rudiments of spark operation and adjustment.

Miss Packer made her first voyage as a professional operator on the Clyde Lines flagship SS Mohawk on 29 November 1910. With 300 passengers on board for the voyage from New York to Charleston and Jacksonville, she was kept very busy. As her town was Jacksonville she presented good copy to local newspapermen who clamoured on board at the ship’s arrival at the southern ports. She was reported as having been attracted to the post of shipboard operator by the heroism of Jack Binns, celebrated operator of the White Star Liner Republic when in January 1909 the vessel was rammed in thick fog by the Italian freighter Florida. Miss Packer’s career at sea was brief and she left maritime life a year later, possibly due to the publicity that seemed to follow her on her ocean travels.

During a strike of cable company telegraphers in 1911, a few women gained seagoing appointments of the West Coast of America. Miss Edith Coombs sailed from Seattle on the SS Roanoke and a Miss Tucker is recorded as having served on the SS Indianapolis. When the question of Miss Coombs remaining at her post in the event of an accident was raised she insisted that the passengers would not need to worry as to their safety on her account. Interviewed at San Francisco prior to returning to Portland she stated she would remain at her duty post until ‘the last flickering spark of electricity’ could be transmitted from the ship. If necessary, she declared the intention of remaining on board with the Captain until the last soul had been rescued. The expression ‘ladies first’ would not apply to Miss Coombs!

The possibility of women serving as wireless operators on British ships had apparently been put forward. A paragraph in Marconigraph of July 1912, undoubtedly outlining the Company’s view, reported:
‘The question of employing ladies to act as relief operators on liners has recently been alluded to in the Press. That women have not been employed in this capacity has nothing to do with efficiency; it would be a physical impossibility for women to do such work. The life of an operator at sea is scarcely a suitable one for a woman’.

In contrast was the situation on the other side of the Atlantic. With the appointment of Miss Mabel Kelso as wireless operator to the liner Mariposa at San Francisco, a question was raised in the US Congress as to whether a woman should be entrusted with the protection of lives in this responsible position. The Department of Commerce & Labour at the time of the appointment held that there was nothing in existing law to stop women being in charge of wireless telegraphy apparatus.

In 1913, some 30 women are recorded as being licensed and serving as operators on vessels trading between San Francisco and Seattle. The ladies had to develop new sending techniques at sea. On landline circuits they had been accustomed to using the semi-automatic ‘bug’ key, originated by Horace Martin at the turn of the Century to ease the ‘glass arm’ complaint of telegraphers. With the early marine wireless equipment, large ‘pump handle’ types were essential to handle the often high currents being keyed.

War
Whilst many women continued as landline telegraphists in the British Post Office, there is no record of them working on wireless circuits in the United Kingdom at this time. The situation changed with the outbreak of World War I.

Early in 1915, the Women Signallers’ Territorial Corps were formed and described in the London Standard as ‘undoubtedly the most
effective of all the semi-military organisations of women. When the contribution of wireless was more fully appreciated, arrangements were made early in 1916 for women in the Signallers' Corps to attend the East London Wireless College for instruction in wireless telegraphy. The Marconi Company provided apparatus to enable the ladies to undertake regular practice and familiarisation with wireless methods of working. In the jingoistic atmosphere of the period, the stated aim of the Corps was to ‘link up every town and village throughout the Kingdom and to release men for the firing line’. They were also to be prepared to act as instructors to men in the services destined to become wireless operators in the front line. The authoritarian attitude by the Government at this time may well have sown the seeds of the Suffragette Movement. As an example, ‘The habits of discipline and co-operation inculcated by the (wireless) training should prove invaluable in fitting them the women) to take their share of responsibility in the present crisis’. Whether or not they took up positions is not known, but the first ladies to qualify and be certified as wireless operators in Great Britain in 1913 are recorded as Miss Parker of London, who later became the wife of a naval officer, and Miss Turnbull of Innellan, Argyllshire. A Miss A C Raine received wireless training at the North British Wireless School, Glasgow and was reported to ‘have carried out important wireless duties’ during WWI.

Special Duties

In 1917, there is a report of a ‘number of young ladies’ performing special duties at ‘one of the great wireless stations in Wales’. This was probably at the trans-Atlantic receiving station at Towyn. This location also served as the keying centre for the high-power transmitter at Carnarvon which came into operation in March 1914. Also in 1917 was the news that in the United States, Miss Maris Dolores Estrada had passed an examination for the highest class licence then awarded by the Department of Commerce - the first lady to receive a First Grade Commercial Wireless Operator’s Licence. Miss Estrada must have been quite a lady. Born in Zacatecas, Mexico in July 1890 she graduated as a telegraphist at the age of 15. She soon reached the rank of Chief Telegraphist and moved between various telegraph offices. She was at Villanueva when the first Mexican Revolution broke out and joined the staff of the leader, Madero. When he triumphed, she was appointed in charge of the Mazapil Telegraph Office. During later turmoil in the country she was less fortunate. In 1913, having this time chosen the losing side, she ended up in jail with her mother. After being released and enjoying further adventures she went to the United States in 1916 to study English. She later obtained her wireless licence in five months.

Male Chauvinism

Wireless World spoke with the voice of the male chauvinist in an editorial in March 1918. Commenting on the rumours that other countries were training women as wireless operators it left no doubt as to the Marconi Company’s view: ‘Operators were training not so much to decorate a “painted ship upon a painted ocean’ as to sit calmly and unruffled at their posts when face to face with death and disaster’. It pointed out that with few exceptions, ‘the feminine temperament is an uncertain factor in times of emergency. Although proving an excellent student in wireless school there was always the likelihood of the natural weakness revealing itself at a critical moment’. It ended rather magniloquently with ‘to introduce women (for wireless work) on board would be unfair to womankind and the mercantile marine’.

Social behaviour in confined Britain could in no way be compared with that of the wide open spaces of the North American Continent and the Americans’ outlook on life and leisure activities. Prior to 1912, due chiefly to the lack of licensing regulations in the United States, early amateur wireless operation had escalated and many of these enthusiasts were female.

The process of ‘courting’ was frequently undertaken by young Americans with the aid of keyed spark transmitters, often to the annoyance of commercial stations with which they frequently interfered.

In Britain at this time, the role for women, in all but the upper classes, was very much in the home and taken up with household duties. The first reported female to be active as an amateur in the UK was Miss Barbara Dunn in 1928, although it was not generally known until 1930 that, in fact, a lady was at the key of G6YL. She was followed five years later by Miss Nell Corry G2YL. Mrs C E Ingram of Ilford, Essex is on record as being granted an experimental (amateur) licence before WWI and issued with the callsign ‘IXI’. But this may well have been because of business interests and her association with Ingrams’ Commercial and Wireless School.

Moving Ritual

A rather moving ritual took place at the BT radio station at Highbridge, Somerset (better known as Portishead Radio) early in 1988. Ms Hilda Whittle, who joined the Post Office to train as a telegraphist in 1916 was invited to tour the station and during her visit, allowed to exercise her prowess at Morse. Armed with paper and pencil she sat alongside a radio officer at a Teletype computer terminal and copied a message in Morse code from a container vessel. She was surprised to find the message addressed to herself and delighted to find it had been pre-arranged and congratulated her on seven decades of knowledge of the Morse code. Until 1928 she had been taking down telegrams onto a pad with a pencil.
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-sized booklets
- Personal study programme
- Regular marked tests
- Courses regularly updated
- 48 hour despatch
- Free advice before you enrol
- Telephone Helpline
- Free ‘How to Study’ Guide
- Installment 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 __________________________

RRC
The Rapid Results College

Dear Sir/Madam,

Please send me my prospectus as quickly as possible.

Mr/Mrs/Miss/Ms ____________________________
Address ___________________________________
Postcode __________________________

The Rapid Results College
PROSPECTUS: 081-946 1102 (24 hour Recordacall Service quoting Dept. No. above.)

NEW!
DIRECTORY OF
MILITARY AVIATION
COMMUNICATIONS
(VHF/UHF)
EUROPE, NORTH AFRICA, MIDDLE EAST
FIRST EDITION, 1991

- Only Directory of its kind available today
- Cross-referenced by both location and frequency
- Over 6,000 frequency listings
- Covers 30-400 MHz

$19.95, plus $8 overseas airmail;
$10 overseas airmail to all other countries;
$3 Priority First Class Mail to U.S. addresses.

Please allow 4 to 6 weeks for delivery

FOREIGN ORDERS must be payable in U.S. dollars. You may
use Visa, Mastercard, Postal Money Order, or Cheques drawn
on U.S. Banks. We do not assume responsibility for losses
other than providing proof of shipment.

HUNTERDON AER0 PUBLISHERS
P.O. Box 754 • Flemington, NJ 08822-0754 USA

LINIPLEX
Loop Antenna

50kHz – 30MHz

- Only 1 metre wide
- Classic loop characteristics
- Figure of eight directivity
- Deep broadside nulls
- Effective at ground level
- Sensitive only to magnetic field
- Rejects power line interference
- Weatherproof and lightweight
- Current driven push-pull amplifier
- Patent pending

PHASE TRACK LTD., 16 Britten Road, Reading, RG2 0AU, England
Tel: 0734 752666

Short Wave Magazine, April 1991
£119.95
D 2935
• All electrical Digital World Receiver • LW/MW/FM/13 x SW • Continuous tuning over total AM band • Direct keyboard tuning • 9 station memory • Variable pitch BFO for CW/SSB reception • Touch panel switching • LCD frequency display • Mains/battery supply

£1800.00
Panasonic RF-9000

FDM 87.5-108MHz
LW/MW/SW (1.6110-2.9009MHz)
FM (87.5-108MHz)
SW (2.9010-30.0000MHz)

Precision: Direct Readout to 100Hz for SSB/CW/AM. Direct Readout to 10kHz for FM

£24.95

£199.95
WESTON SYSTEM - ICF.2001 D with active antenna AN-1 in one complete package.

*£319.95*
ICF SW1E
ICF SW1S KIT
ICF SW1E and CONVENIENT SUPPLIED ACCESSORIES: ACTIVE AERIALS, AUTOMATIC MULTIVOLTAGE MAINS ADAPTOR, HARD CARRYING CASE

*£149.95*
SONY SLIM STYLED TRAVELLERS SHORTWAVE MULTIBAND AND STEREO CASSETTE RECORDER

*£199.95*
NEW ARRIVAL:- SONY CRF-V21

ALL MAJOR CREDIT CARDS ACCEPTED ALSO CHEQUES AND POSTAL ORDERS
ALL SETS ARE GUARANTEED PRICES INCLUDE V.A.T.
ALL GOODS DESPATCHED WITHIN 48 HOURS

P.O.A.

ASK ELECTRONICS LTD
248-250 TOTTENHAM COURT ROAD
LONDON W1P 9AD

TEL: 071-637 0590/071-637 0353 TELEX: 27768
FAX: 071-637 2690
Philips DC777 SW Car Radio

It's not very often that a car radio gets a review in this magazine. But the new DC777 from Philips, reviewed here by John Waite, has a few special features.

This new car radio/cassette from Philips features the normal long, medium and v.h.f. coverage. What makes this model particularly interesting is the provision of eleven short wave broadcast bands. Although this may seem an odd feature to include in a car radio, it's likely to be of great interest to anyone who travels widely.

Besides the short wave facility, the DC777 has all the features you would expect to find in a modern car radio, including a security code. So let's take a more detailed look at this interesting receiver.

Installation

Perhaps one of the most important aspects of a car radio is that it must fit into a standard housing. You may be thinking this is a strange point to put first, but ease of use is vital for a receiver such as this. With most modern cars, the only place a radio could be mounted is in the slot provided, so there's not usually any choice. You'll be glad to hear that the DC777 has been designed to fit into a standard 182 x 53mm dashboard housing. According to the manual, there are specialised mounting kits available to suit some of the more popular models. When installing the DC777, using the supplied mounting hardware, you first need to secure the metal sleeve to the dash. This gives the main support for the receiver, though in some cases you may have to fit an optional rear support bracket. Electrical connections were made using a standard car antenna socket and four multi-way plugs and sockets on the rear panel. The connection options provided were very comprehensive and should suit just about every possibility. One of the four sockets was used to carry the various power supply connections and was supplied with a matching plug and screw terminal connectors.

Besides the basic supply, there were two switched outputs from the DC777. One of these was for connection to an electric antenna, while the other could be used to power auxiliary equipment. This could perhaps be a slave amplifier or active speaker system. The great advantage of this system is that the power to all parts of the system is controlled from the on/off switch of the DC777. A further refinement was provided as a night illumination lead. This could be connected to the instrument lighting circuit of the vehicle so that the DC777 lighting came on at the same time as the vehicle dashboard lights.

Moving on to the audio connections, these were equally versatile. The DC777 could be configured to drive either two or four speakers by selecting the appropriate connections from the supplied lead. The impedance requirements of the speakers was the standard 4Ω, so should present no problems. Besides the speakers, there was another 7-pin socket on the rear panel. This carried the line outputs for connection to a graphic equaliser or slave amplifier. Although there was no plug supplied for the line out socket, it was available as an optional extra.

With all the connections made, installing the DC777 was simply a case of sliding it into the mounting sleeve. One of the beauties of this system is that removal is equally simple. Philips had even included a pair of handles to simplify the removal. This ease of removal is great from the security point of view. The user is encouraged to remove the radio if the vehicle was being left unattended for a length of time.

To help deter theft, the DC777 is fitted with a security code feature. This is a clever, but simple, system that should prove very effective. The way it works is that a security code is supplied with the radio - Philips call it a 'passport'. Once the security code feature has been enabled, a four-digit code has to be entered whenever the main power supply has been interrupted. In practice, this means the code has to be used after the DC777 has been removed from the car. Until the correct code had been entered the receiver remains silent. I must say it's good to see a large equipment manufacturer taking security seriously and providing the motorist with some positive help. With the
installation complete it was time to take a close look at the DC777’s range of operational features.

Ingenious

One problem facing car equipment manufacturers is the limited front panel space afforded by the standardised car radio slot. Because of this, a fair degree of ingenuity is required when incorporating short wave bands.

The first example of this on the DC777 is the multi-function volume, fader, balance, treble and bass control. This is all handled by combining one rotary control with a touch button. This control normally acts as a conventional volume control. However, when the AUDIO button is pressed, its operation cycles through the four other modes. An indication of the current mode is given by the display showing FAD, BAL, LO or HI. To keep the operation as simple as possible for the driver, this control automatically reverts to volume if it remains unoperated for ten seconds. You could also quickly silence the radio by pressing the MUTE button.

The short wave enthusiast will be pleased to hear that the frequency selection options were very comprehensive. The basic system employed is search tuning which, as the name implies, causes the radio to search for stations. The way it works is that you select the appropriate band and then press the < or > button to start the search. The radio then stops at the first signal that exceeds its detection threshold. The search can be continued by repeated pressing of the buttons. This is an effective system for in-car use as the radio does the work rather than the driver. There was also the option to use the < and > buttons for manual tuning. This was particularly useful if you wanted to listen to a station that was too weak for the search to pick up.

The short wave listener will find the direct frequency entry extremely useful. Access to this function is rather ingenious and involves the release of a fold-out, numeric key pad from the front panel.

Selecting a frequency is simplicity itself - you just enter the frequency in kHz followed by the E key. The only problem with this mode is that it’s really not suitable for operation whilst driving. One solution is to utilise the DC777’s forty-five pre-set memories. These are arranged as five memories on each of the long, medium and v.h.f. wavebands, with twenty available for short wave. This is backed by a further ten auto-store memories that are only available on v.h.f. and medium wave. The auto-store memories are likely to be extremely useful for the traveller as, when activated, they automatically search and store the five strongest stations in special memories. These stations can then be recalled at the press of a button. That completes the tuning options, but the DC777 has plenty of other interesting features.

Cassette Player

Besides being a very capable short wave receiver, the DC777 includes an auto-reverse cassette player. Operation of the cassette deck is very simple and includes the usual forward and reverse winding. In addition to automatically reversing direction at the end of a tape, the direction could be reversed at any other time at the press of a button. Other features included were a digital clock and three timers. These timers could be set to operate to any of the memories. I must admit though, I was at a bit of a loss to think of a practical use for these timers!

Performance

Rather than just look at the on-air performance I took the opportunity to carry out a few measurements. The first test was to check out the DC777’s sensitivity. These tests showed some very good results throughout the DC777’s range. The short wave bands turned in a best sensitivity of 0.5µV for 12dB SINAD at 9.5MHz while the worst case was 1.5µV at 21.45MHz. Moving on to the medium and long wave, these were equally sensitive and more than adequate for the task. The v.h.f. sensitivity also proved to be very good at 1.0µV for 12dB SINAD.

Test Results

I next looked at the distortion of the recovered audio signal. This proved to be good with long, medium and short wave giving distortion levels of less than 1%. As expected the v.h.f. distortion was significantly lower at 0.3%.

With the measured results looking good, I turned my attention to evaluating just what the receiver was like to use. I was particularly impressed with the performance of the search tuning feature. I have seen many implementations of this and most suffer from an inability to exclude interference.

Because of these failings the search is rarely effective on the more congested bands. Philips seem to have cracked most of the problems and the DC777’s search performance was excellent, even on busy short wave bands. There was no indication of the technique used, but it really was effective.

The Auto Store also worked extremely well and was particularly useful when travelling outside your normal area. In my home area, the search and store routine took about thirty seconds to complete.

The direct frequency entry was another good point, though in practice, it could only be used whilst stationary.

<table>
<thead>
<tr>
<th>Specification:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
</tr>
<tr>
<td>v.h.f. (f.m.)</td>
</tr>
<tr>
<td>l.w.</td>
</tr>
<tr>
<td>m.w.</td>
</tr>
<tr>
<td>s.w.</td>
</tr>
<tr>
<td>90m</td>
</tr>
<tr>
<td>75m</td>
</tr>
<tr>
<td>60m</td>
</tr>
<tr>
<td>41m</td>
</tr>
<tr>
<td>31m</td>
</tr>
<tr>
<td>25m</td>
</tr>
<tr>
<td>21m</td>
</tr>
<tr>
<td>19m</td>
</tr>
<tr>
<td>16m</td>
</tr>
<tr>
<td>13m</td>
</tr>
<tr>
<td>Audio Power</td>
</tr>
</tbody>
</table>

Summary

The Philips DC777 is certainly a very capable mobile radio/cassette unit with an impressive range of well thought out features. The inclusion of short wave coverage adds extra interest and gives it the edge over many others. The performance and operational feel of this model was really very good and well up to standards required. The DC777 should have appeal strongly to anyone who travels widely.

The Philips DC777 can be purchased from any authorised Philips outlet and is priced at £299.99. Thanks to Philips UK for the loan of the review model.
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.

LOWE DOCKS AT BRISTOL

In addition to Heathrow, we have now opened our latest centre in Bristol to serve the South West. Similar to Heathrow, we are stocking a full range of communications equipment from transceivers, both commercial and amateur, to a large selection of VHF scanners and HF communications receivers.

There are full demonstration facilities in the showroom plus a fully equipped workshop to take care of any first line servicing problems on the spot. Like all our branches, there is a selection of fully tested and guaranteed second hand equipment for you to choose from.

The new centre is being managed initially by Dave, G6CXA, but we are looking for a full time manager; so we will welcome approaches from anyone who is interested in turning their hobby into a full time job.

HOW TO FIND US

The new Lowe Communications Centre at Bristol is just over the Totterdown bridge from the main A4 Bath road in St Philips. From the traffic lights on the A4, go across the bridge and turn immediately left at the T junction. You will see the centre on the left in front of the river. Turn first left and park anywhere in front of it. Parking is free as you would expect at one of our shops. We are just 10 minutes from the end of the M32 motorway and a short walk from Temple Meads station.

LOWE ELECTRONICS LTD

Bristol: Unit 6, Ferry Steps Industrial Estate, Albert Road, St Philips, Bristol BS2 0XW. Tel: 0272 771770

Heathrow: 6 Cherwell Close, Langley Slough, Berks SL3 8XB. Tel: 0753 45255
If you have a subscription then you will know about the Short Wave Magazine Subscribers' Club. If you do not have a subscription then doubtless you will be wondering just what this new page is all about. Membership of the SWM Subscriber's Club is free and automatic for all Subscribers and is our way of saying thank you to all those who have enough faith in their favourite magazine to pay for it 'up front'. Each month there will be Special Offers and occasional competitions with some really useful prizes to be won.

This month we have two special offers for Short Wave Magazine Subscriber's Club members. Godfrey Manning has often mentioned videos of aircraft subjects in his 'Airband' column and two titles which he particularly likes are *Wings at War*, capturing the story of military air power from World War 1 to Vietnam, and *Wings: The Jet Age*, the story of the jet aeroplane using a unique blend of archive and original material to trace the path of progress to the modern supersonic aircraft.

As a member of the Short Wave Magazine Subscriber’s Club you can obtain your own copy of *Wings at War* for £12.25 and *Wings: The Jet Age* for £9.50. Both prices include VAT and Post & Packing.

The closing date for this special video offer is 31 May 1991. Please mark your orders SWM Subscriber's Club April, PW Publishing Ltd., FREEPOST, Enefco House, The Quay, Poole, Dorset BH15 1PP.

This offer is limited to one copy of each video per subscriber and your order must be accompanied by your Subscriber Number or a subscription order using the form printed below. We regret that only SWM Subscriber's Club members can apply.

**SUBSCRIPTIONS TO SHORT WAVE MAGAZINE**

Be sure of your copy every month, beat the price rise and qualify for the Subscribers' Club as well. Special offers and discounts normally available to all members, including those abroad.

Please indicate the type of subscription required:

- SHORT WAVE MAGAZINE 1 YEAR
  - £19.00 (UK)
  - £21.00 (Europe)
  - £22.00 (Rest of World)

- PRACTICAL WIRELESS 1 YEAR
  - £19.00 (UK)
  - £21.00 (Europe)
  - £22.00 (Rest of World)

- SPECIAL JOINT SUBSCRIPTION 1 YEAR ONLY
  - £32.00 (UK)
  - £35.00 (Europe)
  - £37.00 (Rest of World)

Prices current at March 1991
Subscription to commence with issue dated...

Please send me *Wings at War* at the special Subscribers' Club price of £12.25 inc. P&P.
Please send me *Wings: The Jet Age* at the Subscribers' Club price of £9.50 inc. P&P.

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

Name
Address

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

Charge to my Access/Visa Card the amount of £

Card No.
Valid from to
Signature

Credit Card Orders can be taken on (0202) 605524.

If you do not want to deface your SWM, a photocopy of this coupon is acceptable.
SPECTRUM FAX
TRANSCCIVE OR RECEIVE ONLY
Our FAX programs now cater for the three popular line speeds, 60, 120 and 240 lines per minute. All, as always, received screens can be saved to tape, and/or sent to your printer.

Everything you need to receive FAX ........................................... £40.00
Complete Transceive System .................................................. £75.00
(Alternatively, we can still supply the 120 lines per minute only systems for £33 and £65 respectively)

We offer a generous trade in allowances to customers wishing to upgrade their systems. Ring or write for details.

Send large SAE (3p stamp) for details of all our products.

J. & P. ELECTRONICS LTD.
Unit 45, Meadowmill Estate, Dixon Street, Kidderminster DY10 1HH Tel: (0562) 753893

CLARK SCAM HEAVY DUTY 60 TELESCOPIC PNEUMATIC MASTS
Rectracted 7' Head load 40lbs with or without supporting legs + erection kit + book + handbook ...................................................... £30.00 - £50.00
CLARK SCAM HEAVY DUTY 70 TELESCOPIC PNEUMATIC MASTS
Rectracted 7' Head load 60lbs with or without legs + erection kit + book .......................................................... £50.00 - £90.00

TEXSCAN CATV SET TOP CONVERTOR Tuner FR range 30MHz - 400MHz output on channel 36 UHF - PAL Synthesizer controlled - keypad or IR remote controller. Brand new & boxed with circuits & information. Not tested. £20 or two for £30

RACAL MA240 ENCRYPTION UNIT Speech or data encryption for use with HF-VHF or fixed telephone equipment. Solid state. Alloy air sealed case - 12V DC supply - each unit can send or receive - but two must be used one to receive the other to send both switched to the same number selectable from rotary switches on the front panel. £100 or two for £150

RACAL MA2420 - MA2421 AUTOMATIC MORSE RECEIVING AND SENDING SYSTEM. MA2420 AUTOMATIC MORSE SENDER - Small solid state unit incorporates a full alphanumeric keyboard for entering messages which can be sent immediately or stored for 30 days. Operation in Morse code 10 to 20 wpm or 60 to 120 times this speed. Internal storage of up to 1000 characters and data. Brand new. £150 or two for £250

MA2430 AUTOMATIC MORSE READER Set contains: - reads Morse code from above unit or radio audio output at up to 100 words per minute, by hand or automatic - stores up to 912 characters - readout on unit - letter by letter - LCD display or printer etc. - many adjustable speeds - ASCII or Baudot. Power 11-30V DC or AC mains by MA4232 power unit with or without charger - includes lead, connector & book. Not tested. Internal battery (NiCd) may need replacing due to storage. Brand new ........................................ £100

AS ABOVE BUT ARABIC NOT ENGLISH But supplied with kit to convert to English keyboard cover + prams + book. Line adaptor. Brand new ......................................................... £150

MARCONI T2008 SIGNAL GENERATORS 10KCS TO 10MCS ANYFM or sweep output. Complete with book. Not tested - as they come from the pile - will have small faults - as received MOD hence clearance price. £250 each. Front panel protected with metal cover therefore fair condition. Wooden kit box of leads etc. .......................................................... £25

ARMY TYPE MORSE KEYS Large quantity available ........................................ £5 ea
ARMY WHIP AERIALS AND BASE 12 or 16 - NEW ........................................ £20 - £25

Small selection only listed. Export trade prices are possible - write for details £39.95 inc. VAT & carriage extra.

JOHNS RADIO
Government and manufacturers surplus Electronic items. Stabilized power units and Telecommunication Equipment.
84 Whitehall Road East, Birkenshaw, Bradford. BD11 2ER
Tel: No: (0274) 684007 Fax No: (0274) 651160

AR1000/HP100E SIDEBAND
Adds USB/LSB/RTTY/CW modes to your scanner. A ready built unit, fully tested, complete with all leads, connectors and instructions. Continuously variable coverage, not tied to 5KHz steps. Battery or mains adapter powered. Easy to operate. Other makes and models possible - write for details £39.95 inc. P&P.

ALSO AVAILABLE:
500kHz-1300MHz continuous MOD kit ................................ ... £15.00
RF Amplifier - Mobile ................................................... £29.00 Base .................................................. £35.00
Broadcast Band filter (88-108MHz) ........................................... £19.00
5 Hour charger .................................................................. £11.99

RGW Electronics 5 Braunston Place, Rugby, Warwickshire CV22 5JZ

Weather
Satellites

Timetep 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 Timetep engineers.

Lawrence Harris uses Timetep equipment for his column in Shortwave Magazine. Les Cunnington who received the first Chinese Feng Yun image and presented it to Chinese Diplomats, also uses Timetep equipment.

PCSAT III
This innovative package will receive NOAA, METEOR, OKEAN, FENG YUN, INTELSAT GOES and SMS. 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 just some of the features this system offers. Extensive filtering and a precision A-D are used on an internal PC Half Card, for superior image quality.

Animation from Meteosat is no mere gimmick! The atmosphere is a fluid in constant motion. Follow the dynamic progress of storms and clouds cover, of up to 100 full frame continuously animated images!

The really important feature is the ability to display in 800 pixels 600 lines and 256 colours, all at the same time. Some other systems will display 256 colours but only in far less resolution.

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 Preamplifier £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 VAT & postage

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 PC's 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

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

Short Wave Magazine, April 1991
**REGENCY HX2000**

**HAND HELD SCANNER**

20 Programmable channels + full search + Scan (Factory Refurbished)

Frequency Coverage:

- **BAND:** 118-136MHz (Aircraft)
  - **MODE:** AM
  - **RECEIVER:** AM
  - **INCREMENT:** 12.5kHz
- **BAND:** 138-174MHz (VHF High)
  - **MODE:** FM
  - **RECEIVER:** FM
  - **INCREMENT:** 5kHz
- **BAND:** 406-490MHz (UHF)
  - **MODE:** FM
  - **RECEIVER:** FM
  - **INCREMENT:** 12.5kHz
- **BAND:** 490-512MHz (UHF "T")
  - **MODE:** FM
  - **RECEIVER:** FM
  - **INCREMENT:** 12.5kHz

£99.95 + £3 P&P Limited stocks avail.

---

**SKY SCAN**

**DX-DISCONE**

25 to 1300MHz

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 polarised 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 Mk II**

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, Nr Stourbridge, Worcestershire.

Telephone: (0562) 730672 Fax: (0562) 731002

SHOW ROOM OPENING TIMES:
Mon - Fri: 9.00 - 5.30pm Sat: 9.00 - 1.00pm

Callers welcome.

---

**Short Wave ATU** will improve your shortwave antenna...£36.00 + £3.00 P&P

**Short Wave Long Wire** complete...£19.95 + £3.00 P&P

Or **AR300 XL Aerial Rotator and control Max Load: 100lb £39.95 + £2.95**

**AR201** Rotator Support Bearings provide additional support for long aerials...£15.00 + £1.50 P&P.
WEATHER WATCHING PRODUCT GUIDE
Comprehensive details of what's available and where to get the best buys

BEGINNERS' GUIDE TO WEATHER RECEPTION
How to get started

HERE IS THE SHIPPING FORECAST
Explaining the BBC's weather reports for ships

LISTENING TO WEATHER FORECASTS
What they are and where they can be found

WEATHER SATELLITE & FAX RECEIVE SYSTEM REVIEWED
Instant grey scale facsimile on your IBM-PC! Just connect the supplied lead from the serial port to the extension speaker socket of your HF radio receiver to receive isobar maps, re-transmitted cloud cover pictures, press photos and radio amateurs. This is a really easy to use package with its own on screen tuning indicator. Excellent value for money!

ICS-FAX: £89.95 inc VAT (£2.50 post, packing)


MONITOR THE WEATHER

PC HF FAX
Receive weather charts and rebroadcast satellite pictures via radio on your PC computer.
- Surface analysis.
- Significant weather.
- Plotted data from observation stations.
- Forecast charts for 24, 36, 48 and 72 hours.
- Upper air analysis of wind and temperature.
- Rebroadcast satellite visual and infra red pictures.
- Plus many other forecast and analysis pictures.

The program has comprehensive features, such as:
- Save and print from disk.
- Unattended automatic capture.
- Displays up to 16 intensity levels.

PRICE ONLY £99.00 inc VAT P&P £3.25

PC GOES
Receive satellite pictures direct from both orbiting and Meteosat satellites. Every day over 12 satellites photograph the earth in visible or infrared light and relay these images back to earth. PC GOES allows you to capture and analyse these images on your PC computer.

Features:
- Tracks up to 10 satellites.
- Save and print from disk.
- Unattended automatic capture.
- Slideshow animation.

PRICE ONLY £199.00 inc VAT P&P £3.25

PC SWL
Decodes data sent over shortwave radio from around the world and displays this information on your PC computer.

Decodes:
- Morse code marine weather forecasts.
- FEC marine synopsis and forecasts.
- NAVTEX forecasts and gale warnings.
- Data from Meteorological Reporting Stations.

PRICE ONLY £99.00 inc VAT P&P £3.25

Order PC HF FAX and PC SWL together for ONLY £178.00 inc VAT P&P £3.25
Weather Watching Product Guide

This Product Guide has been compiled especially for Weather Watching by Lawrence Harris who compiles the 'Info in Orbit' column each month in Short Wave Magazine.

General Information

Some retailers sell complete systems of varying complexity, so it is important for the prospective purchaser to have a clear idea of what they wish their system to be able to do - see the 'Beginners' Guide'.

The product list is not exhaustive - it includes summaries of products that I have been able to locate from various manufacturers, but remember prices and specifications do change, so enquire first. In compiling this list I have taken great care but errors or omissions may have occurred. All prices quoted include VAT.

Manufacturers and Retailers

Several manufacturers and retailers who supply products for this market responded to my requests for product lists. This alphabetic list includes addresses, telephone numbers and the code letter used to identify them in the Product List.

VHF Transmissions - NOAA/METEOR/OKEAN

Antennas

- Dartcom crossed dipole (rigged design). £86 (D).
- Kit to build 4-element antenna. £114.5 (G).
- Kit to build crossed dipoles inc. phasing harness and mast clamps. £175 (B).
- MA20 Crossed dipole with phasing harness and cable. £46 (H).
- Crossed dipole with phasing harness and cable. £39 (F).
- Crossed dipole with phasing harness. £39.95 (K).
- CD137 Crossed dipole. £35 (G).
- VC20 20m antenna cable and plugs. £15 (C).

Pre-amplifiers

- 137 MHz 12dB gain with good filtering, requires boxing. £14 (D).
- 137 MHz 14dB gain, kit (extra needed). £10 (G).
- 137 MHz boxed. £21 (H).
- 137 MHz boxed. £23 (F).
- 137 MHz 13dB gain with good filtering. £25 (K).

Receivers

- Kit to build receiver module. Needs boxing and other parts. £48 (B).
- 136-138 MHz synthesised scanner module: with or without I.c.d. direct frequency readout. £160 or £131. This module needs to be wired and completely boxed (D).
- Dartcom receiver as above but completed. Available to RIG members. £398.
- Dartcom receiver as above but with computer control. £495.
- Maplin kit to build v.h.f. receiver. £75 (plus additional cost for box etc). (G).

Framestores

Not often sold as separate items but can be obtained second-hand sometimes from RIG members - see their quarterly magazine for advertisements. Hardware having similar functions is listed here.

Graphstore BBC System. MSG20 a framestore for use with the BBC computer range, having on-board a half-megabyte memory with several processing facilities and providing resolution to 512 x 512 x 128 grey levels, but only for NOAA/METEOSAT: boxed module. £407. (H).

Other Products

- Software: Instant Track - satellite predictions program with good graphics and much more. £25. (K), (E).
- Framestore analogue to digital conversion range adapter: this device can be fitted inside the YU3UMV framestore and allows the optimum setting of the analogue to digital converter for infra-red pictures leading to an improved number of grey levels. £19. (D).
- Books: numerous titles of interest to satellite hobbyists available from various sources. (F), (I).
- Posters and teaching materials: various sources including (F).
- Pictures, videos and slides: various sources including (F).

Martelec MSR30 synthesised 6-channel scanning NOAA receiver.
VHF Transmissions - NOAA/METEOR/OKEAN (continued)

Maplin decoder kit. Converts a.p.t. signals into digital 8-bit data for home computers. approx. £80 plus box, etc. (G).

Maplin framestore kit. A detailed study of the various options should be undertaken before starting this as a project. The cost of the 'high resolution' unit is about £85 but the necessary components will add several more pounds. Do not undertake this project lightly! approx. £100. (G).

Computer Cards

These are 'cards' which fit inside the computer and contain the electronics necessary to convert the audio output of a weather satellite receiver into data that is in a form that the computer can process.

There are cards made for different computers and some manufacturers make more than one card for the same computer - giving a choice. The electronics may be mounted on an external unit (a module) for connection. Note - prices exclude the computer.

AMIGAFAX. Interface and software. Details not received yet but believed to retail at around £110. (A).

AMIGASAT. Comprises software and hardware for the Commodore Amiga computer models 500, 1000, 1500 and 2000 with minimum of 1Mb RAM. Facilities include 8-bit resolution from tape or live source providing 16 grey shades, digital signal processing, zoom, image compatibility with IFF packages. Currently about £150. (H).

APT-1. WXSAT module for the Spectrum computer; must be used with the interface unit and decodes pictures directly on to a dot matrix printer - no video display: two modules needed costing. £40 and £59. (J).

DIGISAT. Runs on an IBM-compatible PC, having 640Kb of RAM and preferably an EGA or VGA monitor giving 800 x 600 x 64 grey levels. The card takes the audio signal (2.4kHz a.m. modulated a.p.t.) from the receiver and there are some adjustments to be made for setting up purposes.

Decoding of FAX is also provided on this card, as is animation. £176. (H).

PC-GOES. Hardware interface and software - runs on an IBM-compatible PC giving 640 x 480 x 16 grey level resolution. No animation but hard copy printer driver included. METEOSAT image downloading facility. £199. (C1,(H).

PCSAT III. This card slots into an IBM-compatible computer and stores the full transmitted resolution on disk. Caters for all satellites and takes tape recordings, including METEOR without needing a sync track. Contrast, colour and an animate facility are included. £199. (K),(E).

WXSAT MSS20. A BBC computer based decoder system. Takes audio data from a receiver and processes it for the BBC user port, giving a resolution of 160 x 250 x 8 colours. Features include zoom, colour setting, picture inversion, adjustment and screen dump routine. £90. (H).

Dartcom acquisition board for PC-compatible computers, available to RIG members. £723.

Receiving Station (excluding computer)

METPK METEOSAT system. Includes MRS2/R receiver, LY1961 Yagi, MSPA pre-amp, 10m cable, PCGOES software and demodulator. £694. (C).

Dartcom VGA system. Requires a minimum PC AT 286 with mouse, VGA monitor and 1Mb extended memory. £2400 plus delivery. Dartcom also do other systems at much higher prices.

Spacetech NOAA station. Includes podule, software, v.h.f. receiver, antenna and cables. Archimedes system. £659, Acorn system. £704, Atari system. £636. (F).

Spacetech METEOSAT station. Includes podule, software, s.h.f. receiver, Yagi and pre-amp plus cables. Archimedes system. £948, Acorn system. £1005, Atari. £925. (F).

Spacetech Archimedes, Acorn and Atari systems for v.h.f. and s.h.f. Various combinations available and the price includes the podule or interface, software, s.h.f. receiver, antenna and pre-amp, v.h.f. antenna and receiver and all cables eg., for the Archimedes system v.h.f. and s.h.f. (NOAA and METEOSAT). £1269. Acorn system. £1326. Atari system. £1245. (F).

Timestep. Equipment combinations available for the Atari, Amiga, Archimedes, Nimbus and PC clones and they also sell computers. Examples for PCs, include dish, feed, pre-amp, cable, receiver, PCSAT3 and cable: eg METEOSAT. £715. One NOAA system includes antenna, pre-amp, 50m cable, PROscan receiver, PCSAT3 and box. £613. (K).
**SHF Transmissions - METEOSAT & GOES**

**Antennas**
- Dish, feed and mount clamp. £253. (D).
- Dish (Timestep) patio mounting. £256. (F).
- Yagi LY1691 44-element loop, length 2.79m, gain 15dB, beamwidth 16deg. £178. (C).
- Yagi (SHF Comms in Germany). £214. (F).
- Yagi 55-element. £124.95 (K), (E).
- MSD20 patio dish including feed. £174. (H).
- Combination Yagi, pre-amp and downconverter (Yagi to be assembled), some extras required. £180. (G).
- MC1010 low-loss cable and plugs. £23. (C).

**Pre-amplifiers (1.69GHz band)**
- 24dB gain for 1.5dB noise figure. £92. (K).
- 16dB gain for 1.0dB noise figure, GaAs F.E.T. type. £128. (F).
- Good specification pre-amp in kit form (some extra components required) available to RIG members. £40.

**MC1010 low-loss cable and plugs. £23. (C).**

**Receivers**
- WX1069 s.h.f. 2-channel receiver with computer control. £295. (E).
- ME50/G5 GOES 2-channel receiver, 1.7GHz in and audio out. £199. (K).
- MSR2/R 2-channel 1.6GHz receiver, 0.05μV sens. £279. (C).

**Down-Converters**
- DC1691. Conversion gain 33dB with 1dB noise figure. £142. (C).
- MSC20. 2-channel 28dB gain with 1dB noise figure. £177. (H).
- RIG (Dartcom). 2-channel. £160. (D).

**Complete Systems**
- METEOSAT. The 'plug in and go' type of system which does not require anything else; compact framestore system, includes Yagi, pre-ampl, cable, 2-channel microwave receiver, framestore, 12in b/w monitor and all cables. £795.95. (E).
- Timestep. Package includes all hardware listed under 'Receiving station' plus the computer. Price is dependant on options selected. (K).

**High Resolution Picture Transmissions - HRPT**
Equipment prices are considerably higher in this field because the development costs have to be recovered at an early stage, rather like a.p.t. was five years ago! There are a few manufacturers developing systems which are normally far beyond the pockets of the amateur market. I have included just two for this review.

**Equipment Requirements:**
- NB: Not all items will be available for immediate purchase.
- HRPT receiver
- HRPT data card (for computer)
- HRPT software

**Antennas:**
As for ME50/G5 - the signal is transmitted in the 1.69GHz band at various frequencies for ME50/G5, NOAA and FENGYUN but a high quality pre-am is essential.

**HRPT Receiver:**
- 8-channel receiver with 1.7GHz input. Approx. £500. (K).

**PC Data Card:**
Card fits into a suitable computer and receives data from the receiver and stores it directly on the hard disk. (Watch this space!)

**HRPT Software:**
Likely to be supplied with the data card.

For the professional purchaser with no funding problems, Dartcom of Postbridge in Devon have joined with British Aerospace to produce an HRPT system that is, perhaps, the ultimate weather satellite computer decoding system. It has a price tag of around £70,000!
Lawrence Harris explains what weather satellite watching is all about, how you can make a start and, of course, how much it all might cost you.

Everyone who watches the television news has seen pictures from weather satellites, because they are regularly used to show the movement of weather systems. However, the actual pictures transmitted are of far better quality than those shown.

Many people have set up equipment to receive the signals from these satellites and new products have been produced to decode them. The development of ever faster and cheaper computers has added to the choice of systems available to produce pictures.

**What Can We See?**

The satellites have at least two types of sensor. The visible light one produces a black-and-white image of the earth below, and does not record colour information, those that you see in books have been artificially produced for aesthetic purposes.

The other sensor detects infra-red (heat) radiation and so can produce pictures continuously. The satellites have two such sensors, the second responding to water vapour concentrations. Many years ago I was involved in ground-based measurements of the amount of water vapour above a field, using this type of sensor to investigate the effect of rain on future satellite links!

Heat sensors normally show hot features (like deserts in the day-time sun) darker than cool features (like high-altitude clouds). Desert sands are hot during the day and cold at night so the change can be seen in infra-red. The Russian METEOR 3 series of weather satellites can produce infra-red images but these are reversed - cold clouds appear as black and the warm oceans as white.

The OKEAN satellites carry a visible light scanner, a microwave sounder and radar. Some of the most interesting pictures that I have recorded were from OKEAN `seeing' through clouds.

**How much Detail is Visible?**

Being lower than the geostationary satellites, the polar orbiters see more detail - objects about 1km. Higher orbiting satellites see details down to a few kilometres.

However, there is an important point here - both NOAA and METEOSAT have two types of transmission each requiring different equipment for its decoding, and providing a choice of resolution.

High-resolution imagery is transmitted as digital data using the 1.69GHz band and the equipment needed to decode it is very pricey, especially for the beginner. My ‘Info in Orbit’ column will keep readers up-to-date with developments in this exciting field.

Here, I will be looking at medium resolution pictures that are the original pictures but with some data removed, so allowing the whole picture to be transmitted in a shorter time or at a lower frequency.

**Receiving Equipment**

Having decided to investigate weather satellite reception, the next step is to see what equipment is needed. Several combinations of equipment can decode pictures, ranging from one of the cheapest modules that can be attached to a computer, to a complete system which does everything but at a price. We’ll look at the various options later.

---

**Dipoles, Dishes and Yagis**

Any receiving system ultimately depends on its antenna. You could spend £1000 on a computerised satellite station, but with a poor antenna you will not get good results. Start with a good quality antenna.

Satellites are normally spin stabilised so we use right-circularly polarised crossed dipoles. For better directivity we have one set of reflectors below the main dipoles. You can make a simple dipole to receive signals for test purposes by connecting some cable (inner core and outer sheath) to two copper rods (each 510mm long). Commercial units cost between £15 - £80.

Your v.h.f. antenna should be as high as possible and feed the receiver via good quality cable of matching impedance. For cable over 20m long you may need to use a pre-amplifier at the antenna end.

To receive METEOSAT (1.69GHz) you need a dish or Yagi and a down converter. The dish should be one metre or more in diameter and a Yagi should have at least 40-elements. You may find that a pre-amp is not needed if METEOSAT is transmitting at full power. This s.h.f. signal is usually changed to 137.5MHz using a down-converter, to feed your v.h.f. receiver, just like the polar satellite signals. You can buy METEOSAT receivers which accept the s.h.f. signal and decode it to produce the audio signal, bypassing the down-converter.

Dishes can be home-made, as was my first dish, using chicken wire on a wooden frame, or bought in - see the products review elsewhere in ‘Weather Watching’. For home-construction you need to build to a parabolic shape, though the errors tolerated by the system are about 20mm! Yagis constructed for METEOSAT can work well and are included in the products review mentioned earlier.

The antenna/pre-am/cable feeds your v.h.f. receiver which must be properly designed for weather satellites having good out-of-band signal rejection. Ordinary v.h.f. receivers cannot cope with the signal format used by weather satellites. The output is in the form of an audio signal having recognisable tones and data content and with experience you can tell what type of satellite is being heard.
You may want to look at different satellites and so need several frequencies. Receivers have either crystal or microprocessor (chip) synthesised frequencies, the latter covering a wide range. A new satellite may transmit on a frequency not covered by a crystal receiver - check what the manufacturer will do if this happens!

**Scanning**

A scanning facility allows you to leave the receiver looking sequentially at each selected frequency e.g., 137.30, 137.40, 137.50, 137.62 and 137.85MHz and stopping when a signal or interference is picked up, depending on your squelch setting. The squelch allows you to set the signal strength you wish to detect before the receiver stops scanning. If set too low, then noise or interference may hold the receiver instead of allowing it to scan. Too high a setting results in missed signals. Well designed intelligent scanners may ignore interference and look for the genuine signal. My son Tim designed a 2.4kHz detectors that does this job!

For good signal decoding your receiver should have an i.f. bandwidth of about 50kHz to allow for Doppler effects (the satellite is moving rapidly).

Sensitivity is the receiver's ability to detect a signal in the presence of noise. New components enable receivers to have sensitivities of about 0.2µV for 12dB quieting, this refers to the fact that without a signal, an f.m. receiver produces noise.

Receivers allow the programming of frequencies to be done by computer, offering opportunities to monitor satellites in your absence and to record signals (on tape) and the associated frequencies.

To convert the signal into a picture requires a suitable decoder which can be a framestore or a computer fitted with a module. Some framestores are still available - see the production reviews - and you can construct your own from kits if you are skilled. But, without any doubt, the trend is to use a computer fitted with suitable hardware and running associated software. This will continue because of the enormous flexibility of these systems.

It is essential to know what you require of a framestore before spending hard-earned cash on a unit only to find that it doesn't do what you had expected.

**Quality Image**

It should allow you to produce a quality image with some 64 grey levels. You will want to decode infra-red pictures as good as the visual light images, but infra-red data is contained in a smaller dynamic range so the black-and-white level settings on the framestore need to be adjusted. Beware of any unit which cannot provide quality infra-red images unless it is offered at a lower price and you are buying it as an introduction to the process.

It should allow selection of all types of transmission, i.e. METEOSAT, NOAA, METEOR and OKEAN formats. Will it provide high quality pictures for a good monitor? Can it offer a choice of resolutions? See one demonstrated if at all possible. However, you must remember that the framestore needs a good signal to do a proper job!

Framestore construction is a major electronics project requiring considerable time, and includes the alignment of many circuits. You can join a specialist club such as the Remote Imaging Group which can provide expert advice. Various component specialists can provide the parts used to 'populate' the printed circuit boards - I hope that you have more success than I did in the early days!

An alternative to tackling the whole project yourself is to buy the boards from a supplier and pay an expert to do the soldering and alignment of the principal circuits.

The trend towards computers fitted with suitable decoding boards to produce pictures must continue. For quality results you need to use a modern machine and there are several decoders available. The first consideration is to balance your requirements against the cost. Do you already have a suitable computer? Products are available for the Archimedes, Atari, Amiga, Macintosh and PC clones.

You can use computers like the BBC and other relatively low memory units that have had software written for them by professionals. They will produce pictures, but they may not be of the highest quality obtainable from more expensive machines fitted with recently designed decoding boards. However, you may well be satisfied with results from the cheaper machines when first starting out.

There are far many products to review them all, so once again try to see some demonstrations. If you are starting from scratch, I would recommend considering a 286 PC clone with VGA monitor.

**Revealing Details**

The first requirement is to be able to stretch the contrast in images like winter visible-light or infra-red to reveal details not otherwise obvious. Computers can be programmed to show land, sea and clouds in their normal colours. The limitation in accuracy is because the original image was based on reflectance (albedo) where white is cloud and dark is sea - so there will be ambiguities because land, sea and cloud can have the same albedo differing in colour only, indistinguishable by the sensors.

**Infra-red imagery** can be effectively displayed in red and blue - red representing warm and blue, cold. This limitation results in some coloured satellite pictures showing features with 'wrong' tinges. Careful selection of the boundaries can minimise these shortcomings!

The final picture is displayed on a monitor or printer and there are many types available. If bought separately the monitor will need to match the existing system and should ideally be at least ECD (enhanced colour display) and preferably VGA (versatile graphics adapter, sometimes called videographics array) or even SVGA (super VGA). You can get acceptable results from cheaper models though.

**The Future**

The weather satellites will continue to provide decodable data for years to come, according to published plans for new launches and I believe that new computer systems will allow more applications to develop. Schools have great opportunities to use these systems for all topics from geography (this IS the river Nile) to mathematics (why is METEOSAT geostationary)?

For the individual the ever changing weather, iceberg watching, hurricanes, etc., make it far more interesting than conventional television!

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>dB</td>
<td>decibel</td>
</tr>
<tr>
<td>ECD</td>
<td>enhanced colour display</td>
</tr>
<tr>
<td>f.m.</td>
<td>frequency modulation</td>
</tr>
<tr>
<td>i.f.</td>
<td>intermediate frequency</td>
</tr>
<tr>
<td>kHz</td>
<td>kilohertz</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>s.h.f.</td>
<td>super high frequency</td>
</tr>
<tr>
<td>SVGA</td>
<td>super VGA</td>
</tr>
<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
</tr>
<tr>
<td>VGA</td>
<td>versatile graphics array</td>
</tr>
<tr>
<td>µV</td>
<td>microvolt</td>
</tr>
</tbody>
</table>

**Fig. 3:** NOAA 11 image of UK & Europe with almost no cloud on 20 July 1990.
Here is the Shipping Forecast

Regular listeners to BBC Radio 4 will be familiar with the litany of names and figures which announcers fit so skilfully into a precise, five-minute broadcast at 05.55, 13.55, 17.50 and 00.33 daily. Joan Ham lets us into some of the secrets behind the shipping forecast.

In spite of the enchanting technicolour graphics of the television weather forecasts and the comfortable regional voices on radio telling us that it will be fine and sunny for the cricket, there is something magnetic about the exact formula of the BBC shipping forecasts. Those five-minute bulletins are a vivid voyage around the British Isles with a panorama of changing weather, flying clouds, winds, rain and sun like a speeded-up film. Regular listeners also gain a degree of personal skill in assessing the next day’s local weather from the data.

Names

How did the seas around our coasts get their names?

The sea areas are named from islands or sandbanks within their boundaries and are thereby instantly recognisable to mariners using them. The BBC first broadcast shipping forecasts in 1925 from 5XX (Daventry), when the vaguely-defined areas were just Shetlands, the North Sea divided into a large eastern block of Forties and Dogger with Tay and Humber covering the coastal stretch from Shetland to The Wash, followed by Thames (Yarmouth to Dungeness), the southern area consisting of Wight and Channel; Severn, Mersey and Clyde progressing up the Irish Sea, and Shannon and Hebrides as the Western area completing the Atlantic side of the forecast areas.

In 1932, the northern part of the map was extended and the boundaries redrawn to add Faeroes and Orkney and the Shetland area boundaries were moved eastwards, taking in part of the large Forties section. This catered for the trawlers which used those waters in increasing numbers.

It was not until after WWII when peacetime shipping needed more information over a wider area that the boundaries were again redrawn and new ones added. The compass-point divisions were abandoned and the seas divided by blocks which ran parallel to latitude and longitude lines in the Atlantic out to 15°W. The Channel and North Sea were sectioned into neat ruled blocks, of which Forties and Dogger were still the greatest areas, with Heligoland and Humber south of them between the Danish coast and England from about Bridlington to Cromer. Thames, Dover, Wight, Portland and Plymouth divided the Channel out to a point due south of Wexford, Ireland, and the area between the northern boundary of Forties and Iceland became three blocks called Fair Isle, Faeroes and Iceland. Cromarty, Forth and Tyne replaced the old Scottish and east coast Tay and Humber areas as far as Bridlington.

These names survived unchanged until 1955 when meteorologists decided that Heligoland should be renamed German Bight which was more familiar to people living adjacent to it. The North Sea areas underwent other changes in the Forties and

The Met. Office

BBC Weather bulletins for shipping-map

(See separate insert for plotter)

Fig. 1: BBC Weather bulletins for shipping-map as published by The Met. Office.

Dogger region when Viking was added to take in part of Fair Isle and Forties and the eastern part of Dogger became Fisher. There was a squaring northwards of the German Bight area and Iceland was further clarified as SE Iceland. These names survive to this day, with one new addition made in 1984, when Utsire was designated east of Viking and Forties for the benefit of Norway.

The Bulletins

The old 5XX transmissions were the first public telephony broadcasts of weather and were sent out on 1600m twice a day. Gale warnings had been sent out for shipping as early as 1911, becoming a regular service in 1921, mostly in code and even spark transmissions for ships that had no other wireless. The Air Ministry station GFA sent out the c.w. transmissions, which could be received over great distances, but the BBC shipping forecast as we know it began in 1925 from 5XX. These were general weather observations and pressures followed by wind and visibility forecasts for the next 12 hours. The shipping forecasts were discontinued during both World Wars, as the information was naturally of strategic importance.

Today’s ‘Sea Area Forecasts’ begin with any gale warnings, which are issued when winds are expected to reach Force 8 (34 - 40 knots) or more, followed by a general synopsis of the pressure systems and their expected movements for the ensuing 24 hours. The areas are then listed in order, followed by figures denoting wind speed and direction, weather and visibility.

Equipment And Data

The weather ship scheme began after WWII, when 13 stations were established in the North Atlantic manned by various nations. Although this was officially ended by the
World Meteorological Organisation in 1989 to save costs, three of the countries continued independently. Norway operates Polarfront out of Bergen at station 'Mike', 66°N, 02°E; USSR has Odessa-based ships at station 'Charlie', 52°45'N, 35°30'N which is almost in the middle of the N. Atlantic between Ireland, Greenland and Newfoundland and Great Britain's Cumulus out of Greenock at station 'Lima', 57°N, 20°W is between the other two. Cumulus is mobile, not fixed, and returns to Greenock every five weeks to change crew and take on supplies. She has another two years of service in view before being replaced by satellite and other updated systems.

From 1982, The Netherlands operated OWS Cumulus alternately with the UK OWS Starella at station 'Lima', but in 1985, Starella finished her tour of duty and Cumulus was officially handed over by The Netherlands to the UK (at a token price of £1) and commenced single manning of station 'Lima'. Her complement of 18 staff usually includes six Hull and Fleetwood trawlersmen and six specialists for the meteorological, oceanographical work and radio operation. She also has ample spare accommodation for guest scientists and trainees, having been built to passenger ship standards.

In addition to the weather ships, information is gathered and transmitted by 450 merchant and other ships commissioned by the UK and 7500 throughout the world. The oceans also provide data via lightships, buoys, radiosonde balloons, oil rigs and aircraft. Although there are still a few manned lightships, their weather stations are all automatic nowadays. Visibility and wind direction present problems to automation, and the shipping forecasts sometimes reflect this when odd data are missing from particular locations. Their information reaches Bracknell via Inmarsat and Goonhilly, or by radio and telex.

Coastal Stations

The second part of the BBC Shipping Forecast consists of reports from coastal areas and contains interesting detail, reported again as a series of numbers: wind speed, direction and tendency - veering (changing clockwise, i.e. E to SE), backing (changing anticlockwise, i.e. opposite SE to E), weather, visibility - fog, visibility under 1000 metres; poor, 1000 metres to 2 nautical miles; moderate, 2 - 5 nautical miles; good, above 5 nautical miles: barometric pressure and the trend (rising, falling, quickly, slowly, steady). The trend is what has happened in the three hours preceding the bulletin. Coastal stations reporting observations are, Tiree, Butt of Lewis, Sumburgh, St Abb's Head, Smith's Knoll Automatic, Dover, Royal Sovereign, Channel Light Vessel Automatic, Land's End, Valentia, Ronaldsway, Malin Head and Jersey.

Many of the Trinity House light vessels are no longer manned, and with automation the weather observing services which they provided ceased. Nearby land stations replaced most of them, but sometimes it is possible to install automatic weather stations on board. Smith's Knoll Automatic in the coastal waters E of Cromer and Channel Light Vessel Automatic stationed SW of Portland are the most recent light ships to be fitted; others may follow. Their 'belt and braces' arrangements for ensuring that the information reaches its destination at Bracknell via Darmstadt, include two alternative satellite transmission paths and two separate power supplies.

The Future

Although satellites provide a great deal of the information, Bracknell still requires surface observations for comparison and verification. The information provided by mariners will always be valued, but the new Global Maritime Distress and Safety System which the World Meteorological Organisation will introduce between 1992 and 1999 ushers in the 21st century with the disappearance of the ship's radio officer as we know him. It will be just under 150 years since the ex-captain of The Beagle established the Meteorological Dept. of the Board of Trade, forerunner of the Met. Office. He also invented two kinds of barometer. Admiral FitzRoy's introduction preceded radio by many years, and we are now well on the way to systems of weather reporting and forecasting that he could never have envisaged.
Listening to Weather Forecasts

The weather is probably talked about more than any other subject. Knowing the weather conditions at the receiver or transmitter can help in planning a successful DXing session and P.C. Mitchell unravels some of the mysteries of weather forecasts.

Both tropospheric openings and Sporadic-E disturbances are assumed to be weather-related phenomena, but arguments are very much in evidence as to the precise mechanics of this relationship.

In less technical terms, it is known that falling barometric pressure after a prolonged spell of reasonably settled weather (high pressure) is beneficial for good v.h.f. and u.h.f. reception. It is also probable that thunderstorms may trigger Sporadic-E disturbances.

There is likely to be, therefore, particular interest in the reception of voice weather broadcasts in addition to many other sources of weather data, such as that obtained via c.w. FAX, RTTY and satellite transmissions.

Today, with great advances in computer forecasting techniques and satellite communications, weather predictions and observations are, generally speaking, highly accurate. The listener today has a veritable mine of constantly up-dated, high-grade, weather data available for interpretation.

**Shipping Forecasts**

Of primary concern to ships within UK coastal waters, BBC broadcast shipping weather forecasts on Radio 4, 198kHz (a.m.) at 0555, 1355, 1700 and 0333 (UK time). More details on this service are given in the article 'Here is the Shipping Forecast' by Joan Ham elsewhere in this publication.

The area covered by these reports is divided into named sea areas. The format begins with warnings of any gales in coastal waters, BBC broadcast shipping forecasts in addition to many other sources of weather data, such as that obtained via c.w. FAX, RTTY and satellite transmissions.

To compliment shipping weather reports, there is an Inshore Waters Forecast on Radio 3 (a.m.) 1215kHz at 0655BST and 90.2-92.4MHz f.m. and at 0038BST Radio 4 198kHz daily. In addition to numerous land forecasts on most BBC and commercial radio stations (long wave and f.m.), the latter probably being the most widely received of all weather information. The general weather forecasts will also give warnings of severe weather for the on-going 24-hour period and it will be noted that, unlike shipping forecasts, land weather reports will include additional minimum and maximum temperatures expected. Shipping forecasts giving much essential information to seafarers, together with the land forecasts mentioned so far, will present to the more general listeners a fairly accurate general picture of weather conditions in and around the British Isles, with no attendant problems regarding reception. However, for a more in-depth study of the subject, other radio sources must be sought that give more precise data both for the UK and many other world-wide locations.

**Aeronautical Weather Reports**

Voice broadcast aeronautical reports will, in the main, appear to be more esoteric in nature. The first recorded use of radio communication between aircraft and ground was on 27 August 1910 in New York State, USA. Doubtless, shortly after this, the state of ground weather conditions were relayed to the pilots of those early planes. Likewise, to the pilot of today, a precise picture of meteorological conditions is essential for the safety of aircraft from take-off to landing.

The VOLMET stations in the UK are provided by the Civil Aviation Authority for the broadcasting of comprehensive weather information for both military and civil aircrew
and operate throughout the 24-hour period. The following abbreviations will, in general, apply to these and other broadcasts mentioned later on:

H24 - broadcast continuous throughout a 24-hour period.
H+00 - actual timing of broadcast on the hour.
H+05, H+10, H+20, etc. - broadcast as indicated minutes past the hour.
A - actual weather report or aviation weather report.
F - landing forecast. T - forecast trend type.
METAR - routine airfield weather report.
SPECI - special weather report following a significant change from a previous report.

UK & European VHF VOLMETs

These are broadcast on v.h.f. for reception by both military and civil aircraft flying within UK airspace and its immediate European vicinity with v.h.f. reception area. Due to v.h.f. line-of-sight reception it may not be possible to receive all of these at any one location due to the different locations of transmitters, but high performance doppler may bring in the more distant signals.

All major airports in the UK are covered by the London VOLMETs and a single Scottish VOLMET, all of which are H24 continuous, with time of report (in UTC) for airport broadcast and of AT type (actual report and trend) as follows:

<table>
<thead>
<tr>
<th>Location</th>
<th>Time</th>
<th>W/D</th>
<th>KT</th>
<th>RVR KM</th>
<th>WTR</th>
<th>CLOUD OKTAS</th>
<th>°C</th>
<th>DP</th>
<th>QNH</th>
<th>O</th>
<th>G</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belfast</td>
<td>0920</td>
<td>090</td>
<td>10</td>
<td>+10</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>11</td>
<td>1020</td>
<td>G</td>
<td>50 KT</td>
<td></td>
</tr>
<tr>
<td>Coningsby</td>
<td>0925</td>
<td>110</td>
<td>11</td>
<td>+10</td>
<td>2</td>
<td>1</td>
<td>11</td>
<td>9</td>
<td>1020</td>
<td>G</td>
<td>15 KT</td>
<td></td>
</tr>
<tr>
<td>Kinloss</td>
<td>0920</td>
<td>100</td>
<td>9</td>
<td>+10</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>5</td>
<td>1020</td>
<td>G</td>
<td>15 KT</td>
<td></td>
</tr>
<tr>
<td>Heathrow</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manston</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odiham</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prestwick</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St Mawgan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shannon</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bardufoss</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gutersloh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oslo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sola</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keflavik</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ascension</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Sample reports RAF & Shannon VOLMETs. Selected locations.

<table>
<thead>
<tr>
<th>DATE: 22/10/90</th>
<th>VOICE WEATHER BROADCASTS</th>
<th>ALL TIMES UTC</th>
<th>ALL ACTUAL WEATHER REPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Time</td>
<td>W/D</td>
<td>KT</td>
</tr>
<tr>
<td>---------------</td>
<td>------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>1. RAF VOLMET</td>
<td>H24</td>
<td>4.722, 11.200Mhz</td>
<td></td>
</tr>
<tr>
<td>Belfast</td>
<td>0920</td>
<td>090</td>
<td>15</td>
</tr>
<tr>
<td>Coningsby</td>
<td>0925</td>
<td>110</td>
<td>11</td>
</tr>
<tr>
<td>Kinloss</td>
<td>0920</td>
<td>100</td>
<td>9</td>
</tr>
<tr>
<td>Heathrow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manston</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odiham</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prestwick</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>St Mawgan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shannon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bardufoss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gutersloh</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oslo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sola</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keflavik</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ascension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. SHANNON VOLMET</td>
<td>3.413, 5.505, 8.957, 13.264Mhz</td>
<td>No barometric pressure given.</td>
<td></td>
</tr>
<tr>
<td>Brussels</td>
<td>1030</td>
<td>260</td>
<td>7</td>
</tr>
<tr>
<td>Frankfurt</td>
<td>1050</td>
<td>250</td>
<td>7</td>
</tr>
<tr>
<td>Munich</td>
<td>1000</td>
<td>290</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 3: Sample report RAF & Shannon VOLMETs. Selected locations.

is given in which wind is blowing from in compass degrees magnetic e.g. 090° from due east. Wind speed in knots. CAVOK - ceiling and visibility OK, visibility 10km, or more, no rain, fog or snow and no cloud below 5000ft, in other words a decent summer's day! Visibility in metres. RVR - runway visibility range is only given in visibility is less than 1500 metres (due to fog, heavy rain or snow, etc.) and is a localised assessment at the end of airport runway. Table 2 gives the weather state and standard report abbreviations. Cloud base height is given in oktas or eighths followed by cloud height in thousands of feet. Hence eight oktas indicates sky totally obscured at indicated height, one okta is only one eighth sky obscured by cloud. If CAVOK is given then there is no significant cloud. If a thunderstorm is in the vicinity of the airport then this is stated as 'cumulo-nimbus' cloud - pilots endeavour to fly round this rather than through it! Temperature in degrees Celsius (Centigrade) Dewpoint (also in Celsius) is the temperature to which the air can be cooled without causing condensation. The lower the dewpoint in relation to the air temperature the drier the air. Hence in fog or heavy rain, air temperature and dewpoint will probably be the same (in other words, rather humid). QNH is barometric pressure in millibars. Usually show pressure in millibars. After this report of weather conditions, if
Table 4: Sample report New York & Gander VOLMETS. Selected locations.

<table>
<thead>
<tr>
<th>New York VOLMET H+00</th>
<th>H+30</th>
<th>3.485, 6.604, 10.151, 13.270MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of report UTC:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl. levels 000° C</td>
<td>Vis. km</td>
<td>Wtr.</td>
</tr>
<tr>
<td>Chicago</td>
<td>5.85 C</td>
<td>50</td>
</tr>
<tr>
<td>New York</td>
<td>CLEAR</td>
<td>61</td>
</tr>
<tr>
<td>Bermuda</td>
<td>28C 7BK</td>
<td>60</td>
</tr>
<tr>
<td>Miami</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlantic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montreal</td>
<td>1 S 5 BKN</td>
<td>25</td>
</tr>
<tr>
<td>Goose</td>
<td>2 BKN 5 C</td>
<td>6</td>
</tr>
<tr>
<td>Iqaluit</td>
<td>1.5 C</td>
<td>10</td>
</tr>
<tr>
<td>Winnipeg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmonton</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sondestrom</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cloud cover (USA & Canadian VOLMETS) CB = Cumulus-nimbus, OVC = Overcast (8 oktas), BKN = Broken (5 - 7 oktas)

<table>
<thead>
<tr>
<th>DATE: 22/10/90</th>
<th>3. NEW YORK VOLMET H+00</th>
<th>H+30</th>
<th>3.485, 6.604, 10.151, 13.270MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK time of report:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>SCT = Scattered (1 - 4 oktas)</td>
<td>C = Ceiling</td>
<td></td>
</tr>
</tbody>
</table>

Table: Sample report New York & Gander VOLMETS. Selected locations.

Airfield weather reports will also be given on request from both v.h.f. and u.h.f., the latter mainly on military airfields, usually on aerodrome tower frequencies and published in v.h.f. and u.h.f. frequency lists. Also ASIS (airfield information service) and ATIS (automatic terminal information service) continuously broadcast weather and airfield conditions from numerous civil and military airports on the navigation aid band 108 to 118MHz (a.m.). All the interpretations above will also apply to following weather broadcasts.

**UK HF SSB Voice Weather Broadcasts**

For aircraft beyond v.h.f./u.h.f. range requesting airfield and general weather states the following VOLMETS will give detailed forecasts and reports, but full lists of stations are not included since these are too numerous to list.

- Shannon: 5.505, 8.905 & 13.286MHz H24 H+00 and at five minute intervals. Type A, F, S. All principal UK and European civil aerodromes (Table 3).
- Royal Air Force: 6.722 & 11.200MHz continuous. Type A. All principal UK and European military and some civil airbases plus Ascension Island (Table 3).
- New York: 3.485, 6.604, 10.051 & 13.270MHz H24 H+00, 05, 10, 15, 20, 25, 30, 40 & 45. All principal airports in eastern United States Note that this follows a different format. Temperatures are given in Fahrenheit and no barometric pressure is given. (Table 4).
- Gander (Newfoundland): Shared frequencies with New York. H24 at H+20, 25, 30 & 55. All principal eastern Canada airports plus Sondre Strom. Format as for New York but temperature is in Celsius (Table 4).

The Weather Satellite Handbook has changed considerably since it was first published in 1976, driven by the ever increasing sophistication of the satellites themselves as well as the steady march of technology that has made it easier and easier to watch the elusive images provided by the ‘birds’.

The ten chapters cover Operational Satellite Systems, Weather Satellite Antenna Systems, Weather Satellite Receivers, Video Formats and Display Systems, the WSH Microcontroller, Scan-Converter Display Boards, Scan-Converter and Computer Interfacing, Satellite Tracking, Station Operating and Advanced Applications. There is a Glossary of terms and three Appendices cover parts and equipment suppliers, a scan-converter parts list and the WSH 700 Basic program listing.

There are plenty of circuit diagrams and the chapter on Satellite Tracking has the WSH Predict BAS satellite prediction program listing for IBM PC compatible computers, written in GW/BASIC.

It is interesting that in the back of the book is a selection of advertisements for equipment for the WXSAT enthusiast with a couple of well-known British suppliers in there.

This book is well worth putting in your shack if you are into weather satellite watching.

Further Reading On Weather Satellite Technology

WEATHER SATELLITE HANDBOOK Fourth Edition by D.R. Ralph E. Taggart W9BDT
Published by ARRL
192 pages, 275 x 210mm. £13.50 plus 85p P&P from SWM Book Service
ISBN 6 87259 319 3

This book explains all about weather satellites, how they work and how you can receive and decode their signal to provide the fascinating pictures of the world’s weather.

The Weather Satellite Handbook has changed considerably since it was first published in 1976, driven by the ever increasing sophistication of the satellites themselves as well as the steady march of technology that has made it easier and easier to watch the elusive images provided by the ‘birds’.

The ten chapters cover Operational Satellite Systems, Weather Satellite Antenna Systems, Weather Satellite Receivers, Video Formats and Display Systems, the WSH Microcontroller, Scan-Converter Display Boards, Scan-Converter and Computer Interfacing, Satellite Tracking, Station Operating and Advanced Applications. There is a Glossary of terms and three Appendices cover parts and equipment suppliers, a scan-converter parts list and the WSH 700 BASIC program listing.

There are plenty of circuit diagrams and the chapter on Satellite Tracking has the WSH Predict BAS satellite prediction program listing for IBM PC compatible computers, written in GW/BASIC.

It is interesting that in the back of the book is a selection of advertisements for equipment for the WXSAT enthusiast with a couple of well-known British suppliers in there.

This book is well worth putting in your shack if you are into weather satellite watching.
Technical Software Weather Satellite & FAX Receive System

Before the arrival of budget-priced computer systems, there were few ways in which the listening enthusiast could extract meaningful information from the strange sounds that can be heard by tuning the dial on a domestic radio. Lawrence Harris has been looking at a low-cost Spectrum-based decoding system.

When you progress to better quality short wave receivers, you realise that there are many different types of transmissions. You can quickly learn to recognise c.w., FAX and possibly even weather satellite signals.

Several hardware and software manufacturers have recognised the interest that listeners have in decoding these transmissions, producing products that will translate these strange signals into meaningful pictures and charts for a surprisingly low outlay.

This is what Richard Wilmot of Technical Software set out to do for those who already have a certain minimum level of equipment. Several readers of my 'Info in Orbit' column have told me of their results using this equipment, so I was interested in trying it out for myself.

Before contemplating just what this hardware can do, you must appreciate what gear you need to have. The equipment requires a Spectrum computer, dot matrix printer, a television and a suitable h.f. receiver.

Fig. 1: A visible light image from NOAA 11 printed on a dot matrix printer using the APT-1 module.

Supposing you had the gear, you need to set it up correctly. Technical Software provide the software for all Spectrum versions and a fairly comprehensive instruction leaflet explains about the setting-up procedure and gives details on FAX and weather satellite transmissions.

I am reasonably familiar with the weather satellites, having been involved with them and other satellites for many years, but my knowledge of FAX was relatively limited. So I needed to look up fairly basic information on frequencies from columns in SWM. I felt that a little bit of information about suitable frequencies would have been helpful. However, the more experienced utility monitoring enthusiasts will know that frequencies vary from season to season and reception varies considerably during the day, so a cheap frequency guide could be useful.

I set up the system to decode the signals from weathersats first, as I have several tapes full of recordings made from various satellites. The instructions correctly tell you to make the connections with the equipment power off.

**Hardware**

The hardware provided by Technical Software consists of three units. The SIA-2 interface adaptor board is needed for either module and was well constructed on a double-sided glass-fibre p.c.b., though without the interface. One i.c. is the Z80 clock timer and the other is a peripheral interface controller.

This unit is connected to the expansion port provided at the back of the Spectrum. This didn't prove to be a problem - after I had re-read the instructions showing that automatic starts are available for FAX. So I

Fig. 3: A FAX transmission showing isobars over Europe.
Weather Satellite Reception

Suitable Listening Guides

Air & Metro Code Manual 10th Edition by Joerg Klingenfuss. £15.00
The Satellite Experience’s Handbook, £7.50
Guide to Facsimile Stations 10th Edition by Joerg Klingenfuss, £14.00
The Pocket Guide to RTTY & FAX Stations by Bill Laver. £2.95
Also a frequency list is available from Mike Richards G4WNC, author of ‘Decode’ column, see Short Wave Magazine for details.

Abbreviations

Continuous wave (Morse): c.w.
Facsimile: FAX
High frequency: h.f.
Integrated circuit: i.c.
Index of Co-operation: IOC
Kilohertz: kHz
Megahertz: MHz
Printed circuit board: p.c.b.
Revolutions per minute: r.p.m.

Further Reading On Weather Satellite Technology

RADIO AURORAS
by Charlie Newton
Published by RSGB
93 pages, 240 x 183mm.
Available from RSGB, £7.65 (non-members) £6.50 (members)
ISBN 1-872309-03-8

Every month the propagation columns include details of auroral, magnetic and solar events that have been reported to me by both astronomic and radio observers. Obviously there is much more behind these complex happenings than the end product which I publish and I feel sure that many of my readers want to know more about the cause, as well as the effect, of such natural disturbances.

Radio Auroras is a book dedicated to these subjects and, in a reader friendly manner, the author explains, with easy to follow diagrams and graphs, the reasons why a disturbance on the sun can upset the earth's magnetic field and/or cause an aurora to manifest within its polar atmosphere.

Apart from his own 30-year study of auroral activity and the innumerable hours he spent analysing the special auroral logs completed by thousands of European amateurs, the author has included valuable data so willingly supplied to his project by famous scientists and scientific institutions around the world.

The adequate introduction to the subject matter is followed by seven chapters explaining how an aurora begins, the changes in the magnetic fields of the earth and the sun, auroral propagation on the 144MHz band, a fascinating analysis of the contribution made by radio amateurs during sunspot cycle 21 and a really detailed report of the great solar storm of March 1989.

The book is well indexed and its pages are thoughtfully laid out providing a sensible balance between informative text and the associated diagrams. From theory to fact this book is a winner, a great credit to the author and a fine example of the international co-operation that exists in the amateur radio movement. In my view the price of £9.95 is modest compared to the valuable research packed within its pages.

Ron Ham

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

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

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

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

There are plenty of illustrations to give the reader an idea of what results you can expect from various systems including a FAX picture from Bracknell. Both printer dump and photographic type results are shown to give a good idea of the different levels of resolution that can be achieved. The best one was on page 62, a photograph of the Isle of Portland, land thematic mapper, 30m resolution.

If you think you would like to get into weather satellite watching, then this book could make the way ahead a little easier for you.
For all the information you need on weather watching from both satellites and terrestrial sources, read *Short Wave Magazine* each month.

Ron Ham covers terrestrial details in his monthly ‘propagation’ column, while Lawrence Harris keeps you up-to-date with his ‘info in orbit’ column.

There’s always plenty to interest the listener in *Short Wave Magazine*, on sale the fourth Thursday of every month from your local newsagent.
Weather Satellite Systems

Timestep produce weather satellite systems that operate from Meteosat, GOES, GMS, NOAA, Meteor, Okean and Feng Yun. Using an IBM PC compatible computer enables the display of up to 1024 pixels, 768 lines and 256 colours or grey scales depending on the graphics card fitted. We support all known VGA and SVGA cards.

The choice is yours of whether you go for a Geostationary or Polar Orbiting system. You can start with either one and add to it later. We can supply complete systems including the PC at very competitive prices or you can buy one part at a time. All the systems and hardware are designed by Dave Cawley and Peter Arnold and manufactured in Britain.

Complete Meteosat systems giving 400 different images a day are available for under £700 including the Meteosat antenna.

Polar orbiting systems, receivers, antennas, pre-amps and tracking programs together with the PROscan receiver are available at modest cost. Instant Track, the definitive polar tracking program, is just £24.05 inclusive.

The image above is taken from the AVHRR sensor of NOAA 11 HRPT using our new HRPT system. It will be available from summer 1991 at a cost of approximately £1200.00 less antennas. The antenna system can be two Timestep Yagis or a 1.2M dish.

Several unique features are available (depending on the software version) such as: NOAA latitude and longitude gridding, NOAA temperature calibration, False Colour with autoshade, Pan and Zoom, Transect, Histogram and variable equalisation, 3D display, 100 frame animation from Meteosat, Live on screen display at up to 1024 x 768 x 256, Mouse interactive operation, Median filter to remove country outlines from Meteosat and a Laser dump facility. New options and features are being added all the time.

Call or write for a full catalogue

Timestep Weather Systems

Wickhambrook Newmarket CB8 8QA England
Tel: (0440) 820040 Fax: (0440) 820281
by Ron Ham
Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Patrick Moores (Selsey), using his special apparatus, made drawings of the large sunspot group which he observed near the sun’s east limb. Fig. 1, at 1740 on January 8 and its position again, near central meridian, at 1040 on the 13th, Fig. 2. Ted Waring (Bristol) counted 17 sunspots on the 11th and 8 on the 22nd.

Cecil, Henry Hatfield (Sevenoaks), using his spectrophotocscope, located 2 sunspot groups and a small bright pillar prominence at 1123 the 8th; 3gps at 1145 on the 11th; 2gps and a large quiescent prominence at 1445 on the 13th; 3gps at 1202 on the 16th; 2gps at 1212 on the 19th; 3gps at 1205 on the 21st and 3gps at 1437 on February 1. Henry added that one group on the 1st was ‘very large’, possibly 16 spots, with a small flare. His 136MHz radio telescope recorded individual bursts of solar noise on the 7th, 11th and 22nd.

The magnetometers used by Garry Hawkins (Bristol), Karl Lewis (Saltash), Ron Livesey, David Pettitt (Carlisle), Tony Hopwood and Doug Smillie, between them recorded activity from January 23 to the 29th with an ‘active storm’ on the 24th. The layout and general constructional details (no circuit) of Doug Smillie’s ‘Hall Effect’ magnetometer can be seen on page 91 of Charlie Newton’s book Radio Auras, (ISBN 1 872309 03 8), available from the RSGB, price £7.65 to non-members and £5.50 to members.

International Beacons

First, I regret to report the death of Mark Appleby who was a regular contributor to the beacon section of this column and, although he is no longer with us, his consistent work will not be forgotten because it has been recorded in our sister magazine Practical Wireless for posterity to use.

We all extend our deepest sympathy to Mark’s family and his many friends.

Secondly and as usual, my thanks are due to Chris van den Berg (The Hague), Gordon Foote (Abingdon), Henry Hatfield, John Levesley (Bransgore), Ted Owen (Malton), Fred Pallant (G3NNM (Storrington), Ted Waring and Ern Warwick for their contributions.

Fig. 1.

Tropospheric Band II

The slightly rounded atmospheric pressure readings, recorded at my home in Sussex, for the period December 25 to January 25 can be seen in my ‘dx television’ column elsewhere in this issue. High pressure changes within the period helped to create a few openings in Band II (87.5 to 103MHz) to those listed in Fig. 3. Ern also logged consistent signals during this period from IK6BAK on 24.931 and 18.100MHz; KH60/B, 28.310MHz; 4UL/JK and 4X6TJ/B on 14.100MHz and D.K0/WCY on 10.144MHz.

Fig. 2.

Magnetic

The magnetometers used by Garry Hawkins (Bristol), Karl Lewis (Saltash), Ron Livesey, David Pettitt (Carlisle), Tony Hopwood and Doug Smillie, between them recorded activity from January 23 to the 29th with an ‘active storm’ on the 24th. The layout and general constructional details (no circuit) of Doug Smillie’s ‘Hall Effect’ magnetometer can be seen on page 91 of Charlie Newton’s book Radio Auras, (ISBN 1 872309 03 8), available from the RSGB, price £7.65 to non-members and £5.50 to members.

International Beacons

First, I regret to report the death of Mark Appleby who was a regular contributor to the beacon section of this column and, although he is no longer with us, his consistent work will not be forgotten because it has been recorded in our sister magazine Practical Wireless for posterity to use. We all extend our deepest sympathy to Mark’s family and his many friends.

Secondly and as usual, my thanks are due to Chris van den Berg (The Hague), Gordon Foote (Abingdon), Henry Hatfield, John Levesley (Bransgore), Ted Owen (Malton), Fred Pallant (G3NNM (Storrington), Ted Waring and Ern Warwick for their contributions.

Fig. 1.

Tropospheric Band II

The slightly rounded atmospheric pressure readings, recorded at my home in Sussex, for the period December 25 to January 25 can be seen in my ‘dx television’ column elsewhere in this issue. High pressure changes within the period helped to create a few openings in Band II (87.5 to 103MHz). For instance, at 0810 on January 13, using my elderly, ex-military, R216 receiver, Fig. 4, led to a chimney-mounted dipole, I heard BBC Radios Bristol and Shropshire, at good strength and counted 6 continentals scattered through the band. The R216, although insensitive by todays standards, is ideal for sorting out stations because the frequency range of 87.5 to 103MHz is spread across some 560mm of its film strip scale.

On the 13th, 14th and 15th, Simon Hamer (New Radnor) logged BBC Radios Guernsey, Jersey and Suffolk and stations in Belgium, France, Germany - including AFAZ and BFBS1, Holland, Ireland and all of Scandinavia. In the latter he identified Radios ‘FYN’ and ‘SYO' from Denmark, ‘NRK’ P1 and P2 from Norway and ‘SV5E’ from Sweden.

George Garden (Edinburgh), operating his car radio around 1600 on the 29th, heard BBC local radio from the north-west with Leicester being mentioned, a weak signal for a short period from BBC Radio York and strong signals from the IBA station Radio Borders.

Francis Hearne (Bristol) tells me that Bristol’s incremental station ‘FTP’ (for the people) is no longer broadcasting and its spot has been taken by Galaxy Radio. “This station came on air on 21.9.91 and is part of the Chiltern Radio group,” said Francis.

Fig. 2.

Tropospheric Band II

The slightly rounded atmospheric pressure readings, recorded at my home in Sussex, for the period December 25 to January 25 can be seen in my ‘dx television’ column elsewhere in this issue. High pressure changes within the period helped to create a few openings in Band II (87.5 to 103MHz). For instance, at 0810 on January 13, using my elderly, ex-military, R216 receiver, Fig. 4, led to a chimney-mounted dipole, I heard BBC Radios Bristol and Shropshire, at good strength and counted 6 continentals scattered through the band. The R216, although insensitive by todays standards, is ideal for sorting out stations because the frequency range of 87.5 to 103MHz is spread across some 560mm of its film strip scale.

On the 13th, 14th and 15th, Simon Hamer (New Radnor) logged BBC Radios Guernsey, Jersey and Suffolk and stations in Belgium, France, Germany - including AFAZ and BFBS1, Holland, Ireland and all of Scandinavia. In the latter he identified Radios ‘FYN’ and ‘SYO' from Denmark, ‘NRK’ P1 and P2 from Norway and ‘SV5E’ from Sweden.

George Garden (Edinburgh), operating his car radio around 1600 on the 29th, heard BBC local radio from the north-west with Leicester being mentioned, a weak signal for a short period from BBC Radio York and strong signals from the IBA station Radio Borders.

Francis Hearne (Bristol) tells me that Bristol’s incremental station ‘FTP’ (for the people) is no longer broadcasting and its spot has been taken by Galaxy Radio. “This station came on air on 21.9.91 and is part of the Chiltern Radio group,” said Francis.
Let RADIO RESEARCH turbo-charge your scanner. Customising packs for the
contains a selection of modifications to enhance and improve your scanner.
Increase speed, sensitivity and much, much more, for only...£5.00
(Postal service which scans you have)

400 Channel upgrade for PRO-2004 .................. £15.00
AR100/Fairtune full coverage 1-1330MHz .............. £5.00
or SAE for details/prices list

Listen-in when you are "out" with the amazing AUTO-VOX
Connect to any receiver with a switch control and the AUTO-VOX will automatically
switch your tape recorder on and off as signals are detected. A MUST for scanner owners
* Requires only a FP3 type battery *
Available as a kit with full instructions and parts ready built and tested
* Return to a neatly compressed tape of all the action *
Kit - £9.95 Ready built - £19.95 both inc. P&P

Radio Research (SWM), 3 Pasture Close, Whitmore, Staffs ST5 5QD

FJP Kits & Components

Kit Manufacturers - Amateur Radio Products Proprietor F. Powell
63 Princess Street, Chadderton, Oldham, Salford M31 2SL
Credit cards - Tel: (0543) 566457 10am - 9pm next days orders
All kits use full spec components and are boxed less batteries
PWM Marlborough MW converter £26.00
PWM TAW VLF converter
PWM Badger 2m Rx kit £60.00
Guides with all orders.

Over 100,000 models stocked, originals and photostats. FREE catalogue
Repair & Data
Computers, Kitchen Appliances etc. Equipment from the 1930s to the present and beyond.
Test Equipment, Amateur Radio, Vintage Valve Wireless, Any Audio, Music Systems,
Increase speed, sensitivity and much, much more, for only...£5.00
contains a selection of modifications to enhance and improve your scanner.

switch your tape recorder on and off as signals are detected. A MUST for scanner owners.

* ONLY! £299.95 (List price £349.95) *

NEW! PRO 2006: WITH HYPERSCAN
400 Memories AM/FM 25-520, 760-1300MHz, 240VAC/12VDC
ONLY! £299.95 (List price £349.95)

AOR 1000 Mkl: 1000 Memories
1-600, 805-1300MHz AM/FM/WFM
ONLY! £245.00

NEW! AOR 2500: 2000 Memories
0.5-1500MHz, AM/FM/SSB Computer Control Option
ONLY! £499.00

PRO 2002 .................. ONLY £209.95(List price £239.95)
PRO 2024 .................. ONLY £149.55(List price £179.95)
PRO 2025 .................. ONLY £89.95(List price £99.95)
PRO 34 .................. ONLY £219.95(List price £249.95)
PRO 38 .................. ONLY £89.95(List price £99.95)

All Scanners include FREE P&P & insurance in the UK. 12 months warranty

Link Electronics
Authentic Family
228 Lincoln Road, Peterborough PE1 2NE
(0333 3457311) SAE for leaflet.
Phone for latest on second-hand bargains

GAREX ELECTRONICS

WIDEBAND SCANNERS
All major brands available, with the all important service back-up. AOR; BLACK
JAGUAR; RIVCO; ICOM; YUPITERU. Also good stock of second-hand sets
Tel: (0364) 72770 Fax: (0364) 72007

GAREX ANTENNAS
Premium quality British antennas & accessories from REVO. "REVCONETE
VHF/UHF" Discrove (Guardante free from exaggerated advertising claims)
S0239 connector: £38.95 N-type for improved UHF performance: £38.95
Optional vertical whip feature for experiences
"RADAC" nest of dipoles: not listed but not equalled. Guaranteed Tx capability
over customer-specified 6 bands in the range 27-470MHz, with excellent
widband Rx performance: £5.00
S0239 Conn: £38.00
N-type: £37.00
Special VHF/UHF Airband RADAC: 108-380MHz:
Top quality cable and connectors also available.

GAREX PREAMPS
PA3 series 20MHz - 1GHz: min. 13dB gain fitted with HPF to reduce break-through problems.
PA3/5 with special mains PSU, PL50 connectors: £49.95
PA3/6, as above with N connectors: £53.45
"Back-of-set" models: PA3/18 (BNC connectors): £35.50
PA3/15 (SO239): £35.50
PA3/1N (in cassettes): £38.95
Mains adaptors for "back-of-set" models: £25.00

MOBILE ANTENNAS
REVO super Mag-mount + 5/8 for 2m: £3.45
Mag-mount +4.5dB 70cm: £3.45
Body-mount 1/2" or 3/4" mag-mount (state which) + 5/8 for 2m: £19.95
3/8" hole body mount + 70cm collinear (4.5db): £19.95
Mag-mount with 3db 900MHz whip: improve the performance of your cell- phone or 900MHz scanner; in the car or on the office filing cabinet: £34.95
All with 4m feeder. Plugs on request. REVO unbeatable glassmounts, with matching units for peak efficiency; 2m or 70cm: standard model £39.95
Japan model £69.95

METEOSAT WEATHER SYSTEM
The complete basic METEOSAT system, no computer, just a plug-in and go
package that can be up and running in 10 minutes. Antenna, receiver, frame
store, all cables through to 12" mono monitor: £79.95
or less monitor: £59.90

GAREX VHF PREAMPLIFIERS

Miniature (only 34x9x15mm), any frequency in the range 40-200MHz, up to 5dB gain. Stock versions: 6m, 4m, 2m, 137MHz (W Sat): £11.95
Airband 118-136MHz (reduced gain): £11.95
Other frequencies in the range 40-200MHz to order: £14.25

TONE BURST GENERATOR
Telex Power driver unit matching above Rx, with modulator, fully aligned,
tuned matching units for peak efficiency: 2m or 70cm: standard model £39.95
Japan model £69.95

PYE ANTENNA RELAYS
12V operation, handles 50 watts up to 200MHz:
3/4" hole body mount + 70cm collinear (4.5dB): £15.95
(10 for £100) Suitable PTT fist microphone: £19.95

WESTMINSTER FM BANDWIDTH CONVERSION KITS
Converts 50kHz or 12.5kHz FM Westminsters (UHF or VHF) to Amateur band
10-11MHz output. Full data. Requires xtal, approx 15MHz:£15.95
High quality PMR front end by famous manufacturer, modified to make a 4m
commercial R/T gear, re-wired and tidied up to make free-standing unit, no

WIDEBAND ANTHANASIS

VISA
This month I am going to briefly return to the frequencies used during the Gulf War. Several readers have said that they have not heard very much on the frequencies listed in the January issue. First, it has to be said, you must be patient. It is no use dialing up a frequency and expecting to hear a constant flow of communications. The Forces are regularly changing channels and of course it may well be that at any given time or day of night the frequencies being used may not be suitable for propagation into the UK area. Patience is the key.

I am providing a shorter list here which includes some new frequencies. All are upper sideband (u.s.b.).

**Airborne Warning & Control System (AWACS):**

**Allied Ground Forces Primaries:**

**Allied Ground Forces secondaries:**
4.704, 5.690, 6.204, 6.810, 6.906MHz.

**US Army Engineers (callsign Castle 1 to Castle 12):**

**Saudi Air Force:**
7.525, 12.215 & 22.126MHz.

**US Navy Hicom (High Command):**
3.095, 5.526, 8.967 & 8.990MHz.

**US Army Engineers (callsigns Castle 1 to Castle 12):**
9.130 & 11.425MHz.

**US Navy Hicom (High Command):**
7.525, 12.125 & 26.128MHz.

**Saudi Air Force:**
3.095, 5.526, 8.967 & 8.990MHz.

**Dharan air base ("Hotel One"):**
9.130, 11.100 & 18.019MHz.

**Riyadh air base ("Hotel Two"):**
7.300 & 12.112MHz.

If you have a receiver that covers 30 to 35MHz it is also worth tuning around this band as, depending on propagation, quite a lot of activity can be heard at times (narrow f.m. mode). Feeding my Icom R7000 with an old CB base station antenna has at times produced far more interesting transmissions in this segment that has been found below 30MHz. Listen out for the callsign "Dragon" which appears to be tank groups and their support crews.

Several readers have reported monitoring activity not only in the Gulf area but also from stations handling aircraft en-route from Europe to Saudi Arabia. The popular route seems to be down through Italy and on to Egypt and then to the Gulf. Several comments have been made about the very poor level of communication discipline at times with stations calling over the top of each other and obviously not listening out on the channel before transmitting. Air crews have at times also given away a surprising amount of information about their home base, tail numbers, passengers and cargo and destinations. If we did not know before, we now know that the colour identifiers for air-to-air refueling tankers are Azure and Blue for those based at Mildenhall in the UK (Eastern Atlantic refueling) and Ebony and Gold for for Pease Air Force Base in New Hampshire (Western Atlantic).

**Readers’ Letters**

Firstly may I thank everyone who has written in not only with logs, lists and tips but also for the encouraging remarks about this new column. It seems it was long overdue and seems it was very much on the frequencies used during the Gulf War. Several comments have stated that they have not heard very much on the frequencies mentioned by John. Mr Coulter says the ship is then given two working frequencies. This sounds as if the station concerned is only using channel (4)18 for initial contact when in fact the calling channel for this group is channel (4)21 which has shore stations on 4.4194MHz and ships on 4.1250MHz. Perhaps someone can shed more light on this.

A letter from John Garnett of Truro lists the two main frequencies for Plymouth and Edinburgh rescue as 5.680MHz (primary) and 3.023MHz (secondary) and he asks if anyone can shed light on h.f. frequencies then let us know.

Whilst we are on the subject of search and rescue it might be an idea to look at the main marine calling and distress channel. Certainly the most active frequency in waters around the British Isles is 2182MHz. You will also find them on 134.800MHz if you have a v.h.f. scanner and are within range. John also adds 5.698MHz for US coastguards and I can confirm hearing many East coast stations on this channel particularly in the late afternoon and early evening. Just a tweak of the dial below them you will occasionally hear Plymouth rescue on 5.695MHz and they also use 5.683MHz.

I have also heard Edinburgh Rescue using 5.420MHz in addition to the two frequencies mentioned by John. According to some sources 5.454MHz is used for helicopter search and rescue in the North Sea but I have yet to hear anything on this channel myself.

By checking the latter frequency it should be possible to identify the land station by listening to the initial call from the ship. I cannot be more specific as so many stations use this channel it could be one of several. The only point that puzzles me slightly is that Mr Coulter says the ship is then given two working frequencies. This sounds as if the station concerned is only using channel (4)18 for initial contact when in fact the calling channel for this group is channel (4)21 which has shore stations on 4.4194MHz and ships on 4.1250MHz. Perhaps someone can shed more light on this.

**Abbreviations**

- **AWACS**: Airborne Warning & Control System
- **CB**: Citizens’ Band
- **f.m.**: frequency modulation
- **h.f.**: high frequency
- **MHz**: megahertz
- **u.h.f.**: ultra high frequency
- **u.s.b.**: upper sideband
- **v.h.f.**: very high frequency

**The Up-to-Date News & Information Service for the Listening Enthusiast**

**RADIO LINE**

0898 654676

UPDATED EVERY SATURDAY

Calls charged at 33p per minute cheap rate, 44p per minute at all other times.
The attention of the world has been firmly fixed on the Gulf, and is likely to remain so despite the liberation of Kuwait City on February 28. From Baghdad was rather erratic in the first couple of months of the year, presumably following the destruction of some of Iraq's transmitting sites. Some new stations appeared, including the 'Mother of Battles' Radio, although this was very short-lived. It was first noted on January 26 but by February 3 had disappeared. Radio Baghdad's services started to use some rather odd frequencies and by the end of February, transmissions had settled down to three channels 3.98, 4.60 and 8.35MHz all of which were on the air for most of the day.

The Allied forces, meanwhile, made extensive use of the radio spectrum in attempts to encourage Iraqi soldiers to desert. During mid-February transmissions were noted around 6.6MHz, a military communications area of the shortwave bands, with a 90-second message transmitted in Arabic. This would then be repeated on a frequency around 10kHz along the band. Presumably this was aimed at signals staff in the Iraqi military who doubtless were tasked with monitoring the Allied military communications frequencies.

BBBS

BBBS, the British Forces Broadcasting Service, has been making use of short wave, with a feeder noted on 6.84MHz from Cyprus to BBBS stations in the Gulf which could not, for one reason or another, be fed by satellite from London. The American equivalent, AFRTS, is fed from the UK on 9.023MHz and, in Europe, on 12.95MHz.

The Red Cross Broadcasting Service doubled its output after the commencement of hostilities. There is now a second Sunday of the month broadcast in addition to the long standing last Sunday of the month transmission. English is heard at 1100 on the second and last Sunday of the month on 7.21MHz, repeated the next day (Monday) at 1700 on the same frequency.

Gulf Links

One programme which has suffered as a result of the Gulf War is Radio Austria's DX Programme. This was dropped for a number of weeks to allow extended coverage of events. However, it returned on March 3. It is broadcast in English on 1355 and 13.73 at 1130 and 1430UTC.

Radio Australia has been running a Gulf Links programme for the forces in the Middle East. The programme contains messages from friends and relatives at home sent in by telephone or on cassette, and it is similar to the BBC's Gulf Link programme which kept the British hostages in touch with home for long a year. The Radio Australia programme is transmitted at 1430 on 25.75MHz (which is heard clearly in the UK) and on 21.75MHz.

The Baltic

Whilst the news media has been concentrating on the war with Iraq, developments in the Soviet Union have been quite dramatic. On January 13, Soviet Interior Ministry troops were deployed in Lithuania resulting in the death of several people during clashes as the television station was occupied. Relays of Radio Vilnius, carried on short wave by the Soviet radio transmission network, stopped for several days, although Lithuanian transmitters, still in the hands of the independent authorities in Lithuania, continued to broadcast. Negotiations with the Soviet broadcasting authorities proved successful in getting the external service of Radio Vilnius back on the air, and now the 2300UTC North American service can be clearly heard on 8.75MHz. Listeners have been urged to send in reception reports by FAX.

The number is 0122 22 15 71 and the station's address is Radio Vilnius, Vilnius, Lithuania.

Neighbouring Baltic state Latvia has started a somewhat sporadic English language service. Radio Riga can be heard on 5.335 at 0530, 1230 and 2130 on some days.

Down south in Kazakhstan, there is a new English service from Kazakh Radio on Monday, Wednesday and Friday at 0130, noted on 5.915MHz. Other frequencies which may be worth watching in this time are 7.23, 6.135 and 5.035MHz.

Albania

Further south, that last bastion of Marxism, Albania, seems to be going through something of a revolution, with demonstrations on the streets, and the toppling of a giant statue of the former Head of State, Enver Hoxha. English from Radio Tirana is heard at 1830UTC on 9.48 and 7.211MHz, and at 2230 on 9.76, 9.66, 7.215 and 1.395MHz. Radio Tirana has certainly become more liberal in recent weeks. A New Year message from the station admitted that in the past not all heard from the station has been the exact truth, but in future the staff would endeavour to report the news more objectively. The Albanian domestic service is on the air on 5.057MHz.

In Hungary, there is speculation that up to 50% of Radio Budapest's output is to be cut from the end of June. It is likely that Italian, Spanish and Turkish will cease, and other services will be curtailed. It is probable that the station's twice weekly DX programme, which has a total of 18 airings during the week, will be cut. If listeners feel strongly enough, it might be worth dropping a note of protest to the Director of Programmes, Radio Budapest, Budapest, Hungary.

Radio Canada International

At the end of February there was still no news about the future of Radio Canada International. The Canadian Broadcasting Corporation, RCI's parent organisation, announced late last year that it could no longer support the international service which costs some Can$20 million to run. It is probable that the Department of External Affairs will find most of the cash to run RCI, but it may be that the station will be reduced to only French and English, with all other language services axed.

Relays

The BBC World Service is benefitting from an increased number of rebroadcasting agreements. World Service is now heard in Auckland and Hamilton in New Zealand on f.m., and on medium wave in Wellington, while in Czechoslovakia, f.m. transmitters in Prague, Brno and Bratislava are now carrying World Service. The BBC is also investigating the possibilities of using Soviet transmitters to improve its audibility in the Sub-Continent. It is examining the potential coverage from senders in Tashkent, Alma Ata and Frunze, although no final agreement has been reached with the Soviet authorities. This would indeed be a remarkable achievement, considering that jamming of the BBC's Russian Service is not that distant a memory. The facilities may be available because of the reduction in many of the foreign language and regional services of Radio Moscow. There has been a reduction in the overall hours broadcast by the station, although frequency usage has stayed constant in terms of number of hours per week.

Possibilities

Other possible relays which the Corporation is considering include facilities within Mongolia and a joint relay station to be constructed in Thailand with the Dutch. This is becoming less likely, with the Dutch government having vetoed the expenditure for the time being. The military coup in February may also make things less easy for the BBC. The World Service programme line up undergoes major changes in April, with a second News Hour introduced at 1300UTC to complement the existing programme which is now advanced to 2100UTC. The weekly Wavguide programme will be heard on Saturday at 0905, Monday at 0930, Tuesday at 1115 and Thursday at 0130.

Sounds Interesting

Radio Netherlands is reintroducing a listener contact programme from Friday April 5. Called Sounds Interesting, it will be open to suggestions from listeners. Send your suggestions to the station at Radio Netherlands, PO Box 222, 1200 JG Hilversum, Holland. Radio Netherlands in English is heard at 1300UTC on 9.715 and 9.550 and at 1430UTC on 5.955MHz. The evening transmission at 2030 heard to West Africa has also been well heard lately on 13.70 and 15.560MHz.

Adventist World Radio has announced plans to build a transmitting station in Italy near Argenta which will have two 100kW and two 250kW transmitters. There will be curtain antennas to service much of Europe, as well as the Soviet Union, the Sub-Continent, North Africa and the Middle East. AWR currently uses transmitters in Sines, Portugal and its own facilities in Forli, Italy.

RadioSat

Finally news of a new venture which aims to supplement, if not to replace, short wave broadcasting. The International Radio Satellite Corporation, known as RadioSat for short, plans to launch three geo-stationary satellites each with 200 stereo audio channels that will be leased to international broadcasters. The problem at the present time is that there are no receivers available to pick up such satellites (which have yet to be commissioned), but the RadioSat organisation is already talking with receiver manufacturers, aiming to have sets costing around £50.00 or less throughout the world. We'll have more details next time. Bandscan covers Europe. In the meantime you can get the latest news by listening to RadioLine on (0989) 564767. This is updated every Sunday and will give you the latest developments in the listening scene ahead of the magazine.
Another month on and the Gulf War still dominates the headlines and the satellite news feeds. Last month, I mentioned the Intelsat VA F11 at 57°E to provide easy access to the broadcast media for uplinking reports back to the UK in the Ku band. Ku output on this bird has been spotted into London. The UK news pool downlink into the UK at 11.48GHz. Additional feeds have been brought into service for other media reports, mainly for North American TV networks. CNN out of Riyadh are on 10.980, CBS Tel-Aviv on 11.015; ABC Tel-Aviv 11.600 and CNN from Baghdad on 11.167GHz. Unfortunately, I am badly sited and unable to see much past 23°F, but those more fortunate with a clear look to the south-east report fair quality signals from 57°F down to a 1m dish.

Another Gulf news feed source that appeared on January 22, was the ex-15°E Eutelsat I F4 that has been re-positioned for Eutelsat's service to 6-4°E. This bird has been providing French TV downlinks with the French TDF circuit uplinking out of Riyadh into Paris at 11.05GHz horizontal, active at times throughout the day into late evening. This Saudi feed in SECAM is a dedicated French link and carries material for other French networks as indicated by their identification logo. UK satellite trucks (Starbirds) are known to be sited in Amman (11.676Hz hor Eutelsat I F4) and at least one in Saudi. Amman is usually seen via the semi permanent EBU link over Eutelsat I F4 using sound in sync at 16°E 11.17GHz. The Jerusalem Capital Studios are often seen signing at 16°E 11.17GHz. The Jerusalem Capital Studios are often seen signing at 16°E 11.17GHz. The Jerusalem Capital Studios are often seen signing at 16°E 11.17GHz.

Despite the Gulf War, the world continues. The funeral of King Olav V in Norway was seen live January 30 over the TVN and TV4 transponders on Intelsat VA F12 1°W. The Nor-Net-TV Ruta transponder on this bird 10.969GHz has been testing in the clear with 02MAC (in the clear' means with no encryption). Meanwhile, TV10, a new Norwegian cable channel, is using the Nor-Net transponder at weekends (Fri-Sun) for 6 hours from 2000 - mainly films and bought-in material, though 15% or so will be of Norwegian production.

Eutelsat I F2 successfully launched. During February, prior to the 21st, it was testing its transponder load from a temporary position at 21.5°F. David Thorpe at Crewe noted them at 11.55GHz with strong signals, the bird had to fly away from the test slot prior to Feb 21 to clear for the Astra 1B launch on that day, If F2 will move to its designated slot at 10°E over the next few weeks.

Intelsat VIF4 27°W has established a permanent US-Europe pair of news feeds over the last few weeks from RAI-New York 11.12 vertical and Worldwide Television News/PVHS #1 11.07GHz vertical- the latter in 525 lines NTSC. Finally, one disturbing development - though not unexpected - was VN NEWS on their VisEurope 13°E downlink at 12.52GHz with encryption suggesting a variation on Nagra vision. It's suspected that broadcasters have been 'lifting' news material from satellite downlinks and not paying for their use, recently the BBC lost a High Court case when certain of their sports material was recorded off-air by a rival broadcaster and then transmitted in the rival's news.

**Orbital Slot News**

Speculation continues over the future of the MAC format which had been promoted as the way forward to improved picture and sound quality plus High Definition TV (HDTV). However, politics are now seeking an alternative to the MAC system of transmission following the demise of BSB. Both the West German PAL-PUS and an Italian video compression technique are under discussion through the former German system is most favoured. Thomson Broadcast together with the Dutch Philips group were heavily into MAC research, but rumour suggests that Thomson may pull out. This coupled with the problems of the French TDF satellites that are falling all were using D2 MAC, and with nominal viewing figures is further evidence of a likely fall from grace of MAC.

The new Eutelsat II F2 will take up its 10°E station mid March carrying TV, radio and digital business traffic. It carries 16 Ku band transponders (50W t.w.t. amplifiers), 12 of which will be in TV service and the others with business traffic. There are 6 series II birds, II F3 will launch mid July 91. The EBU have confirmed the use of four series II transponders and options on a further two, all on the 'wide-beam' footprint to ensure adequate coverage for its 33 European members. Luxembourg based SES, owners of the Astra satellites has not yet confirmed all of the lease holders for their new 1B craft now orbit, apart from two new BSkyB channels ex-BSB Marco Polo and several German channels, speculation continues about the Discovery Channel, CNN and Children's Channel. SES is planning for the IC and ID satellites with thoughts of 18 transponders for these craft -IC will provide additional channels plus the important back-up for 1A and 1B, meanwhile ID will carry four higher powered transponders for future HDTV options. All the Astra satellites will be co-located at 19.2°E.

Meanwhile overseas, the Hong Kong based ASIASAT is proving a financial success with 12 of its 24 transponders giving a dual 6-channel service over most of the Far East, and several other countries - amongst them Korea, Burma and Nepal - likely to take up transponder leasing. The bird is solely C Band (4GHz) and earlier in its career had been rescued by a Shuttles flight after failing to reach orbit. China launched the satellite earlier in 1990. Also in the Far East, PacStar is a new projected satellite communication system to be operational late 1993, recently Taiwan signed as a co-partner.

CNN coverage of the Gulf War has gained that channel much publicity and, it's interesting to note that Hanoi, Vietnam now has a CNN receive terminal for the THVN network in the capital for accessing news material and for transmitting various news programmes dubbed into Vietnamese - the US Government were initially against the move but eventually permitted CNN to install the system. CNN meanwhile has gained access to MATV systems in Hong Kong, and in Ghana the GBC have installed their own dish at the Accra Broadcasting house to receive and re-transmit parts of CNN programmes over the GBC.

Fred Pilkington, one of our experienced enthusiasts from Newmarket is fortunate to occasionally stay in Southern Spain and relates the story of his neighbour receiving both Sky Movies and Sky News on their terrestrial TV. Further investigation revealed that Eurosport was also being received at u.h.f. A directional antenna and portable TV was assembled by Fred and careful pointing of the Yagi suggested the satellite signals were radiating from an apartment block 200m away, the result of a leaking distribution system.

Fred now intends to take a high gain Yagi on his next visit so that he can watch the Astra programmes, in addition to the local Spanish terrestrial offerings!
First a letter from Kevin Walton: who is ex-9M2ZZ, but has now returned to USA and is operating as N4RMF. If anyone still needs a QSL for the 9M2ZZ operation, he can be reached at PO Box 316, Culpepper, Virginia 22701-0316, USA. Ian Hamilton is in Riyadh, Saudi Arabia, where he takes a copy of 3W7M and a Philips D288 into the air-raid shelter with him when necessary. Ian notes the antics of what he describes as a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Daniel Peake from Burnage is still using his AR88D to a 30m antenna; he has now added an ADR AR89D but does not need a lot report since he is using it on the inbuilt helical antenna. On 14MHz JX7DFA, JW1QCA, LX150L, A71CD, JX7DFA, JW1QCA, LX150L, A71CD, his notes on 7MHz he found JAIUTS, and JAXGXM, while 21MHz presented him with J5EJL, H44AP (Solomons), JX7DFA (Jan Mayen), T3Y1, T77T and ZK2G. On 28MHz the log includes BPSC, PJ2HB, PT2F, TG6G, ZS8AO and Y5SEM.

Eric Pickering (Blackburn) voices interesting thoughts on antennas; being somewhat of a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Ian Hamilton is in Riyadh, Saudi Arabia, where he takes a copy of 3W7M and a Philips D288 into the air-raid shelter with him when necessary. Ian notes the antics of what he describes as a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Daniel Peake from Burnage is still using his AR88D to a 30m antenna; he has now added an ADR AR89D but does not need a lot report since he is using it on the inbuilt helical antenna. On 14MHz JX7DFA, JW1QCA, LX150L, A71CD, his notes on 7MHz he found JAIUTS, and JAXGXM, while 21MHz presented him with J5EJL, H44AP (Solomons), JX7DFA (Jan Mayen), T3Y1, T77T and ZK2G. On 28MHz the log includes BPSC, PJ2HB, PT2F, TG6G, ZS8AO and Y5SEM.

Eric Pickering (Blackburn) voices interesting thoughts on antennas; being somewhat of a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Ian Hamilton is in Riyadh, Saudi Arabia, where he takes a copy of 3W7M and a Philips D288 into the air-raid shelter with him when necessary. Ian notes the antics of what he describes as a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Daniel Peake from Burnage is still using his AR88D to a 30m antenna; he has now added an ADR AR89D but does not need a lot report since he is using it on the inbuilt helical antenna. On 14MHz JX7DFA, JW1QCA, LX150L, A71CD, his notes on 7MHz he found JAIUTS, and JAXGXM, while 21MHz presented him with J5EJL, H44AP (Solomons), JX7DFA (Jan Mayen), T3Y1, T77T and ZK2G. On 28MHz the log includes BPSC, PJ2HB, PT2F, TG6G, ZS8AO and Y5SEM.

Eric Pickering (Blackburn) voices interesting thoughts on antennas; being somewhat of a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Ian Hamilton is in Riyadh, Saudi Arabia, where he takes a copy of 3W7M and a Philips D288 into the air-raid shelter with him when necessary. Ian notes the antics of what he describes as a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Daniel Peake from Burnage is still using his AR88D to a 30m antenna; he has now added an ADR AR89D but does not need a lot report since he is using it on the inbuilt helical antenna. On 14MHz JX7DFA, JW1QCA, LX150L, A71CD, his notes on 7MHz he found JAIUTS, and JAXGXM, while 21MHz presented him with J5EJL, H44AP (Solomons), JX7DFA (Jan Mayen), T3Y1, T77T and ZK2G. On 28MHz the log includes BPSC, PJ2HB, PT2F, TG6G, ZS8AO and Y5SEM.

Eric Pickering (Blackburn) voices interesting thoughts on antennas; being somewhat of a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Ian Hamilton is in Riyadh, Saudi Arabia, where he takes a copy of 3W7M and a Philips D288 into the air-raid shelter with him when necessary. Ian notes the antics of what he describes as a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Daniel Peake from Burnage is still using his AR88D to a 30m antenna; he has now added an ADR AR89D but does not need a lot report since he is using it on the inbuilt helical antenna. On 14MHz JX7DFA, JW1QCA, LX150L, A71CD, his notes on 7MHz he found JAIUTS, and JAXGXM, while 21MHz presented him with J5EJL, H44AP (Solomons), JX7DFA (Jan Mayen), T3Y1, T77T and ZK2G. On 28MHz the log includes BPSC, PJ2HB, PT2F, TG6G, ZS8AO and Y5SEM.

Eric Pickering (Blackburn) voices interesting thoughts on antennas; being somewhat of a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Ian Hamilton is in Riyadh, Saudi Arabia, where he takes a copy of 3W7M and a Philips D288 into the air-raid shelter with him when necessary. Ian notes the antics of what he describes as a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Daniel Peake from Burnage is still using his AR88D to a 30m antenna; he has now added an ADR AR89D but does not need a lot report since he is using it on the inbuilt helical antenna. On 14MHz JX7DFA, JW1QCA, LX150L, A71CD, his notes on 7MHz he found JAIUTS, and JAXGXM, while 21MHz presented him with J5EJL, H44AP (Solomons), JX7DFA (Jan Mayen), T3Y1, T77T and ZK2G. On 28MHz the log includes BPSC, PJ2HB, PT2F, TG6G, ZS8AO and Y5SEM.

Eric Pickering (Blackburn) voices interesting thoughts on antennas; being somewhat of a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Ian Hamilton is in Riyadh, Saudi Arabia, where he takes a copy of 3W7M and a Philips D288 into the air-raid shelter with him when necessary. Ian notes the antics of what he describes as a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.

Daniel Peake from Burnage is still using his AR88D to a 30m antenna; he has now added an ADR AR89D but does not need a lot report since he is using it on the inbuilt helical antenna. On 14MHz JX7DFA, JW1QCA, LX150L, A71CD, his notes on 7MHz he found JAIUTS, and JAXGXM, while 21MHz presented him with J5EJL, H44AP (Solomons), JX7DFA (Jan Mayen), T3Y1, T77T and ZK2G. On 28MHz the log includes BPSC, PJ2HB, PT2F, TG6G, ZS8AO and Y5SEM.

Eric Pickering (Blackburn) voices interesting thoughts on antennas; being somewhat of a 'radio hooligan' who is audible from home on around 14.175MHz, and seemingly operated by a woman in Lebanon.
NEW MODEL NOW ARA60
ACTIVE ANTENNA 50MHz - 60MHz
WITH LIMITED PERFORMANCE UP TO 100MHz
Professional electronic circuitry with very wide dynamic range. Meets professional demands both in electronics and mechanical ruggedness. 12.5m glass fibre tube. Circuit is built into the base of the tube. Ideal for commercial and sw receiving systems. Both antennas come complete with 7 metres of cable, interface, power supply and brackets. £159.

ERYAN FT767GX
Kenwood TS850S
Kenwood TS680S
Kenwood TS140S
Kenwood TS850S

FIRST CLASS SHORT WAVE RECEIVER
BUY THIS FOR £855 AND RECEIVE AN ARA 60 FREE. WORTH £115.
ALSO R7000 complete with ARA 1500 £999.
CR 9000 150MHz - 2000MHz inc ARA 60 +
ARA 1500 and delivery .......... £399
SPECIAL FOR APRIL
ICOM R72 RECEIVER inc. FM board, carry handle & Securicor delivery U.K. mainland. £639.00

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

NEW PRODUCTS
MICROFIC'S NEW CODE SCANNER
Copies Morse, CJE and ASCII 32 Character Display £179.00

FROM US TO YOU:
Buy an R1 complete with Ni-Cad pack & charger at £299 and receive FREE all of the following extras: 180MHz empty battery case, KP4 headphones, LC57 soft case, LC59 soft case for BP90, CP12 cigarette lighter & Securicor delivery. Also available.

R100 at £499
Complete with AC adapter + FREE delivery U.K.

BREDHURST ELECTRONICS LTD.
Hand high, Goodwood, W. Sussex. RH17 6BW
(0444) 400786

SPECIAL PRICE
NRC 525 Receiver £975 inc. ARA 30 Active Antenna

SECRETARIES
PYE L1100 20MHz to 1500MHz inc. ARA 60+ £1599

PALOMAR PRODUCTS
R - X Noise Bridge for antenna checks up to 10MHz £59.95
Receiver Preamp - 1.8 to 51MHz £119.95
Transceiver Preamp - R.F. Switched £148.95
Super Snoopr - vertical indoor antenna for SWL £99.95
Loop antenna - Directional indoor antenna £149.95
Menu ranges phone for details Tuner Tuner - ATU adjustment without mineralising £99.95
SWR & Power meter - LED display £129.95
Swr without adjustment £99.95
2W 20W 200W 2000W PEP £129.95
Small Ceramic Egg Insulators (each) £0.65 £0.30
Large Ceramic Egg Insulators (each) £0.65 £0.40
30mg Soldered Ribbon Cable (per mtr) £0.58 £0.10
450mg Soldered Ribbon Cable (per mtr) £0.50 £0.10

NEW PRODUCTS
ANTENNA BITS
AKR 1000 Handheld Scanner
* 1000 Channels
* 80 - 500MHz continuous 80 - 1300MHz continuous
* AM, FM (narrow & wide)
* Complete with NiCad and mains charger £249

GOODS NORMALLY DESPATCHED WITHIN 24HRS - PRICES CORRECT AT TIME OF GOING TO PRESS - EX.VisualStudio MAIL ORDER & RETAIL

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

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

Short Wave Magazine, April 1991
AVIATION ENTHUSIASTS
AVIATORS - LISTENERS

AIR TRAFFIC CONTROLLERS - on hand to help 'Guide' you towards an interesting & rewarding pastime.


Information pack only £50p.

AIR SUPPLY
83b High Street, Yeadon,
Leeds LS19 7TA. TEL: 0532-509581
Opening times: 10.00am - 1.00pm and 2.00pm - 5.30pm
Shop just two minutes from Leeds Bradford Airport. (Closed Wednesday & Sunday).

Another FIRST from CAP.CO -
RMA Series Antennas

The FIRST truly complete set-top HF Receiving Magnetic Loop Antenna system designed by G4OGP.

Produced with the Short Wave Listeners in mind, but often used by Amateurs to improve their reception.

The ONLY set-top Antenna system that can be rotated and tilted to eliminate low angle and high angle noise.

RMA-1 Incorporating High-gain Low-noise RF Pre-amplifier coverage 1.8MHz to 8MHz ..... £85.50
RMA-2 Pre-amplifier (without) ......................... £49.50

In addition, separate wire aerial in external socket allows coverage up to 1.5GHz.

(Postage: One aerial £5.00 - both Aerials £7.50.)
Send SAE for details of our range of Capacitors, ATUs and Magnetic Loop Antennae.

CAP.CO ELECTRONICS LTD.
Unit 28, Penley Industrial Estate, Penley, Wrexham, Clwyd LL13 0LQ
Tel: 0948 74717
Toward the end of 1990, Lt. Col. Rana Roy (Meerut, India) received many unidentified television pictures, in Band I, from stations in South-East Asia, via ‘F2’ and/or TEP (trans-equatorial propagation) openings, almost daily, from October 30 to December 26 when “the DX seemed to taper off.” A typical example of the unidentified pictures came at 1656 on November 13 when, on Ch 2 (48.25MHz), he saw a news reader, Fig. 1, from a SE Asian News programme which finished at 1700. “A clock at 1705 showed the time at 7.30 pm,” said Rana, adding, “This was followed by another programme of world news, Fig. 2.” His fascinating log for that day continued, “At 1725 saw Ads. At 1730 another station came up on E2 as a floating picture. At 2000 Bangkok (‘Ch3’), came up with clear pictures, Figs. 3 & 4, from February 2 and 4 but with the addition of New Zealand (BCNZ) on Ch. NZ1 (45.25MHz), Thailand, with ‘3’ logo on Ch. E2 (48.25MHz) and the USSR (TSS) on Ch. R2 (59.25MHz), Denmark (TV2) and Ireland (RTV) on Ch. E4 (62.25MHz) on the 7th.

Simon has now received verification for his television reports from both Australia (ABC and New Zealand. David Glenday (Arbroath) caught a brief glimpse of Italy’s ‘RAI UNO’ and Spain’s ‘TVE 1’ on the 18th. It is possible that the ‘F2’ disturbance on the 16th was caused by the large sunspot group, observed and drawn by Patrick Moore at his observatory in Selsey, which can be seen in my ‘Propagation’ column elsewhere in this issue.

Picture Archives

George Garden caught his first glimpse of the ‘Sports’ and ‘Movie’ channels on a satellite TV system installed at a hotel in Edinburgh and, down south near Guildford, Les Jenkins, using a tiny ‘dish’ antenna to feed his satellite TV converters, logged a couple of interesting pictures, Figs. 4 & 5, from Eutelsat 2 on January 14. Les is not sure about the origin of the ‘Usinen’ test card, Fig. 5, but he knows that its frequency is 1161MHz and he has noticed that the wording sometimes changes to ‘Tonprogram’ and ‘Deutsche Welle’. "Perhaps it’s marking a space for things to come,” said Les, any ideas readers?

Tropospheric (Weather)

The slightly rounded atmospheric pressure readings for the period December 26 to January 25, Fig. 12, were taken, at noon and midnight each day, from the Short and Mason barograph installed at my home in Sussex.

The already high pressure increased rapidly from 30.32in (1023mb) on the 24th to 30.45in (1028mb) at midnight on the 25th and 30.52in (1032mb) on the 26th and 4.02in in January, but what about the following report from Rana Roy?

“We have had a severe cold wave here from 31 Dec. to 07 Jan. 91. There was heavy snowfall and icy gales in Kashmir, Himachal Pradesh and Hills of Western Uttar Pradesh. Temperatures went down -10.8°C in Sinigagar, -6°C in Shimla, -39° in Spiti in Himachal Pradesh and -41° in Drass in Ladakh. In the plains of Rajasthan the lowest temperature recorded was at Churu (-2°C). In Meerut temperature came down to 1° at night at 11° in the day”. In his letter on January 12, Rana said that the night and day temperatures were 5° and 19° respectively. “Early January was dominated by low pressure and there was no DX then, but the second half of the month has had several high pressure areas moving over the British Isles so there has been a little tropospheric DX, but it has been weak signals,” wrote David Glenday.

Most of us experienced some form of the arctic conditions between February 4 and 11 during which period I recorded an overnight temperatures of 18°F down to 10°F and up a little to 13°F on the 10th, 7th and 8th respectively and watched the pressure gradually fall from 30.5in (1023mb) at midnight on the 5th to 29.7in (1005mb) at 1800 on the 8th as various snow storms crossed the country.

Tropospheric (Openings)

David Glenday received pictures in the h.f. band from Denmark (TV2) and Holland (NED1,2,3) on January 14 and added the sound transmissions from Germany (NRD3 & ZDF) on the 15th. He logged Denmark (TV2) and Ireland...
Mobile DXing

Our keen mobile DXer, George Garden, took advantage of the falling pressure on the 28th and took his carborne JVC receiver, log-periodic antenna and Labgear amplifiers with a quad bow-tie stacked antenna and Labgear amplifiers.

TYNE TEES' (Ch.49) and 'BORDERS' (Ch.59) from Chatton and Selkirk respectively. The weather was persistently cold with a slight amount of fog on the horizon and a dense layer of complete cloud cover,” said George. On January 14/15, Simon Hamer received pictures from Austria (ORF1), Czechoslovakia (CTST1), Denmark (DR), Finland (YLE1 & 2), Germany (ARD), Poland (TV1) Norway (NRK), Sweden (SVT1) and the USSR (TSS) in Band III and Austria (ORF2), Denmark (TV2) DANMARK, Finland (YLE), Germany (ARD, DFF, NDR3, RTL+, SWF3, WEST3 and ZDF), Poland (TVP2). Norway, Sweden (SVT2) and the USSR in the u.h.f. band again on February 4.

Band III in India

From his home in Meerut, Rana Roy received pictures in Band III during tropospheric openings from Agra (Ch. E9), Kasauli (E8) and Lahore TV (E5) at 2250 on November 15, Agra, Amritsar (E7), Bahatinda (E12), Delhi TV with Lahore TV overlapping on Ch. E5 and Kasauli at 0730 on the 29th; news from Jaipur (E5) and programmes from Kasauli at 1930 on December 8, Agra (“fighting for predominance on the screen” with Jalandhar), Amritsar, Bhatainda, Kasauni at 0730 on the 24th and later at 2040 Lahore TV was overlapping Delhi TV. Next morning at 0700 Lahore's test-card was again riding up on Delhi's signal and another tune through Band III found signals from Amritsar, Bhatainda, Jalandhar and Kasauli. Rana's trop-DX for 1990 ended at 1630 on the 26th with Education TV for children from Lahore.

Slow Scan Television

During the Christmas holidays, P. de Jong (Leiden, Holland) received 32 seconds slow scan television captions, around 14.228MHz, from Belgium (ON4ABP), France (F&GIO), Germany (DF3IF & DL5SBL), Holland (PA3AII), Spain (EA2JO) and Wales (GW4WFM).

Abbreviations

- Ch. channel
- DX long distance
- in inches
- m metres
- mb millibars
- MHz megahertz
- u.h.f. ultra high frequency
- v.h.f. very high frequency
- °C degrees Celsius
- °F degrees Fahrenheit
- v.h.f. very high frequency
DEWSBURY ELECTRONICS

IF IT'S KENWOOD IT MUST BE DEWSBURY
A FULL RANGE ALWAYS IN STOCK

FRG 8800 £649

KENWOOD R5000 £875

NRD 525 £1095

SUPA-TUNA
For Kenwood range of products
Makes selecting frequencies easier
£65.95 inc. VAT P&P £2.50

KENWOOD R2000 £595

IC—R71E £855

WAVECOM W-4010 DECODER
PRICES FROM £975.00 inc. VAT

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

Stockists of DAIWA — POCOM — ICOM — YAESU — JRC — BNOS — WAVECOM
Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands DY8 1TG
Telephone: Stourbridge (0384) 390063/371228
Fax: (0384) 371228

Instant finance available subject to status. Written details on request
**ANTENNA RANGE**

**CUSHCRAFT**
- A3 3 Element Triangular Beam ........................................ £329.00
- A4 4 Element Triangular Beam .......................................... £393.35
- 10-3CD 3 Element 10m Monobander .................................... £115.04
- 15-3CD 3 Element 15m Monobander .................................... £139.70
- 20-3CD 3 Element 20m Monobander .................................... £238.21
- AP6 8 Band Vertical 25ft High ........................................ £164.35
- AP5 5 Band Vertical 25ft High ......................................... £150.00
- 18 Element 2m Boomer Antenna ......................................... £150.00
- 15 Element 2m Boomer Antenna ......................................... £96.00
- Ringo Ranger 2m Vertical ................................................ £42.88
- New R5 5 Band half wave Vertical .................................... £299.00
- DW 10, 16, 24MHz Rotary Dipole ...................................... £175.00

**BUTTNERUT**
- HF 6V & 5 Band Vertical Antenna ........................................ £167.00
- HF 2V 8040 metre Vertical ............................................... £142.00
- A 1824 HF8V 17/12m Add on kit ........................................ £34.99
- 20MK/IF HF2V 20m Kit .................................................. £33.39

**FULL RANGE OF ACCESSORIES FOR THE BUTTNERUT RANGE**
- HY-GAIN
  - TH2 M3 Triangular Element ........................................... £279.00
  - TH2 BX 4 Element Vertical ........................................... £172.00
- JAYBEAM
  - TB2 M3 3 Element Triangular .......................................... £365.00
  - TH2 M3 3 Triangular Beam ............................................ £246.00
  - TB1 M3 2 Triangular Beam ............................................ £123.30
  - VR5 M3 Triangular Vertical .......................................... £85.56
  - DE6 & 6 Element Beam ................................................ £159.37
  - 4V/4m 4m 4 Element Beam ............................................. £48.46
  - 4V/10m 6m 4 Element Beam ............................................. £58.05
  - LW1/2m 5 Element 2m .................................................. £22.53
  - LW2/2m 5 Element 2m .................................................. £28.28
  - LF1/2m 5 Element 2m .................................................. £83.05
  - SK/4m Paraboom ......................................................... £42.68
  - SK/8m 8 Element Crossed .............................................. £54.60
- SCANNING RECEIVERS
  - WIN 108 Air Band ...................................................... £175.00
  - WIN 108 Air Band Receiver ........................................... £68.00
  - AOR900UK ................................................................. £235.00
  - Base Station Receiver AR2002 ....................................... £487.00
  - NEW HF 225 General Coverage Receiver ............................ £425.00
  - AOR 300 Base Station ................................................ £769.00

**KENWOOD RANGE**

**TS950SD HF Transceiver** ............................................. £199.00
**TS950S HF Transceiver** .............................................. £249.00
**TS940S HF Transceiver** ............................................. £299.00
**AT-940 Automatic Antenna Tuner** ................................ £244.88
**SP940 Speaker with Filters** ....................................... £87.55
**TS580 HF Transceiver** .............................................. £195.00
**AT850 Auto Tuner** ................................................... £144.82
**PS22 Heavy Duty PSU** .............................................. £230.00
**AT-32 Speaker** ........................................................ £63.46
**DSP100 Digital Processor** .......................................... £420.00
**TS405 HF Transceiver** .............................................. £138.81
**AT440 Automatic Antenna Tuner** ................................ £144.82
**PS90 20 Amp Power Supply** ....................................... £222.48
**TS1405 HF Transceiver** ............................................ £662.00
**PS430 Power Supply** ................................................ £173.78
**AT250 Automatic Antenna Tuning Unit** ......................... £366.00
**AT230 Antenna Tuning Unit** ..................................... £208.67
**SP290 Speaker with filters** ....................................... £60.49
**TL922 HF Linear Amplifier** ....................................... £149.00
**MC50 Base Station Microphone** .................................. £88.22
**TK715 2 Multimode Mobile Transceiver** ......................... £399.00
**TR650E 150cm Transceiver** ..................................... £699.00
**TS2315 50Watt 27m Transceiver** ................................ £289.00
**TS4315 35Watt 70cms Transceiver** ................................ £318.00
**TH701E 25 Watt Transceiver** ..................................... £469.00
**TS6905 HF Transceiver + 6 Metres** ............................... £995.00
**TH25 2m FM Handheld Transceiver** ................................ £238.00
**TH25E 2m FM Handheld Transceiver** ............................. £199.00
**TH215E 2m Handheld FM Transceiver** ........................... £228.00
**TH405E 70cm Handheld FM Transceiver** ......................... £245.00
**R500 General Coverage Receiver** ................................ £875.00
**VC20 VHF Converte 105-174MHz** ................................ £167.21
**R2000 General Coverage Receiver** ................................. £599.00
**VC10 VHF Converte 118-174MHz** ................................ £615.95
**HS5 Extra Heights Antenna** ...................................... £859.00
**TS9504 Dual Band Transceiver** .................................. £195.00
**LF50A Low Pass Filter** ............................................. £39.00
**SP90 Mobile Speaker Unit** .......................................... £20.40

**MFJ ACCESSORIES RANGE**

**G5RV full size high power** ........................................... £29.50
**G5RV half size high power** .......................................... £27.00
**G5RV full size** ........................................................ £18.50
**G5RV half size** ........................................................ £16.50
**G5RV 160-1000 Antenna** ............................................ £28.50
**Dipole 80-10 kWs** ..................................................... £25.00
**6m 3 Element Beams** ................................................. £26.00
**50m Enam. Copperwire** ............................................. £6.95
**2m Slim Jim** ............................................................ £10.50
**6m 2E1 HB9CV Beam** ............................................... £15.00
**D130 Widescan Discone** ............................................ £79.00

**JAVIATION**

As specialists in the VHF civilian and UHF military airbands, we can offer unbiased professional advice and information on all the various receivers & scanners available suitable for airband listening.

With equipment from Yupiteru, Fairmate, AOR, Icom, Win, Black Jaguar, Revco, Uniden, Tandy/Realistic, Sony, Signal and others, we probably carry one of the widest ranges available.

For a catalogue please send a LARGE SAE or if you would like a chat please give us a call - we will be happy to talk to you.

Our VHF & UHF Frequency Listings are both updated to late November and must be the most comprehensive available. Our VHF list includes ICAO 3-letter designators, callsigns, squawk codes and much more, while the UHF lists include stud numbers, range and other frequencies. Both lists have LATCC transmitter site/frequency tie ups.

Carlton Works, Carlton Street, BRADFORD, West Yorkshire BD7 1DA
Telephone: (0274) 732146 Facsimile: (0274) 722627
N o further need to be in suspense! The Christmas Quiz (January issue) only produced four entries, all correct. J. Pennington (DSNH/Shoeburyness) has a PPL and works professionally in aviation. P. Grimmett (Evesham) even identified the part of the aircraft in question to be the hydraulic system ground servicing connectors. Nicholas Winter ( Hull) also provided captions for the other, non-competition, photos - beyond the call of duty! The other entries were from D. Andrew (Torrington).

The answer was a SEPECAT (Anglo/French) Jaguar fighter, since made famous by daylight sorties in the Gulf War. There can only be one winner and using random selection the prize of a Victor Tanker (again, topical) jet pipe temperature gauge goes to P. Grimmett. Here’s another question (no prizes this time) for the military buffs. Why don’t Jaguars operate at night, even though equipped with FLIR?

Now a ‘Stop Press’. I have discovered where the annual PFA International Rally has moved to this year. The previous venue, Cranfield, was an essential source of parts for my Museum. This year Wroughton, Wiltshire (home of the Science Museum’s main transport collection) will host the Rally on July 5-7. I hope to be there on the Saturday if anyone wants to arrange to meet up.

Runway Braking Action

As noted by Peter Wade (Sevenoaks), the recent weather has brought chaos with the extremely close runways at intervals for snow clearance. No wonder Delivery Controllers are losing their cool if up to 80 flights are already awaiting slots due to weather delays!

Braking action is usually measured by the Mu-Meter on a 0-1 scale. The reading according to how briskly the vehicle in which it is carried can skid to a halt. The Mu-Meter, which gives a 0-100% reading, is installed inside a vehicle. This is a decelerometer which gives a 0-100% reading according to how briskly the vehicle in which it is carried can skid to a halt!

Follow-Ups

Michael Farrier (Hatfield) responded to the request by Mr. & Mrs. Hasman & Son (Leicester) in the February issue and some historical radio navigation charts are on their way. Thanks for your generosity, Michael.

The new North Atlantic h.f. circuits have been mentioned several times in recent issues so I’ll just thank Sean Carvin EI2CR (Dublin) and Geoff Halligey (Bradford) who both sent official charts showing that NAT-A, B, C, D and E are now all in use. Despite what I said in November 1990, the 8.968MHz frequency is part of NAT-E (not NAT-A). NAT-B is still in use, but not at Santa Maria and New York where NAT-E has taken over.

In January John Howarson (S. Humberstone) had his questions about reporting points answered. Various Alconbury, Bentworths, Upper Heyford and Woodbridge military procedure reporting points were described. In an explanation regrettably far too long to print here, Mike Tighe (London) adds more detail on this subject. Apparently one military procedure (which requires specific pilot training) that uses these reporting points is the Aircraft Surge Launch And Recovery (ASLAR) which enables instrument approaches at busy times such as exercises and tactical evaluations.

The stages in an ASLAR approach are:

1. Initial Approach Fix, often co-located with an existing holding pattern;
2. The aircraft in formation take up a line-of-sight to achieve separation for landing;
3. Deceleration point (reached by the leader first, of course);
4. Final Approach Fix;
5. Final Approach Speed Point (speed depends on aircraft type and, presumably, weight).

There is also, inevitably, a missed approach point.

Private pilots don’t use these procedures - they don’t fly formation sorties! But they’re worth knowing about as it is possible to encounter military aircraft on instruments in the open t.f.r. Although these aircraft should keep a look-out, it’s all too easy to become engrossed in the instruments and with ‘head inside the cockpit’ not notice another aircraft as quickly as usual.

When writing to me about any ‘follow-up’ it helps to state in which issue the subject was last mentioned.

To Russia - By Balloon

In February, I mentioned the Cameron/Uparin flight and the details are filled in for us by Roy Merrall (Durban). You can plot the progress on a chart:

- 3/10/90 1200Z 54°57’N 09°19’E
- 2/10/90 1615Z 55°35’N 11°32’E
- 3/10/90 0845Z 51°52’N 20°04’E
- 3/10/90 0915Z 57°58’S 20°39’E
- 3/10/90 1030Z 58°42’N 21°04’E
- 3/10/90 1147Z 57°44’N 22°35’E
- 3/10/90 1315Z 55°15’N 24°04’E
- 3/10/90 1345Z Coasting at Riga
- 3/10/90 1423Z Landed Sigulda, 15km SE Riga.

Hardware

Michael Farrier asks an important question where receiving any small signal is concerned (all the more important on v.h.f. and u.h.f.). Does the coaxial feeder cable between the antenna and the receiver matter?

Yes it does, the better the quality, the stronger will be the received signal. Without boring everybody with the maths involved, look for the attenuation figures in the specification when buying coaxial cable. There will be a number of dB (decibels) per metre at 100MHz. The smaller this figure, the better the cable.

What about antenna pre-amplifiers? Rule 1: if you must have one, be careful as it might also amplify all manner of interfering transmissions and it might also increase the noise as much as the wanted signal! But put it at the masthead, where it can boost the wanted signal before the coaxial cable gets a chance to attenuate it again. Warning to my transmitting amateur colleagues: make a fool-proof arrangement whereby you can’t transmit through your pre-amp or the result could be expensive.

An a.t.u. is always a good idea for an h.f. receiver and Graham Tanner (Hartington) reports good results with the CM Howes kit he built. With a 65RV antenna feeding a Sony ICF-2001D through the a.t.u., interference from a nearby computer is almost crushable. Shame the kit doesn’t include a template to help with drilling the front panel of whatever metal box you decide to enclose it in.

Software

Computers continue to work wonders in various ways for aviation enthusiasts. David I Shaw (83 Quarry Moor Park, Harrogate Road, Ripon, N. Yorks HG4 3AQ) has been collecting and listing callsigns for 30 years. I’ll bet you didn’t have a computer when you started, David! He invites anyone to send him callsigns to add to his 120-page computerised list and will exchange information with other enthusiasts.

ICAO publishes Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services which is an official callsign list. It will set you back a surprising sum and is available from CAA Printing and Publication Services, Greville House, 37 Grattan Road, Cheltenham, Glos GL50 2BN. Tel: (0242) 235151.

Another database enthusiast is Chris Kirby (Aynho). Your village, if memory serves, looks like a good v.h.f. site but wherever it’s driven over your spectacular hill, calling CQ on 144MHz is no-one ever answers! The information is integrated from many official sources including NOTAMs and in this case, Chris, although you feel that you’d rather not release the 84-page list generally I can see no problems if you were to do so. Perhaps the airline operations departments would be glad of it? Listings by frequency are very unusual so you might be filling a niche.

Disaster!

Although Paul Hilton now lives in Thatcham, Berkshire, he was brought up in Colorado Springs, USA and his first flight was in a TWA 707 from Stapleton, near Denver. He was interviewed in a newspaper report of a fire at Stapleton’s fuel farm. Flights were affected not so much by the smoke pall but more by lack of fuel availability. Although the larger tanks were spared, some firemen were injured. Despite the commercial value of the fuel it took two days to call out a specialist oil fire-fighting company who, once on scene, extinguished the blaze in 17 minutes!

Let’s hope it doesn’t happen here. Closer to home, Paul can’t work out why Concord pilots prefer landing on 09L/27R at Heathrow, unless it’s to cut
down taxiing time to Terminal 4. I can't find a better explanation in the Heathrow let-down plates, so can anyone else (such as a Concorde pilot) supply the answer?

Frequency News

Graham Tanner enjoys the h.f. details in this column but reminds me that I have 'only scratched the surface'. True - but this magazine could never replace the full-size En Route Supplements which I often mention from the usual suppliers. One of these, the Africa and Southern Asia section from the RAF FLIPS, was found by Graham to include the Falklands. Source: I AI DU, RAF Northolt, West End Road, Ruislip, Middlesex, HA4 4NG, Tel: 081-8452300 ext 209. For details of all the h.f. aeronautical circuits I recommend World HF Aeronautical-Mobile/R/T Frequency Allocations by Tim Christian (£6.99 UK post paid from Isoplethics, 157 Mundesley Road, North Walsham, Norfolk NR28 0CD). Graham also produces an h.f. listing; is this to be made available to readers and if so, how much will each copy cost?

Another 'surface scratch', this time from Alan Gentry (Cirencester). Frequencies in MHz as primary, main secondary, alternative secondary (where appropriate). Propagation prediction to the UK is 0700-0900Z in each case.

Auckland & Sydney 8.867 13.261
Abidjan, Canaries, Dakar, Recife 8.861
Manaus, Piarco, Porto Velho, Paramaribo 8.855 5.526

The next three deadlines (for topical information) are April 12, May 17 & June 14. All correspondence to 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS.

Circuit

A rectangular flight path commencing with take-off from a runway, circling the aerodrome and landing back on the same runway. The sides of the rectangle are called legs. All turns in any particular circuit are made the same way, most commonly to the left (this would be a left-hand circuit).

Crosswind leg

After take-off in a circuit, the aircraft climbs ahead to a safe speed and height (typically 800 ft above aerodrome for a light, single-engine aircraft). At this point a 90° turn is made on to the crosswind leg.

Downwind leg

The crosswind leg of a circuit is flown until, typically, the end of the runway disappears under the tail of the aircraft. A 90° turn is made so as to fly the aircraft parallel to the runway but in the opposite direction to that used for take-off. Hence the aircraft is now flying downwind. On passing above the threshold, a downwind radio call is made.

Base leg

In a circuit, the aircraft turns onto base leg after the downwind leg and commences to descend. The runway comes in to view at right-angles to the aircraft's track.

Final leg

In a circuit, the final descent path prior to touch-down. Achieved by making a 90° turn at the end of the base leg. A final radio call is made. The end result is a landing or a touch-and-go or a go-around without touching the runway. If the runway is obstructed, it is occasionally necessary to perform a tight circular orbit on finals whilst awaiting further clearance.

The Satellite Book

(A complete guide to satellite TV theory and practice)
by John Breeds
published by Swift Television
280 pages, A4. Price £27.00 plus 85p P&P
ISBN 1 872567 01 0
Available from the Short Wave Magazine Book Service

This book deals almost exclusively with television broadcast satellites and is a comprehensive collection of chapters on topics, each written by an expert in that field. It appears to be aimed at the professional satellite system installer for whom it is invaluable, but it will be appreciated by a much wider audience - anyone interested in satellite technology. The theory of geostationary satellites and the concepts of satellite 'footprints' related to the size of dish are covered without omission and in a very pleasing style.

A little mathematics is included to explain orbits and other concepts without leaving the reader feeling overwhelmed. It is inevitable that a book dealing with TV satellites will be overtaken by events and the recent merger of BSkyB and SKY illustrates how quickly this can happen. However, this does not affect the information included at all. Chapters on the installation of receiving equipment explain the importance of using the correct tools, suitable dish locations, ladder safety, dish mounting, cables and connectors and even customer care!

The chapters on basic microwave theory are also well-written - I worked in this field for several years doing research linked to this very application, and was impressed with the writer's efforts to explain matters clearly and concisely. Antenna theory, the potential applications using small dishes that could receive signals from adjacent satellites, and the solutions to these problems - all are covered comprehensively. With this book the topic of TV broadcast satellites is completely de-mystified. Background material, such as a description of British Telecom's Teleport terminal and its various antennas, the EUTELSAT fleet and all the 'footprints', together with ASTRA 1 and 2 are covered in detail as one would expect in a book of this nature. Finally, technical topics such as MAC and signal encryption are explained in an interesting manner, leaving the reader feeling that the wonders of electronics are that bit more easy to understand. To summarise: an excellent book, not just for the dish installer but for anyone who wants to know more about satellite television in all its aspects.

The Experimental Aircraft Project of British Aerospace.

Abbreviations

a.t.u. antenna tuning unit
CAA Civil Aviation Authority
f.i.r. flight information region
FL Flight Level
FLIP Flight Information Publication
FLIR Forward Looking Infra-Red
ft feet
h.f. high frequency
ICAO International Civil Aviation Organisation
kHz kilohertz
kt knots
MHz megahertz
NOTAM NOTice to AirMen
PFA Popular Flying Association
PPL Private Pilot's Licence
R/T radiotelephone
u.h.f. ultra high frequency
UTC Universal Co-ordinated Time (=GMT)
V.h.f. very high frequency
Z time UTC
° degrees
The TOKYO HX240 HF Transverter when coupled to an all-mode 2m rig will give you 50 watts on 80 to 10m. RAYCOM have put together this unique unit with the new YAESU FT290Rii inc. DC and COAX leads!!!
Once again I begin the column with details of yet another new scanner. This time it is YUP TERU announcing the MTV-7000 as a successor to their popular MTV-5000 Jupiter II handheld. The new model incorporates several additional features including continuous frequency coverage from 100kHz to 1300MHz, w.b.f.m. so that you can listen to f.m. broadcast stations and TV sound, 200 memory channels, manual tuning control, selectable tuning steps and all the other features standard on the MTV-5000. The case has also been redesigned to remove the sharp corners although the overall size remains about the same. The price is expected to be in line with that of its main competitors, so expect to see it expected to be in line with that of its competitors, so expect to see it expected to be in line with that of its competitors, so expect to see it expected to be in line with that of its competitors, so expect to see it expected to be in line with that of its competitors, so expect to see it expected to be in line with that of its.

Following on from last month's comments regarding Mk I versions of scanners you would like to extend the frequency coverage of your AOR AR100HP/IDOE handheld or have problems with f.m. broadcast band interference then RGW Electronics may have the solution. They are offering a range of inexpensive add-ons for use with many different models of scanning receiver. You can write to them for further details at: 5 Braunston Place, Rugby, Warwickshire CV22 5JZ.

New Allocations

Several people have reported that p.m.r. base stations are now operating in the London area. Many of these are either Trunked Systems or Community Repeaters with base transmit frequencies centred on 82MHz. The paired receive frequencies are at present unknown. It is assumed that this band will become more active as users of the current 97.5-88MHz p.m.r. allocation are moved in order to make way for further expansion of the v.h.f. f.m. broadcast band.

Activity also seems to have increased in the old Band III TV allocation where the lower of the three sub-bands reallocated to p.m.r. base stations is now showing signs of activity. This uses frequencies in the range 176.5-183.5MHz for the base station transmitter paired with frequencies 8MHz higher between 184.5-191.5MHz for mobile stations. Most transmissions in this band are likely to be from 'Trunked' Systems with many users sharing the same channels, the distinctive buzzing of the 1200baud data channels being the most characteristic feature.

Fellow SWM columnist Roger Bunney dropped me a line to say that the BBC have been carrying out test transmissions on 47.645MHz in the London area. These consisted of an announcement which repeatedly stated "This is a test from the East tower". The aim was apparently to find a cure for a problem resulting from a new Outside Broadcast allocation which was interfering with a.v.h.f. cable distribution system in TV Centre - the transmit frequency corresponds to cable TV Channel E2. The transmissions were from BBC TV Centre and used 25W from a 3-element vertical Yagi pointing north. The transmissions, which have now ceased were clearly audible at Roger's home in Romsey, Hants, at a distance of around 112km, which demonstrates the potential of this band providing that good antennas are used.

Digital Traffic

Observant readers struck in traffic on the M25 may have gazed towards the heavens and noticed strange pods with helical antennae sprouting from the many bridges and gantries which cross the motorway. These are part of a new traffic information system which uses digital packet transmissions in the old 156-163MHz Post Office System 4 radiophone band.

The system operates by the downward facing pods detecting the rate of traffic movement at certain key points. The information is then transmitted back to a central control point where the raw data is processed. This allows the position of any hold-up to be determined, the details of which are then transmitted back to any motorist with a special receiver fitted to their car. This is designed to give an alarm signal if problems are anticipated on the road ahead. The unit also incorporates a large liquid crystal display which presents a stylised map of the motorway and junctions along with useful directions to help avoid the jams. If the scheme is successful you can expect to see an expansion of the scheme to other routes in the near future.

Illegal Listening

My thanks to the anonymous reader who sent me a news clipping from the Southampton Evening Echo regarding a Citizens Band enthusiast who was operating from his car whilst parked on a local spot of high ground. The police noticed that he had a scanning receiver in the back of his car, which was seized and taken back to headquarters for examination. The receiver was found to be tuned to police frequencies, aircraft stations and a Home Office channel. The case later came to court and he was found guilty of 'obtaining information which he was not authorised to receive'. The end result being a 6-month conditional discharge.

Reading the article it is not clear if the scanner was actually switched on at the time or if it was being re-broadcast over the CB radio. It is also not apparent if the scanner was returned after the court case.

However, as I have said before in this column it is illegal to listen to anything other than Broadcast, Amateur and CB stations in the UK unless permission is given to monitor frequencies for a specific purpose. It should be noted that this is not normally granted to private individuals.

It's still not that common for cases of illegal listening to come to court, most cases that do are usually in connection with other offences. You only have to go to an airport, airshow or yacht race these days to see a whole range of scanners receiving in public use. Technically, of course, all of these people are committing an offence, but it's unlikely that any prosecution would result unless someone did something really stupid. However, from comments I have heard several bodies are now concerned about the number of scanning receivers in circulation and their possible use by criminals. As a result it is likely that much more attention may be paid to the use of scanners in public places.

I hope that readers of this column will take note of these comments and use their receivers responsibly.

Talk-through Operation

Regular reader A. Sheldon has been picking my brain again, this time with a question regarding what is commonly referred to as 'Talk-through' operation. This is often used on CB and mobile stations to pass messages directly to each other via a fixed base station. The idea being that the range of the base station is much greater than that which could be expected from the mobile station alone.

The question is how do these systems work and how are they controlled? A basic talk-through system consists of a receiver tuned to one frequency connected to a separate transmitter and antenna operating on another frequency. If the transmitter is fed with the audio signal from the receiver and is arranged to switch to transmit each time the receiver squeal opens, then any signals that are received will be re-transmitted on the second frequency. If such a system is placed on a hill or high building then any mobile stations operating on the correct frequencies and within range will be able to communicate with each other via the base station. Because the base station is well sited it can provide a much greater communication range than would be possible if the mobiles transmitted directly to each other because of the surrounding terrain or screening effects of nearby buildings.

One good example of such systems are the Amateur Radio Repeater stations operating in the 2m band between 145.8-145.8MHz and the 70cm band between 430.0-430.4MHz. These have transmit/receive frequency spacings of -600kHz and +1.6MHz respectively and require a short tone burst of 1750Hz to initially activate the automatic control circuits.
It may seem easy to construct such a system but there are one or two problems which have to be overcome first. The main one being how to prevent the base transmitter from overloading or 'blocking' the receiver it is connected to. When a base station can simultaneously transmit and receive signals this way it is said to be capable of duplex operation. Several techniques can be used to provide sufficient isolation between the transmitter and receiver, the easiest one being to put them in different locations. This has the advantage of being cheap but you still have to interconnect the two sites, and you end up with areas where mobiles can hear the base transmitter but the base receiver can't hear them.

The more usual method is to have the transmitter and receiver at the same site but use special filters to separate the incoming and outgoing signals. Such a unit is referred to as a duplexer and often provides enough isolation to make it possible to use the same antenna for both transmission and reception.

In order to make the construction of such filters practical it is necessary to have a reasonable frequency separation between the transmit and receive frequencies. These tend to be in the order of 5-10MHz at v.h.f. and 10-14MHz at u.h.f. As we go higher in frequency the spacings get larger in order to maintain the ease of construction.

The use of 'Talk-through' operation is restricted in commercial systems by the DTI Radiocommunications Division, as it tends to encourage idle chat between mobile stations. As most channels used by p.m.r. stations are shared it is important that each user gets a fair share of the 'airtime' so any talk through operation generally has to be under the control of an operator.

Most commercial base stations are connected by BT lines back to the control centre. This allows the operator to receive and transmit messages as if they were actually located at the base station. If a mobile station requests talk-through operation the operator can flick a switch to connect the transmitter to the receiver via the BT lines, permitting the re-transmission of any incoming signals. When a large area has to be served several different sites may be used to give the required coverage. In this situation an automatic control system may be used to determine which site is receiving the best signal and route it to all the transmitters simultaneously. It is for this reason that you usually can't hear mobile stations directly, as they use a much lower transmit power than that of the base station and are often just too far away.

If the sites are very remote the control station may use radio links in the u.h.f. and s.h.f. bands to remotely control the base station. Different audio frequency codes are then used to select the required functions.

Most commercial traffic heard using talk-through operation is in fact likely to be using either a Community Repeater or Trunked System. In both these cases the base station is automatic in operation with several different users sharing the same system. Each user has their own electronic call sign which allows them to only hear calls addressed to themselves. Each user also has a transceiver back at their control centre and this is used to link to the base station in exactly the same way as the other mobiles, again a special control circuit in the transceiver only allows them to hear calls specifically directed to them. Anyone monitoring such a base station without a special decoder will hear the different conversations of users juxtaposed.

**Abbreviations**

| CB | Citizens' Band |
| cm | centimetres |
| DTI | Department of Trade & Industry |
| f.m. | frequency modulation |
| kHz | kilohertz |
| km | kilometres |
| m | metres |
| MHz | megahertz |
| p.m.r. | private mobile radio |
| s.h.f. | super high frequency |
| u.h.f. | ultra high frequency |
| W | watts |
| W.B.F.M. | wideband f.m. |

**Using an ERA Microreader Mk 11**


Richard L. King of St. Ives, Cambs sent us the following information regarding the connections to the 9-pin serial ports on IBM compatibles and the AMIGA.

From the AMIGA manual it appears that the serial port is a 25-pin D-type connector. The important connections are:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Frame Ground</td>
</tr>
<tr>
<td>3</td>
<td>Received Data</td>
</tr>
<tr>
<td>4</td>
<td>Request To Send</td>
</tr>
<tr>
<td>5</td>
<td>Clear To Send</td>
</tr>
<tr>
<td>7</td>
<td>System Ground</td>
</tr>
</tbody>
</table>

The 'tip' of the jack plug goes to pin 2 as stated in the article, but the 'ring' of the jack plug should be connected to pin 5 (Signal Ground). Pins 7 & 8 (RTS & CTS) should be joined together on the 9-pin D-type connector.

From the AMIGA manual it appears that the serial port is a 25-pin D-type connector. The important connections are:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Carrier Detect (ODC)</td>
</tr>
<tr>
<td>2</td>
<td>Received Data (RD)</td>
</tr>
<tr>
<td>3</td>
<td>Transmitted Data (TD)</td>
</tr>
<tr>
<td>4</td>
<td>Data Terminal Ready (DTR)</td>
</tr>
<tr>
<td>5</td>
<td>Signal Ground (SG)</td>
</tr>
<tr>
<td>6</td>
<td>Data Set Ready (DSR)</td>
</tr>
<tr>
<td>7</td>
<td>Request To Send (RTS)</td>
</tr>
<tr>
<td>8</td>
<td>Clear To Send (CTS)</td>
</tr>
<tr>
<td>9</td>
<td>Ring Indicator (RI)</td>
</tr>
</tbody>
</table>

...
The above price excludes delivery. All machines are subject to availability and are supplied with a 12 month Return to Vendor Warranty. E&OE.
Robert Fulford of Exeter has recently purchased an ICS Electronics FAX-1 decoder to operate with his Lowe HF-225 receiver. The antenna in use is a simple 15m long wire. Robert’s favourite FAX station is Offenbach Meteor on 134.2kHz. This has in the past been a favourite with many but sadly suffers from severe adjacent channel interference from a radio location system. The fact that Robert can receive the station well is testament to the excellent filtering of the HF-225 receiver. Robert’s only complaint so far is that he hasn’t received any re-broadcast Meteosat images. According to my schedules these images should be sent at the following times: 0130, 0144 UTC, 0315, 0643, 0852, 1225, 1539, 1843 and 2143 UTC. If this has changed, perhaps someone would like to drop me a line with the details.

Mr G Dobson of Bradford runs an ERA Microreader with his Icom R-71 receiver and 30m long wire antenna. He reports very good results over the past two years and is about to expand his station to include a printer. Once question he has concerns the number of 850Hz stations that are not decodeable. I’m afraid this is just a fact of life. There are a wide range of signals that sound for all the world like RTTY but are other forms of data transmission. To receive many of these systems would require a system upgrade to a more comprehensive decoder. As such, he said, the low 850Hz station would not make all signals resolvable as many are encrypted or in foreign alphabets.

Mr C Vasili of London has a question about the operation of his Icom R-71 receiver. He uses his receiver with an ERA Microreader for utility reception and questions the receive mode he should be using. If he selects c.w. or s.s.b. all is OK, but if he selects the R-71 to RTTY the Microreader doesn’t work. The reason is simple and is due to there being two standard tones for RTTY. In Europe most RTTY decoders use what is known as ‘low tones’, these are 1275Hz and 1445Hz for 170Hz shift signals. The “other” standard is called ‘high tones’ and is used mainly in the USA and Japan. This standard uses tones of 2124Hz and 2294Hz - quite a difference from the ‘low tones’. In its standard form the R-71 is set-up for ‘high tones’ when switched to RTTY. As some receivers can be converted to ‘low tones’, it may be worth contacting Icom UK to see if they can help. The answer for most people is to decode RTTY signals with the receiver set to U.S.B.

This month I have received several letters from readers asking some pretty basic questions about how to get started with utility decoding. Rather than answer them on individual replies I thought it would be more useful to cover the main issues in the column.

**Decoding Systems**

There are basically two ways to decode utility stations hardware and software, unfortunately the division between the two is not always that simple. In Fig 1 I have shown the decoding process using block diagrams. Let’s start with the receiver, This has to process the radio transmission and convert it into a pair of tones representing the two possible states of the signal. The frequency or pitch of these tones will depend on the shift in use by the transmitting station. The next stage in the process is the filtering. The purpose of this is simply to remove all but the wanted signals. In practice the filtering stages are normally only capable of removing interfering signals that are above the highest wanted tone or below the lowest. This means that if there is interference within the signal, the filter has failed. Although the filtering is a separate function, there are often several stages of filtering from the receiver through to the decoder. In fact some more sophisticated receivers, such as the Lowe HF-225, can provide most of the filtering required for utility decoding.

Moving on to the decoder, this is where most of the work is done. This stage has to convert the incoming tones from the receiver and filter into a format suitable for display and subsequent viewing by a human. The most basic form of decoder for RTTY would be a device called a terminal unit. This simply takes the two tones and converts them into two d.c. voltages. The problem with this very basic type of decoder is that the display process is left with much work to do. The display would have to provide extensive processing of the two d.c. voltages before the final text display could be produced. Perhaps the simplest way to do this would be to use a Teleprinter. This is an electromechanical device, like a typewriter that converts this simple d.c. voltage into printed text. You may remember seeing these being used a few years ago to display the football results during the Saturday afternoon Grandstand. The main restriction with using a Teleprinter is that you can only receive RTTY and only one speed at that. The next simplest way of processing the output from a terminal unit is to use a computer. You can buy a special program for some computers to make it behave just like a Teleprinter. The subtle difference is that the decoded signals usually appears on the screen. Another important difference is that the computer program can usually be set to handle many different modes and speeds, instead of being stuck with single speed RTTY. Until recently this type of decoding system was by far the most common.

However, developments in computer programming, i.e. software, have resulted in a comparatively new system that gives the simplest of all decoding systems. In this system all that is required is a receiver and a computer. The computer provides the basic audio signal and the computer program handles the filtering, decoding and display functions. Another great advantage of this type of system is that it is generally very cost effective. Although there is not normally an external filter stage with these decoding systems the addition of such a filter usually provides a worthwhile improvement. This is particularly true when trying to receive very weak or noisy signals. An example of this type of decoding system is the RX-4 from Technical Software.

Besides the basic decoding and display systems I have described so far, there are other systems available. The first of these are commonly known as intelligent terminal units or data controllers. Examples of this type of unit are the AEA PK-223 and the Kantronics KAM, both of which have been primarily designed for the amateur radio market. These units contain extensive filtering and decoding for many different modes. The reason for calling them intelligent decoders is that they contain their own microprocessor and program that adjusts the filtering and decoding routine to many different modes. Another great advantage with these units is that they usually included some form of tuning indicator. The most common form of tuning display being a i.e.d. bargraph. The decoders can handle many modes i.e. Packet, RTTY, c.w., ARO, FEC and FAX. You will however, still need to provide a display for the decoded output. The output from these more advanced decoders is designed to be connected to what is known as a dumb terminal. This odd name in fact means a simple visual display terminal. This is a device rather like a computer with limited processing power. What happens is that the screen displays any information sent to it via the RS-232 port and the keyboard is used to send signals from the RS-232 port. The coding used for this information exchange is simple ASCII and the speed or baud rate can usually be altered over a range of standard values. You don’t have to use a dedicated dumb terminal, as most computers can be easily set-up to behave like a dumb terminal. In addition, there are a few specialised programs available to provide very sophisticated control of these intelligent terminal units with most common home computers.

One of the big advantages of these units is that the latest decoder can be incorporated by a simple change of internal software. This software is usually contained in a plug-in ROM chip. If you are interested in transmitting data (via amateur radio) this is very clearly the way to go.

The final type of decoder, and perhaps the most desired, is the self contained type. Examples of these are the ERA Microreader, Wavecom 4010, etc. Prices for these vary widely ranging from about £150.00 through to over £1000.00. This type of decoder is very clearly the neatest way into decoding as all you need for a basic system is a receiver and the decoder. Although I have called these self contained, one does need a display device. This is usually either a standard TV or a simple video monitor. As with the intelligent terminal unit, the modes covered by these units are controlled by plug-in software. In the advanced units such as the W-4010, you can add receive modes by buying optional plug-in software modules. Regular readers of this column will no doubt be aware that the Microreader is probably the most popular stand-alone decoding system among short wave listeners. This popularity is due to its ease of use combined with a very reasonable price.

---

**Fig. 1: Decoding Process.**

Short Wave Magazine, April 1991
The fact that it is completely self-contained with its own display adds to its popularity.

The final type of decoding system that is worthy of note is the latest computer-based systems. The reasons for the success of this approach is that they utilise the best points of the other systems I have described. They have the flexibility afforded by a software-based system and the filtering and signal processing that is best carried out with traditional electronics.

Examples of these systems are the RX-8 from Technical Software and the IBM-based Code-3 from Hoka Electronic. This latter incorporates an extremely wide range of decoding modes. One special feature of this package is that raw data can be stored for analysis at a later date. This is great when trying to analyse transmissions with a short duration.

Sotetwe are a quick run through the range of decoding systems that are currently available. To get a full view of the range of equipment take a close look at the advertisements in the magazine.

Amstrad PCW

I seem to receive a fairly steady stream of letters from readers who would like to use the PCW8256 and 8512 computers for utility reception. One such letter came from W. Batho of Chipping Norton. He has seen a PCW8256 at a good price and asks if it's suitable for radio use. Unfortunately there is currently no dedicated radio software available and it seems likely that one day. The only solution for users of these computers is to use an intelligent terminal unit. The snag with this is the additional cost.

To use the PCW with an intelligent terminal unit it needs to be configured to act as a dumb terminal. This can be done by using the MAIL322 program that's provided on the system disk. A more powerful alternative would be to use the MEX public domain communications program. This gives some very useful file handling facilities. These can be very useful for storing decoded information or when issuing commands to the terminal unit. It also gives you access to the printer, so you can get a print-out of interesting data.

Mike Bradbury of Stoke-on-Trent has been using this system for some time and reports great success. The decoder in use with his station is the PK-232. Another great advantage of being able to store decoded data to disk is that some of the inevitable decoding errors can be edited out using a standard text editor. The place to go for your copy of the MEX program is the Public Domain Software Library, Winscombe House, Beacon Road, Crowborough, East Sussex TNG 1UL. Thanks to Mike for supplying this information.

BARTG R-5 Filter

From my earlier dissitation you will have noticed that filtering is an important part of any decoding system. No matter what decoding system you use, you will normally find that some additional filtering will improve performance. The performance improvement is most noticeable when receiving signals suffering interference from adjacent stations. Although there are many ready built filters on the market I thought it would be interesting to feature something for the constructors. This filter is known as the R-5 and is an adaptation of a manufacturer's application notes. The filter centres around the use of the switched capacitor filter technology.

The type of filter required for decoding is a bandpass unit, i.e. it only passes a pre-set band of frequencies. In this design, the bandpass feature is created by combining two filters - a low pass and a high pass. The advantage with this technique is that by altering the cut-off frequencies of the two filters the effective bandwidth of the bandpass is also varied. In this design each filter can be varied between about 50Hz and 3.5kHz giving an extremely wide adjustment range.

The heart of the filter is the two switched capacitor filter integrated circuits, AMI S3528 and S3529. These are seventh order elliptic type and provide a very steep cut-off with an attenuation of 51dB at 1.3 fo.

To make the R-5 filter as versatile as possible, there are several switching options to set the bandwidth of the filter. The most popular methods are the 40-way CB switches or 10-way rotary switches. However, the constructor is left with a free choice to suit his or her particular need. In my situation, with my Hoka Code-3 decoding system, I need a filter with a fixed centre frequency of 1750Hz but a bandwidth variable from 900Hz down to 100Hz. This can be achieved with some simple diode matrix switching.

The R-5 is really only suitable for the keen constructor as it is supplied as a printed circuit board and circuit diagram only. The constructor is left to find the components and a suitable enclosure. Despite the effort, there is a much satisfaction in this type of home construction and considerable savings to be made. The R-5 can typically be built for approximately £30.00, which compares very favourably with commercial units.

The acid test is - how does the R-5 shape up on the air? For this test I was able to borrow a complete unit from Ted Hatch G3ISO. This was connected between the low-level audio output of my Icom IC-720 and the Code-3 decoder. As expected, the R-5 made little difference to strong clean signals, but when working under noisy conditions the improvement was considerable. By careful adjustment of the high and low pass filters, most adjacent channel noise could be eliminated. The result was a significant reduction in the number of received errors. Although I have concentrated on the use of the filter for utility reception, its wide adjustment range means that it is equally effective on speech transmissions.

So, to conclude, the R-5 is certainly a very effective filter that is likely to be of use to most listeners. If you are interested, I must stress that you need to have enough constructional skill to build a project from just the p.c.b. and circuit diagram. Non-members of BARTG can obtain p.c.b.s at a cost of £5.25 inclusive of post and packing.

The address to send your order to is: BARTG Components Manager, Ted Hatch, 147 Borden Lane, Sittingbourne, Kent ME10 1BY. My thanks to Ted for the loan of the review model.

Frequency List

Only a few selections for you this month, as the tutorials have taken quite a bit of column space. If you want a more complete list drop me a line including three stamps and I’ll post one to you. The format for the list is the usual frequency, mode, speed, shift, callsign, time and notes.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Mode</th>
<th>Speed</th>
<th>Shift</th>
<th>Callsign</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.92MHz</td>
<td>RTTY</td>
<td>50</td>
<td></td>
<td>GRC70</td>
<td>0840UTC</td>
<td></td>
</tr>
<tr>
<td>11.141MHz</td>
<td>ARQ</td>
<td>100</td>
<td>70</td>
<td>MFA Rome</td>
<td></td>
<td>UTC</td>
</tr>
<tr>
<td>12.108MHz</td>
<td>RTTY</td>
<td>50</td>
<td>150</td>
<td>ANSA Rome</td>
<td>1005UTC</td>
<td></td>
</tr>
<tr>
<td>12.718MHz</td>
<td>CW</td>
<td></td>
<td></td>
<td>NMN</td>
<td>2146UTC</td>
<td>USCG Portsmouth</td>
</tr>
<tr>
<td>12.700MHz</td>
<td>CW</td>
<td></td>
<td></td>
<td>CWA</td>
<td>2134UTC</td>
<td></td>
</tr>
<tr>
<td>12.801MHz</td>
<td>CW</td>
<td></td>
<td></td>
<td>TAH</td>
<td>2033UTC</td>
<td>Istanbul</td>
</tr>
<tr>
<td>12.857MHz</td>
<td>CW</td>
<td></td>
<td></td>
<td>WW</td>
<td>2001UTC</td>
<td>FN Dakota</td>
</tr>
<tr>
<td>14.912MHz</td>
<td>RTTY</td>
<td>75</td>
<td></td>
<td>OFZG</td>
<td>1546UTC</td>
<td>MFA Belgrade</td>
</tr>
<tr>
<td>15.922MHz</td>
<td>RTTY</td>
<td>50</td>
<td></td>
<td>EI Djaza'ir</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.935MHz</td>
<td>RTTY</td>
<td>50</td>
<td>400</td>
<td>SJA291</td>
<td>1546UTC</td>
<td>MENA Cairo</td>
</tr>
</tbody>
</table>

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARQ</td>
<td>Automatic ReQuest repeat</td>
</tr>
<tr>
<td>ASCII</td>
<td>American Standards for Computer Information Interchange</td>
</tr>
<tr>
<td>BARTG</td>
<td>British Amateur Radio Teledata Group</td>
</tr>
<tr>
<td>c.w.</td>
<td>continuous wave (Morse)</td>
</tr>
<tr>
<td>d.c.</td>
<td>direct current</td>
</tr>
<tr>
<td>dB</td>
<td>decibels</td>
</tr>
<tr>
<td>FAX</td>
<td>facsimile</td>
</tr>
<tr>
<td>FEC</td>
<td>Forward Error Correction</td>
</tr>
<tr>
<td>Hz</td>
<td>hertz</td>
</tr>
<tr>
<td>kHz</td>
<td>kilohertz</td>
</tr>
<tr>
<td>i.e.d.</td>
<td>light emitting diode</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>ROM</td>
<td>Read Only Memory</td>
</tr>
<tr>
<td>RTTY</td>
<td>Radio TeleType</td>
</tr>
<tr>
<td>s.s.b.</td>
<td>single sideband</td>
</tr>
<tr>
<td>u.s.b.</td>
<td>upper sideband</td>
</tr>
<tr>
<td>UTC</td>
<td>Universal Co-ordinated Time (=GMT)</td>
</tr>
</tbody>
</table>
Within a day or two of the start of the Gulf war, only one Russian weather satellite was left operating at v.h.f. METEOR 2/19 has remained transmitting on 137.85MHz throughout the period, while METEOR 3/2 was switched off. It is possible that other METEORS are transmitting higher resolution data. There should shortly be a change-over, possibly to METEOR 2/17, because 2/19 will run along the terminator. During mid-February NOAA 9 passed times coincided with NOAA 11 and so it hasn’t provided a.p.t. during this time.

FENGYUN 1-2 stopped transmitting a.p.t. data in early January though Dave Cawley tells me that he is still receiving the high resolution data (h.r.p.t.). The Russian oceanographic satellite OKEAN 2 transmits the occasional picture and, on February 10 at 1633UTC, I saw a live pass running along the terminator. Similar ones have occurred since. A screen dump from an OKEAN 2 pass last summer, showing south eastern Sweden can be seen in Fig. 2.

**SALYUT 7/COSMOS 1686**

This re-entered in early February over the South Atlantic and, fortunately, there appear to have been no casualties. I plotted the satellite’s Mean Motion (its number of revolutions per day), which increases prior to re-entry, the data from January 1 onwards was entered on a spreadsheet and the graph is shown in Fig. 1. The height was calculated every few days using old Kepler elements and finding that they can give inaccurate predictions was a problem for Peter Staunton who is an electronics engineer at University College, Dublin. He had problems trying to record live passes and finding that they didn’t appear at the predicted times. I dispatched a set to Peter in fact, good recordings could be obtained by just leaving the frequency set to which ever (NOAA) satellite is wanted, and adjusting the SQUELCH control on the receiver to a reasonably high level to eliminate the lower elevation passes. I do this occasionally with NOAA 11 for the midday pass if there is an interesting weather satellite system that I want to look at later.

**Spectrum Computer**

There have been more queries about satellite software for this computer. Alistair Harley asks whether I know of decoding hardware and predictions software for his Spectrum. As it happens Technical Software recently loaned me their modules to review for **SWM** which is published in **Weather Watching** - free with this issue! For those readers who have asked me about prediction programs here is the good news!

Victer Suller has written to me about his program which gives good results using standard Kepler elements. He has generously offered to make the program available if a suitable pre-paid cassette is sent. His address is 104 Grove Park, Knutsford, Cheshire WA16 8QB. My thanks to Victor for responding to my request.

**Amiga**

A letter from James Patton of Perth asked for recordings of a.p.t. data to try out his decoding system made for the Commodore Amiga 500, called Amigasat. He is the chairman of the local computer club and comments that his Philips monitor uses high persistence phosphors to overcome the dreaded Amiga flicker!

**PC Clones**

Tony Pattinson of Reading uses a Maplin receiver and decoder to feed his PC clone (this term is used to describe a computer which is built like the IBM PC clone and runs the same software) but says that he had to build a parallel-serial converter to get the data in. I would be very interested to hear from anybody who is using Maplin hardware because I have not located any specifications for their kits. Some readers say they work, others appear less fortunate!

B Martin of Bournemouth wrote to ask about bulletin boards that could provide Kepler elements for the weather satellites. I believe that this is being considered by the Remote Imaging Group (RIG) and I will publish details as soon as they are available. He also asks whether I could do a review of the VGASAT software produced by Timestep Weather Systems because, like an increasing number of people, he also has a PC clone computer and currently uses software from California. Timestep have told me that they will be bringing out a new version of VGASAT shortly for PCs with hard drives and from what I have heard about the software it sounds worth waiting for. Peter Cotton of Comar Electronics has also told me that they are releasing a new version of PC GOES soon and has offered to let me have a review sample.

Another reader wanting advice on software for PC clones is Philip Morris who has a fast PC compatible with super VGA. With that machine it is essential to buy a quality receiving system and so some study of the available hardware/software is required. **Weather Watching** should prove useful! There are a number of PC clones and one of the early ones was the Amstrad PC1640 which has the ECD (enhanced colour display) which has better screen clarity than the earlier standard. Ray McCrith wants to use his Amstrad for decoding purposes including weather satellite pictures. It will be necessary to buy suitable receiving equipment as well of course but **Weather Watching** should help you to work out a cost.

**General**

Some readers may have seen the piece...
AERIAL TECHNIQUES

NEW AKAI MULTI-STANDARD VCR PAL/SECAM/NTSC

- Multi System 10 Standard
- Quick Brand
- Quick Mile Search
- Quick Mile Scan
- NTSC
- PAL
- SECAM
- CTS (3) 30 & 60
- PAL D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.
- SECAM D/K.E.,
in the *Daily Telegraph* on January 23 which has led to some correspondence. A C Gabanski of Huddersfield wrote to ask where to begin in the field of satellite monitoring. This month’s special supplement should help! Letters arrive asking for Kepler elements and mentioning other radio work, as did John Lundy who is the chairman of Andover Radio Club. They have been decoding WEFAX and have just completed building a satellite receiver, and he promises to let me know how they get on. Bob Warriner operates the Proscan scanner and Prosat3 (I think that this is a version of VGASAT) software from Timestep Weather Systems and says that it all works very well except for OKEAN 2 data, which, he says, refuses to synchronise.

I use this software and on rare occasions there is a problem with OKEAN because it transmits various picture formats one of which might not be recognised by the software. If anyone finds this to be a problem Timestep have offered to make the necessary modifications. Most of my OKEAN data is recorded to allow me to analyse it later and I find that a trial run or two gives superb results - see Fig. 2 for a screen dump print.

**Keplers**

This is proving to be a popular offer! I receive several requests each week for copies of recent Kepler elements for the weather sats. Please remember to enclose an s.a.e. if you write for a set. I always annotate the list with the latest operating frequencies.

**Out of Sight**

A letter from Pat Gowen, asks whether anyone else has noticed the subhorizon satellite signals during periods of high solar flux, particularly last November? Pat comments that he has been receiving signals from UoSAT-3 on 435MHz about six minutes before it was due above the horizon! I have noticed some evidence of this with METEOR 3/3 when I followed it well below my western horizon in December. I have also heard NOAA 11 while still a degree or two below my western horizon.

**Frequencies**

The American NOAA satellites transmit on:
- NOAAs 9 and 11 - 137.62MHz;
- NOAA 10 - 137.50MHz;
- OKEAN 2 - 137.40MHz occasional transmissions.

The Russian METEORS 2/16 to 2/20 and 3/2 or 3/3 use 137.30, 137.40 or 137.85MHz when switched on. The Chinese FENGYUN 1-2 uses 137.80MHz, but has been off recently.

**Reports and queries**

Some letters have been held over until next month - correspondence on any satellite matter is welcome but please enclose an s.a.e. if you want a personal reply. I was recently made redundant from my full-time computing job so I shall unexpectedly have more time to respond!
In order to compensate for seasonal changes in propagation the S.W. broadcasters are permitted, by international agreement, to vary their operating frequencies and schedules up to four times a year, namely in March, May, September and November. Some changes to the information contained in this article can therefore be expected soon after this issue arrives on the bookstalls.

Unfortunately some S.W. broadcasters do not comply with the agreement and make changes without warning. Most listeners find that it is almost impossible to keep up with these stations' activities.

**Long Wave Reports**

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (GMT). Unless otherwise stated, all logs were compiled during the four week period ending 7/2/91.

Encouraged by his transatlantic l.w. reception last month, Alan Roberts (Quebec) checked the band most nights. Due to the high level of interference from local TV receivers, his search for European signals often had to be delayed until after mid-night (0500UTC). At sunrise in Europe, it was not continued beyond 0200 (0700UTC).

On January 9, he picked up a news bulletin in French on 216kHz at 0600UTC. The station confirmed Radio Monte Carlo, Monaco on 0630. He noted their signal via Roumoules (1400kHz) as SINPO 33333. On the 18th, three signals were heard, but definite ids could not be obtained. Classical music and announcements in German were noted on 172kHz at 0430. A woman speaking in Russian was heard on 171 at 0450, broadcast in Arabic and unrecognizable speech was heard on 207 at 0550, which rated 12222.

On the 24th, he heard a news bulletin, weather report and commercials in French on 183, 32222 at 0615. A signal was evident on 196 at 0625, rated 12222, but the low depth of modulation made it impossible to confirm that it was the BBC. In an attempt to improve reception, Alan is now constructing the I.W. preselector designed by Ray Howgego in SWM Dec’90.

Further to l.w. station identification (L.M.S Feb’91 SWM), Kenneth Buck (Edinburgh) offers the following suggestions. First, ascertain the direction of the incoming signal with a loop and compass, then refer to the maps in Dial Search, see Book Service. Record what sounds like a news bulletin, which may contain local news. Find someone who knows a foreign student at a University or College and ask him/her to translate the recording.

**MW Transatlantic DX**

The thrill of hearing m.w. transatlantic signals for the first time was experienced by Jamie Tullett in Co.Londonerry. At 2244 he picked up news signals from CJYQ in John’s, NF on 938 heard this by 0200. Around midnight: WFAN in New York, NY on 660 at 2315 and CKLM in Laval, Quebec 1530 at 2341. Much to his surprise, the broadcasts from VOCM in St. John’s on 950 were still audible at 0610.

The Caribbean Beacon, Anguilla on 1610 was heard for the first time by Bart O’Brien in Co.Wexford. Although their signal was weak it was quite clear. He says, "No doubt the fact that it is very isolated at the end of the m.w. spectrum helps in this respect."

Generally poor conditions were noted by Jim Willott in Wellington, with an absence of signals from the Caribbean and S.America. Nevertheless, S10333 signals were noted from CQYO in 830 at 2345 and CKGY in Moncton, NB 1220 at 0120.

Good reception of WINS in New York, NY on 1010 was noted by Tim Shirley in Bristol. On January 1, their signal was rated as S10344 at 2330. Eight east coast U.S. stations and seven in eastern Canada were logged by Simon Hamer while searching the band in New Radnor from 0000 until 0115 UTC.

**Other MW DX**

While checking the band at 2300, Simon Hamer picked up the sky wave component of the 1000kHz transmission from Negpur, India on 1560. At 0200 he heard the BBC via Masirah Island, Oman on 1413 (0300-0400). Sky wave signals from Garunay, Saudi Arabia on 900 (1000-1100) were received by Tim Shirley at 2030.

Some stations in Algeria were noted in the logs. Alan Bead 531 (600/ 12222) during 2300. Another station noted on 0232 by Sheila Hughes in Morden, Les Trelums 549 (6000kHz) as S10434 at dusk by George Millmore in Laval, Quebec.

**MW Local Radio DX**

Surprisingly, the 250W transmission from BCR.Kent via Ruston 1602kHz has been received during daylight by John Stevens in Largs! He can also receive BCR.Solent via Faraham 999 (1kW) during the day, but there is no trace of IOW Radio via Wootton 1242 until after 0200. Airport information Radio, Heathrow 1584 also becomes audible via sky wave paths after 0200, but so far the co-channel broadcast from Gatwick has not been heard.

David Porter (Kudlow) tells me that IRL Beacon Radio (WAB) now operates on 1017kHz from the BBC site at Shrewsbury, so no doubt they will be interested in reception reports from places near and far. That goes for others as well. I am looking forward to your reports.
The 17MHz Band

The 17MHz (16m) signals from R.New Zealand Int via Moosbrunn 21.490 to Eng at 1830, rated as 43554 at 0852 by Jim Cash in Swanwick; BFSF via Daventry 21.735 (Eng to Guif0930-1000) 23323 at 0945 by Robin Clay in Plymouth; BBC via Limassol 21.470 (Eng to Africa 0900-1745) SI0433 at 1000 in Oman; Vatican R. Rome 21.515 (Eng to Asia 1200-1230) 44444 at 1200 in Morden;SRV via Schwarzenburg 21.630 (Eng, Fr, Gerd to Middle East 1515-1630) SI0454 at 1600 by Cyril Kellam in Sheffield; BBC via Ascension Island 21.660 (Eng to S.Africa 0700-2155) SI0344 at 1500 by John Coulter in Winchester; BSKSA Riydeh, S.Arabia 21.565 (Ar to N.Africa 1100-1700) SI0544 at 1605 by Ted Agombar in Norwich; also on 2455 (u.s. p.c.) 44444 at 1920 by Darran Taplin in Brenchley.

Other 11m Signals

Those to other areas included R.Austria Int via Moosbrunn 21.490 to Eng at 1830, rated as 44444 at 0852 by Jim Cash in Swanwick; BFSF via Daventry 21.735 (Eng to Guif0930-1000) 23323 at 0945 by Robin Clay in Plymouth; BBC via Limassol 21.470 (Eng to Africa 0900-1745) SI0433 at 1000 in Oman; Vatican R. Rome 21.515 (Eng to Asia 1200-1230) 44444 at 1200 in Morden;SRV via Schwarzenburg 21.630 (Eng, Fr, Gerd to Middle East 1515-1630) SI0454 at 1600 by Cyril Kellam in Sheffield; BBC via Ascension Island 21.660 (Eng to S.Africa 0700-2155) SI0344 at 1500 by John Coulter in Winchester; BSKSA Riydeh, S.Arabia 21.565 (Ar to N.Africa 1100-1700) SI0544 at 1605 by Ted Agombar in Norwich; also on 2455 (u.s. p.c.) 44444 at 1920 by Darran Taplin in Brenchley.
58 entries were logged during daylight or at dusk. 

**The 15MHz Band**

Although the 15MHz (19m) signals from R.New Zealand Int. are for listeners in Pacific areas they have reached the UK some evenings. Their 100kW signal was logged in N.London as 33333 at 0845. Some of those to other areas stem from R.Australia via Carnarvon 13.745 (Eng to S.E.Asia 1400-2100) was noted at 2137 in Bungay; RCI via Yamata 11.705 (Eng to Europe, N.Africa 1150-1215) S10444 at 2315 in Birmingham; WHRI Noblesville 13.700 (Eng, Sp, Port, Yu 1700-0000) 44444 at 2125 in Worthing; WINB Red Lion 1.165 (Eng 2002-2245) 24322 at 2210 in Co.Down.

**19m to Europe**

Many broadcasters use 19m to reach Europe. Among those noted were R.Sophia, Bulgaria 15.160 (Eng 0730-0800) S10444 at 0730 in Bristol; RCI via Sackville 15.325 (Fr,Eng 1700-1730) S1055 at 1716 in Edinburgh; R.Algiers via Sackville 11.945 (Eng to S.E.Asia 1500-1600) 34343 at 1530 in Swanwick; RAE Buenos Aires, Argentina 15.345 (Ar, Eng, Ger, Sp, Yu 1515-1700) rated 44444 at 1716 in Worthing; WINB Red Lion 1.165 (Eng 2002-2245) 24322 at 2210 in Co.Down.

**The 13MHz Band**

The 13MHz (22m) broadcasts to Europe include R.Austria Int. via Moosbrunn 13.730 (Ger, Fr, Sp, Ar 1400-1700), rated 54444 at 0015 in Wallsend. GODR Tehran 13.864 (Para to Europe 1300-1400) 44554 at 1600 in Norwich; UAE.

**Long Wave DX**

<table>
<thead>
<tr>
<th>Freq</th>
<th>Fix</th>
<th>DXer</th>
<th>Station</th>
<th>Country</th>
<th>UTC</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>SBA</td>
<td>B</td>
<td>W2XCA</td>
<td>New York</td>
<td>1400</td>
<td>A</td>
</tr>
<tr>
<td>500</td>
<td>BDI</td>
<td>B</td>
<td>KOSM</td>
<td>Dallas</td>
<td>2200</td>
<td>A</td>
</tr>
<tr>
<td>1200</td>
<td>ZCU</td>
<td>B</td>
<td>W9XM</td>
<td>Illinois</td>
<td>2200</td>
<td>A</td>
</tr>
<tr>
<td>1800</td>
<td>WEQ</td>
<td>B</td>
<td>KMGR</td>
<td>Kansas City</td>
<td>2200</td>
<td>A</td>
</tr>
<tr>
<td>2400</td>
<td>KDK</td>
<td>B</td>
<td>KQFN</td>
<td>Green Bay</td>
<td>2200</td>
<td>A</td>
</tr>
<tr>
<td>3000</td>
<td>W8A</td>
<td>B</td>
<td>W6XMT</td>
<td>Los Angeles</td>
<td>2200</td>
<td>A</td>
</tr>
<tr>
<td>3600</td>
<td>WZK</td>
<td>B</td>
<td>W9XM</td>
<td>Illinois</td>
<td>2200</td>
<td>A</td>
</tr>
</tbody>
</table>

**Transatlantic DX**

**USA**

<table>
<thead>
<tr>
<th>Freq</th>
<th>Station</th>
<th>Location</th>
<th>UTC</th>
<th>DXer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500</td>
<td>W4W</td>
<td>New York</td>
<td>1400</td>
<td>A</td>
</tr>
<tr>
<td>1700</td>
<td>W2B</td>
<td>Boston</td>
<td>1400</td>
<td>A</td>
</tr>
<tr>
<td>2000</td>
<td>W2W</td>
<td>New York</td>
<td>1400</td>
<td>A</td>
</tr>
<tr>
<td>2300</td>
<td>W2W</td>
<td>New York</td>
<td>1400</td>
<td>A</td>
</tr>
<tr>
<td>2900</td>
<td>W2W</td>
<td>New York</td>
<td>1400</td>
<td>A</td>
</tr>
</tbody>
</table>

**Canada**

<table>
<thead>
<tr>
<th>Freq</th>
<th>Station</th>
<th>Location</th>
<th>UTC</th>
<th>DXer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500</td>
<td>CJO</td>
<td>Saint John</td>
<td>1400</td>
<td>A</td>
</tr>
<tr>
<td>1700</td>
<td>CJO</td>
<td>Saint John</td>
<td>1400</td>
<td>A</td>
</tr>
<tr>
<td>2000</td>
<td>CJO</td>
<td>Saint John</td>
<td>1400</td>
<td>A</td>
</tr>
<tr>
<td>2300</td>
<td>CJO</td>
<td>Saint John</td>
<td>1400</td>
<td>A</td>
</tr>
</tbody>
</table>

Jim Cash’s listening post in Swanwick.

In large Largs; Aligarh, India 11.620 (Eng to Europe 1845-2230) S10444 at 2125 in Lytham St.Annes; R.Damascus, Syria 12.085 (Eng to USA 2110-2210) S10544 at 2137 in Bungay; RCI Yamata 11.705 (Eng to SE.Asia 2200-2230), noted as poor in Derby; VOFC Taiwan via Chieko 11.915 (Eng to Europe 2200-2230) S10444 at 2210 in Alwince; R.Japan Rovia 11.835 (Eng to Europe, N.Africa 2200-2300) S10444 at 2315 in Brighton; R.Finnland via Pori 11.755 (Eng, Fr, Sw to USA, S.America 0000-0125) S10544 at 0015 in Wallsend. Signal potentials from R.Netherlands Int. have reached the UK in the 9MHz (31m) band some mornings. At best, their signal on 9.700 (Eng to Pacific areas 0630-1110) was 44444 at 0810 in Dolgeloua and 34343 at 1045 in Torquay.

Afternoons on 31m

Some of the 31m broadcasts noted during the afternoon stemmed from WRNO New Orleans, USA 9.715 (Eng to USA, C.America 1200-1400, Sunonly), noted as 23222 at 1246 in Plymouth; VQ1R LG9 9.565 (Eng to SE.Africa 1330-1500) S10444 at 1420 in Brighton; BBC via Lisslun 9.680 (Eng to Europe 0900-1515) S10555 at 1455 in Slough; R.Pyongyang, N.Korea 9.325 (Eng, Fr, Russ, Kor, Sp, Ger to Europe 1300-1500, also to USA), noted as 33333 at 1510 in Moscow; BBC via Kranj 9.740 (Eng to S.Africa 1515-1830) 34343 at 1530 in Northampton; Voice of Vietnam, Hanoi 9.840 (Eng to Africa 1600-1630) S10333 at 1614 in Macclesfield.

Later, VQ1R Tehran 11.922 (Eng to Europe 1930-2020) was S10544 at 1950 in Lytham St.Annes; R.Cairo, Egypt 9.900 (Eng, Fr, Ger to Europe 1800-2235) 44444 at 2115 in Brechinley; R.Vilnus, Lithuania 9.750 (Eng to USA 2200-2330) 44333 at 2131 in Sunderland; R.Tirana, Albania 9.780 (Eng to USA 2200-0000) S10544 at 2330 in Bournemouth; Voice of Israel, Jerusalem 9.835 (Eng to W.U.S.A, Europe 0000-0301) 45554 at 0005 in Wallsend.

The 7MHz Band

Good reception has been noted in the 7MHz (41m) band from BBC via Tsang, Tsou, Hong Kong 7.190 (Eng to C.Asia 1500-1515) S10343 at 1515 in Northampton; AIR:Via Delhi, India 7.412 (Hnto S.Africa 1515-1741) 45243 at 1530 in Brighton; R.Korea, Seoul 7.530 (Fr, Kor, Ar, Ger, Eng, Sp, Port 1545-2345)
C.M. HOWES COMMUNICATIONS

**ACTIVE ANTENNA FOR SCANNERS**

The HOWES AA4 Active Antenna gives full coverage from 25 to 1300MHz. It is designed to be the ideal solution for those requiring a compact, broadband antenna for use with scanning receivers. The AA4 features advanced technology with a low noise microwave IC amplifier.

- **Fully broadband covering 25 to 1300MHz.**
- **Low noise microwave IC, NFO, Over 10dB gain. IP3 +15dBm.**
- **Coax powering 12 to 14V DC at less than 20mW.**
- **10dB switched attenuator on the receiver interface board.**
- **16 inches long, 1.2 inches wide. Easy to build or buy ready built modules.**

If your scanner reception could benefit from the addition of a remotely located antenna, or you would like a much more powerful, more compact alternative to the ugly discrete types, then the HOWES AA4 Active Antenna could be the ideal solution for you. Please read the review in the November '90 Short Wave Magazine. Excellent performance in a small size.

**AA4 Kit:** £18.80

**Assembled PCB modules:** £24.90

---

**HF SSB and CW RECEIVERS**

Our range of simple, but very effective receivers opens up the world of long distance radio communications for a very modest outlay. Most of the kits listed below are designated for use with various amateur bands. Give us a ring to discuss your requirements for frequencies not shown here.

The kits contain the electronics to build the receivers. "Hardware packages" contain the mechanical items (case, dial, knobs, sockets etc.) to go with the "works" supplied in the basic kit. In addition, all our amateur band receivers have matching transmitters to suit the Novice and full amateur licence. These can be combined with other kits to form complete transceiver projects.

**Kit** | **Assembled PCB**
--- | ---
**SSB/CW RECEIVERS**
**DXR10** | £24.90 | £36.90
**DecRx4** | £15.60 | £21.50
**DecRx20, 40 or 80M** | £15.60 | £21.50
**DecRx10 Hardware package:** | £14.00 | £19.00
**Receiver Accessories**
**CBA2** | £5.80 | £8.90
**CSL1** | £5.80 | £8.90
**DCS2** | £8.90 | £12.90
**DFDS** | £9.90 | £14.90
**XMIC** | £16.90 | £24.90

**CV100 - ADD SHORTWAVE TO YOUR SCANNER!**

This kit converts 1 to 40MHz, up to 101 to 140MHz so you can tune these frequencies with a normal VHF scanner. No mods to the radio are needed.

**CV100 kit:** £25.90

**PLEASE ADD £1.20 P&P to your total order value.**

**HOWES KITS** are produced by a professional RF design and manufacturing company. They contain a good quality printed circuit board with screen printed parts locations, full clear instructions and all board mounted components. Sales and technical advice are available by phone during office hours. Please send an SAE for our free catalogue or specific product data sheets.

---

**73 from Dave G4KQH, Technical Manager.**
### Equipment Used

- **Adogmer, Norwich:** Grundig Satellit 400 + r.w.
- **Thomas Barnett, Stouph:** Kenwood R-2030 + r.w.
- **Lee Bar, Sunderland:** Matsui MR-4099 + r.w.
- **Darren Beasley, Bridgwater:** Philips D9255 + a.t.u. + 10m wire.
- **Donald Bisshopp, Oteiheim:** Grundig Satellit 500 + built-in whip.
- **Dennis Bashor, Detroit:** Matsui MR-4099 + r.w.
- **Kenneth Back, Edinburgh:** Lowe HF-225 + r.w. in loft or on pole.
- **Jim Cash, Swindon:** Kenwood R-5000 + trap dipole.
- **Bill Clark, Rotherham:** Sony ICF-SW7000 + r.w.
- **Robin Clark, Plymouth:** Sachs DX9000 + 15m wire.
- **Phil Cooper, Guernsey:** Sony ICF-7600DS + r.w.
- **John Couther, Winchester:** Yaesu FRG-7 + r.w.
- **Ron Damp, Wonthor:** Racal RA71 - chimney mounted whip.
- **Peter Eastan, Edinburg:** Kenwood R-5000 + trap dipole.
- **Doug Eastwood, Wallsend:** Trio R-600 + inverted V trap dipole.
- **Caron Frissze, Co-Lease:** Goodmans ATS-501.
- **Ron Galliers, London:** Philips DF9255 or Fairfax HF-100 + built-in whip.
- **Alf Gray, Birmingham:** Cador CR70 + P9100 + a.t.u. + Ex-Army whip.
- **Simon Hamer, New Radnor:** Lafayette HE280 or Grundig S4100 + loop.
- **Robyn Harlow, Bourne:** Matsui MR-4099 + r.w.
- **Mark Hayward, Brislington:** Yaesu FRG-7 + AI11000 + 3.3m wire.
- **Francis Heame, Bristol:** Sharp GPAS 3 cassette radio + r.w.
- **Paul Hilton, Newbury:** Sony ICF-2001 + Dexta, AD240.
- **Simon Holland, Douglas, IM:** Sangean ATS-403 + built-in whip.
- **Sheila Hughes, Morley:** Sony ICF-7600DS, Vega 206, or Panasonic DR48.
- **Rhodoclip Illiman, Thame:** Onan Sony ICF-7600DS + 23m wire.
- **Clym Kellam, Sheffield:** Realistic DX600 or Sony ICF-7600DS + 5m wire.
- **Eddie McKeehan, Co.Down:** Dagturn TM2126.
- **George Millermore, Westow, IV:** Dagturn TAMP 1720 + (uv/r.w. loops.
- **John Naze, Brightdon:** Kenwood MR-4099 + r.w.
- **Bart O'Connell, Co.Wexford:** Sony ICF-2001 + hexagon loop.
- **John O'Halloran, Harragate:** Radio RA71 + r.w.
- **Fred Pallant, Stornington:** Trio R-1000 + built-in whip.
- **John Parry, Northwic:** Realistic DX400 + 33m wire.
- **Roy Patrick, Darley:** Low HF-125 + 44m wire.
- **Ron Prisco, Barney:** Home Built UV 1001/SRJ straight RX.
- **Philip Raeburn, Macelfield:** Int. Marine Radio T-7000 + r.w.
- **Kenneth Reece, Penrith:** Icom RB900, Kenwood R-5000 or JVC NRD 525 + 24m.
- **Alain Roberts, Quebec, Canada:** Low HF-225 + r.w.
- **John Robinson, Alton:** Lowe HF-225 + 24m + r.w.
- **Tim Shirley, Bristol:** Trio R-600 + loop or r.w.
- **Chris Shorten, Norwich:** Matsui MR-4099 + 10m wire.
- **Alan Smith, Northampton:** Matsui MR-4099 + MoHue KK-3 k.t. + r.w. + r.w. + 14m.
- **Cliff Stapleton, Torquay:** Trio R-1000 + dipole or 25m wire.
- **John Steiner, Long:** Hammarlund HC 180 + loop or r.w.
- **Darrin Taplin, Brenchley:** Yaesu FRG-7700 + 7700 active antenna.
- **Phil Wrenchon, St Albans:** Sangean ATS-310 + built-in whip.
- **Jim Willett, Grimly:** ICA AR17 + Diawla C2-22 + 4m square fixed loop.
- **Ken Willis, Scarborough:** Kenwood R-2000 + 10m.
- **Julian Wood, Eign:** Kenwood R-2000 + Yaesu FR770-7000 + 5m wire.

### Tropical Stations

<table>
<thead>
<tr>
<th>Frequency MHz</th>
<th>Country</th>
<th>City</th>
<th>Equipment Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.675</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.685</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.695</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.705</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.715</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.725</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.735</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.745</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.755</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.765</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.775</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.785</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.795</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.805</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.815</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.825</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.835</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.845</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.855</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.865</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.875</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.885</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.895</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.905</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.915</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.925</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.935</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.945</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.955</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.965</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.975</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.985</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>3.995</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.005</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.015</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.025</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.035</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.045</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.055</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.065</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.075</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.085</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.095</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.105</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.115</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.125</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.135</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.145</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.155</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.165</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.175</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.185</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.195</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.205</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.215</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.225</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.235</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.245</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.255</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
<tr>
<td>4.265</td>
<td>Italy</td>
<td>Genoa</td>
<td>Dell Satellite 660</td>
</tr>
</tbody>
</table>
INDEX TO ADVERTISERS

Aerocraft Techniques ........................................... 54
Air Supply .......................................................... 40
Allytronics ............................................................ 44
Amdata ................................................................. 18
ARE ................................................................. 14
ASK Electronics .................................................... 26
Ballard, Nigel ....................................................... 61
Bredhurst .............................................................. 39
Cap Co ................................................................. 40
Camden Mini Steam ............................................. 50
Chevret Books ..................................................... 59
Colomar Electronics ............................................. 59
Comar ................................................................. 50
Dexton ................................................................. 29
Dewsbury Electronics ........................................... 43
Dressler Communications ................................ 39
ERa ................................................................. 59
FJP Kits ................................................................. 34
Flightdeck ........................................................... 54
Garex ................................................................. 34
Howes, CM Communications ......................... 59
Hunterdon Aero Publishers .................................. 23
Icom (UK) ............................................................ Cover iii
Interbooks ........................................................... 18
J. & P. Electronics ............................................... 31
Javieron Radio ...................................................... 31
Lake Electronics .................................................. 54
Link Electronics .................................................. 34
Lowte Electronics ................................................. Cover ii, 8, 9, 25
Martin Lynch ......................................................... 21
Mauritron Electronics .......................................... 34
Nevada Communications .................................. Cover ii, 16, 17
Phase Track ............................................................ 25
PW Publishing ....................................................... 50
RGW Electronics .................................................. 31
Radio Research .................................................... 34
Radio Shack ........................................................ 61
Rapid Results College ....................................... 25
Raycom ............................................................... 47
Rhylands FG ......................................................... 59
SRP Trading .......................................................... 32
Solid State Electronics ...................................... 54
South Midlands Communications .................. 13
Spaceitech ............................................................. 26
Stephens Jammers ............................................... 44
System Request .................................................... 50
Technology Partners .......................................... 54
Timetest Electronic ............................................ 25
Waters & Stanton ..................................................... 22

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

While the Publishers will give whatever assistance they can to readers having complaints, under no circumstances will the magazine accept liability for non-receipt of goods ordered, or for late delivery, or for faults in manufacture. Legal remedies are available in respect of these circumstances, and readers who have complaints should address them to the advertiser or consult a local Trading Standards Office, a Citizen's Advice Bureau, or their own solicitor.

SCANNERS FROM RADIO SHACK

SUPER BARGAINS IN REALISTIC SCANNERS!

PRO-38 10 Channel handy scanner (£99.95) ........................................ £91.95
PRO-2022 200 Channel search & scan (£249.95) ................................... £205.00
PRO-2024 60 Channel search & scan (£179.95) ................................... £99.95
PRO-34 200 Channel handy search & scan (£249.95) ................................ £199.95
PRO-2006 400 Channel with fabulous performance (£349.95)........ £249.95
AR-800E Hand-held 75-105, 118-147, 406-455 & 830-950MHz £169.00
AR-900 UK Hand-held with 4 search ranges ................................ £199.00
AR-950 Base/mobile scanner .................................................. £249.00
AR-1000 Series II 0.5-650 & 805-1300, 1000 memories £249.00
AR-2002 25-550 & 800-1300MHz ............................................. £478.00
AR-3000 All mode scanner 10khz-2036MHz ................................ £765.00
Kenwood RZ-1 Wide band coverage ........................................... £685.00
Icom IC-9000 25-2000 high performance receiver/scanner ................ £395.00
Icom IC-1000 100khz-1000kHz 100 memories handy £395.00
Icom IC-A1 100khz-1000kHz base/mobile .................. £485.00
Black Jaguar AM/FM handy scanner ..................................... £199.00
Bearcat UBC-200XL Wideband £229.00
Jupiter MVT-5000 Hand-held 100 memories £249.00
Jupiter MVT-6000 Base/mobile version £259.00
Fairmate HP-200E Wideband 100-600 & 800-1300kHz £269.00

We will be pleased to quote you for anything you require in the communications and computer field. In order to avoid a great deal of time wasting on parts, we now deal with callers by appointment. We are pleased to hear from you and see you. We aim to give you the attention you deserve, so please call us first.

73s Terry Edwards G3STS

RADIO SHACK LTD
188 Broadhurst Gardens, LONDON NW6 3AY

Tel: 071-624 7174 Fax: 071-328 5066
FOR SALE - Two computers for use with above, computer for use with above, new, £180. Also suitable laptop FOR SALE PK-232 decoder, as (0256) 468649.

54 Queen Mary Avenue, AOR3003scanners.J.P. Wright. erage receiver or AOR2002 or WANTED good general cov-

gently a 934 home -base or GBX4000 mobile CB and ur-

Ace Cooms 2515 scanner 5-

RX loads of software, sold all (Norwich).

FOR SALE Kenwood R5000 re-

receiver, mint condition, a.m. fil-

ter, boxed with manual, com-

puter interface and software available forAmstrad6128E700 o/n.(0253) 73158 (Lancs).

FOR SALE Amiga 500 external drive, FM2/AM2 digital data controller (RTW, c.w., ASCII, packet, SSTV, FAX, AMTOR, Navtex h. v. h. TX, RX, ICS SSTV, ICS FAX, both latest ver-

sion including interface for TX RX loads of software, sold all together EBT. Also Realistic h.f. RX/DX302 good worker E5R. AOR Ace Cooms 2515 scanner 5-

1500MHz gaps superb US export £475. 081-476 9737.

FOR SALE/EXCHANGE Eddys-

tone 680XH57/670a receivers, both require attention. Yamaha 505cc single cylinder motorcycle, approximate value £500.

WANTED good general cov-

erage receiver or AOR2002 or AOR2005, any type of receiver, matched or not, £60. Tel:654321 (Marlborough).

FOR SALE RX-8 (BBC version) inc satellite decoding module. Total cost as new £200, im-

maculate condition quick sale £160. Tel:091-548 5586.

Write out your advertisement in BLOCK CAPITALS - up to a maximum of 30 words plus 12 words for your

name. Please enclose a covering letter to Trading Post, Short Wave Magazine, 78 St. Enoch House, The Quay, Poole, Dorset BH15 1PP. You must send the flash from this page, or your subscription number as proof of purchase of the magazine. No traders or for equipment which is illegal to possess or which cannot be licensed in the UK will be accepted.

FOR SALE Pye Pic3 needs at-


FOR SALE Grundig Yacht Radio 1970 vintage complete with all bui-

ted in extras. Offers for or exchange for an-

tenna or a.t.u. (Tel:0272) 860031 (St.Albans) after 6pm.

WANTED Up to £500 for near mint vintage communications receiver, makes in order of preference, Eddystrone, Hal-

lcraffer, HRO, Racial, Marconi services other considered. Taylor, 27 Christofer Way, Emsworth, Hants.


FOR SALE Over 'spilt' of P/V s.a.e. for list, buy/ sell 15p each. Mike Evans, 120 Loughton Way, Buckhill Essex, ISG 6A.9.

FOR SALE Kenwood R-5900 working perfectly, 1 year old, 8000 Irish Pds o.n.o. 'Taran' Brit-

ish registered p.s.u. 14.3 70VA as new,3000 Pds o.n.o. HRO receiver. N. Cameron E4DZ, 16 Sy Mrs's Crescent, Westport, Co. Mayo, Eire.

FOR SALE WIN108 airband scanner with complete with carry-

ing case, boxed, mint condition, as new, 12 months old, £110. Peter. Tel.: 071-274 9221 after 6pm.

FOR SALE Realistic DX400 re-

ceiver, a.m.150Hz-30MHz, f.m. 87.4MHz-108MHz. Modified an-

tenna input to accept 3.5mm jack, instructions, good condi-

tion, £55. John Fryer. Tel.: 081- 535 2208.

WANTED Instructionmanual for Grundig Satellit 2000 interna-

tional. Good price paid. Tel.: (0253) 155506 (Cardiff).

FOR SALE Collector's piece. National HRO Type TM communications receiver (ex-WWW) complete with full coil-set in con-

tainer plus extra coils, instructions, accessories, accessories, etc. Buyer collects. Offers please.John Tel: (0844) 339211 (Bucks).

FOR SALE Fairimate HP100e hand held scanner/communications receiver, boxed complete with NICads and charger, £210. 27 alkali Dry batteries, Durrington, Shetland Is. Tel: (0950) 659129.
ICOM are proud to introduce the IC-R72 Communications Base Receiver to complement the IC-R100 Mobile and IC-R1 Handheld receivers giving the enthusiastic listener a full choice.

Features:
- Direct Frequency entry
- 99 Memory Channels
- Built-in clock and timer
- AC/DC operation
- Noise Blanker
- Pre-amp and Attenuator
- ICOM's DDS system (direct digital synthesiser)

IC-R72 Communications Receiver
ICOM's communication receivers have a reputation for reliability and quality. Building on this reputation the IC-R72 HF receiver is one of a new line of wideband receivers to satisfy listeners everywhere. This compact receiver has continuous coverage from 100kHz—30MHz, in SSB, AM and CW modes. An optional UI-8 adds FM reception. The easy to operate IC-R72 is superb for beginners or experienced DX'ers alike and is equipped with a variety of functions. The IC-R72 joins ICOM's current line of quality receivers. For a free brochure on this or any other ICOM Amateur Radio product contact your local authorised ICOM dealer or ICOM (UK) Ltd.
MEET THE FAMILY

AOR, suppliers of the best scanning radios in the world invite you to meet the family. Ranging from the handy AR-900UK to the mighty AR-3000, the AOR range is designed to satisfy the needs of every listener. When you buy AOR, you know you are supported by a company with a long history of designing and producing scanning receivers, and they only produce the best. When you buy from Lowe Electronics, that support is even greater, because no-one in Europe knows more about the hobby of listening than Lowe. Shown here are just four models from the range.

AR-900UK. Covers 108-136, 137-174, 220-280, 300-380, 406-470 and 830-950 MHz. This massive coverage gives you airband (VHF and UHF), marine, amateur, land mobile and everything else worth listening to. 100 memories, scanning, searching; all that you want in a modestly priced handheld. Comes complete with rechargeable batteries, charger, two aerials.

AR-1000. Took the world by storm and now in its Series II form is even better. Continuous coverage from 500 kHz to 600 MHz and from 805 to 1300 MHz makes the AR-1000 unbeatable in its class. 1000 memory channels and AM/FM/Broadcast FM modes mean that you can hear everything that's going on. We supply it complete with the famous DA-900 wide band gain aerial, rechargeable batteries, mains charger, dc power lead, carrying case, everything you need. Join the thousands who are using and enjoying the AR-1000.

AR-950UK. A desk top or mobile version of the AR-900UK with the same frequency coverage plus the 60-88 MHz low band VHF land mobile range. Operates from 12 vdc for mobile use or at home with a simple mains power unit. Extra front end band pass filters for better performance, and ease of use thanks to the AOR skill in design make the AR-950UK a firm favourite with serious listeners.

AR-3000. Truly the ultimate receiver, the AR-3000 covers the frequency range from 100 kHz all the way to 2036 MHz — without any gaps at all. From Long Wave right through to satellites, the AR-3000 will cope with it all. All mode — AM, FM (wide), FM (narrow), USB, LSB, CW; means that you can keep track of aircraft on the long haul journeys when they switch to HF SSB. Listen to the world on Short Wave, to the BBC on Medium Wave, even to TV sound on UHF; nothing can escape the AR-3000. There has never been another receiver to compare to this amazing achievement from AOR.

An information pack and a free copy of our “Listeners’ Guide” is available upon receipt of your name, address and four 1st class stamps.

LOWE ELECTRONICS LTD
Chesterfield Road, Matlock, Derbyshire DE4 5LE Tel: 0629 580800 Fax: 0629 580020

*BOURNEMOUTH: 0202 577760 *BRISTOL: 0272 771770 CAMBRIDGE: 0223 311230 *DARLINGTON: 0325 486121
*GLASGOW: 041 945 2626 LONDON (EASTCOTE): 081 429 3256 LONDON (HEATHROW): 0753 45255
S WALES (BARRY): 0446 721304

*Closed all day Monday

Listeners in the know, know Lowe