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More Advanced RTTY
Dewsbury DM-1000 Reviewed

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Cover:
The Yupiteru VT 225 is the subject of the SWM Test Report on page 34, where Chris Yates reveals all about this great little hand-held. The cover shot shows the advantages of listening to the airband channels, hear those parachutists as they prepare to jump!
The Airband Special Feature in the February issue went down particularly well, as you can see from some of the letters published this month.

For the rest of the year, we have several very interesting specials lined up for you. Next month we will home in on the religious broadcasters - those very popular short wave broadcast stations around the world listened to by many of our readers.

Novice Licence Review

The first year of the newly introduced Novice Licence will be the subject of a review by the Radio-communications Agency. They would like as much input as possible from any readers, including instructors, who have had experience of the Novice Licence, Test or courses.

As at the end of January some 272 Novice Licences had been issued; mostly Class B. It is interesting to note, though, that a further 487 had passed the Test, but had not yet applied for a licence! I wonder why?

If you have any comments to make, then the Secretary of the Novice Licence Review Group, Room 613, Waterloo Bridge House, London, SE1 8UA, would like to hear from you.

Reaction

I know from your comments that you enjoyed the constructional articles that have appeared in SWM. Well, next month, all being well, I plan to start a series of articles detailing the construction of a novel receiver with reaction designed by well-known author, Ian Hickman.

This project will cover the 3.5MHz (80m) amateur band and should give constructors a great deal of pleasure as they listen to amateur single sideband and Morse transmissions on a receiver of their own creation.

Dear Sir

First may I thank you for such an enjoyable and informative publication.

I read with interest your novel feature regarding the construction of a short wave crystal set in the December issue.

Although I was unable to enter the competition as I had no time to make one until the Christmas holidays, I did indeed find the results quite staggering, with the reception of stations from all over the world obtained within the first few hours.

This simple project can help greatly with the understanding of radio; I spent some time finding the best coil arrangement, capacitor and diode. However, it also raised questions with regard to the more complex theory of radio, one example being the properties of inductors and tuning capacitor in the tuned circuit relating to the Q obtained. I found a great improvement using the toroidal coil over an alternative coil wound on a ferrite rod.

Perhaps SWM could cover these subjects in more depth in future issues.

The equipment I normally use is a Sony ICF-7600DS radio, a T and a pi a.t.u. with random wire antennas in the loft, Howes and Maplin audio filters, v.h.f. dipole in the loft, 15in and hexagonal loop m.w./l.w. antennas and an ERA Microreader MkII.

M. Smith
Warwickshire

Components for SWM Projects

In general all components used in constructing SWM projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

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

Limited stocks of most issues of SWM for the past five years are available at £1.80 each including P&P to addresses at home and overseas (by surface mail).

Binders, each taking one volume of the new style SWM, are available at £34 (UK), £37 (Europe) and £39 (rest of world).

Orders for p.c.b.s, back numbers, binders, each taking one volume for which the binder is required. Prices include VAT where appropriate.

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

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

Dear Sir

Following the two recent articles in SWM on the subject of non-directional beacons and aero Radiobeacons in February, I have become interested in this aspect of DXing.

I have found that I can indeed receive a substantial number of these stations and many of them have been logged in my s.w.l. logbook.

However, I have also found that I am able, with my receiving station, to DX these beacons well into Europe, but alas have no way of identifying a large number of them. Can any reader inform me as to where I can purchase a publication that will enable me to do this?

My thanks to Ben Nock, Percy Tannac and Colin Frowen (as well as SWM) for their articles on a very interesting aspect of the short wave hobby.

Leighton Smart GWOLBI/GW20049
Trelewis
Dear Sir
I feel I must congratulate, through your pages, the staff of the Tatung UK Service Division and C.M. Howes Communications.

A few months ago, the whip antenna on my Tatung TMR7602 (an excellent receiver) broke. Despite searching through various catalogues and a visit to my dealer I could not obtain another antenna the same length. Luckily in a TV servicing book I noticed the address of the Tatung UK service division and although it stated 'trade only' I still sent my order. Imagine my surprise when I received a quotation within three days of me posting my enquiry. I sent off a cheque straight away and received my antenna after another three days. A truly fantastic service considering I am not in the trade.

I must also congratulate the staff of C.M. Howes Communications. I posted an order to them for an antenna kit and was really pleased to receive my goods within five days. I understand large companies can meet speedy delivery times, but speedy dispatch like this from a small company and a service department (and the Post Office), in my view, certainly deserves congratulation.

A Hammond, Stroud

Dear Sir
I am afraid that Mr J Alton in his letter in the February 1992 issue of Short Wave Magazine is at fault with his equipment terminology. The TR9, as I recall, was a fairly short range high frequency telephony transceiver, using 2V valves with a 2V enclosed h.t. battery and a 2V rechargeable acid cell. It was crystal controlled and I am not sure how many channels it had. I know it could be operated on the 'darkie' (dark) or emergency frequency of 6.44MHz. There was certainly no box of coils associated with it.

A neat case of coils was, however, used in the 1082 receiver, used with the associated 1083 transmitter. This was the c.w. fore-runner before the 1154/1155 was introduced. The 1082 was a straight set 2 x r.f. - detector and 2 a.f. (five valves) with volume and reaction and 2 plug in coils with two tuning controls. I believe the aerial coils were coloured green and the anode coils red. The case contained the necessary green and red coils to cover the ranges covered by the set.

The 1083 transmitter consisted on two quite large valves (master oscillator and power amplifier) with associated coils. The heaters were driven by the main aircraft supply, h.t. was provided by a motor generator giving 1000V. A trailing antenna was used on one of the ranges.

R J Speed G3XPV
Shenfield

Dear Sir
I bought the February '92 issue to use with GB2SCB, a Scout Communicators Badge course. The item on airband beacons was of interest, so on January 27 (cold & foggy here) I had a listen using an FT-767GX with a 14MHz dipole at 30ft. I also used the audio peak filter and the narrow band c.w. filter to sort out some signals. Please thank Ben Nock.

One other comment is about the Hawarden beacon. Its letter is quite weak on 1414KHz, while it was strong on 1415KHz. I have no idea of the location of most of these beacons, but had a fine hour making the list.

Thanks for a nice mag. I always buy it when I am going to do a lot of listening. It's the best listeners' magazine.

Albert Heyes, Warrington

Dear Sir

The letter from John L Alton regarding his early experiences in the Royal Air Force was interesting, but as my memory serves me, being a wartime wireless operator mechanic, seems to contain errors.

The TR9, as I recall, was a fairly short range high frequency telephony transceiver, using 2V valves with an enclosed h.t. battery and a 2V rechargeable acid cell. It was crystal controlled and I am not sure how many channels it had. I know it could be operated on the 'darkie' or emergency frequency of 6.44MHz. There was certainly no box of coils associated with it.

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

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to other magazines. The views expressed in letters published in this magazine are not necessarily those of Short Wave Magazine.
Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. April 21 - Problems Relating to Remote Control of Small Loop Antennas, discussion led by G4OXK. Paul Truth GW4QG. 01-738 2561.


Barnsley & DARC: Mondays, 7.15pm. Darton Hotel, Station Road, Darton, Barnsley. April 6 - Talk by Radiocommunications Agency, 13th - Theatre Lighting by GSX5V. 27th - Getting Started on Satellites by G4LEU. Ennie G4JUE (0258) 716539.


Chelmsford ARS: 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford. April 6 - RTTY/AMTOR & Usability of Satellite by G3EDM. Roy Martyr. Chelmsford 352252 ext 3815.

Conwy Valley RC: 1st Thursdays, 7.15pm. The Studio, Penrhos Drive, Colwyn Bay, Clwyd. April 2 - Visit by Dragon ARC, "Return Debates". Merfyn Jones GW4ANNL. 72b Princes Drive, Colwyn Bay, Clwyd. (0492) 530725.

Derby & DARS: Wednesdays, 7.30pm. 119 Green Lane, Derby. April 1 - Foolish Junk Sale. 8th - AMTOR, What it is & How it Works by G3DFD. 15th - Radar; The Early Years by G0KII. 22nd - Video Show, 29th - Cheese & Wine Party. Richard Buckley. Ambergate 824275.


North Ferryl United ARS: Fridays, 8pm. North Ferryl United Football Social Club, Church Road, North Ferryl. April 3 - Discussion with G0VUK. 17th - Club Station on the Air, 24th - Packet Notes by G6KIA. Frank Lee. (0402) 650410.

ARC of Nottingham: Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. April 2 - AGM, 7th - Forum, 10th - Operator's Guide to 144MHz by G0DTH. 23rd - WAB Activity & Construction Evening, 30th - Electromagnetic Compatibility by G0S0Z. Rex Beallst. (0603) 233440.

Poole RS: 2nd & 3rd Fridays, 7.30pm. Lady Russell RHouses, rear of Jelicoe Theatre, Poole College of Further Edu- cation, Constitution Hill Road, Poole, Dorset. April 10 - AGM. V. Cotton. (0202) 760231.

RSGB City of Bristol Group: last Mon- day, 7.45pm. Room 14, Dialstone Centre, Cliftonwood Road, Clifton. April 6 - Test Equipment & Usage by G3NUQ, 23rd - Interesting Snapshots of the NMSA by GM3EXX. K. Fox. Jack Hood. (0698) 222295.

Saltash & DARC: 1st & 3rd Fridays, 7.30pm. TDC Hall, Rillaton, Saltash. B. Giles. (0752) 844321.

Sevenoaks & DAR: Sevenoaks DC, Coomil Offices, Argyle Road, Sevenoaks. April 22 - Direction Finding with the Dartford DF Club.

South Bristol ARC: Wednesdays, Whitechapel Folkhouse Assoc, Bridge Farm House, East Down Rd, Whitechapel. April 1 - CW Night, 8th - Visit to HTV Studios, 22nd - Weather Forecasting, How it Works by G0AXW. 29th - Mystery Subject by G3DXU. Len Baker. Whitechurch 822222.


South West ARS: 3rd Thursdays, 7.30pm. St George's Social Club, Church Street, Cockfosters, Barnet. April 18 - 10m Contest, 25th - Construction Contest. Peter Povey G3OOSO. QTHR.


Readers' Letters

David Conway (Swanscombe) has a station he's trying to identify. It's on the air around 7.15MHz, but as he doesn't have a digital radio that can only be regarded as approximate.

On October 28, he started receiving it at 0925, when it was playing Baby Love by Daniel Minogue. The announcer spoke in a foreign language - not David's strong point - but he did pick out the words 'Bad Company'. Yes David, they are (or were) a pop group, but somewhat before your time! The music this station plays is only pop music and as that's David's preference, he'd like to know more about the station.

Well David, the number of stations this could be is huge, there are at least 9 stations listed for 7.15MHz alone in the 1992 WRTTH! Even stations like the BBC, Radio Australia and Radio Canada International can't be ruled out as they may be transmitting one of their many foreign language programmes. Let's see if anyone out there can help from their own log book.

Chasing Awards

The Scarborough Amateur Radio Society are celebrating their 60th anniversary. To commemorate the occasion, they have a Diamond Jubilee Award available. Like many groups offering awards, they are not only open to the licensed amateur, but can be claimed by 'listeners' on a 'heard' basis. This means you have to log both sides of a contact, noting both call signs, both SINPO codes as well as the date, time and frequency. You should also make any comments that will help the Award Manager check out your log.

Many Awards are very attractive and can result in a change from QSL card chasing. There is often details of all kinds of awards on the 'News' pages in SWM; these are usually open to listeners.

The Scarborough ARS Award is open for contacts between 1 January and 31 December 1992, so you've lots of time to get logging.

You must hear one contact with the Society's Headquarters Station, G4BP, and five contacts with members of Scarborough ARS. The contact between the two stations in each case can be on any mode and any band, but not via repeaters.

If you would like a list of Scarborough ARS members, then send an s.a.e. to the Awards Manager.

An extract from your log is one of those gems of information you can astound your friends with should you go on a school trip to the Science Museum or the British Library in London.

The British Library has a new item in its collections - a recording taken from a gramophone cylinder that belongs to the Science Museum. It was originally recorded 102 years ago! Now recently recovered, it may be the only surviving recording of Queen Victoria - well before any of your time (mine too!).

The National Sound Archive was initially called in because the technology to play the cylinder has disappeared. Using a modern electric phonograph and a variety of filtering techniques, including a new Computer Enhanced Digital Audio Restoration (CEDAR) technique they managed to play it.

The cylinder has three bands recorded on it. One has the shadow of a woman's voice, but no words can be made out. Another has a man's voice and some whistling. The final band has a woman's voice, and through a lot of noise the words "Greetings...the answer must be..." are totally clear. Now, Morse is known to have gone... but the British Library has not been able to find the address, drop me a line before the 31st December and I'll find out the addresses and publish them in future issues of 'Junior Listener'. This isn't new! In a few months ago I mentioned the British DX Club and the Radio Prague Monitor Club. I now have some details of another two clubs, both especially interesting for the beginner or younger listener.

BRT - Belgische Radio en Televisie - have an International Listeners' Club. You need to send for an application (ask for a schedule too) and then send them two reception reports per month giving details on one or more of their foreign language programmes. You then receive a club membership card, their magazine Club Echo and their QSL cards. Nothing could be simpler.

The address for the application and a schedule (so you know when and where to listen) can be obtained from: BRT, PO Box 26, 1000 Brussels, Belgium.

The next club is the World DX Club. It was founded in 1968 and has about 450 members, mostly in the UK. For your membership, you get a 36-page, A4 magazine that covers broadcast stations, listening, medium wave, short wave and f.m., QSLing and programme listening.

The magazine is mailed out just 10 days after the deadline, so the information is up-to-date. The subscription rate is £10 for 12 issues of the magazine sent first class post or 13 issues send second class.

If you're interested, send your subscription to: 17 Motspur Drive, Northampton NN2 6LY, unless you live the the USA, when you should send to: Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610, USA.

I must admit, the bumper magazine I read kept me interested all the way through. I was especially envious of the short wave logbook - if only mine looked as good.

Clubs to Join

Deutsche Welle tops the list of all foreign broadcasting services in Tanzania. This is the result of a recent audience research survey by the University in Dar-es-Salaam. It shows that 3.5 million Tanzanians representing 16% of the population listen regularly to DW - followed by the BBC World Service with 9%. The technical signal quality of DW was rated as 'clear' by 99% of those questioned.

You may be able to hear DW in English if you listen to their West Africa broadcasts at 0600-0650, 1100-1150 and 1900-1950UTC. Frequencies to try are: (11.78, 13.79 & 15.205MHz), (15.41, 17.8 and 21.6MHz) and (11.785, 13.78, 15.35 and 17.81MHz) respectively. These frequencies and times apply after March 29.

If you'd like to try out your German talents, then you can listen at almost any time of day, as there is a programme being beamed to Europe. The best way to find out when and where to listen is to ask the station for a schedule. In this instance, the address you need is: Deutsche Welle, Raderberggurtel 50, PO Box 10044, D-5000 Koln 1, Germany.

Did You Know

The magazine is mailed out just 10 days after the deadline, so the information is up-to-date. The subscription rate is £10 for 12 issues of the magazine sent first class post or 13 issues send second class.

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Help

If there is a station you would like to contact, but don't have their address, drop me a line and I'll find out the addresses and publish them in future issues of 'Junior Listener'. This isn't restricted to legitimate broadcast stations, if you've been listening to pirates or utility stations and want to QSL, let me know and I'll see what I can find out for you.
The Radio Authority have sold the licence to Allied Radio, has decided to return its licence to the Authority. The Authority believes that the setting up of Air, which offered information to Heathrow and Gatwick travellers, was a useful venture and a worthwhile experiment. The Authority will be considering over the next few months how to make use of the spare a.m. frequency.

**Airport Information Radio Ceases**
The Radio Authority have announced that one of its licensees, Airport Information Radio (air), has ceased broadcasting. The holder of the licence, Allied Radio, has decided to return its licence to the Authority. The Authority believes that the setting up of Air, which offered information to Heathrow and Gatwick travellers, was a useful venture and a worthwhile experiment. The Authority will be considering over the next few months how to make use of the spare a.m. frequency.

**Satellite Computer Program**
Swift Television Publications have just released the ‘Satmaster’ computer program for satellite engineers, technicians and enthusiasts. Based on a 3.5in disk for IBM PC compatibles with MS DOS 3.0 or higher, it is a fully fledged tool for all installation data, measurement and interference potential- and will give you full data of elevation, azimuth, offsets etc for any satellite from any location anywhere in the world! Input data on your own installation such as dish size, receiver location, etc. and it will tell you where to point and all the necessary angles, even advising the size of dish to install for optimum receive quality on a given satellite.

Programmed-in menus will guide you easily through your problems to a rapid answer with over 20 000 words of on-screen technical guidance. It’s possible to plot your own primary and secondary dish lobe patterns, which in turn will guide in both prediction and the minimising of interference, and the eventual results both text and graph can be printed out or screen displayed. Cost for this unique program is £35.00 post free UK, add £2 for Europe and £4 elsewhere. Price includes a user manual.

Swift Television Publications, 17 Pittsfield, Cricklade, Swindon SN6 6AN. Tel: (0739) 750620

**AOR Competition Winner**
Mr. N. Evans, What Scanner Competition winner, outside Salisbury Cathedral with his prize, an AOR 2000 scanner donated by AOR (UK).

**Greenweld Newsline**
Because of the ever increasing amount of surplus stock being purchased, Greenweld are instigating a new service for all their customers - the Greenweld Newsline. By calling (0891) 505121, callers will get a recorded message giving details of stocks purchased during the last week. This will include items not advertised elsewhere because the quantity is too small. Every caller who places an order will be entitled to a free gift too, details are on the recorded message.
The calls are charged at 36p/min cheap rate, 48p/min other times.
Greenweld Electronic Components, 27 Park Road, Southampton S01 3TB.

**Ukrainian Broadcasts**
The BBC's new Ukrainian Service, given the go-ahead last October, was joined by its first Ukrainian member of staff this week. Olexy Solohubenko, formerly a radio broadcaster with Ukraine's Radio Kiev, will assist the service's first head, Elisabeth Robson, in preparing to put the new service on the air this spring.

As well as direct short wave broadcasts from London, BBC World Service will be looking at opportunities for rebroadcasting the programmes on Ukrainian radio stations. To start with there will be a half hour daily programme of news and current affairs. A second half hour every evening is due to be added in October.

**Encapsulated Traps**
The new G2DYM encapsulated Q-TEK traps are coil-capacity combinations designed to resonate in the various amateur bands. Being encapsulated in polyester resin makes them physically robust, electrically stable and non-hygroscopic. The ratio of length to diameter of the traps, plus low-loss materials results in high efficiency. Because of the high Q and impedance at resonance, the traps act as effective insulators in the band in which they are resonant.
The traps shown in the photograph are £15 each for 28, 21 and 14MHz; £18 for 7MHz and £20 for 3.5MHz. WARC band traps are £17.50 each. Special frequencies can be made to order. Post and packing is £1 each or £1.50 per pair.
G2DYM Aerials, Uplowman, Tiverton, Devon. Tel: (03986) 215.

**Radio Habana**
Radio Habana, Cuba broadcast to Europe in English on the following frequencies:
- 17.705MHz from 1900-2100UTC
- 9.760MHz from 2000-2100UTC
- 7.215MHz from 2200-2300
Listen out for DXers Unlimited with Arnie Coro, which goes out every Tuesday and Saturday evening.
Radio Habana Cuba, PO Box 6240, Havana, Cuba.
**ISWL Publications**

*Guide to English Short Wave Broadcasts to Europe (Winter Schedules 1991/1992)* is a new publication from the International Short Wave League. It is printed in a clear, bold face and provides data in a manner that is not only comprehensive but practical. The information is presented throughout in time order with aligning programme time periods, country and station names, frequencies, programme types - i.e. news, features, sport, religious or World Service transmissions. All frequencies are given in kilohertz.

The presented information reflects recent English language programme cut-backs by some stations and also the various altered schedules of others. Every care has been taken to ensure that the information provided is accurate and current. Some of the data has originated from direct observations by experienced League short wave listeners and DXers.

Notes for daily operation appear on page 20, this being followed by a three-page chapter entitled ‘The DX Week’ in which comprehensive broadcast details of the many programmes of interest to short wave listeners and DXers are listed on a day-by-day basis.

The booklet costs £1.00 or 2 IRCs from

**ISWL. 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA.**

Standard Frequency & Time Signal Stations of the World contains all the necessary data enabling immediate access to standard frequency and time signal station information. As such it is an invaluable reference work required for determination of immediately usable frequency communication paths and on occasions for the calibration of station equipment.

The chapters cover (a) an explanation of the various time systems, (b) transmission systems used, (c) standard frequency and time signal stations in frequency order from 16 to 22536kHz and from 95 to 171.13MHz, (d) call signs in alphabetical order, including location and frequencies and (e) short wave listeners and DXers are listed on a day-by-day basis.

This publication costs £1.75 or 3 IRCs (postage stamps to the value of £1.75 are also acceptable) from: **ISWL. 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA.**

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**1992 Second Wireless Exhibition**

From Saturday June 20 until Sunday June 28, the Fareham and District Amateur Radio Club will again be presenting a Wireless Exhibition on board HMS Warrior 1860 with the kind permission of Captain Frazer Morgan, Captain of HMS Warrior 1860.

Exhibits on display will represent the advance of wireless communications from Marconi/Jackson days up to 1942. The exhibits displayed are being loaned by individuals, HMS Collingwood Wireless Museum and Mr Len Newman G6NZ. Admission will be by normal admission to HMS Warrior 1860.

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**TV DX News**

The RTM Morocco TV logo has changed an is now a 5 pointed star with the large figure '2' in the centre - for RTM-2 - it is assumed that RTM-1 also favour this more western design from the previous Arabic style.

The financially troubled French La Cinq network may be rescued with two proposals, mainstream broadcasters Canal+ and TF1 have suggested a news channel with the other broadcast networks also supporting this move, approval is now awaited from the French authorities. Meanwhile the Italian TV magnate Silvia Berlusconi is involved with a European partnership to offer a popular TV programme channel over the La Cinq facilities, though with less French originated programme input than at present, though allowing the present La Cinq programme format to continue into the early Summer.

Many TVDxers must have seen the new German captions 'MDR' and 'ODR' on various channels in the recent excellent propospheric openings late January/early February. With the demise of the E and W German TV networks on December 31 last allowing higher powers away from Band 1 TV areas. It’s likely that Poland will allow 50MHz operation sometime during early Summer ’92. Thanks to *Six News* for this information.

Radio Delta in Bielska-Biala, Kormoran in Wegorzewo, Alex in Zakopane.

Radio Wa-Wa on 70.91 and 90.00MHz, Radio Jutrzenska on 98.1MHz these two are in Warsaw. Meanwhile, Moscow has Radio Roks (a rock station) on 103.0MHz, this is relayed from a satellite feed ex Oslo.

On 30 December 1991, TVDXer Robert Copeman, Victoria in Australia received via Sporadic-E the 1W TV relay transmitter at Wingatui, New Zealand, identified as TV2 Ch. 1 and measured on his scanner at 45.28MHz!

Amateur radio operation at Band 1 50MHz is increasing - Estonia has allowed operation from October last up to 200W max e.r.p. though away from the Band 1 TV Tallinn region. In other States of the Union, 50MHz amateur operation is awaited eagerly once the authorities have made appropriate decisions. At the same time Sweden relaxed conditions on 50MHz operation allowing higher powers away from Band 1 TV areas. It’s likely that Poland will allow 50MHz operation sometime during early Summer ’92. Thanks to *Six News* for this information.

Finally the new Swedish TV4 network is now expanding and TVDXers may have noticed a few signals at in the recent openings.

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Currently in operation are

- **Goteborg** - Ch. E46
- **Malmo** - Ch. E47
- **Sundevall** - Ch. E50
- **Orebro** - Ch. E58
- **Horby** - Ch. E50
- **Norrkoping** - Ch. E54
- **Uppsala** - Ch. E52
- **Karlstad** - Ch. E46
- **Stockholm** - Ch. E42
- **Vasteras** - Ch. E51
- **Vastervik** - Ch. E51

During the first half of '92 the following will open:

- **Bollnas** - Ch. E49
- **Gavle** - Ch. E30
- **Skovde** - Ch. E47
- **Borlange** - Ch. E60
- **Vannas** - Ch. E50
- **Boras** - Ch. E55
- **Helsingborg** - Ch. E41
- **Karlskrona** - Ch. E44
- **Alvsbyen** - Ch. E52

All of the above transmitters are main (high powered).

Roger Bunney
Aerial Systems for serious listeners

Look to Lowe

DX-One Electronic Antenna £249 inc VAT
The World Radio TV Handbook said of the DX-One "... the best of its type available anywhere in the world." It has a frequency range of 50kHz - 50MHz (+3dB) and 10kHz - 75MHz (+6dB); it is both horizontally and vertically polarised, so low-angle (DX) signals suffer less selective fading. The output level from the antenna is adjustable in steps from +6dB to -40dB for optimum matching. The extremely high intercept point (+66dBm 2nd order, +40dBm 3rd order) and a very low noise figure (12.8 dB) ensure optimum performance. The indoor unit contains a mains power supply, a step-wise attenuator and a very effective medium wave suppression filter. It also has two receiver outputs for feeding two receivers without mutual interference.

SP-2 Antenna Splitter £152 inc VAT
A growing number of radio enthusiasts have two receivers, but no space for two separate antennas. The SP-2 is the answer for connecting two receivers to one antenna (be it active or passive). The SP-2 offers a very high degree of isolation between the two receivers (<30 dB). The SP-2 ensures that, within the frequency range of 50kHz - 50MHz, no unwanted mutual interference, heterodynes or signal loss will occur as a result of connecting a second receiver.
With a single receiver, the SP-2 offers a precision step-attenuator (0 - 40 dB) which helps to reduce receiver inter-modulation. Included is a very effective switchable medium wave suppression filter.
For those with space for a second antenna (e.g. one horizontal, one vertical), the SP-2 offers a simple way to switch between the two for comparison purposes.

Magnetic Longwire Balun £36 inc VAT
This balun has been described in the trade press as the "most revolutionary development for shortwave listeners in the last 25 years". Quite a claim! But this antenna device does solve one of the most severe problems associated with random long wires; the input cable. An MLB allows you to use highly screened co-axial cable between the antenna and receiver WITHOUT energy loss due to impedance mismatch. Computers, light-dimmers, televisions, and fluorescent lights no longer cause interference problems. We recommend RG58/u 50ohm co-axial cable.
The MLB has been designed so that a very short length of antenna wire can be used and still be perfectly matched to the 50ohm antenna input of the receiver. Even an antenna of just 12.5 metres (41 feet) provides good results from 100kHz - 40MHz without the need for an antenna tuner. Static build-up on the antenna is allowed to leak away to earth potential - excellent for protecting receivers with FET front end circuitry. Static noise levels on long, medium, and the tropical short wave bands of 60 & 90 metres are considerably lower. The MLB is easy to mount on existing longwire or "T" antennas.

MLB Antenna: Mark I £56 inc VAT
A complete passive wire antenna with a built-in MLB, the MLB Antenna: Mark I has excellent performance on long, medium, and short waves. It is 12.5 metres in length and can be mounted vertically or horizontally. Frequency range 100kHz - 40MHz.
The MLB Antenna: Mark I offers all the advantages of the Magnetic Longwire Balun like: coaxial feeder, broadband performance without an antenna tuner and static decoupling. Heavy duty and completely water-proof, it comes complete with nylon support cord, heavy-duty insulator, high-quality plastic covered antenna wire, PL 259 connector and a watertight rubber sleeve to cover co-axial/MLB connection.

MLB Antenna: Mark II £67 inc VAT
Similar to the Mark I, but 20 metres long. The MLB Antenna: Mark II offers improved performance at medium and long wave frequencies, although the high frequency performance above 30MHz is reduced.

THE LISTENERS' BOOK OF THE YEAR GETS EVEN BETTER
The new 1992 issue of 'Passport to World Band Radio' is now with us and it's even better than before. The 200 pages have risen to almost 400 and every section carries the unmistakable authority of the world's best short wave companion.
Broadcasts are listed as before; not only in frequency order but also by language, country of origin AND the times of broadcasts. There are no less than 56 pages of receiver reviews, including the latest NRD-535 and Drake R-8, together with news, views and general information.
If you own a short wave radio, you MUST have the 'Passport' by its side. The price last year was £12.95; we have kept the price the same this year at £12.95 (plus £1.55 p&p.). Send off today.

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Short Wave Magazine, April 1992
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**R-2000** £549 inc VAT

**R-5000**
- 100kHz - 30MHz
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- 10Hz step Dual Digital VFOs
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- RS-232C interface for use with 'CONTROL' software

**R-5000** ...£925.00 inc VAT

**The NRD-535 General Coverage Receiver**

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

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

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

For the keen broadcast DXer, there is also a 100 memory board for locking on to an incoming AM signal and then picking off either sideband.

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

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

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

**NRD-535 HF Receiver**
- NRD-535 HF Receiver £1,095 inc VAT
- CMF-78 ECSS option £202 inc VAT
- CMH-530 RTTY option £104 inc VAT

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CUMBERNAULD: Cumbernauld Airport Foyer Tel: 0236 721004
LONDON (HEATHROW): 6 Cherwell Close, Langley Tel: 0753 545255
LONDON (MIDDX): 223/225 Field End Rd, Eastcote Tel: 081-429 3256
NEWCASTLE: Newcastle Intn'l Airport Tel: 0661 860418

Short Wave Magazine, April 1992
The first question I can hear you asking is, why Guam? Well, there are a whole host of reasons that I hope will become clear during the article. Let's start by placing Guam on the map. Guam is a relatively small island of about 541 sq.km, or just under twice the size of the Isle of Wight. The island form part of the Mariana group and is located on the edge of the Pacific Ocean about 2400km east of the Philippines. To help you locate it Fig. 1 shows a map of the general area.

Like many of the smaller islands, Guam is self-governing, but dependant on a larger nation which, in this case, is the USA. The island supports a population of some 134,000 people of which nearly 8000 are full time US service personnel. The heavy military presence is because Guam is an important Air Force and Naval base. It's location in the Pacific gives it a significant strategic value - hence the continued US involvement.

This may lead you to ask - why put a weather station way out in the Pacific? Typhoons are the main reason.

Guam is a relatively small Pacific island, just under twice the size of the Isle of Wight, with a significant strategic value. Howard Bird looks at the US Naval Weather Station on Guam and the supporting network. Why put a weather station way out in the Pacific? Typhoons are the main reason.

Existing utility enthusiasts will know of GUAM through its FAX transmissions that contain up-to-date reports on the interesting weather patterns in the Pacific. These reports include Typhoon warnings, where appropriate. The FAX station at Guam has a real mouthful of a name - U.S. Naval Oceanography Command Centre/Joint Typhoon Warning Centre, Guam! To make life easier the military authorities have abbreviated this to NAV-OCEAN-COM-CEN/JTWC! Us mere mortals, however, know the station simply as GFAX.

Being a Naval Station, its prime responsibility is to provide information to the US military. However, that still doesn't explain why Guam was chosen as a weather station. Guam sits right in the typhoon area and holds the record for the lowest ever recorded atmospheric pressure. This was recorded in October '79 while Guam was in the eye of a typhoon. The pressure was measured at amazing 870mb. One unfortunate spin off of this low pressure is high tides. It's not unusual to see tides that are 3 to 3.5m higher than normal. This is one of the reasons why we so often see severe flooding associated with Typhoons.

This may all seem a little off track for this article, but I hope it helps to put the work of this station in perspective. Its key role is to monitor for and provide Typhoon warnings. Although the station's main purpose is to protect military shipping and operations, the information is of great significance to the civilian population.

**FAX Signals**

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7th Fleet. It also supports many other Naval activities in the Western Pacific and Indian Ocean. The Guam FAX service is based around two continuous broadcasts that originate from the Fleet Numerical Oceanography Centre in Monterey, California. These broadcasts are distinguished by the areas that they cover. One concentrates on the Western Pacific while the other deals with the Indian Ocean. Because of the importance of Guam for Typhoon monitoring, these broadcasts are supplemented by local contributions.

The US Navy has its own coding system to identify the two circuits or transmissions. The code KFBV is used for the Pacific and K3SN for the Indian Ocean. I'm sure many newcomers imagine that distributing a FAX signal is simply a question of connecting the signal to a transmitter and away you go. The real distribution system turns out to be really quite complicated. To give you an idea I've included a couple of simplified routing diagrams in Figs. 2 and 3. In simplifying the diagrams, I've excluded most of the intermediate stations and all the feeds that supply land based military establishments.

If we look at the Indian Ocean K3SN distribution first (Fig. 2), you can see that extensive use is made of the geostationary military satellites that serve the Western Pacific (WestPac Milsat) and Indian Ocean (IO Milsat). The WestPac Milsat provides the links to the Holt h.f. transmitter in Australia and the Totsuka Japanese transmitter. The Barrigada and Capas Tarlac transmitters are fed by conventional microwave links. These transmissions are supplemented by a direct broadcast to the fleet from the Indian Ocean Milsat. This satellite also feeds the Diego Garcia transmitter that's monitored by many UK listeners.

Covering the Western Pacific is a somewhat easier task as you can see from Fig. 3. The area is covered by three transmitters at Totsuka, Barrigada and Capas Tarlac. Because these stations are all located in the Western Pacific area, simple microwave feeds can be used for all transmitters.

These complex distribution networks give an indication of just how difficult it is to maintain good quality communications over large areas.

I'm sure many of you would like to have a listen around to see if you can hear any of these stations. To help you I've listed here the current operating frequencies for main transmissions from both networks.

**Western Pacific Network**

- **Indian Ocean Network**
- Apra Harbour, Guam (NPN): 5.262, 10.257 & 19.862MHz.

One interesting note in the station manual points out the computer generated and local Guam charts may differ. If this occurs, the Guam version is the one that's right. The reason for this is that the typhoon monitoring is done from Guam so is likely to be more accurate than a remote computer generated model. I know many people who receive FAX charts have difficulty working out what some of the charts are trying to convey. To help overcome this I've listed here the key measurements contained on a number of the standard charts. Each section starts with the Guam abbreviation followed by the description.

FSNH 36 HR PROG BLEND: This is a 36 hour forecast of pressure centres, fronts, troughs, etc., oceanic winds and mid latitude isobaric contours.

MSPN 36 HR SIG WAVE HT PROG: This is a 36 hour forecast of significant wave heights (measured in feet) and the direction. The area covered is the North West Pacific.

FBNH 36 HR SIG WX PROG: 36 hour forecast of pressure centres, fronts, troughs, etc., significant cloud cover, significant weather and high winds/sea. The chart uses standard weather symbols.

GRADDY: This gives the ocean temperature, gradient and frontal positions for the North West Pacific.

MSST: Sea surface temperature analysis for the Northern hemisphere.

MSLD: This is a sonic layer depth chart.
DATA MODES

CZ PROBABILITY: 50% reliability of convergence zone probability analysis.
ASEH FINAL SFC ANAL: Surface analysis - isobaric 20°N/20°S poleward - streamline tropical.
MSEH SIG WAVE HT ANAL: This gives an analysis of the significant wave height in feet.
NOGAPS: This is a preliminary surface analysis including 24, 36 and 48 hour prognosis.
NORAPS: 24, 36 and 48 hour surface prognosis.

In addition to these charts, GFAX transmits a number of satellite images. The images come from the Defense Military Satellite Program (DMSAP) and the GMS satellite. The times to watch for satellite images are as follows:
Western Pacific Broadcast (KFBJ): 0105, 0320 & 0640UTC.
Indian Ocean Broadcast (K3SN): 0150, 0320, 0450 & 0745UTC.

You’ll need to either be an early bird or burn the midnight oil to catch these!

Summary

I hope this feature has helped you get a better understanding of just how a major weather FAX network operates. The system is very complex but plays a vital role not only in safety at sea and in the air but also in warning of potential disasters.
If any of you would like to QSL the address is: Naval Oceanography Command Centre, PO Box 12, FPO San Francisco 96630, USA.
My thanks to Day Watson and the US Navy for supplying this information.

QSL Addresses

TANJUG World Service, Obilicev Venac 2, Postfah 438, Belgrade, Yugoslavia.
Swiss PTT, Berne Telecommunications Headquarters, Mobile HF Radio Services, Laupenstrasse 18, CH-3030 Berne, Switzerland.
Telecom (New Zealand), Awarua Radio, PO Box 1647, Invercargill, New Zealand.
Spanish PTT, Telefonica, Servicio Maritimo, Paseo de Recoletos 41,3a, 28004 Madrid, Spain.
MCI International Inc, Chatham Radio/WCC, PO Box 397, North Chatham, MA 02650-0387, USA.
Romaradio PT, Statione Ricevente, Via Della Cesarina 282, 00139 Roma, Italy.
Qatar Public Telecommunications Corporation, PO Box 217, Doha, Qatar.
US Navy Pearl Harbour, Naval Western Oceanography Centre, Box 113, Pearl Harbour, Hawaii, HI 96850-550, USA.
United States Coastguard NMA, Radio Station Miami, 16001 SW 117th Avenue, Miami, Florida 33177, USA.
Boufarik Radio 77F, Statione Radiomartime, Attention Le Chef de Centre, BP234, 09400 Boufarik, Algeria.
Algeria Press Service APS, Attention Le Directeur Technique, 7 Blvd Che Guevara, Alger, Algeria.
Juncaco Radio PRI, Estacao Costeira de Rio Grande, Rue Otacilio Charao 199, 96200 Rio Grande RS, Brazil.
Halifax Coast Guard Radio VCS, Ketch Harbour, Halifax, Canada.
The Director, Beijing International Communications Station, Government Radio Administration, Si Chang An Chieh, Beijing, People’s Republic of China.

Alexandria Radio SUR, Manshia Square 9th Florr, Alexandria, Egypt.
Helsinki Radio OJU-OHG, SF-01700 Vantaa, Finland.
Station Radionavale Le Regine FUG, La Regine Marine Nationale Centre de Transmissions du France-Sud, F1150 Bram, France.
Radiostation Forces Aeriennes FDY, Escadron Electronique 1/800, F-45 Orleans-Bricy-Air, Loire, France.
Magyar Tavirati MTI Iroda, Fem Utca 5-7, PO Box 3, H-1428 Budapest, Hungary.
Kao Hoan Cho Maritime Safety Agency, Central Station JNA, Tokyo Centre, 2-1-3 Kasumigaseki, Chiyoda-ku, Tokyo, Japan.
MAP RABAT, Ministere des Postes, Telegraphes et Telephones, Le Chef du Service des Transmissions, Rabat, Morocco.
WLO Radio, Mobile Marine Radio Inc, 7700 Rina Avenue, Mobile, Alabama 36618-1199, USA.
NMF-NIK, United States Coast Guard, Communication Station Boston, Marshfield, Massachusetts 02050, USA.
AXI, Bureau of Meteorology, PO Box 735, Darwin, Northern Territory 0801, Australia.
KVM70, US Department of Commerce, National Oceanic & Atmospheric Administration, National Weather Service Pacific Region, Box 59027, Honolulu, Hawaii 96850-4933, USA.
SA Weather Bureau, Private Bag X097, Pretoria 0001, South Africa.

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Short Wave Magazine, April 1992
This high technology product is based on the abundant technical experience gained by JRC in the professional communications receivers field. This means that the NRD535 is arguably one of the best receivers available to meet the discerning listener's needs. Brief specifications are as follows.

- **Frequency coverage:** 800-1300MHz
- **Memories:** 5, 10, 12.5, 25 & 100kHz
- **SSB, CW, AM & FM modes.**
- **99 step frequency entry keyboard.**
- **Direct frequency entry.**

The new NRD535 epitomises the very best in communications receiver design. The very latest model available from SONY is the ICF-SW77. This receiver covers LW, MW, SW and FM stereo broadcast bands and has SSB reception on the SW bands. A comprehensive keypad and LCD display give easy control over the massive array of features available.

Other SONY products available include the minuscule ICF-7610, the versatile ICF-7700, the popular ICF-3001D and for airband enthusiasts the AR7 and ICF-F906L.

**SMC are pleased to be able to offer the AOR range which includes both hand portables and mobile/base station models.**

All the receivers are built to the highest possible specification yet remain very competitively priced. Often the leaders in the field, the AOR range is proving very popular amongst both professional and non professional users.

The top of the range model must be the AR3000 which covers 100kHz-306MHz without any gaps. The next range model is the AR2000 which is a convenient unit for mobile or base operation and covers 500kHz-600MHz with 800-1300MHz. Last but not least is the AR000 which is an extremely flexible handheld scanner covering 500kHz-1200MHz.

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- **The Bearcat 200XLT is the cream of the Bearcat handheld scanner range.**
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- **Suitable for a novice in the scanner market.**
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**Up to £1000 instant credit, a quotation in writing is available on request, subject to status.**

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**Carriage charged on all items as indicated or by quotation.**

**Prices and availability subject to change without prior notice.**

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

**SCANNING RECEIVERS**

<table>
<thead>
<tr>
<th>Brand</th>
<th>Model</th>
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<tr>
<td>ALINCO</td>
<td>DJX1</td>
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<td>ICOM</td>
<td>R100</td>
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<tr>
<td>FAIRMATE</td>
<td>HP2000</td>
<td>£259.00</td>
</tr>
</tbody>
</table>

**ACCESSORIES**

**NEW FROM MALDON**

- **ACTION HUNTER** series of wide band set top and mobile antennas to suit most scanners. Also TX on ham and cellphone! Call for details.
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- **REVCONE** Low cost discone £39.95
- **GMP** Magnetic longwire balun £38.95

**SHORTWAVE RECEIVERS**

<table>
<thead>
<tr>
<th>Brand</th>
<th>Model</th>
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<td>ICOM</td>
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<td>SFYR</td>
<td>HP150</td>
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</tr>
<tr>
<td>LOWE</td>
<td>HF225</td>
<td>£329.00</td>
</tr>
</tbody>
</table>

**DON’T FORGET**

We also have a range of pre used equipment – all fully warranted – and we’ll be happy to take your receiver or scanner in part exchange. Simple, speedy mail order – ring for details.

**OPENING HOURS:**

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(MON open 10am, SAT close 5pm)
Let's start with the abbreviations - t.d.m. means Time Division Multiplex, while f.d.m. is Frequency Division Multiplex. Very technical sounding words, but what does it all mean?

The division bit is obvious, it's the multiplex term that seems to confuse most people. In communications terms this simply means more than one communication channel. So from that we can conclude that a multiplex transmission carries more than one communication channel. From a commercial point of view, there are many pressures to get as much as possible out of any communication link. The reason is that the major cost was not the equipment associated with the link. This could be all the cables on a land line system or transmitters, receivers and antennas for a radio link. These pressures have inspired all manner of ingenious methods of increasing the usefulness of a communications link.

**Early Systems**

Before I deal with some modern examples, let's take a look at some of the early multiplex systems. The first systems were all based around the wire communications links in use during the late 1800s. The links were fairly basic and used predominantly hand-sent Morse code. The first attempt to handle more than one communication came with the German Duplex system. However, this was quickly superseded by the highly successful Quadruplex system, designed by Thomas Edison in 1874. This system used eight operators handling four sets of messages. These were arranged as two messages in each direction. The success of this system can be gauged by the fact that it remained in service for some thirty-five years. This is a considerable achievement when you consider the rate of technological development during the late 1800s and early 1900s.

At around the same time, 1872 to be precise, Jean-Maurice-Emile Baudot was working on a time division multiplex system for use with the newly developed printing telegraph. Although little interest was shown initially, by 1877, the French Post and Telegraph authority had adopted the system. The key to this system was a rotating distributor with separate sectors for each teleprinter. The number of sectors determined the number of teleprinters that could use the link. In practice, there were several different configurations with a maximum of four teleprinters per circuit. The Baudot system was probably the first true time division multiplex system. This was because it shared the circuit by letting each channel have access to the circuit for a fraction of the available time. I've illustrated the system in Fig 1.

The next significant step, in terms of multiplexing, came in 1918 with the development of the first frequency division multiplex system. Although the basic principles had been anticipated by Bell in 1875, it was not until 1918 that technology had advanced enough to produce the high quality filters demanded by this system.

Before I get on with the modern examples, let's just outline frequency and time division multiplex.

**Mike Richards, SWM's tame 'Decode' columnist, has received many letters asking about Time Division Multiplex and Frequency Division Multiplex. In this article he explains what it's all about.**

**FDM**

Let's start with a look at how we could utilise a basic speech band radio link using f.d.m. or frequency division multiplex. Incidentally, the term speech band means that the transmitter is designed to accept a standard telephone speech channel containing frequencies from about 300Hz to 4kHz. Now let's see how we could use this transmitter for RTTY signals. The simplest way would be to use the system adopted by many amateurs. Here the mark and space conditions of the RTTY signal are converted into two tones of around 1200 and 1400Hz. These tones can then be passed over the radio link in the same way as a speech signal. Many amateurs simply connect the output of their RTTY units direct to the microphone socket of their transceiver. Although this system works well, it doesn't use the full potential of the radio link. The reason for this is that the RTTY signal only requires a very small part of the available 300 to 4kHz speech band. I've shown this in Fig. 2. To illustrate the point, a 50 baud RTTY signal will happily operate in a segment only 60Hz wide. From this you can see that the normal speech band could carry several RTTY signals with ease. What we need to do is divide the speech band in to 60Hz slots. This technique is called frequency division multiplex and takes us back to where we started. To further clarify the technique, let's look at a real example of an f.d.m. system.

One of the most common examples of f.d.m. is the multi-channel telegraph system used by many military and PTT operators. The system is known as m.c.v.f.t. which stands for Multi-Channel Voice Frequency Telegraph. There are many variants of this system, but the one I'll look at is the twenty-four channel 50 baud version.
shown in Fig. 3. As you would expect, this method of f.d.m. enables twenty-four separate telegraph signals to be sent over one speech radio link. This is clearly a great improvement over our original single channel version!

Fitting all twenty-four channels into the speech band is done by spacing the channels 120Hz apart and using a shift of 60Hz between the mark and space frequencies. The twenty-four channels have centre frequencies that start at 420Hz and extend to 3180Hz. Using channel one as an example, the centre frequency is 420Hz giving mark and space frequencies of 390Hz and 450Hz respectively.

Although the system is quite simple to explain, decoding is not quite so easy. The problem lies in the close spacing of the channels. This means that very sharp audio filters are required to separate the individual channels for decoding. There are few systems available to the amateur that can handle this mode, but one example is the Code-3 from Hoka which includes this mode as an option. If you want to hear what an m.c.v.f.t. signal sounds like, try tuning to 18.6029MHz VoA, 18.535MHz RAF or 18.016MHz Rota.

**TDM**

Time division multiplex uses a totally different, and perhaps simpler principle, than the f.d.m. system I've just described. In essence all that happens is that several channels take it in turns to send their information over one circuit. In a practical system, the change-over between each channel is so fast that the user cannot detect it happening. The basic principle of a two channel system is shown in Fig. 4. This results in the systems appearing to have a number of completely separate channels.

The most common modern implementation of this on the h.f. bands is the ARQ-M system. This is used by many operators, but the most common is the French military telegraph network. The ARQ-M system supports either two
or four teleprinter channels and operates with channel speeds of between 50 and 100 baud. An added sophistication with ARQ-M is that the system is fully error correcting.

The secret of the error correction system lies in the code used to represent the characters of the alphabet. The ARQ-M system employs what is known as the International Telegraph Alphabet No. 3 or ITA3. This code uses a combination of marks and spaces to convey the characters. The unique feature of ITA3 is that each character always contains three marks and four spaces. It's this simple feature that's used to detect errors. At the receiving end the decoder checks every received character to see if it contains the right mix of marks and spaces. If all is well, the character is decoded and printed. If an error is detected, a signal is sent back to the transmitter asking for a repeat. This simple technique is used for most of the error correcting h.f. RTTY modes.

Let's now look at how channels are combined to build a two channel ARQ-M system. The process is basically very simple with the channels sent one after the other. However, in order for the synchronisation and error correction to work a couple of adjustments are made. The first is to send the information in groups of four or eight characters per channel. Breaking the data up in this way is necessary for the error correction process. If an error is detected the lost characters are repeated in the next complete block. So that the receiver can identify the start of a block, or repetition cycle as it's known, the first character is sent inverted. This means that it contains four marks and three spaces. The choice between four and eight character repetition cycles is entirely dependent on the propagation delay between the transmitter and receiver. It's therefore only the very long distance links that need to use the eight character system. Let's move on to take a look at how the two channels are combined in a four character repetition cycle system. I'll call the channels A and B for convenience. The transmission starts with B1 followed by A1 and so on up to A4 and B4. In order to help the receiving unit to identify the channels, A1 is sent inverted whilst A2-3 are sent erect. To differentiate between channels A and B, B is sent in the opposite sense. This means that B1 is erect whilst B2-4 is inverted. I can see that this sounds very complicated, so I've included a diagram in Fig. 5 to help. Once you get the general idea, it's really quite straightforward.

If you want to try your hand at this mode, here's a few frequencies to check-out: 19.100MHz, 96 baud, 2 chan, French military. 22.915MHz, 200 baud, 2 chan, MoD Paris. 9.285MHz, 96 baud, 2 chan, Brazzaville.
YUPITERU

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A powerful pocket scanner that leaves the competition standing. A super sensitive set designed for optimum performance on the Civil/Military/Airbands.

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- 30 Direct entry memories
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- 1000 Memory Channels

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Over the last year the HP2000 has outsold almost all other models.

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- Swappable audio switch
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- All metal case for improved EMC compatibility

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- 805 - 1300MHz Supplied with mains power supply...

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- 100 Memories
- AM/FM/WFM
- 3 Scanning speeds

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BEARCAT 200XLT

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Still one of the easiest to use, and the most reliable scanners on the market. Easy to program, sensitive receiver:

- 200 Memories
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A mobile/desktop version of the 200XLT above but with 100 memories.

Supplied complete with mains power supply...

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AOR SCANNERS

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- 1000 Memory Channels...

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500 mAh...

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SONY

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One of the new additions to the Sony range, the SW77 covers 150kHz to 30MHz plus 76-108MHz. With a rotary tuning dial, 125 scan memories, reception of AM, FM, USB, LSB, CW, tape record facility, this is a superb all-rounder...

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SW1E

Pocket shortwave plus VHF radio supplied with headphones, case and shortwave guide. This model won't hurt your pocket!

Price: £149

SW7600

One of Sony's most popular VHF and Shortwave radios. 75-108MHz, 1.5 - 30MHz Shortwave.

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AIR 7

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

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

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AOR's top of the range model now improved.

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INTRODUCTORY OFFER SUPPLIED WITH FREE WIDE BAND DISCONE WORTH £40.95

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MODEL M75
For base and handheld scanners. £25.95
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For optimum performance. £69.95

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20-element wideband beam. £135.00

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Full coverage receiver with 42 memories, receives LW, MW, FM and SW bands £299

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War games, in-flight refuelling, interception of Soviet BEAR recon B-52, Military Airshows, secret coded transmissions, these are only a taste of what's in store in this publication. £17.95
The DM-1000 is a complete decoding system for RTTY and c.w. signals. All that’s required to get on the air is a receiver and a simple video monitor, making the DM-1000 very attractive to those who don’t want to get involved with computers. One of the other attractions is the smart feature that Dewsbury have called SmartLock, providing fully automatic decoding of most RTTY and c.w. signals. Let’s take a closer look at this interesting new unit.

Connecting-Up

Being a largely self-contained decoder, the external connections have been kept to a minimum. To help the operator keep a tidy station, all the sockets are tucked away on the rear panel. Connection of the audio signal from the receiver is made using a standard 3.5mm jack. Ideally, this signal should be taken from an auxiliary output on the receiver, though an external speaker socket would suffice. Using an auxiliary output has the advantage of providing a constant level output that should make it suitable for use with many of the receivers on the market.

The power requirements of 9-13V at 600mA, were easily met by an optional mains unit. If you wanted to use an alternative power source, this could be connected via a 2.1mm coaxial power socket.

The only other connection required for operation to start was the video lead. The video output from the DM-1000 was a normal composite video signal suitable for most monitors. As the display was monochrome there’s no need for expensive (and noisy) colour monitors. It’s important to note, however, that the video was not suitable for direct connection to a TV. If you want to connect to a TV, you’ll need an optional video modulator. To make sure the resultant display was easy to read, you could adjust the number of characters per line. The two options provided were 40 or 80 characters per line. This should be adequate to cover most requirements.

CW Reception

Despite being one of the oldest radio communications systems, c.w. is still in constant use on the h.f. bands. The DM-1000 has been designed to make c.w. reception as easy as possible.

Operation of the DM-1000 was controlled by the 16-button keypad on the top panel. Although this was simply marked 0-9 and A-D, it was able to control all the functions. The secret was in the use of a menu driven system that indicated the function of the buttons on the video monitor. Using this system each key could be assigned a different function depending on the mode selected. This was backed-up with a summary of commands printed on the top panel. One unusual point was that there was no conventional ENTER key, the function being carried by the stop key (.)

After the initial sign-on screen, the display gave a choice of receiving RTTY or c.w. modes. Once within the desired operating mode the key pad takes on differing functions depending on the specific mode selected.

Simple to operate decoding systems are always in demand by utility listeners. A recent addition to the market is the Easy Reader DM-1000 reviewed here by Mike Richards.
The SmartLock system was the indicator. The status line gave an indication of decoding the required signal. Although not really a tuning indicator, it provided a useful indication that the DM-1000 was decoding the required signal.

The next item on the status line was shown on the display. The selected speed, in w.p.m., was displayed when the manual speed selection had been chosen, the selected speed, in w.p.m., was shown on the display. The next item on the status line was the SmartLock indicator. SmartLock is the name given to the signal tracking system employed by the DM-1000. The next section of the status line gave an indication of the selected mode which, for c.w., was basically auto or manual. If the manual speed selection had been chosen, the selected speed, in w.p.m., was shown on the display. The next item on the status line was the SmartLock indicator. SmartLock is the name given to the signal tracking system employed by the DM-1000. The great advantage of the SmartLock system is that it can track incoming signals over a wide range. As I mentioned earlier, one of the advantages is the wide tuning range of the DM-1000. The second advantage is its ability to analyse incoming signal checking for polarity and speed. Once the parameters have been established, the SmartLock continues tracking, so following any speed changes. As a further sophistication, the decoder could be locked onto the current parameters. This was particularly useful when conditions were very poor, as it prevented the SmartLock from hunting during heavy fading or interference.

Unlike some other systems, the DM-1000 did not inhibit printing while the SmartLock was calculating. The result of this is that garbage is printed when first tuning into a station. This only happens for a short period while the SmartLock analyses the signal. In most cases this took no more than about 5 seconds. If you try this on the amateur bands you may well find that it won't lock - don't worry it's the signal not the decoder. Although many amateurs send good quality c.w., there is still a lot of very poor c.w. to be heard on the bands. The main problem is not from new licensees, but the experienced amateur that develops a characteristic 'swing'. This completely disrupts the element spacing of the code, making it very difficult to resolve.

To help keep the display readable, the DM-1000 includes a word-wrap feature that ensures that words are not split across two lines. For occasions where the decoder gets confused by a signal you could hit the '2' button to restart the SmartLock.

**Automatic RTTY Reception**

To complement the c.w. modes, the DM-1000 includes fully automatic RTTY reception. This is a great boon for the newcomer to utility listening. All you have to do is approximately centre the signal on the tuning indicator and the DM-1000 does the rest. As with c.w. it starts by printing garbage but this changes to clear text once the SmartLock has finished processing. There was also the facility to re-activate the SmartLock process should the signal change. The SmartLock is very comprehensive in its operation as it selects the baud rate, shift and signal polarity. I can assure you that this operation can take quite some time if you have to do it manually - I speak from experience.

The status line for RTTY reception was similar to that used for c.w. The parameters shown were:

- Mode, code, baud rate, SmartLock, polarity, figs/lets and printer status. This clear display enabled the operator to quickly evaluate the status of the decoder.

For operating under difficult conditions the SmartLock could be locked once the signals parameters had been established. This prevented the SmartLock from re-analysing the signal under noisy conditions. The baud rates supported by the DM-1000 were 45, 50 and 75 baud, thus covering most of the common transmission types.

Where the signal type is known, it's generally quicker to use the manual mode and set the parameters yourself. The setting of these parameters had been kept very simple and, for most, all that was required was a single key-press to toggle the setting. Another useful feature was the inclusion of a baud rate check facility. When enabled this gives a read-out of the baud rate of the signal being received.

The DM-1000 included the facility to receive ASCII transmissions at 110 and 200 baud. However, as there are virtually no transmissions using these formats, the mode is unlikely to be used.

**Simple To Operate**

With the review model connected to my Icom receiver and a suitable video tape, the SmartLock continues tracking, so following any speed changes. As a further sophistication, the decoder could be locked onto the current parameters. This was particularly useful when conditions were very poor, as it prevented the SmartLock from hunting during heavy fading or interference.

Unlike some other systems, the DM-1000 did not inhibit printing while the SmartLock was calculating. The result of this is that garbage is printed when first tuning into a station. This only happens for a short period while the SmartLock analyses the signal. In most cases this took no more than about 5 seconds. If you try this on the amateur bands you may well find that it won't lock - don't worry it's the signal not the decoder. Although many amateurs send good quality c.w., there is still a lot of very poor c.w. to be heard on the bands. The main problem is not from new licensees, but the experienced amateur that develops a characteristic 'swing'. This completely disrupts the element spacing of the code, making it very difficult to resolve.

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DATA MODES

Abbreviations

Abbreviations

c.w. continuous wave (Morse)
d.c. direct current
Hz hertz
kg kilogrammes
kΩ kilohms
mA milliamperes
mm millimetres
mV millivolts
p-p peak to peak
RTTY Radio TeleType
u.f. ultra high frequency
V volts
w.p.m. words per minute
°C degrees Celsius
Ω ohms

monitor (borrowed from the Editor - thanks Dick), I was ready to decode. The DM-1000 lived-up to my expectations, proving very simple to operate. All you had to do was select either RTTY or c.w., tune into a signal and wait for the SmartLock to do its job. In most cases this took around five seconds which I thought was quite acceptable. You could also keep a check on what SmartLock was trying by watching the status line at the top of the screen. When tuning to a station where you know the format, it was worth switching to manual to speed up the process. Once you'd selected the baud rate, the only other variable was the polarity, this could be changed with a single key-press. The DM-1000's ability to resolve difficult c.w. signals was very good and it was able to quickly lock onto most signals. The only exception being the amateur transmissions I mentioned earlier.

Although the tuning indicator was useful, its response took a little getting used to. This was because it responded to the decoding software rather than the signal direct. This put in a delay between a change of receiver tuning and the display responding. This minor disadvantage was offset by the very wide tuning tolerance of the DM-1000.

Conclusion

The DM-1000 has proved itself to be a very compact and capable decoder. It will have particular appeal to the newcomer due to its ease of use. The provision of just c.w. and RTTY modes has the advantage of covering most decodable transmissions, whilst keeping operation simple.

The use of software decoding also has advantages as the decoding modes and facilities can be upgraded by a change of software. This means that the DM-1000 should be able to keep up with new developments, thus giving the unit a longer life.

The DM-1000 is available from Dewsbury Electronics, 175 Lower High Street, Stourbridge, West Midlands DY8 1TG. Tel: (0384) 390063, price £199.95. My thanks to Dewsbury for the loan of the review model.

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72 & 73 from Dave G4QKH, Technical Manager.

Short Wave Magazine, April 1992
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<thead>
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<th>Model</th>
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<td>50kHz - 60MHz</td>
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<td>ARA</td>
<td>Complete with cable + PSU &amp; Interface</td>
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AOR

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ALINCO DXJXIE

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PRICE BREAK THROUGH SHINWA SR001

Remote control full feature receiver
£299

ICOM

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SHORT WAVE MAGAZINE
Let's start with a look at the type of receiver you will need.

Receivers

The minimum requirement is a short wave receiver that's capable of receiving single sideband signals. The range of receivers that fits the bill is understandably very large. At the bottom end there are receivers like the Panasonic RF-B45 that was reviewed last month. If you've a large budget there are many fine receivers to whet the appetite. The current leaders are the Drake R8E, JRC NRD-535, Icom IC-R71E, Yaesu FRG-8800, Kenwood R-5000, Lowe HF-235. If you're into real big money then the Icom IC-9000 at 4000.00 is a top of the range receiver. In between these extremes are a host of very respectable receivers. If you like to buy British, then the Lowe HF-150 and HF-225 are fine performers.

Although s.s.b. reception is the key feature for utility listening, there are one or two other parameters that can make life a lot easier. The first of these is the size of the tuning steps. Some of the popular signals, such as amateur RTTY, marine Telex and I.F. FAX use narrow shifts of 200Hz or less. This narrow shift means that accurate tuning is essential. If the smallest tuning steps on your receiver are 100Hz you can see that it would be very difficult to accurately tune one of these signals. Ideally you need a receiver with tuning steps of about 20Hz or less. However, if your receiver is fitted with a b.f.o. this can be used to bridge the gap where the tuning steps are wide.

With all utility signals, good filtering can produce significantly improved results. There are various types of filter but these can be broadly divided in to audio and r.f. filters. The r.f. filters form part of the receiver and may be switchable to give different bandwidths. The range of filtering options need to be carefully considered when selecting a receiver. In the vast majority of cases it's only the more sophisticated receivers that offer a choice of bandwidths. Some of these manufacturers include a range of filters as standard whilst others can supply them as optional extras. For utility listening I would recommend the following: 500Hz, 1.8kHz and 2.4kHz as being desirable in a sophisticated monitoring receiver.

With audio filters the listener has a much wider choice. This is because these filters can be mounted to the receiver so freeing the listener from dependence on the manufacturer. The prime function of the audio filter is adjustment of the audio bandwidth. It can also be very useful to have a variable notch filter. Two of the most popular audio filters are those from Datong and the BP34 from the makers of the Microreader, ERA Ltd.

Whilst still on the receiver, I ought to make a brief mention of antennae. The only difference between general short wave listening and utility listening is that of interference. Because all decoding systems use some form of computing power there is a higher level of potential interference than with a voice only station. If you're using a commercial self contained decoder, the increase is minimal. To minimise the effects of the interference it's generally advisable to choose an antenna with a screened down lead.

What Modes?

When thinking about joining the ranks of utility listeners, one of the first decisions you need to make concerns the modes you want to receive.

There are a vast range of modes transmitted but fortunately the majority of decodable information is carried by just a small number. By far the most common is simple c.w. Despite it's simplicity, it's still used extensively by maritime operators. The next in popularity is RTTY which is used primarily for news agencies and weather data. The popularity of these two modes can be gauged by the fact that virtually every utility supplier caters for at least these modes. For those on a limited budget I would recommend starting with just RTTY and c.w. To be effective any program needs to be able to handle RTTY baud rates of 45, 50 and 75 with shifts of 170, 400 and 800Hz. For c.w. you need to be able to cope with speeds of between about 15 and 30w.p.m.

The next step up in receive modes is the Automatic Repeat ReQuest (ARQ) systems. Of these, the simplest and most common is the AMTOR and SITOR variants. From the listeners point of view, these two modes are the same. In simple terms AMTOR is the amateur version of SITOR. If you buy a decoder that can handle these modes you'll normally find that FEC is included. The difference between the two is that SITOR is used for links between two stations while FEC is a broadcast mode. This means it gets used to transmit traffic lists and the like.

If you've an interest in receiving weather charts and press photos, you need to consider a FAX decoder. I'll cover the various forms later, but you will need the following receive modes: IOC288 and 576 Drum Speeds of 60, 90, 120 and 240r.p.m.

The next step up from the modes I've covered takes you into many advanced modes. If you are to be successful in receiving these you really need to have mastered the simpler modes first. One of the other snags with the more complex modes is that many of the stations spend many hours just idling with no traffic, even when they do transmit, the information is often encrypted. Despite these drawbacks, many listeners gain a great deal of pleasure from locating, indentifying and decoding these transmissions. Perhaps the most popular of these complex modes are ARO-E, ARO-E3 and ARO-M.

Decoder Choice

This is perhaps the most difficult area for the newcomer. The first decision to be made is whether or not you want to get involved with computers. For most this is a simple and clear cut decision. If you don't have a particular interest in learning about computers I would suggest you avoid this route. This is because there are so many extra things that can (and will) go wrong. If you're an enthusiast you'll learn a lot from getting the system going. Without this enthusiasm you could be in for a hard time! One of the most common problems with computer based systems is interference that can be very difficult to locate and cure.

If you've decided to avoid computers then you'll be looking for a stand-alone decoding system. One the most popular and well established is the ERA Microreader. This neat little unit provides automatic reception of c.w and RTTY using an internal liquid crystal display. The systems has been recently complemented with a large display to increase it's readability. To bring the unit right up-to-date they'll soon be expanding it to include SITOR. A new arrival in this market is the Easy Reader DM-1000 from Dewsbury Electronics.
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DATA MODES

Look up the review in this issue for more details.

Moving further up-market to the more sophisticated units, there are several to choose from. The Wavecom 4010 is certainly one of the market leaders with a very comprehensive set of receive modes. Unlike the Microreader the 4010 needs an external video monitor to display the decoding signals.

If it's mainly FAX you're interested in, the ICS FAX-1 is a very capable performer. This unit uses a printer as a display unit, so you'll need to take account of this in your budgeting.

At the top end of the self-contained FAX units is the AOR WX-2000 and ICS FAX-2. These two units are expensive, but provide top quality images suitable for professional use. The FAX-2 has an added advantage as it can also receive RTTY and NAVTEX transmissions.

If you decide to go for a computer based decoding system there is a considerable choice available. Technical Software have their popular RX-4 package providing RTTY, c.w., SSTV and AMTOR reception for many popular home computers. These include the BBC, Commodore CB4, VIC-20 and Sinclair Spectrum. For more complex modes the BBC based RX-8 is a formidable contender.

Spectrum owners also have excellent support from J & P Electronics. At the top of their range is the RAMS IV package which provides RTTY, AMTOR, SSTV, and c.w. reception. There is not so much of a choice for Atari users but Grosvenor Software offer a

RTTY, AMTOR and c.w.

system.

For the widest choice of software the IBM compatible PC is the best choice. At the top of the range is the impressive Hoka Code-3 system. This features some twenty-four modes as standard, with many more available as optional extras.

For FAX reception both ICS Electronics and Comar Electronics provide sophisticated IBM based systems.

If you're looking for a good all round system at a modest price Grosvenor Software are well worth investigating. Their BMMULTY package includes RTTY, AMTOR, c.w., SSTV and FAX.

There is also a very good range of public domain software available for IBM compatibles. This includes all sorts of utilities as well as some good basic decoding systems. A good starting point is the Public Domain Software Library.

Intelligent Terminal Units

These terminal units offer an decoding system that's accessible to virtually all computer users. The Intelligent Terminal Unit contains its own microprocessor that handles all the decoding. The decoded output is then passed to the host computer via a standard serial port. The most famous of these is the AEA PK-232 which features RTTY, AMTOR, FAX, c.w., ASCII and Packet. The nearest competitor is the Kantronics KAM which features a similar range of modes.

Abbreviations

AMTOR AMateur Teleprinter Over Radio
ARQ Automatic Request Repeat
ASCII American Standards for Computer Information Interchange
c.w. continuous wave (Morse)
FAC facsimile
FEC Forward Error Correction
Hz hertz
kHz kilohertz
I.F. low frequency
R.F. radio frequency
RTTY Radio Teletype
SITOR Simplex telegraphy Over Radio
SSTV Slow Scan Television
W.P.M. words per minute

Useful Addresses

Kelvin Hughes Ltd, Central Mail Order, Royal Crescent Road, Southampton, Hants SO9 1WB. Tel: (0703) 223772.

Grosvenor Software, 2 Beacon Close, Seaford, East Sussex BN28 2JZ. Tel: (0323) 893378.

Public Domain Software Library, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (0892) 663208.

ERA Ltd., 5 Clarendon Court, Winwick Quay, Warrington WA2 8GP. Tel: (0925) 573118.

Technical Software, Fron, Upper Llandwrog, Caernarfon LL54 7RF. Tel: (0286) 881886.

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

Hoke Electronics (UK), 26 Bury Road, Shillington, Beds SG17 7GW.

Klingenfuss Publications, Hagenloher Str 14, D-7400 Tuebingen, Germany.

Universal Shortwave Radio, 1280 Aida Drive, Reynoldsburg, OH 43068, USA.

Datong Electronics Ltd, Clayton Wood Close, West Park, Leeds LS16 6QE. Tel: (0532) 744822.

BARTG, Ann Reynolds, 169 Bell Green Road, Coventry CV6 7GW.

ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Arundel, West Sussex BN18 6BD. Tel: (0903) 731105.

Comar Electronics, Unit 10, Samuel Whites Estate, Medina Road, Cowes, Isle of Wight PO31 7LF. Tel: (0983) 200308.

Dewsberry Electronics, 176 Lower High Street, Stourbridge, West Midlands DY8 1TG. Tel: (0384) 390063.

Summary

As I hope you can see from this article there are many routes to utility monitoring. The golden rule is to try before you buy wherever possible. The ideal way to do this is to visit one of the many radio rallies that are held all around the country.

If you do decide to take the plunge, don't forget to keep an eye on my Decode column for all the latest news and products.
Amongst a nation of listeners, a few were keen to delve deeper into the intricacies of wireless and attempt to construct their own radio receivers. To these there was one idol - John Scott-Taggart.

From the early Twenties to the beginning of WWII, Scott-Taggart contributed some 500 articles to the popular technical press, starting with his first published design the ST100, sporting two valves in 1925.

He produced on average one design a year, each incorporating the new techniques in wireless as they were being developed until the appearance in 1937 of the ST900 with five valves.

Probably the best remembered were his ST100 and ST300 receivers that were fully covered in the mid-1930s in Popular Wireless and TV Times.

Full constructional details were given in all his designs, the 'bread-board' technique of the wiring being shown in illustrations and photographs. Layout was more leisurely and spaced out at this time as there was no need to compress everything to meet the needs of miniaturisation.

Inter-valve wiring did not necessarily travel via the most direct route. It was aesthetically pleasing to form the heavy gauge wire into right angles, following perhaps more rigidly the schematic circuit diagram. Resistors were often fitted into 'holders' and valves and condensers were supplied with screw terminals and connected by wrapping wire ends round the screws and tightening them with a knurled nut.

With the exception of valve cans, no one seemed to be bothered by screening.

Fullest Instructions

Scott-Taggart’s articles contained the fullest instructions; even the template of the tuning dial was supplied; with all the then European broadcast stations printed on it. And for those with the time and inclination to go deeper into the subject he produced his Manual of Modern Radio. From its publication in late 1934 this book became the bible for all seriously minded wireless enthusiasts.

John Scott-Taggart was born in Bolton in 1897. In addition to a grounding as an electrical engineer he also qualified as a barrister at law at University College, London. He became head of the Patent Department of the Radio Communication Company in 1920 and in 1922 founded the Radio Press Ltd.

Between 1918 and 1934 he took out 30 patents in his own right relating to radio circuits in general and more specifically to aspects of valve manufacture. He became involved in RAF radar training during the early part of WWII and was awarded the OBE in 1975 for 'Services to Radio Engineering'.

In the preface to The Manual of Modern Radio the author stated that it was assumed the reader knew nothing whatever about radio or even electricity. An adequate understanding of radio could be achieved without a course in physics, chemistry and mathematics it was claimed. And Scott-Taggart went on to prove just that. Apart from some graphs showing valve characteristics (which were clearly explained in the text) there was no mathematical treatment. Even Ohm’s Law was described simply as: ‘The relationship between current, e.m.f. and resistance’. In some 380 pages, aided by 541 drawings Scott-Taggart went on to lay bare the theory, practice (and at that time the mystery) of radio reception.

Basic Background Knowledge

The writing may be considered ‘middle-class’ - which is understandable as the author was the son of a consulting engineer. It was written for that portion of the population who were genuinely interested in wireless and prepared to spend their leisure time acquiring basic background knowledge that would enable them to build their own radio or radio-gramophone. The
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**NEW PSU-101 MK IV**

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Short Wave Magazine, April 1992
writing contrasts with the ease of style and 'user friendliness' of the F J Camm manuals that were to follow a few years later. But they were really for a different group of hobbyists. Whereas Camm's books appealed to the masses with straightforward, get-up-and-go text profusely aided by diagrams, Scott-Taggart's instructions were for the thinking man who perhaps wanted to know not only 'why' but 'how' a circuit worked.

Modesty was not one of Scott-Taggart's attributes, as those who recall some of his magazine articles may remember. Some of the introductory paragraphs in The Modern Manual of Radio are an example of his self-esteem.

'Between the stiff covers of this manual will be found a summary, supplemented by criticism when it has been found necessary, of the whole modern techniques of broadcast reception'. He later advises: 'Only very occasionally, if he reads from cover to cover, will he (the reader) have to leave a paragraph to a second reading'.

Easier to Digest

However, his descriptive text was far easier to digest than many academic textbooks of the era and he did have the knack of being able to explain wireless in the clearest of terms. And this without undue verbiage.

His forte was the thermionic valve and an example of his technique shows his use of a mechanical analogy to explain its operation. The triode is represented as a fountain (filament) with water being sprayed through a rose (space charge). When a pump is brought into action (h.t. supply) some of the water is sucked up to a funnel (anode) and ultimately goes back through pipes to the trough of the fountain. The grid was shown as a belt-driven propellor or fan which could either produce an updraught to help the water (positive charge) or a downdraught to hinder the flow (negative bias).

One or two recommended practices in the book, it must be admitted, would be frowned upon today. But they simply show the approach that was taken at this time.

One technique, of using the mains wiring as an aerial is certainly questionable and would appear to be downright dangerous. A set was described in which the feed to the aerial terminal of the receiver is taken from one side of the primary winding of the mains transformer through a capacitor. The reader was
warned that ‘the condenser has to be flawless as regards insulation!’ And to reassure the faint hearted it mentions that sometimes two condensers in series could be used for extra safety.

It is interesting to read of the latest innovations at this time. Short wave reception below ten metres; Iron core tuning inductances (i.f. transformers); the metal valve and the electrolytic condenser. Mention is also made of the ‘Westector’, developed by the Westinghouse Company and apparently the first metal rectifier to be used as a detector in a receiving circuit.

*The Manual of Modern Radio* is by no means rare and should be obtained for around £10 at the right bookshop. It is a joy to read even if only to reminisce about times and circuits long gone. For the older generation it may recall the first two-valver that was built with reaction control and probably explain to them some techniques that they were possibly a little hazy on (but reluctant to admit).

Undoubtedly the writings of John Scott-Taggart put many on the right road to an understanding of wireless as a hobby and possibly paved the way for a few to a career in the radio industry.

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**Listen With Grandad**

By Leon Balen and David Leverett

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

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

Quick! Tell Grandma to ‘phone your Uncle Jim and warn him that if he hasn’t renewed his TV Licence yet, the detector van has just turned into his street!
YUPITERU MVT-7000 £289
1MHz-1300MHz FM/AM/WBFM
Includes ni-cad pack and charger
The Yupiteru MVT-7000 is the very latest scanning receiver to leave the factory, being a complete update of the MVT-5000. Its sensitivity is unsurpassed and its logical controls and beautiful design make it one of the smallest and slimmest scanners around. Our professional customers love it and you will too when you try it. Fully featured it has 200 memories, extensive scanning features, is fully programmable and even has an adjustable contrast control on the LCD. To try it is to buy it, so be warned!

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

SONY ICF-2001D £289
150kHz-30MHz + airband
USB/LSB/AM/SSB (sync) Includes free universal AC adaptor
If you want a truly portable communications receiver that performs as well as base station models yet fits into the domestic scene, look no further. At £399 it would be good value. At £289 it's an absolute bargain.

YUPITERU VT-150 £169
142-170MHz FM
Includes ni-cad pack and charger
The VT-150 is a purpose designed scanner that covers the marine, and 2 metre amateur band plus a bit more! There is no doubt that a scanner dedicated to a particular part of the radio spectrum will out perform one that is designed to cover everything. If your interest is in this frequency range, look no further. It's the VT-150 from AOR, the world's leading scanner manufacturers. If you want a truly portable communications receiver that performs as well as base station models yet fits into the domestic scene, look no further. It's the VT-150 from AOR, the world's leading scanner manufacturers.

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

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

Yupiteru MVT-5000 scanner £229
25-550MHz & 800-1300MHz AM/FM
The MVT-5000 is a superb budget priced scanner with amazing sensitivity added to which it is very simple to use. The only gap in its range is the TV broadcast band and if you can live with 100 memories it offers incredible value! Hundreds are in use, many by professional users and like all Yupiteru equipment it has proved to have unpassed reliability. Available from stock with our 12 month parts and labour warranty.

For nearly twenty years we've been selling radio communications equipment at sensible prices. Prices that enable us to still be there when things go wrong. That doesn't mean we're expensive, it simply means we give you good value.

If you want full performance at a good deal. And you can't ask for better prices. Prices that enable us to still be there when things go wrong. That doesn't mean we're expensive, it simply means we give you good value.

Now you might claim that old "Joe Bloggs Shack" is quoting you a better price, so why worry? The Shack" is quoting you a better price, so why worry? OK, we're expensive, it simply means we give you the service you can trust. A full 12 month's warranty is also included.

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"Professional Grade" Scanner
DJ-X1. 500kHz-1.3GHz
“A Scanner of Unrivalled Performance”

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

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

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

- 3 scanning speeds
- 3 scanning modes
- 100 memories in 3 banks
- Auto memory loading
- Priority channel
- Dual rate battery saver
- Large battery pack
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- Dual antennas
- 5 programmable bands
- Wider range of frequency steps
- Super front end sensitivity
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Short Wave Magazine, April 1992
Yupiteru VT 225
Airband Scanner

Chris Yates has been putting the latest airband scanning receiver from Yupiteru through the mill and reports on what he found in this exclusive test report.

First Reaction

Everything about the VT 225 smacks of quality engineering, the smart styling, positive feel key pad and superior sound quality are all indicative of a well thought out, well made machine. For the serious airband enthusiast this is very much a matter for personal choice, but for the purpose of this review I looked at two distinct areas of civil aviation - airways and airport control.

Living directly underneath the intersection of several major airways - Amber One and Blue One amongst them - and with an international airport almost on the doorstep, that dictates a fair degree of number punching on less well specified equipment than the VT 225. However, with the VT 225's ability to store up to 100 frequencies in memory, it was possible to enter all audible channels - some forty of them - and simply scan for activity. The memories are arranged in banks of ten and whilst it is possible to scan all of them in one go, a useful feature allows the user to specify which band or banks he wishes to monitor. With that in mind it was feasible to store airport and approach frequencies in two, whilst using the remainder for airways control, switching between them at will.

Band Write is the only confusing function on this receiver. At first glance it appears to be an autowrite facility, but allows occupied channels discovered during the frequency search to be downloaded into memory for scanning at a later time. It isn't, and therefore needs further explanation.

Most airband and scanning receivers have a limit function that allows the user to define lower and upper parameters of a frequency search. On the Yupiteru VT 225 this function is called 'Band Write'. It allows up to ten search bands to be committed to memory, but the dual-function, front panel keys are laid out in a logical fashion that is very easy to understand. What to listen to is very much a matter for personal choice, but for the purpose of this review I looked at two distinct areas of civil aviation - airways and airport control.

There are airband receivers and airband receivers, but Yupiteru equipment is very much in a class of its own. Like Signal before it, I think that the name is destined to become synonymous with the best in aviation receivers. That may sound a little over optimistic but it is a comment sure to be echoed by the many owners of the VT 125. This impressive hand-held first appeared on the UK market some eighteen months ago and has been a firm favourite ever since. Despite its small size the VT 225 packed a powerful punch with full a.m. coverage of all 200 navigation and 760 communication channels between 108.000 and 137.000MHz - plus a goodly portion of the adjacent p.m.r. band - with exceptional sensitivity. But, given this extended range, I could never understand why Yupiteru hadn't provided it with the ability to resolve f.m. signals, or for that matter, included the military allocation 225.000 to 399.000MHz. I need muse no longer, the soon to be introduced VT 225 provides all that and more.

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Aside from the normal air/ground/air communications activities, the civil aviation frequency allocation is crammed full of almost continuous Atns, Volmet and Oceanic Track broadcasts, not to mention some very peculiar noises.

To avoid locking onto these transmissions whilst searching for activity it is possible to command the receiver to ignore them by using the Pass function. That also applies to scan mode where individual channels can be locked out.

Programming errors are dealt with very easily. Corrections are made with a prod of the C/AC button using the UP/DOWN keys to select the offending digit and then simply inserting the correct number, followed by the ENTER command.

As with most airband receivers and scanning equipment the VT 225 has a priority function. Held in memory zero, I invariably leave this monitoring the international distress frequency 121.500MHz - a practice that has resulted in some fascinating and occasionally harrowing listening.

**On Air**

Whilst the majority of these features are now de rigueur amongst better quality high priced equipment, the Yupiteru VT 225 stands apart from the rest in its performance on the air.

The quoted 0.5µV sensitivity figure is very much on the conservative side - a fact evidenced by its ability to pull in transmissions inaudible on other equally sensitive equipment.

that resulted in my being able to monitor aircraft cruising at 33000ft out to the FIR boundaries with Denmark, Holland and France at S2, S5 and S6 respectively on the built-in signal strength indicator and using a left mounted dipole cut for the civil airband.

Turning to the military allocation a fast search through the lower part of the band revealed some fascinating activity. The Red Arrows exercised with air to air comms on 243.450MHz, whilst a succession of USAF Military Airlift Command flights could be heard in communication with Eastern Radar (285.900MHz).

Sensitivity was equally good at u.h.f. with traffic monitored descending into Valley, Finningly, Fairford and Mildenhall to name but a handful of airfields.

In fact, in terms of sensitivity the VT 225 compared favourably with the grand-daddy of aviation receivers - a Signal R535 - which I've often used to monitor Shuttle activities with a suitably cut crossed dipole.

That being the case, I couldn't help wondering whether it would perform equally well, but with no mission flying during the review period it was not possible to find out.

Whilst a.m. or n.f.m. is readily selectable throughout the receiver's v.h.f. range, at u.h.f. narrow band f.m. is locked out in four specific frequency bands - 253.000 - 255.000MHz, 262.000 - 268.000MHz, 271.000 - 275.000MHz and 380.000 - 382.000MHz. These are mobile telephone allocations in Japan and I understand that the importers, Nevada Communications, have arranged with Yupiteru to have these restrictions removed on VT 225s intended for the UK market.

**Conclusions**

One final and pleasing aspect of the VT 225 is the quality of sound reproduction. In such small receivers this is very often compromised by lack of space for a reasonable speaker arrangement. By ingenious design the VT 225 suffers none of the afore mentioned drawbacks and sound reproduction is on a par with, or even better than, many of its larger and somewhat more expensive brethren.

That, together with a well thought out list of features comparable with top flight equipment, makes the Yupiteru VT 225 both a pleasure to use and own. The receiver comes complete with its own helical antenna, a set of four 1.2V NiCads, charger, external power cord, earphone and carrying strap. At £229 including VAT it is worth every single penny. Thanks are due to Nevada Communications for the loan of the very first unit into the country.

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**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency Coverage:</strong></td>
<td>108.000 - 142.000MHz</td>
</tr>
<tr>
<td></td>
<td>149.500 - 160.000MHz</td>
</tr>
<tr>
<td></td>
<td>222.000 - 391.000MHz</td>
</tr>
<tr>
<td><strong>Step Size:</strong></td>
<td>10, 12.5, 25, 50 &amp; 100kHz</td>
</tr>
<tr>
<td><strong>Modes:</strong></td>
<td>a.m. &amp; n.f.m. (see text)</td>
</tr>
<tr>
<td><strong>Sensitivity:</strong></td>
<td>a.m.: 0.5µV (S/N 10dB)</td>
</tr>
<tr>
<td></td>
<td>f.m.: 0.5µV (SINAD 12dB)</td>
</tr>
<tr>
<td><strong>Antenna Impedance:</strong></td>
<td>50Ω (b.n.c. socket)</td>
</tr>
<tr>
<td><strong>Power Requirements:</strong></td>
<td>Internal: 4 x 1.2V NiCad cells.</td>
</tr>
<tr>
<td></td>
<td>External: 12V d.c.</td>
</tr>
<tr>
<td></td>
<td>Mains power unit</td>
</tr>
<tr>
<td><strong>Current Drain:</strong></td>
<td>150mA, 60mA charging.</td>
</tr>
<tr>
<td><strong>Audio Output:</strong></td>
<td>100mW (4.8V into 8Ω for 10% t.h.d.)</td>
</tr>
<tr>
<td><strong>Dimensions:</strong></td>
<td>559 x 147 x 38mm.</td>
</tr>
<tr>
<td><strong>Weight:</strong></td>
<td>280g.</td>
</tr>
</tbody>
</table>
Please remember that, under normal circumstances, radio or television signals transmitted within the VHF Bands II (98.5-108MHz) and III (175-230MHz) and the U.H.F. Bands IV (471-608MHz) and V (815-956MHz) have a limited range and travel, line of site, through the troposphere. As you know, the different layers of the earth’s weather, can cause signals to increase their range considerably when certain changes, linked to high atmospheric pressure, take place.

With this in mind, I suggest that you read the following Band II reports in conjunction with the tropospheric section in my “Television” column elsewhere in this issue and don’t forget that tropospheric- openings may be fine for DXing, but, because the V.H.F. and U.H.F. bands are shared between a multitude of stations, the domestic listener or viewer may be enduring interference from other stations while these conditions prevail. In recent years broadcasters have helped to limit the grumbles by explaining the cause of such interference in their weather reports.

**Tropospheric**

The predominantly high pressure and the persistent frost and fog in January and early February contributed to the tropospheric conditions which opened Band II on several occasions. George Garden (Edinburgh) heard a short repetitive tone played fairly rapidly around 88 and 104MHz throughout the evening of the 10th and wonders if it was some sort of radio beacon being propagated by the lift. Simon Hamer (New Radnor) received stations from Belgium, Germany and Holland on February 1st. Andrew Jackson (Birkenhead) received programmes from Holland (NOS1) on the 29th. (Birkenhead) received programmes from Holland (NOS1) on the 29th.

**Solar**

Ron Livesey (Edinburgh), using a 2.5in refractor telescope and a 4in projection screen, located 4 active areas on the sun’s disc on December 8, 24 & 26, 5 days on 5, 23, 27 & 29 and 6 on the 4th, 10th, 11th & 13th. Patrick Moore (Selwyn) made a drawing of the ‘cluster’ of sunspots that he observed at 1015 on January 3rd, Fig. 1. With his spectrohelioscope at his observatory in Sevenoaks, Cmdr Henry Hatfield located 4 sunspot groups, 14 filaments, a ‘hedgehog’ prominence on the NE-limb, a medium ‘mushroom’ prominence on the SE-limb and 4 other quiescent prominences at 1235 on the 10th, 14ts & 7gms at 1210 on the 21st and, despite high cloud, he observed 4gps, 17ts & 9 small gps at 1240 on February 3rd. Also, on the 3rd he noted that he had been observing the W-limb and a long chain group near the E-limb were both active. Henry’s 136MHz Radio telescope recorded individual bursts of solar noise on January 13 & February 2nd and continual noise storms on January 31 & February 3rd. Tony Hopwood (Worcester) recorded ‘juicy’ solar flares at 1302 on the 14th and at 1910 & 1932 on the 26th & 30th respectively. Tony found propagation unusual from the 22nd and said, “there were periods before noon and after sunset when the m.u.f. (maximum usable frequency) jumped to well over 20MHz giving enhanced h.f. and v.h.f. reception, including TV and radio signals in the 70MHz band”.

**Auroral**

In December, Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of ‘glows’ for the overnight period on days 1, 10, 12, 16, 20 & 26, ‘arc or band’ on the 1st & 10th, ‘ravied arc’ on the 27th, ‘ravied bundles’ on the 27th & 28th, ‘active, moving and pulsating’ on the 9th, 27th & 29th and ‘coronal’ or ‘half sky’ on the 29th from observers ranging from Southern England, through Scotland to Goose Bay in Canada. The ‘ray bundles’ were seen from Hampshire and Sussex on the 27th. Auroral reflected radio signals were copied by Tony Hopwood, in the 144MHz band, on December 27. Doug Smillie (Wishaw) heard them weakly at 1235 on the 10th, 5gps, a ‘mushroom’ prominence on the SE-limb, a medium prominence on the NE-limb, 14 filaments, a ‘hedgerow’ prominence on the W-limb and a long chain group near the E-limb were both active.

**Propagation**

Denmark & Ireland on the 14th, BBC (Derby & Humberside) & Ireland on the 15th, Ireland on the 16th, BBC (Wales), Germany & Holland (NOS2) on the 21st, BBC & Radio Cymru (Wales) on the 24th, France on the 29th, Aire FM (Leeds), BBC (Wales), Germany & Ireland on the 28th, BBC (Yorkshire), Holland & Ireland on the 28th, BBC (Wales) & Holland on the 29th and BBC & Radio Cymru (Wales), Germany & Holland on the 31st. But now to the sun and other activity in the earth’s atmosphere.

**Magnetic**

The various types of magnetometers used in December by Tony Hopwood, Karl Lewis (Saltash), Ron Livesey, David Pettitt (Carlisle) and Doug Smillie recorded between them magnetic storm conditions on days 1, 2, 4, 8, 10, 13, 16, 17, 18, 20, 27, 28, 29, 30 & 31. Finally, my thanks to Gordon Foote, Henry Hatfield, Ted Owen (Maldon), Fred Pallant (Storrington), Ted Waring (Bristol), Ern Warwick (Plymouth) and Ford White (Portland) for their 28MHz beacon logs which, when amalgamated, enabled me to prepare the chart seen in Fig. 2. Fred Pallant and Ern Warwick heard the German beacon DKX10 (28.257MHz) on January 25 for the first time in a long while. Henry Hatfield remarked that EA2JA was ‘very loud’ on January 12 and Tony Hopwood reported ‘good reception’ at times from WWV (Boulder) on 20MHz up to 2100.

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Fig. 1: Patrick Moore’s drawing of a cluster of sunspots observed on 3 January 1992.

Fig. 2.
Thanks for all the letters, especially those commenting on my first column. The February offering was completed in about eight days, those since have had the benefit of much more time and more information from readers. Peter is on the mend, and well on the way to a full recovery; he may be back in ‘the hot seat’ by the summer.

**G5RV**

Of the dozens of letters that I have received, at least a third of them have asked, “What is a G5RV antenna?” The G5RV was designed at least 40 years ago, and is principally a transmitting antenna for use on all the h.f. amateur bands, but it works equally well across the whole of the h.f. spectrum when connected to a good receiver through a.t.u. It is basically a long-wire dipole 31m long, which is fed by 10.3m of 300Ω ribbon cable feeder. The top of the ribbon cable connects to the centre of the dipole, one side of the ribbon cable connects to one ‘leg’ of the dipole, and the other side connects to the other ‘leg’. At the bottom end of the ribbon cable is a balun to convert the 300Ω feeder to 50Ω to match standard coaxial cable. The whole antenna should be installed as high as possible, and as straight as possible, with the ribbon cable hanging vertically. They are simple to make yourself, the only difficult part being the balun.

Several letters commented on the way my G5RV is installed in my loft, and usually only cost a bit £15-20 anyway. I got my parts ready from a local amateur radio dealer, where they usually only cost about £15-20 anyway. So why am I telling you all this? Well the USAF will soon be starting these deployments across the Atlantic into Europe, so the ‘Head Dancer’ callsigns are being used regularly. Remember that ‘Head Dancer’ will also crop-up on the NAT-A/NAT-B frequencies when crossing the Atlantic.

**More Mystery Signals**

A letter and tape from S Hosegood in London contains details of a large net of stations heard during the afternoon of December 7 on a frequency of 4,478MHz u.s.b. The accents are all English, and it sounds like some sort of Army manoeuvres or training net. The call signs are mostly four-digit letter/number combinations (e.g., F77B, M19C), and many others join and leave the net as time goes by. There are mentions of tanks, APCs, helicopters, aircraft, artillery and various ‘enemy sightings’. One theory is that this was a school CCF training session, but the voices sounded too adult for CCF members, and also the 7th was a Saturday (may be significant?) Any ideas? Can anyone provide a list of frequencies and modes used by school CCFs today?

Last month, I briefly mentioned some unknown voice transmissions on 6,738MHz u.s.b. I now know that this is being used by UN forces in the Western Sahara. I am not sure if the troops are Australians or New Zealanders, but they have been active most evenings passing general messages. They have also been heard on 6,753MHz u.s.b. On February 15, one UN station was heard trying to contact MARS station AFA2X0 on 11,176MHz u.s.b. when he was called by another UN station, and then GSY2E to ‘channel 30’. Any ideas?

Next month, I hope to include some information on the ‘Mystic Star’ network, and some more NASA frequencies.

**Head Dancer**

This is the h.f. callsign for EC-135 aircraft (military Boeing 707) often mentioned in the replies. The callsign belongs to one of a limited number of USAF aircraft that are used to control the deployment of fighter aircraft over long distances. Several times a year, the USAF will send a number of fighter aircraft from the USA to overseas bases. Deployments are known as ‘Coronets’, those that cross the Atlantic (or ‘Crayon’). Most of these are established at Dharhan in Saudi Arabia (‘Crayon’), that ALCC is still there today. Once the aircraft is in radio contact with the GCCS station, it will first try to call the most suitable ALCC. The aircraft will also pass its cargo and what time it expects to be there. Several times a year, the EC-135 will use a USAF GCCS station to regularly contact TAC HB at Langley AFB in the USA (‘Raymond 01’). The EC-135 will pass a set of information known as a ‘JJ report’, which details the progress of a flight of aircraft. This describes as follows:

**Item 1:** the number of the message sent to Raymond 01

**Item 2:** the callsign of the lead aircraft in the flight, sometimes only the number is given

**Item 3:** the number of the refuelling taking place

**Item 4:** ‘on-bloom’ time (UTC) for aircraft in this cell to refuel

**Item 5:** ‘off-bloom’ time for last aircraft in this cell to refuel

**Item 6:** ETA at destination - normally omitted

**Item 7:** amount of fuel (in thousand of pounds) given to each aircraft in this flight (e.g. 4.8 - 8,000lb)

**Item 8:** latitude/longitude for start and end of refuelling
Nicholas Earley from Victoria, Australia has invested in a 1.5m dish with related equipment and is receiving many signals from the AUSSAT satellites - including BBC TV Breakfast Show, BBC news, etc., thought to be en-route to Ch.3 Sydney. Nicholas says that the BBC advise their World Serv ice TV will be targeted into Australia probably early '94.

A local newspaper cutting suggests that Hong Kong Telecom International is to offer a compilation of CNN/ESPN for transmission down from Indonesia's Palapa satellite to offer competition to the AsiaSat 1 Star TV service. Interesting to see that Singapore cable service is allowing CNN to operate on its facilities provided it shares with other programming sources, the BBC were offered but sought exclusive cable carriage only, the Singapore government refused and opted for CNN.

Orbital Slot News

Several new TV channels have appeared over the past few weeks, Show TV is active on Intelsat II F2 10°E (11.575GHz vertical) and is a Turkish orientated service though so far content seems to be from the MTV pop music channel. Show TV is uplinked from France.

Teleon is now operating with a 24 hour general programme format for Turkish nationals in Western Europe, again on 10°E at 11.586GHz horizontal in the clear with its main office at Istanbul, Turkey.

"Free Choice TV" appears over Eutelsat II F1 13°E though perhaps not so free since it aired with Sat-Box encryption and now into scrambled D2MAC as from early February, based in Holland. Another Dutch satellite programme 'D2-TV' is now operating a test programme with 16/9 wide screen format in D2MAC over Eutelsat II F3 16°E. Soft porn broadcaster 'Adult Channel' opened January 31 from Transponder 28 on Astra 1B using after midnight downtime on the Comedy Channel. Daytime downtime on the same transponder is now absorbed by the 'TV Asia' channel for some 4 1/2 hours daily though more transmission hours are now being discussed with SBS Astra. A Chinese channel is expected Summertime '92 over Astra.

Discovery Channel aired over Intelsat 21°W is introducing 'The Learning Channel' from early March which uses a 2 x 3 hour programme format (the 1200-1500 hour sequence repeating the next day but at 0900-1200 and so on). Programme strands will be educational, 'healthy' leisure and schools. The 7 days a week service will include both US and bought-in European material. After Astra 1D is launched '93, SES have confirmed an order for Astra 1D to be co-orbita l with the other 3 Astra birds at 19°E to act as a kind of 'sister' carry the extra business, often Gor

The Latvian test card seen on the Visnews Moscow circuit at 11.51GHz 14°W.

The Middle East Broadcasting test card via Eutelsat II F1 13°E 11.55GHz horizontal received by Peter de Jong using a 900mm dish.

Most of the period has been dominated by the many satellite feeds from the Winter Olympic Games in the French Alps. We are seeing an increasing number of news inserts preceded with 'VTM SNG1' (or '2') usually on the latest Eutelsat II F3 bird at 16°E, the SNG operation is based in Brussels operating the standard mobile uplink truck with related payload equipment though I have only seen VTM operat in the 12.5GHz Telecom band to date.

The usual Visnews Moscow Bureau playouts take place several times a day over Gorizont 15 at 14°W 11.51GHz left hand circular - the first one of the day is normally 1000UTC. At other times, when the transponder is not in use, an unmodulated carrier is continuously transmitted. For the past few weeks, Videocrypt, mainly due to cost, ease of decoder acquisition and minimal size compared with the 18in rack configuration that tends to echo BMAC. Until all subscribers have realigned their dishes onto Eutelsat II F3 for the new Videocrypt service, BAE Sportscast will continue to downlink in parallel (double illuminate) with her original transponder on Eutelsat F1 14°E.

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Despite the recent publicity in the Maxwell Communications Empire, Maxsat is going ahead with its satellite linked supply service for industry and broadcasters. Before Christmas Maxsat provided uplinking from the Dutch Summit talks and now Maxsat provides regional linking from the ITN Westminster studio into local ITV studio - the service started mid February.

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The end of March '92, industry pundits speculate that Flimm will be transmitting in Eurocrypt D2MAC and thus ending the several years of blatant decoder piracy throughout Europe.

British Aerospace (BAE) have dropped BMAC scrambling on the Sportscast service and has gone to Videocrypt, mainly due to cost, ease of decoder acquisition and minimal size compared with the 18in rack configuration that tends to echo BMAC. Until all subscribers have realigned their dishes onto Eutelsat II F3 for the new Videocrypt service, BAE Sportscast will continue to downlink in parallel (double illuminate) with her original transponder on Eutelsat F1 14°E.

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logged from WA4DDE & 9H4CM; but reversion to c.w. for 9NLG, W1GUE, WA3AFS, WB4DBB, KG4W, VC1HA, W3HHG, K1ZM, NE5P, NJ4JV, K8FX, WB6E, NB6G, W8GUJ, K8MP, W0RWS, VE3KLM, VE2GDI, VE3HX, RY0U, UO6F, UOSON, RA0CEJ, UASFI, TS0Z (an SM in drag!); EPHASBUH and the usual smaller stuff.

Ron Gallier (London N1) is looking toward retirement to Southend area, so his outlook over the water should produce some interesting signals, even though restricting activity for the moment. Other than the European stuff, it's ES4NG, V01X, 3LW, 4N3GQ, KASZ1, GMXKOD, up from Sweden; KA2STI, KAEUE, WND8B, K4CFF, NB8LW, ES1QD working various WS, 70DX calling without success on various 0s, A92BE and umpteen others. What is particularly interesting on Ron's list is that he slips in the odd c.w. signal among the sideband ones, so is obviously looking at both ends of the band.

Ian SM in drag! offers most of the W call areas, including 8Q7XX being called without success on 14MHz. On Eighty, K2JMY, KO1F, VE2CMT, PG5NB, 9ZS1AU, K1ZM, KC1KQ, W3HHG, NX8H, KJ2EB, YV6LAV, RY0U, RI0JB, JR5JAQ, 9Q5TE, EARTH & 4S7/SH. On 3.5MHz he snaffled WA3AFS, WB4DBB, KG4W, VC1HA, W3HHG, K1ZM, NE5P, NJ4JV, K8FX, WB6E, NB6G, W8GUJ, K8MP, W0RWS, VE3KLM, VE2GDI, VE3HX, RY0U, UO6F, UOSON, RA0CEJ, UASFI, TS0Z (an SM in drag!); EPHASBUH and the usual smaller stuff.

Another correspondent to tackle the c.w. signals this time was Gerald Bromwell in Manchester; so I'll mention here his pileups first. On 21MHz he picked up ZA1HA, ZA10A, 8P9CU, 9K21C, while for 24MHz the W call areas, including 8Q7XX being called without success on 14MHz. On Eighty, K2JMY, KO1F, VE2CMT, PG5NB, 9ZS1AU, K1ZM, KC1KQ, W3HHG, NX8H, KJ2EB, YV6LAV, RY0U, RI0JB, JR5JAQ, 9Q5TE, EARTH & 4S7/SH. On 3.5MHz he snaffled WA3AFS, WB4DBB, KG4W, VC1HA, W3HHG, K1ZM, NE5P, NJ4JV, K8FX, WB6E, NB6G, W8GUJ, K8MP, W0RWS, VE3KLM, VE2GDI, VE3HX, RY0U, UO6F, UOSON, RA0CEJ, UASFI, TS0Z (an SM in drag!); EPHASBUH and the usual smaller stuff.
It is not unusual for tropospheric openings to outweigh everything else during the mid-winter period. But this January has been exceptional as summed up by David Glenday, a very experienced DXer from Arbroath, who remarked, "overall it's been the best January for tropospheric DX that I've come across". There is much more about this later after we have discussed the happenings in the ionosphere.

**Band I**

"We have had fairly regular F2/TEP reception from SE. Asian region in November," wrote Lt. Col Rana Roy (Meerut, India) who found that the pictures were clear at times thus giving him a chance to get a few idents before the events tapered off in December. He logged these ionospheric disturbances almost daily from November 2 to the 29th and again on December 1, 2, 4 & 12. Despite the smeary and distorted images, typical at such times, he positively identified pictures from Bangkok (TV3) on Ch. E2, at 1245 on February 3.

**Satellite TV**

Among the signals that Rana Roy received from Asiasat are captions from Burmese TV, Fig. 3 and the Hong Kong based 'Star TV', Fig. 4. Peter de Jong (Leiden) logged a caption from Netherlands Broadcasting on Eutelsat II F2 at 1602 on December 8, a test-card from Spain, Fig. 5, via Eutelsat II F3 (16 E) at 1820 on January 14 and a programme from Turkey, Fig. 6, from Eutelsat II F2 at 1030 on the 19th.

**Weather**

Ever since wireless communications began, the prevailing weather has always been a topic of conversation between operators whatever their modes of transmission. This was proved again by the slow-scan television caption, Fig. 7, received by John Scott (Glisgow), on the 14MHz band in January. "The weather here is cloudy and cold, the temperatures are between 14°C in the day and 2°C at night. Whenever we do have the sun, it is very weak," wrote Rana Roy on January 16.

The slightly rounded atmospheric pressure readings, Fig. 16, for the period December 26 to January 25, were taken at noon and midnight from the barograph installed at my home in Sussex. The pressure was predominantly high throughout with persistent fog and many frosts. The rainfall for January was low at 0.94in with the heaviest amounts in my rain gague on the 4th (0.26in), 9th (0.30in) and 26th (0.28in).

**Picture Archives**

For the benefit of our new readers, Andrew sent photographs of a test-card from Denmark (TV2 NIBEI), Fig. 8 and a caption from Holland, Fig. 9, both in full colour, that he received in the evening of January 25 the pressure rose from 30.5in to 30.8in and fog started to form. However, at lunchtime on the 26th the temperature rose to 31.0in before settling down to 30.9in by late evening," wrote Andrew Jackson from Birkenhead.

**Tropospheric**

Mike and Wendy Evans (Buckhurst Hill), using a Thomson TS2551 receiver, a D100 converter, received pictures from Germany (RTL+) during the afternoon of January 13. While the predominantly high pressure system of 30.7in was still moving on the 26th, I received watchable pictures from Ireland’s RTE 1 on their Ch. 1 (215.25MHz) in Band III. At 2145, I saw their logo, adverts for ESB, Galatee and Xtra Vision and the start of Thief Is Your Life-filmed in Dublin. There was a fair bit of channel-interference on the u.h.f. band during the evening of the 30th. At 0445 on the 31st I saw three, very strong, Dutch test-cards (PTT/NED3) between Chs. 30 and 50. By 1120, the Belgian test-card (BRT TV1), inscribed with 'NICAM-STERO' and antenna mounted 6m above their roof, proved very rewarding with u.h.f. DX between the 10th & 15th. In that time, they saw a variety of programmes and idents from stations in Belgium (RTBF2), Denmark (TV2), France (A2, Canal+, FRS/RES, TF1 & TV8), Germany (ARD1, HR3/FTM, NDR, NR3, RTL+, SWF, WDRZ & ZDF1 & 2), Holland (NED1 & 2, Fig. 11) and Sweden (TV2 & 8). These signals came from Schoten and Wavre in Belgium, Nibe, Tommerup and Vordingborg in Denmark, Amiens, Avignon, Bergara, Boulogne, Brest, Chartres, Clermont FDN, Dunkerque, Lens, Lille, Marseille, Tours & Sens in France, Aurich, Bardin, Bremen, Dortmund, Dusseldorf, Fernsehen, Flensburg, Hamburg, Hanover, Harz/Gotingen, Hessen 3, Hoher Meßner, Neumünster/Schleswig, Osnabruck, Saarbrücken-Schocksberg and Ulizen in Germany and Goes, Lopik, Markelo and Smilde in Holland. Mike and Wendy's wide range of receivers for DXTV can be seen in Fig. 10.

John Woodcock (Basingstoke), using a D100 converter, received pictures from Germany (RTL+) during the afternoon of January 13. While the predominantly high pressure system of 30.7in was still moving on the 26th, I received watchable pictures from Ireland’s RTE 1 on their Ch. 1 (215.25MHz) in Band III. At 2145, I saw their logo, adverts for ESB, Galatee and Xtra Vision and the start of Thief Is Your Life-filmed in Dublin. There was a fair bit of channel-interference on the u.h.f. band during the evening of the 30th. At 0445 on the 31st I saw three, very strong, Dutch test-cards (PTT/NED3) between Chs. 30 and 50. By 1120, the Belgian test-card (BRT TV1), inscribed with 'NICAM-STERO' and antenna mounted 6m above their roof, proved very rewarding with u.h.f. DX between the 10th & 15th. In that time, they saw a variety of programmes and idents from stations in Belgium (RTBF2), Denmark (TV2), France (A2, Canal+, FRS/RES, TF1 & TV8), Germany (ARD1, HR3/FTM, NDR, NR3, RTL+, SWF, WDRZ & ZDF1 & 2), Holland (NED1 & 2, Fig. 11) and Sweden (TV2 & 8). These signals came from Schoten and Wavre in Belgium, Nibe, Tommerup and Vordingborg in Denmark, Amiens, Avignon, Bergara, Boulogne, Brest, Chartres, Clermont FDN, Dunkerque, Lens, Lille, Marseille, Tours & Sens in France, Aurich, Bardin, Bremen, Dortmund, Dusseldorf, Fernsehen, Flensburg, Hamburg, Hanover, Harz/Gotingen, Hessen 3, Hoher Meßner, Neumünster/Schleswig, Osnabruck, Saarbrücken-Schocksberg and Ulizen in Germany and Goes, Lopik, Markelo and Smilde in Holland. Mike and Wendy's wide range of receivers for DXTV can be seen in Fig. 10.
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Short Wave Magazine, April 1992
**Automatic Solution**

Enthusiastic airband listeners are well aware of the usefulness in making tape recordings of communications. However, for some time the physical connection of an automatic tape recorder has proved difficult due to problems of complex interfacing and incompatibility. In response to this, AOR have manufactured a connecting lead to provide an “Automatic Solution” to your recording requirements.

Whether attended or not, the AR3000A will switch On/Off a tape recorder when an ‘active’ channel or frequency has been located then clears. This enables you to have a second listen to ‘brief transmissions’ and provides a permanent record of communications. If unattended, the AR3000A plus tape recorder enables you to return home with the knowledge that nothing has been missed. This facility also lets you review the day’s communications within a matter of minutes. The ready-made lead is called the AOR-CR400 and will plug directly into a suitable cassette tape recorder. Although we do not suggest a specific tape recorder, make nor model, we have tested the compatibility of the Realistic CTR-82 (Tandy) cassette recorder. It works very well in conjunction with the AR3000A / CR400 and the effectiveness cannot be questioned.

The AR3000A has a built-in real time clock and timer circuit to further add to it’s flexibility. You may program the receiver to switch on and start monitoring at a preset time while unattended. The AR3000A offers an extremely wide frequency coverage from 100 kHz to 2036 MHz. In simple terms this means that one minute you can be listening to Radio 4 on 198kHz in the longwave band, key in a new frequency 5.505 MHz USB and you may listen to the European VOLMET weather forecast service. In a similar area of the shortwave band key in 5.680 MHz USB and you can monitor the search and rescue coordination frequency. The possibilities are endless, key in 133.7 MHz for Amber 1 commercial air corridor travelling North/South across most of the country, key in another frequency for your local tower, approach, radar or Air Traffic Information Service. UHF airband is also well within the range of the AR3000A, sensitivity in this area being extremely good when compared to other units on the market today. The 400 memory channels and rapid rate of search and scan makes the receiver ideal for searching the vast frequency expanse of the UHF airband and saves hours of manual tuning.

The high sensitivity offered by the AR3000A receiver provides reception over surprisingly large areas when connected to a suitable external aerial such as the DA3000 discone. Your listening need not be restricted to the airbands alone. World-wide monitoring of other popular bands is just as easy, whether you wish to listen to our own BBC World service, VOA Voice of America or similar transmissions from most countries of the World. Marine band both VHF and the long distance shortwave services, Amateur band transmissions ranging from a local enthusiast just down the road to America, New Zealand and the remote areas of the World... all are available on the AR3000A.

To further enhance the versatility of the AR3000A two computer control IBM-PC compatible software packages are also for the AR3000A. The first of these is the AOR Spectrum Coordinator offering sophisticated search, scan and data-base facilities plus 3,000 memories and an integrated logbook. The second is ACEPAC-3A offering search, scan and a graphical display of band activity.

The DA3000 is a wide band 16 element discone aerial especially designed to complement the AR3000A receiver. It has a usable frequency coverage of 25 to 2000 MHz. Build quality is excellent combining Aluminium and Stainless-Steel. The aerial is supplied with approximately 15 metres of coaxial cable terminated in BNC connector ready to plug directly into the AR3000A. The DA3000 has an easy to follow instruction sheet and is supplied with ‘V’ bolts and clamps to ease installation, however a small additional support pole will be required.

The WA5000 ultra-wide range receiving aerial is designed for areas where space is a problem and provides coverage from VLF to SHF. A MOS power FET amplifier is utilised to provide superior performance on the shortwave bands between 30 kHz and 30 MHz.

The total length on the WA5000 is 1.3 metres and is fed by an SO239 standard connector located in the aerial base mount and out of the direct effects of the weather. Approximately 15 metres of terminated coaxial cable is provided ready to plug in and start using. The aerial is powered by 12V DC @ 100 mA (mains power supply provided), this being fed up the coaxial cable. A small interface box is included for connection to the power supply and AR3000A receiver. Where you have limited space, the WA5000 makes an ideal companion to the AR3000A receiver.

**R.R.P.**

- AR3000A £765.00, CR400 £9.99, AORSC £75.00, ACEPAC-3A £119.00, DA3000 £69.00, WA5000 £150.00 including VAT.

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Programmes were seen again in Band III on Chs. E8 and E10 for the 27th and test-cards from Belgium and Holland on the 31st and test-cards from Belgium and Holland at 1302 on February 1. Test-cards from Holland's PTT NED 1 & NED 3 appeared in the u.h.f. band at 1304 on the 1st and 0345 on the 2nd respectively. At midday on February 1, Fred Pearce (Driffield), using a Lowe HF-225 receiver, added, "Thenew Mitteldeutscher (MDR3) programmes have been seen here a few times, including colour bars on E5c".

The good conditions on January 14, 20, 21 & 31 yielded for Simon Hamer pictures in Bands III and/or IV & V, from Belgium, Czechoslovakia (CST1 & 2), Denmark, France, Germany, Holland, Ireland, Norway, Sweden & Switzerland (PTT/SRG1). Among the programme idents he saw were HEUTE (news) and SPORT AKUELLE from Germany. Michael Larsson (Cheadle) looked for u.h.f. DX in the UK on the 28th, 30th & 31st and his reward was a programme from Ireland's RTE (RTBF1), Denmark (TV2) and France (PTT NED3) on the 15th, Belgium (RTBF1), Denmark (TV2) and France (Canal+) on the 20th, Denmark, France and Holland on the 21st, Belgium (BRT1) and RTBF1 on the 28th, Ireland (RTÉ1 and Network 2) on the 28th, Belgium, France, Germany and Holland (NED2 & 3) on the 29th, 30th and 31st and Belgium England (BBC1 South from Harlington) and HTV West from Merseyside and Holland on February 1. Throughout the period Andrew proved the value of rotating his antenna to get the full benefit of the good conditions.

During the evening of the 31st, Tony Hopwood (Upton-on-Severn) reports co-channel interference on his local TV booster at Malvern a mere 4km away which is normally unaffected. Band III provided the DX for Bob Brooks in January when he saw a clock, showing 1300 followed by the news from an unidentified source on Ch. E12 between 1200 and 1215 on the 8th, programmes from Ireland's RTE throughout the 18th and 24th and February 1, a programme from France (Canal+) and a test-card from Denmark (DR) on the 28th, a test-card from Belgium (BRT TV1) and a film from France on the 29th and a cartoon and news from Belgium's BRT and RTBF respectively and a cartoon, logo (ZTM), and a travel film from unidentified stations on the 31st.

**SSTV**

Among the slow-scan television pictures copied by John Scott, around 14.230MHz in January are calling signals from stations in Germany, Fig. 12, Holland and Ukraine, a sign-off from Spain and an often seen type of operator's drawing, Fig. 13.

Fred Pearce received good pictures from Russian stations on the 14MHz band on the 11th and 21st. David Glenday, using a Lowe HF-225 receiver with its own rod antenna and a BBC computer with Technical Software's RXB program, logged signals from Germany, Russia and Scotland around 14.230MHz and 'CQ', Fig. 14, and operator ident, Fig. 15 captions from DL7TR on 21.34MHz. The text on the picture in Fig. 15 reads "THATS ME BURKHARD" who was sending these pictures, from the antenna on his roof in Fig. 14, to WA2KUK in the USA. Judging by the number and variety of captions and drawings that I have seen I have come to the conclusion that the SSTV fraternity are an inventive and most humorous bunch.
Y

es I really do run an aircraft museum! It is a small offering, but dedicated to demonstrating the principles of flight, radio navigation, engineering, etc. There are no whole aircraft (due to lack of space) and nothing historic. The exhibits aren't behind glass, either. Instead, you will find a range of representative aircraft components that have mainly been re-wired or otherwise modified to give a simulated demonstration of their function. One reader was incredulous that the museum really existed. So come and see for yourself! To arrange an appointment to view, call me (weekday evenings before 2200 local) on 081-956 5113. To ask that genuinely urgent, the Ministry of Defence has even provided a last-minute submission to 'Airband', that's also the number to ring. The museum and this column share the objective of helping you to enjoy your hobby through a better understanding: anyone reading this will, I am sure, benefit from a visit.

**Competition Results**

Only four entries were received so it must have been suitably hard this year! Most off course was N. Winter (Hull) who diagnosed an MBB 105 - a rather humble machine when compared to the one pictured in January. Due to the difficulty, I will accept Hughes 300 or Schweizer 269 for anyone reading this will, I am sure, benefit from a visit.

**Pleasure Flight**

Despite my appeal in February, only four more readers expressed an interest in going on a pleasure flight and so this project has lapsed through lack of response. Perhaps economic circumstances are not encouraging enough at the moment. So, thanks to John Ware (Redhill), David Head (Malvern), M. Hilditch (Milton Keynes) and Bill Henderson (Shoreham-by-Sea).

Bill saw a DC-3 approaching 25 at Heathrow? Basically, any low approach requires a mandatory control service, you still 'squawk' the conspicuity code. This enables any radar operator to see your aircraft and make allowance when instructing other aircraft that are under control. For example, you might be flying just outside a control zone, in which case the radar controller will see you clearly and can be confident that you won't get into the way of flights inside the zone. Formerly the conspicuity code was 4321 but it is now 7000 throughout Europe - pilots take note and read AIC 18/1992. Do not dial up the emergency code 7700 by mistake! Code 7000 means 'Should you see me on your radar screen, don't worry, I'm keeping clear of your traffic'. Another interesting code, 2000, is applied in a 'non-s.s.r. environment' such as Greek controlled airspace. Here, control depends on position reporting, i.e. it is procedural. Radar is not employed for control purposes. However, there may be military or other uses of radar and so a transponder setting is advisable. Code 2000 means 'Here I am, just in case you want to know - but it isn't certain that my controller is actually looking at me'.

Godfrey Manning photographed this immaculate P-51D Mustang at North Weald.

**Follow-Ups**

J.P. Olway G3RMA (Paignton) agrees with my conclusion in February that s.s.r. is really a particular version of a.m. I did emphasise the point, though, that a receiver specifically designed for the job will be necessary before s.s.r. can be resolved.

In truth, a.m. is actually amplitude modulation with carrier and both sidebands. Single sideband is really a.m. with the carrier and one sideband suppressed. Any other variation of a.m. is also possible - for example, both sidebands but vestigial carrier. But, I must make it clear, you won't encounter any such special combination on the airbands.

The broadcasters have confused things further by muddling up modulation method and frequency band. Instead of v.h.f. they mistakenly refer to f.m. and instead of medium wave they say a.m. The marketing departments of receiver manufacturers have exacerbated this situation by marking their waveband switches with f.m. and a.m. instead of v.h.f. and m.w. or v.w. as the case may be. No wonder the average non-technical broadcast listener is confused!

**HF**

Tim Christian (North Walsingham) follows the allocation of h.f. channels with interest. Just to show how congested this part of the spectrum is, he introduces a new frequency: 89.819MHz for Karachi, Bombay and Delhi (MID-2). Unfortunately, it clashes with North Atlantic C (NAT-D) although it is the new one is intermittent. As well as sound to air, f.h. (such as this channel) is also used for the various stations in the area to pass traffic information to each other. We're coming to the end of the current sunspot cycle peak, so the existing MID-2 allocation at 10.018MHz is predicted to become less effective when the m.u.f. declines. Tim wouldn't be surprised, then, if the new frequency replaces this higher one. MID-2 also has 5.658MHz available.

As a reminder, NAT-D is one of the North Atlantic areas controlled jointly by Shanwick and Gander. It has 2.971, 4.675, 8.881 and 13.291MHz available for handling aircraft on the more northerly tracks.

As an aside, Tim wonders what happened to Interflug - the airline of the former East German Republic. Since reunification I believe that it has been absorbed into Lufthansa who are rapidly replacing many of the Eastern Bloc aircraft types with more modern Western ones. The Editor has recollections of a flight from East Berlin to Leipzig on a fully loaded Interflug Antonov 24. Acceleration towards take-off speed started outside the terminal building, continued round the perimeter track and take-off appeared to be achieved by the simple expedient of retracting the undercarriage!

Needless to say, he returned to Berlin with a more civilised form of transport.

**Operational News**

At Cranfield, runway 08/26 has been withdrawn (AIC 3/1992). Building works have restricted the available space here which is why the PFA rally can no longer be held on this aerodrome.

A personal involvement in airfield operations provides work for Brian Tollervey (Gosport). He's an electrician at a small field and mostly works on lighting maintenance. A quiet aerodrome such as this presents few problems of access to the runway in between movements. So how do they cope at Heathrow? Basically, any low-priority work can be done at night when...

**CONTINUED ON PAGE 46**
Several readers have written to me asking what they can do to minimize the effect of strong signals interfering with reception. This mainly tends to occur in urban areas where it is often difficult to avoid problems with interference due to the large number of transmissions from local sources.

Albert Barker of Sussex has problems with a national paging system on 153MHz interfering with marine reception at 156MHz. Mike Totham of Gloucester has problems with both paging systems and links from a local police HQ, Bert Allerton of Sheffield finds paging systems on 138MHz interfering with satellite reception at 136MHz and finally R. Jackson of Cheshire finds that a local taxi company produces reception on just about any frequency.

When very strong signals are amplified in the r.f. stages of a receiver they can overload the preceding stages and produce unusable signals on other frequencies. In really bad cases, the unwanted signal can be so strong that it will cause the receiver to ‘block’ preventing the reception of any other signals. One way of minimizing this problem is to restrict the number of signals which are allowed to reach the receiver. Most designs only have to tune over a small range of frequencies. This makes it easy to design a bandpass filter stage to reject any unwanted signals outside the required frequency range before they can cause any trouble.

The problem with scanning receivers, particularly those with continuous coverage, is that they have to tune over a much larger frequency range. This makes it difficult to design and expensive to produce bandpass filters which will ‘track’ the frequency the receiver is tuned to whilst at the same time being capable of rejecting unwanted signals.

One alternative is to use a notch filter to reduce the level of the unwanted signal. This is only really practical when the receiver is used in a fixed location and the frequency of the interfering signal is known. I featured two different designs of notch filter in the December 1990 column which I found to be effective in dealing with strong signals from paging systems on 138MHz and f.m. broadcasting stations in the 88 -108MHz band. These filters produce fairly broad notches that are very effective in removing signals at spot frequencies, but have the disadvantage of reducing the level of other signals which are close in frequency. The only way to improve this situation is to increase the Q of the tuned circuit. This is not quite so easy to achieve in practice as it involves constructing the filter from very low loss materials. This may necessitate silver plating some components, which is not practical for most of us.

I found the best solution was to obtain a suitable filter on the surplus market, which could be modified to operate on the desired frequency. The best place to find such devices are at amateur radio rallies. Many of the companies who sell amateur equipment usually have duplexing filters, removed from commercial base stations, which they are prepared to sell at a reasonable price. Try and avoid large designs that are likely to use quarter wavelength lines and concentrate on the more compact designs using helical resonators. These are generally used for mobile equipment operating in the range 136 -460MHz. If you need to provide a notch at a lower frequency I have seen duplexers designed to operate at frequencies as low as 70MHz but you may need search around in order to find one.

One of the most suitable types I have found was manufactured by Airtech Ltd and has the type number M5044A. This is a 4-section unit designed to operate at around 450MHz. The case measures 130 x 80 x 180mm and has three N type sockets mounted on one end. Internally the coil consists of four small cylinders, each with a BNC ‘T’ connector at one end and a small tuning plunger at the other. The cylinders are interconnected by short lengths of coaxial cable which form part of the filter network. The original purpose of the unit was to allow simultaneous transmission and reception of signals with the same antenna or providing the two signals were more than a few megahertz away from each other. Although the unit contains several BNC connectors the most important parts as far as we are concerned are the cylinders, which contain helical resonators. These work rather like conventional quarter wavelength stubs, but the line is coiled in order to make the unit as small as possible. In addition to reducing the size, coiling the line also suppresses any resonances at odd multiples of the fundamental frequency, which is a distinct advantage. In this application the outside dimensions of each cylinder are about 80mm long and 40mm in diameter, with one end secured by four screws. If the end is removed the helical resonator is revealed. This consists of about six turns of thick silver plated copper wire wrapped around a Perspex core.

A ‘T’ connector is removed the helical resonator is revealed. This consists of about six turns of thick silver plated copper wire wrapped around a Perspex core. The end attached to the cylinder is capacitively coupled to the inner of the BNC ‘T’ connector which is mounted on the end of the cylinder. The other end of the resonator is not connected to anything but has a hole down the centre of the Perspex core which the frequency adjustment plunger fits into.

In its unmodified state the resonator will tune over the range 450 -700MHz but if more turns are added to the end of the coil or if a new coil is wound the operating frequency can be made to go as low as 120MHz by providing one end of the coil is directly connected to the inner of the BNC ‘T’ connector. I have modified this to tune to 145MHz. The resonator has been replaced with a new 16 turn coil of silver plated wire, which is about 15mm in diameter and 50mm long. One end is connected to the BNC connector and the mechanical rigidity has been improved by filling the gaps in-between the turns of coil with epoxy resin. The unit is connected in series with the coaxial cable feeding the receiver and the sliding plunger adjusted to notch out the offending signal. This has to be done very carefully as the notch is very sharp and only a small movement can shift the frequency by several megahertz.

By now you may be wondering if all of this effort is worth it. All I can say is that a lot depends upon how much of a problem interfering signals present. I have several base stations operating within 100m of my house and I am still able to use a pre-amp ahead of the receiver without any major problems. Although I do have to use four separate notches. Before I fitted them the receiver squealed with a high pitch when I moved around the station transmitting. Making listening almost impossible. In this sort of situation any improvement is worthwhile and a lot cheaper than moving house.

Active Deflectors

Mark McDermott of Aberdeenshire is one reader who doesn't have problems with interference, mainly because he can't hear anything to start with. He lives at the bottom of a 60m cliff on the north-east coast of Scotland, and as you might expect he doesn't hear much on his scanner. However, reception from the top of the cliff is great, so he wonders if it is possible to relay signals from the top of the cliff to his house without having to buy miles of coaxial cable. He heard a couple of amateurs talking about using two antennas as a passive relay to provide radio coverage in a blind spot, and wondered if this technique could be used to help him.

Well Mark, many similar systems are already used to provide TV reception for small isolated communities where the cost of building a conventional relay station would be prohibitive. These operate in either of two ways, the first is to receive the signal at some suitable location, amplify it and then re-transmit it via another antenna aimed at the target area. This system is often referred to as an active deflector. It can only be used under certain conditions where there is good isolation between the transmit and receive antennas and there is no likelihood of the re-transmitted signal interfering with the direct signal. If more gain is required or if there is a chance of interference then the second method has to be used. In this case the signal has to be changed in frequency before it is re-transmitted and the equipment is referred to as a transposer. In both cases some form of power supply is required, which in many cases is provided by either solar cells or wind generators which are used to charge lead acid car batteries.

It may be possible to build a wideband active deflector, but it is not a project for the faint hearted and is not likely to be particularly cheap, but if you want to have a go then the following notes may give you some idea of what is involved. The first step is to determine what loss there is between the relay site and the house. This depends upon the distance and frequency and is given by the formula:

$$\text{dB (loss)} = 32.5 + (20 \times \log(D km)) + (20 \times \log(F MHz))$$

where D is the distance in km and F is the frequency in MHz.
So if we assume that there is an unobstructed path between the top of the cliff and the house of about 1km then we obtain loss figures of 60.5dB at 25MHz, 72.5dB at 100MHz, 84.5dB at 400MHz and 92.5dB at 1GHz.

In order to make the system effective we need to overcome this loss with a combination of both antenna and amplifier gain. In order to keep the antennas to manageable proportions the majority of this gain has to be obtained in the amplifier. The most gain you are likely to achieve with a wideband antenna such as a log periodic beam is around 6dB so if we use one vertically polarised for reception at the relay site and, two others horizontally polarised, one at the relay site for transmission and the other at the house for reception, we should be able to obtain about 18dB gain. Which means that we still have to find about 70dB worth of gain from elsewhere.

Trying to obtain more than this amount of gain is not easy as the final amplifier stages must not become overloaded on strong signals and the input and output signals must be kept separate from each other.

The simplest way to achieve this is to use two thin film hybrid r.f. amplifier modules such as the Philips OM381 in series. These were originally designed for use in TV distribution systems and are broadband devices which give just under 30dB gain per module across the frequency range 40 - 860MHz. One or two additional components and a 12V d.c. power supply are all that is required to turn the modules into a working circuit. With so much gain being provided by the amplifier care must be taken to keep the input and output signals isolated from each other.

Power is another problem but I would think that a small solar panel and car battery would be capable of providing sufficient energy especially if the supply is turned off when it is not required with a time switch. A small brick-built housing for the electronics and a mast for the antennas will also be required but you may be able to talk a local farmer into helping you. In addition you may be able to spread the cost of such an installation if you can find neighbours who would also like to improve their TV and f.m. radio reception.

As I said not a job for the faint hearted, and in this instance it may actually be cheaper to move house!

Airband 44

there is hardly any flying. There are also slack times in the middle of the day but this is on the decrease and can be further reduced by seasonal traffic peaks. Ultimately, a runway might be closed for repairs that can't wait. At Heathrow, single-runway operation might be possible. If not, then aircraft are 'stacked' in the holds and, hopefully, none will need to divert to another terminal due to full state. In the end, it's a trade-off between the inconvenience of late or diverted flights and the danger of essential ground equipment being out of action.

Brian's question is also an opportunity for me to remind ourselves of the lighting encountered at airports. Runways are brightly lit by a combination of white centre-line and/or edge markers. The threshold end might have a red border and, at the far end of the roll-out, the lights are also often red. Calvert lighting guides the final approach direction before the runway is reached. To show the correct glide path, there is a variety of slope indicators which all show red lights for 'you're too low' and white for 'too high'; correct angle is indicated by a mix of reds and whites.

Avoiding confusion with taxiways is essential. These are more dimly lit by green centre-line and blue edge lights - making an attractive vista to decorate the airport at night. Sometimes the green lights are switched on and off by the Ground Movements Controller in order to guide particular aircraft; in this case the controller will issue a taxi clearance which includes the phrase 'follow the greens'.

The next three deadlines (for topical information) are April 10, May 8 & June 5. All correspondence to 'Airband,' c/o The Godfrey Manning, Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS. All replies are via this column; unfortunately it is not possible to enter in to direct correspondence.

Middle marker on the i.r.s. approach to Runway 09 at Jersey in the Channel Islands.

Godfrey Manning.

Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AIC</td>
<td>Aeronautical Information Circular</td>
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<tr>
<td>a.m.</td>
<td>amplitude modulation</td>
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<tr>
<td>DC</td>
<td>Douglas Commercial</td>
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<tr>
<td>f.m.</td>
<td>frequency modulation</td>
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<td>h.f.</td>
<td>high frequency</td>
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<td>l.w.</td>
<td>long wave</td>
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<td>MHz</td>
<td>megahertz</td>
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<td>m.u.f.</td>
<td>maximum usable frequency</td>
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<tr>
<td>m.w.</td>
<td>medium wave</td>
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<tr>
<td>PFA</td>
<td>Popular Flying Association</td>
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<td>s.s.b.</td>
<td>single sideband</td>
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<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
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Spectrum +3 Interface

Trevor Dare of Jersey wonders if anyone out there has managed to interface a Spectrum +3 computer to an AR3000. I know I have featured similar requests before but no one will admit to having achieved it - can anyone help?

Once again I seem to have reached the bottom of the page, so until next month, good listening.
The METEOSAT 5 (officially called MOP-2, the METEOSAT Operational Programme) label appeared after a long wait, on February 11. Although launched in early March last year, number 5 still has problems and was taken out of routine operations within two days of the transfer from METEOSAT 4, which happened last May. Since then, METEOSAT 4 (MOP-1) remains the operational satellite with only occasional problems such as interference from the sun during the equinoxes. Both METEOSAT 4 and 5 are near to longitude 0°.

Meteosat 5 is occasionally used for image collection but METEOSAT 4 is then used for the re-transmission of those images. A careful note of the time of those pictures showed that they were about an hour old - this is referred to as having a slot offset of -1. Normally, pictures are from the last scan, taken every 30 minutes. The original problem with number 5 is now believed to be a very small movement of the radiometer cold optics lens, and referred to as having a slot offset of -1. METEOSAT 4 and 5 are still using 137.85MHz. A further METEOSAT 4, which happened last March, is still using 137.85MHz. A further METEOSAT launch has now been officially confirmed - J.Martin of North Harrow have asked for an explanation of Keplerian element parameters. Over the next few editions I'll cover each one. In order to get a computer program to predict when a satellite will be above the horizon at your receiving station you have to provide the program with a set of numbers (elements) which describe the details of the satellite's orbit. Several numbers are required to describe the orbit and different computer programs may require slightly different versions! Some require the 'equator crossing time' yet others need different parameters. It is possible to use a set of Kepler elements to calculate other parameters used in different programs.

Current Polar Satellites

There haven't been any unexpected changes within the NOAA satellite group. For some weeks all four were transmitting a.p.t. and their beacon signals have also been strong (see Frequency Listing). A significant (well I think so!) milestone during the progression from winter to spring, was reached in early February when the afternoon passes of NOAA 11 finally remained in the visible format right to the end of the picture - near the north pole. During the longest hours of winter (between mid November and early February) the northern hemisphere is very dark and NOAA 11 switches over from visible to near infra-red just after passing Scotland! Meanwhile METEOR 3-4 has continued to transmit continuous telemetry although I would expect a change-over to 3-5 when 3-4 reaches the terminator. At that time its solar panels will be poorly illuminated and so there may be power problems. The predictabe switch-off from METEOR 2-20 to 3-19 occurred on February 11, still using 137.85MHz. A further METEOR launch has now been officially scheduled so perhaps 3-6 will make an appearance.

Keplerian Elements

A number of correspondents including J. Martin of North Harrow have asked for an explanation of Keplerian element 4570 m/s 7686 m/s

Fig. 1: Screen shot of SAT303 Satellite Predictions program from P.J. Bartlett.

Fig. 2: METEOSAT 4 via Offenbach from Tony Hulme.
and therefore every place on the earth. Inclinations can vary between 0 and 180° - the larger inclinations simply refer to satellites orbiting in the opposite direction. Intermediate inclinations between 10 and 80° are commonly used.

Fig. 3: Iceberg near Antarctica from UoSAT 5 - Martin Sweeting.

Kepler Elements

If you want a print-out of the latest elements just send me an s.a.e. All operating weather satellites are included, together with their transmis-

sion frequencies. In early February some have been put into a position which contains an error in the NOAA 10 elements, having a RAAN value of 0.0 - my apologies for this. This data is supplied courtesy of NASA.

New Products

I have asked a number of suppliers of weather satellite products to keep me up-to-date with their latest hardware. I have not had a startling response from them, which is surprising since the idea is that readers of this column will be interested to know of the latest hardware. I have not had a startling response from them, which is surprising since the idea is that readers of this column will be interested to know of the latest hardware.

Profiessor Martin Sweeting of the University of Surrey sent me a photo- graph (see Fig. 3) taken by the UoSAT 5 satellite in November 1991 showing the large iceberg that detached itself from the Antarctic ice sheet. The University continues to collect routine images which are made available in the Amateur Satellite Service on 435.120MHz at 9000bps f.s.k.

Letters

Last month I mentioned P.J. Bartlett of Pinner who provided information about satellite predictions software for the Atari ST computer. He sent me a screen-shot (see Fig. 1) of the SAT303 program. L.D. Corna of Holsworthy in Devon has been an avid satellite monitor for many years and uses the Griffin and George receiver and colour framestore for monitoring METEOSAT and the polar orbiters. He mentions that he has seen high altitude aircraft trials on METEOR pictures. Tony Hulme of Blackpool is a keen monitor of the Shuttle program and is a regular listener to the Russian manned space station MIR on 145.500MHz. The other frequency worth monitoring from MIR is 143.625MHz which can be heard on most days when MIR passes over the UK.

Tony has quite a collection of equipment, an Icom IC-R70 receiver with down-converter, the Technical Software RX4 multi-mode system, a PC386 computer running InstantTrack satellite predictions and an ADRO201 scanner. An assortment of antennas feed these various receivers! Tony's only problem is that he has not had a QSL card from NASA, but received several from the MIR cosmonauts.

Fig. 2 shows one of Tony's printouts.

Bandwidth for WXSATS

Peter Burgess of Gloucester describes a problem that he has with his weather satellite equipment. He uses a home-assembled Maplin decoder fed from a Realistic PRO-2022 scanner, itself fed from a crossed dipole. The decoder feeds an Amstrad PC1540 and he has written his own assembler program to produce the pictures, using the reduced EGA mode of 640 by 200 lines with 16 grey levels. Peter explains that the signals sound loud and clear and yet his picture is not synchronising properly. There also appears to be a problem with reception - he experiences deep, cyclical fades.

Finally, Peter asks what the receiver bandwidth requirements are for weather satellites. From the description, the first item to check is the bandwidth of the scanner. It is probably only a narrow-band f.m. unit (often 12kHz). Normal weather satellite transmissions consist of the main carrier (around 137.50MHz) which is frequency modulated by a sub-carrier of 240kHz. This sub-carrier is amplitude modulated by the image data from the satellite's own scanner. The bandwidth of this unusually complex telemetry is about 30kHz with another 20kHz or so of added Doppler shift! That is why a dedicated weather satellite receiver has this extra bandwidth. With the wider bandwidth the improvement will be considerable and should provide proper synchronising tones. The antenna problem described by Peter does sound like a wrongly-phased crossed dipole.

This effect was seen when the Chinese FENGYUN satellite was launched and its telemetry was found to be left-circular instead of right-circular causing deep signal fades.

Pat McMahan E1018 wrote from Eire to say that he has been a s.w.l. for several years but when he recently got a v.h.f. scanner he was able to tune in to the WXSATS. His children have a Amstrad PC1512 and Pat wonders about the availability of cheap software for producing satellite pictures. I don't know of low-cost software for the 1512 but perhaps a reader might be able to help? Several letters held over till next month - thank you all for writing!

Other Satellites

With the number of frequencies that can be monitored using synthesised frequency scanners probably many monitors will try searching for the occasional unexpected satellite in the 137MHz band. There are several that can be heard between 136.0 and 137.95MHz. The Japanese Marine Observation Satellites MOS-1 and MOS16 transmit on 136.10MHz and the Chinese FENGYUN satellite has this extra bandwidth. With the wider bandwidth the improvement will be considerable and should provide proper synchronising tones. The antenna problem described by Peter does sound like a wrongly-phased crossed dipole.
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**Price to be confirmed Approx. £300**

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**SHORT WAVE MAGAZINE**

April 1992

49
When it comes to SONY
Look to Lowe

ICF-SW1E
Amazing is the only word to describe this ultra-compact radio. Measuring less than 5" x 3" x 1", yet packed with features and performance of a full-size portable, it covers long wave, medium wave and ALL of the short wave spectrum from 150kHz to 30MHz. It even covers FM stereo using the supplied earphones. You get keypad frequency entry, manual tuning and scan tuning for easy operation; whilst clear LCD digital readout (5kHz on SW) ensures accurate tuning. To keep your favourite stations, ten memories are provided and other features include dial lamp, Local/DX attenuator, keyboard lock, tone control and record output jack. To complete this total package there is even a built-in digital clock and alarm. A host of accessories including aerial, carrying case, manuals and others.
List price: £172 Lowe price: £149

ICF-SW7600
This new SONY portable is a microprocessor controlled general coverage receiver with many advanced features packed into its 7.5" x 4.75" x 1.25" case. Direct access tuning from a clear keypad, manual tuning with UP/DOWN keys, 150kHz to 30MHz coverage plus FM broadcast (FM in stereo through supplied earphones), AM/FM/SSB modes, ten memory channels, auto scanning, tilt stand, keypad lock, 24 hour digital clock with timer and full facilities for tape recording.
List price: £172 Lowe price: £149

ICF-2001D
Top of the SONY range and a firm favourite. I use one myself at home. The 2001D is a full-feature portable receiver giving you coverage from 150kHz to 30MHz with USB/LSB/AM modes, 116MHz to 136MHz for the airband enthusiast and full coverage of the VHF FM broadcast band. Dual PLL frequency synthesis ensures accuracy and stability and the readout on short wave is to 100Hz. Features include keypad frequency access on all bands plus manual tuning control, built-in ferrite bar for LW & MW plus whip for SW and VHF, 12/24 hour clock and timer, wide/narrow IF filters, SONY synchronous AM detector with selectable sidebands, 32 channel memory with direct keypad access and memory scanning. Every possible feature is provided. The 2001D comes complete with many useful accessories.
List price: £345 Lowe price: £279

AIR-7
An unusual airband portable and truly showing the SONY individual approach to design. The AIR-7 is easy to use and the audio quality is excellent; not only on airband but on broadcasts as well since it covers the 108-136MHz airband, the FM broadcast band, the VHF high band from 144-174MHz and, believe it or not, the LW/MW and low SW bands from 150-2194kHz. Ten memory channels, memory scan, keypad lock and priority channel. A truly comprehensive package. Complete with accessories. List price: £287 Lowe price: £229

ICF-SW77
SONY has brought Short Wave Radio operating convenience to new dimensions with the new ICF-SW77 through the exclusive combination of quick access tuning, synchronous detection, pre-set station tuning, auto scan and more!

Features:
- AM & SSB (LW, MW, SW)
- FM Stereo reception
- Synchronous detection for less fading/interference
- Keyboard entry/manual tuning rate 50Hz/1kHz
- Auto Scan Tuning
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- Full brochure on request

Specifications:
- Frequencies: FM 76.5-108MHz
- LW/MW/SW 150kHz-30MHz
- Antennas: Telescoping SW/FM, Ferrite bar LW/MW
- Size: 274mm x 165mm x 46mm
- List price: £389 Lowe price: £329

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Short Wave Magazine, April 1992
Philip Mitchell of Newbury has written with a tip for FAX operators who use printer based decoders. One of the problems with printing FAX images is that it eats ribbons! The cost effective solution, proposed by Philip, is to re-ink the ribbons. Whilst not new, I think the idea is worth another mention. Philip has had great success by using a bottle of ink-pad ink, applying it to the ribbon with a sable brush. Although this works fine for Philip, I would personally advise against using ink-pad ink. This is because the ink in a printer is designed for the pins in the print head. If you use an ordinary ink, there is a risk that either the head may gum up or wear badly. If you take a look at any of the popular computing magazines you should find an advert for proprietary re-inking compounds. One other tip is not to get the ribbon too wet - you'll lose definition if you do.

Ray Pugh of Southport is having difficulty finding a suitable printer for his ERA Microreader with optional large display. Like many short wave listeners, Ray is not computer trained, but has some difficulty finding his way past all the jargon. The problem is compounded through a lack of mobility. I think Ray's requirements align with many other listeners, so I'm asking for your comments and experiences. What I need to find is a current model printer that's physically small, cheap, quiet and has a parallel interface. As some readers need a serial interface, it would be useful if this was also available. I eagerly await your suggestions!

Ray Beriford of Bakewell in Derbyshire has recently migrated from the amateur bands to utility listening. The equipment in use is the very capable JRC JST-125 transceiver with a PK-232 intelligent terminal unit. The computer is an IBM PC compatible which links to the PK-232. With his change of interest, Ray is looking to expand his reception modes from those covered by the PK-232. Having seen my mentions of devices like the Wavecom and Pocom units, he's asked where he can get more details. There are two options here. The first is to visit one of the many radio rallies where you can see many of the units being demonstrated. An alternative is to contact Dewsbury Electronics as they carry a very comprehensive range of the more sophisticated decoders. However, as he already owns an IBM compatible PC, the Code-3 from Hoka is likely to be a very strong contender.

Image Processing

Philip Mitchell also quoted a chart that I published in the February "Decoding" column where I commented on the peppy background caused by interference to off-air. The only problem was that the image appeared to be very clean when printed in the magazine! This is a spin-off from a good desk Top Publishing (DTP) and printing system. These systems are designed to give the best possible print quality. Because of this you can run into trouble if you're trying to show a poor image! Probably the classic example of this occurred a few years ago with a sun spot chart. If you're not familiar with sun spot charts, these usually comprise a white disk with a number of small dots representing the sun spots. On this particular occasion the printer, in an attempt to give a good image, erased all the dots from the chart. This left a clear white disk!

However, the story is not all negative, as it gives an indication of what can be done to improve a noisy FAX image. The technique is not new and is used extensively in the scientific world to pull signals out of the noise.

For the utility listener, the most obvious application is to clean-up FAX images. The systems that lend themselves best to this are the IBM PC based FAX decoders. Most of these feature the ability to save the received chart or photo as a .PCX file. A .PCX file is a format for storing graphic data and enables graphic images to be moved between programs. By using this system, you can receive the FAX image and pass it to a paint or other graphic's program. Once in this system, the interference patterns can be erased and missing lines inserted. Although this can be time consuming, the results can be really good. Once the image has been cleaned, by far the best type of printer is one of the modern laserwriters. This is an expensive option for most listeners, but if you have access to a laserwriter at work, why not see if you can take a disk in for printing.

If you've experimented with computer processing of FAX images, I'd very much like to hear from you.

TASS Update

The news here seems to be no news! I've been scanning the bands and can find no trace of activity on any of the old TASS frequencies. I've also received letters from many readers telling me the same sorry tale. For the utility listener this is a real blow as TASS was certainly the most prolific of the h.f. press agencies. Although there will doubtless be new agencies formed as the new states find their feet, they probably won't return to RTTY. This is because of the effectiveness and availability of satellite links. If the old RTTY links are retained it will probably only be as a back-up system. However, it may turn out that the cost of maintaining the old links means that they become totally abandoned. However, as Robert Hall of South Africa quotes in a recent letter, there are still plenty of stations to monitor. From the press point of view there are some twenty stations still active. A selection of the most popular being: TANJUG, XINHUA, KCNA, MENA, PAP, ANSA, PANA, IRNA, TELAM, MAP, KYODO, CNA and JANA.

If any catches any transmissions on old TASS frequencies, I'd be grateful if you could write with the details.

Press Photos

This is a subject that seems to reappear regularly. The latest to write is Mr. T. C. Buckle of Daventry. He currently uses a Spectrum +2 computer running the J & P Electronics RAMS IV decoding package. Although he reports great success with both amateur and weather FAX images, he's not been able to find any press photos. This is not uncommon, as there are very few reliable transmissions left on the h.f. bands. The main reason for this is that the major press agencies use satellite links or land-lines for the bulk of their transmissions. However, all is not lost, those that are still transmitting...

Before I go on to describe them, I ought to make mention of the equipment you need. Although you can receive press photos with most FAX programs, you really need one that supports a grey scale for best results. Many of the simpler FAX programs are designed primarily for receiving charts and so are unable to print either black or white. Using this method, each element of the received image is examined and declared to be either black or white. This has great advantages when receiving charts, as it helps to give a clean well defined image. However, when trying to receive photographs, the program continues to attempt to switch between black and white. From this you might think that this type of program can't be used for photos. In practice it can, because the software dithers whilst receiving a mid tone and creates the illusion of a grey scale. However, the quality is greatly reduced when compared to that from a more sophisticated decoder.

By far the most consistent of the press stations is the transmission from DCF39 on 139kHz. This station is based in Germany and relays photos and new items for the DPA agency. To receive this transmission you will need a decoder that can operate with a 150Hz shift, set to an IOC of 286 and a drum speed of 60 r.p.m. Because this station uses the narrow 150Hz shift, the tuning is particularly critical. You'll find that you can adjust the contrast of the received image by careful fine tuning.

The range and quality of images transmitted from this station are usually very good and certainly copious! One of the disadvantages with this type of signal is the level of interference that many listeners suffer. This is often very difficult to locate and cure. From letters I've received on the subject, a good quality audio filter can really pay dividends with this type of interference.

One characteristic of most press FAX stations is the lack of normal start
and stop tones. This means that many images have to be started manually — so demanding a lot of time from the operator.

The next most interesting press photos come from the Associated Press agencies in Buenos Aires. This is one of the last of the long distance FAX links and provides some very interesting images. The frequencies to watch are: 17.672MHz (LUZ67), 18.093MHz (LR084) and 20.736MHz (LSA608). The format used is similar to DCF39, with an IOC of 288 and drum speed of 60 r.p.m. The main difference is in the shifting used which is the standard 408Hz used for most h.f. FAX signals. This has the advantage of simplifying the tuning. The main problem with this station is the infrequency of the transmissions, coupled with the lack of start or stop tones. This means that you have to listen for the start of the transmission and then manually start the decoder. Because the signals disappears for only long periods between images, you need to manually stop the decoder at the end. Although time consuming, the results are usually worth the effort. As with the i.f. transmissions, good audio and r.f. filtering can make a tremendous difference to the quality of the received pictures. If you have information on any other reliable press FAX transmissions, perhaps you’d drop me a line with the details.

Free Software

I thought that title would catch your eye! Regular readers will no doubt be aware of the RTTY weather decoding programs that Bill Nicoll has so kindly provided. Well, Bill has now gone one stage further and made these, and some new programs, available on disk. Just to whet your appetite, here’s a list of the new programs, available on disk, provided. Well, Bill has now gone one stage further and made these, and some new programs, available on disk.

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Operating frequencies for WLO. The well-known maritime station. This list was supplied via Tim Anderson of St. Leonards, Sussex.

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<td>As usual I’ve included a selection of loggings supplied by readers during the past month. I also have a more complete list that’s available to all who supply three first or second class stamps to the address at the head of the column. The format for the list is: frequency, mode, speed, shift, callsign, time and notes. 123.7kHz, FEC-A, 96, 200, DCF42, - , PIAB Bold, 2.822MHz, RTTY, 100, 425, DHN37, - , 2222, Greek Meteor, 3.3314MHz, AUTOSPEC, 68.5, 85, - , 2123, Oil rig, 4.2538MHz, c.w., - , - , EAH, 2125, Istanbul radio, 4.583MHz, RTTY, 50, 425, DDK2, - , 1512, Quickborn Meteor, 5.24MHz, RTTY, 50, 400, - , 2300, TANJUG press, 6.972MHz, RTTY, 50, 400, YDG56, - , ROMPRES, 7.646MHz, RTTY, 50, 425, DDH7, - , 1428, Quickborn Meteor, 7.854MHz, RTTY, 50, 400, ZAA, - , 1900, ATA Tirana, 7.960MHz, RTTY, 50, 400, - , 1910, IRNA press, 7.946MHz, ARQ-E, 96, 400, UNID, - , 2343, 4 CRC idling, 8.02MHz, RTTY, 50, 400, - , 1816, KCNA press, 8.4367MHz, RTTY, 50, 400, PBC, - , 1223, Dutch Navy, 9.048MHz, RTTY, 75, 400, DFZG, - , 0760, MFA Belgrade, 10.536MHz, RTTY, 75, 850, CFH, 2142, CF Halifax, 10.551MHz, RTTY, 50, 400, GF3L, - , 1740, Bredenell meteor, 10.595MHz, RTTY, 50, 400, - , 1840, MAP Rabat, 10.611MHz, RTTY, 75, 400, - , 1816, Mena, 11.5654MHz, ARQ-242, 192, 138, - , 1621, 4 channel 4 CRC idling, 12.6627MHz, c.w., - , - , 7TFB, 1756, Skidka radio, 12.835MHz, c.w., - , - , SVA, 1411, Athens radio, 13.016MHz, c.w., - , - , 1907, Rome radio, 13.36MHz, ARQ-242,46, 400, CU4L7, - , 1236, PTT Lisbon, 14.367MHz, RTTY, 75, 400, - , 1210, XINHUA, 17.105MHz, c.w., - , - , IRM, 1946, CIRM Rome</td>
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Short Wave Magazine, April 1992
**Long Medium & Short**

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

The final transmissions from the historic BBC Daventry station will no longer take place in March 28, when the current winter schedule ends. Most of the broadcasts will be transferred to the Wooferton station, which has spare capacity owing to a reduction in VOA relay requirements.

Apparently there is to be a final closing ceremony around midday on Sunday March 29, to which many former members of staff have been invited. One of the 'senders' will carry a special transmission on 15.070MHz, followed by an official switching off at 1230.

**Long Wave Reports**

Note: LW. & MW. frequencies in kHz; S/W in MHz; Time in UTC (+GMT). Unless stated, all logs made during the four weeks ending February 1.

Encouraged by reception of transatlantic signals from Europe last month, Alan Roberts (Quebec) has been checking the band more frequently. Conditions often proved to be favourable, but on 0500 at 0900 he heard chimes, followed by headlines and a news bulletin in French from Europe via Saarlos, Germany (200Kw) on 183KHz. Reception was fair. There was no mention of 'Europe 1', but 'Edition 1' was quoted twice. At 0610 he heard a nati take in on Arabic and N African music on 207kHz. Reception was poor, but the nature of the broadcast suggested that it came from Asil, Morocco (880Kw).

**Medium Wave Reports**

While at Cwm Nantcol, Gwynedd (754m a.s.l, near the coast of N/W Wales), Sid Morris searched for transatlantic signals on five nights. Using a Nevada MS 1000 scanner plus telescopic whip antenna, he heard broadcasts from six stations in the USA and in seven in Canada. The first came from WINS in New York on 101KHz at 0130. Best reception occurred was 0145. Conditions then deteriorated and much fading was evident by 0430.

Speech and music were heard on 530KHz by Tim Bucknell (Congleton) after midnight on January 25. The signal, which peaked 23422 at 0025, may have come from CJYO in St John's, NF but Tim was unable to obtain a definite id. Since then he has monitored 530 several times without success.

Signals from CJYO on 530 is used by many DXers as a pointer to conditions. It was SI023 at 0017 by Jim Willett in Grimsby. The Caribbean Beacon, Anguilla 1510 became audible on 0020 and peaked 5510 at 0025. Sky wave signals from stations in Spain have been dominating the band after dark. John Stevens (Largs) says, "I doubt if there is any legal frequency in use from 520-1602KHz which has not got a Spanish transmission on it after dark. Even local people with portable radios who listen to a.m. broadcasts in the evening are complaining about it."

Many local radio transmitters that transmit on both m.w. and v.f. are closing their m.w. outlets to make way for additional Community Radio stations. Due to space constraints this issue is printed, BBC R Gloucester 603, BBC Oxford 1485, R.Northampton via Trowell 1521 and R.Cleveland via Stockton 1548 may well have closed down.

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**Medium Wave Chart**

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<th>Country</th>
<th>Power</th>
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**Note:** Entries marked * were logged during darkness. All other entries were logged during daylight or at daybreak.

Some broadcasts aimed at Europe come from R.Japan via Moya 21.575 (Eng, Jap 0700-0830 & M.East) 25533 at 0730 in Abu Dhabi; V of the UAE in Abu Dhabi 21.735 (Ar 0600-0900) 44444 at 0830 in Hadlersfield, R. Pakistan, Isalmabad 21.565 (Eng 1100-1120) SI033 at 1100 in Guildford; UAE in Dubai 21.605 (Eng 1330-1355) 45555 at 1330 by David Edwards in Wallisend, R. Romania Int, Bucharest 21.665 (Eng 1300-1400) SI044 at 1337 by Bill Clark in Rotherham; RC via Zakkale in 1992 (Eng 1700-1730) SI044 at 1700 by Bryan Kimber in Hereford; WYFR 21.500 (Eng, Fr 1700-2000) heard at 1830 by Swann Lee in Huntingdon; HCJB, Ecuador 21.455 (s.b. & p.c. 24hrs) 54334 at 1300 by Chris Shorten in Norwich. The 21.465 MHz (11m) broadcasts from R.New Zealand Int via Rangataiki, N.Island have been clearly heard in the UK some days. The 100kW broadcast on 17.770 (Eng to specific Africa 0800-0900) was 25211 on 2310 in Bridgend, and 54334 at 0600 in Norwich.

In the African area No. 1, Gabon 17.630 (Fr, Eng to Africa 0700-1600) SI044 at 0900 in Hereford; VQA via Licorish in 1985 (Eng 1000-1100) SI033 at 1100 by John Coulter in Winchester; RFJ via Issoudun 21.770 (Eng to Asia, Oceania 1400-1500) 44444 at 1435 by J. Aranachalam in Thumrait, Oman; R.Norway, R. Moscow, Russia 21.665 (Eng to America?) SI034 at 1600 in Rollwy Reg; WCSN 21.840 (Eng to Africa 1600-2000) SI034 at 1600 by Cliff Stapleton in Torquay, R.Nederlands via Bonaire 21.885 (Eng to Africa 1600-2100) at 1831 by Rhoderick Illman in Oxford; BBC via Ascension Is 21.660 (Eng to Africa 0900-2000) SI037 at 1831 by A. Garen Beasley, Bridgewater.

IC: Steve Cai, Soutoum.
B: Tim Bucknell, Congleton.
C: Steve Cai, Soutoum.
D: George Millmore, Wootton.
E: Paul Gibson, Edinburgh.
F: Francis Heavey, Bristol.
H: Eddie McKeown, Co. Down.
I: George Millmore, Wootton, Oxford.
J: Sue Morris, Rollwy, Reg.
K: Hugh Quinn, Co. Kidmore.
L: John Stevens, Lare.
M: John Stevens, Lare.
N: John Wells, East Grinstead.

Local Radio Chart

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Long Wave Chart

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</table>

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

Short Wave Magazine, April 1992
Why not pay a visit to your nearest ICOM Hamstore. In addition to the full range of ICOM equipment, you will discover an excellent source for all your Amateur Radio requirements.

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"PHONE US NOW FOR BEST PRICES"
Tropical Bands

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Potential 13MHz (22m) signals from R.Australia have also reached the UK. During their Carnarvon broadcasts to Pacific areas on 13.755 (Eng 1500-1700) the signal has often peaked at 14145, as noted in MacKesfield at 1721. Also received here were their Carnarvon signals to Asia 13.705 (Eng, 1700-1900) S1033 at 2245 in Huntington; also at 1722 in London; R.Australia 13.605 (Chin, Eng 2200-0000) S1033 at 2115 in Torquay. Amongst the reported broadcasts was CO Down/DW via Julich; 13.610 (Eng to M.Aest 1500-1700) heard in Birmingham; R.Australia Int via Macclesfield 13.705 (Eng, Fr, Sp to Pr 0700-1000) the signal has often peaked at 14145, as noted in MacKesfield at 1721. Also received here were their Carnarvon signals to Asia 13.705 (Eng, Fr, Sp to Pr 0700-1000) S1033 at 2245 in Huntington. The signal has often peaked in Manchester at 1722. Also received here were their Carnarvon signals to Asia 13.705 (Eng, Fr, Sp to Pr 0700-1000) S1033 at 2245 in Huntington. The signal has often peaked at 14145, as noted in MacKesfield at 1721. Also received here were their Carnarvon signals to Asia 13.705 (Eng, Fr, Sp to Pr 0700-1000) S1033 at 2245 in Huntington. The signal has often peaked at 14145, as noted in MacKesfield at 1721. Also received here were their Carnarvon signals to Asia 13.705 (Eng, Fr, Sp to Pr 0700-1000) S1033 at 2245 in Huntington.
Short Wave Magazine, April 1992
Americas, New York, NY 10019, USA.
Radio WABC, 1330 Avenue Of The Americas, New York, NY 10019, USA.
Radiofax have continued to make representations to the Home Office, the DTI and the Radio Communications Agency in effort to obtain a licence to broadcast from the UK. The present service on 3910, 6205 and 12255kHz is provided from Southern Ireland. Programmes include reports on electronic and scientific subjects, with an emphasis on communications and media news. The production called Sparks is obviously aimed at radio amateurs and persons in the communications who generally possess the f.h. receiving equipment with which to hear the broadcasts.

Recently, imported religious material, and a relay of the Radio Caroline satellite service has been added to the varied format. It is suggested that if all those who wrote to the station also contacted their MP, politicians would become aware of the educational aspects and business potential of Radiofax. There is a distinct possibility of former USSR states selling air-time on high power f.h. transmitters to earn badly needed revenue, to help subsidise their broadcasting activities. The UK tends to licence stations many years after the bubble of enthusiasm and commercial endeavour has burst.

Readers Write

Cyril Kellam from Sheffield says what happened to Radio Harmony? He wrote to Venus, Texas, with two RSCs but no reply. Alas, Harmony lost it's American backing and the intended American Religious programmes went to Radiofax and are broadcast under the name Reflections. Mr Steel sends a fax he received from Radio Caroline's Station Manager Peter Moore. He mentions the Caroline relays on WWCR, Radiofax and the Intelsat satellite. There is also a station Newsline Tel: (0839) 669990. This is a premium rate line 34p per minute offpeak 45p a minute peak rate. Paul Wilson writing from Huddersdon, Herts, says he is a Technical College student studying BTEC HND Media Production with Business Studies. He requested, and hopefully received, information for his radio production assignment on offshore pirate radio of the 80s. The completed programme should make interesting listening.

Raymond Kelly at Nuneaton, asks about GSSling pirate stations? Most acknowledge reports fairly quickly, while others have a very prompt with a card featuring a naked lady (in the best possible taste). Do remember to send return postage in the manner requested on air. A word of caution, under certain circumstances persons in the UK could be involved in a minor legal infringement by communicating with, and sending revenue to an unlicensed station. The law exists primarily to deter business contacts and advertisers. I have a station address list showing the most frequently heard s.w. stations. Further GSS information is contained in the British DX Club members journal called the Short Wave Correspondence.

Adrian Cooke sent me a complimentary copy of the first issue of FRQ Magazine. It consists of 20 pages of pirate radio information, this includes a Free Radio Directory showing s.w. stations in alphabetical order. The nearest thing to a pirate radio handbook! A stamped addressed envelope to FRQ P.O. Box 112, Crew, Cheshire CW2 7DS. will get you full details.

Gary de Quincey from Bedford complains he was unable to get his January copy of SWM. A subscription is the answer, it's delivered to your door and usually arrives several days before it's in the shops.

Coming Soon

An information and QSL service for Dutch m.w. stations provided by the Dutch Pirate Radio Service (UK) keep the letters and logs coming, and I'll see you on this page in July.

FM Reception Chart

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Short Wave Reception Chart

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Readers Write

A Michael Catts, Bury, Lancs.
B. Sean Cooper, Wells, Norfoix.
C. Mark Jones, Peterborough, Cambs.
D. Bob Marsh, Bexleyheath, Kent.
E. David Matthews, Llandrindod Wells, Powys.
G. Sid Morris, Rowley Regis, W.Midlands.
H. John Parry, Northwich, Cheshire.
I. John Robertson, Alnwick, Northumberland.
J. David Williams, Southampton, Hampshire.
K. Tim Bucknill, Congleton, Cheshire.

Manports

A C.F.R.
B. E.F.
C. D.E.F.
D. F.K.
E. C.E.F.
F. D.E.F.
G. C.D.E.F.
H. D.E.F.
I. C.D.E.F.
J. C.F.
K. C.D.E.F.
L. C.D.E.F. G.
M. C.D.E.F. G.
N. C.D.E.F. G.
Bearcat UBC 200XLT scanner
Bearcat UBC 760XLT scanner
Sony SW800 shortwave radio
Nevada MS1000 desktop scanner
AOR AR1500 hand-held scanner
AOR AR2002 base scanning receiver
AOR AR2500 base scanning receiver
AOR AR2800 base scanner with SSB
AOR AR3000 scanning receiver
Yupiteru VT125 UK airband receiver
Yupiteru VT150 VHF hand-held scanner
Fairmate HP2000 wideband scanning receiver
Alinco DJ-X1 hand-held scanning receiver
Alinco BCA5A UK charger
Icom IC-R1 hand-held RX
BJ200 MKIII Black Jaguar
Yupiteru MVT6000 mobile
Yupiteru MVT7000 hand-held
Grundig Sattelit 500
Sangean ATS803 receiver
The new Drake R8E communications receiver
Grundig Yacht Boy 220
Grundig Yacht Boy 230
Grundig Cosmopolit
Sangean ATS800
Satellit 650

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<th>Description</th>
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<td>AR-950</td>
<td>Base/mobile scanner</td>
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<td>AR-2000</td>
<td>Series II 0.5-1300MHz, 1000 memories</td>
<td>£269.00</td>
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<td>AR-1500</td>
<td>NEW - as above, with SSB</td>
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<td>AR-2002</td>
<td>25-550 &amp; 800-1300MHz</td>
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<td>AR-2500</td>
<td>Base/Mobile 5-550 &amp; 800-1300 MHz RS232</td>
<td>£419.00</td>
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<td>AR-2800</td>
<td>Base/Mobile 0.5-600 &amp; 800-1300MHz</td>
<td>£395.00</td>
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- **R-5000** Kenwood's De-lux HF set £335.00
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Short Wave Magazine, April 1992
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Many Radio Amateurs and SWLs are puzzled. Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you’ll know – but what about the many other signals?

HOKA ELECTRONICS HAVE THE ANSWER! There are some well-known CW/RTTY decoders with limited facilities and high prices, complete with expensive PROMS for upgrading etc., but then there is CODE3 from Hoka Electronics! It’s up to you to make the choice – but it will be easy once you know more about Code3. Code3 works on any IBM-compatible computer with MS-DOS 2.0 or later and having at least 640k of RAM. The Code3 hardware includes a digital FSK Converter unit with built-in 220V ac power supply and RS232 cable, ready to use. You’ll also get the best software ever made to decode all kinds of data transmissions. Code3 is the most sophisticated decoder available and the best news of all is that it only costs £299!

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Features include:
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- ARO-ES - CCIR 519 variant
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- FEA-4 (FEC10A/FEF101)
- FE5 - 5C1000 Simplex
- Press IDEA - 300 baud ASCII FT8
- Wartime - 300 baud ASCII FT8
- Phonepress - 300 baud ASCII FT8
- Keele - 75 baud ASCII FT8
- Keele - ASCII Synch./Async.
- ASCII - CCITT 7, variable character length/parity.
- SWED-AR0/AR0-S - CCIR 518 variant.
- ARO - 100 baud Simplex AR0.

For more information send large SAE (33p stamp) for details of all our products.

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William R. Nelson W4UF
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Mike Wooding G7GOH
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FOR SALE Realistic PRO-2005 scanner, 400 channels, v.g.c., £210. Tel: 071-722 4684.

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FOR SALE AOR2000 scanner, boxed, £350. Tel: (0473) 685889 evenings.

FOR SALE Icom R-7000, boxed, immaculate from first date of purchase. Never been used. 25-2200MHz, £750. Norman. Tel: (03309) 50022 evenings only, Kincardineshire, Scotland.

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FOR SALE ICS FAX-1. Receives WXFAX maps, Navtex, RTTY with manuals, £115. Also Epson FX-1000 wide-carriage printer for above, £220. Tel: 071-623 9546 London.

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YOUR SPECIAL LUXURY COACH IS WAITING TO TAKE YOU TO THE FRIEDRICHSHAFEN HAMFEST 1992!

Don't miss the bus and get left behind!
Every year at the end of June, the attractive town of Friedrichshafen, set alongside beautiful Lake Constance, hosts Europe's largest amateur radio show. The number of visitors usually exceeds 15000, and the huge indoor flea market is second only to the Dayton Hamvention.

Getting there
Our reasonably priced trip will enable you to travel there in comfort in our luxury coach. The coach comes equipped complete with video, coffee machine and a toilet. We'll be picking up passengers from Victoria Coach Station in London, early in the morning of Thursday June 25. Then we drive to Dover, to catch one of the first ferries across. We'll arrive in Friedrichshafen late that evening, so there's no overnight travelling involved on this holiday!

Where we stay
During our holiday in Friedrichshafen we will be staying for four nights in the best Hotel in town The Buchorner Hof Hotel. Roger Hall G4TNT, has examined the Hotel Bar (very closely!) the rooms, and eaten in the restaurant, and he says it's certainly very luxurious.

Double rooms
The only minor problem is that most of the rooms are doubles. In this case, they really mean double-beds, not twins! This means that this trip is more suitable for couples, and so we can encourage more husband and wife or girlfriends to come, we have organised a couple of day excursions for the Friday and Saturday. One trip is to the beautiful Island of Mainau, famous for its flowers and topiary and the other is into the heart of the Black Forest, the home of the cuckoo-clock. Both trips will provide delightful days out.

There's so much to do, so much to see and it's such a good value-for-money trip that the coach will soon be booked up so hurry!
The complete holiday including: coach travel, all tolls, four nights Hotel accommodation (with breakfast and evening meal) and excursion costs just £199.95 each (based on two people sharing a room). A few single rooms are available for a supplement of £12.50 a night.

Interested in coming? Why don't you call Roger Hall G4TNT, on 071-731-6222 during the day or weekends, or the answerphone at night, for further information. Or you can call Rob Mannion G3XFD, the Editor, on 0202-6789558 for a chat about the trip. Alternatively you can send your deposit of £25 now to book your place to:
Friedrichshafen Holiday 1992,
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Our new combined VHF/UHF frequency listing running to over 100 pages is now available. The new publication is in the same format as our previous individual lists and is updated with the same regularity. Not only have we joined both lists together but added some extra information as well. Compiled by enthusiasts for enthusiasts (sorry about the cliche!) — The best available or so we would like to think.

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**Memories**: 60 holding frequency & mode

Aerial inputs: 600 ohms, 50 ohms & Hi-Z Whip
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**Case**: All-metal light alloy case
**Size**: 185mm(W) x 80mm(H) x 160mm(D)
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