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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.

Orders for back numbers, binders and items from our Book Service which the binder is required. Prices available from a variety of suppliers will be quoted in the article. Components for SWM Projects are available from the SWM PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 021-353 9326.

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Limited stocks of most issues of SWM for the past five years are available at £2.00 each including P&P to addresses at home and overseas (by surface mail).

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editorial

In the Letters section is a complaint from a reader about the facilities at one of the largest UK rallies. I attend around twenty rallies of all shapes and sizes - some in ultra-modern leisure complexes, others in marquees erected on fields occupied the day before by farm animals! The facilities are often outside the organisers' control - there being nowhere else in the locality suitable. Whilst I can sympathise with the letter writer, I also understand the organisers' problems.

This is the time of year when editors face the dilemma of the Christmas message. It's like the April Fool spoof articles - do they fit into the April issue or the issue current on April Fools' Day? To hedge my bets I will wish you a Merry Christmas in this issue and leave the Happy New Year bit for the next issue.

Dick Ganderton G8VFH

letters

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER US PUBLISHED 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 any other magazines. The views expressed in letters published in this magazine are not necessarily those of Short Wave Magazine.

Dear Sir
In reply to the letter from Bill Mitchell (E15GQ) regarding unnecessary change, I would presume that it was written partially with tongue in cheek.

Mr Mitchell surely realises the difference between the Morse letters SOS sent on a transmitter in c.w. mode and the words 'secure' 'pan' radiated on a voice modulated transmitter.

In asking what the procedure is with regard to receiving a distress call, common sense should dictate procedure even with a comparative newcomer to radio, never mind a licensed amateur!

The Morse code in the commercial field is not altogether dead and gone, as it is still in fairly common use on deep sea merchant ships where it often compliments modern GMDSS satellite systems.

If Mr Mitchell cares to listen into 500kHz c.w. mode during the night, especially in bad weather, he will on occasions, be able to hear SOS relays from coast stations or TTT urgency messages.

Dear Sir
I have acquired a Marine receiver, marked 'Spey' type SP1. Would you be so kind as to advise me of the name and address of the manufacturer.

Thanking you in anticipation of the courtesy of your reply.

David Clarke
Seaford
East Sussex

Dear Sir
I am writing to ask if anyone has a receiving set that can be used to work the new British stations contacted by satellite. I have always enjoyed listening to satellite stations in the past but the new ones are proving elusive.

Does anyone else have comments regarding this or any other such event? We would be pleased to hear your views.

J. Ball
Wallington
Surrey

Does anyone else have comments regarding this or any other such event? We would be pleased to hear your views.

E. R. Billiald
Arnold
Nottingham

Does anyone else have comments regarding this or any other such event? We would be pleased to hear your views.

Dear Sir

Does anyone know of this receiver? If you can help, please reply c/o the SWM Editorial Offices.

Does anyone else have comments regarding this or any other such event? We would be pleased to hear your views.

Short Wave Magazine, December 1994
Dear Sir

John Griffiths’s article in the October SWM on scanning receivers touches on the ignorance of scanner owners that result in the ‘For Sale’ ads or ‘once used, still boxed’ units, always to be found in the classified section.

Like John, I am also a long-time radio enthusiast, 40 years plus, and like to think I know a bargain when I see one. I am now on my third scanner, an all action, software dictated gadget that covers frequencies I had never heard of 40 years ago.

My first was a SX200N, and the less said about that the better, but it did work of sorts and gave me my first ‘wide band receiver’ and sixteen channels seemed to be enough.

My second was a Uniden Bearcat pocket job that was much better, more sensitive and at least I felt confident that it would hear the frequencies it was tuned to, (not so with the SX200N).

The Uniden had a channel lock out facility, the purpose of which only really came home to me when I bought a Yupiteru MV7100. I will return to that in a moment.

On the matter of ignorance, some years ago I spotted an ad in (somebody else’s!) Exchange & Mart for a ‘scanning receiver’. The advert was very, very misleading. Apart from being described as a scanner, it was promoted as ‘normally retailing in excess of £200’ (about the cost of the Uniden) having ‘hundreds of channels’ and was being sold at around £19 including P&P!

I couldn’t resist this ‘bargain’ that turned out to be a manually tuned two band receiver with a squelch control that should have been labelled a strangulation adjustment.

After a very lengthy series of correspondence with both the supplier in Wales and the Exchange & Mart, my money was returned, but it was hard work. Thiservals it item was certainly contravening any advertising standards in force at that time.

Now with my latest acquisition, the Yupiteru, that cost well in excess of £300. I am still wondering whether I have done the right thing. When I first tested it very early, I was rather disappointed. The advertising photographs show this unit attached to its own antenna and tuned to L.S.B. on the 40 metre amateur band, and the signal strength indicator full scale.

Try it, it doesn’t really work, a 500mm telescopic rod is not quite appropriate for this frequency. I know this, but I bought one. Attach to a proper antenna and the receiver is swapped even with the attenuation switched in, and the weak amateur signals are few and far between.

This is the case across most amateur short wave bands. It works quite well with its own antenna with broadcast short wave stations, but then so does my £30 three band portable.

Generally, this receiver’s front end is so wide band that intermodulation, cross modulation and spurious harmonies around, even on the simple antenna. This is where the channel lock out comes in, or in the Yupiteru’s case, the ‘search pass memory’.

There are 500 such memory allocations and I will probably need them all. The receiver generates so many harmonics within its own tuning range, I am surprised they are not preset to be passed when the receiver is manufactured.

Yes, I know scanning receivers are prone to such problems, but as such, do they really justify the price tag? A look at the Yupiteru specification in the handbook makes no mention of bandwidth, selectivity, spurious responses, etc., etc., and I am not surprised. Having said all this I will probably keep the receiver. The software is well thought out and it has some useful features over and above the previous scanners I have owned. But to return to the ignorance factor, purchasers of this receiver may not be aware of these shortcomings, and, like me at the outset, disappointment may overrule any acceptance of these deficiencies.

It will work quite well with an antenna appropriate for the frequency, not a discone. With my six metre antenna connected, performance is reasonable on this band, attach a discone and everything within the bandwidth of the latter appears to be received all at once!

For a pocket sized scanner that works quite well above 30MHz, I suppose it is acceptable, and by the way, the ads say it tunes from 100kHz, but try and find Radio 4 long wave, unless of course you live in Droitwich, £300 plus though is a bit much, so beware.

I offer this letter solely as guidance for your other readers, and is based purely upon my own experience.

Andrew Walker G3OUT
Woodhall Spa
Lincolnshire.

Dear Sir

Please would you give serious consideration to publishing a correction regarding Off The Record (October SWM page 74, ‘Holidays’, final paragraph). It is strongly recommended that passengers do NOT operate electronic equipment whilst airborne, especially radio receivers.

There have already been documented cases of low-powered consumer devices interfering with on-board navigation equipment. The Civil Aviation Authority, in Aeronautical Information Circular 58/1992, have published a strong warning about this hazard. Although watches, calculators and cardiac pacemakers are regarded as generating negligible interference, other apparatus is a real danger. The Automatic Direction Finder is the most likely navigational aid to be affected and, as it has no in-built failure warning, this problem can be insidious.

The worst culprits by far though, are cellular telephones (see AIC 28/1991) which not only affect the aircraft but also jam the ground-based telephone network, even when no call is in progress.

I’m sure you’ll agree that SWM must be careful not to issue dangerous advice to readers.

Keep up the good work on the column.

Dr. G. L. Manning
Edgware, Middlesex.

Dear Sir

I note from Andy Cadier’s contribution to the October issue that he recommends s.w.i.s to use portable radios for in-flight entertainment.

In my experience, many airlines do not allow the use of portable radios during flight due to the possibility of these interfering with navigation equipment.

It may therefore be prudent to suggest that prospective listeners request permission for their use from a crew member first.

Gerry Haynes
Herts.

Thank you for pointing out the potential danger in operating any form of electronic device onboard an aircraft. The cellular telephone problem is probably not widely known. I’m sure that SWM readers would not want to create problems. Ed.

Dear Sir

I wonder if I can get an inclusion in your Letters page.

The subject is GRM from the PACE satellite receiver Type MSS1000. This is one of the latest from PACE and it receives satellite signals very well indeed, but the problem in my unit is the radiation of very strong broadband noise.

I have had a look on a spectrum analyser and the noise covers from 3 to 50MHz and needs a 15µV signal to get over the noise threshold on 20 metres.

I have discussed the problem with PACE whose Zero Defect Dept. (yes, that’s right) are aware of the problem but seem to be having no luck at this time for curing it. Whilst I can recommend this receiver for its performance for which its designed, I am quite worried that this noise problem may be spreading around the UK.

I am lucky as the receiver is in my house and not next door, so that when I go on the air I unplug it. You can imagine the comments from the family - ‘I don’t get on the air as much these days! The DTI have been informed.

Am I the only person with this problem? By the way, has anyone seen a dish positioner module yet for the MSS1000?

J. Melvin G3LIV
Newcastle, Tyne & Wear

Yet more pollution of the air waves - soon we won’t be able to hear anything but GRM. What do you, the readers, think the solution to this problem is?
The AR3030 receiver combines a classical appearance on the outside using aluminium extrusion & cases with a high-tech low noise DDS (Direct Digital Synthesizer) design inside with the legendary Collins 6 kHz AM mechanical filter fitted as standard, the result is “THE NEW CLASSIC from AOR”.

Collins is a trade name of Rockwell International

The AR3030 offers high performance, user friendly operation, an easy to see large rear illuminated LCD and true value for money, the list of “standard features” is exceptional:

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- 5 Hz DDS tuning
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- Unrivalled selectivity offered by the Collins 6 kHz AM mechanical filter
- Options of a substitute Collins 4 kHz AM mechanical filter, Collins 2.5 kHz SSB mechanical filter and Collins 500 Hz CW mechanical filter (ceramic SSB filter fitted as standard)
- TCXO for the ultimate in frequency stability ideal for data communications and ECSS
- Dual VFOs plus 100 memories which retain all operating data
- Front panel AGC fast / slow
- Standard rear panel RS232C connector, I.F. output, audio outputs and carrier operated relay
- Large analogue S-meter
- Direct frequency entry by MHz, kHz or metre band
- Optional VHF converters for airband (108 – 139.9999 MHz) and 2m HAM + MARINE (140 – 169.9999 MHz)

AM/S-AM: 6kHz/-3dB in the normal position using the legendary Collins eight resonator mechanical filter (526-8636-010 or 526-8695-010) and a 2.4kHz/6dB Murata ceramic filter (CFJ455K6) in the narrow position. A narrower 4.0kHz Collins mechanical AM filter may be fitted in the standard AM filter position (a wider AM filter such as Collins 8.5kHz/3dB 526-8561-020 could be fitted in the AM position). Due to the I.F. cascade filter, the widest possible filter is 8.5kHz.

USB/LSB/FAX: 2.4kHz Murata ceramic filter (CFJ455K6). An optional Collins 2.5kHz/3dB Collins eight resonator mechanical filter (526-8635-010 or 526-8694-010) of higher specification may be optionally fitted (workshop fitting) to replace the 2.4kHz filter.

CW: 2.4kHz Murata ceramic filter in the Normal position. An optional Collins 500Hz/3dB Collins seven resonator mechanical filter (526-8634-010 or 526-8693-010) may be optionally fitted (workshop fitting) in the Narrow position.

FM: 15kHz Murata ceramic filter (CFU455E2) fixed. Selection of Normal/Narrow is disabled.

Strong signal handling is very good providing 3rd order intercept measurements of around +15dBm between 1.8 – 28 MHz with 50/25 kHz tone spacing.

* Special offer for a limited period only
AR3030 receiver with one optional Collins filter ‘or’ VHF converter ‘or’ PC software at no extra cost

£699.00 including VAT

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Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbyshire DE4 4BG
Tel: 01629 825926 Fax: 01629 825927
Free Booklets

It was whilst reading the October issue of Monitor, the magazine from the International Short Wave League - that I saw details of a couple of free booklets. The radio station KNLS, Anchor Point, Alaska have a couple of booklets that will interest the new listener. The first is called DX Propagation for Beginners and is written by Carl Mann who has over 30 years experience as a listener. He wrote the book to help DXers improve their reception during the low end of the 11-year sun spot cycle. Monitor says that it is written in a simple and straightforward style so hopefully it will be useful to readers of this column. You should send two IRCs to cover postage with your request.

The second booklet mentioned is also by Carl Mann and is called DX Tips for Beginners. This has been around for some time, but KNLS still have some copies available. Again you should send two IRCs for your copy. Please mention the ISWL and Short Wave Magazine if you contact KNLS. Their address is: Station KNLS, Anchor Point, Alaska 99556, USA.

John Mathew of Norwood has written with a selection of interesting questions that I’m sure have been asked by many readers in the past.

The first concerns the very strong, but ‘silent’ signals, that he comes across when using his Yupiteru scanner. He wonders why such strong unmodulated signals exist. The answer is they don’t! The signal John has found is most probably what is known as a ‘birdie’ or spurious signal and is a feature of most scanners. I could go into a lot of maths to explain why this is a feature of most scanners. I probably wouldn’t thank me, so I’ll use a simpler approach.

In order to convert the v.h.f./u.h.f. radio signal down to audio, the incoming signal is subject to a number of mixing or frequency changer stages. At each of these stages the radio signal is mixed with a locally produced signal and the difference, or sum, selected. It is a feature of this process that a number of unwanted frequencies are also produced.

It’s these spurious signals that find their way back into the receiver and give rise to the unmodulated carriers. You will often find the worst offenders listed in the receiver’s operating manual. One of the difficulties caused by these ‘birdies’ is the unwanted interruption of frequency searches and scans. The solution depends on the sophistication of your receiver, but can usually be handled by using the Lock-Out feature. This facility is usually activated by pressing the Lock-Out button whilst the appropriate memory channel or frequency is selected. However, I would suggest you check out the operating manual if you’ve not previously used the Lock-Out.

John’s second question relates to the reception of short wave broadcast signals. He has noted that listeners claim to have received signals from stations that are beaming to another country. The question is simply how does one know where the signal is directed? Although some stations may announce the intended country or area, the most reliable way is to refer to a broadcasting guide. If you have access to one of the popular guides such as The World Radio TV Handbook or Passport to World Band Radio you will find that the frequency schedules normally show the frequency, power, transmission times and intended area. You can use this information to quickly establish the source and intended destination for all short wave broadcast transmissions. If you don’t have a broadcast guide, the SWM Book Service stock both these books - and many more, good idea for Christmas!

New Scanner

Link Electronics have sent me some details of a new scanner from the Realistic stable. The PRO-2035 is a 1000 channel base station that has two methods of tuning - rotary tuning and direct frequency entry. Hopefully, no matter whether you want to wander around the bands or want to go direct to a frequency you should find this radio easy to use.

Other features include a priority channel, search facilities, a lock out, scan delay and selectable a.m./n.f.m./w.f.m. From the photograph it looks a ‘user-friendly’ radio. I don’t have any details on price, but I’m sure a call to Link Electronics on (01733) 345731 will tell you all you need to know. They are still offering part-exchange deals if you want to change your scanner.

Their address is: Link Electronics - Tandy Millfield, 216 Lincoln Road, Peterborough PE1 2NE.

British DX Club

The British DX Club has changed their address. You should address all correspondence to British DX Club, 126 Bargery Road, Catford, London SE6 2LR.

New Scanner

Now then, newcomers may wonder who are the British DX Club and what’s the point in joining. Well, short wave listeners don’t usually join local amateur radio clubs because the amount they have in common can be very little. So if you don’t join a local club, where can you compare notes with others who enjoy the same hobby as yourself? There are several listeners clubs you can consider, such as the International Short Wave League, Medium Wave Circle, British DX Club, for example.

The British DX Club is a non-profit making organisation and it’s run by a Board and Editorial Team, all of whom are unpaid volunteers. What is also good to see is that members are encouraged to attend Board/Staff Meetings to debate issues relevant to the club. Your £9.00 membership fee gets you Communication, the monthly publication, that arrives at the beginning of each month. As they have such short lead-times, it is very up-to-date with any changes that occur in the world of listening.

The magazine covers just about every aspect of the radio spectrum so there should be something for everyone in it. It also includes a helpdesk, so you can discuss your questions and learn from the answers given to others.

The various short wave listener clubs represent very good value for money and are an ideal way for listeners to get together and exchange ideas and views. Think about it.

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Station Approach,
Broadstone,
Dorset BH18 8PW,
Tel: (01202) 659930.

Cirkit's Latest

The new, winter 1994/5 edition of the Electronic Constructors' Catalogue from Cirkit has just been published.

An invaluable aid to anyone remotely interested in electronics and radio construction, includes tools, components, hardware, test equipment... the list just goes on. Over 4000 lines stocked, the catalogue includes £21.00 worth of discount vouchers. For further information contact: Cirkit Distribution Ltd., Park Lane, Broxbourne, Herefordshire EN10 7NQ.
Tel: (01992) 448899.

Amateur Radio Licence Age Requirement Reduced

Holders of the Amateur Radio (Novice) Licence who are between the ages of 10 and 14 years will now be able to obtain a full licence, conditional on the following: The individual must be at least ten years old and must have held a Novice A or B class licence for minimum of a year. They must, of course, also have passed either the full class A or B licence exams (RAE) including the 12 w.p.m. Morse test for a class A licence.

Keeping the Spectrum Clean

The Radiocommunications Agency staff are staying ahead in the battle to keep unlicensed broadcasters off the air. During the last year they have carried out 570 raids against over 150 pirate stations.

The Agency is responsible for taking enforcement action to keep the radio spectrum clean for licensed users to operate without interference to their services. Staff in the Agency's 20 District Offices are responsible for dealing with unlicensed radio users and those who operate outside licence conditions. Enquiries, Tel: 0171-215 2150.

Listen With Grandad by Leon Balen & David Leverett

Short Wave Magazine, December 1994
Change of BBC FM Frequencies

October 25/26 High Wycombe, Buckinghamshire. To allow better use of the v.h.f. broadcast band the High Wycombe f.m. transmitter has changed its frequencies for Radios 1, 2, 3 and 4. The change is only slight, listeners whose radios have tuning dials will need to make only small adjustments to the tuning. Those with digitally tuned radios should reprogram to the appropriate new frequencies. The High Wycombe transmitter serves listeners in the High Wycombe, Hughenden Valley and along the valley of the River Wye to the east, as far as the north side of Woodburn Green. Listeners with r.d.s. radios need not make any action, except to ensure the r.d.s. function on the radio is selected. The radios will then automatically tune to the appropriate frequencies, which are - Radio 1 99.6MHz, Radio 2 90.0MHz, Radio 3 92.2MHz and Radio 4 94.9MHz.

Television Relay Stations

September 22 St. David’s, Dyfed. A new relay is opening with kind co-operation of the Dean of St. David’s, the Very Reverend J. Wyn Evans, and permission from the chapter - the relay has been installed inconspicuously in St. David’s cathedral tower. The transmitting antenna is built into a new flagpole on the top of tower.

The relay has been built jointly by the BBC and NTL on behalf of the ITC it provides good television and teletext reception for about 250 people in the western half of the city. Viewers will need good quality antennas to utilise this relay. Existing antennas aligned on other stations are likely to be of the wrong group and therefore should not be used for the new relay. Antennas should be roof mounted and vertically polarised with a clear line of sight of the new flagpole on the cathedral.

Station Details

Channels:  
BBC Wales on 1 33  
BBC Wales on 2 26  
HTV wales 23  
S4C 29

Antenna Group: A  
Polarisation: Vertical  
Effective Radiated Power: 2W

Reception advice is available from either:

BBC Engineering Information  
White City  
201 Wood Lane  
London W12 7TS  
Telephone: 0181-752 5040

or

ITC Engineering Information  
Crawley Court  
Winchester  
Hampshire SO21 2QA  
Telephone: (01962) 848647

Radio and TV DX News

Digital Audio Broadcasting (DAB) looks set for a September 1995 opening by the BBC - initially across the London area - and extending to 60% of the population by 1998, emphasis being on urban and major national traffic routes. UK coverage will be at Band 3 within the 217-230MHz spectrum with the long term aim to broadcast by satellite in the 1.5GHz (L) band. France intends to operate at 50MHz and L Band where-as Germany will commence initial DAB within a slowly vacating (of TV) ch.E12 Band 3 slot. Germany will commence DAB early 1995 and by year’s end will have established several areas operating within ch.E12 with gap filling by supplementary L Band transmissions. Still in London and success by the residents of Poplar who claimed and won £1 million damages from the owners of the Canary Wharf Tower following construction of said building which in turn caused a shadow of local TV reception from Crystal Palace. The ruling is that the interfering with television reception constitutes and ‘actionable offence’. This means that developers must put to rights any loss or deterioration in local broadcast reception should their structure interfere with previous good reception!

The Indian government is to allow the setting up of private local radio and TV stations subject to approved guidelines. Private companies will also be allowed to up-link programmes and news feeds onto satellite without permission, thus allowing major programme operators such as the BBC CNN etc to establish their own studio centres on Indian soil.

Taiwan has developed her own digital HDTV system and initial transmissions will commence early 1998 with full service two years later. And freedom on the air waves of Panama with the freeing of ten u.h.f. channels for use by private broadcasters for the next 1 century.

In the Czech Republic the private Radio Echo has now hit the air waves on three medium wave frequencies, replacing the earlier transmissions of Radiozurnal. Echo will feature news, features and music.

Confusion within Poland over broadcasting laws lead to the arrival of many illegal radio and TV stations. The situation has now been regularised with several of the non licensed stations now gaining official approval. Nationwide transmission has been approved for ‘Radio RMF’ (ex Cracow); ‘Radio Zet’ (Warsaw) and the Catholic ‘Radio Maria’. Television approvals have been given to ‘Polsat’ for national transmission, regional stations are ‘NTP Plus’ (north, Central and West); ‘Wisla TV’ (South); ‘Wielkopolska Telewizja Regional’ (West) and ‘Canal Plus’ (national scrambled network - subscription basis - films etc + three hours of locally made programmes daily). Many local radio stations have been given transmission approval.

The plan to private radio stations in Israel have been delayed pending the appointment of a director general of the new Radio Authority Council. Decisions should have been made April last but with indecision over which government department will handle the upcoming commercial stations the situation remains in limbo!

More potential interference (or DXing potential ?) may arise with the use of the radio LAN (local area networking) within industrial complexes rather than the usual hard wired system. This system allows complete flexibility in office design without the restriction of wired communications. Telecomms firm Mase have recently announced a new radio LAN system that extends coverage from 180m to 2km. The matter of security obviously is in question. More information is awaited from the Mase Group.

There’s a new main TV transmitter operating near Brussels, Belgium of the BRTN-2 TV2 using ch.E25 horizontal at 1000kw erp. The BRTN TV2 ch.E25 Brussels 10 kW e.r.p. transmitter has closed down (5th September actioned). The RTBF is currently testing in 16:9 - as many DXers witnessed in the October trop openings! Zuid Holland TV (ZH-TV) has closed down on ch.E49 due to financial problems, the transmitter is now off the air.

From reader Tony Llewelyn Jones (Bangor) arrives information for the forthcoming ‘Telefis na Gaelige’ Gaelic language network, this will operate solely at u.h.f. running 1800-2100 approx daily from 1996. Transmitters for the TnG service likely to be received in Wales will be Three Rocks ch.E55; Cairn Hill ch.E50 and Clermont Carn ch.E68.

Belgian 16:9 HDTV test card as received here in Romsey from ch.E3 Liege via the Tropospheric opening in October.

Short Wave Magazine, December 1994
**English Listeners Guide from ISWL**

The International Short Wave League announce their latest publication, *Guide to English Language Short Wave Broadcasts to Europe (Winter Schedules - 1994)*, which is available now priced at £1.50. The guide is of a similar format to that of the Summer Schedules.

**New Address for BDXC**

A new address has been announced with immediate effect. This address is to be used for all enquiries regarding the club, ordering publications and as destination for schedules, press releases etc. British DX Club, 126 Bargery Road, Catford, London SE6 2LR.

**Short Wave International Frequency Handbook**

This is a new edition of an old favourite. Many hours of 'hands-on' monitoring and checking have gone into updating the information and listings. With a cover price of £12.95 plus P & P, this book represents excellent value and should be alongside the receiver of all s.w.l.s.

**Young Amateur of 1994**

Seventeen year old Robert Aley from March, Cambridgeshire has won this years award. First prize of £300 was presented by Roger Louth, the RA's Director of Mobile Services.

**Base Station Scanning Solution**

The PRO-2035 is the latest scanning receiver to be launched by Realistic. This new 1100 channel base unit offers rotary tuning in addition to direct frequency entry - a very useful feature when roaming around the bands.

The new receiver features a triple conversion architecture to ensure minimum spurious response. Incorporating the usual host of Realistic features - Hyperscan, lock-out, scan delay et al the modes of operation are a.m./n.b.f.m. and w.f.m. Memory backup is achieved by use of a lithium battery unlike most hand-held units. The receiver is a true base station unit, power can be provided by either 240V a.c. mains or external 12V d.c. source. Frequency coverage is discontinuous in the range 25-1300MHz. This high quality scanner should meet the needs of the scanning enthusiast looking for a performance base unit. The price for the PRO-2035 is £349.00.

The PRO-2035 is available from both: SRP Trading, SRP Radio Centre, 1686 Bristol Road South, Rednal, Birmingham B45 9TZ; Tel: (0121) 460 1581; and Link Electronics, 216 Lincoln Road, Peterborough PE1 2NE. Tel: (01733) 345731.

**Data Kits From The Barn and Badger**

The Amateur Radio Software Barn - GOLOV/G4IUE are pleased to announce that they have reached an agreement with Badger Boards to sell their kits to allow both transmission and reception of data modes.

The kits provide an interface between radio and computer. Modes included are, Morse, SSTV, FAX RTTY and AMTOR.

Kits cost from £19.00 excluding case or the unit can be purchased ready built for £24.00, are again not including case. Connections by way of a five-pin DIN for the radio end, and a 9-way D-type for the PC port. Included in the price is shareware decoding software.

For further information contact Ernie Baily Tel: (0836) 748958. Nigel Horne, Tel: (01226) 283021, or via the internet njh@smstl.demon.co.uk.

**JVFAX Interface**

Martelec have produced a sophisticated interface unit for use with the ever popular JVFAX shareware capable of better results than the simple comparator circuit used by others. This unit enables the decoding and high resolution display of all h.f. FAX, and weather satellite modes using a standard, compatible PC. The JVF1 interface addresses the requirement with a microprocessor-based design, incorporating specially designed filters for FAX an APT signals. The JVF1 is housed in a rugged diecast metal enclosure and because it connects to the PC's serial port, it is both suitable for use with both portable and desktop machines. An external d.c. supply of 8-16V at 100mA is required to power the interface.

The JVF1 costs £94.60 including VAT and carriage.

For further information contact: Martelec, The Acorns, Wyck Lane, East Worldham, Alton GU34 3AW. Tel: (01420) 82752.
AVON
Bristol International RC: Tuesdays, 8pm. The Fighting Cocks Public House, Hen斯cliffe Lane, S33 8AA. The club has been formed so that all radio enthusiasts, whether they be Licensed Clubs, Amateurs, s.w.l.s or CBers can get together and have a good natter and do things that you do in radio clubs. Tel: 01439 272129.

Bristol City of Bristol Club: Tuesdays, 7pm. All visitors, hall, bar, welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Clubs, Amateurs, s.w.l.s or CBers can get together and have a good natter and do things that you do in radio clubs. Tel: 0117 9239262.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc., Bridge Farm House, Dursley Road, Whitchurch. November 33; 14th - Christmas social. (01494) 877747.

DERBYSHIRE
Derby & DARC: Wednesdays. 7.30pm. 115 Green Lane, Derby. Mrs Hayley Winfield, 2 Hils Cottages, Crich, Matlock. Derbyshire DX 4504. November 30 - Where have all the carbon granites gone? J21G. GM9KX. December 7 - Amateur TV group meeting. 7th June, 14th - Christmas social. For more information ring (01298) 374288 at a Wednesday evening.

DEVON
Torbay ARC: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. December 16 - TARS Christmas party, Peter GAUTO. (01803) 864528.

DORSET
Dorset Police ARC: 1st and 3rd Thursday at Force HQ at 7.30pm. December 1 - Club project update. 15th - Christmas do (01202) 229251.

FIFE
Dunde ARC: Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. November 29 - AEC area control by Mike. Dalrymple GM4GUC, December 6 - construction night, the RSGB and its committees by Ian Stuart GM4AUP (President of RSGB) and Frank Hall GM8BZX (Zone 6 council member). GM4FSB, 30 Albert Street, Dundee. (01382) 859504.

NORFOLK
Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Dickson Lane, Dereham, Norfolk. December 7 - Amateur television by Peter BALKC, 16th - Christmas social. George Parkhouse (B06589) or Stephen (01603) 201462.

NEWCASTLE UPON TYNE
Newcastle ARC: Tuesdays, 7pm. Carton Close, Tynemouth Avenue, Walderslade, Chatham, Kent. November 24 - Annual general knowledge quiz evening at BRATS, GTH (Parkwood), December 9 - Amateur television by Peter BALKC. 16th - Christmas social. George Parkhouse (B06589) or Stephen (01603) 201462.

Northumberland ARC: 1st and 3rd Tuesdays at Force HQ at 7.30pm. The School Annex, Camden Road, Tunbridge Wells. December 16 - Xmas party. John G7OCI. (01920) 564940.

NOTTINGHAMSHIRE
Mansfield ARC: Fridays, 8pm. Queen Mother House, Aberdeen, November 16 - GMARC Christmas party and video/frim show, Will GM3CZS or 01623 356152 or Bob or (0115) 522170.

GROSVENOR
Crystal Palace & DRAS: 3rd Saturdays, 7.30pm. All Saints Church Parish Rooms, Bury Park, SE19. December 19 - Christmas party and video/frim show, Will GM3CZS or 01623 522170 or Bob or (0115) 522170.

EDGWARE & DRAS: Thursdays, 8pm. Waiting Community Centre, 145 Orange Hill Road, Burnt Oak. November 24 - Morse training evening, December 8 - The great Edgeware annual quiz. Red Bishop. 0181-204 1808.

Wimbledon & DARC: 2nd and last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. November 26 - Microwaves by G4BUX. December 9 - Xmas social (0181) 940-2180.

HAMPSHIRE
Horndean & DAR: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. December 1 - Video evening. Steve G3SWN.

HEREFORD & WORCESTER

HERTFORDSHIRE
Hoddesdon ARC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. November 24 - AGM. December 8 - Quiz and natter night. John G7OCI. (01920) 466639.

KENT
Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Keghill Gardens, Hayes. December 13 - Christmas party. A. Messenger. (0171-877 0472)

Medway ARC: Fri. 15ths, 7pm. Community Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. November 24 - Annual general knowledge quiz evening at BRATS, GTH (Parkwood). December 9 - Amateur television by Peter BALKC. 16th - Christmas social. George Parkhouse (B06589) or Stephen (01603) 201462.

WARRICKSHIRE


SUFFOLK

Sudbury & DRA: 1st & 3rd Tuesdays, Wells Hall, Old School, Great Cornard, Five Bells Public House, Bures Road, Great Cornard. December 6 - Open forum - questions and answers on anything relating to radio & music. Wilf Natter & noggin night. Tony Hamran GBLT. (01671) 312122.

WARWICKSHIRE

MEDWAY
West Bromwich Central Radio Club: Sundays, 7.30pm (talks begin at 8pm). The Sandwell Hotel (upstairs function room), High Street, West Bromwich. December 4 - The work of the County Ambulance by Ian Nichols, 11th - AGM. Ian Leitch. (0121) 584 (home) or (01205) 355322 ext. 2083 (office).

Birmingham South West: Hibs Heath Community Association, Hamstead House, Fairway Road, West Heath, Birmingham. December 7 - Quiz night, Ken Dowling. (0121) 458 1036.

West Bromwich Central Radio Club: Sundays, 7.30pm (talks begin at 8pm). The Sandwell Hotel (upstairs function room), High Street, West Bromwich. December 4 - The work of the County Ambulance by Ian Nichols, 11th - AGM. Ian Leitch. (0121) 584 (home) or (01205) 355322 ext. 2083 (office).

WILTSHIRE
Salisbury Radio & Electronic Society: Thursdays, 7.30pm. 3rd Salisbury Sea Scout Hut, St Marks Avenue, Salisbury. December 28 - Planning for winter sports, December 6 - Oscilloscopes by Frank Hall GM8BZX. Christmas party, mulled wine and mice pies. J. David Kennedy. (01722) 330971.

Trowbridge & DARC: 3rd Saturdays, 8pm. The Southwick Village Hall. December 7 - Christmas party and presentations. Ian GGORL. (01225) 864986.
Computer Control for the HF225 Receiver
Part 2

In the second and concluding part of this feature, Mike Bradbury shows how to set the receiver frequency or scan the first ten internal memories under computer control.

Now we have dealt with the construction of the interface, modification of the K225 keypad and the principle behind the MC145100 crosspoint switch IC which is used in the interface. The test program LISTSING 1, should have enabled most PCW users to test the interface without too much effort and hopefully users of other computer types were able to modify the program to suit.

We now look at two skeleton programs, which can be used in your own database creations, one to enable the HF225 receiver frequency to be set from frequency information stored within the database and the other to permit scanning of the first ten internal memories.

Listing 1, 2 and 3 are specifically for the PCW computer but are easily modified for other types. Enter LISTING 2 into your computer, save as "PROG2.BAS". Then, ensuring that the interface is correctly connected, RUN the program. The computer will prompt you to enter a frequency in kHz (via the keyboard, not the K225 keypad!) and the receiver frequency will be set accordingly. "What's the point in that?" you may ask, "I could have done that from the keypad!" The program aims to show how a frequency stored in a variable, in this case FREQ, can be analysed digit by digit and the corresponding crosspoint switch operated to send the digit to the receiver. If the frequency was stored within a database then it can be seen that the receiver could be automatically tuned as each database record is selected. The stored frequency is checked to be within the range of the HF225 (line 150) and rejected if out of range. Frequency setting is only possible to the nearest kilohertz, so any decimal part which you may enter is removed by rounding (line 140) to the nearest kilohertz.

<table>
<thead>
<tr>
<th>Keypad</th>
<th>MC145100 Switch Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>not used</td>
</tr>
<tr>
<td>1</td>
<td>binary</td>
</tr>
<tr>
<td>2</td>
<td>address (0 to 15)</td>
</tr>
<tr>
<td>3</td>
<td>and D4 (binary 16)</td>
</tr>
<tr>
<td>4</td>
<td>not used</td>
</tr>
<tr>
<td>5</td>
<td>and D5 (binary 32)</td>
</tr>
<tr>
<td>6</td>
<td>STROBE and DATA lines</td>
</tr>
</tbody>
</table>
| 7      | to IC3. To set a switch ON, its' binary address is set on D0 to D3 and the DATA and STROBE are both set high. This is achieved by adding 48 (16 for STROBE and 32 for DATA) to the switch address. In line 30 of Listing 2, variable on% is defined as 48 and line 260 adds this value to the switch address xpt%. The result being sent to the Centronics port by the OUT command. After a time delay, subroutine 340 to 350, the switch is set to OFF by setting the switch address and STROBE high with the DATA line low. In line 30, variable off% is defined as 16 and line 270 adds this value to the switch address xpt%, the result being sent to the centronics port. Thus to send digit 4 to the receiver, switch 5 must be pulsed by outputting the value 53 (5 for switch address plus 48 for STROBE & DATA) to the computer port to operate the switch and 21 (5 plus 16 for STROBE) to reset it.

The number of digits to be sent to the receiver vary from two for the lowest frequency of 30kHz to five for the highest frequency 29999kHz and line 200 in conjunction with the FOR/NEXT loop, selects each digit of the entered frequency sequentially. The digits are then sent to the receiver by pulsing the crosspoint switch according to the digit required. (Refer again to Table 1.2).

As it is possible for random data to be sent to the interface on power-up, it is advisable to include lines

Errata:
In part 1 of this project some errors crept in, these are as follows:

Fig. 2: The column legends for the keypad were omitted, they are as follows: from left to right c1, c2, c3. The n.c. pin on the MC145100 i.c is the c1 input.

Fig. 4: The junction of IC1 pins 11, 14 & 15 and IC2 pins 14 & 15 should be connected to point Y. The diode is D1.

Fig. 7: 'c1' should not be present. The correct sequence for the ribbon cable is, from the bottom, 0V, r1, r2, r3, r4, c2, c3, c4, +V.

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60 to 80 at the start of your own programs to ensure there are no switch hang-ups on initialisation.

**Scanning Routine**

Having looked at frequency setting principles, we can now go on to investigate scanning. Type NEW to clear LISTING 2 and enter LISTING 3, saving to disc as "PROG3.BAS". Refer to the HF225 operating manual and ensure that memories 1 to 10 each have a different frequency stored. Run the program, follow the on-screen instructions and you will find that the first ten receiver memories are scanned. The process can be stopped/started by pressing the spacebar on the keyboard. The principle is the same as for Listing 2 but now the digits 1 to 9 for channels 1 to 9 and * for channel 10, are sent in sequence to the receiver with a preset time delay between each digit. The HF225 has its a.g.c. active all the time so the scan speed has to take that into account. Pressing the spacebar when you identify an active channel will then hold that channel. To adjust the scan speed, change the value of scanspeed% in line 40, the higher the value the slower the speed. Memory channel 20 could also be included if desired and is selected by keypad # when in channel mode (Hint: # is crosspoint switch 15). A channel lockout routine could be added quite simply so that if for example you wished to monitor four h.f. Aero channels, then only four internal memories need be scanned. This facility is included in the PCW program referred to later. The programs in Listing 1, 2 and 3 are intended to demonstrate some of the uses of the HF225 interface and to encourage readers to experiment with their own software, no matter what type of computer is in use. If this project meets that aim then it will have done all that I set out to do. Remember also that there are two unused opto-isolators on lines D6 (binary 64) and D7 (binary 128) from the computer port which could be used for tape recorder switching etc.

When the interface and computer control are in use the keypad still remains functional and manual fine tuning can take place if necessary, but for this to be so, you must ensure that any software you write does not leave any crosspoint switches in the ON state. If you find that the keypad does not work at any time during your experimentation, simply run a switch reset routine similar to line 60 in Listing 1 and also include a clean exit routine rather than using the STOP or BREAK key.

Recognising the fact that some readers do not have the time, inclination or knowledge to experiment or write software and producing this type of software is not cost effective for the professionals, I have produced a database program for the PCW 8256/8512 only, to operate with the HF225 interface which has both automatic frequency setting and scanning of internal memories. Data is stored in disc files, each 500 records long and each record has four fields for station ident, frequency (in kHz or MHz), time schedule and notes. The data is arranged in twenty banks, each bank containing 25 records all of which can be seen on one screen. The banks can be named to suit individual requirements and thus allow grouping of frequencies of interest.

The program makes use of multiple screen windows allowing relevant data to be displayed as necessary and the main menu is visible at all times. A search facility is included but in the current version is sequential (as opposed to faster methods) but even so, the search time is not too excessive. Figs. 1 to 4 are screen dumps taken from the program and are self-explanatory. Any readers who would like a copy of the programs please write to me, enclosing s.a.s.e., via the SWM Editorial Offices for details on how to obtain your copy.
PROMOTION CONTINUED — DUE TO OVERWHELMING DEMAND

RECEIVER BARGAIN

INTEREST FREE FINANCE — UP TO 3 YEARS

ICOM
IC-R9000 (£495.00), 10% deposit @ £495.00, then 36 months interest free @ £123.75
IC-R7100 (£1395.00), 10% deposit @ £140.00, then 24 months interest free @ £52.29
IC-R100 (£629.00), 10% deposit @ £63.00, then 18 months interest free @ £31.44
IC-R72E (£859.00), 10% deposit @ £86.00, then 18 months interest free @ £42.94
IC-R71E (£1059.00), 10% deposit @ £105.00, then 18 months interest free @ £53.00
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AOR AR8000UK (£449.00), 10% deposit @ £45.00, then 12 months interest free @ £33.66
AOR AR3000A (£949.00), 10% deposit @ £95.00, then 18 months interest free @ £47.44
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YUPITERU MVT8000 (£369.95), 10% deposit @ £37.00, then 12 months interest free @ £27.74

If you’re between 18-70 years of age working, retired or disabled, subject to status, you may well qualify for our new special interest free finance. For fast mail order, phone today for your forms.
In the course of a day I get asked many questions about short wave receivers but the most common is 'Should I spend more money - what will I get if I do?'. I've always believed that the more you pay, the more you should get, and in receivers, this doesn't strictly mean you'll hear more stations - a popular misconception! Spending more money will normally get you a receiver designed and manufactured to a much higher standard. In the case of the NRD535, this starts with the fact that it is made by the Japan Radio Company. They've been in business far longer than some of the other household names and as most of their products (h.f. transceivers, radars, marine electronics) are used professionally, you can be assured of the pedigree.

A more expensive receiver can normally be upgraded to suit the needs of listeners who may have very different needs. For example, the i.f. filters fitted are excellent, giving good selectivity that will probably suit most people, but optional s.s.b. and c.w. filters can be fitted to tailor the receiver to your particular needs. The c.w. buff may fit the 500 or 300kHz filter and the datacoms purist may want the 1.8 or 1kHz s.s.b. filter. Personally, I'd rather fit the CFL243W Bandwidth Control Unit as it gives me a continuously variable i.f. bandwidth right down to 500kHz - superb for the wide range of listening that I do, coping with weak s.s.b. signals, both data and voice, suffering badly from strong stations on adjacent channels.

We can offer our own exclusive modification to the NRD535 by changing one of the a.m. filters and rebuilding the audio amplifier stages. This results in much better reproduction of a.m. broadcast stations, ideal for those who listen to programs rather than tuning around looking for weak signals all the time. This goes a long way towards reducing listener fatigue. We can do this modification for £195.00 or if you order it to be done at the time of supply, just £117.50.

In its basic form, it is an excellent receiver which will more than please most listeners. However, if the type of listening you do changes or perhaps if you become more experienced, the fact that you can upgrade without having to trade in will protect your investment. To help protect your investment, we are now offering a full two-year warranty on JRC receivers purchased from ourselves.

NRD535.......£1549.00

P.S. We are aware of a quantity of these in circulation with incorrect mains transformers for the UK market, and with Japanese manuals.
All the experts agree – the secret of successful listening starts at the antenna. Skimp on the antenna and you might as well not bother! For years many of us struggled with longwires and a.t.u.s, getting increasingly frustrated at the growing level of interference generated by household wiring and appliances. Then along came the MLB – half the price of my a.t.u., but promising to do twice as much – match my longwire to 50 Ohms AND cure my interference problem. So, I tried one - a week later my three a.t.u.s were up for sale – most of the domestic interference gone and fewer knobs to twiddle!

The MLB has made a real difference to my listening – and to the hundreds of customers I’ve recommended them to since. At just under forty pounds, the MLB is exceptional value, and correctly installed I’m sure it will make a difference to yours. Just available is the MLB ISOLATOR. When used in conjunction with the MLB, this new addition to the range will provide you with a convenient terminal to attach an earth wire and totally isolate the earth connection of the aerial from the earth connection between the mains supply and the receiver – another hiding place for noise. Ring today for full information on these and other interesting products that we know will help you to get more out of your listening!

The new SRX from Lowe

A PRICE BREAKTHROUGH IN SHORT WAVE LISTENING, ONLY £39.95.

FOR THE BEGINNER who wants to try out the fascination of short wave listening,
FOR THE EXPERIENCED short wave enthusiast who needs a Go-Anywhere portat
FOR ANYONE who just want to keep in touch, the SRX-50 is an amazing receiver.

Just look at the features:-
★ Quartz controlled p.I.I. synthesised for accuracy.
★ Clear digital l.c.d. frequency read-out
★ Coverage of:
  Long wave (153-281kHz a.m.)
  Medium wave (531-1602kHz a.m.)
  Short wave (5.9-15.5MHz a.m.) and even stereo f.m. broadcast (87.5-108MHz).
★ Direct preset, manual or AUTO scan tuning.
★ Supplied with stereo earphones.
★ 20 memories (5 on each band) for storage and recall of favourite frequencies.
★ 24 hour digital clock with alarm and timer function.

The Constant Companion

Now you have your SX-50, the perfect accessory has to be the ‘Passport To World Band Radio’. Almost 400 pages of the latest information on short wave stations will help you find the service you need in an instant. All listed by frequency, language, time of day, the ‘Passport’ is your constant guide.

Our price £12.95 PLUS £2.00 POSTAGE (POST FREE WHEN ORDERED WITH SRX-50).

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Communications Hse.
Chatham Road
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Tel: (01622) 692773

YORKSHIRE
34 New Briggate
Leeds
North Yorkshire
Tel: 0113-245 2657

SOUTH WEST
117 Beaumont Road
St. Judes
Plymouth
Tel: (01752) 257224

EAST ANGLIA
152 High Street
Chesterton
Cambridge
Tel: (01223) 311230
The antenna tuning unit found in many short wave listener 'shacks' is perhaps one of the most energy efficient devices used in this hobby - it can provide several noise free 'S' points on the signal strength meter, relatively compact, easy to use and needs no power! The antenna tuner provides a degree of frequency selective filtering and allows most antennas be they long wires, short wires, vertical whips or w.h.y. to match into the receiver input impedance, thus maximising signal energy transference, improving system signal/noise performance and giving optimum reception quality.

Several efficient designs are available commercially, as advertised within the pages of Short Wave Magazine in both kit form and ready assembled, ranging in price from £40 up to nearly £100. They all generally feature 2 air spaced tuning capacitors, a large air spaced coil with tappings selected by a multi-position switch. In recent weeks a very competitively priced antenna tuner kit has appeared from the C.M. Howes stable - the CTU8 - intended for receiver use and available as either a kit or ready built for use. Always enthused - when time allows to construct simple things - the author ordered a CTU8 kit and awaited the postman.

Five days later the box arrived revealing an exciting collection of components, hardware and paperwork - yes it looked simple to construct! The components within the kit differ somewhat from the traditional approach to antenna tuners as I've known them over too many years - no large air spaced coil and slow motion tuning 'condensers'. These are now replaced with miniature wound inductances for p.c.b. mounting, the tuning gangs no longer a shining set of vanes but tiny solid dielectric blocks à la Taiwanese radios these days. I began to have doubts....

Building the Beast
Reading the 'can't go wrong' paperwork you just cannot make an error as it is clearly explained with practical illustrations. Mr. Howes advises that we have a twin capacitor matching T network which provides a wider matching capability than most traditional a.t.u.s together with front-end filtering - often necessary with modern receivers. Coverage is a full Medium Wave through to 30MHz in 8 switched overlapping ranges and will provide...
matching into a receiver 50-75Ω input impedance from a wide range of antennas be they coaxial fed, long or short wires.

Soldering takes a gentle 60 minutes armed with cutters and a 25W soldering iron, all the inductors are clearly colour coded and plug simply into the pre-drilled p.c.b. The rotary switch and tuning capacitors similarly 'plug' into prepared holes and solder in position. The only hard work is cutting the shaft of the rotary switch - prior to soldering into circuit - to a specified length. All holes are pre-drilled, matching self adhesive artwork is supplied as are the 3 control knobs. Total construction time is an unhurried 90 minutes.

The builder should note the comments concerning the fitting/soldering of the two S0239 input/output sockets to avoid damage to the plastic case.

The only alignment is the presetting of 2 trimmers in each of the tuning capacitors. Once the assembly is complete AND checked(!) the black moulded case is assembled and screwed together, self adhesive feet on the underside 'stuck on' and it's ready for testing.

**Worked First Time**

If you've followed the instructions carefully the tuner unit will work at once. Mine did! Unlike many a.t.u.s I've used, the settings on the CTU8 are sharp. Once the signal (or frequency band of interest) is established, switch to the appropriate selector band, peak the 'ANT' capacitor, then the 'RX' and back for a repeat on the 'ANT'. Depending on the antenna and receiver in use, be prepared for a signal increase on the 'S' meter of up to 3 points (at least that what appears on the Eddystone 1590 of mine with the a.g.c. switched out). In a band where no signals are present there will be an increase in 'galactic ambience' as the 'noise' is heard to peak. Automatic gain control - a.g.c., sometimes called a.v.c. will tend to mask signal peaking by bringing up receiver gain as you pass through the peak, remember that you are looking for a noiseless increase in signal level. The CTU8 worked over the entire prescribed band well, it matched and increased signal strengths when correctly peaked up with up to three 'S' points from my 20 metres of random vaguely shaped inverted L wire. Having an interest in daytime m.w. from Radio Jersey and Radio Guernsey the CTU8 produced a worthwhile improvement in signal strength without any increase in noise, lifting in effect the signal out of ambient hash. Performance was in fact similar to the Global model AT-1000 but at considerably lower price!

Radical change of circuit/component technique to the die hard traditionalists like me feels odd - but it worked. For the minimal cost increase I would have liked an a.t.u. bypass switch to both assess signal improvement and for general band tuning without requiring the a.t.u. This feature seems to be lacking on most commercial a.t.u.s though the latest Global offering has one fitted.

**Final Thoughts**

Covers all medium wave and short wave frequencies to 30MHz. Weighs in at only 365g. Compact in dimension at 153mm deep (including protruding rear sockets and front knobs), 176mm wide and 62mm high including the stick on feet. The Howes team will happily answer any problems, a deliberate query relating to receiving problems received a reply within four days - impressive. Competitive at £29.90 (£49.90 ready built) + £4.00 postage UK - and it does work well. Recommended for all s.w.l.s.

Available from C.M. Howes Communications, Eydon, Daventry, Northants NN11 3PT. Tel: (01327) 60178.
Mike Richards takes a look at the new PRO-44 scanner from NetSet.

Portable scanners have a very wide appeal and new models are always greeted with a degree of excitement. The new PRO-44, although very capable, is not breaking any new ground and is essentially a logical development in a well established range of scanners. It features the usual v.h.f./u.h.f. coverage from 68 through to 512MHz with a couple of gaps for the v.h.f. broadcast band and the band from 174 to 380MHz. Storage of all your valuable frequencies is by way of fifty programmable memories plus a single monitor channel.

Good Looks
Regardless of any technical considerations, the PRO-44 certainly looks and feels very good. The smart grey (aren't they always) case had a smooth semi-matt finish with pleasantly curved contours. It also fitted very neatly into the hand. There was however, at least one odd point with the way in which the top panel was sign-written. My initial impression was that the panel was up-side-down. I'm not sure whether or not you will be able to see it in the photos, but when you hold the PRO-44 in your hand and look at the top panel, the volume/squelch lettering is definitely up-side-down. I can only assume that NetSet intended the PRO-44 to be used whilst clipped to a belt because this is the only operational position where the sign writing appears the right way around! It's a fairly minor gripe, but a gripe nonetheless.

The rest of the layout was very conventional with a headphone/speaker jack and antenna socket on the top panel, well placed display/keypad and a belt clip at the back.

Making Connections
Most users will, I'm sure, use batteries to power the PRO-44. The options here are to either use six conventional AA cells or to employ Ni-Cad rechargeable batteries. In either case, the batteries fit into a removable holder that mounts through the bottom of the receiver. If using Ni-Cad batteries, you can take advantage of the PRO-44's built-in trickle charging circuit when the receiver is not in use. To do this you just connect the standard 9V external power unit (not supplied) to the charger jack on the side panel. It's particularly important to be sure you don't accidently do this when conventional batteries are fitted. To this end there was a minor problem as the charger and external power sockets were not only next to each other, but used the same size plug. As a result, it was very easy to accidentally plug into the wrong socket. In addition to battery power, you can also run the PRO-44 from an external source through the aforementioned external power socket. The requirements were for 9V d.c. at around 50-100mA so are easily met by a variety of plug-top units. If you're interested in mobile operation you can power the PRO-44 from a 12V car battery providing you use a suitable adapter to limit the available voltage and current. The supplied antenna was the usual helical rubber unit that mounted using a standard BNC plug and socket. The use of a good quality socket is a good plus point and makes it very easy to use the PRO-44 with more efficient external antennas when operating from home or mobile.

The final connection was the 3.5mm phone jack on the top panel. The output power at this point was about 200mW which could be used to drive either a pair of headphones or an external speaker. If you are considering using an external speaker it will have to be efficient in view of the low audio power available.

Power Saving
One very important aspect for portable use is the battery life and NetSet have included a good battery saver circuit. This battery saving is permanently enabled and starts after a period of five seconds without the squelch lifting or a button being pressed. Once activated, the PRO-44 enters its standby mode and monitors for a signal for a quarter of a second in every whole second. This effectively reduces the power consumption to around 30% of normal and represents a worthwhile saving. This whole process is transparent to the operator and you hardly notice the change as the PRO-44 starts its battery saving mode. With the very high cost of dry cells and the memory problems associated with rechargeables, this battery saving feature is good news.
**Simple Operation**

With any scanner by far the most important factor is the ease of operation. The PRO-44 does well here with its well laid-out keypad and straightforward operation. As with most of the simpler scanners, operation revolves around the memories or channels.

Entering a frequency into one of the memories was simple enough. All you do is press MANUAL followed by the memory number then PGM and the frequency, finishing the operation with the ENTER key. If you get any of this wrong the word ERROR appears on the display and you have to start again.

Although you can enter any frequency into the PRO-44, it automatically rounds down those that do not align with the pre-set frequency steps. These pre-set steps were 12.5kHz on all frequencies except for 68-88MHz and 137-174MHz which used 5kHz steps and the 108-136.975MHz Air band that used 25kHz.

Once you’ve programmed up a few memories you can then use the SCAN option to search out any active frequencies. The scan was pre-set to cover all the fifty memories though you can use the LOCK-OUT feature to control this. To exclude a memory from the scan all you had to do was select the memory and press the U/OUT button. The only other facility to ease scanning was the scan delay. This could be applied to any channel with a single button press and caused the scan to pause for two seconds after a transmission before recommencing the scan. This proved to be plenty long enough to cover the normal over changes associated with many v.h.f./u.h.f. transmissions. Whilst the storage options were perfectly adequate you first have to find those interesting frequencies.

The tool for this is the PRO44’s frequency search mode. Before you can use this option you have to program the start frequency into one of the memories. The search can then be started by pressing either the up or down arrow buttons. To help with this mode the delay function can be universally applied with a single key press. The only problem with the PRO44’s search is that there is no search limit, all you can do is set the start frequency and it will then search throughout its entire frequency range looping from low to high and vice versa as it reaches the frequency limits. The saving grace is that you can manually intervene by pressing the up and down buttons. By pressing these buttons you can instantaneously reverse the search direction and so contain the search to the required band. Once you have located an interesting transmission you can store this in the temporary MONITOR memory with a single key press. At the end of the search you can then move the saved frequency to one of the permanent memories.

Incidentally both the scan and search were executed at a healthy 16 channels/steps per second. It’s also worth noting that the numeric keypad was easy to use and was positive enough to keep keying errors to a minimum.

**Good Audio**

Many scanners fall down badly on their a.m. audio quality which often suffers quite severe distortion. The end result is that air band transmissions become very difficult to monitor. This is not the case with the PRO-44 where the audio was surprisingly crisp and clear. The f.m. audio was also well up to standard. The only performance problem I found with the PRO-44 was i.f. breakthrough due to the relatively poor image rejection of 50dB. A typical example of this was breakthrough of 150MHz Radiopaging transmissions into the Air band. However, it’s important to remember that this is a weakness that applies to most scanners in this price/performance class. However, you do need to bear this in mind when choosing any scanner, particularly if you live near any strong v.h.f./u.h.f. transmitters.

**Specifications**

- Frequency coverage:
  - 68-88MHz (5kHz steps)
  - 108-136.975MHz (25kHz steps)
  - 137-174MHz (5kHz steps)
  - 380-512MHz (12.5kHz steps)
  - 50 plus 1 monitor
  - 68-88MHz, 137-174MHz & 380-512MHz 1.0μV for 20dB signal/noise
  - 108-136.975MHz ±2.0μV for 20dB signal/noise
  - 50dB at 76, 124 and 154MHz
  - -6dB ±10kHz, -50dB ±20kHz
  - 50dB at 154MHz (10.7MHz i.f.)
  - 16 steps/channels per second
  - 10.7MHz and 455kHz
  - 50kHz
  - 200mV
  - 36mm BD
  - +9V d.c. at 40mA (squelched)
  - -10°C to +60°C
  - 145 x 58 x 42mm
  - 250g

- Channels: 50
- Selectivity: 20dB
- Spurious Rejection: 20dB
- i.f. Rejection: 50dB
- I.F. Frequencies: 108kHz
- Delay Time: 2 seconds
- Operating Temp: +9°C to +40°C
- Audio Power: 200mV
- Antenna Impedance: 50Ω
- Dimensions: 145 x 58 x 42mm
- Power Requirement: 36mm BD
- Weight: 250g
- Frequency Bandwidth: 5kHz/12.5kHz
- Sensitivity: 1.0μV
- Signal/Noise: ±10kHz, -50dB ±20kHz
- I.F. Frequencies: 108kHz
- Selectivity: 20dB
- Spurious Rejection: 50dB
- i.f. Rejection: 20dB
- I.F. Rejection: 20dB
- I.F. Rejection: 50dB
- I.F. Rejection: 50dB

**Summary**

Despite the odd top panel marking and the i.f. breakthrough, the PRO-44 is a capable portable scanner that at £129.95 is very good value for money. Its strongest points were the audio quality and the automatic battery saver circuit.

The good range of features combined with the very competitive price should make the NetSet PRO-44 a popular choice.

The PRO-44 is available from: Haydon Communications, 132 High Street, Edgeware, Middlesex HA8 7EL. Tel:0181 951 5781. My thanks to Mike Haydon for the loan of the review model.
Can You Hear This?

Acoustic Early Warning Trials

On a rather nostalgic note, something a little different, W. Harms investigates a pre-radar experiment for aircraft detection.

Everyone is aware that for some years prior to the last war, research was conducted in radio direction finding, etc., which culminated in the successful radar systems employed to give advance warning of approaching enemy planes. However, not so well known is that trials were made with acoustic detection prior to RDF and, in a way, this is not surprising for they had limited success, at least in comparison with the radio systems. It was a chance conversation in 1936 with a research officer associated with quite different trials which I was arranging in South Wales that gave me an inkling of what had been going on. During an interval, he gave me a few details of his previous research exploits. It appeared that a long massive curved concrete wall had been built, concave in shape, for the purpose of concentrating the sound of approaching aircraft, this was picked up by several microphones located at the focal area. It had been located at an isolated part of Dungeness, away from any man-made sounds and facing the sea. A short wall a erected sea-wards reduced the possible wave sounds and when trials were in hand, day or night, local roads and traffic were stopped. Clouds affected the results appreciably due to their reflection, height and density. Various types of apparatus were used, some of which could face inland, and an interesting feature mentioned was that the roar of the London traffic was easily discernible when it started up at 4am, especially with suitable cloud cover.

Not until I retired to Bexhill a few years ago did I think about this subject, but when I learned about some strange concrete edifices at Greatstone, not far from New Romney, my curiosity necessitated a visit of inspection. With a little difficulty I located the site, for few people knew about this strange activity at the time and even fewer know about it today. I was then able to view the reality of what had been described fifty years earlier; this then led me to find out more about the subject and this I now summarise.

Sound Mirrors

Towards the end of the 1914-18 war when German bombers were raiding London, advance warning of aircraft approaching was tried in the form of a pair of 4m diameter concrete concave dishes at Broadstairs and Dover, with a degree of success. Concrete is a good sound reflector and is mouldable, these acted as 'sound mirrors' with a microphone at the focal point. They were vertical and pivoted for 'aiming'. The 1918 Armistice obviated more experiments and not until the late 1920s was there a development; this was in the form of a string of 7m diameter saucer-shaped listening discs laid horizontally along Romney Marsh, each with its microphone and connected to a centre; then followed the massive concrete wall, to which I referred to earlier; it was 60m long and 9m high, curved horizontally and vertically, and with a dwarf wall in front, designed as a strip mirror with its own control room attached. It seems that the intention was to combine a series of large strip mirrors of this type located some miles apart with numerous listening discs at intermediate positions to give audible warning over a wide front.

RADAR Won The Day

It is now common knowledge that the Radio Direction Finding systems at Bawdsey in Suffolk had proved themselves in 1935; activity at Greatstone ceased forthwith. If one is prepared to scramble over loose shingle, the remains of this great wall and the bowls are still visible, steadily disintegrating and settling into the adjoining gravel pits.
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### SCANNING RECEIVERS

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**Short Wave Magazine, December 1994**
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Short Wave Magazine, December 1994
CAMEL COMMS

Radio and the Camel Trophy 1994
Argentina, Paraguay, Chile

Richard Diamond G4CVI was involved in setting up and running the communications for this year's 'Camel Trophy'. Here he recounts some of the highlights of the adventure.
Inside the 'Comms Car'. The dust is from the Atacama Desert crossing.

The TV satellite up-link transmitted several megawatts e.r.p. on 14GHz.
That time of year finally arrived again and the SMC team were on their travels once more. Amongst the organisational staff there is a saying “Camel Trophy is not a job, it’s an adventure” and sure enough, the 1994 event lived up to it.

For the uninitiated, Camel Trophy is an off-road, four-wheel drive adventure with a competitive element that this year started at Iguazu Falls, Argentina, transited Paraguay, passed over the top of the Andes and finished at Hornitos, a small settlement on the Pacific coast of Chilé just to the north of Mejillones. Eighteen international teams participated all hoping to win the coveted Camel Trophy. Basically the teams gain a percentage of the possible points during several special tasks, the balance being made up by the teams themselves voting for other teams based on their abilities and helpfulness during the event. Camel Trophy most definitely is not a race, it is a team event. If they didn’t work together, none of them could hope to complete the gruelling route.

Six Tonnes of Radio

The SMC team’s part in this activity is to provide all necessary communications for the event management along with telephone, FAX and electronic mail links that the 300 strong press contingency required. That was no small order - six tonnes of communications equipment was shipped out in advance of the team, who then had to fit out the management vehicles and set up base stations at Iguazu (Argentina) and Mejillones (Chilé). Having set up the base stations, both had to be manned 24 hours a day to provide the necessary safety and management cover. Between these activities the communications team, Richard G4CVI, Paul G4CCZ, Mike G3SED, Nic G3KOX, Colin G3PSM, Richard G8SVC and Darren (no licence) found time to activate the calls CE/GOSMC and LU/G4SMC. Activity on the amateur bands was severely hampered this year by the high level of commercial activity but they still managed in excess of 6000 QSOs.

Initially a commercial link was established just below 14MHz between the two base stations, the availability of the channel was extremely fortunate as it permitted the use of the amateur Create 714X3 4-element Yagis at both ends, signals of S9+20 were present for nearly 20 hours a day, every day, with just a few hours in the early morning when contact was not possible.

As the Chile station was established at the base of the Andes, the opportunity to establish a solar powered repeater at 170MHz on a local ‘hill’ was jumped at. The ‘hill’ was 1680m high, there being no access roads, the equipment had to be transported by Lama Helicopter. Straightforward enough you might think, however, disaster struck, on the second trip the helicopter dropped the solar panels from an altitude of 610m onto the desert below and yes, you guessed it, onto the one big rock in the area (it probably made no difference to the damage but it was Murphy’s Law!). The previously brand new solar panels were now in thousands of pieces, having cleared up the mess, the problem was to find replacement panels. BP Solar in the UK were quick to react and had replacement panels available within 24 hours.

Not Much Air at 4400 metres

The Cushcraft Yagi was originally installed at the Argentine base station set up at Iguazu Falls, along with a 714X3 and numerous wire antennas. This station was dismantled a week after the event started and some of the equipment transported to Chilé by a chartered 737 aircraft. During the move, communications to the convoy of Landrovers was
Maintained by the Chile base station and from the chartered aircraft on 9MHz. As the Press followed the convoy's progress, 100 of them travelled from Asunción in Paraguay by train to the summit of the Andes, a trip of some 36 hours. They were accompanied by Richard GBSVC who manned a Yaesu FT70 h.f. manpack transceiver and two INMARSAT satellite fax transceivers from the train!

Having a GB callsign - UK Class B licence - Richard was not able to be active on the h.f. amateur bands. However, he was kept busy with the commercial traffic and also had to contend with the low oxygen content of the air at an altitude of 4400m.

Amateur h.f. activity was primarily on the WARC bands using c.w. although several excursions were made to the other bands. Mike G3SED made several interesting observations based on his efforts on 80 metres.

From both Chile and Argentina, propagation as you might expect at dusk, was not able to be active on the WARC bands using c.w. although primarily on the WARC bands. Mike was unable to break in.

On another occasion, Mike was accused of being a pirate as he was too strong. Most of this opening was using the FT650 going AWOL (absent without leave) at the end of the event.

Fortunately, SMC came to the rescue and provided yet another FT650, a move that later provided some 2000 QSOs on 6m from JY.

Out with the Soldering Iron

Towards the end of the event, disaster struck again. The Alpha 86 developed a fault - permanent TX. Fortunately the operate/standby switch could be used for change over, providing for a somewhat comical operating position for the operator, particularly while operating pile ups!

Ordinarily, the covers would have been off and the soldering iron out, however, with only a couple of days to go and the circuit diagram being located in Argentina some 1000 miles away, it was decided to put up with the inconvenience.

With the end of the event, the equipment was packed away and returned to the UK for servicing prior to the pre-scout for next year's Camel Trophy.

The pre-scout for Camel Trophy '95 commenced some two months later in Belize, where Richard G4CVI was active as V31RD using only a trapped dipole and an FT1000 - pile-ups were easy to start and 100s of QSOs were rapidly made.

The station was located some 7m from the Gulf and the sea take off certainly showed benefits - for next year's event, the team will be active from this location using the call V32D.

As with all the previous events of this nature that the team have been involved with - G4SMC/8R1, G4SMC/9M6, LU/G4SMC, CE/G0SMC and PB8ZCB - the QSL route is via G4SMC, SM House, School Close, Chantlers Ford Industrial Estate, Eastleigh, Hampshire S053 4BY, UK.

It is hoped that the V31RD operation will also be able to operate on the 6 metre and 2 metre amateur bands. The current plan for 2 metres is to take a Henry 2002 1kW amplifier and a 17-element Cushcraft antenna, which should have e.m.e. capability, but on the horizon only. With the event running during May and June, there is a good possibility of sporadic E QSOs.
Over the next few years, more and more aircraft will be fitted with ACARS. The simplest and cheapest way of listening in on the action is by using the new

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Short Wave Magazine, December 1994
Monitoring ACARS

Richard McLachlan G3OQT looks at some interesting developments in the aircraft data communications scene.

The monitoring of airband communications is a hobby that has become more and more popular over the last 10 years, especially in the UK. In common with the rest of the communications field, there are changes in progress in this area that involve greater use of digital techniques.

During peak air traffic periods, there are over 1000 commercial flights simultaneously in the skies over North America alone. The control of these flights is the responsibility of air traffic control centres. This control generates hundreds of simultaneous voice messages on v.h.f. frequencies, to which have to be added the flight management messages from airline operations centres. Much of the voice contact traffic is used for simply describing routine aircraft manoeuvres such as push back, take off time, landing time, gate arrival, aircraft performance, fuel consumption and position reports. Most messages also require read back for confirmation thus doubling the load on the voice channels. As Flight Engineers were eliminated from the flight decks of many aircraft, this reporting load fell on pilots, and a method had to be found to ease the work load and the demand on available frequencies.

The Solution

Developed by a private company in America called Aeronautical Radio Inc. (ARINC) during the mid 1970s, the solution is called ACARS (Aircraft Communications Addressing and Reporting System). However, it took nearly 20 years for the technology and price of available computer equipment to catch up and make the system viable for commercial operations.

ACARS is basically a network of several hundred ground radio stations, mostly situated in North America and Europe, which enable aircraft to operate as airborne computer terminals linked to them by v.h.f. radio. Those who are familiar with amateur packet radio will recognise the similarity between this and ACARS. Information is automatically collected from sensors on board the aircraft and transferred over the radio link to ACARS ground stations, it is then relayed to a central processing computer for distribution to users such as airlines via ARINC’s electronic switching system. Currently in North America alone, over 2 million ACARS messages are processed every week! In addition to automatic data messages, the system is becoming widely used for transmission of weather information, fault reporting, and any other text messages that may be required between aircraft and ground.

Space within this article does not permit a full description of the various components of the ACARS system, but those interested will find a more complete explanation in one of the books listed below.

What Equipment Do I Need?

ACARS messages in Europe are transmitted in short data bursts on a single frequency of 131.725MHz. The mode used is a.m., and messages are simplex i.e. both air and ground stations are on the same frequency. Unless you live within 10 miles or so of a ground station, you will only hear the aircraft end of the transmission burst will be nearly over before the squelch opens!

You will then need a suitable decoder plus a display device. ACARS is a very specialised and high speed data mode, and only decoders that have been specially designed for it will be able to function. Currently the only devices available are three general purpose data decoding models manufactured by Universal Radio in the USA, and the new Lowe Electronics Airmaster. The latter uses a small hardware interface which plugs into and takes its’ power from an IBM compatible PC, which also runs the special decoding software.

What Messages Will I Hear?

With aircraft operating at 10.6km and above, you will expect to hear them up to around 250km away. ACARS messages are sent immediately after aircraft

Further Reading

Those wishing to study this subject in more depth will find a chapter in the Worldwide Aeronautical Communications Frequency Directory, and a fuller description in Understanding ACARS, - see review on page 64 of this issue. Both these books are published by Universal Radio Research in the USA, and are available from the SWM book service. In addition, ARINC themselves have a very comprehensive list of publications on the subject, most of which are highly technical and start at around £50 each, but nevertheless provide full engineering descriptions of every aspect of the system.
Monitoring ACARS

departure, during high altitude flight, and during approach to land. Whilst not all commercial aircraft are ACARS equipped, it is now standard fitting on all new Boeing and Airbus deliveries, and is rapidly becoming a standard feature with all major airlines. Part of the ACARS message header specifies the flight number and the aircraft callsign and registration number, so it is very simple to build up a data base of users. It is not within the scope of this article to explain all the message formats, but typical examples are shown below.

Future Developments

ACARS was primarily designed for use with v.h.f. a.m. It has also been used experimentally via h.f. and satellite links, and it is likely that there will be future expansion in this area. Various manufacturers of GPS equipment are also bringing out economy airborne avionics that use ACARS in conjunction with differential GPS (Global Positioning System) facilities to enable smaller aircraft to have the benefits of precision satellite based landing and navigation aids that until now have been confined to airlines because of the high cost. Adding ACARS monitoring capability to your receiving station will open the door to a whole new world of digital aircraft communications.

Sample of a typical ACARS message

5R - Position Report

The Label 5R is used to identify down link messages initiated by the aircraft with respect to position reports. These reports also contain weather information at the various positions.

Aircraft Reg. # N618DL
Message Type 5R

.N618DL 5R
2802DL0751YYZ2228310RWF00080404M40300095 BKN OCC LTM0.80/90

Sky Cx. BKN —
Turbulence OCC —
Turbulence LT —
Speed in mach .80 —
Wind speed 095 knots
Wind Direction 300°
Static Air Temperature -40°C
Fuel on Board 0404
Time over next reporting pt. 0008
Next Reporting Point RWF
(Redwood Falls, MN VORTAC)
Flight Level 310
Time over current position 2228
Current Position YYZ (Toronto)
Carrier & Flight Number Delta #751
Message Sequence 2802

You’ve seen it on the cover, you’ve read the review on pages 18 and 19, now you can buy one, or have someone buy you one for Christmas. If you have been wondering about entering the exciting hobby of listening and scanning but didn’t want a second (or even first) mortgage - here’s the ideal opportunity to get started. The NETSET PRO-44 gives you all you need to get started, a receiver, Nicad batteries and a charger.

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Reviewed: HFJ-784 DSP Filter
QRP Sprint Transceiver
Eberhard Backeshoff is a name increasingly well-known in WXSAT decoding circles. He is the author of a comprehensive decoding program called JVFAX, currently in its seventh version, which he has made available to the community without charge. For normal operation, the software requires an interface unit, and, using a suitable device, Eberhard’s program can decode a variety of utility FAX and WXSAT signals. It also provides transmission facilities! This review relates to one particular interface, the Martelec Communication Systems JVF1, which is designed to ‘talk’ to JVFAX. This review is not, therefore, a comprehensive review of the program.

Martelec have produced this interface, which takes the audio signal from the receiver and converts it to the digital form required by the computer's serial port. I have been using this unit for a couple of weeks to check consistency and convenience of operation. Some problems that I initially found related to the software rather than the interface, but further reference to the documentation, together with more careful adjustment of the interface, have virtually cured each problem.

**Unit Description**

The interface, excluding cable, comes complete in a small metal case, which has been drilled and finished, the top having a protective surface. You need a cable to connect to the computer's serial port, and one can be obtained locally, by post, or from Martelec. If you wish to construct your own cable, the notes describe the connections required.

**Connections**

One side of the box has a standard 9-pin D plug, for connection to the RS-232 serial port on your PC. Most PCs have two serial ports, and you may already be using a mouse on one connector. I used an adapter to allow connection to both ports for testing. More on this later as it requires an important setting to be made.

The second output controls a receiver, specifically the Martelec MSR40 WXSAT v.h.f. unit. I was not able to test this - not having the receiver. The notes suggested that it might be possible to configure other receivers to work with this control device.

The other side of the unit has three inputs: a power supply (12V), a.p.t. from a WXSAT receiver, and FAX from a utility station, as received on a general purpose scanner. An adjustable potentiometer (VR1) is fitted on the external surface of the box, and used to change the gain of the interface, to balance it with the receiver. Once optimised, little further adjustment should be required. Input for a.p.t. is via an RCA phono connector, and accepts between 100 and 500mV (peak-to-peak) - rather lower than my receiver was set to deliver - a nominal 1Vpp. This required an adjustment to be made - as described later. The other phono connector is for FAX.

**Displays**

There are two types of display on the top of the unit - a 16-bit I.e.d. indicator labelled Tuning, and a Mode display, consisting of 8 I.e.d.s indicating the receive mode. This is activated by the JVFAX setting chosen - details are given in the software documentation.

**Configuring the Software and Interface**

For subsequent easy use of software and interface, it is essential to configure the system correctly. Time must be spent adjusting signal levels. JVFAX is written for the PC, so I used a 486SX running at 25MHz, but it will run on slower machines.

The interface is really an extension of the software, and notes on adjustments are provided, though I felt that some sections were barely adequate. After connecting the unit to the serial port, I used a battery pack in order to eliminate possible fluctuations in the supply voltage.

**JVFAX Settings**

The unit was connected to COM1 (my mouse's port). This has an address (location in the computer's RAM) of 03f8h, so this figure should be checked during configuration of JVFAX. This process is adequately detailed in the notes. You may prefer to use COM2 (your second serial port - where fitted), in which case the address will need changing to 02f8h. Other parameter changes are listed in the notes and they should not be a cause for concern to even the most computer-unaware person.

**Unit Adjustments**

The next adjustment involves balancing the input level from your receiver, into the unit, then into JVFAX. As instructed, I removed the base cover of the interface and identified the two internal potentiometers (VR2 and VR3) - no problem - they are labelled. The notes recommend adjusting these and feeding an a.p.t. signal from a ‘live’ satellite. To make preliminary adjustments, I used tape recordings of NOAA and METEOR WXSATs. These enabled me to get the system operating quickly, rather than waiting for a suitable NOAA or METEOR to come along.

The unit did not appear to be able to synchronise images from tape recordings, although the notes imply that such recordings can be used. Martelec confirm that this feature may not be currently enabled.

Using live telemetry from a NOAA WXSAT, I
watched the program display the incoming signal. During reception, JVFAX shows the black-to-white spectrum content in a miniature screen display.

The 16 interface I.A.D.s. show the number of hits (instantaneous signal analysis measurements of the incoming picture) counted in each of 16 gradations - ranging from white to black. In the absence of signal, all remains quiet - only the black bin is occupied. When a.p.t. is detected, hits are registered in other bins, and the program screen display switches to a.p.t. SQUELCH on. The signal from my receiver swamped the interface - many of the hits were shown as 'white'. I turned down the external control to its minimum setting, in order to get an acceptable spread of hits.

To improve this balance between receiver and interface, I removed the cover from my receiver, and after locating my interface, I removed the software. The two controls (VR2 and VR3) adjust signal levels for METEOR and METEOR WXSATs, I checked that triggering was accurate in each case. The result was a clear, well-defined picture from each WXSAT.

The two controls (VR2 and VR3) adjust signal levels for METEOSAT and METEOR/NOAA/OKEAN satellites respectively. I did not find any significant adjustment was needed, other than as described in the notes. Signal strengths differ between each group, but some compensation can be made within the software.

Picture Alignment and Synchronisation

A poorly aligned picture has a non-vertical edge - it tilts in one direction. The correct automatic triggering of JVFAX reception depends on correct adjustment of control VR1. This (external) control should be carefully set so that some hits appear in the white bin of the histogram on the unit. The on-screen picture should show white being received - that is, METEOR edges or NOAA calibrations should be seen. To confirm all was well, I quit the program, then re-started it. The automatic triggering into Squelch on, showed that adjustment was nearly complete. Using realtime signals from NOAA and METEOR WXSATs, I checked that triggering was accurate in each case. The result was a clear, well-defined picture from each WXSAT.

The combined program/interface can give a virtually perfect image. JVFAX permits the attainment of 256 grey levels, if you have sufficient memory available. Using the 64 grey level setting, I monitored several METEOR 3-5 passes, and looked carefully at the picture quality. The software operates slightly differently from some other systems - it uses picture scroll - so you can see most of the detail as the pass proceeds.

Future Proof?
The unit contains a number of standard chips, and has the advantage of using a replaceable program chip. Martelec suggest that this can be swopped, if required, for later developments. However I am not sure what developments are envisaged.

Final Notes

The power supply need only be left connected while the interface is being used. Most times I'm afraid I forgot to disconnect it, but power consumption is minimal. This is an effective unit and complements the software excellently. It costs £91.65. My thanks to Martelec Communication Systems, The Acorns, Wyck Lane, East Worldham, Alton, Hants GU34 3AW. Tel: (01420) 82752 for providing the review unit.
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Short Wave Magazine, December 1994
Be a RadioScience Observer Part 2

Using Radio Receivers To Make Scientific Observations

Joseph J. Carr, B.Sc., M.S.E.

In the first instalment of this three-part series looked at the general subject of radioscience observing and activities that were open largely to short wave receiver owners in the high frequency (h.f.) bands from 3 to 30MHz. In this second part, Joseph J. Carr takes a look at hunting for Sudden Ionospheric Disturbances (SIDs), solar events causing fluctuations in terrestrial radio propagation, by looking at the Very Low Frequency (v.l.f.) bands from 10 to 60kHz. Home-brew v.l.f. receiver projects, especially designed for SID hunting, are covered.

Very Low Frequency SID Monitoring

Propagation of v.l.f. radio signals is very different from h.f. propagation. The D-layer of the ionosphere is found 50 to 80km above the Earth's surface. Assuming a height of, say, 60km for the D-layer, a 10MHz h.f. signal can fit 2000 wavelengths in the space between the Earth's surface and the D-layer. Not terribly interesting from a propagation point of view. But look what happens in the v.l.f. band. At 100kHz, the wavelength (λ) is 3km, while at 10kHz λ is 30km! Thus, a 10kHz signal can fit only two complete wavelengths in the space. This fact means that there is essentially a v.l.f. 'duct' or 'waveguide' between the Earth's surface and the bottom of the D-layer that acts very much like microwave waveguide, making propagation relatively efficient. As a result, v.l.f. signals tend to be somewhat more consistent and free of fading than short wave signals. When an SID occurs, the received signal strength of the v.l.f. signal increases, rather than decreasing as in h.f.

Simple VLF SID-Hunter Receivers

Hunting SIDs on v.l.f. can be done with a variety of receivers. Some people with funds available have used surplus v.l.f. military receivers, or industrial surplus 'tuneable a.c. voltmeters' (e.g. Hewlett-Packard Model 3121). Some modern short wave general coverage receivers operate down to 30kHz (e.g. the Lowe HF-150 and HF-225 models). Most hobby SID hunters use rather simple radio receivers of their own construction. Fig. 1 shows the block diagram of a receiver, widely used by members of the American Association of Variable Star Observers Solar Division (AAVSO-SD), designed by Art Stokes (N8BN) of Ohio. The v.l.f. signal (20-30kHz) is tuned using an LC resonant circuit, of which more later. The signal is amplified in a transistor gain block providing about 70dB of gain. It is then rectified and integrated, and then sent to either a 0-1mA d.c. current strip chart recorder or an A/D converter. The schematic for the Stokes receiver is shown in Fig. 2. The gain is provided by three identical transistor common-emitter amplifiers using the 2N4401 device, or its equivalent (I've used several different substitutes without ill-effect). Gain is controlled by a 10kΩ potentiometer between stages Tr1 & 2. Note that gain is reduced somewhat in Tr1 by limiting the capacitance of the emitter bypass capacitor (C5) to 0.1µF, rather than the 2.2µF used in the other two stages. This is done to prevent overload of the input stage by strong local signals.

The rectifier-integrator consists of a diode voltage doubler circuit (D1 & 2, C8 & 9) based on 1N34 or 1N60 germanium diodes, or their equivalents (e.g. ECG-109). Silicon diodes (e.g. 1N4148) can also be used, but with reduced sensitivity due to the higher junction potential. Capacitor C9 also serves as the integrator to smooth out variations due to signal noise and ripple effect from the diodes.

The output of this circuit is a direct current proportional to the input signal strength, and will be of the order of 50µA to 1mA, depending on the strength of the station. This...
signal can be easily recorded on a current-input strip chart recorder or a recording VOM. If you want to use a voltage-input A/D converter, then place a 10kΩ to 100kΩ resistor across terminals B-C to convert the current signal to a voltage signal.

On my receiver, I use a slightly different alternative output circuit that allowed for a d.c. panel meter as well as output to a recorder. This alteration, shown in Fig. 2 with dotted line connection to the output, consists of a 200µA d.c. microammeter in series with a 25kΩ potentiometer. The selection of the 200µA d.c. meter was a matter of 'junkbox' availability and is not terribly critical - any meter from 50µA to 1mA f.s.d. seems adequate.

A printed circuit board for the 88mH toroid block and rectifier-integrator is shown in Fig. 3a, while its component arrangement is shown in Fig. 2b. Trigger transformer, shown as L1a/b in Fig. 5b.

Another popular approach is to use 88mH toroidal telephone line transformers. These are available in both single-winding and transformer configurations, and are popular with amateur radio operators who use them to make narrow audio bandpass filters.

Advertisements in amateur radio publications show various parts sources. A problem is sometimes seen on 88mH toroids, however. While those parts bought as telephone company surplus are higher Q and have an accurate inductance rating, many after-market parts are lossy (high coil resistance) and thus are lower Q. They also often exhibit an inductance that is quite a departure from the advertised "88mH", as the tolerance seems to be 20% on some parts. I measured a group of twenty 88mH toroids from a dealer (not telephone surplus) and found the inductances varied from 79 to 103mH.

The main tuning capacitor (C11) is an a.m. broadcast band variable unit, typically with a capacitance range of 10 to 365pF, or sometimes 380pF or 440pF. The Maplin Electronics (PO Box 3, Rayleigh, Essex, England SS6 28B, UK) order code FF39N capacitor is suitable. Alternatives include the Maplin FF55E (500pF), FF51F (500pF) and FF40T. The latter unit is a dual-10-365pF unit.

The tuning range can be altered by switching in either one or both sections (20-730pF when both sections are in parallel).

The second tuning capacitor (C12) is optional. It could be a trimmer, to calibrate the tuned circuit, a fixed capacitor to add to the capacitance of the C11, or a combination of both.

Another alternative LC tuned circuit is shown in Fig. 5a. In this circuit the 88mH inductor is replaced by two inductors in series. Fixed and variable inductors are relatively easily obtained in values up to 56mH for the adjustable coil and either 60mH or 82mH for the fixed coil, depending on the desired frequency range. I used Toko coils purchased from Digi-Key (PO Box 677, Thief River Falls, MN, 56701-0677, USA) under part numbers TK1724 for the 68mH fixed coil, TK4423 for the 56mH adjustable coil, and TK1724 for the 56mH adjustable coil and either part numbers TK1724 for the 68mH fixed coil, TK4423 for the 56mH adjustable coil, and TK1724 for the 56mH adjustable coil. In both of these tuning circuits, the antenna signal is fed to the input of the tuning network through a fixed 100pF capacitor (C10). This approach is fine for random length wire antennas, but for low impedance loop antennas a low impedance input is preferred. One way to accommodate this type of antenna is to use a xenon tube trigger transformer, shown as L1a/b in Fig. 5b. I used a

### Table 1. VLF Radio Stations

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<td>PK-232</td>
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Maplin 6kV unit, order no. JE15R, that had an inductance of 6.5mH on the h.v. side (used for L1a) and 4µH for the l.v. side (used for L1b).

SID hunters who live near a.m. f.m. or m.w. broadcast stations, or where the v.i.f. signals are rich in number and strength, may prefer to use the optional tuning circuit shown in Fig. 6a. This circuit uses a double-tuned LC tank circuit arrangement, so is more sharply tuned than the single-tuned sort of circuit shown previously. The main components are the same as described above. When I built this circuit it tuned 18 to 31kHz using the components specified. This type of circuit relies on a small-value mutual reactance coupling the two tuned circuits. In this particular case, a small capacitance, C3, is used. It is shown as a small value variable capacitance in order to permit finding the smallest capacitance that doesn’t severely attenuate the signal. I have also used 6.8pF fixed ceramic capacitors in this position to good effect.

Some people also report using a mutual inductance for coupling, instead of a mutual capacitance. In those cases, which I have not tried personally, C3 is deleted, and the ground ends of L2 and L4 are lifted, and then connected together (see Fig. 6b) at the free end of a grounded 100pH to 1mH (L5) fixed inductor.

The dual-tuned LC resonant circuit provides narrower bandwidth than single-tuned circuits. However, care must be exercised in building this circuit. The first caution is to mount the inductors either in shielded enclosures or a long way apart, to minimise interaction of their respective magnetic fields. Toroidal cores are superior in this respect, but lack the adjustability of slug-tuned solenoid wound coils.

The second caution is to be careful to correctly align the network. Four alignment points are provided, two inductances and two trimmer capacitances. When I built my first receiver using this design,
I made good use of my hand-held digital LC meter to pre-match the components. With the trimmers connected to the main tuning capacitors (C1a & b), plus any other capacitors in each tuning network (e.g. fixed capacitors if used, not shown), and all other components disconnected, the trimmers were adjusted until the capacitances of each main/trimmer combination were equal.

I also was fortunate enough to have a small collection of 68mH and 82mH fixed inductors and 56mH adjustable inductors to hand. I selected two fixed inductors that were very nearly the same inductance (only 0.1mH difference), and then ensured that both adjustable coils were set to the same inductance. When these components were installed on the circuit board, the circuit required very little alignment.

Misalignment will cause a broadening of the frequency response. It may be so broad as to be double humped, i.e. the resonant points of the two LC networks will be different to be seen on the tuning dial. While this defect is not fatal to v.l.f. SID detection, it can be quite annoying.

Unfortunately, it is the nature of many brands of coils in the 10-100mH range to have poor tolerances (±20% is common, while ±10% is the usual case). These differences can ruin tracking of the LC tuning network, so the extraordinary measures seem justified. There is a certain amount of interaction between the two networks, so be prepared to 'diddle' the coils and trimmers a bit to achieve single hump resonance as the network is tuned past a fixed signal. The finished receiver (actually one of several I built) is shown in Fig. 7. It was built in a rather deluxe painted cabinet, and fitted with a vernier 6.1 calibrated dial. Not all SIDs hunters are quite so fancy, however. Many have built the receiver inside a 75mm high aluminium chassis and used a simple 1:1 knob for the tuning shaft.

**An Improved v.I.F. Receiver**

Three modified versions of the Stokes receiver were also built. The first, which I published in *Communications Quarterly* [Carr, 1994] was a triple-tuned version. It used three single-tuned LC networks, one at the input of each of the three stages. But triple-ganged variable capacitors in the desired capacitance range were difficult to obtain, and the surplus market proved an unreliable source while I was able to obtain my own capacitors, many readers reported difficulty locating sources. It was also noted that the marginal utility of a triple-tuned design was less than optimum. The second and third variations of the Stokes design were single and double-tuned respectively.

The second variation is shown in Fig. 8. It retains the single-tuned design of the original Stokes receiver, but adds a second output stage in parallel with the first. A problem with typical SID-hunting receivers is that they are d.c. output devices. I wanted to be able to see the r.f. signal on an oscilloscope, so I added a single amplifier stage in parallel to Tr3. This version has been built in both 18-30 and 40-70kHz versions. The later was built to receive WWVB, the 60kHz NIST time and frequency station in Colorado. The waveform of WWVB, exactly as seen from the auxiliary output of Fig. 8, is shown in Fig. 9. The characteristic binary digital amplitude-shift modulation (a 10dB shift in amplitude) is clearly seen. The printed circuit board, modified for the circuit of Fig. 8, is shown in Fig. 10.

The third modification is shown in Fig. 11. This receiver is also double-tuned, but in a different manner than above. In this design, there are two single-tuned LC networks in different stages of the r.f. chain. An advantage of this design is that it permits the use of a dual a.m. broadcast band variable capacitor, rather than a triple capacitor. Dual broadcast band capacitors are easily obtained.

An advantage of the design of Fig. 11 is that it overcomes an annoying little problem seen in the original design. The sensitivity of the receiver is set with a potentiometer between Tr1 & 2. I found, consistently in several designs constructed, that there was a very non-linear response in this control. The deflection of the output meter would increase slowly as the potentiometer was rotated from minimum signal up-scale, but at about one-third the rotation range the signal level jumped abruptly. It was also noted that there were only two settings needed, one high and one low, for the widest range of signals (after all, there are only a few down there). As a result, the third design included a switch (or relay as shown) selected signal level. The two selections are derived from trimmer potentiometers mounted on the board with the circuitry. This approach eliminated the spurious coupling problems inherent in routing r.f. signals off-board through coaxial cables to a front panel potentiometer. A variation on the theme, which I've tried on the
workbench but not 'off-the-air,' is to use the PIN diode attenuator shown in Fig. 12, rather than a potentiometer.

Another change in the design was the use of operational amplifiers in the output stages. This concept was later breadboarded with op-amps in all stages, but the tested version used low-gain op-amps in just the output stages and the three-transistor Stokes gain block in the front-end. Amplifier IC1 is used as a buffer for the rectifier/integrator. With both feedback and input resistors to this stage equal to each other (100kΩ), the gain is -1, and the overall gain is set by Tr1-3. But if additional gain is required, then the builder can make the feedback resistor greater than the input resistor, and the gain is increased by the factor R19/R18.

The rectifier/integrator consists of C20, D1 & 2, and three integrating capacitors C22, 23 & 24. The reason for using three integrating capacitors is to give a selection of three RC time constants. Some people complain that the tuning is too heavily damped with the 220pF capacitor (which broadens the response on the dial), so I provided a choice of three.

The d.c. signal output stage is a unity gain buffer amplifier. It's job is to isolate the circuit from problems in the external world, such as short circuits in the wiring to the d.c. recorder or A/D converter. It also serves to provide a very low output impedance.

Several different operational amplifiers are suitable for use in a v.l.f. radio receiver. Although there are plenty of high performance, high frequency devices on the market, some very low cost 'classics' are quite useful. The Signetics 5534 is widely available and works fine. Also, the CA-3130, CA-3140 or CA-3160 will perform well.

A number of different designs are emerging for v.l.f. SID hunting receivers. Art Stokes has published a receiver circuit, based on operational amplifiers, that uses the gyrator filter circuit as a tuned element. A member of the Society of Amateur Radio Astronomers (USA) told me that he was working on an operational amplifier receiver that uses the bandpass active filter concept. At least one successful attempt was made using the state variable filter design.

### Antennas for VLF DXing and SID Hunting

Antennas for the v.l.f. receiver can be any of several types. Ideally, a shielded loop made with 60 to 150 turns of wire is used, especially where local electrical noise is at a high level. These loops are discussed in detail in my Receiving Antenna Handbook (available from the SWM Book Service). A small shielded loop will guard against interference from 50/60Hz power line harmonics, which can be surprisingly strong in the 20-
30kHz region. It will also provide some protection against TV/NCR horizontal oscillator noise, especially if the directive property of the loop can be brought into play. The shielded loop is nearly ideal for a wide range of v.l.f. monitoring tasks, especially if a preamplifier is built into the loop.

While a loop antenna is ideal, I've also used my amateur radio h.f. trap vertical antenna with the coaxial cable ungrounded. Art Stokes, who kindly advised me on SID receiver design and use, reports that a 25 to 50mm aluminium tube about 3m long is very popular. He had used such odd 'antennas' as the ungrounded metal rain gutter down pipe on his house, and the ungrounded aluminium dome of a small amateur astronomy observatory in his backyard. Wire antennas seem somewhat more prone to noise pick-up, according to Art.

**Next Month...**

In the third of this series we will take a look at hunting for 'whistlers' and 'spherics', i.e. natural radio signals in the v.v.l.f. range from 1 to 10kHz. Those signals are generated by lightning strikes on the other side of the Earth, and then propagated through the Earth's magnetosphere. We will also examine some things one can do when a solar eclipse approaches.

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>a.m.</td>
<td>amplitude modulation</td>
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<tr>
<td>A/D</td>
<td>analogue to digital</td>
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<td>d.c.</td>
<td>direct current</td>
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<td>dB</td>
<td>decibel</td>
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<tr>
<td>f.s.d.</td>
<td>full scale deflection</td>
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<td>h.f.</td>
<td>high frequency</td>
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<td>Hz</td>
<td>hertz</td>
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<td>kHz</td>
<td>kilohertz</td>
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<td>km</td>
<td>kilometres</td>
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<tr>
<td>kW</td>
<td>kilowatts</td>
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<tr>
<td>kΩ</td>
<td>kilohms</td>
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<td>l</td>
<td>lambda (wavelength)</td>
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<tr>
<td>l.f.</td>
<td>low frequency</td>
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<tr>
<td>m.W.</td>
<td>medium wave bands</td>
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<tr>
<td>mA</td>
<td>milliamperes</td>
</tr>
<tr>
<td>mH</td>
<td>millihenries</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>mm</td>
<td>millimetres</td>
</tr>
<tr>
<td>pF</td>
<td>picofarad</td>
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<tr>
<td>Q</td>
<td>the 'goodness' of a tuned circuit</td>
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<tr>
<td>r.f.</td>
<td>radio frequency</td>
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<tr>
<td>SID</td>
<td>Sudden Ionospheric Disturbance</td>
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<tr>
<td>TV</td>
<td>television</td>
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<td>v.l.f.</td>
<td>very low frequency</td>
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<tr>
<td>v.v.l.f.</td>
<td>very very low frequency</td>
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<tr>
<td>VCR</td>
<td>video cassette recorder</td>
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<tr>
<td>μA</td>
<td>microamperes</td>
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<td>μF</td>
<td>microfarad</td>
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Reflections

This month we reflect on television and the slow and fast-scan pictures that travel through the sometimes hostile atmosphere before reaching their destination. The BBC opened a limited range 405-line television service, from London's Alexandra Palace, in November 1936 that was closed in September 1939 due to the outbreak of WWII. However, the same service was restarted in June 1946 from the same place and on the same frequency (45MHz) in Band I (then 40-68MHz).

Within a decade, television covered most of the United Kingdom. The BBC occupied five channels in Band I and the Independent Television Authority had six channels in Band III (115-230MHz). In the 1950s there were two ways to add ITV to the home entertainment. The options were, a new 13-channel receiver with a turret tuner and a combined Band I/Ill array on the chimney or, have a tuneable converter for the original set and a separate Band III Yagi added to the home entertainment. The options were, a new 13-channel receiver with a turret tuner and a combined Band I/Ill array on the chimney or, have a tuneable converter for the original set and a separate Band III Yagi added to the existing mast. As the changes took place the familiar Band I 'H' and 'X' shaped antennas gradually disappeared from the skyline. All the transmitters were strategically sited to give maximum coverage and every channel was shared.

For instance, in Sussex, depending on your location, we had the choice of Channels 1 and 9 (BBC and ITA from London) or Channels 3 and 11 (BBC and ITA from the Isle of Wight). Although the national programmes were virtually the same throughout the UK many of the 'extra' news and weather broadcasts had a 'local' flavour.

Exhibition.

I was reminded of all this when I visited the Vintage Wireless Day held at the Amberley Museum (Houghton, Sussex) on September 11. Inside one of the museum's buildings there was an exhibition of early 405-line televisions that had been skillfully restored by Dave, Bill Journeaux and John Wakely. Among the visitors that day was TVDXer George Garden from Edinburgh.

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Fig. 1

Hostile Atmosphere

Earlier I referred to the 'sometimes hostile atmosphere'. By this I mean the sudden outbreaks of Sporadic-E that upset the normal paths of signals in Band I and the tropospheric openings that, under certain weather conditions, often cause chaos in Bands III IV and V. Hostile Atmosphere

I meant

Sporadic-E

I am always pleased to receive reports from TVDXers who monitor Band I looking for the 625-line transmissions from those countries that still use this band.

Pictures from the Commonwealth of Independent States (CIS) were received on Ch. R1 (49.75MHz) by LT. Fig. 2

Collectors

Those among you who collect and renovate early televisions should pay special attention to the electrical values and condition of the capacitors and resistances in the frame and line time-base circuits. Also make sure that the track on the control itself (a variable potentiometer) is clean and the spindle rotates smoothly. Where a turret tuner is fitted make sure the studs on the coils and the associated wiper contacts are clean. You may find the actual coil blocks in the rotating part of the turret are out of numeric order. Sometimes engineers would put the 'local' combination of coils, say channels 1 and 9 or 3 and 11, next to each other to save the customer rotating the switch through several unwanted channels and back again. It also saved wear and tear on the turret mechanism. Please beware, the chassis and spindles may be live at the full mains voltage!

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### 21" Colour

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- Full screen of readable text with on-screen tuning indication.
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6 & 7 Clarkson Place, Dudley Road, Lye, West Midlands DY9 8EL
Col. Rana Roy (Meerut, India), during Sporadic-E disturbances on August 4, 7, 12, 21 & 24. In addition, he saw pictures from Dubai TV on Ch. E2 (42.25MHz) between 1650 and 1810 on the 31st.

Now that the 1994 Sporadic-E season is over it's worth keeping an eye open in the mornings, throughout the winter months, on Chs. E2 and R1 for short-lived openings that can be very rewarding. You may also see smearable, unlockable, fluttering and ghostly type images on Ch. E2. Most likely these will be coming from the Far East due to abnormal reflections in the upper, F1/F2, regions of the ionosphere. Rana has in fact seen this during the early evenings of August 24, 25, September 5, 13 & 14.

SSTV

Disturbances in that region of the ionosphere can also spoil, or enhance, the reception of slow-scan television pictures that are exchanged by amateur radio operators in the 14, 21 and 28MHz bands. "It is amazing that all the digital information sent from so many miles arrives here to display a picture, all colours, etc., and content in the correct places," said John Scott (Glasgow).

Briefly, slow-scan captions are converted into pulses that are then carried on a radio signal, via the ionosphere, to the receiver. Listen around 14.230MHz and you should hear these pulses, like high pitched 'twitters', which in turn are converted back into pictures by some form of simple interface system can produce good results using the computer for slow scan, many more stations are sending out colour pictures," writes John Scott. He added, "It shows the advances in SSTV from the days when Copthorne Macdonald WA2BCW transmitted the first pictures across the Atlantic to England in December 1959."

During September John copied slow-scan pictures, around 3.730MHz and 14.230MHz, from stations in England, Canada, Portugal (Fig. 5), Russia, Scotland, Spain, Sweden and the USA (Fig. 6).

Solar

The natural state of the ionospheric layers can be wrecked for many hours by a disturbance on the sun and it's thanks to the astronomers among our readers for telling us when this may have occurred. A good number of sunspots, including a group, were seen by Patrick Moore (Selsey) on his projection screen. Fig. 7 at 0900 on September 5. By the same method, Ted Waring (Bristol) counted 22 spots on the 5th and reports that, "by the 10th the number of spots had declined to two". Although Ted's screen was blank on the 17th and 20th, a small group of two spots appeared by the 22nd.

Tropospheric

While in Kent, Arthur Grainger (Carcars Junction), using a Sony 7600, logged quite a few French stations in Band II and identified France Culture (98 & 99.9MHz), Info (105.6, 105.8 & 106.5MHz), Inter (103.3, 103.7 & 104.8MHz), Musique (85.7 & 85.6MHz) and RF Nord (95.5 & 106.2MHz). From his home in Scotland Arthur found the band 'quite active' on September 23, 24 & 25, when his haul included Radios Aberdeen, Cleveland, Cymru-Leicester, Merseyside, Ulster, Ireland's RTE FM 1, 2 & 3, Manx Radio and Linca FM.

"The first I knew of the opening was when I was listening to radio and heard weak stations interfering with my local radio stations," wrote Richard Wood (Redditch). Richard then searched Band II and found French and German stations. This prompted him to check the TV channels and he found pictures on Ch. E4 (62.25MHz) from Holland (NED1). He watched a Star Wars film, with Dutch subtitles, followed by a logo 'AVRD' and, during the news, an iden appeared with the figure 1 inside a diamond shape.

Rana Roy received strong coloured pictures in Band III from Bhatinda (Ch.12), Kassaul (E6), Lahore (E3) and Jalandhar (E3) during good tropospheric conditions between 0700 and 0915 on September 18, 19 & 20.

Weather

The all important, daily variations in atmospheric pressure for the period August 26 to September 25, Fig. 8, were taken at noon and midnight from the barometers used by Arthur Grainger in Scotland (dashed line) and myself in Southern England (plain line). In September, I recorded 3.68in of rain compared to a high of 7.13in for the same period in 1993. The largest amount of 0.85in fell on the 12th, followed by 0.40in and 0.50in on the 16th and 19th respectively. The rest descended in much smaller amounts on 16 other days. At the beginning of the month Arthur Grainger watched one of the most violent thunder storms that he had ever seen from a hotel room in Ashford.

"Meanwhile", said Arthur, "back home in Scotland, from what I have been told, on what was quite a calm day, there came a huge gust of wind quickly followed by thunder. So loud and sudden was the thunder that the children who were playing in the street at the time, ran to their homes in terror".

Figure captions:

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 8

Short Wave Magazine, December 1994
The armed intervention in Haiti by the American Forces seems to have simmered down across the Eastern Mediterranean. The latest from the Clarke Belt was received at the slightly out of almost spot on to time pictures from these figures he was able to receive craft. John was able to work out state that they are indeed a single MIR space craft back to Earth from veteran sat zapper John Andrew Sykes (Kings Lynn)

Calculating inclination and equatorial steam out of the situation and moving into the region took the immediate threat. The media, of course, were also picking up on the conflict with several SNG vehicles 'on location' prior to Day 1. After the Gulf of Aqaba in Egypt, the President is seen during a military review in Baghdad. Andrew Sykes (Kings Lynn) noticed several out of Kuwait and Baghdad.

The other main news originates from veteran sat zapper John Locker (Wirral). Extensive research by John confirms the ZSSRD-2 satellite that provided live video from the MIR space craft back to Earth from 15°W is in fact Cosmos 2054! Calculating inclination and equatorial tracks shows a dramatic co-rotation between the two craft sufficient to state that they are indeed a single craft. John was able to work out optimum access times and from these figures he was able to receive almost spot on to time pictures of the MIR station. Pictures confirmed the MIR docking procedures, walks in space and the cosmonauts.

Interesting to note that the video was received despite the lack of band frequency 10.820GHz circular. Previously, signals had been monitored at 10.635GHz, if your gear is capable of covering this out of band frequency then check out for MIR activity. Signals are circularly polarised, your normal plane polarised (i.e. vertical or horizontal) settings will not improve the signal strengths irrespective of the polarity setting. If you have a new extended Astra 1D LNBF - that reaches down to 10.7GHz then you're in business. The signal downlink from MIR is not time-tabled, transmissions are completely random and it's largely luck that signal are received. Check out the press for MIR space activity. The best way of checking out the ZSSRD/Comos 2654 satellite has been active and John now outputs the data downlinked feed at 11.385GHz at 15°W. If the TV screen darkens and there are flashing lines then ZSSRD is present, it just a matter of awaiting video feeds - which unfortunately are completely random.

The Equinoxes - April and October - can result in funny things happening to satellite signals. During daytime when the sun is above the horizon it happens that said sun passes 'behind' the Clarke Belt satellites. Our little cist point at the satellites also - in effect - points at the sun. Solar radiation can produce high levels of radiated interference - even at 11GHz - sufficient to mar or completely knock out the weaker signals from the satellite downlink. From late morning through to the late afternoon the radiation causes interference to satellite signals even as strong as Astra! John Locker noticed the knocking out of several satellites including the feed from the 'States of America' via Eutelsat 601 at 27°W. The loss of the CNNI downlinking CNNI, Stationar 7 at 140°E, Rimsat 130°E, Apsat 138°E, and Eutelsat 25°E were unable to feed CNNI. Known as a Solar Outage, it's quite common at this time of the year as the sun is lower in the sky. TürkSat 1B is definitely operating as of early October. A letter from Stathis Panagiotides, (Christchurch) is active with both C and Ku band signals has also noticed new signals from the 702 bird including an unknown Arabic C Band signal with a sunrise logo. Other C-Band offerings have revealed Sky News 4060GHz, Intelsat 512 at 21.5°W and a 'Mediabest' NTV signal from Intelsat 506 at 50°W at 11.636GHz. I suspect most of our UK readers are active with Ku band but we'd like to hear from any UK reader active in C Band and the viability of small dish reception.

Whist in the C Band mood, our Thailand activist Alan Smith has been playing around with his dish and extended his Eastern horizons to past 140°E from the earlier 103°E. A mass of new channels has been discovered from birds such as Rinisat 130°E, Apsat 138°E, Eurasian CNNI, Stationar 7 at 140°E, Rinisat with test programmes at 142.5°E and an unidentified craft carrying ATN at 147°E. Careful checking between 142 and 147°E eventually confirmed yet another satellite at 145°E though another Stationar. I have often mentioned the Ekran u.h.f. satellite operating from 59E at Ch.E54, the AsiaNet programme service has now left Ekran and been replaced with a scrolling advertisement for 'World Satellite and Radio Company - TV Companies on Satellite-Radio Stations on air in Medium Wave and Short Wave Band', the advertisement goes on to advise that World Satellite arranges for satellites, earth stations and radio transmissions, inviting prospective users to ring both Moscow and London offices for details. I understand that this firm is staffed by ex-BCBers and can arrange leased transponders and transmitting facilities. Bindu Patadi (Bangalore) also tells of his locating a new transponder from Intelsat 505 at 66°E with NHK Tokyo/Paris and WTN London feeds in C Band 3.975GHz.

Intelsat K is a favourite hunting ground for unusual TV sightings from the USA - here is 'The Weather Channel'. The 6.60MHz audio sub-carrier carried heavy data traffic. From John Locker, Wirral.

During a military review in Egypt, the President is seen catching up on the latest page 3 news, obviously with a cold as the Kleenex box is close by! From John Locker, Wirral.

Aiden Murphy (Eire) sent in a sparkle shot of NASA TV (live) seen via Intelsat 601 at 27°W via Reuters TV established their own editing facility near Port au Prince during the Haiti troubles. From John Locker, Wirral.

Cheap Satellite Receivers!

DRS Trading have advised me that they are offering manually tuned receivers at extremely low prices, mainly from trade in deals/surplus stock. A wide range of receivers, including remote controlled are available from £10 upwards. In addition dishes, mounts and tracking systems are also available at attractive ('enthusiast level') prices. If you are considering starting off in this hobby and have limited funds it may be worth contacting this company - Unit A, Sprint Industrial Estate, Chertsey Road, Byfleet, Surrey KT14 7BD or Tel (01932) 356527. Callers are welcome to look in but you must ring first to confirm a convenient time.

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Don't panic. I've done mine... have you? If you haven't I hope your insurance is up to date!

Conditions

At the time of writing - early October - the sun seems to have stabilised. Certainly though, after the long plateau of good conditions we are now looking at, there is still more than a year of the same sort of state, until Old Sol starts his next outbreak of spotiness. Informed opinion sees the next rise start around the end of 1995 or some time in 1996, though of course it is no more than informed guesswork.

Letters

Let's start with Ken Cathcart in Walsall, who comments that the bands have been up-and-down, with 14MHz producing YS1XS for San Salvador, K7DLT in Anchorage, Alaska and 5K2Z2 in Kuwait. 16MHz was also tried and here JA8PJI, JA1JKR and PT7CB were logged. Finally on 3.5MHz Ken listened to PA6BTF, the Arnhem commemorative special on September 15, plus VP8BKT, 5N9ZRC/M, ZS2MM, VP8LJA, ZS3EGI and G9ATC heard via RS1. As a final note Geoff notes that he has finally managed to get on 14MHz to get the new call operational!

An undated letter from Keith Goodchild in Tring that seems to have been delayed in the post somewhere - perhaps someone forgot to feed the snail - indicates he cannot see anything the RSGB does for the s.w.l. that SWMor PW cannot do more cheaply! That might inflate our WP/corporate ego(s) but, alas, it just ain't true.

Without the RSGB and the other national societies that together form the world organisation IARU, there would be no amateur bands at all to listen to, PW Publishing Ltd. isn't in the business of running a G.S. bureau; no representation at the regular WARC events would mean the end of the world as we know it!

More Mail

Albert Hoys in Penketh, Warrington, says he is surprised that nobody, either in PW or SWM, mentioned the opening on 28MHz, that covered 09.15UTC on July 17 until around 1400 on 19th. During the daylight hours the band seems to have been open to most of Europe. The Rotary Evening Net at 1845UTC was tuned to with interest by Finbarr O'Driscoll in Skibbereen, Co Cork, Eire. For once the reception was nice and clear with none of the noises that usually apply at that sort of range. Finbarr noted their times: The UK net, Sundays 09.00-1000 and 1900-2000 local around 3.62MHz.

The international one is 1300-1300UTC, around 14.293MHz.

How do I know an antenna tuner is working? For the listener, one needs a properly -tuned - up tuner. To the operator, one needs a coverage of at least 0.3W into a short antenna.

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Top Band addicts should seriously consider subscribing to the Top Band Newsletter put out by G3XTT and G3RBP.

Correspondence to Don Field, G3XTT, 105 Shipkate Bottom, Peppard Common, Henley-on-Thames RG9-5HU. From this I learn of two more threats to our bands. First, the basically satellite-based GPS (Global Positioning System) is now filling in some gaps with earth-based rigs running several waves of Top Band. One such is being noted in UK as an indicator of Top Band propagation to New Zealand! Secondly, the thousands of drift-net buoys - declared illegal by the U.N. back in 1992 but still being licensed by the U.S. authorities - that are plastered all over the range from just above the m.w. broadcasts up to 2.5MHz. Each one sends out an ident signal in tone Morse, followed by a long dash, repeating every four minutes. One noted in Top Band by a W2 was also logged on the same day in KH6! They are supposed to radiate 3W into a short antenna and to have a coverage of at least 325km. However it seems from spec sheets that they turn out rather more power than 3W.

Technical Corner

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Finale

That's it again. Your letters and comments, please, as always, by the start of each month, addressed to me at PO Box 4, Newtown, Powys SY16 1ZZ.
HF Sideband

This month I'm going to start to work through the backlog of questions that arrived with your requests for the 'Hurricane list'. I hope that the list has been useful, and I look forward to receiving your logs.

Letters

D Creasey of Derbyshire asks about 'Hilda East', that he reports hearing numerous times on various frequencies. I feel sure that I have mentioned this several times before, but I could not find anything in my stock of back issues of the magazine. 'Hilda' is the callsign used by the USAF control centre that is responsible for worldwide transport flights by USAF aircraft. It is situated at Scott AFB in Illinois, and is split into three sections, or cells.

'Hilda East' cell covers the Atlantic Ocean, across Europe, and into the Indian Ocean; 'Hilda West' cell covers the entire Pacific area and Australasia, and 'Hilda America' cell covers North and South America. USAF transport aircraft flying around the world keep in regular contact with 'Hilda' to report their progress, their ETA, and to see if there are any messages for their flight.

During the Summer, many aircraft were heard contacting 'Hilda' with callsigns ending in 'RW', these were relief flights en-route to Rwanda. As I type these words in early October, if there are any messages for their progress, their ETA, and to see if you need exotic equipment!

Chris Kay from Bristol writes asking about signals he heard on 14MHz, where two stations, both with 'American' accents, made several phone-patches on behalf of third parties. Some of the phone-patches were made in English, and some were in French. The callsigns used were 'XV9' and several with 'CIW' followed by three digits. When I first read Chris' letter, I thought that this must have been US MARS (Military Affiliated Radio System) traffic, but after a bit of research I found that this was, in fact the Canadian equivalent - CFARS

(Canadian Forces Affiliated Radio System). The callsign XV9 is allocated to the Canadian Forces in Damascus, Syria, while the CIW callsigns are allocated to stations in Canada.

The MARS and CFARS systems are used by US and Canadian military personnel, to allow them to contact friends and relatives in their home countries. The equipment used is either adapted military radios or ham equipment, and the frequencies are usually just outside the recognised Ham Bands. The following list of frequencies will be of use if you are interested in listening to the CFARS.

- Alpha 6.977
- Bravo 14.3845
- Charlie 14.4568
- Delta 14.4615
- Echo 14.445
- Foxtrot 20.970
- Golf 20.962
- Hotel 29.7135
- Juliet 14.4525
- Kilo 14.448
- Lima 20.976
- all in MHz u.s.b.

All the CFARS callsigns starting with 'CIW' are in Canada, while those starting with 'XV' are around the world where Canadian troops are deployed on UN duties (Cambodia, Syria, Egypt).

John O'Neill from Eire asks about an apparently new callsign being used by RAF Rescue helicopters. He wants to know which helicopters use a SMG (Sierra-Mike-Golf) prexfix to the callsign. If you look back to the September 1993 issue of this column, I gave a rundown of the various frequencies, Squadrons and callsigns used by the UK SAR services, and I mentioned a number of changes that would take place during 1994. One in particular, was the move of the SAR Engineering Wing from RAF Finningley to RAF St Mawgan, which has now taken place.

Many RAF airfields are allocated a three-letter alphabet call that their aircraft can use for their callsign, and the callsign prefix 'SMG' is allocated to St Mawgan (another common one heard on h.f. is 'FYY', which is Finningley). John also asks about v.h.f. used between SAR helicopters and Mountain Rescue Teams. The only ones that I can find (in the UK Scanning Directory) are 94.3 and 84.6 MHz n.f.m.

Alan Burnett-Provan from the West Midlands writes with details of how he tuned to 5.680MHz and found an Air/Sea Rescue operation in progress. Alan uses a Realistic DX-440 and asks if anyone can suggest a suitable voice-activated tape recorder that he can use to record h.f. s.s.b. signals. Well Alan, I can suggest the Sony TCM-38V, which also includes a handy time-index recording system to record the date and time of the recording. But, before you go and part with your cash, you'll find that a voice-activated recorder is almost useless with h.f. s.s.b. signals due to the amount of interference and background noise. If anyone has any alternative suggestions, I'll be happy to pass them on.

Traffic Log (frequency in MHz, all u.s.b. unless indicated)

4.540 Whirlwind 3 working Architect, requesting weather for Mildenhall and Lynemouth.
5.535 Flight '669F' working Speedbird London with a phone-patch to a hotel in London.
5.567 Teheran ATC working Gulf Air 32, instructing them to QSY to 2.929MHz.
5.680 RAF Nimrod '1202' reporting to Edinburgh Rescue that they were receiving a distress beacon on 121.5MHz. Sea King 'Rescue 137' took off from RAF Lossiemouth to search for the beacon, and eventually traced it to an aircraft parked at Inverness/Dalcross airport.
6.683 (l.s.b.) Andrews VIP working a SAM 972 carrying ex-President Jimmy Carter back to Washington from Haiti after his peace-keeping efforts.
6.730 'JFC' working 'Groove Control' with a radio check, and a weather report for their current position. 'Groove' passed details of a planned rendezvous with a helicopter just off the south coast.
6.693 SAM 972 working Andrews AFB carrying ex-President Jimmy Carter to Haiti; they were also heard on 11.460MHz.
8.861 NASA 426 (a NASA research aircraft) working Dakar ATC. The pilot reported that they were on a scientific exercise in connection with the flight of Space Shuttle Discovery.
9.113 Station 'N7G' working 'GDX', reporting 'we would like to receive you, please count while we adjust the antlers'. I have absolutely no idea who these operators are.
11.176 Air Force Rescue 3D working Ascension GHF5 with a phone-patch to CAMSLANT Chesapeake, and reporting that the centre of the search was 31°18'N 79°26'W, and the size of the search box was 136 nautical miles by 55 nautical miles. Later, while working Andrews GHSF, they had a phone-patch to 'Miami Operations Center', who requested that they QSY to 5.696MHz.
11.234 Andrews VIP working RAF Gibraltar, passing their ETA and requesting a weather forecast for Gibraltar and Tangiers.
14.4525 CFARS station VXV9 (in Damascus, Syria) working Canadian station CW823 (Halifax, Nova Scotia) with several 'moral' phone-patches for Canadian troops in Syria.
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 Convertor unit with built-in 230V AC power supply and RS232 cable, ready to use. You'll also get the best software ever made to decode all kinds of data transmissions. Code3 is the most sophisticated decoder available and the best news of all is that it only costs £329!

- Morse – Manual/Auto speed follow. On-screen WPM indicator
- RTTY Boot/Boot/RTTY/AT2/CTT2 plus all bit inversions
- Slicer – CCIR 455/244-4, AM, SSB/DSB/CCIR FEC, NAVTEX etc.
- ARQ coded with selective calliing monitoring, 300 Baud
- Facsimile, all ITU/CCITT (up to 16 shades at 1024 x 768 pixels)
- Autotape – für ein und mit all known interlavers
- DUP-ARQ Attne – 125 Baud Simplex ARQ
- Twingles – 100 Baud FTBC Simplex ARQ
- ASCII – CCITT 5, variable character lengths/parity
- ARQ-D 95/95 – 200 Baud Simplex ARQ
- AR-RX – ARQARQ – ARQ100 simplex
- SWED-ARQ/ARQ SW – CCIR 919 variant
- ARQ-62 – 100 baud Duplex ARQ
- TDM242/ARQ-M2-242 C242 242 with 12/4 channels
- Internal 5513 & CW Filter for RX.

All the above modes are pre-set with the most commonly seen baudrate setting and number of channels which can be easily changed at will whilst decoding. Multi-channel systems display all channels on screen at the same time. Split screen with one window continually displaying channel control signal status etc., along with all system parameter settings e.g. unshift on space, Shift on Space, any transmitted error correction information is used to minimise received errors. Baudot and Sitor both react correctly to third shift modes (e.g. Cyrillic) to generate ungarbled text unlike some other decoders which get 'stuck' in figures mode!

Eight options are currently available extra to the above specification as follows: 1) Oscilloscope. Displays frequency against time. Split screen storage/real time. Great for tuning and analysis. £35. 2) Piccolo Mk 6. British multi-tone system that only we can decode with a PC! £65. 3) Ascii Storage– Save to disc any decoded ascii text for later processing. £35. 4) Coqiet – French multi-tone system, again only on offer from Hoka! £25. 5) 4 Special ARQ and FEC systems i.e. TORG-101X, ROU-FEC/RUN- FEC, HC-ARQ (ICRC) and HNF-FEC. £75. 6) Auto-classification – Why not let the PC tell you what the keying system is? £5. 7) SYNOP Decoder for AAXX & BDBX formats. FULL W/M/STATION list. £35. 8) FACTOR (both Amateur and ICRC). £25.

Please add £7.50 to the above prices for carriage by fully insured First Class Postal delivery (definition method).

Call or write for our comprehensive information leaflet – there is just not enough room here to tell you everything about Code3! Professional users – please ask about our new CODE30 DSP unit available now! (Piccolo down to -12dB S/N!!) Prices start from £1775 (includes all options).

Mail Order to: Eydon, Daventry, Northants, NN11 3PT
Tel/Fax: 0327 60178

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Sales Office: Ntech Communications, 8 The Crescent, Willingdon
East Sussex BN20 9RN • Tel/Fax: (01323) 483966 • Mobile: (0850) 545871

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CLEAN UP YOUR RECEPTION with this DUAL BANDWIDTH AF FILTER for £29.80! • Reduce noise and interference! • Sharp SSQ/Speech filter with faster roll-off than IF crystal filters! • 300Hz bandwidth CW filter • Printed and punched front panel • All aluminium case • Simply connects between radio and external 'speaker or 'phones • Suits all general coverage receivers and transceivers • ASL5 kit plus H4OR hardware. £29.80 (ex. P&P)

EASY TO BUILD HOWES KITS!

BUILD YOURSELF A LITTLE BEAUTY!
The brand new HOWES DXR20 Communications Receiver makes an excellent constructional project. Covering the 20, 40 & 80M amateur bands, plus any other HF with optional plug-in band modules. This design combines ease of construction with a wide frequency coverage and good performance.

- 8 pole RF filters • 5L6440 BB mixer • FET VFO • Active AF filtering • 1W AF output • DXR20 Electronics kit: £39.90 HA20R Hardware pack: £28.90

DXR20 Electronics kit: £39.90 HA20R Hardware pack: £28.90

[Picture shows receiver built with DXR20, D822 & HA20R, size £79.70]

MW1 An excellent first project. A super portable receiver covering medium wave broadcasts plus 160M hams. Includes case & all parts except the battery: £29.90

TRF3 Shortwave Broadcast TRF receiver for AM/SW/CW, 5.7 to 17MHz. Complete electronics kit plus Hardware Pack: £41.40

Please add £4.00 P&P or £1.50 P&P for electronics only kits.

HOWES KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets. Delivery is normally within seven days.
Bandscan

Australia

With most commentators predicting a summer dominated by fires like those of last January I'm now keeping the v.h.f. converter in my ageing Kenwood R2000 tuned all day to the local bush fire brigade frequency. It's nice to have some advance warning of being called out to fight fires around the area. Mind you, I may not have that luxury too much longer. As I point out later, the whole way official and semi-official frequency management is heading in Network (WRN) service got me to enthral the average s.w.l. or bush fire brigade volunteer either.

Our brigade has also had to hassle with Great and 1300-1500 UTC to get free licences for our swag of v.h.f. CB radios. For my own licences I haven't had to hassle, just pay up. Given that they are now rotting from lack of use in my collection of electronics and radio pieces, when renewal became due last time for my own licences for two v.h.f. CBs I rang the bureaucracy to see if they were really needed. The word? Unofficially, of course. I was told to throw the renewal notices away and await an announcement on the future of licensing. More on that later.

Radio Australia

I have talked to people at Radio Australia (RA) since my mention of Radio Australia services in Europe last time and they have faxed me some information on RA world-wide coverage. Apart from standard short wave h.f. services, Radio Australia is also available through a range of satellite and cable services throughout the world.

In Asia and the Pacific RA is available 24 hours a day through the Australia Television signal on the 1B satellite on Channel 22 (MTV) on the Indonesian B2P satellite. The English service is also available on the Japanese CAN cable network.

In the UK and Europe, RA can be heard twice daily on the World Radio Network (WRN) service carried by the ASTRA 1B satellite on Channel 22 (MTV) on the 7.38MHz sub-carrier. The ASTRA RA programmes are broadcast from 0700-0800 and 1300-1500 UTC. WRN relays are carried by United Artists Cable in south-west London and Cable Link in Dublin. RA can also be heard on YLE Radio Finland in Helsinki and Kabo Television Amsterdam in the Netherlands.

In North America, RA is on the ASC 1 satellite and WRN relays are carried by Cable Television in Seattle, Cable Television in Phoenix and Cable Television in New York. In Canada, Cable Television in Ottawa and Radio KASQ-FM in Little Rock, Arkansas. I also mentioned last time the rumour that the BBC was offering RA transmitter time in exchange for the use by the BBC of RA's Shepparton transmitters. As it turns out, the quid pro quo is the use by RA of a back line on the BBC World Distribution Network to get RA signals to WRN for its two hours of transmission per day.

CB Licence Fees Eliminated

In the context of widespread non-compliance with the mandatory code requirement required under International law. I for one would applaud the move, but I can't help but say I'm very sceptical of ORACLE's chances. If they're serious, no doubt you will hear more here and in 'PM in due course.

Government Radio Network

New South Wales (NSW) government organisations and departments are headed towards a fully integrated radio network within the next few years. Imaginatively named, the Government Radio Network (GRN) - I'm sure our North American cousins would have done better than that - the network will be constructed, maintained and operated by Telecom Australia and multi-national communications company Motorola.

Ultimately, the GRN will provide for computer aided dispatch, for transmission of data including computer aided despatch; for interconnection with the telephone system; for interconnection with the telephone system; for interconnection across the entire network. Amateur magazine ARA's commentator is not too impressed with Motorola's involvement claiming that the NSW government has handed a valuable monopoly to a foreign company. Naturally, Motorola claims huge benefits including greater efficiency, increased privacy and more flexibility. The ARA commentator points out on the other hand that the NSW government is retaining the ability to dominate GRN's six member board.

Amateur Licence Changes

As another follow on from the series of ongoing inquiries into log keeping, the authorities to chase people who use CBs without licences, the Department of Communications and the Arts (DoCA) and the Spectrum Management Agency (SMA) have eliminated the need for fees altogether. Commencing October 3, owners of CB transceivers no longer needed the $A10 licence fee. In their place, what are known as class licences were introduced. This move came as an outcome from an earlier inquiry into the whole licence structure. In effect a class licence is held by the SMA on behalf of all users. I have no information on whether money changed hands from DoCA to compensate the SMA for loss of revenue. Mind you, it must have cost an arm and a leg in bureaucratic terms alone just to send out licence renewals, collect fees and chase non-compliance. Net income was probably quite small anyway if the anecdotal evidence I get from around the place is anything to go by.

The SMA has been quick to point out that class licensing does not mean complete deregulation. Transceivers will still be expected to comply with technical standards and operating out of band or with a linear amplifier will still be an offence.

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The author tries a Lightning for size.

Your Experiences

Mark Griffiths (Dyfed) sent a photo of a Concorde landing at Glamorgan (Rhose) airport about a decade ago (the airport is now better known as Cardiff Wales). Sorry it won't reproduce too well.

It was from there that Mark flew to Rhodes with Airports MD-83 (callsign: 'Kosribe'). I agree with Mark that the DC-8 type cockpit is rather cramped, having myself spent some flying hours wedged into one. You too can buy the same navigation chart as used by the crew. Suppliers are listed on my website and include the Broadstone Editorial Office (NOT to me please!). Likewise, the same suppliers provide similar charts. Supplements that are the best source of frequency information for foreign airports. Mark found Rhodes (Lapithos) Tower to be on 118.2 and Approach on 120.6kHz. It was quite correct of the airline to forbid the operation of electronic equipment by passengers (TVs, radios and computer games being included). Sometimes these devices can adversely affect the aircraft's own systems.

That local media, monitored by Huw Davies (Dyfed), covered a bit of excitement concerning a low-flying F-15 (a little bit too exciting for the passengers (TVs, radios and computer games being included). Sometimes these devices can adversely affect the aircraft's own systems.

The flight number designates the aircraft type and from which airfield it originates, e.g. Rescue 137 is an RAF Lossiemouth Sea King. Double figures are fixed-wing, usually Nimrods. The Marine Rescue Coordination Centre at Lowestoft provides their fire rescue craft are on 8.364: Channel 16 marine f.m. band distress is 156.8 MHz. The ARINC 716 Centre, by Paul Beaver and Paul Berriff, published by Patrick Stephens Ltd. (unfortunately out of print) and the RAF Flight Information Handbook is sold by the RAF Northolt, the address of which is Airband Factsheet as mentioned above.

Search and Rescue

All this brings me on to this subject, that you asked for when answering the last Christmas Quiz (watch out for another quiz, next month!).

There are two types of distress call, which are used for the same purpose, but are transmitted on different bands and are both used in the United Kingdom. The first is the 'Mayday' call and the second is the 'Pan'.

A 'Mayday' call is transmitted on 121.5Hz when an aircraft is in immediate danger of collision, fire, crash or any other situation where there is a serious and continuing threat to life. A 'Pan' call is transmitted on 243Hz when there is a situation which is not a danger to life, but requires immediate attention. A 'Pan' call is also transmitted when a position report is required. A 'Mayday' call is transmitted on 121.5Hz when an aircraft is in immediate danger of collision, fire, crash or any other situation where there is a serious and continuing threat to life. A 'Pan' call is transmitted on 243Hz when there is a situation which is not a danger to life, but requires immediate attention. A 'Pan' call is also transmitted when a position report is required.

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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>ARINC</td>
<td>Aeronautical Radio INCorporated</td>
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<tr>
<td>a.t.i.s.</td>
<td>automatic terminal information service</td>
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<td>CAA</td>
<td>Civil Aviation Authority</td>
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<tr>
<td>c.w.</td>
<td>continuous wave</td>
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<td>DC</td>
<td>Douglas Commercial</td>
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<td>f.m.</td>
<td>frequency modulation</td>
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<td>ft</td>
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<td>GASIL</td>
<td>General Aviation Safety Information Leaflet</td>
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<td>Hz</td>
<td>hertz</td>
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<td>kHz</td>
<td>kilohertz</td>
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<tr>
<td>LATCC</td>
<td>London Area &amp; Terminal Control Centre</td>
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<td>m</td>
<td>metres</td>
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<tr>
<td>MD</td>
<td>McDonnell Douglas</td>
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<tr>
<td>MHz</td>
<td>megahertz</td>
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<tr>
<td>NATO</td>
<td>North Atlantic Treaty Organisation</td>
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<tr>
<td>SAR</td>
<td>Search And Rescue</td>
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<tr>
<td>u.h.f.</td>
<td>ultra high frequency</td>
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<tr>
<td>u.s.b.</td>
<td>upper sideband</td>
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<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
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Frequency and Operational News

The 9/94 GASIL, from the CAA reports that Birmingham’s a.t.i.s. is now on 126.275 instead of 120.725MHz. T. Trenfield (Tamworth) notes that the East Midlands a.t.i.s. is now on 126.225 instead of 121.775MHz.

Royal Flight callsigns have changed again (see last month) with AIC 107/1994 superseding 52/1994. A true Royal Flight (i.e. in purple airspace) will have the callsign ‘Kittyhawk 99R’ where 99 is a number denoting the individual pilot. Other flights with passengers entitled to CAA priority (but not purple airspace) do not have an ‘R’ at the end of the callsign. All other details remain the same as published last month.

Information Sources

Thanks to Geoffrey Powell (Tamworth) for recommending JP Airline Fleets as a source of world-wide addresses of airlines. Where can you obtain this from, Geoff? I’ve found the ABC World Airways Guide also contains this information, but obtaining a copy depends on the kindness of your local travel agent. The guide is published monthly, so ask your travel agent to save you an out-of-date copy. Beware: when you go to collect, it will take up a lot of room in your shopping bag!

The next three deadlines (for topical information) are December 9, January 13 and February 10. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 0181-958 5113 (before 2130 local please).

NEW! TU3 Antenna Tuner

* Ideal for receivers with a long wire Antenna on the H.F. bands, 1-30MHz.
* Versatile! The touch of a switch gives any one of 3 different arrangements.
* Quality case - black with printed aluminium front & back facias. Measuring only 170-140-50mm.
* Kit complete with ALL components and hardware including pre-punched case and panels.

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Short Wave Magazine, December 1994
To Business

Frequency lists seem to be very popular indeed and you will know, if you're a regular reader, that I support those produced by Tim Anderson and others like him. New to the scene and offering a free service is Paul Wey of Baldock. Paul's idea is sound and worth mentioning as he has produced a special scanning report which he hopes to update regularly. This is planned to have updates every fortnight during summer and once a month in winter. If sufficient interest in the project is expressed, Paul plans to open a membership service on a yearly basis for £15.00. This will include individual event listing as and when they occur. Having seen the present issue I can verify that there are some interesting frequencies within the guide and, if 'all coverage' scanning is your scene then you can't do much worse than to write to Paul Wey, 2 Icknield Way, Baldock, Hertfordshire SG7 5AJ.

Reader Steven Rogers of Saxmundham's 'Can't Remember' issue is for details of modifications to the HP-200E. I've since received a very similar letter from Chris Smith of Colwyn Bay who suggests the following: Memory Wipe - only accessible by wiping one at a time. Beep - wire disconnection inside the set. An envelope HP 200E Mods.

I would advise, however, that no responsibility for modifications can be accepted by either myself, the correspondent or the magazine! Chris reports his works well after the mod. Another Irish reader, who shall remain nameless but knows who he is, states that driving a car and finding bumps in the road works on his. He also says trying the following sequence on his AOR AR3000 works like a dream: 2nd F key, Alarm Set and Enter = total wipe out!

Scanning

It's wet a try, whatever! Just don't complain if it all goes pear shaped on you! The mystery of 456.825MHz is solved or, at least, partially! Many people write in to say the frequency is heard around the Liverpool area using the callsign ILB - Inshore Life Boat. Certain conversations within the RNLI fraternity suggest it is a private voluntary rescue boat. Unless, of course...

Sports

Frequencies reported have been relayed but some more appear. Stephen Allan of Drumtradochit reports hearing rally sport on 141.825MHz in the airband, allegedly BBC OB teams using a helicopter. Marshalls have been heard on RAYNET T10 (145.250MHz) and on frequencies in the 141-142 000MHz range. 167.200MHz is also reported as being used - A. Howden of Eastfield, near Scarborough, also reports 169.225MHz as used by Northern Officials and known as 'C'. Humber Rescue, which is an RACMSA motor sport ambulance, uses 86.4375 and 169.000MHz for safety info, doctors, sector marshalls and medics.

An unidentified reader reports hearing a Sicilian taxi company on RAF 'Follow Me' frequencies used in Tower-ground vehicle comms. I believe postcards were exchanged to confirm the OSL! This leads to the question: do other readers who use p.m.r. or other 'work' radio sets ever get propo lift enough to hear other foreign, stations on frequency? I'd be interested in knowing! Just to what the appetite, one airfield is known to have heard the call 'Rover One' on their ground frequencies - later discovered to have operating on another field over a hundred miles away! It was later established, at that field anyway, that the base geographic location be inserted in comms to ensure they knew who was who?

Can anyone confirm ASDA FM on 7.92MHz as having been heard on a scanner? Ian McDermott of Essex also asks if anyone knows the frequencies used by people like drive-in meal spots and burger bars. I can't answer these as I'm not into satellites and don't like fast food!

Geoff Brown of Northampton reports ballrooms as being heard, at the Northampton Balloon Festival on 122.475MHz and not on the recognised 129.900MHz. Geoff asks is this new or was it peculiar to the day? It does not appear in the UK Scanning Directory.

An interesting letter from N.R. Simpson of Co. Durham mentions the fact that, at least in the USA, railway companies renew their company frequencies in scanner listings! This is quite something, considering the heavy hand of officialdom that persists here. He also goes on to say that train enthusiasts carry scanners with them and are seldom seen without them! I now visualise train spotters carrying one more accessory - a scanner! It does beggar the question: why are certain countries more open about scanning than others? Who knows.

Tim Anderson of listings fame sends me details of a low band frequency used by UNAMSAT and which will be of interest to fans of meteor scatter. The frequency is 40.977MHz and you can expect to hear echoes of meteor trails and eventually a report on a packet downlink. Best times to listen are during Quadrantids, Lyrids, Leonids and Geminids but not during Perseids which was supposedly due! I suspect that's double Dutch to most of us, but fans of meteor scatter can find out more by accessing GB7HAS on amateur BBSes although it is local to Tim.

Now, WATCHDOG! This is as reported, a Military Police callsign and is part of a system known as Radio Appointment Tities. It also places the callsign holder at SNCO level. It is a low grade security system and easily heard although I have found out that most military nets will be encrypted before too long. Make the most of it if you can it's that your area! My sincere thanks to all concerned on that one, and also for clearing up my ignorance on the link between the call and MAFF. I know defence cuts are swinging but, for a while, I thought that the Min of Ag and Fish were being roped into other areas! Encryption is liable to be CTCSS or the like. This means, in practise, that the average scanner owner will not be able to decode signals - which is exactly what is planned.

Whips and Ducks

E.H. Gastrell of Almondsbury reports poor results with the supplied whip on his Yupiteru YT-225 on marine band. Likewise, I had the same thing on my own. I have said that I swapped the whip for my AOR-2000 whip and found the set much better. I also suggested changing the supplied whip for commercially available ones, and Mr. Gastrell tells me that a Maplin supplied replacement whip, code Cat. No. YG 15R and designated as a 2m rubber duck did the trick. I agree that such a fine set which is supposedly an air/marine receiver should be let down by a poor part such as this. However, we do have to remember that the VT-225 is, essentially, an air - v.h.f./u.h.f. - band set. Still, maybe better attention to the extra portion should have been addressed. There are many replacements on the market and if you wish to opt out of the supplied one for a 'better' one, do remember to go for a replacement cut near to the band you want! It's no use getting a u.h.f. replacement if you want v.c.w.

Concerning the previously mentioned lists made by Paul Wey I have some gen which he passes on and which may be of interest to all. It seems the proposed security fit of DVP chips and CTCSS tones to certain users may be longer in coming than was previously envisaged! Equipment in use of the PFX variety will be replaced by Motorola equipment, which will allow for chip fits of both named systems above. Again, procurement and establishment may take some time.

Poor Site?

My own scanning, in my new temporary location isn't that hot despite thoughts to the contrary! As you can imagine, when I'm not...
Scanning With A Haydon Nest

Widely constructed - was my first thought when examining the DSS and MSS1300 antennas, both are essentially the same antenna, the difference being the base, the MSS has a magnetic base for mobile use, the MSS variant has a very neat folding stand affair for desktop use. Essentially, the active part of the antenna is a nested set of eight elements connected in parallel to a metal disk, which is in turn connected via the base to the inner of the coaxial cable. The elements are anodised to protect them from the weather. The rest of the antenna also appears to be well protected from environmental intrusion. The BSS-1300 is a nest of dipole salamanders and the package comes complete with a wall and pole mount, 10m of fitted coaxial cable terminated with a BNC plug. The other two types have less cable supplied (5m) as they should be used closer to the receiver.

In Use

The specifications for those antennas states a frequency range of 10-1300MHz, but as most scanner enthusiasts are unlikely to use this type of antenna below 50MHz, a much better choice for lower frequencies would be a random length antenna with an a.u.c. It is the higher frequencies where this kind of antenna comes into its own. I connected the antenna to a variety of receivers - a PR-43, AR150, AR3000A, PRD-2035 and an Icom R710. The results achieved were pleasing across a wide range of frequencies and services. As my location is one of the highest in the area I had an advantage. I am also located far away from Hum airport so control tower and taxiing aircraft are normally heard. There are also a handful of amateur band repeaters both 144 and 430MHz types within range, and all of these were received at the kind of signal strength I would normally expect. Listening to higher frequency services (500MHz and higher) proved to be as fruitful, with signals typical of those received on my permanent set-up. A somewhat more expensive solution I might add! Price performance ratio is very good with these antennas.

Added Bonus

If you are a licensed Amateur then you also get the added benefit of an antenna for both the 144 and 430MHz bands. Tex Swann's G1TEX the PV Technical Projects Sub-editor carried out some quick tests with the magnetic mount version of the antenna and came up with the exciting fact that it was usable as a transmit antenna with an acceptable s.w.r. over the normal parts of those bands. As it is unlikely that these antennas would be used solely for transmitting this is good enough. It is not recommended, however, that the desktop version be used for transmitting due to the lack of a ground plane. At the end of the day it has to be horses for courses - so there can be no criticism of the Haydon antenna in this respect.

The XSS-1300 range of antennas are available exclusively from Haydon Communications, 132 High Street, Edgware, Middlesex HA8 7EL. Tel: 0181-951 5781.

Thanks to them for the loan of the review model. The prices are as follows, MSS-1300/DSS-1300 £44.95, BSS-1300 £64.95 all plus £3.00 P&P.
Airwaves 94

Our Airband correspondent Godfrey Manning G4GLM takes a look at what should be an invaluable accessory for airband listeners.

At last

A 'third party' frequency list that I can recommend! I generally advise buying En Route Supplements from the suppliers in the Airband Factsheet (available from the Broadstone Editorial Offices). You can't beat these for currency, completeness and accuracy.

Much of the more obscure (especially military) information is made accessible in Airwaves. Not only are facilities/activities listed, giving their frequencies, but also there are reverse lists - when the frequency is known, the allocated user can be found.

Airways sectors are listed so much more clearly than in the Supplements but I'd like to see a map to make this subject even easier in future editions. The main transponder code groups are included. In fact, the book covers all the way from h.f. up to u.h.f.

What's missing?

I couldn't find G-HEMS (the London Hospital helicopter that's always newsworthy). There are no navigation beacons. The author hopes to produce updates each April and invites readers to submit additions and corrections.

Main sections follow. Area radar listed by control centre. Airfields and facilities include air-to-air, aerobatic teams and air refuelling alongside actual aerodromes. The v.h.f./u.h.f. list by frequency is next, followed by major worldwide h.f. circuits (listed by area). Then come h.f. operations (civil, military and space shuttle) with domestic h.f. channels at the end, followed by h.f. allocations in frequency order. Latest LATCC changes and finally squawk codes complete the work.

This book answers a lot of the more obscure questions asked by 'Airband' readers. Price £7.95 plus P&P from the SWM Book Service.

World-wide Aeronautical Communications Frequency Directory

by Robert E. Evans.

This heavyweight book from America should not be confused with the plethora of simple frequency lists that are available from numerous sources throughout the UK. It is quite simply the best and most authoritative book on aircraft communications to be found outside the professional text book area. The author has spent probably many months of painstaking research to put together a mass of data covering all aspects of h.f. and v.h.f. aircraft communications all over the World. Part of the book consists of listings of frequencies - the remainder is devoted to explanations in simple non-technical language of when to listen, where to listen, what you will hear, and what it means when you do hear it! Not only civil aircraft are covered, various military, government, weather, safety, space, law enforcement and similar services. The book is divided into chapters on h.f. voice communications, h.f. digital communications, v.h.f./u.h.f. voice communications, and v.h.f. digital communications. £19.95 plus P&P.

Understanding ACARS

by Ed Flynn

The Future Air Navigation Systems (FANS) concept marks the emergence of the next generation of air traffic management systems that will ultimately cover the globe and replace current voice based systems. Part of FANS is the replacement of all routine communications by computer data links, of which ACARS is one of the first elements starting to be implemented. ACARS stands for Aircraft Communications Addressing and Reporting System, and can be likened to airborne packet radio. For those wishing to delve into the realms of digital v.h.f. aircraft communications, this book is a must. Whilst it is relatively cheap and easy to receive and decode ACARS transmissions, their interpretation is another matter altogether. In this book, Ed Flynn describes the overall ACARS system and types of messages to be heard, lists common abbreviations used, and gives examples of the interpretation of several different sample messages. This book is the result of the painstaking efforts of a small group of pioneering American enthusiasts, and is a valuable introduction to this fascinating area of airband listening. £9.95 plus P&P.

Both of these books are published by Universal Radio Research in the USA, and are available in the UK from the SWM Book Service.
How to use the Propagation Charts

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

The bold middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50% probability of success for the path and time.

To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.
Printed circuit boards for SWM constructional projects are available from the SWM PCB Service. The boards are made in 1.5mm glass-fibre and are fully tinned and drilled. For a list of boards see May issue of Short Wave Magazine (p.48).

Orders and remittances should be sent to; Badger Boards, 80 Clarence Road, Erdington, Birmingham B23 6AR. Tel: 021-384 2473, marking your envelope SWM PCB Service. Cheques should be crossed and made payable to Badger Boards. When ordering please state the Article Title as well as the Board Number. Please print your name and address clearly in block capitals and do not enclose any other correspondence with your order.

Please allow 28 days for deliver. Only the PCBs listed are available.

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Lowe Competition

Part 3

Win a Lowe HF-225 Europa

The Lowe Europa is a double conversion superhet. How many intermediate frequencies does it use and what are they?

Question 3:

Answer 3:

as reviewed in the September 94 issue of SWM. The Editor's decision is final, and no correspondence will be entered into.
During summer I mentioned the forthcoming launch of OKEAN-4, the latest in the series of oceanographic satellites operated by the Commonwealth of Independent States (CIS - formerly Russia). I must credit Timestep Weather Systems for its timely announcement, on their Bulletin Board, of the launch. Their BBS gave me the first Kepler elements set. NOAA-11 was finally launched in October, and did not pass unnoticed! Within a few days, I received prints from Kurt Feller of Switzerland, of his reception of NOAA-4 on October 13 at 1800UTC, on 137.40MHz. He uses a dot matrix printer, Fig. 1. More OKEAN information and pictures later.

Current WXSATs

While we were waiting for the OKEAN launch, there was little new activity. NOAA-11 continues to exhibit a fault condition - see Fig. 2 - in which there is no picture detail, only the usual side-by-side channels. The next NOAA WXSAT is scheduled for launch in some months' time. As at late October METEOR 3.5 remains the only CIS WXSAT in regular operation, though this must change soon, purely on historical experience. As the plaques of each CIS WXSAT enters a favourable aspect to the sun - see last month’s article - changes in WXSAT operation normally occur. CIS WXSATs coming south over Britain (from the dark North Pole) during late autumn and winter, will normally be in eclipse, and therefore not transmitting. Expect to hear the METEOR suddenly switch on when it crosses the night-day terminator near northern Norway and Sweden (on easterly passes).

New OKEAN - 137.4MHz

The October launch of OKEAN-4, provides an opportunity to recap on the type of images received from this class of satellite, and to anticipate what we might expect from its (sporadic) transmissions.

The first Russian experimental craft used for collecting earth resources data, was launched in July 1974. The series became known as METEOR-PRIRODA, and acquired data in a number of spectral bands. The first two satellites were put into orbits about 900km high, with an inclination about 82° and the launch name COSMOS, the name used for almost all Russian satellites, regardless of type.

The Russians later revealed that COSMOS 1076 and 1151, were tested as early ocean monitoring missions. The term ‘monitoring’ refers to weather - not military. These two satellites had orbits typical of ELINT (electronic intelligence) satellites, rather than those orbits normally used for earth monitoring.

A number of the METEOR-PRIRODA satellites transmitted pictures using the a.p.t. (automatic picture transmission) format, that is, picture data - bright clouds and dark sea - were amplitude modulating a 2400Hz carrier, that then frequency modulated the main 137MHz carrier. In other words - these COSMOS satellites were using the same transmission format as the WXSATs - and could therefore be decoded with the same equipment.

A typical image, containing three channels, two of which include data is shown in Fig. 3. The image is that of the north-west coast of Norway. The right-hand picture shows a visible-light image with extensive cloud cover; the middle section shows the radar-type image that has penetrated the cloud to reveal the Lofoten Islands, at least on the enhanced version! The right-hand edge shows a number sequence - referred to shortly.

During the mid-80s, people using WXSAT scanners to monitor the 137MHz band, sometimes picked up clear signals on 137.40MHz, which could be decoded by framestores and computers to produce an image similar to normal a.p.t. This signal had the modulation characteristics of NOAA and METEOR WXSATs, but was otherwise distinctly different. We were listening to a breed of COSMOS carrying new imaging equipment.

Oceanographic Imaging

COSMOS 1500 was the first in the series to follow a programme of oceanographic imaging applications. Launched on 28 September 1983, it occasionally - unpredictably - transmitted a.p.t. on 137.40MHz. It carried several pieces of equipment, imaging for observing the weather, an X-band (30mm) sideways-looking radar - having a resolution better than 2km, a u.h.f. spectrometer using several wave/heights with varying resolutions, a four-channel scanner, and receiving equipment to monitor remote sensing stations.

It also carried a data recording facility for later playback to ground stations. I recorded at least one of these playbacks - a clear picture of a region near the north pole - received from an oceanographic satellite passing over Eastern Europe!

Others, who had made personal contact with the Russian authorities, and were closely involved in monitoring Russian activities, probably had some knowledge of the timing of these COSMOS launches - but I didn’t. So when I first picked up these new signals on 137.40MHz during the mid-80s, I wondered what part of the Russian space programme I had stumbled across! After making new contacts during my search for Kepler elements, I identified the source of these images as coming from a new satellite in this series - COSMOS 1869.

Information collected by these satellites was used to produce new geological maps of the USSR. Short term problems, such as forest fires, were detected by satellite sensors. Ice coverage in northern hemisphere lakes and shipping lanes, was carefully monitored by this class of the COSMOS series, and used for aiding navigation. Estimates suggest that many thousands of roubles were saved by the application of this data.

During the late 80s, we heard several COSMOS satellites transmitting pictures. These continued the trend - all contained visible-light images, together with a radar section - see Fig. 4 - an image I obtained on October 19 from the new satellite, showing evening twilight, and imagery probably from the microwave sounder. A third type of image - that from a radar - was included. Because of these variations, the overall format of the satellite picture likely to be received, was unpredictable.

The Numbers

One of many picture formats transmitted by this series, includes a sequence of numbers related to onboard operations. The pictures from Kurt Feller and me show part of this sequence. One of the numbers increments each minute: it is associated with the time elapsed, in minutes, since midnight in Moscow. The other numbers have been
identified by researchers as relating to the operation of individual items of equipment. Sometimes visible-light pictures occupy almost the whole frame format, sometimes the number sequence is included. Usually the frame is split into sections containing different types of imagery. The radar image has a published resolution of about two kilometres, and was often of high quality, but rarely lasted for more than a few minutes. I assume that the reason for this short duration was the power requirement of the radar system. It looks sideways from the satellite's direction of travel, and is power hungry. This theory is supported by the observation that most radar images occurring during the sunlit section of the orbit, while the solar panels were well illuminated.

**COSMOS to OKEAN**

Images of varying quality were received from COSMOS 1503, 1602, 1619, and 1766 during the 80s. In July 1988, a new series of COSMOS satellites was identified when OKEAN-1 was first heard. This also transmitted on 137.40 MHz, scanning at 4 lines per second, as had its predecessors. OKEANs 2 and 3 followed. The new OKEAN-4 has the orbital characteristics of previous satellites in this series, an orbital period of about 98 minutes, giving a Mean Motion (number of orbits per day) of about 14.7. The satellite orbits between 631 and 851 km above the Earth - significantly less than other NOAA or METEOR orbits, but similar to previous OKEAN craft. One of my images from OKEAN-4 - a superb radial image of the Finland region - received just before press time is seen in Fig. 5. In future months we may receive regular imagery, particularly if there is a significant ice build-up in the Bothnian area. As mentioned, OKEAN satellites have played a significant role in ice monitoring in the northern hemisphere.

**Letters**

**Thomas Kirtley** of Little Haywood is involved with his school’s radio club. They used to decode RTTY transmissions with an old Apple computer, then FAX using a Spectrum computer. They now plan to build the interface designed by Tom Wootan, published in the October edition. Thomas had hoped to obtain the Maplin Mapsat receiver, but found that it has been removed from the catalogue. To be realistic, this receiver was based on an old design, and reports suggest that it was susceptible to paging interference.

**Jim and Hilda Richardson** of Hife sent several pictures, one of which included a sunny Britain, imaged by NOAA-9 in mid-May this year - see Fig. 6. Adding colour to black-and-white imagery sometimes seems more of an art form than science! It is difficult to prevent cloud edges becoming green or blue, and merging into the ocean. They managed this very well with their NOAA-9 picture, but readers will have to take my word for that!

**CD-ROMs**

Several correspondents have asked for further information on some of the topics mentioned in the Special (Space) Edition of Info, in October.

**Eric O’Hara** of Malmesbury asked about the availability of CD-ROMs from NASA. These are stock items at an increasing price of UK suppliers, and I am hoping to produce a review of some of the products. The UK company Spacecraft Science Resources, one of the few companies that responded to my request for information, stock a selection including METEOSAT archived images, some from the French land mapping satellite SPOT, and some NASA astronomical collections obtained by the Voyager spacecraft. Spacecat has contact details of Tel: (01305) 822753. I understand that Timeselect may also stock WXSAT/astrology CDs, but unfortunately they haven’t, as yet, responded to requests for information. A number of American companies will sell CDs over the telephone, if you use a credit card. A perusal of the astronomical magazines (Astronomy and Sky & Telescope) will provide current telephone numbers.

**JVFAX**

**Ray Howgego G4DTC** of Caterham in Surrey, has kindly sent me some information of interest to people using the PCG/GEOS/WEFAX system. Ray mentions that the JVFAX program version 7, can be used with the hardware unit that comes with the PCG/GEOS system. Ray feels that JVFAX provides somewhat better facilities, and, for reception of WXSAT transmissions, Ray advises using the Hamcom configuration setting, entering the address and IRQ for the appropriate COM port, to which the interface is attached. Ray advises disabling memory drivers (by editing your CONFIGSYS file), because JVFAX does not need high memory.

**Two other recommendations by Ray are the activation of a c.t. (automatic tuning control) on all pictures, and to wire, if necessary, a variable potentiometer between the lead and the interface. Adjustment should reduce the crushing of the peak whites, which can occur with high signal strengths. Not much left for me to review now. Ray, but thanks!**

**J. Pretorius** wrote from the Republic of South Africa, telling me that he monitors METEOSAT as well as the WXSATs, though I am uncertain whether he receives METEOSAT directly or via HF utility transmissions. He lists several HF broadcasts that transmit WXSAT imagery, as received in South Africa. His WXSAT receiver is a DAKA Technologies unit - new to me. Unfortunately, the pictures that were enclosed would not reproduce well enough for publication.

**Search and Rescue**

**John Garnett** of Tuno enquired about information on SAR, the search and rescue facility carried by several WXSATs. The system involves ground-based transmitters - called Emergency Locator Transmitters (ELT) and Emergency Position Indicating Radio Beacons (EPIRB) which, when activated, transmit emergency beacons on 121.5, 243 or 406 MHz. One or more of these (ground-based) beacons will be received by any satellite carrying suitable SAR equipment. This provides a high probability of detection and location, greater location accuracy and coded user information, plus global coverage.

From Doppler measurements of the beacon signal, its location is calculated. This is then passed to the Mission Control Centre, which alerts the relevant Rescue Co-ordination Centre. Anyone travelling to remote areas should consider carrying one of these devices.

**Should you ever hear a transmission on any of these frequencies, call the Coast Guard service and provide details. By international agreement some Russian satellites also carry compatible equipment - called the COSPAS system.**

**Kepler Elements**

Different options are available:

1. A print-out of the latest WXSAT elements is available. Please send a stamped addressed envelope (SAE) for this.

2. I send monthly Kepler print-outs to many people, join the list by sending a 'subscription' of £1 (plus four self-addressed, stamped envelopes) for four editions. For those outside the UK, please enclose a IRC for each list requested. I will forgo the extra stamp to further international relations.

3. I can provide files on disk containing recent elements for the WXSATs, NASA's, etc. and a large ASCII file holding elements for many satellites.

This allows automatic updating of your computer program without the need for manual data entry. A print-out is included identifying NASA catalogue numbers, with other groups of general interest, in both launch and object formats - ideal for computer data retrieval. This is constantly being improved and notes are provided. Please enclose cash, a cheque, or PO for £2 with your PC-formatted disk and, 5.c. Please use adequately sized envelopes for your disk. I sometimes receive empty packets!

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**Frequencies**

**NOAA's 9, 11, 12 on 137.62 MHz; NOAA's 10, 12 on 137.50 MHz; NOAA's beacon on 136.77 and 137.77 MHz; METEOSAT 1, 2, 3, 4, 5, 6, 7 on 137.54, 137.55, 137.85 MHz and OKEAN-4 137.40 MHz but sporadic transmissions.**
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**Decode**

**All the Data Modes**

Although the Klingenfuss CD has been around for some time, I've only just managed to get my hands on a review copy. This very comprehensive CD comprises two directories, containing around two and a half hours of recordings and seventy-one different emission types. The disk was presented in a standard double CD package with a separate six page A4 leaflet describing the contents. The leaflet was probably the weakest point as it needed some better protection to stop it being damaged through normal use. One likely solution is to keep it in a standard A4 ring file with a separate pocket to hold the disks. (Even better would be for Klingenfuss to redesign it to fit into the CD case. - Ed.)

One of the main advantages of a CD based recording over traditional tape systems is the ability to quickly select the required track. By using the information sheet and the most basic of CD players, you can rapidly move straight to the transmission type you want to hear.

So, what are the seventy-one emission types on the CD? To help you find your way around the CDs they are divided up into logical sections. The first thirteen tracks deal with non-teleprinter signals and cover a wide range of transmission systems. Included here were c.w., double sideband broadcast, FAX, Hellschreiber, and a variety of s.s.b. variants including a selection of scrambled signals.

The teleprinter based systems were further sub-divided into three categories: Simplex, Duplex and FEC. In this case simplex transmissions are defined as those that operate on a single frequency and can only send information in one direction at a time. A Duplex transmission, on the other hand, would normally use a pair of frequencies and be able to handle simultaneous two-way traffic. In addition to the expected RTTY Packet and Sitor signals, the simplex section contained all manner of obscure systems. Included here were NATO encrypted systems, Cycinic, Piccoly, Golay, Pocsag, S quirky ARQ, to name just a few.

In addition to providing a listing of the transmission types, the information leaflet included a handy abbreviation section. This was particularly helpful for the newer listener.

The next question is what can you do with all this information? There are two main uses for this CD, or any recording of emissions types. The first and probably most useful is to familiarise yourself with the sound of the various transmission types. By learning the sounds of the different modes you can save a lot of time when tuning around the h.f. bands. Despite all the advances in decoding technology, a trained ear is still the fastest way to identify the broad transmission types. An example of this is to be found with the pseudo random Nato signals that are scattered throughout the h.f. bands. They sound for all the world like ordinary RTTY and can cause great frustration for the new listener. With some practice you soon learn to "finger print" these signals with the unique combination of sound and a baud rate measurement. Once this has been mastered you can concentrate your listening activities on decodable signals.

Once you've spent some time familiarising yourself with the Klingenfuss CDs, they should be used very effectively to identify many unusual signals. It's important to note that you really do need to spend some time listening to the radio before you can put it to practical use. You will also need access to a simple audio CD player. For the review, I used a battery powered Sony Discman player that proved perfectly adequate.

In addition to learning the sounds of utility signals, a pre-recorded sound of the same can be useful for checking out your decoding equipment. Those of you who may have tried this with cassette tape recordings will no doubt have encountered some problems. The main reason for this is the poor speed stability of most cassette recorder and playback systems. If the replay speed is not exactly the same as the original recording, you will find that both the pitch and baud rate of the signal is effected. In addition, there are usually some short term speed variations, which can then be passed on to your decoder. (Listen to old cassettes and you will soon get the idea.)

The result is that is it often very difficult if not impossible to reliably decode signals from a cassette tape. The Klingenfuss CD has a distinct advantage here as the digital recording system ensures perfect pitch and speed stability. As a result, you can use the CDs to checkout your decoder with one or two pre-recorded cassettes. You will need to set the character frequency and baud rate of your decoder to match that of the transmission. Fortunately this is easy as the information leaflet supplied with the CD includes this information.

I tried the CD with HAMCOMM, JVFAX, Lowe Modemaster and Hoka Code 3 all with good success. The only problem I had was with the c.w. transmission on disk 1. This recording used a very low, 500Hz, sidetone that was outside the range of the HAMCOMM and Modemaster decoders.

The only real problem with the dual CD set is the relatively high price at £43.00. This is because there is not really enough demand to be able to take advantage of high volume discounts that are enjoyed by the music and computing industry. If you would like to order a copy or require more information contact Hagenloher Str. 14, D-72070 Tuebingen, Germany. My thanks to Joerg for the loan of a review copy.

**Spot Frequency Receiver**

Whilst touring the Leicester Show in October I found a great new receiver from C. M. Howes Communications. The new DXR20 direct conversion receiver kit features coverage of the 3.5, 7 and 14MHz amateur bands plus any other frequency of your choice between 1.6 and 30MHz. This extra band is achieved using plug-in modules. Where the receiver may have special appeal for utility listeners is the optional crystal controlled fixed frequency module. This is potentially great, either for unattended FAX reception, or as a second receiver for FAX. This would then leave you free to tune the bands for new frequencies with your main receiver. Howes have built up a lot of experience in direct conversion receivers and their kits are very well documented.

For those that want to keep construction to a minimum, Howes can supply ready assembled main circuit boards. In addition to the basic frequency coverage, the DXR20 features 1 watt audio output and operation from a 12 or 14V d.c. supply at around 500mA. The receiver can be further enhanced by the addition of the optional S-meter and digital frequency display. If you go for the ready assembled main board, the optional HA20R hardware kit can be used to provide the case and all the necessary mounting hardware. The current prices are £39.90, assembled main board £67.90. Optional band modules £7.90 each and HA2OR hardware pack £28.90. If you would like more information please contact C. M. Howes Communications, Eydon, Daventry, Northants NN11 3PT. Tel: (01327) 60178

**Networking**

The observant amongst you will have noticed the appearance of an Internet address at the head of the column. Having spent some time getting acquainted with the CompuServe network, I'm now scouring the Internet. But why I hear you ask. Let's start with a very brief description of the Internet. The Internet as it today has evolved over the past ten or twelve years and is basically a world-wide network of interconnected computer systems. Included amongst these computers...

---

Mike Richards G4WNC, PO Box 1863, Ringwood, Hants BH24 3XD. Compuserve: 100411,3444 Internet Mike@decode.demon.co.uk

Meteosat image from Edinburgh University via the Internet.
systems are universities, government departments and many other commercial and educational establishments of varying sizes. The reason for the interconnection is to provide fast and efficient exchange of information between all those connected to the system. In addition to being able to send electronic letters (E-mail), the Internet has comprehensive facilities for the transfer of files between computers. It's important to note the tremendous size of the current Internet which has an estimated 20 million users and around 30,000 systems connected. With so many users it's not surprising to learn that just about every subject is covered with vast quantities of programs and information files. It's the easy access to such huge quantities that is the prime reason for joining the Internet.

So how do you join? It's really very easy as you just have to set up a subscription to one of the network operators. In addition to the many commercial operators providing business access, there are now a number of organisations that make Internet access easy for the individual and more than reasonable prices. It's also a good idea to make sure you use a coaxial cable and wire you will generally find this is available at very reasonable prices. It's also a good idea to make sure you use a coaxial lead to bring the antenna into the shack. If you want to really do the job properly you should also consider adding a magnetic longwire balun to the interface between the coaxial cable and the antenna wire. With the antenna sorted out Geoff should find he's able to receive a good number of useful stations.

Special Offers

It's clear from my postbag that there are still lots of new people joining the hobby and trying utility listening for the first time. As a result, I've decided to introduce two new FactPacks specifically for new listeners.

FactPack 3 - Starting-Out guides the new utility listener through the various decisions that have to be made regarding the choice of receiver, decoder, antenna and popular accessories. In addition to basic set-ups, the guide covers the more advanced station for those that prefer to start further up the market.

FactPack 4 HAMCOM/IVFAX Primer has been written to provide a step-by-step introduction to receiving your first RTTY and FAX signal using these popular programs. The FactPack covers installing the software as well as hints on how to set the configuration to match your computer and receiver. Although I try to turn the orders round in a day or two, you should allow up to two weeks for delivery. Other offers available are: IVFAX 7, HAMCOMM 3, Day Watson Beginners List, Decode List, Complex Modes List, FactPack 1 Interference, FactPack 2 Decoding Accessories (details as per last month).

To receive any of these offers just send me a self addressed sticky label plus 50p per item or £1.50 for 4, £2.00 for 5, £2.50 for 6 or £3.00 for 7 or 8 items. If you are ordering IVFAX or HAMCOMM you will also need to send a blank formatted 720Kb disk for each program or just one 1.4Mb disk.

Temperature Chart from Geoff Crowley.

Frequency Lists

Having recently been ticked-off (quite rightly) by a reader for not mentioning contributors names. I'll start this month with a list of all those who've contributed to their month's selection. They are Geoff Allgood, Guy Dennam Day Watson, Peter Thompson Roy Munro and Dave Woods. My thanks to these people and everyone else who has sent in contributions. You will note that I've also changed the frequencies for MHz to kHz, again to link with readers preferences - who says I don't listen!! I've even increased the number of complex modes in the frequency list to keep the more experienced readers at bay!

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A numerical increasing of listeners are finding that researching the I.W. maritime beacon can be both interesting and rewarding. Those who did so during July, August and September often found the propagation conditions were favourable after dark.

The sky waves from some quite distant beacons were received by the listeners who checked the band well into the night. Two beacons on the coast of Greenland were logged by Robert Conolly in Kilkeel, namely Jakobshavn (JV) on 367.0 and Princess Christian Sund (OZN) on 372.0. The latter was also heard after midnight by Jim Edwards in Bryn, Robert Moore in Holywell and just before dawn by Steve Cann in Southwold. He found it audible by the time it was light.

Around 0430 UTC Steve Cann heard for the first time the beacon on Cabo de Palos in S Spain (PA) on 313.0 and Ingolsholm's lid, Iceland (IN) on 316.0. Another Icelandic beacon at Grimsby (GR) was logged at night by Geoff Crowley in Aberdeen. Over in Co. Feermanagh Tom Smyth picked up the sky waves from Raufaroftuf, Iceland (CI). This one included the Ile de Gramiga Lt.

Kenneth Buck (Edinburgh) did not only hear for the first time the beacons at Akraberg (AB) on 381.0 and Noslo (NL) on 404.0 kHz. At first he detected strong signals without ident, but after selecting the a.m. mode on his Love-HF 225, he received good clear ident.

Apparently they are using a keyed tone without carrier insertion - a point that other DXers should bear in mind. He suspects the Greenland beacon (OZN) on 372.0 may also use that mode, but he is unable to hear the signal. No doubt it is another zero-beacon on the same frequency.

The elusive Vestspill beacon (WW), which is part of the Latvian group on 372.0, was logged at night by John Eaton (Woking) and others. Several beacons in Scandinavia, France and N Spain that Albert Moore (Douglas, IoW) had not previously heard were logged after dark. A spiral loop was used by Peter Rycraft (Wickham Market) to compile his interesting list at night for the chart.

The ground waves from quite distant beacons were picked up by some listeners during daylight, but others found that a trace level of local electrical noise masked the weaker signals. This problem was encountered by Darren Beasley in Bridgwater, but he traced it to the VAX computer at the hospital where his FRG-100 receiver! He now uses a 12v car battery instead. A tip for other FRG-100 owners perhaps?

What will Peter Westwood (Farnham) visit the Lizard Lighthouse. The keepers were surprised to learn that he was interested and rewarding. Those who did so during July, August and September often found the propagation conditions were favourable after dark.

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Long Wave Reports

Note: I.w. & m.w. frequencies in kHz; s.w. in kHz, Time in UTC (+GMT). Untested, all logs compiled in the four week period ending September 30. The broadcasts in Russian from Radio Volga via Burg on 261kHz, intended for their armed forces in Germany, have now been discontinued. However, Roy Patrick (Derby) tells me that the Burg transmitter is still being used by Rasioprovina, a German communist satellite radio station. He has heard their broadcasts in German at 14:00UTC.

Medium Wave Reports

A marked improvement in the reception of m.w. transatlantic signals was evident on some nights in September. Regular checks were made by Harry Richards (Barton-on-Humber) in the hope of hearing WSSH in Boston on 1510kHz. A 0031 on September 16 he heard their broadcast of President Clinton's speech about Haiti. Their signal was SINPO 34232. On September 17 he listened to their tests on 1530kHz, during which their signal peaked a remarkable 4434. He found the reception of WBBR in New York on 1130 so good at 0109 on September 25 that he was able to, "just sit down and listen to the programme!"
The broadcasts from Harcour Light, Grenada on 1400 were heard at 2302 by Roy Merrill in Dunstable on September 14., their signal was SI122. At 2337 he logged WTO in Washington on 1500 as SI122, but their ident was not logged completely. On September 17 he listened to a sports programme by WSSH in Worcester on 1440 at 2359 (SINPO333). He listened again on September 25 and heard at 0140 WINS in New York on 1010 (SIC022).

Long Wave Chart

<table>
<thead>
<tr>
<th>Station</th>
<th>Country</th>
<th>Power (kW)</th>
<th>Listener</th>
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<tbody>
<tr>
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<td>Brod@Xml</td>
<td>Algeria</td>
<td>1000</td>
</tr>
<tr>
<td>153</td>
<td>Doneb@x</td>
<td>Germany</td>
<td>500</td>
</tr>
<tr>
<td>153</td>
<td>Beac@x</td>
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<td>1200</td>
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<td>162</td>
<td>Alois@x</td>
<td>France</td>
<td>2000</td>
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<tr>
<td>117</td>
<td>Nader M@x</td>
<td>Morocco</td>
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<td>117</td>
<td>Kall@x</td>
<td>Russia</td>
<td>1500</td>
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<td>117</td>
<td>Gracen@x</td>
<td>Germany</td>
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<td>189</td>
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<td>190</td>
<td>Schh@x</td>
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<td>Var@x</td>
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<td>190</td>
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<td>Norway</td>
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<td>190</td>
<td>Raz@x</td>
<td>Poland</td>
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<td>Broadw@x</td>
<td>Luxembourg</td>
<td>2000</td>
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<td>Petrau@x</td>
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<td>S, Italy, Poland</td>
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<td>Bel@x</td>
<td>Bulgaria</td>
<td>2000</td>
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</tbody>
</table>

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

Short Wave Reports

Owing to the deteriorating propagation conditions in the h.f. bands many broadcasters made changes to the times and/or frequencies of their s.w. transmissions towards the end of September. Some were reflected in the reports I received from listeners and as many as possible have been included here.

Very unreliable conditions now exist in the 25MHz (111m) band, consequently it is no longer being used by international broadcasters.

Propagation in the 21MHz (13m) band varies considerably from day to day, nevertheless it is still being used to reach listeners in specific areas. The broadcast to Europe from UAER in Dubai on 21.605 (Eng: 1000-1055; 1330-1350) can usually be heard here, but sometimes they fade into the noise. They were rated 35233 at 1030 by Darren Beasley in Bridgwater.

The Voice of Greece, (Eng to SE.Asia 0900-1030) was 22222 at 1430 in Oxted; VOA via Greenville 21.453 at 0835 by P. Guruprasad in Pune; Monitor R.Int via WSHB 21.640 (Eng, Fr to Africa) 34433 at 1835 in Oxted; VOA via Greenville 21.453 (Eng to Africa) 24233 at 1420 in Storrington.

Frequent daily variations in propagation were also observed in the 17MHz (16m) band. During the morning Slovak R.Int via Rimasko Sobota 17.485 (Eng to Asia 0830-0835) was 22222 at 0900 in Barton-on-Humber.

CHRJ, Quito 21.455 (Eng, u.s.b. + 13300) was 22222 at 1330 in E.London.

Townsend in E.London, BBC via Limassi 21.470 (Eng to Africa 1400-1615) 44444 at 1412 by John Eaton in Woking, via Ascension Is 21.600 (Eng to Africa) 24233 at 1510 in Storrington; R.Pakistan via Sines 21.515 (Port to M.East, India, 1400-1600) 34233 at 1430 in Newry; WYFR via Okeechobee 21.525 (Eng, Fr, Ger, Port to Africa) 24233 at 1510 in Storrington; R.Portugal Int viaccb 21.640 (Eng, Fr to Africa) 34333 at 1835 in Oxted, VOA via Greenville 21.453 (Eng to Africa) 24233 at 1420 in Storrington.

Short Wave Reports

When the conditions are favourable some of the broadcasts to other areas may be heard here. Those noted before noon came from Slovak R.Int via Rimasko Sobota 21.705 (Eng to Asia 0830-0835) 44444 at 0830 in Newry; R.Australia via Darwin 21.725 (Eng to Asia 0630-1100) 24233 at 0944 by David Edwardson in Newry; Monitor R.Int via WSHB 21.640 (Eng, Fr to Africa) 34333 at 1835 in Oxted, VOA via Greenville 21.453 (Eng to Africa) 24233 at 1420 in Storrington.

Further to the reports of R.Free Europe on 1530 (see LM&S, November 94-1) 34443 at 1430 in Newry; VVYFR via Okeechobee 21.525 (Eng, Fr, Ger, Port to Africa) 24233 at 1510 in Storrington; R.Moscow Int 17.710 (Eng, F to Africa) 34444 at 1835 in Oxted, VOA via Greenville 21.453 (Eng, Fr, Ger, Port to Africa) 24233 at 1420 in Storrington.

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

H.C. John Eaton, Woking.

Short Wave Magazine, December 1994
<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency (kHz)</th>
<th>Power (W)</th>
<th>License</th>
<th>Comments</th>
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Note: Entries marked * were logged during daylight. All other entries were logged during daylight or at dusk.

Licencors:
- J. John Eton, Woking
- B. Simon Hackett, Silsbee, Cornwall
- G. Shepherd, Harrow, London
- E. Robbi, Ellesmere, Boston
- E. M. Smith, Proseley, Oxford
- G. George, Wilton, Wiltshire
- K. I. Bard, Aylesbeare, Cornwall
- D. A. W. Smith, Barnstaple, Devon
- J. W. H. Baker, Calne, Wiltshire
- N. Andrew Stokes, Leicester
- D. R. Taylor, Elwood, Wiltshire
Local Radio Chart

No1, Gabon 17.630 (Fr to W Africa 0700-1600) SI0333 at 1416 by Bill Clark in Rotherham. PFI via Montaisvill 17.660 (Fr to C Am 1407-1555) 33555 at 1440 in Woking, WFRF Okeechobee 17.760 (Eng to N Am 1400-1700) 32222 at 1506 in Strirling; WCBN Birmingham 17.715 (Eng to N Africa? 1500-1600) 33555 at 1515 by Peter Pollard in Rugby. R Nederlands via Bonaire? 17.605 (Eng to W Africa 1300-2025) 45444 at 1840 by Michael Griffin in Ransome, WYFR. RHAVIB Dubai 17.760 (Eng to 2100-2200) 44444 at 2115 by Ross Lockley in Strirling.

Rather more reliable conditions were noted in the 15MHz (19m) band, for example in the Australiandomain from Carnarvon on 15.530 (Eng to N Asia 0600-0900) as 45433 at (3840) in Adelaide & 15.170 (Eng to N Asia 0900-1200) 43433 at 1101 in Newry: 5.530 from Darwin (Eng to S Asia 1100-1300) 43433 at 1154 by James Duckworth in Barnet. Also heard in the morning were the

BBC via Limassol 15.575 (Eng to M East 0400-1500) 33223 at 0743 in Leicester and via Malta 15.310 (Eng to S Asia 0900-1400) SI0222 at 1107 by Oliver Boutell in Devoncourt, R Austria int via Mostroeven 15.450 (Gen. Eng to Aust 0800-1100) 32222 at 0830 by Clare Pendle, Voice of Greece, Athens in Aberdeen. 45444 at 1000 in Rotherham. R Norway int, Oslo 15.650 (Norw to 1000-1200) SI0444 at 1020 by Philip Rambaut in Macaronesia: Laurence Mason in Horsefield.

Voice of Spain, Hanno, 15.010 (Eng to Ru 1700-2000) was heard clearly by Martin Price, Orpington. The occupants of this band in the daytime include the BBC via Malta 15.675 (Eng to M East 1600-1700) SI0333 at 1600 in Elondon). R Pakistan, islambad 15.675 (Eng to M East 1600-1700) 44444 at 1611 in Edinburgh; VOA via Morocco 15.410 (Eng to Africa 1600-2000) 34423 at 1620 in Barnet. Later, HCJB Quito 15.300 (Eng to 1700-2000) was heard clearly by Trouth Lockley in Strirling.

Good reception from many areas was noted in the 11MHz (25m) band. R Australia’s broadcasts reached the UK on 11.690 from Carnarvon (Eng to S Asia 1400-1800), noted SI0333 at 1222 at 1548 in Oxford: also on 11.695 from Shepparton? (Eng to Pacfic) SI0333 at 1450 in Oxford.

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reported by listeners in the UK. Their transmission from Flamsteed Street, P.O. BOX 8209 (Eng to S.Africa 1430-2100) was heard at 1310 in Bottrop, Germany. Android R.

5:00 AM

AIR via Bangalore 11.620 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 11:00 in Newry. R.Gordon Smith, Kingston, Moray.

5:15 AM

AIR via Kathmandu 11.615 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 11:15 in Newry. R.Gordon Smith, Kingston, Moray.

5:30 AM

AIR via Cape Town 11.605 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 11:30 in Newry. R.Gordon Smith, Kingston, Moray.

5:45 AM

AIR via Durban 11.595 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 11:45 in Newry. R.Gordon Smith, Kingston, Moray.

6:00 AM

AIR via Mozambique 11.585 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 12:00 in Newry. R.Gordon Smith, Kingston, Moray.

6:15 AM

AIR via Cape Town 11.575 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 12:15 in Newry. R.Gordon Smith, Kingston, Moray.

6:30 AM

AIR via Durban 11.565 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 12:30 in Newry. R.Gordon Smith, Kingston, Moray.

6:45 AM

AIR via Mozambique 11.555 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 12:45 in Newry. R.Gordon Smith, Kingston, Moray.

7:00 AM

AIR via Cape Town 11.545 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 13:00 in Newry. R.Gordon Smith, Kingston, Moray.

7:15 AM

AIR via Durban 11.535 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 13:15 in Newry. R.Gordon Smith, Kingston, Moray.

7:30 AM

AIR via Mozambique 11.525 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 13:30 in Newry. R.Gordon Smith, Kingston, Moray.

7:45 AM

AIR via Cape Town 11.515 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 13:45 in Newry. R.Gordon Smith, Kingston, Moray.

8:00 AM

AIR via Durban 11.505 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 14:00 in Newry. R.Gordon Smith, Kingston, Moray.

8:15 AM

AIR via Mozambique 11.495 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 14:15 in Newry. R.Gordon Smith, Kingston, Moray.

8:30 AM

AIR via Cape Town 11.485 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 14:30 in Newry. R.Gordon Smith, Kingston, Moray.

8:45 AM

AIR via Durban 11.475 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 14:45 in Newry. R.Gordon Smith, Kingston, Moray.

9:00 AM

AIR via Mozambique 11.465 (Hi, Eng, Sp to S.Asia 1430-2100) was heard at 15:00 in Newry. R.Gordon Smith, Kingston, Moray.
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Warrington • WA2-8QP
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**Short Wave Magazine, December 1994**

81
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Collins mechanical filters for
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30MHz, a.m., s.s.b., excellent condition with manual, £180. Tel: 01865 750948.

Icom IC7000, £700. IC-R70, £550. JRC

Icom IC901 communications
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ICS FAX1, FAX, RTTY, NAVTEX
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ICS FAX1, RTTY, NAVTEX, FAX
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filter, reduces/illiminates white, ignorance, powerline noise, broadband noise, steep skirts, adjustable centre frequency/background, RTTY, Morse, s.s.b., boxed, mint, with manual, £275. Tel: Middlesbrough 01642-570 5603.

Kenwood R9500 VC01, c.w. filter, Global ATU1000 v.f.h.f. converter. Doppler Marconi '7 Dresser ARAO30 active antenna. Other bits and pieces, buyer to collect, £200 the lot. Bill Humphrey, 6 Woodhouses, Bishop Auckland, Co Durham DH1. 0LL. Tel: (01388) 605448.

Kenwood R500 receiver, mint condition, 13 months old, boxed with manual, £62, K. Ferry, Middlesbrough. Tel: 01642-570 5603.

Lowe HF150 receiver with keypad, used, long wire balun, £280 o.n.o. ICS FAXIII WXFAX software for IBM-PC, £90 o.n.o. Mr Baker, Essex. Tel: (01934) 515968.

Lowe HF150 short wave receiver, boxed with manual, super condition, price to include keypad and whip antenna, a bargain at £725. Surplus keypad for £150/225 receiver. £22. Tel: Lancs (01253) 277279.

Lowe HF150 with RS232 computer interface, mint condition also M.L.B. and various books, including scanning frequencies, altogether cost £480, accept, £300. No offers, buyer collects. Nick, Nottingham. Tel: (0115) 9652524 anytime.


Lowe HF225 with a.m.f.m. detector and keypad options, boxed with manual, £360. Also ICS FAX3 version 4.2, complete, as new, £90. Tel: Kent (01689) 617475.

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MCL1100 Easy Reader (modified to include on/off switch plus 15in Apple monitor, £200. Datong FL3 filter, £75. Hameg HM203E 20MHz dual beam scope, £200. Can deliver 30m radius. Peter, Glos. Tel: (01453) 751021 (day), (01453) 758762 (after 6.30pm) or FAX (01453) 752490.


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Sony ICF2001D world band radio, f.m., m.w., l.w., AIR, s.w., 18 months old, hardly used, manual, earphone aerial, p.s.u., £175. Also Datong active aerial AD307, £25. Tel: West London 0181-574 5662.

Sony SW555 complete, case and all accessories, £190. Sony SW1E, case and all accessories, £55. Boxed with manuals, excellent. Tel: Oxford 01865 886800 answerphone.

Sony SW555 kit, hardly used, bargain at £150. Sony SW1E, mint condition, £70. Low prices so no offers. Tel: Essex (01708) 222386 evenings.

Sony SW77 150kHz to 30MHz, boxed and manual plus p.s.u. supply, very good condition, £15+ plus postage. Cost £389 new. John, Scotland. Tel: (01525) 203279.

Trio R1000 communications
receiver, g.w.o., 10kHz to 30MHz, £260. Mr Coke, Suffolk. Tel: (01359) 221426.
Also Netset PR044 50 channels, scanner, very small crack on case, Yupiteru MVT7000 hand-held for, £319. Tel: Beds (01525) 854267. fit in your briefcase, together only for mint AOR3000A or Lowe HF225 £450. Will exchange plus £200 cash 30MHz, fitted FRV8800 v.h.f., 118- Yaesu FRG8800 receiver, 150k- Yaesu FRG7700 150kHz to 30MHz, Yaesu FRG7 communications after 7pm. Guide, forget your base sets, these excellent condition, UK Scanning set-up, both with cases, boxed, SW7600, complete, 0.15-1300MHz Gwent. Tel: (01633) 856933. Europa, any test trials invited. Mike, 174MHz. FRT7700 tuner with option and manual v.g.c., £275 o.n.o. a.m., s.s.b., c.w., f.m., with memory Stafford (mobile) (01956) 140938. collect or pay postal charges. Tel: supply. Bargain at £350, buyer must be sold. Alan, Cleveland. Tel: (01642) 559651 after 8.30pm. 

Yupiteru MVT7000 receiver, 8-1300MHz, telescopic antenna, soft case, manual, charger, ear piece, boxed, as new condition, plus UK Scanning Directory, £220. Tel: Bedford (01234) 751760. Yupiteru MVT7000, 8-1300MHz, new, used only five hours, complete with soft case, all accessories and power supply, still boxed, impeccable, £180 includes reg. post. Also CT1600 144MHz transceiver, £80. E. Clayhon, Co. Durham. Tel: (01207) 590171.

Yupiteru MVT7000, 8-1300MHz, super wideband coverage, 200 channel memory, new March '94, hardly used, absolute bargain, still boxed, includes NiCad charger, £220. Tel: Rochdale (01706) 46023.

Yupiteru MVT7100 scanner, as new, only five months old, £160. Tel: Leicester (0116) 2387255 after 5pm.

Yupiteru MVT7100, boxed, hardly used, so as new, mains adapter, also Sky Scan desktop antenna, £325 the lot. Will deliver 20 mile radius. Tel: Gos (01635) 751021 (day).

Yupiteru VT-1251 v.h.f. airband scanner, all accessories, power supply, charger, NiCads, manual, in v.g.c., £95 plus postage, Tel:Watford (01923) 680732.

Yupiteru VT225 civil, military and Marine band scanner, boxed, as new with NiCads, charger and leatherette case, guaranteed May '95, £170. Reg. Timmins, Derby. Tel: (01332) 702094.

Wanted

Buying collections of QSL cards, pennants, souvenirs from worldwide radio stations. Send lists of cards including station and year acquired and any other items. Will reply with an offer. Kenneth Chorle, 43 South Oak Drive, Beaver Falls, PA 15010, USA.

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<td>400.005-520.000</td>
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