FOR THE RADIO LISTENER

short wave magazine

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EDITOR: Dick Ganderton, C. Eng., MIEE, G8VFH
ASSISTANT EDITOR: Kevin Nice, BRS95787
EDITORIAL ASSISTANT: Zoë Shortland
ART EDITOR: Steve Hunt
LAYOUTS: Richard Gale

EDITORIAL
Arrowsmith Court, Station Approach, Broadstone,
Dorset BH18 8PW
Telephone: (01202) 659910
Facsimile: (01202) 659950

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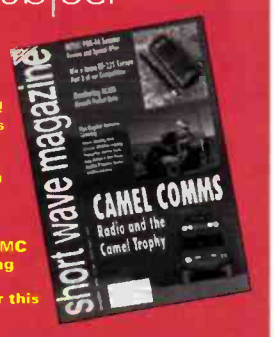
ADVERTISEMENT MANAGER
Roger Hall G4TNT
Telephone: 0171-731 6222
Facsimile: 0171-384 1031
Mobile: (0850) 382666

ADVERTISEMENT DEPARTMENT(Broadstone)
Lynn Smith (Advertisement Sales)
Ailsa Turbett G7TJC (Advertisement Production)
Telephone: (01202) 659920
Facsimile: (01202) 659950

Cover Subject

No, *Short Wave Magazine* has not turned into a rallying publication! The Camel Trophy is an annual event for 4-wheel drive, off-road vehicles and in this issue Richard Diamond G4CVI describes the adventures of the SMC Team while providing the essential radio communications for this gruelling event.



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Components for SWM Projects

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

The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF. Tel: 021-353 9326

Back Numbers and Binders

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).

Binders, each taking one volume are available for £5.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

Orders for back numbers, binders and items from our Book Service should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW,** with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Broadstone (0202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Poole (0202) 659950.

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 dilema 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 (EI5GQ) 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 'securite' '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.

On some merchant vessels carrying only one radio officer, there is an auto-alarm designed to respond to any consecutive four out of twelve four second dashes in c.w. After the alarm is triggered, the SOS signal is transmitted.

No, Mr Mitchell, the assumption that seems to have crept in that Morse is obsolete has not yet reached the international maritime community, where great reliance is still placed upon the mode in spite of some ship owners installing satellite equipment on their ships in order to be able to sail without a Radio Officer. In an emergency, I know what system I would prefer.

David Clarke
Seaford
East Sussex

Dear Sir

I had the unfortunate experience of attending the Amateur Radio Show at the Granby Halls venue on October 21st.

My wife and I were looking forward to an interesting day out, only to have the enthusiasm 'kicked in the head' when we arrived at the shambles that are 'Granby Halls'!

How, Leicester City Council have the audacity to let out such a dirty, stinking, so-called exhibition hall is beyond me!

Parking? To be charged £1 for the privilege of parking my car on what appeared to be the 'Council Tip' really got up our collective noses!

To sum up my feelings, can I say that I have been thrown out of better places and have attended better run car boot sales!

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

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.

J. Ball
Wallington
Surrey

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

letters

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 MVT7100. I will return to that in a moment.

On the matter of ignorance, some years ago I spotted an ad in (somebody elses!) *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. This particular item definitely contravened 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 took delivery, 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 swamped 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 harmonics 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 29/1991*) 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.l.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 navigational 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 QRM 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 QRM. What do you, the readers, think the solution to this problem is?

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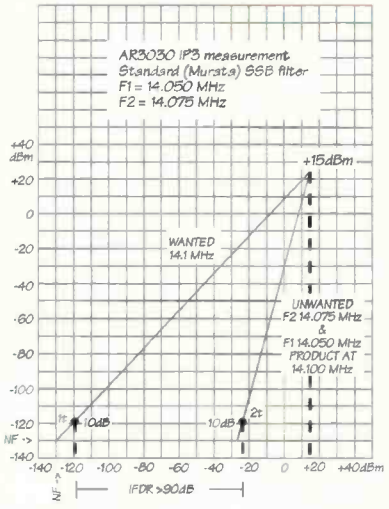
Collins Inside

*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: ● Frequency coverage 30 kHz ~ 30 MHz ● ALL MODE receive AM, S.AM, NFM, USB, LSB, CW & FAX with true carrier re-insertion ● 5 Hz DDS tuning ● Fully adjustable BFO on USB, LSB, CW & FAX ● 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 ~ 139.99999) and 2m HAM + MARINE (140 ~ 169.99999 MHz)

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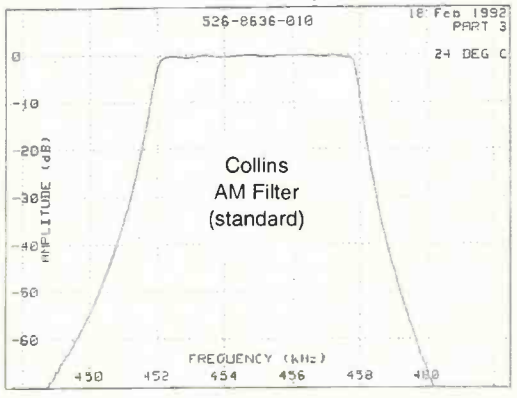
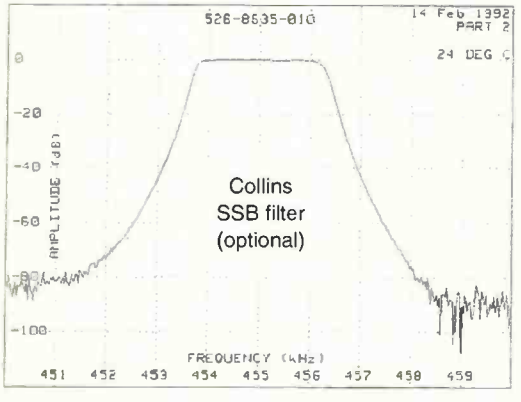
USB/LSB/FAX: 2.4kHz Murata ceramic filter (CFJ455K6). An optional Collins 2.5kHz/-3dB Collins eight resonator mechanical filter (526 8635 010 or 526 8694 010) of higher specification may be optionally fitted (workshop fitting) to replace the 2.4kHz filter.

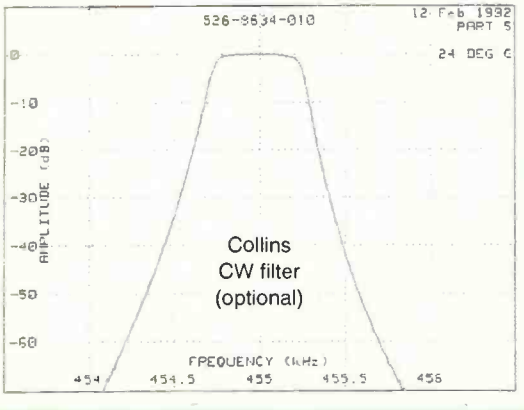
CW: 2.4kHz Murata ceramic filter in the Normal position. An optional Collins 500Hz/-3dB Collins seven resonator mechanical filter (526 8634 010 or 526 8693 010) may be optionally fitted (workshop fitting) in the Narrow position.

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

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







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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 straight-forward 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.

Readers' Questions

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 prove exactly how these signals are generated, but you 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 just 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 you 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.

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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news

Call Book on a disk

The latest edition of this electronic version of the UK amateur call book is now available in both DOS and Windows version both are priced **£14.00 plus P&P** the call book features callsigns up to, G0VHK, G7TTH, 2E1DKM and 2E0AIX. Installations requires 16Mb of hard disk space and MSDOS 3.3 or greater. Microsoft Windows 3.1 is required for the Windows version.

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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

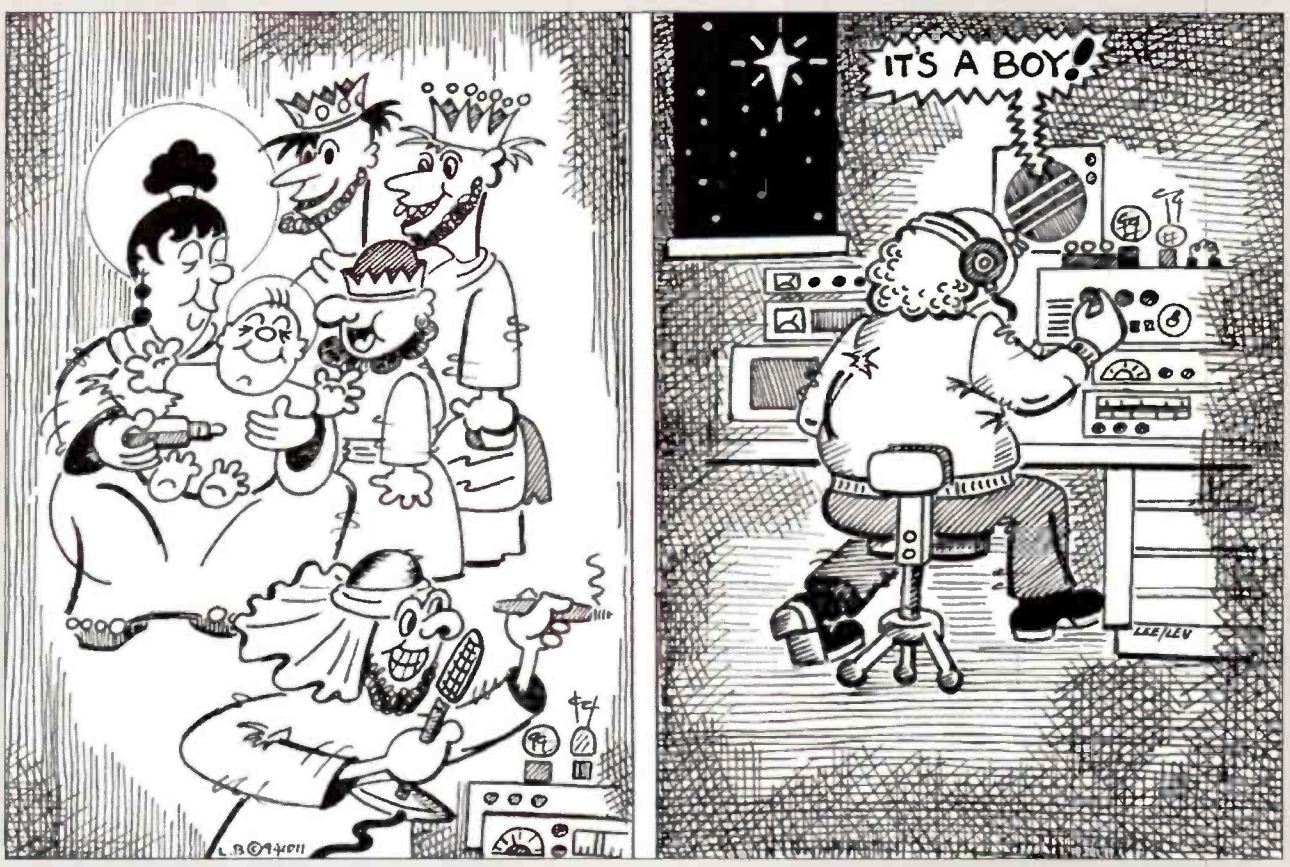
Holders of the Amateur Radio (Novice) Licence who are between the ages of 10 and 14 years will now be able to obtain a full licence, conditional on the following: The individual must be at least ten years old and must have held a Novice A or B class licence for minimum of a year. They must, of course, 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 Radiocomunications 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*



news

NATIONAL TRANSMITTER NEWS

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 take no 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 94.4MHz.

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 receive 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 CNNI 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) 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 privatise 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 Gaeilge' 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.

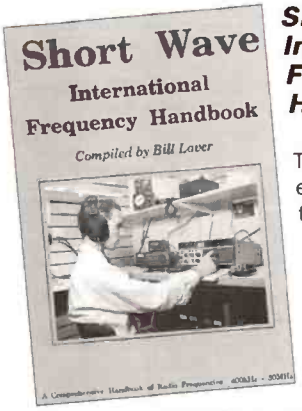
news

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 enquires regarding the club, ordering publications and as destination fro 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. **SWM Book Service, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, Tel: (01202) 659930.**

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.

new products

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, Rednall, 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 - G0LOV/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@smsltd.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 8-15V 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.**

grassroots

Club Secretaries:
Send all details of your club's up-and-coming events to: Lorna Mower, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Please tell us your County and keep the details as brief as possible.

* Short Wave Magazine & Practical Wireless in attendance

rallies

November 27: West Manchester Radio Clubs 'Winter Rally' will be held at the usual venue of the Bolton Sports & Exhibition Centre, Silverwell St., Bolton (town centre). All the usual trade stands (over 75) societies, Bring & Buy etc., all at pavement level, with facilities for the disabled. Bar and refreshments available all day. Doors open 11.00am, 10.30am for disabled visitors. Admission £1, children free. **Dave G1IOO** on **(01204) 24104 evenings only.**

***November 27:** The Bridgend District Amateur Radio Club are holding their radio rally at the Bridgend Recreation Centre, Bridgend. Doors open at 11am (10.30am for disabled visitors). Food and refreshments are available all day. There is also a large Bring & Buy and talk-in on S22. Morse tests are available all day (photo ID req.). Further details from **Mike GW7NIS** on **(01656) 722199.**

November 27: The Coulsdon Amateur Transmitting Society are holding their Radio & Electronics Bazaar at HQ4 Purley Scout Group, access via public car park in Lion Green Road, Coulsdon. There is a flea market, sale of new and second-hand equipment and a talk-in on G4FUR/P on S22. There will also be a lucky number raffle from admission ticket. Starts 10am to 1pm. **Andy Briers G0KZT** on **(01737) 557198.**

***December 11:** The Verulam Amateur Radio Club will be holding its Verulam Christmas Rally at the Watford Leisure Centre, which is located less than five minutes drive from the Junction of the M1 and M25 motorways. Trading will be from 10am to 4pm. **(01923) 222284.**

1995

January 28: The Lancastrian Radio & Computer Rally is being held at the University of Lancaster. There will be all the usual traders, refreshments, a bar and a Bring & Buy. There is excellent access to this rally, five minutes from either Junction 33 or 34 on the M6. Admission is £1. Doors open at 10.30am for the disabled and 11am for everyone else. Further details from **Sue** on **(01524) 64239.**

February 5: The South Essex ARS Radio Rally is being held at The Paddocks, Long Road, Canvey Island, Essex, (The Paddocks is located at the end of the A130). Doors open at 10.30am. Bring & Buy, trade stands and home made refreshments are available. Talk-in on S22. Admission is £1. Free car parking. **Roger G0LTO** on **(01268) 693786** or **Ken** on **(01268) 755350.**

February 12: The 4th Northern Cross Rally is being held at Rodillian School on the A61 between Leeds and Wakefield (near Jn. M1/M62). Doors open at 11am (10.30am for disabled visitors and Bring & Buy). £1 entry. There will be the usual dealers and groups, a bar and refreshments plus a Morse test on demand with two passport photos. Talk in on 144 and 430MHz. **Dave Gray** on **(0113) 2827883.**

February 25: The 10th Rainham Radio Rally is to be held at the Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent ME8 0BX. It is very easy to find from Jn. 4 of the M2 motorway the A278 or from the A2 from Rainham. Doors open at 10.00am, 9.30am for disabled visitors. There will be the usual trade stands, plus a few new ones selling computers. Many special interest groups will be represented, ie. RAYNET, RNARS, Packet, KRGroup and Kent TV Group. There is also a talk-in on S22 GB4RRR, a Bring & Buy, licensed bar, and snacks and refreshments also available with somewhere to sit and eat. Admission is £1, children under 14 free. Further info. from **Martin G7JBO** on **(01634) 365980** any reasonable time.

***March 11/12:** The London Amateur Radio & Computer Show will be held at Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9. Doors open at 10am to 5pm each day. There will be a trade show, lectures, Bring & Buy, on-demand Morse tests, disabled facilities, bars, restaurants, special interest groups and ample free parking. For further information you can contact **Steve White G3ZVW** on **0181-882 5125.**

March 12: Wythall Radio Club will be holding their annual Radio Rally at Wythall Park, Silver Street, Wythall (near Birmingham, on the A435, just two miles from Junction 3 on the M42). Doors open at 10.30am to 4pm. There will be the usual traders in three halls, a marquee, a bar and refreshments and a Bring & Buy stall run by the club. Talk-in on S22. Admission only £1. **Chris G0EYO** on **0121-430 7267.**

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off. The Editorial staff of *SWM* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct.

Editor

AVON
Bristol International RC: Tuesdays, 8pm. The Fighting Cocks Public House, Hengrove. All visitors are welcome. The club has been formed so that all radio enthusiasts, whether they be Licensed Amateurs, s.w.l.s or CBers can get together and have a good natter and do things that you do in radio clubs. PO Box 28, Bristol BS99 1GL.

RSGB City of Bristol Group: last Tuesdays, 7pm. New Friends Hall, Purdown, Bell Hill, Stapleton, Bristol BS16 1BG. November 29 - Construction evening, December 13 - Christmas social. Dave. (0117) 9672124.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. November 30 - Magazine exchange or for table rally next year, December 7 - 20m DX RX evening, 14th - Christmas social. For more information ring (01275) 834282 on a Wednesday evening.

DERBYSHIRE
Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. Mrs Hayley Winfield, 2 Hilts Cottages, Crich, Matlock, Derbyshire DE4 5DD. November 30 - Where have all the carbon granules gone? by Martin G7MKS, December 5 - Amateur TV group meeting, 7th - Junk sale, 14th - Constructors contest. (01773) 856904.

DEVON
Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. December 16 - TARS Christmas party. Peter G4UTO. (01803) 864528.

DORSET
Dorset Police ARS: 1st and 3rd Thursday at Force HQ at 7.30pm. December 1 - Club project update, 15th - Christmas do. (01202) 229351.

FIFE
Dundee ARC: Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. November 29 - ATC area control by Mike Dalrymple GM4SUC, December 6 - Construction night, 13th - The RSGB and its' committees by Ian Stuart GM4AUP (President of RSGB) and Frank Hall GM8BZX (Zone G council member). GM4FSB, 30 Albert Crescent, Newport-on-Tay, Fife DD6 8DT.

GRAMPIAN REGION
Aberdeen ARS: Fridays, 8pm. Queen Mother House, Aberdeen. November 25 - AGM, December 2 - Junk sale, 16th - Festive Cheer. Gordon Stuart GM7PXW. (01224) 780591.

GREATER LONDON
Crystal Palace & DRC: 3rd Saturdays, 7.30pm. All Saints Church Parish Rooms, Beulah Hill, London SE19. December 17 - Christmas party and video/film show. Wilf G3DSC on 0181-699 5732 or Bob on (01737) 552170.

Edgware & DRS: Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. November 24 - Morse training evening, December 8 - The great Edgware annual junk sale. Rod Bishop. 0181-204 1868.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. November 25 - Microwaves by G0OLX, December 9 - Xmas social. 0181-540 2180.

HAMPSHIRE
Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. December 1 - Video evening. S. Swain (01705) 472846.

HEREFORD & WORCESTER
Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. December 13 - Technical topics/talk. Barry Taylor. (01527) 542266.

HERTFORDSHIRE
Hoddesdon RC: 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, Kechill Gardens, Hayes. December 13 - Christmas party. A Messenger. 0181-777 0420

Medway AR & TS: Fridays, 7.30pm. Community Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. November 24 - Annual general knowledge quiz evening at BRATS, QTH (Parkwood), December 9 - Amateur television by Peter G4LXC, 16th - Christmas social. George Packham. (01634) 685585 or Alan Stanley. (01634) 201462.

West Kent ARS: 1st and 3rd Fridays. The School Annex, Camden Road, Tunbridge Wells. December 16 - Xmas party. John Taylor G3OHV. (01892) 664960.

NORFOLK
Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. November 30 - Informal annual dinner. Mike G4EDL. (01603) 789792.

NOTTINGHAMSHIRE
Mansfield ARS: 2nd Mondays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. December 5 - Christmas party. Howard G1JGY. (01623) 423697.

OXFORD
Oxford & DARS: 2nd and 4th Wednesdays, 7.45pm. The North Oxford Grove House Club. Terry Hastings G0CFN. (01865) 863526.

SOMERSET
Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. November 24 - Club station on the air and committee meeting, December 1 - The 'Coker' transmitter by G3PCJ, 8th - Quiz night, 15th - The 'Coker' transmitting testing by G3PCJ. Cedric White, QTHR. (01258) 473845.

SUFFOLK
Haverhill & DRC: 2nd Mondays, 7.30pm. Samuel Ward Upper School, Chalkstone Way, Haverhill. December 12 - Pre-Christmas social evening. Rob Proctor G4PZW. (01440) 704637.

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 related to amateur radio, 20th - Natter & noggin night. Tony Harman G8LTY. (01787) 313212

WARWICKSHIRE
Mid Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St. Johns HQ, Warwick Div., 61 Emscote Road, Warwick. December 13 - Christmas meeting. Don on (01926) 424465.

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. November 28 - Microphones by Jack Cluley G4YIG, December 12 - Open house/night on the air - visitors most welcome. Mr A Beasley G0CXJ. (01608) 682495.

WEST MIDLANDS
Sandwell ARC: The Broadway, Warley. RAE class on Monday nights, Morse class on Wednesday nights and RAE Novice class on Thursday nights. Three operating shacks, h.f./v.h.f./u.h.f., Phone, c.w., RTTY, AMTOR, Packet, all bands. Talks, outings, contest and demonstrations. For further information please ring 0121-552 4619/0121-552 4902.

South Birmingham RS: West Heath Community Association, Hamstead House, Fairfax Road, West Heath, Birmingham. December 7 - Christmas party. Don Keeling. 0121-458 1603.

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 Air Ambulance by Ian Nichols, 11th - AGM. Ian Leitch. 0121-561 2884 (home) or (01902) 353522 ext. 2093 (office).

WILTSHIRE
Salisbury Radio & Electronic Society: Tuesdays, 7.30pm. 3rd Salisbury Sea Scout Hut, St Marks Avenue, Salisbury. November 29 - Planning for winter sports, December 6 - Oscilloscopes by Frank Mitchell G8PCB, 13th - Chrsitmas party, mulled wine and mice pies. J David Kennedy. (01722) 330971.

Trowbridge & DARC: 3rd Wednesday, 8pm. The Southwick Village Hall, Southwick, Trowbridge. December 7 - Christmas party and presentations. Ian G0GRI. (01225) 864698.

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 **LISTING 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! (line 100), 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 kiloherz, so any decimal part which you may enter is removed by rounding (line 140) to the nearest kiloherz.

Inter-grated Circuit IC3 has 16 switches, of which in this application only 12 are used. **Table 1.2** below shows which crosspoint switches are used and the equivalent keypad function.

Table1. 2

MC145100 Switch Number	Keypad
0	not used
1	1
2	2
3	3
4	not used
5	4
6	5
7	6
8	not used
9	7
10	8
11	9
12	not used
13	*
14	0
15	#

Program lines 220 to 250 ensure that the correct crosspoint switch is operated for the required digits 0 to 9 to be sent to the receiver. When entering frequencies below 3000kHz from the keypad, it is necessary to press # before frequency change takes place; lines 290 and 400 to 430 take care of that when frequency setting is done under control of the computer.

Referring to the circuit diagram, the data lines D0 to D3 from the computer port carry the crosspoint switch binary address (0 to 15) and D4 (binary 16) and D5 (binary 32) are the STROBE and DATA lines 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 appropriate 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 10, 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.

Fig. 1: An example of bank organisation.

Fig. 3: Expanded entry showing all fields.

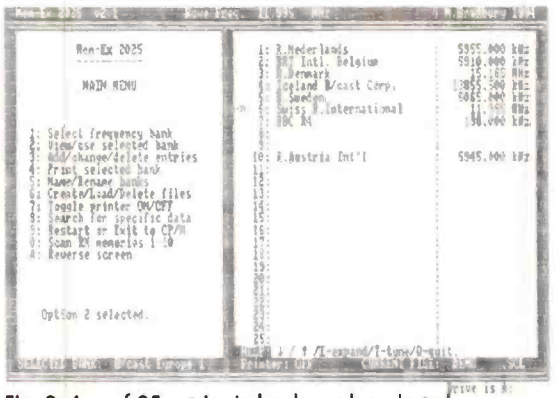


Fig. 2: Any of 25 entries in bank can be selected.

Fig. 4: A match found during a search.

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 computer 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. ■

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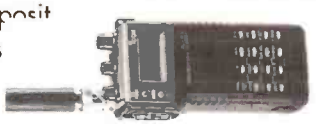

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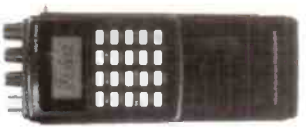

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LISTENING TO

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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 mugh 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.

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How

Roger Bunney gets his soldering iron out and builds himself an a.t.u.

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 impedence, 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 *á 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

es CTU8 ATU

matching into a receiver 50-75Ω input impedence 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 repeak 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 commerical 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,
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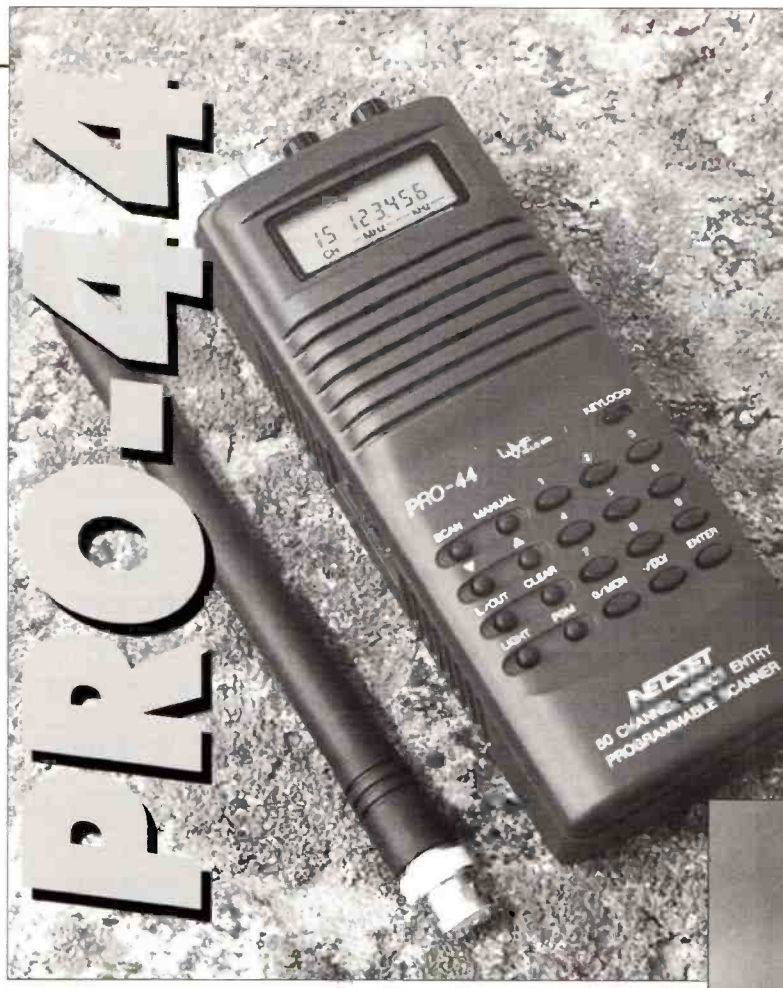
Tel: (01327) 60178.

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 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 re-chargeable 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 accidentally 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 afore mentioned 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 L/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 search 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.

Specifications

Frequency coverage:	68-88MHz (5kHz steps) 108-136.975MHz (25kHz steps) 137-174MHz (5kHz steps) 380-512MHz (12.5kHz steps)
Channels:	50 plus 1 monitor
Sensitivity:	68-88MHz, 137-174MHz & 380-512MHz 1.0µV for 20dB signal:noise 108-136.975MHz 2.0µV for 20dB signal:noise
Spurious Rejection:	50dB at 78, 124 and 154MHz
Selectivity:	-6dB ±10kHz, -50dB ±20kHz
I.f. Rejection:	50dB at 154MHz (10.7MHz i.f.)
Scanning/Search Rate:	16 steps/channels per second
Delay Time:	2 seconds
i.f. Frequencies:	10.7MHz and 455kHz
Antenna Impedance:	50Ω
Audio Power:	200mW
Speaker:	36mm 8Ω
Power Requirement:	+9V d.c. at 40mA (squelched)
Operating Temp:	-10°C to +60°C
Dimensions:	145 x 58 x 42mm
Weight:	250g

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 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. ■

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.

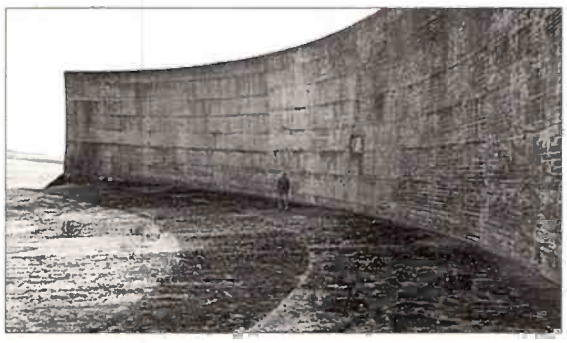
The PRO-44 is available from:
Haydon Communications, 132 High Street, Edgeware, Middlesex HA8 7EL.
Tel:0181 951 5781. My thanks to Mike Haydon for the loan of the review model.

Can You Hear This?

Acoustic Early Warning Trials

On a rather nostagic 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 seawards 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.



The massive concrete 'wall' at Greatstone.

A concrete listening bowl at Greatstone is a silent witness to some interesting experiments nearly 60 years ago.

The concrete 'wall' and one of the bowls at Greatstone.

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 it's microphone and connected to a centre; control room to co-ordinate whatever was picked up. Meantime a strange experiment was tried at Biggin Hill aerodrome in an attempt to produce a 'blind landing system'. With a concrete saucer 7m diameter mounted vertically and a Klaxon (facing the saucer) mounted at its focal point, the resulting sound blasting down the runway, a pilot in an open cockpit aircraft with all the wind and engine noise, was required to locate the 'sound beam' and fly towards it for landing. This had to be abandoned after three pilots crashed.

In 1929, a more serious approach was initiated with a bowl shaped mirror at Hythe and Greatstone. 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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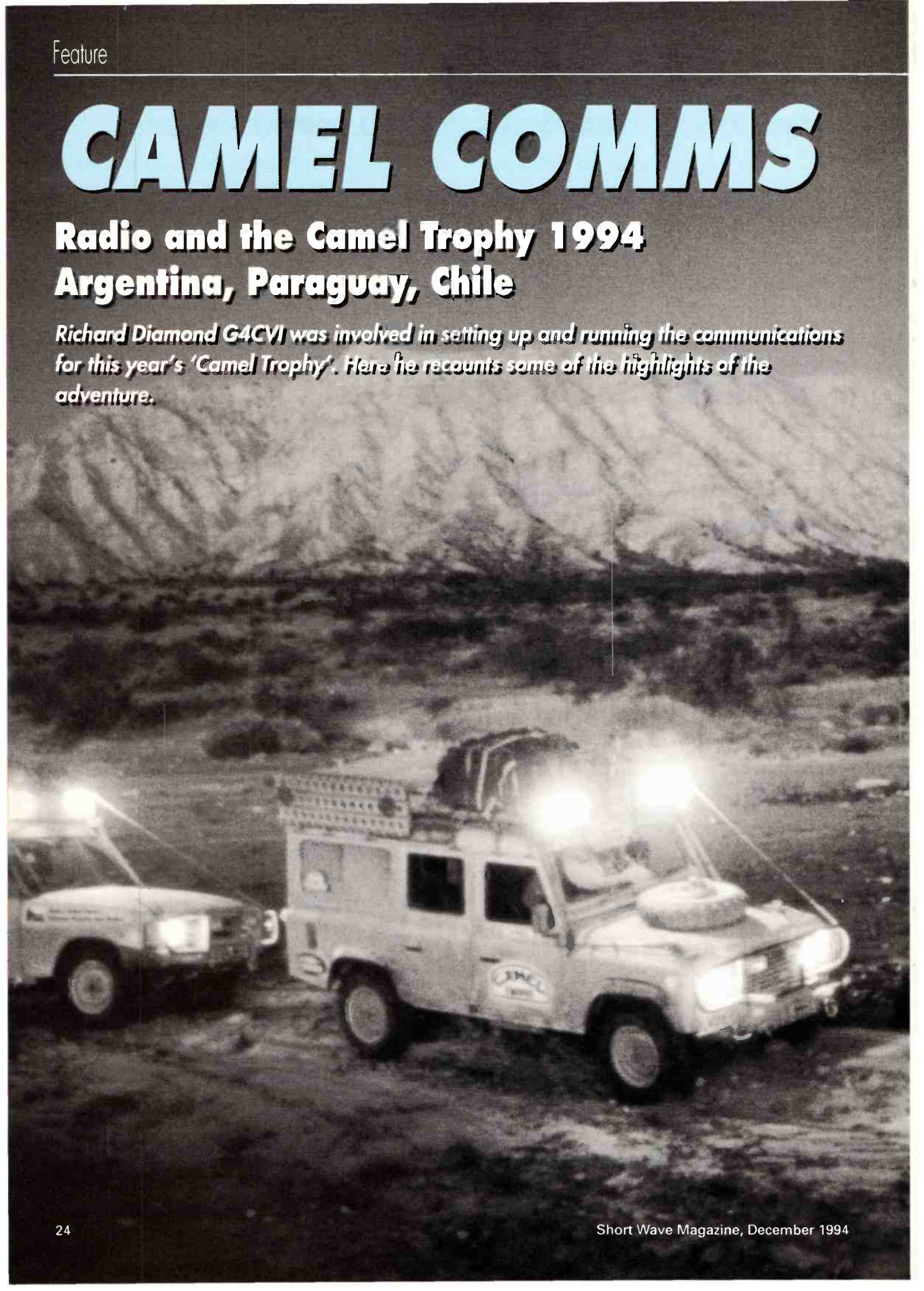
CAMEL COMMS

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.

CAMEL COMMS

The 1994 Camel Trophy started at Iguazu Falls in Argentina and finished on the Pacific coast of Chille just to the north of Mejillones.

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, transitted Paraguay, passed over the top of the Andes and finished at Hornitos, a small settlement on the Pacific coast of Chile 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 (Chile). 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/G0SMC 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.

However, a local Chilean company also reacted quickly and provided the panels with the minimum of delay. Having finally installed the repeater, the coverage was phenomenal, extending from the Chile/Argentine border over 160km away to the east and all the way up and down the Chilean Pacific coast for a similar distance. It was a real bonus for the commercial operation as it filled in that difficult h.f. gap of the first 160km.

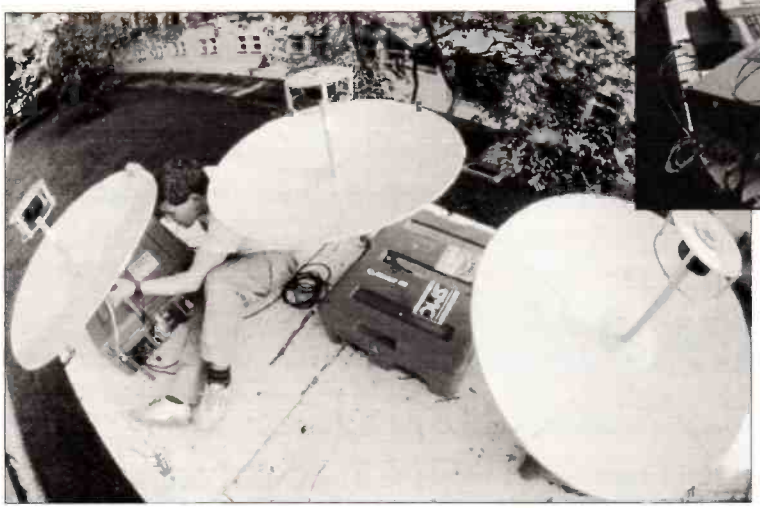
Back at CE/G0SMC Paul G4CCZ and Nic G3KOX set up the 24m trailer mounted tower with a Create 714X3 (40/20/15m) Yagi, a 6-element 50MHz Yagi and numerous wide antennas for 1.8, 3.5 and 5.5, 7.0, 9.0, 14, 21 and 28MHz, later a Cushcraft A3WS for the WARC bands was added but only after operation from LU/G4SMC ceased.

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 Chile by a chartered 737 aircraft. During the move, communications to the convoy of Landrovers was

Mike Devereaux G3SED and Richard Mumford G8SVC manning the Iguazu Falls base station.

Adjusting one of the INMARSAT-A satellite links.



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 G8SVC who manned a Yaesu FT70 h.f. manpack transceiver and two INMARSAT satellite fax transceivers from the train!

Having a G8 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, but the window was only 15-30 mins long, on his first attempt to work Europeans he joined a DX net and was only able to complete a couple of QSOs due to the unnecessary ramblings of several operators. Later he found that going it alone produced an increase of 20 times the QSO rate - interesting, don't you think?

Another significant observation from Mike was that during one of these windows he was listening to two DXers at good strength who were chatting to each other and commenting on the total lack of DX on the band. What's more, they made no attempt to listen between overs! Consequently, 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 used trying to convince the DXers that he really was in Chile!

It was also interesting to note that 7MHz was still open to Europe, at a reasonable strength, as late as 9am. The conclusion that we have drawn is that propagation is far better than most of us imagined and general observations rarely take into account the fact that the DX could be in bed!

Not so for Camel Trophy!

Even though we all knew that the solar cycle was at its worst, we took 6 metres to CE, with an FT650 and a 6-element Yagi. Nic G3KOX left his keyer on in beacon mode for days. Nothing whatsoever was heard and not one QSO was made!

The failure on 6 metres was further compounded by the FT650 going AWOL (absent without leave) at the end of the event.

Apart from the loss of the rig it created further problems as it had been promised on loan to the JY 6m Expedition that Mike, Nic and Paul were all due to participate in just a few weeks later.

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 p.t.t. line 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 PP8ZCB - the QSL route is via G4SMC, SM House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO53 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. ■

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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 link as the ground transmission are relatively low powered. However, most of the aircraft using the system are operating in airways or upper airways, and consequently provide strong signals over a very wide area. Any reasonable a.m. airband radio or scanner should be capable of receiving ACARS, although it may be necessary to use an outside aerial for best results. The squelch control on the radio must be turned completely off, as otherwise the transmission burst will be nearly over before the squelch opens!

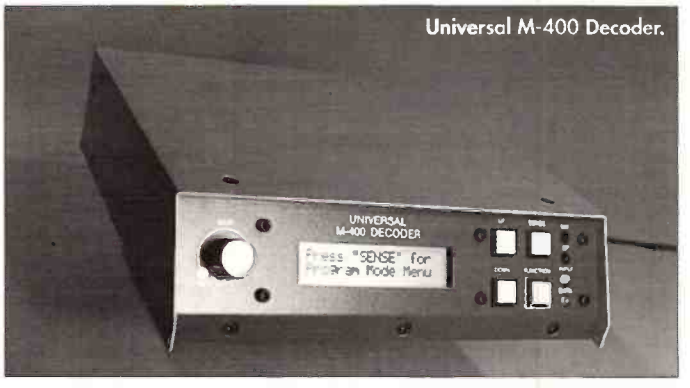
You will then need a suitable decoder plus a display device. ACARS is a very specialised and high speed data mode, and only decoders that have been specially designed for it will be able to function. Currently the only devices available are three general purpose data decoding models manufactured by Universal 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 reveiw 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.



Universal M-400 Decoder.

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

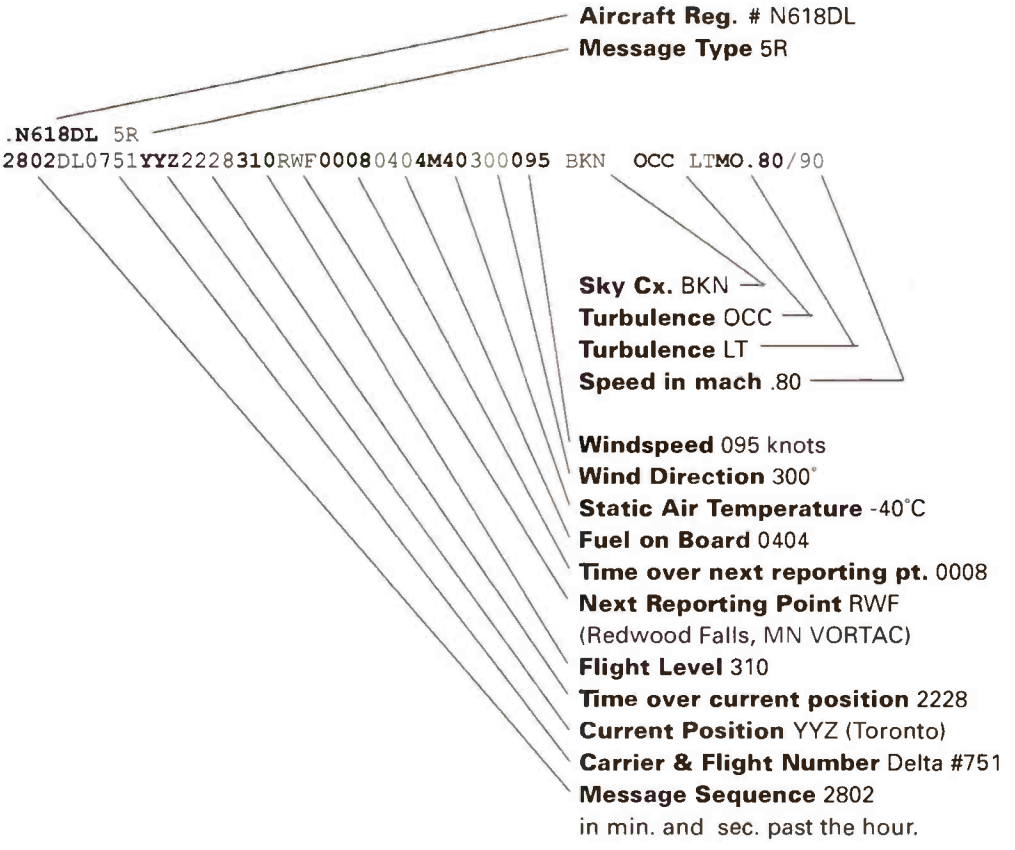
ACARS was primarily designed for use with v.h.f. a.m. It has also been used experimentally via h.f. and satellite links, and it is likely that there will be future expansion in this area. Various manufacturers of GPS equipment are also bringing out economy airborne avionics that use ACARS in conjunction 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.



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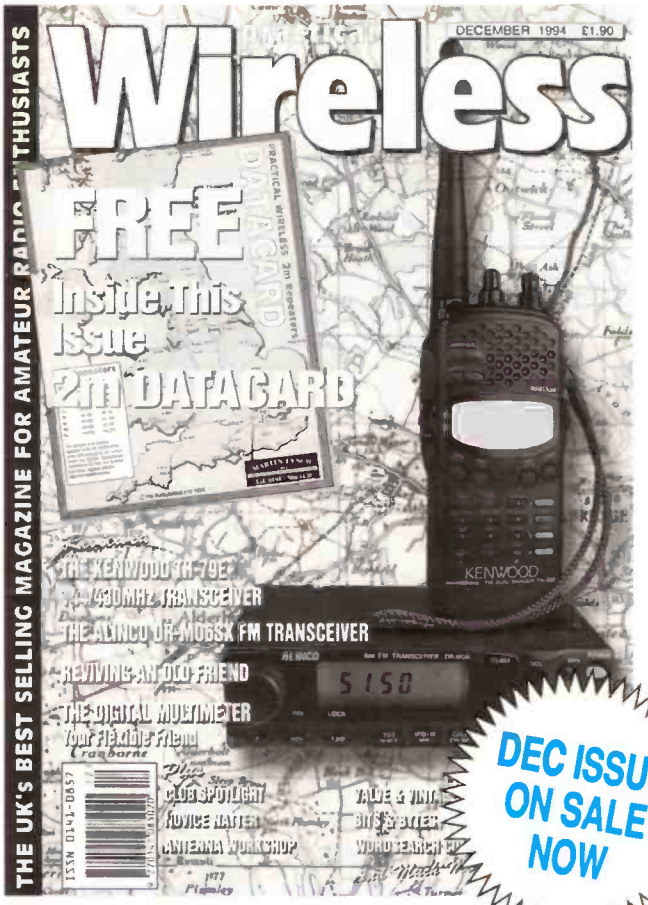

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Martelec JVF1

Considering WXSAT reception or thinking of using JVFAX? then read on. Our Info in Orbit columnist Lawrence Harris investigates the Martelec JVFAX interface, which allows you do both.

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 l.e.d. indicator labelled Tuning, and a Mode display, consisting of 8 l.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

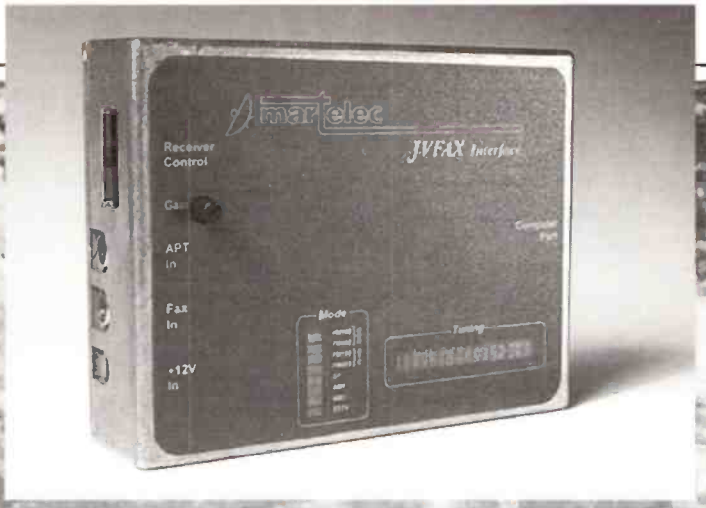
The unit was connected to COM1 (my mouse's port). This has an address (location in the computer's RAM) of 03f8h, so this figure should be checked during configuration of JVFAX. This process is adequately detailed in the notes. You may prefer to use COM2 (your second serial port - where fitted), in which 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 l.e.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 notes (which date back to the mid-80s), I reduced the output signal level from the receiver. This allowed me to increase VR1 - obtaining a sensible spread of black-and-white in the signal.

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 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. Doppler shift on the satellite signal may produce a tilted image, but there is provision for compensation within JVFAX. Initial adjustment is made via the '/' keyboard character; a line appears on the screen, and slope adjustment allows correction of the new image. A second adjustment should complete this correction, producing a straight edge. The use of the 'roll' option can reposition the picture edge in the correct place. These adjustments are software related, rather than being a function of the hardware unit, so full setting up of the combined system is necessary to obtain the highest quality images.

Quality Image

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.

With hardware adjustments made (and fixed), a typical METEOR pass will show land as dark areas, so you may wish to enhance images post-pass. This is done without difficulty, using the enhance feature in edit mode - but again, it is software related, rather than a function of the interface unit.

Much of the initial signal conditioning is performed by the interface, and removing the box cover shows the internal circuitry which performs the conditioning. The immediate benefit of this processing is that slower computers could be used with JVFAX, yet still obtain high quality pictures. Much of the workload is done by this unit, hence the need for the power supply.

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 Sytems, The Acorns, Wyck Lane, East Worldham, Alton, Hants GU34 3AW. Tel: (01420) 82752** for providing the review unit.

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Be a RadioScience Observer Part 2

Using Radio Receivers To Make Scientific Observations

Joseph J. Carr, B.Sc., M.S.E.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. short wave 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 312). Some modern short wave general coverage receivers operate down to 30kHz (e.g. the Lowe HF-150 and HF-225 models).

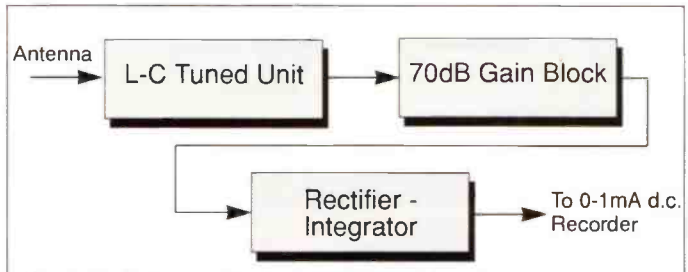

Fig. 1: Block diagram for the AAVSO-SD v.l.f. receiver.

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

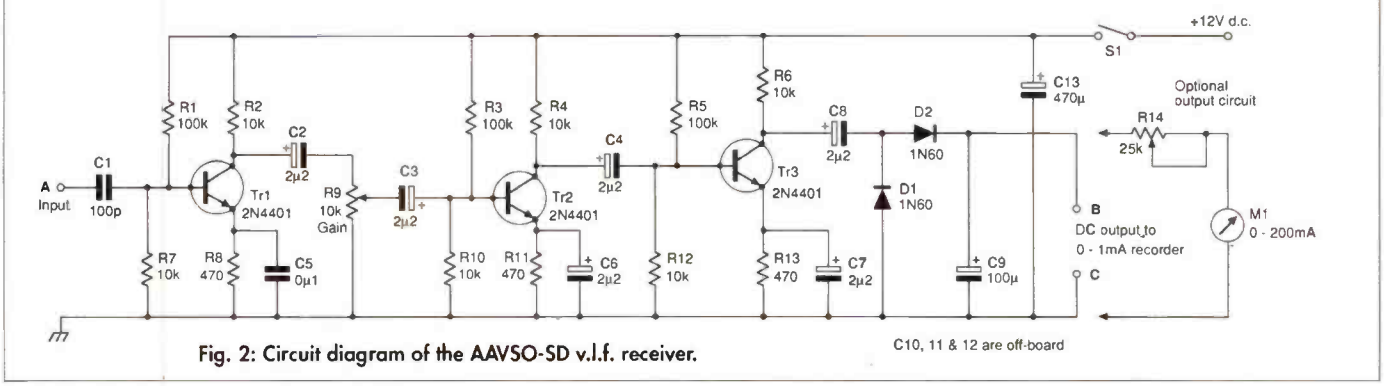

Fig. 2: Circuit diagram of the AAVSO-SD v.l.f. receiver.

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 70dB gain block and rectifier-integrator is shown in **Fig. 3a**, while its component layout is shown in **Fig. 3b.** The LC resonant circuit is mounted off-board, or on a separate piece of Vero-board.

The LC tuned circuit for a v.l.f. receiver can be a bit of a problem, especially at the lower end of the v.l.f. region (SID hunters like the 20-40kHz region). The original Stokes design used some J.W. Miller coils that are no longer manufactured, and Art Stokes' supply is exhausted. Others have used television horizontal oscillator coils (the kind used before digital circuits took over); in the USA these coils operate at 15.734kHz , so are a good bet. Still others have used the 40kHz coils used in older remote garage door openers and ultrasound intrusion detectors.

Another popular approach to the LC tuned circuit, shown in **Fig. 4**, is to use 88mH toroidal telephone inductors. 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 2BR, UK) order code FF39N capacitor is suitable. Alternatives include the Maplin FF50E (300pF), 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 68mH 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 56mH adjustable coil, and TK4423 for the 68mH fixed 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

Frequency (kHz)	Callsign	Output (kW)	Location
15.10	HWU	250	LeBlanc, France
16.00	GBR	60	Rugby, England
16.40	JXN	100	Noviken, Norway
16.80	FUB	250	Paris, France
17.10	UMS	1000	Moscow, Russia
17.40	NDT	50	Vosami, Japan
18.10	-	-	Russia
18.50	DHO	35	Flensburg, Russia
19.00	GQD	500	Anthorn, England
19.60	GBZ	350	Criggons, England
20.27	ICV	100	Tavolara, Russia
21.40	NSS	400	Annapolis, MD
22.30	NWC	1000	Exmouth, Australia
23.00	UTR3	-	Russia
23.00	UQC3	-	Russia
23.10	-	-	TACAMO (airborne)
23.40	NPM	600	Lualualei, Hawaii
24.00	NAA	1000	Cutler, Maine, USA
24.80	NLK	125	Jim Creek, WA, USA
25.00	UTR3	-	Russia
25.00	UQC3	-	Russia
25.10	UTR3	-	Russia
25.10	UQC3	-	Russia
25.50	UTR3	-	Russia
25.50	UQC3	-	Russia
26.10	NPG	1000	San Francisco
26.10	-	200	TACAMO (airborne)
27.10	-	200	TACAMO (airborne)
28.50	NAU	100	Aquada, Puerto Rico
30.60	NPL	500	San Diego, CA, USA
40.00	JG2AS	10	Chira, Japan
44.00	VHB	200	Belconnen, Australia
46.25	DCF46	-	Mainfligin, Germany
48.50	NXL(?)	110	Jim Creek, WA, USA
50.00	MA50	7	Poderady,Czech Rep.
50.00	RTZ	-	Irtutsk, Russia
51.60	NSS	200	Annapolis, MD, USA
51.95	GYA	60	London, England
53.50	-	-	Norway
54.05	NBA	50	Balboa, Panama
55.50	GKH	100	Thurso, Scotland
56.50	NPG	-	Dixon, CA, USA
60.00	MSF	50	Rugby, England
60.00	WWVB	13	Ft. Collins, CO,USA
61.55	-	-	NATO
62.60	-	-	France
65.80	FUE	15	Brest, France
66.66	RBU	80	Moscow, Russia
68.00	GBY20	80	Rugby, England
68.90	XPH	25	Thule, Scotland
71.00	-	2.4	Klenmond (Europe)
73.60	CFH	250	Halifax, Nova Scotia
75.00	HBG	20	Prangins, Switzerland
76.20	CKN	50	Vancouver, B.C., Canada
77.15	NAM	50	Norfolk, VA, USA
77.50	DCF77	50	Mainflingen, Germany
82.75	MKL	40	Petreavie, Scotland
83.80	FTA83	45	St. Andre de Coroy, France
85.00	-	2.4	Toww River (Europe)
88.00	NSS	50	Annapolis, MD, USA
91.15	FTA911	50	St. Andre de Coroy, ..France
113.00	-	2.4	Piquetterur (Europe)
119.85	NPG	50	Dixon, CA, USA
122.50	CFH	15	Halifax, Nova Scotia
124.00	CKN	-	Vancouver, BC, Canada
127.00	-	2.4	(Europe)
128.25	NPL	-	San Diego, CA, USA
131.05	FUF	2	Martinique
133.15	CFH	15	Halifax, Nova Scotia
134.00	NSS	100	Annapolis, MD, USA
135.95	NPG	50	Dixon, CA, USA
137.00	CFH	-	Halifax, Nova Scotia
146.10	NPM	20	LuaLualai, Hawaii
148.20	NPL	25	San Diego, CA, USA

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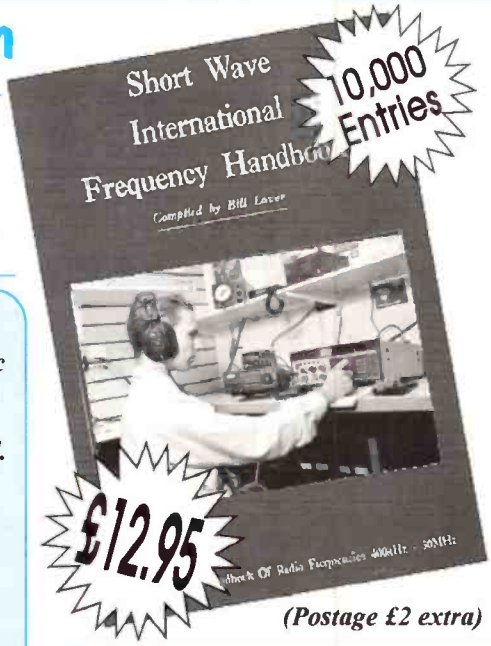

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SID hunters who live near a.m. l.f. or m.w. broadcast stations, or where the v.l.f. signals are rich in number and strength, may prefer to use the optional tuning circuit shown in **Fig. 6a**. This circuit uses a double-tuned LC tank circuit arrangement, 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 100μH 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,

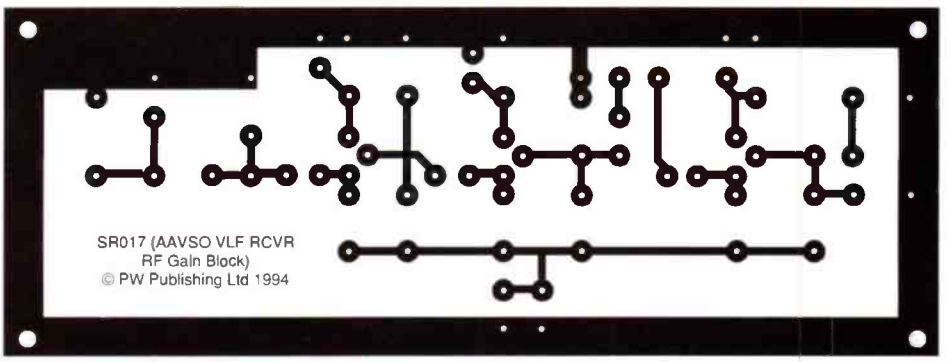
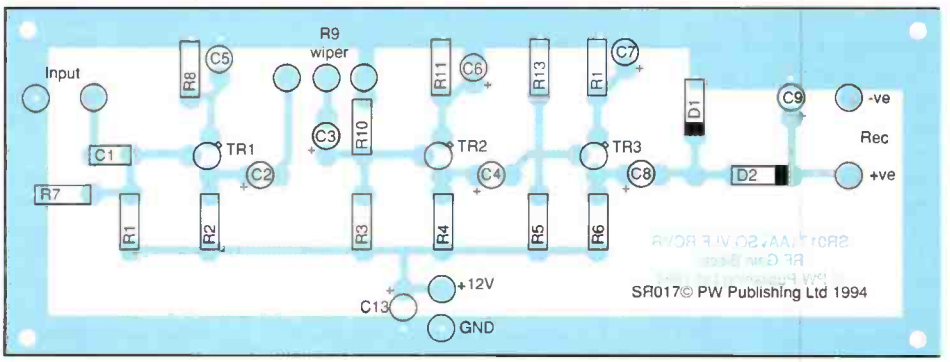


Fig. 3a: Full-size copper track pattern for the circuit in Fig. 2.
Fig. 3b: Component placement.



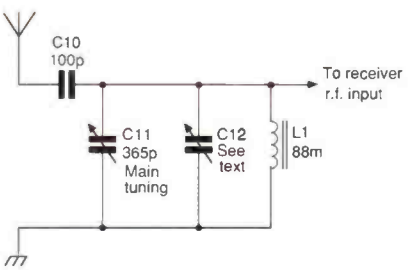


Fig. 4: LC tuned circuit for v.l.f. using 88mH toroid as the inductor.

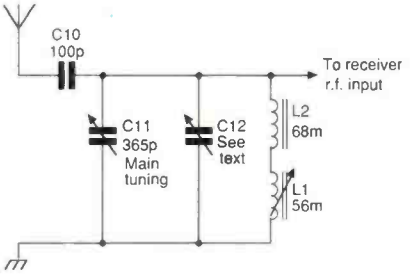


Fig. 5a: Using two coils in series, one fixed and one variable, for the v.l.f. tuned circuit.

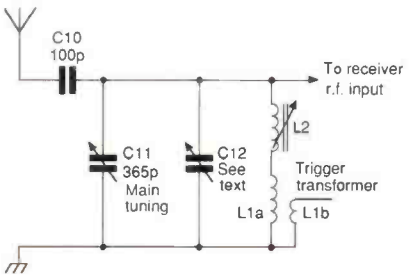


Fig. 5b: A xenon tube trigger transformer used to provide a low impedance.

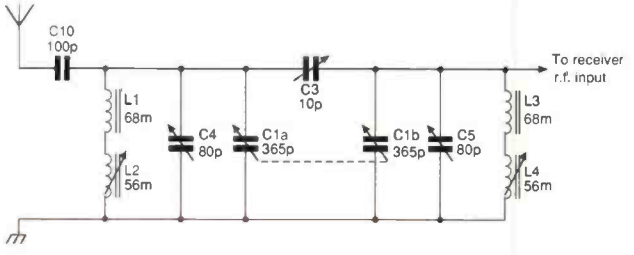


Fig. 6a: Double-tuned circuit for v.l.f. receiver.

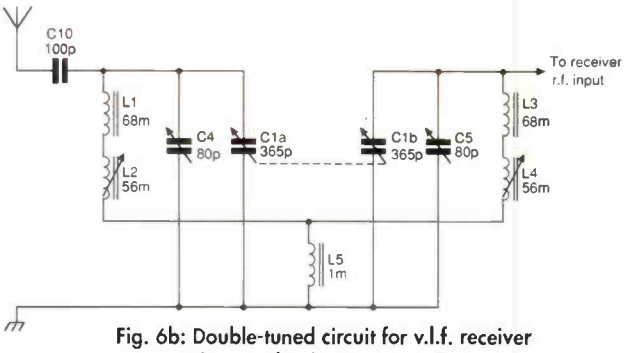


Fig. 6b: Double-tuned circuit for v.l.f. receiver with mutual inductance coupling.

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 by enough 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.

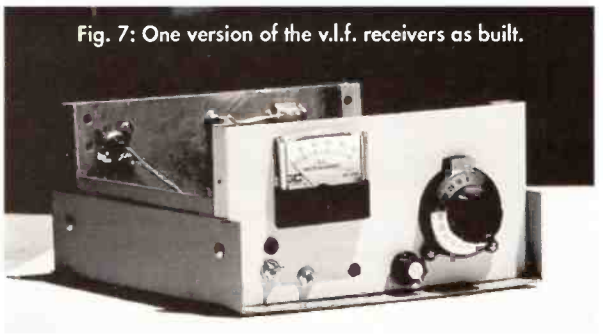


Fig. 7: One version of the v.l.f. receivers as built.

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.l.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

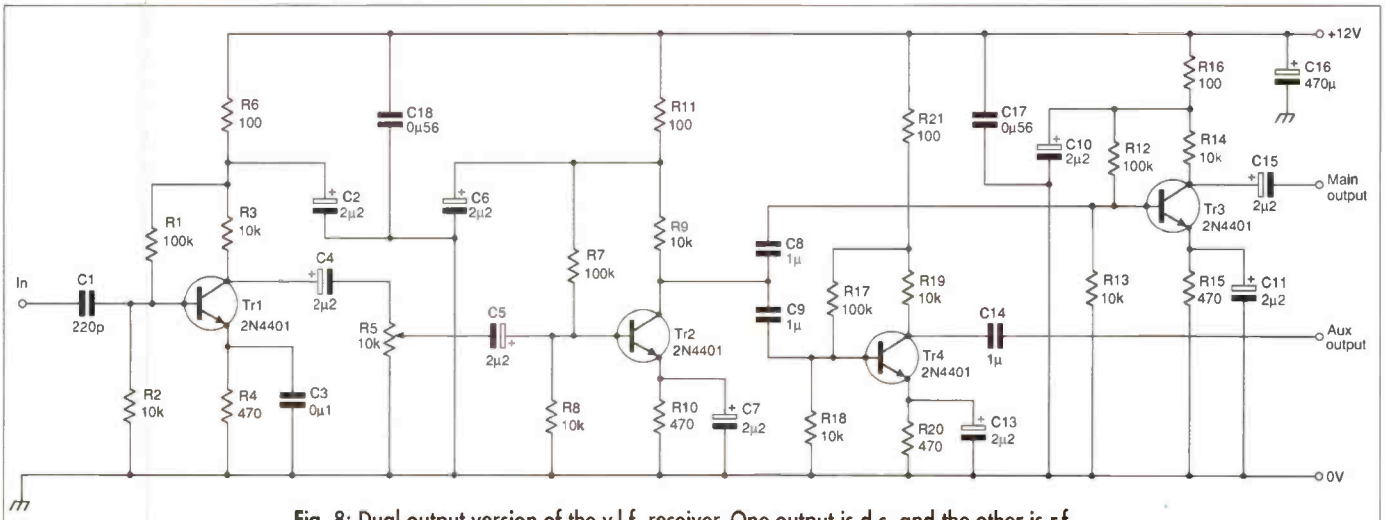


Fig. 8: Dual output version of the v.l.f. receiver. One output is d.c. and the other is r.f.

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, R21, 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

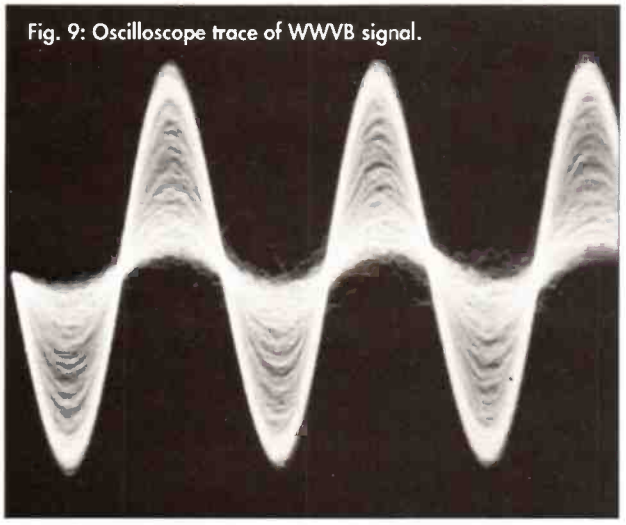


Fig. 9: Oscilloscope trace of WWVB signal.

complain that the tuning is too heavily damped with the 220µF 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-

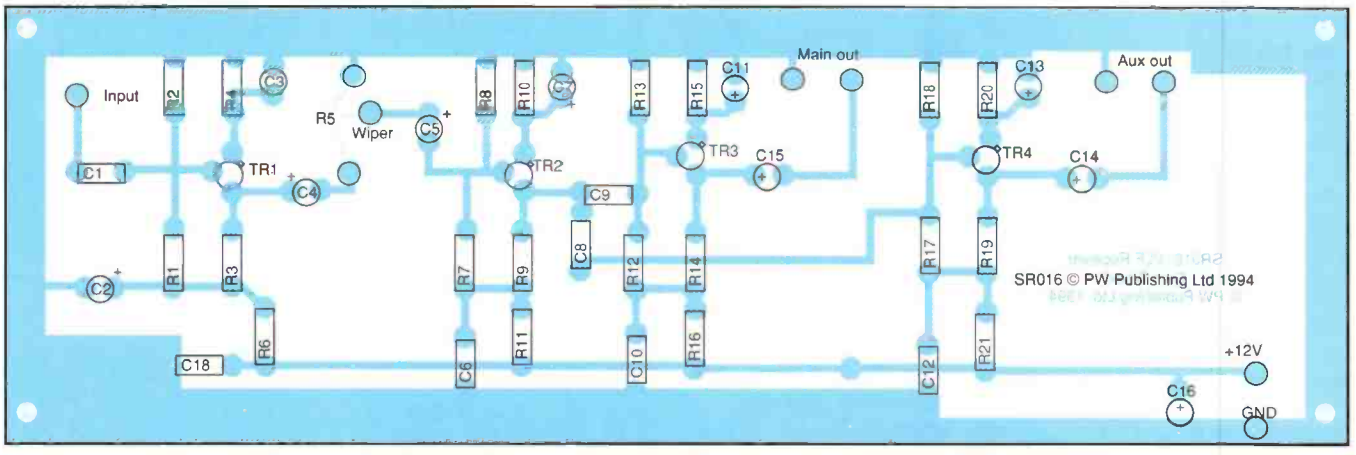
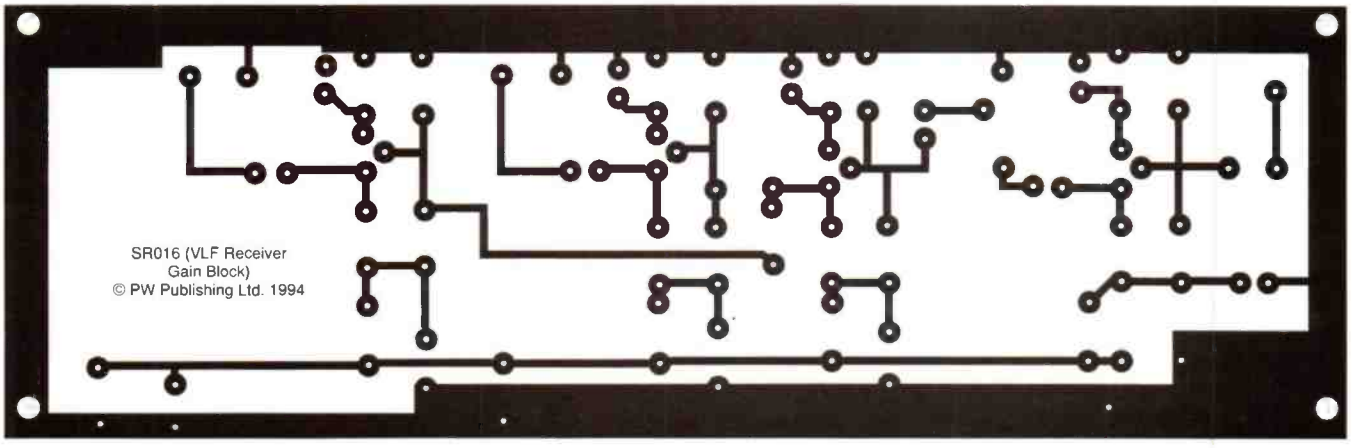


Fig. 10: Full-size copper track pattern for the circuit in Fig. 8.



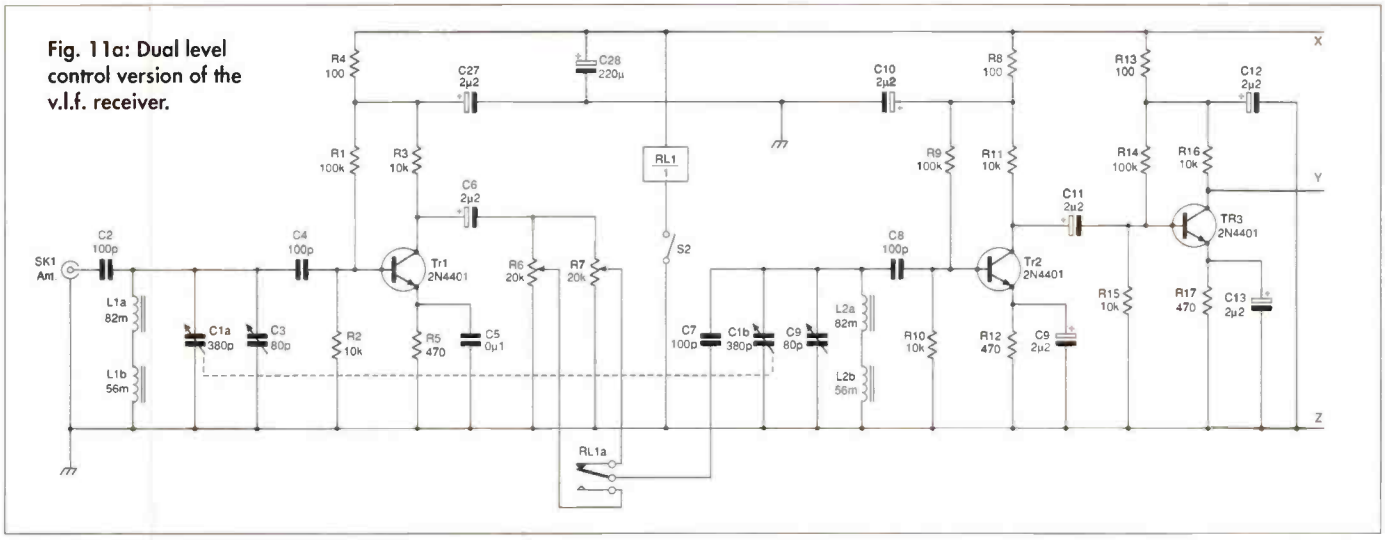


Fig. 11a: Dual level control version of the v.l.f. receiver.

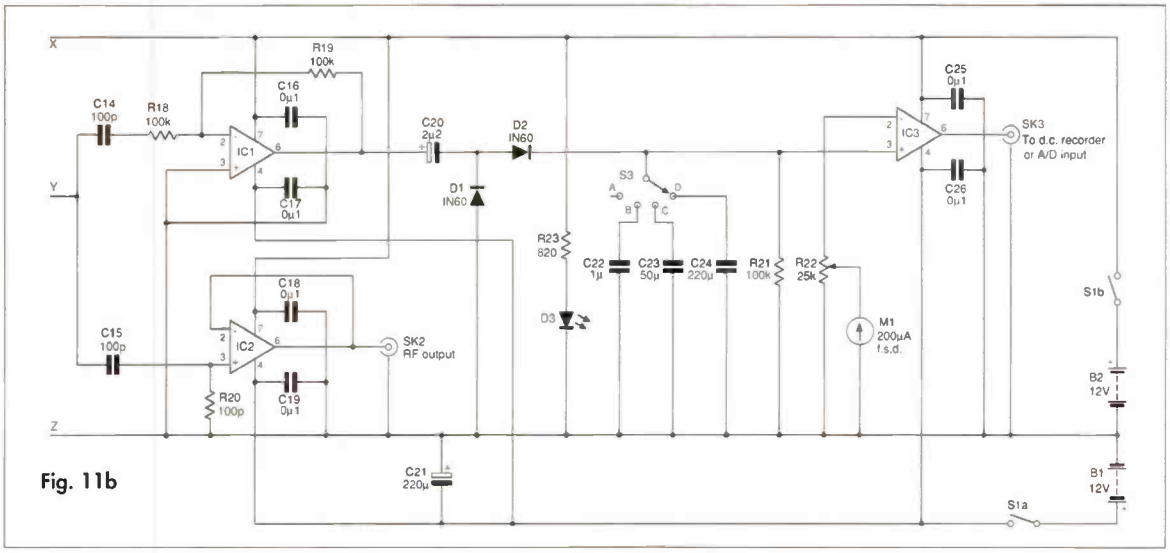


Fig. 11b

30kHz region. It will also provide some protection against TV/VCR horizontal oscillator noise, especially if the directivity 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. ■

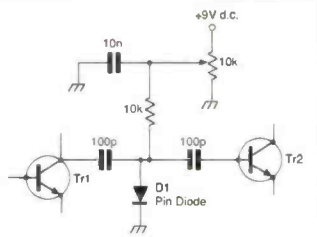


Fig. 12: PIN diode attenuator replacement for the potentiometer level control.

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

%	per cent
a.m.	amplitude modulation
A/D	analogue to digital
d.c.	direct current
dB	decibel
f.s.d.	full scale deflection
h.f.	high frequency
Hz	hertz
kHz	kilohertz
km	kilometres
kV	kilovolt
kW	kilowatts
kΩ	kilohms
l	lambda (wavelength)
l.f.	low frequency
m.w.	medium wave bands
mA	milliampere
mH	millihenries
MHz	megahertz
mm	millimetres
pF	picofarad
Q	the 'goodness' of a tuned circuit
r.f.	radio frequency
SID	Sudden Ionospheric Disturbance
TV	television
v.l.f.	very low frequency
v.v.l.f.	very very low frequency
VCR	video cassette recorder
µA	microamperes
µF	midrofarad

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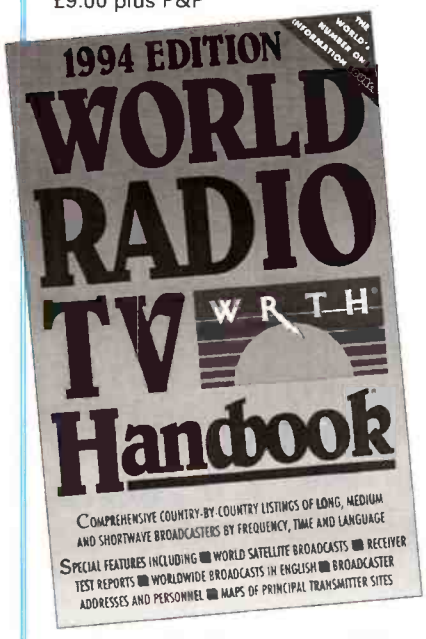

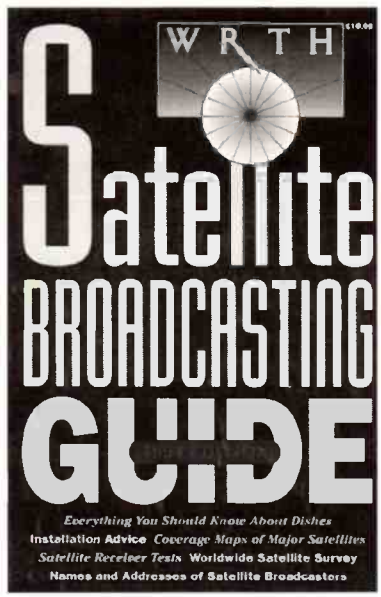

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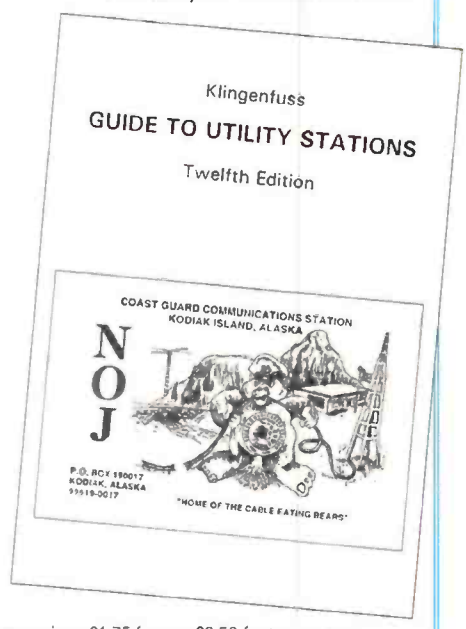

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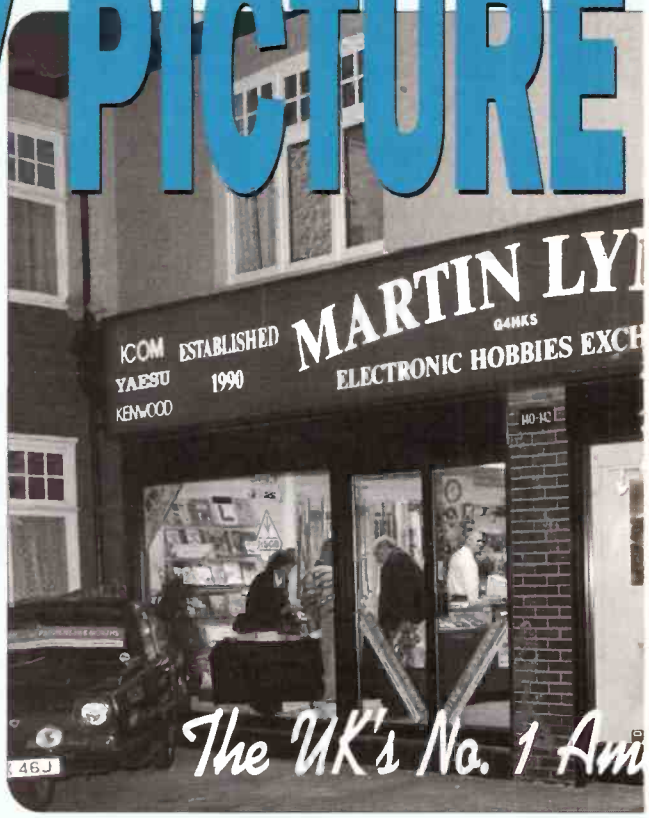

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Reflections

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 (175-230MHz). 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/III 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 **Dave** & **Mary Newman** (Poole), **Fig. 1**, exhibited a dozen or so early 405-line televisors that had been skilfully restored by Dave, Bill Journeaux and John Wakely. Among the visitors that day was TVDXer **George Garden** from Edinburgh seen in **Fig. 2** remembering the Ekco receiver which, as he explained, was the first TV set that his family owned. All of the sets in Dave's impressive display and some of their contemporaries in the museum's own Vintage Wireless building, **Fig. 3**, were producing pictures from a special 405-line source.

One of the event organisers, **Ron Weller**, (Worthing), **Fig. 4**, cast his expert eye over Dave's collection. They had a lot to talk about because Ron, a very experienced radio and television engineer, has unpacked, installed and serviced almost all of the various makes and types of set on show.

As they talked about the antennas, valves and components used in the years before the advent of the solid-state 625-line colour sets, my thoughts returned to some of the problems experienced by the viewers who were most unhappy when the mid-summer tennis programmes on the BBC were blotted out by patterns on the screen and foreign voices on the sound.

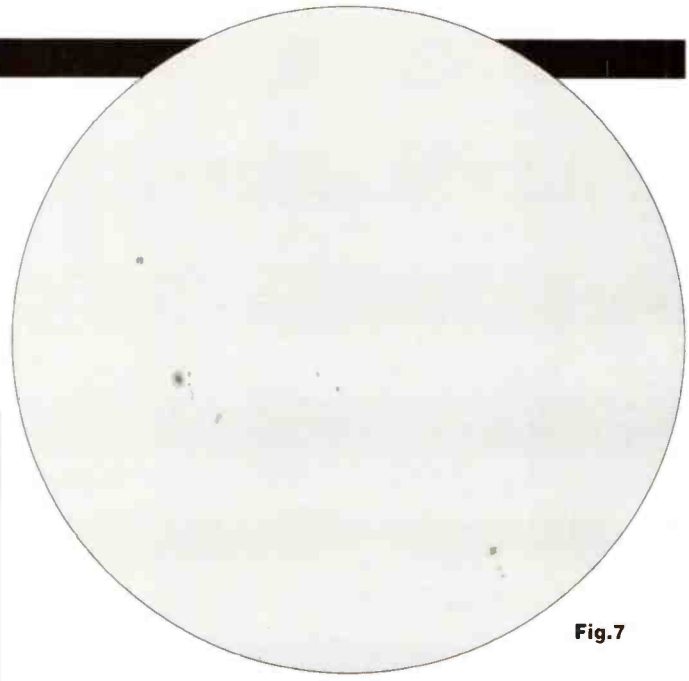


Fig.7

Hostile Atmosphere

Earlier I referred to the 'sometimes hostile atmosphere'. By this I meant the sudden outbreaks of Sporadic-E that upsets 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. Like many other engineers, Ron Weller and I have had to explain to customers that their set was OK but the trouble was 'outside interference' and beyond anyone's control. Both the BBC and the ITA made our task easier by telling viewers about the prevailing interference and adding the words 'please do not adjust your set'. Customers would try to correct the patterning by fiddling with their line (horizontal lock) and frame (vertical lock) hold controls. Consequently, when the interference subsided their screens were completely haywire and an engineer had to call and put it right.

Collectors

Those among you who collect and renovate early televisors 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!**

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.1

Fig.2

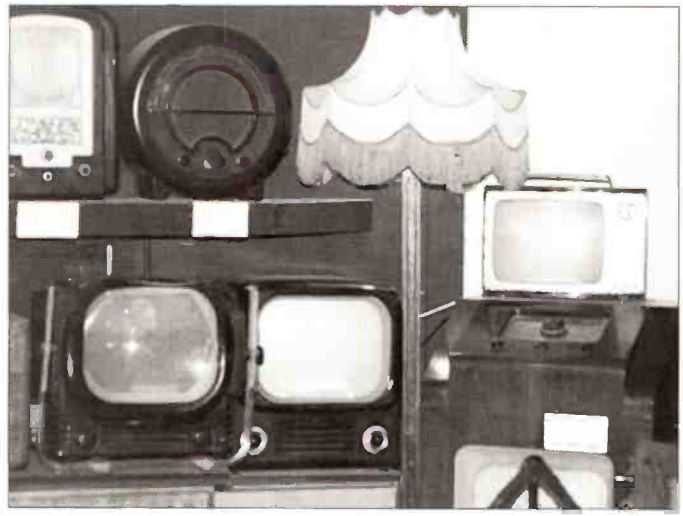


Fig.3

Fig.4

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 (48.25MHz) 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 smeary, 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 computer.

"Now that the software and a 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** (Carstairs 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 (88.7 & 89.6MHz) 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 FM1, 2 & 3, Manx Radio and Lincs FM.

"The first I knew of the opening was when I was listening to my 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 'AVRO' and, during the news, an ident appeared with the figure 1 inside a diamond shape.

Rana Roy received strong coloured pictures in Band III from Bhatinda (Ch.E12), Kasauli (E6), Lahore (E5) and Jalandhar (E9) 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).

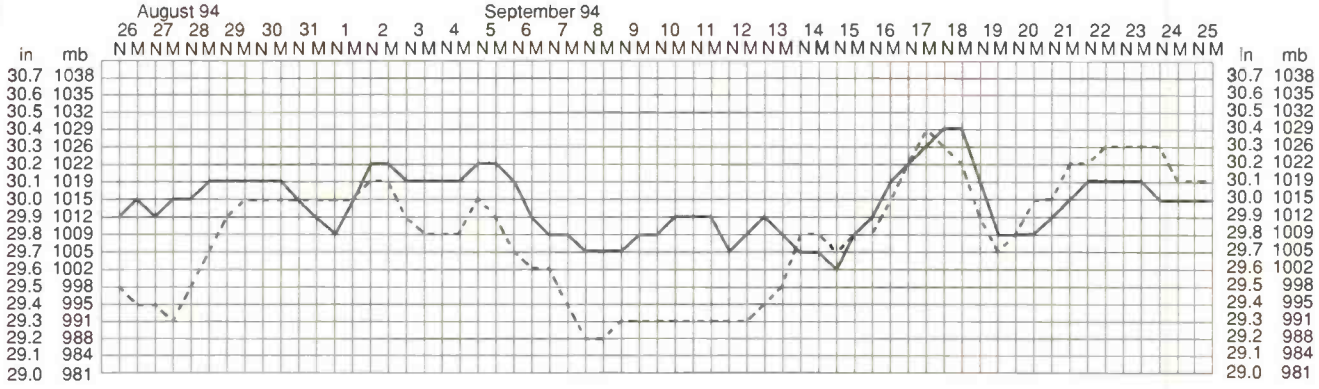
In September, I recorded 3.68in of rain compared to a high of 7.13in for the same period in 1993. The largest amount of 0.85in fell on the 12th, followed by 0.40in and 0.50in on the 16th and 19th respectively. The rest descended in much smaller amounts on 16 other days. At the beginning of the month 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".

Fig.5

Fig.6

Fig.8



Roger Bunney, 33 Cherville Street, Romsey, Hants SO51 8FB

Satellite TV News

The Latest from the Clarke Belt

The armed intervention in Haiti by the American Forces seems to have simmered down across the Clarke Belt and at the time of writing few news packages are seen linking out of Port Au Prince. Several readers have sent in videos showing the various stages of the intervention - **Stuart Page** (Hitchin) and **Andrew Hill** (Walsall) both recorded dramatic live action of the naval task force as seen from hills overlooking the main town, shots - live - from a control room aboard one of the naval vessels with close-ups of equipment, monitoring gear, v.d.u.s, etc. Much of the signal was of a continuous (live) uplink from an aircraft carrier judging by the background communications and the navy crew responses. Flights of helicopters flew off the deck into the blue skies and troops land on the airfield so more live action - and in due course live from the streets of Port Au Prince. All this carried in real time via the 21°W Intelsat K leased Reuters transponders.

The past few weeks also produced what could have become another major conflict in the Gulf region with Iraq forces moving close to the Kuwaiti borders. A mega display of allied force strength moving into the region took the steam out of the situation and encouraged the Iraqi army to move back into the wilderness and with it the immediate threat. The media, of course, were also prepared for conflict with several SNG vehicles 'on location' prior to Day 1 - War, though I never saw a single Middle Eastern uplinked news feed, reader **Andrew Sykes** (Kings Lynn) noticed several out of Kuwait and Baghdad.

The other main news orlglnates 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-relation 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 from the MIR station. Pictures revealed the MIR docking procedures, walks in space and the cosmonauts.

Interesting to note that the video was received at the slightly out of band frequency 10.820GHz circular. Previously, signals had been monitored at 10.835GHz, 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 strength levels irrespective of the polarity setting. If you have a new extended Astra 1D LNB - 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 mainly luck that signal are received. Check out the press for MIR space activity. The best way of checking out if the ZSSRD/Cosmos 2054 satellite has been activated is to check out the data downlink 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 dish pointing 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 CNNI on Intelsat 601 at 27°W. The loss of the CNNI trans-Atlantic feed meant that both Astra 19 and Eutelsat 25°E were unable to feed CNNI down. Known as a Solar Outage, it's quite common at this time of the year as the sun is lower in the sky.

Turksat 1B is definitely operating as of early October. A letter from **Stathis Panagiotides**, Thessaloniki confirms that good signals have been seen from both Kanal D and Kanal 6, now departed from Eutelsat II F4 at 7°E. UK reception is all but impossible since the 42°E craft tightly spots output into Turkey though Stathis receives good level signals at home. Only a suggestion of signal can be seen in the UK on a large dish. Stathis also details a single Ku band beam will target Western Europe at 11.490GHz vertical for the TRT-1 service. For our readers out in Europe Turksat East spot beams are at 11.486, 11.574, 11.662, 10,980, 11.030,11.080, 11.130 and 11.180GHz all horizontal. Upon these transponders will appear TRT1, TRT2, TRT3, TRT4, Show TV, ATV, Kanal 6 and Kanal D - the latter 2 channels are already on-air. There is incidentally a new Turkish channel - Satel-2 -downlinking from Eutelsat II F4 7°E at 11.010GHz horizontal. Moving to the new Intelsat 702 at 1 West, the Israel channels are still present in the Eastern Mediterranean but are generally weaker than before, other that the Israeli programme ILTV-1 at 11.134GHz vertical which is now much stronger in Greece.

Julian Redwood (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 been Sky News 4.060GHz, Intelsat 512 at 21.5°W and a 'Mediatech NY' signal from Intelsat 506 at 50°W at 11.638GHz. 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.

Whilst 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 Rimsat 130°E, Apsat 138°E downlinking CNN, Stationar 7 140°E, Rimsat 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 99°E 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-BBCers and can arrange leased transponders and transmitting facilities. **Bindu Padaki** (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 sparklie shot of NASA TV (live) seen via Intelsat 601 at 27°W

Reuters TV established their own editing facility near Port au Prince during the Haiti troubles. From John Locker, Wirral.

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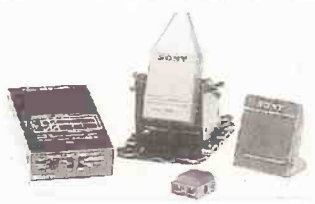

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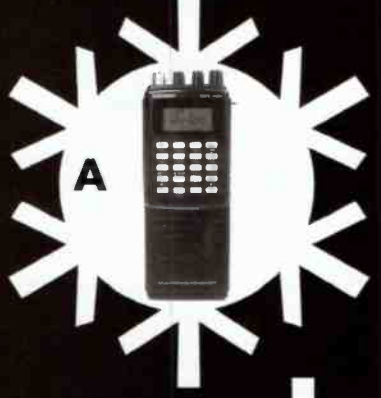

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Amateur Bands Round-up

Listening to the Amateurs

We have a local saying here in mid-Wales - if you can see the hills, it's going to rain; if you can't then it **is** raining. As the hills have disappeared again, it's probably a bit too late to drop the antennas and check them ready for the winter!

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 forward to more than a year of the same sort of state, until Old Sol starts his next outbreak of spottiness. 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, KL7DTH in Anchorage, Alaska and 9K2ZZ in Kuwait. 18MHz was also tried and here JA8LP/1, JA1JRK and PT7CB were logged. Finally on 3.5MHz Ken listened to PA6BTF, the Arnhem commemorative 'special' on September 15, plus VO1FG in Newfoundland.

Just after he ran off his log for this time, **Geoff Crowley** in Aberdeen noted an odd one. This was IK/DK7UY/1P0Y. Basically, DK7UY in Italy, says the prefix. The One Papa Zero Yankee suffix indicates this was to be the 'new country' of Seborga. The world is full of optimists! Turning to the log, Geoff checked Top Band c.w. for DL8NBE, G3LTZ, PA0RKT, OS4ATW and EI2FN, while sideband gave DL5FCJ, F6CNI, LA5FH, LX1JH, OZ1LXJ, RZ3GF, UA4ADX and UR4EDX, plus a string of G stations. Turning to 3.5MHz Geoff found a round dozen assorted GB 'specials', ZW5B, K1ZM, EA8BYL, PY6WO, TA4A, UN7EG, VE1YJ, VO1FG, W8FD, ZF2LC, KC1XX, HZ1AB, JA4OHO, VKs and the Europeans. 7MHz gave fourteen GB calls, including the IWM one and GB2SEG the Scottish Expedition Group; plus LUs and VKs; a switch to 10MHz yielded a brace of Europeans, and then Geoff made his move to the h.f. bands. RTTY was used for LA2TD and UT7FP; c.w. was favoured for KA3CAA/VP9, and then sideband managed VKs, YV, VE7IG, KP2J in the American Virgin Is, other Ws, D44AB, TA3G, ZD7WRG, K9QAM, YB6MF, with a 7-element tribander at 80m in the air, C53HG, PK2ZZ, 7Z1AB with a British accent, KF7S/KL7, 7X2WEK, C31HK, FK8GT, VE2TSG/MM south of Indonesia, AP2AGJ, YB3RF, SO1MZ, 4X1GS, AP2ARS, VY2RO (Prince Edward Is), YV5EN in Caracas, and, of course, the smaller fry. At 18MHz the score opens with 4X1OX, 5N0GC, 7L1WII, JAs aplenty, TA2BK, a selection of Ws, 9H1AL, 4X1FR, PZ1EL, 7Q7JL, A71AN, ZA1MH, PJ8AD, ZD7WRG, ZD9BV, G3UXO/MM on the *QE2*, LU3DAK, VP8GAV in Antarctica and Europeans. Finally, 21MHz where the log shows CX55DY, 9J2FB, HL4RCE, VP8BKT, 5N9ZRC/M, ZS2MM, P88JA, ZS6BGI and G8ATE heard via RS10. As a final note Geoff notes that he has finally managed to get on 144MHz 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 *SWM* or *PW* can't do more cheaply! That might inflate our *PWP* corporate ego(!) 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 QSL Bureau; no representation at the regular WARC events would mean the loss of our present bands; but for the activity of RSGB and ARRL we would probably never have got our bands back after WWII or even the one before! Keith's comment can only be valid given that he listens outside the amateur bands only.

From Crowmarsh Gifford **Allan Grant** writes in to mention that he came across a Spanish magazine *Electronica facil* in which he found an article called 'Criptofono' that seems to be a method of sideband inversion; he wonders if this might be the origin of the loud signals mentioned in the October column. It's the nearest so far, Allan! Incidentally, one or two others wrote in mentioning various signals outside the amateur bands. None of these had any resemblance to the ones noted in northern GM-land, though all have been checked.

"Not much time this month," says **Harry Richards** in Barton-on-Humber. A string of assorted Ws were noted, as far afield as W0WS, several VE7s from Vancouver, VO1BD, HP1LV in Panama, TG9GI in Guatemala, PP1LB and a brace of Aruba signals in P43RR and P43TG.

Events

Between 4-19 January 1995, if all goes well, WA3YVN, WA4VQD and K5VT will operate for at least fifteen days on South Georgia. More details awaited.

FR5HG will have closed down his /E activity on Europa by the time you read this, but I hear that in February he is hoping to activate Glorioso.

Sao Tome, S9, activity can be hoped for; CT1CZT is at the time of writing shortly to start a two-year posting to here, and his licence application is already in. The QSL route will be to CT1ADP.

The T5AR station in Somalia is SM7CIP, and SM7DJZ is handling the cards, but does not expect any logs to reach him until early 1995.

More Mail

Albert Heys in Penketh, Warrington, says he is surprised that nobody, either in *PW* or *SWM* mentioned the opening on 28MHz, that covered from 0915UTC 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 0900-1000 and 1900-2000 local around 3.692MHz.

The International one is 1130-1300UTC, around 14.293MHz.

Net Controls to listen for include K1UIL for the 14MHz one and G4YZE the UK group. Finbarr notes that this net specifically mentions that there are listeners about, for a pleasant change. Incidentally from November, a 1000 local-time activity on 14.282MHz will be tried, under EA5/G3LOD.

Top Band addicts should seriously consider subscribing to the *Top Band Newsletter* put out by G3XTT and G3RBP. Correspondence to Don Field G3XTT, 105 Shiplake Bottom, Peppard Common, Henley-on-Thames RG9-5HJ. 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 hundred watts in 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 UN back in 1992 but still being licensed by the US 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

How do I know an antenna tuner is improving my results? Such an obvious question, and yet....!

As I have said in a previous column, a licensed amateur has the wherewithal to 'tune-up' a tuner, if he first feeds power into a dummy load

For the listener, one needs a simpler system. About the best I have been able to think up is simply a double-pole change-over switch, preferably of the wafer type, and mounted right at the receiver's antenna terminals. One leg of one pole takes the coaxial feed from tuner to receiver. The other leg connects the antenna straight in. As for the second pole, it transfers the antenna wire from the tuner to the other pole and on to the receiver. Now, all you do is try to peak the tuner, and then flip the switch back and forth while watching the S-meter to see how much you're winning or losing. Be aware though, that you can only stand 25mm or so of coaxial cable between switch and receiver; coaxial cable runs around 100pF to the metre, and that capacity is shunting in the 'wire' mode, even though it doesn't matter in the case of a properly-tuned-up tuner.

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.

Graham Tanner, 42 David Close, Harlington, Middlesex UB3 5EA

SSB Utility Listening

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 world-wide 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, there are many flights heading in the direction of Kuwait with callsigns ending with 'KW'. Almost all these flights will contact 'Hilda' at some time during their flight to report their progress, and in some cases to enquire about the status of their air-refuelling tanker aircraft (has it taken-off yet? will it be there on time? what is it callsign? and so on).

Huw Davies from Barry, South Wales writes about a frequency that is being used by Portishead for 'morale' phone-patches for the British troops in Bosnia. Portishead are using 12.133MHz u.s.b. for communications with stations 'UN' and 'AN' in Bosnia - the 'AN' is thought to stand for 'Army NATO'! The contacts generally take place from 17.30 local UK time onwards. On one occasion, Portishead asked 'AN' about his location and equipment, and was told 'a forward observation post tent, overlooking Gorazde'. The equipment was 'standard issue, and the antenna is a 50 foot piece of lighting cable running north-south'. Who says that 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 'VXV9' 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 VXV9 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	14.4585
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 'VX' 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) prefix to the callsigns. If you look back to the September 1993 issue of this column, I gave a run-down 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 alphabetic code 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 84.3 and 84.6MHz 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 Lyneham.
5.535	Flight '6691' 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 2.992MHz.
5.680	RAF Nimrod 'Y2Q' 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	'J7C' working 'Grove Control' with a radio check, and a weather report for their current position. 'Grove' 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 '0XG', reporting 'we would like to receive you, please count while we adjust the antlers'! I have absolutely no idea who these were, the reporter did not mention the accents of the operators. The 'antlers' referred to are obviously their antennas.
11.176	Air Force Rescue 30 working Ascension GHFS 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 GHFS, they had a phone-patch to 'Miami Operations Center', who requested that they QSY to 5.696MHz.
11.234	Ascot 4080 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 CIW823 (Halifax, Nova Scotia) with several 'morale' phone-patches for Canadian troops in Syria.

Greg Baker, PO Box 208, Braidwood, NSW 2622, Australia

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 New South Wales is not guaranteed to enthral the average s.w.l. or bush fire brigade volunteer either.

Our brigade has also had to hassle with bureaucracy over the years too to get free licences for our swag of u.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 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 too 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 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 via the ASTRA 1B satellite on Channel 22 (MTV) on the 7.38MHz sub-carrier. The ASTRA RA programmes are broadcast from 0700-0800 and 1500-1600UTC. 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 Kable Televisie Amsterdam in the Netherlands.

In North America, RA is on the ASC 1 satellite and WRN relays are carried by Cable Vancouver; University Cable in Omaha; Oregon State University Cable; and Radio KUCA-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 and a losing battle by 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 $A18 (approximately £8) per set 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.

Amateur Licence Changes

As another follow on from the series of ongoing inquiries into licensing, the rumour is that amateur radio licence fees and 27MHz marine band fees will be scrapped next year for a similar class licensing scheme. Not surprisingly, I have yet to hear any complaints on either move.

In addition, the syllabuses for all amateur licences are under review. Drafts of the new syllabuses for full call and limited licences are circulating among Wireless Institute of Australia (WIA) divisions and other interested parties. The word is that the new novice draft will be circulated shortly. Once comments are in and the process completed, the SMA will issue the new syllabuses. Simultaneously, the questions held in examination databases will be revised and expanded. If WIA bureaucratic processes are true to form that will all take some time.

While I'm talking amateur matters, I should mention ORACLE, a new organisation based in Wellington New Zealand. ORACLE is the acronym for the **O**rganisation **R**equesting **E**xaminations by **C**ode **L**ess **E**xaminations according to *Amateur Radio Action* (ARA) magazine. In what sounds awfully like a badly timed April Fool's Day story *ARA* says that ORACLE's six member board is determined to do away 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 *PW* 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 despatch; for transmission of data including between portable vehicle mounted PCs; for vehicle location systems; for interconnection with the telephone system; and 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 Florida in the USA installed a similar system 10 years ago, spend $US400 million on it then decided to scrap it because it did not work. I don't know the truth of that but I sure hope our decision makers are taking note.

Meanwhile in my own shire, I'm told that our bush fire brigades will move over to the GRN within two years. This tone squelch controlled system will have the advantage of reducing interference between brigade units operating on different fires at extremities of the shire. It will however reduce brigades' ability to get an overall view of what is happening in the shire and making their own preparations for action. That may suit old style fire controllers, but does not sit squarely with the 1990's push to devolution of responsibility to lower levels.

The system will also make it hard for s.w.l.s to listen in to the vast range of fascinating emergency service transmissions they can at the moment.

Meanwhile, the federal government body charged with co-ordinating the Australian government's procurement of telecommunications services has announced the formation of a similar body for federal government mobile radio services. The system is dubbed CARS for Commonwealth Agencies Radiocommunications System - there goes that imagination again - and it is designed to reduce duplication, eliminate problems with inter-operability, increase coverage and provide better agency service. Agencies mentioned as being interested include the Australian Federal Police, Australian Customs Service, Australian Protective Services, the Department of Defence and the Attorney General's Department. The Australian Protective Service is charged among other things with keeping an eye on diplomats posted to Australia.

Other News

Multipoint Distribution Station (MDS) pay television licence auctions have now been completed for Canberra, Sydney, Newcastle, Wollongong, Melbourne, Brisbane, Gold Coast, Cairns, Adelaide, Perth, Hobart, Darwin and Alice Springs. Gold Coast covers that east coast strip of holiday beaches and hotels just south of Brisbane and north of the New South Wales border. The 190 licences brought in a cool $A90.6 million (£42 million) and are expected to rake in a further the $A4.5 million (£2 million) each year in annual licence fees.

Alan Bairstow from Grimsby South Humberside has written with a range of copies from his logs setting out VK contacts. I always welcome such reports and log entries for Australia, New Zealand or regional stations.

I welcome any news and comments. In particular I am interested in any s.w.l. information on Australian stations heard by *SWM* readers so I can chase up more details and interesting snippets from this end. My address is at the top of this page. For personal replies please send two IRCs.

Godfrey Manning G4GLM, c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS

Airband

The author tries a Lightning for size.
Christine Mlynek.

Propagation at v.h.f. was dealt with in October. **Martin Kay G1EOJ** (Linslade) would like to know how line-of-site distances may be calculated. Let's assume a smooth-surfaced, spherical Earth, with no obstructions. The horizon is caused by the curvature of the planet. If you lie with your eye close to the ground, you can't see any distance at all, but, from the top of a tall building, the horizon seems farther away than when standing at ground level. This is a simple geometrical effect. The distance to the visible horizon (in statute miles) is then 1.42 multiplied by the square root of the height of the observer's eyes above sea level (height in feet).

Radio waves at v.h.f. and u.h.f. consistently go farther than this because the atmosphere bends them, helping them to travel farther around the Earth's surface. The amount of such bending depends on the refractive index of the air at the frequency in question and varies as discussed in October. When receiving aircraft, even greater distances are possible since the aircraft and receiving antenna are both elevated above sea level (in the case of the aircraft, this elevation is usually great). The effect of nearby obstructions (such as high terrain) also complicates the real-life situation.

Hardware

Channel spacing in the v.h.f. communications airband could become a problem. In August, **David Dodwell** (York) mentioned the possibility of 8.33kHz spacing instead of 12.5kHz. Present spacing is 25kHz, but there aren't enough channels to satisfy modern needs. Now **David Wells G0GPE** (Crowborough) sends more details of the *ARINC 716* proposal that the industry considered a couple of months ago. The idea is that the new channels interleave between the existing ones. Here's a challenge to readers and vendors alike: what receivers are currently available that not only tune the proposed spacing, but also have suitable filters? There are no prizes, but I will mention any contenders in this column.

As a matter of interest, the *ARINC* specification allows for 140Hz Doppler shift since the aircraft is moving with respect to the ground station. This shows how insignificant the Doppler effect is at the speeds involved.

That LATCC repeaters really exist is proven by **Colin Goodall** (Gloucestershire) who sent in a photograph of the Winstone site at Birdlip. Elevation is 280m and the mast is an old wooden one!

Your Experiences

Mark Griffiths (Dyfed) sent a photo of a Concorde landing at Glamorgan (Rhoose) 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 by Airtours MD-83 (callsign: 'Kestrel'). I agree with Mark that the DC-9 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 *Airband Factsheet*, yours for free if you send a pre-paid reply envelope to the Broadstone Editorial Offices (NOT to me please!). Likewise, the same suppliers produce *En Route Supplements* that are the best source of frequency information for foreign airports. Mark found Rhodes (Diagoras) Tower to be on 118.2 and Approach on 120.6MHz. 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.

The 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 navigator who ejected when a bird came through the cockpit canopy). The pilot recovered the aircraft to Valley but a Chivenor Sea King, a Valley Wessex and a Nimrod all went after the navigator who landed near the west Welsh coast. Local farmers protested at the low flying. A few years ago, I attended a public meeting on the subject in a semi-rural town that was constantly overflown by training sorties. The mood of the population was quite understanding - they felt that peace-time training was a necessary evil and by and large supported it.

Living close to Lee-on-Solent, **P.G. Tannac** sees the search and rescue Sea Kings take off, and also is overflown by helicopters from Fleetlands. Lee is also a gliding base. Nearby at Tichbourne (near Fareham, Hampshire) the new CAA *en route* centre is taking shape. Airways control will be moving here from LATCC, but any frequency changes are being made now (as reported in this column over the last few months). I am not aware of any plans to change the relay sites.

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!).

Here are the principal frequencies (in MHz unless stated). The Distress & Diversion (D&D) Cells at the London and Scottish Area and Terminal Control Centres (LATCC and ScATCC) monitor 121.5 and 243 continuously. Receivers at the various relay stations work out the direction from which the distress transmission was received. On u.h.f. this causes an automatic display of direction lines on a wall-map; where the lines cross should be close to the transmitter. This is called triangulation. Recently, auto-triangulation was added to 121.5 replacing the manual system but it doesn't yet cover the entire country. Also, terrain tends to limit the coverage when below 900m altitude. Many aerodromes provide their fire services with 121.6 at least for receiving from stricken aircraft and some fire units can talk back to the aircraft on this frequency.

Who calls D&D frequencies? Pilots experiencing immediate threat to life (e.g. ditching at sea), but who are not already in contact with an air traffic service unit, send a 'Mayday' call (derived from the French *m'aider*, 'help me'). Lesser emergencies that still need urgent attention (example: being lost) require a 'Pan' call. When no real emergency is in progress, pilots may ask for a 'Practice Pan' during which they pretend to be lost. Military (but not civil) flights may make 'Securite' calls in which safety information (e.g. about bad weather) is passed.

Some aircraft, and many military pilots who might be required to eject, carry emergency **S**earch **A**nd **R**escue **BE**acons (SARBE), compact transmitters that send out an audible bleep on 243 when activated. Training in the operation of SARBE is on 245.1. Likewise, **A**utomatically-**D**eploying **E**mergency **L**ocator **T**ransmitters (ADELT) are a feature of life rafts and helicopters that might end up in the sea. A non-aeronautical frequency (406) is also available for these and this signal is received by satellite.

International distress and calling frequencies shared by ships and aircraft are 500kHz (Morse) and 2.182. NATO submarine distress is 4.340; survival craft are on 8.364; Channel 16 marine f.m. band distress is 156.8. Rescue Co-ordination Centres mainly control aircraft on 5.680 (day) and 3.023 (night) but the UK also has 5.695 (day) and 3.085 (night).

Scene of search control is on 123.1, 138.7 or 282.8 (NATO) as well as 244.6 in the UK, 252.8 being available to NATO for training. Unicomm (130.425) enables co-ordination at the scene of an accident, e.g. to prevent collisions if more than one helicopter is tasked to the incident.

Below 30MHz the mode is u.s.b. except on 500kHz (c.w.) and, sometimes, 2.182 where some emergency transmitters do not have suppressed carriers. Above 30MHz transmissions are on a.m. except for the marine band.

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 two Rescue Co-ordination Centres are at Pitreavie near Edinburgh and Mount Wise near Falmouth.

Now a few thoughts for the poor rescuer dangling from the helicopter's winch. Most essential aeronautical equipment is duplicated - but not the winch hydraulics. A failure here could lead to aborting a rescue mission. Also, helicopters generally avoid hovering as otherwise, in the event of an engine failure, auto-rotation would be vertically downwards with no forward airspeed to save the day. Contemporary SAR machines are twin-engined, even the current Wessex has two Gnome gas turbines. Operating the winch is another crew member, who talks to the two pilots on the intercom. The pilots probably can't see the person dangling in the strop! Hence the winch operator has to tell the pilots to "inch" so many small units of distance in a particular direction - as well as having to make sure that the tail rotor doesn't get too close to cliff faces, etc. In extreme emergency it can be safer to cut the cable and drop the winch rescuer.

If you want to know more, *Rescue* by Paul Beaver and Paul Berriff, published by Patrick Stephens Ltd. (unfortunately out of print) and the *RAF Flight Information Handbook* is sold by RAF Northolt, the address of which is in *Airband Factsheet* as mentioned above.

Hughes/Schweizer 300 series. *Christine Mlynek.*

The original micro light: Mignet Pou-Du-Ciel. *Christine Mlynek.*

Abbreviations

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

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 128.225 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).

John Griffiths, 9 Rhos-y-Gaer Avenue, Holyhead, Gwynedd LL65 2BE

Scanning

This month sees many personal changes in my circumstances and a slight reduction in my own scanning activity! It doesn't, however, mean I'm going to ignore the column. The role of columnist is exciting and serves to remind me there are as many people out there interested in scanning - and what there is in it - as I am! However, as I'm now residential at college, please don't expect speedy replies to the personal mail - essays come first until I qualify!

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 like 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 could do no worse than write to: **Paul Wey, 2 Icknield Way, Baldock, Hertfordshire SG7 5AJ.**

Reader **Steven Rogers** of Saxmundham asked in September's issue for details of modifications to the HP-200E. I've since received gen 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 s.s.a.e. to the Broadstone Editorial Offices will bring you a copy of Chris's original info sheet. Mark your 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!

It's worth 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....!

Motorsport

Frequencies reported have been relayed but some more appear. **Stephen Allan** of Drumnadrochit reports hearing rally sport on 141.8925MHz in the airband, allegedly BBC OB teams using a helicopter. Marshalls have been heard on RAYNET S10 (145.250MHz) and on frequencies in the 141-142.00MHz 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 QSL! This leads to the question: do other readers who use p.mr. 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 whet the appetite, one airfield is known to have heard the call 'Rover One' on their ground frequencies - later discovered to have been 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 balloons 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 dud! I suspect that's double Dutch to most of us, but fans of meteor scatter can find out more by accessing GB7HAS on amateur BBSs 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 Titles. 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 while you can if that's your area! My sincere thank's 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 swingeing 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 VT-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 civair band!

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

studying I'm scanning but it is pretty bare. Could be due to site and, even though I occupy a top room in the building, it isn't very good for reception. Also I miss the marine scene! I've had some milair activity out of surrounding bases, including USAF calls, but it is sporadic and certainly not as busy as I thought it would be! Ah well, can't be too miserable about it - at least I am getting various p.m.r.which I would not otherwise have got back home in rural Wales!

Legalities again, and a listener who shall remain nameless writes in with the following suprising account of his own activities. It's something I have never come across but - bearing in mind my own involvement with SAR activities - it is a real eye-opener.

The listener involved was monitoring Edinburgh Rescue on h.f. 5.680MHz and could hear a Mountain Rescue Team calling but getting no response. The listener then 'phoned Edinburgh Rescue and relayed, by 'phone, that fact! As he says they were amazed - I think I would be when I got details of the relay party location too! One more instance concerned a fire engine from a neighbouring county *en route* to a major fire and needing directions. After some time in non-response to their calls, the listener again relayed details to the brigade control.

The argument here - from the listener - being that this community involvement can only be good for the hobby. As a current student of community methods for my Dip., and as a SAR team member, I am a bit sceptical as to the truth behind this. A system dependant on the preservation of life and, in some cases, property cannot be seen to be reliant, however well-intentioned the facts, on what is an untrained element. It beggars the question of ethics, I'm afraid. I know that in any SAR scenario I would be hesitant to use an unknown and therefore unqualified individual for message relay. It could be argued, of course, that the individual may well be in a position to help but as for active involvement, that's a whole different ball game. Why? I'll qualify that somewhat. Despite many claims made by over-enthusiastic scanner owners that they know 'procedure' they invariably do not know the full facts. A wrongly relayed code, for example, could set in motion an entirely different approach to a situation - with consequences that could prove to be disastrous. At the end of the day a legal defence based on a suddenly invisible member of the public would be no defence at all.

However, that isn't to say don't get involved if there is something bothering you! For example, there is a local case of a radio listener who did assist South Coast Coastguards in relaying messages from a yacht in difficulties. The ensuing scenario bordered on v.h.f. 'line of sight' comms and the relay did sit within a notorious radio black spot. One word of warning, however, you may well get an official visit to ascertain the background....and while I'm not saying it could be beneficial, it may be that 'others' could decide on a completely different tack being taken.

If it happens to you please, please, please! Get ALL THE FACTS! Don't rush in half-cocked! mention everything you have heard, every detail, and relay it as fully as you can. Again, one - to you - small and seemingly insignificant detail could be the pivot that the whole scenario revolves around. Ascertain your order of call! Don't 'phone the Coastguard if it isn't a Marine matter - though, maybe you could if it was aero and over water. It would then be relayed to the appropriate SAR authority. Likewise, don't 'phone the Police unless you know, for certain, that it would be a Police matter. I'm sure that any authority would relay but, in the initial stages, it would be better to get through to a related authority. Use common sense and stay calm.

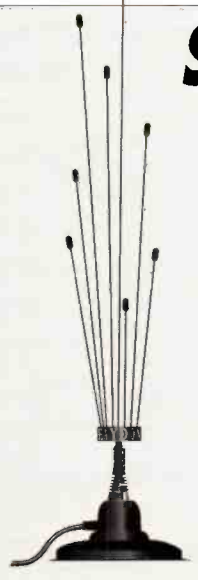
The argument that was put forward by the listener concerned probably looks sensible to him. However, over-simplification can have long-reaching consequences and is, I would say, viewed with suspicion by SAR Teams. For every one well-intentioned member of the public, there are also a few who hoax - involving time, human resource, anxiety and a whole lot of colourful swear words! Most services within the voluntary sector are staffed by individuals who - quite literally - put their lives on the line for no financial gain. Likewise, the paid professionals, whose job it is. No matter the view that scanner owners should be involved as a sort of RAYNET team, the realities are certainly non-existent. You train hard, work hard and update constantly - and integration with a weak and possibly over-zealous link isn't good for professional morale. I know the crews I work with and trust them implicitly. The same could not be said of an outsider.

Snobbishness? Yes, alright - but justifiable.

Bye

On that note I'm going to shut it down now. Thank's to all who have written in praising the Sony ICF-5500M 'Captain 55' by the way. Keep writing - Keep scanning!

Scanning With A Haydon Nest



Wide band scanning antennas are always something high on the priority list for scanner owners. Kevin Nice tries the Haydon XSS-1300 range and adds one to his Christmas list.

Well 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 antennas is a nest of eight elements connected in parallel to a metal disk, which is in turn connected via the base to the inner of the co-axial 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 dipoles and the package comes complete with a wall and pole mount, 10m of fitted co-axial 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

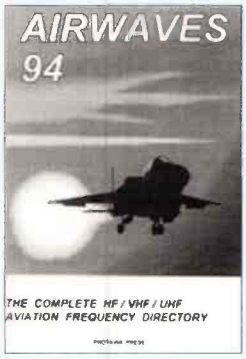
The specifications for these antennas states a frequency range of 10-1300MHz, but as most scanner enthusiasts are unlikely to use this type of antenna below 50MHz, a much better choice for lower frequencies would be a random length antenna with an a.t.u. It is the higher frequencies where this kind of antenna comes into its own. I connected the antenna to a variety of receivers - a PRO-43, AR1500, AR3000A, PRO-2035 and an Icom R7100. 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 not far away from Hurn 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 G1TEX the *PW* Technical Projects Sub-Editor carried out some quick tests with the magnetic mount version of the antenna and concluded that it was usable as a transmit antenna with an acceptable s.w.r. over the normal parts of these 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, Edgeware, 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.

BOOK REVIEWS



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.

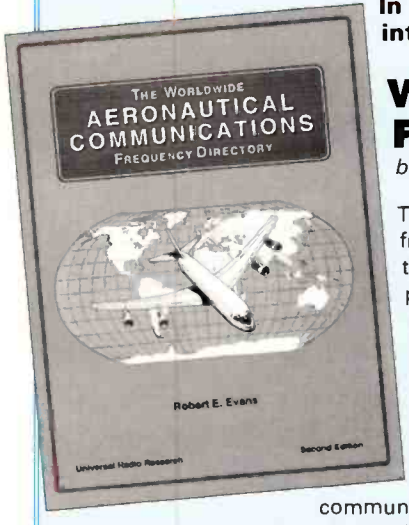
Airways sectors are listed so much more clearly than in the Supplements but I'd like to see a map to make this subject even easier in future editions. The main transponder code groups are included. In fact, the book covers all the way from h.f. up to u.h.f.

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.

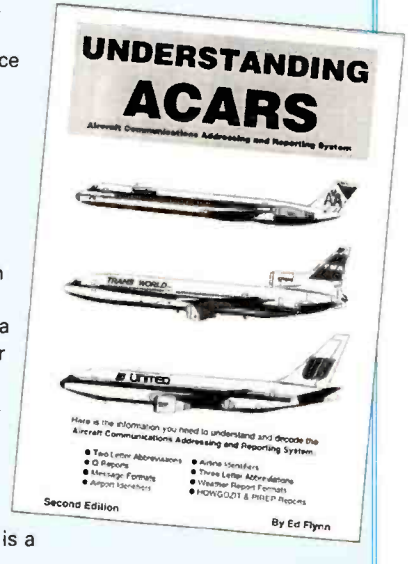


In 'Monitoring ACARS', on page 27 of this issue, a couple of useful and interesting books are mentioned - read on to find out more.

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

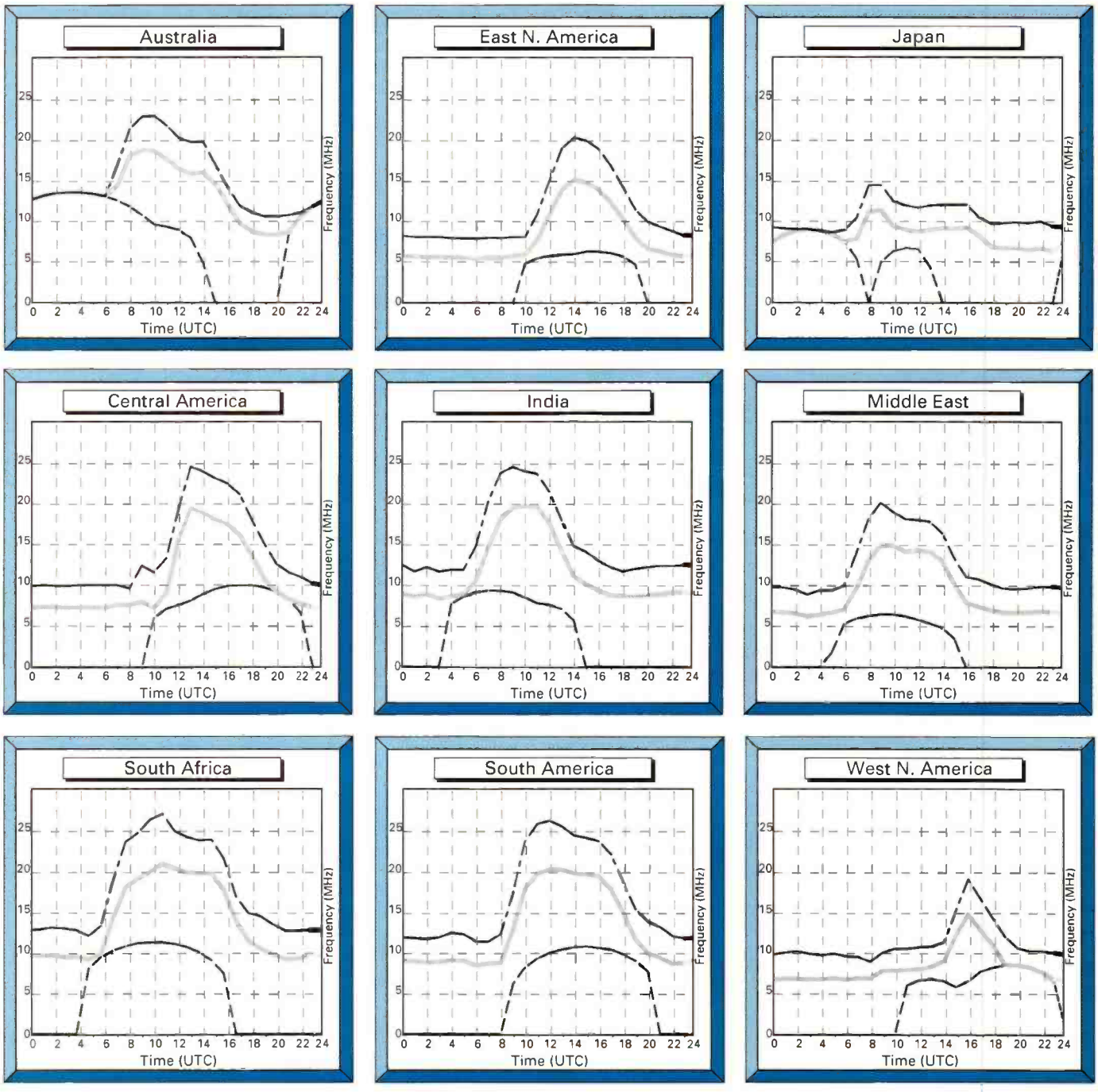
The Future Air Navigation Systems (FANS) concept marks the emergence of the next generation of air traffic management systems that will ultimately cover the globe and replace current voice based systems. Part of FANS is the replacement of all routine communications by computer data links, of which ACARS 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.

Jacques d'Avignon VE3VIA

World Propagation Forecasts December

Circuits to London



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.

LOWE COMPETITION Part 3

as reviewed in the September 94 issue of SWM.

The Editor's decision is final, and no correspondence will be entered into.

Here is the second of the four qualifying puzzles for entry to our grand draw for the £700 prize of a Lowe HF-225 Europa receiver. This extremely capable radio has been kindly donated by Lowe Electronics, and could be yours. On this page you will find a coupon, together with a question to be answered. Save this coupon, together with those in the October and November issues and the one in the January 95 SWM and then follow the instructions to be given in that issue. Photocopies are **not** acceptable. The draw will be held on 6 February 1995. Good luck.

Question 3:

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

Answer 3:

Lawrence Harris, 5 Burnham Park Road, Peverell, Plymouth, Devon PL3 5QB

Info In Orbit

Fig. 1: An early OKEAN-4 image from Kurt Feller.

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.

OKEAN-4 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 OKEAN-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 plane 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).

METEOSAT-5, the European geostationary WXSAT, is positioned at 0° west, and operated the new transmission schedule from October 18. This schedule resumed virtually real-time transmissions of the main formats. It also relays images from METEOSAT-3, positioned over the east coast of America, and, now once more, from GMS-4, positioned near Australia. These images include WEFAX format, broadcast on channel 2, so newcomers to METEOSAT reception should make sure that their METEOSAT receiver or down-converter has full two-channel capability.

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 wavelengths 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 on-board 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

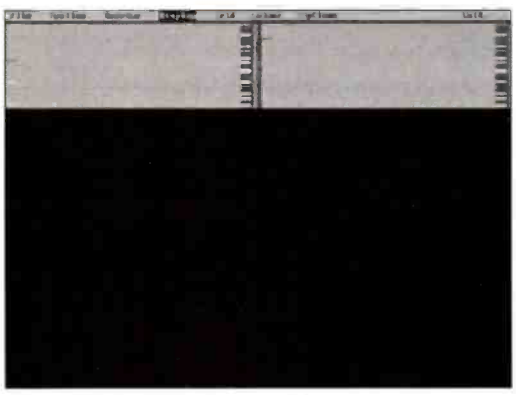


Fig. 2: NOAA-11 fault condition.

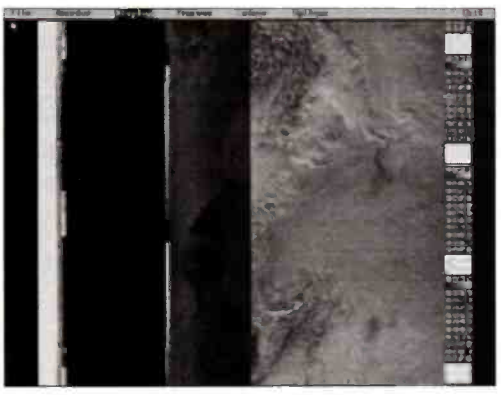


Fig. 3: An early oceanographic image.

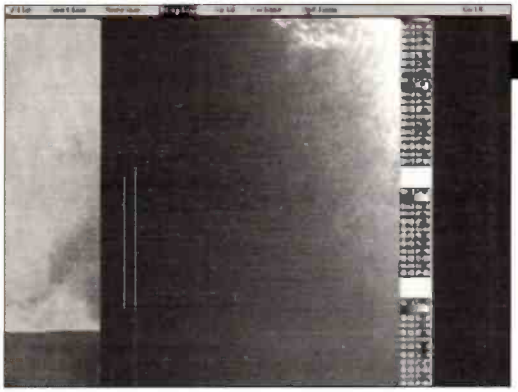


Fig. 4: Evening twilight from 19 October.

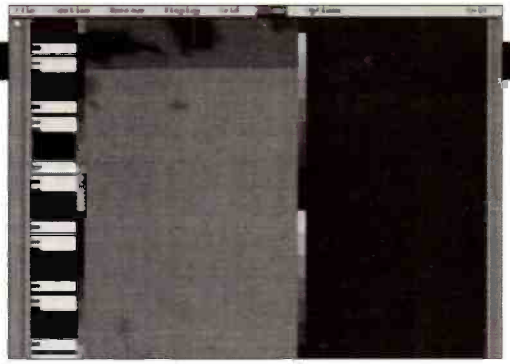


Fig. 5: OKEAN-4 multi-spectral image of Gulf of Finland region.

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 occur 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 1500, 1602, 1689, 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 137.40MHz, 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 666km above the Earth - significantly less than either NOAA or METEOR orbits, but similar to previous OKEAN craft. One of my images from OKEAN-4 - a superb radar 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 Woolner, 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 Fife 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 number of UK suppliers, and I am hoping to produce a review of some of the products. The UK company Spacetech Space 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. Spacetech can be contacted on Tel: (01305) 822753. I understand that Timestep may also stock WXSAT/astronomy 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 PCGOES/WEFAX system. Ray mentions that the JVFAX program version 7, can be used with the hardware unit that comes with the PCGOES system. Ray feels that JVFAX provides somewhat better facilities, and, for reception of WXSAT transmissions, Ray advises using the Hamcomm configuration setting; enter the address and IRQ for the appropriate COM port, to which the interface is attached. Ray advises disabling memory drivers (by editing your CONFIG.SYS file), because JVFAX does not need high memory.

Two other recommendations by Ray are the activation of a.t.c. (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 h.f. utility transmissions. He lists several h.f. 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 Truro 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 406MHz. 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, self-addressed envelope and separate, extra stamp. All WXSATs plus MIR and OKEAN-4 are included, together with frequencies if operating. This data originates from NASA, and is downloaded from various BBSs.

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 an 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, AMSATs, 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 format - 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 s.a.e. Please use adequately sized envelopes for your disk; I sometimes receive empty packets!

Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.50MHz; NOAA beacons on 136.77 & 137.77MHz; METEORs use 137.30, 137.40 & 137.85MHz and OKEAN-4 137.40MHz but sporadic transmissions.

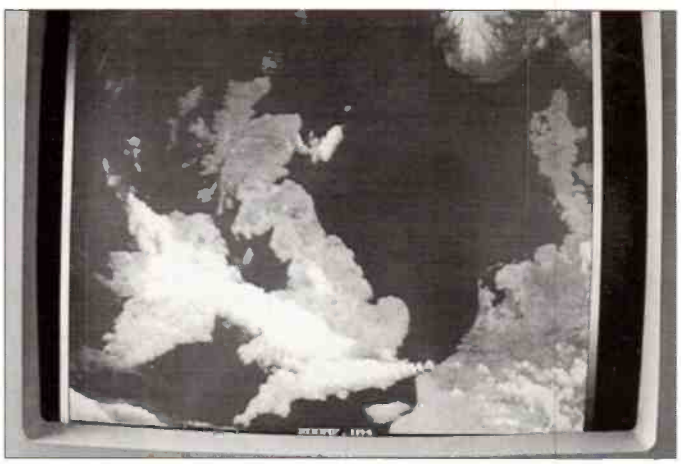


Fig. 6: NOAA-9 in May from Jim and Hilda Richardson.

Timestep

PROsat II is used by most leading Weather Satellite enthusiasts. They have come to rely on the vastly superior features of **PROsat II.** Features such as 1,000 frame full screen full colour animate, 3D, direct temperature readout, latitude-longitude overlays and country outlines from NOAA, and Windows export make Timestep products preferred by most serious users. All satellites are catered for including the awkward Japanese GMS and the very infrequent Soviet Okean series. All current SVGA cards are supported. NOAA images contain full resolution visible **and** infrared data in a stunning 2.4Mb file!

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Advanced Weather Satellite users will by now have read about our new **TRACK II** prediction software. Full screen colour graphics and 6 simultaneous satellites are just some of the amazing features. For the ultimate in detail we offer **HRPT** digital systems with five 1.1km ground sensors, towns and rivers are clearly visible. For everyday use we also have the **PDUS** digital Meteosat system that takes 2.5km data every 30 minutes. Timestep **PDUS** colour animate is used several times a day by Anglia Television because of its very high resolution combined with spectacular colour. Forecasters will appreciate temperature calibrated 30 minute interval images.

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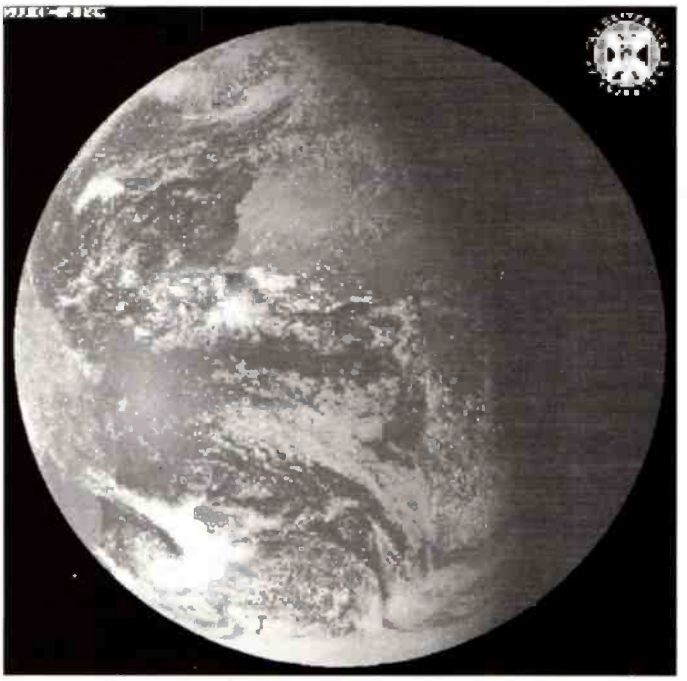
Tel: 01440 820040 Fax: 01440 820281

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

Decode

All the Data Modes



Meteosat image from Edinburgh University via the Internet.

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 disks containing around two and a half hours of recording 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 Klingenfus 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 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, Cyrillic, Piccolo, Golay, Pocsag, Swed-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 modulation 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 can 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 CD 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 source such as this 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, know rather appropriately as wow and flutter, that can cause further disruption to the signal. The end 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 provisos. You will need to set the centre frequency and shift 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 Joerg Klingenfuss Publications, Hagenloher Str. 14, D-72070 Tuebingen, Germany. My thanks to Joerg for the loan of a review copy.

Life Without the PC!

If you don't own an IBM PC or compatible you're probably sick of being told about all the wonderfull free software that's available for these machines. I'd like to redress the balance a little, but need to know what computers you use and some hints as to where to find that illusive shareware. If you can help with any information, please drop me a line.

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 frequeny 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 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 to 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 DXR20 kit £39.90, Assembled main board £67.90, Optional band modules £7.90 each and HA20R 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 aquainted 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 is 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

systems are universities, government departments and many other commercial and educational establismentsof 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 30000 computer 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 organisation that make Internet access easy for the individual or small business. My personal choice was to use Demon Internet (0181-349 0063 for info) as, at the time of writing, they were offering the cheapest full Internet access. The charges require a £12.50 one-off start up fee, plus £10 per month subscription. There are no time charges and, other than the telephone bill, you can spend as long as you like searching the Internet.

In addition to being able to download interesting documents and computer programs, you can also use the Internet to link with specialist user groups. An example of this is the UK amateur radio group. By signing on (it's free) to this Usenet you are automatically supplied with all the latest messages every time you log-on to the Internet. You can also generate your own messages and ask for help and advice. This is a very powerfull tool that gives the operator access to help from around the world.

When it comes to accessing computer files, there are literally thousands available. If you're into weather monitoring and are worried about the pending closure of the l.f. Offenbach transmissions. You'll be pleased to hear that you can freely download the latest Meteosat pictures by accessing the Edinburgh University meteo database via the Internet.

The trick when using the Internet is knowing where to find the information. Fortunately there are a number of tools available to help you carry-out automated searches. However, the best way is to find someone who knows where to look. That's where I can help through this column. I will be searching for interesting information and passing it on to readers Just to get you started, here are a few suggestions from Mark Lewis:

World Wide Web

http://ww.mcc.ac.uk/OtherPages/AmateurRadio.html

http://galaxy.einet.net/galaxy/Leisure-and-Recreation/Amateur-Radio.html

FTP Sites

ftp.ucsd.edu - path => /hamradio

www.mcc.ac.uk - path => /ucsd.edu

ftp.cs.buffalo.edu - path => /pub/ham-radio

oak.oakland.edu - path => /pub/hamradio

If you have any hot Internet tips, please send me a message.

Antenna Trouble

Geoff Searle of Southampton has written asking for help with his decoding system. He currently uses a Sony 2001D receiver and a 16MHz 386 based IBM compatible computer running HAMCOMM and JVFAX. He is also restricted to the Sony's telescopic antenna as he hasn't got around to putting up a more substantial system. Geoff hasn't had much joy so far and wonders if I can help with a few pointers.

I have to say that the very first step is to install as good an antenna as possible. For best results this needs to be an external antenna and should be kept as far away as possible from any sources of interference. Although the antenna should ideally run in a straight line, it's by no means essential. The most important point is to get as much wire up as possible. The type of wire you use is also not too important other than its ability to withstand the elements. Most amateurs use hard drawn copper wire and you will generally find this is available at very reasonably 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 at 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 utility 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.

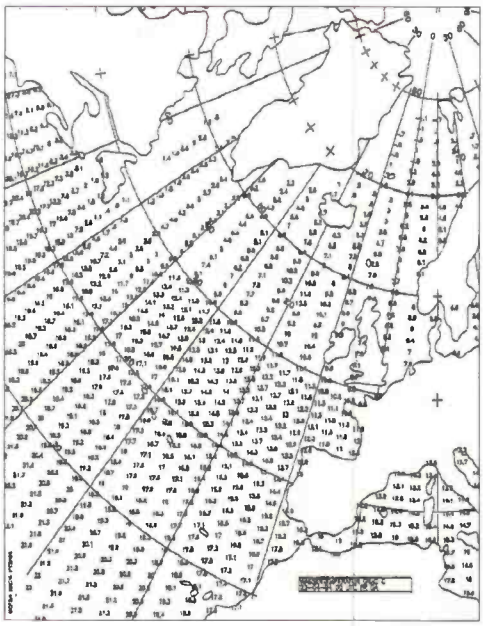
FactPack 3 - Starting-Out guides the new utility listener through the various decisions that have to be made regarding the choice of receiver, decoder, antenna and popular accessories. In addition to basic set-ups, the guide covers the more advanced station for those that prefer to start further up the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

FactPack 4 - HAMCOMM/JVFAX 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: JVFAX 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're ordering JVFAX 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 this month's selection. They are **Geoff Allgood**, **Guy Denman**, **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 from 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!

Freq	Mode	Speed	Shift	Callsign	Time	Notes
134.2	FAX	120	576	DCF54	2201	Offenbach Met
5864.5	FAX	120	576	AOK	2100	USN Rota
6446	FAX	120	576	GYA	0400	RN Northwood
6937	Pol-ARQ	100	-	-	1715	Polish Embassy
7880	FAX	120	576	DDK3	2021	Hamburg met
8028	ROU-FEC	164	-	-	1040	MFA Bucharest
9282	ARQ-E	96	157	-	1617	Belgrade Serbia
10151	SWED-ARQ	100	400	SAM	1555	Stockholm to Colombo
10366	SWED-ARQ	100	170	-	1839	TFC in French then s.s.b.
10903	FEC-A	144	800	TAD		Ankara Turkey
11452.6	RTTY	50	800	RDD77	1826	Moscow Met
12206	FEC-A	144	400	-	1243	Encrypted?
13553	FEC-A	192	380	K4X	1423	Tunis, Tunisia
13571	FEC100	96	-	DFN57	0850	PIAB Bonn
14367	RTTY	75	400	BZP54	0705	Xinhua press
14989	ARQ-M2	96	389	TNL	1701	Brazzaville, Congo
15648	ARQ-E3	48	400	RFTJF	1759	Port Bouet, Cotonou
18344	ARQ-E	192	170	RGFGEB	1140	Bonn, Germany
18556	ARQ-E	96	170	-	1200	New Delhi, India
18621.5	FAX	120	576	LRO84	1450	Buenos Aires met
19422	ARQ-E	96	140	-	1114	Bonn Germany
19974	FEC-A	144	800	TAD	1145	Ankara, Turkey
20348	ARQ-M2	96	400	9RE203	1430	Lumumbashi, Zaire
20423	ARQ-E	96	170	-	1500	Brasilia, Brazil
22004	SITOR A	100	170	-	1230	Islamabad English traffic

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

Maritime Beacons

An increasing number of listeners are finding that searching the l.w. maritime radiobeacon band can be both interesting and rewarding. Those who did so durlng 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 Connolly** in Kilkeel, namely Jakobshavn (JV) on 367.0 and Prins Christians 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 Southampton. He found it was inaudible by the time it was light.

Around 0430UTC Steve Cann heard for the first time the beacon at Cabo de Palos in S.Spain (PA) on 313.0 and Ingolfshofdhi Lt, Iceland (IN) on 316.0. Another Icelandic beacon at Grimsey (GR) on 308.0 was logged at night by **Geoff Crowley** in Aberdeen. Over in Co.Fermanagh **Tom Smyth** picked up the sky waves from Raufarhoefn, Iceland (RG) on 301.1. His log included the Ile de Giraglia Lt, Corsica (GL) on 305.0.

Kenneth Buck (Edinburgh) decided to look for the Faeroe Is beacons at Akraberg (AB) on 381.0 and Noslo (NL) on 404.0kHz. At first he detected strong signals without idents, but after selecting the a.m. mode on his Lowe HF-225 he received good clear idents. Apparently they use a keyed tone without carrier interruption - 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 it because there is a powerful aero beacon on the same frequency.

The elusive Ventspill beacon (WW), which is part of the Latvian group on 312.5, was logged at night by **John Eaton** (Woking) and others. Several beacons in Scandinavia, France and N.Spain that **Albert Moore** (Douglas, IoM) 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 high level of local electrical noise masked the weaker signals. This problem was encountered by **Darren Beasley** in Bridgwater, but he traced it to the Yaesu mains adaptor powering his FRG-100 receiver! He now uses a 12V car battery instead. A tip for other FRG-100 owners perhaps?

Whilst on holiday in Cornwall, **Peter Westwood** (Farnham) visited the Lizard Lighthouse. The keepers were surprised to learn that their beacon (LZ) on 284.5 could be received in Surrey. As the chart clearly shows, it has been heard in quite a few other locations too!

Freq kHz	C/S	Station Name	Location	DXer
284.5	LZ	Lizard Lt	S.Cornwall	A,C,,D*,E,G,I,O,P,Q
284.5	MA	Cabo Machichaco	N.Spain	E*,F*,G,H,P
285.0	NO	Cabo de la Nao Lt	S.Spain	E*
285.0	NP	Nieupoort W.Pier	Belgium	E*,H,P
286.0	TR	Tuskar Rock Lt	S.Ireland	A,C,D,E,F*,G,I,L*,O,P,Q,R*
286.5	AL	Almagrundet Lt	Sweden	E*
286.5	BY	#Baily Lt	S.Ireland	A,E,I,R*
286.5	FE	Cap Frehel Lt	France	H
286.5	FI	Cala Figuera	Majorca	E*
286.5	FT	Cap Ferret Lt	W.France	D,E,G*,H,J*,P
286.5	NK	Inchkeith Lt	F of Forth	C,F*
287.3	BT	Bjargtangar Lt	Iceland	E*
287.3	IB	I.Berlenga	Portugal	E*
287.3	JA	Jaroslawiec	Poland	E*
287.3	LE	Leba Rear	Poland	E*
287.3	MD	Cabo Mondego	Spain	E*
287.3	SE	Sete	France	E*
287.5	DD	Rosedo Lt	France	E*
287.5	FR	Faerder Lt	Norway	C,E*
288.0	HH	Hoek van Holland	Holland	E
288.0	KL	Sklinna Lt	Norway	C*,E*
288.0	OH	Old Hd of Kinsale	S.Ireland	A
288.5	FI	Cabo Finisterre Lt	N.W.Spain	D*,E*,H,J*,Q*
288.5	YM	IJmuiden Front Lt	Holland	C,E,F*,H,L*,M*,O,P
289.0	BY	Baily Lt	S.Ireland	A,C,D,E,I,L,P
289.5	KY	Oksoy Lt	Norway	E*
289.5	LO	Landsort S Lt	Sweden	C,E*,H*
289.5	MN	Hammerodde	Denmark	C*,E*,H
289.5	SN	Ile de Sein NW Lt	France	A,D,E*,G,H,O,P,Q
290.0	BS	Port en Bessin Lt	France	G,H,P
290.0	FD	Fidra Lt	F of Forth	C,E*,F*,P
290.5	DY	Duncansby Hd Lt	NE.Scotland	C,E
290.5	LL	Hallo Lt	Sweden	E*
290.5	SB	S.Bishop Lt	Pembroke	A,C,D*,E,F*,G,I,L*,O,P,Q
290.5	VI	Cabo Villano Lt	N.Spain	B,D,E,G*,H,I*,J*,M*,P,Q*
291.5	CK	T.Navolokskiy	SSR Arctic	E*
291.5	OR	Orskar Lt	Sweden	E*,F*
291.5	SU	South Rock LV	Co.Down	A,C,D,E,F*,G,I,L*,M*,O,P,Q,R*
291.9	AV	Aveiro	Portugal	E*
291.9	LT	La Isleta	Canaries	E*,H*
291.9	MR	Montedor Lt	Portugal	E*,H*
291.9	NA	Punta Lantailla	Canaries	E*,H*
292.0	MH	Mahon, Minorca	Balearic Is	E*
292.0	SJ	Souter Lt	Sunderland	C,D,B,E,F*,I,K*,L*,O,R*
292.5	SM	Pt St.Mathieu Lt	France	A,D*,E,G*,L*,O,P,Q
293.0	CP	St.Catherine's Lt	IoW.	A,D*,G*,J*,O,P,Q
293.0	RN	Rhinns of Islay Lt	Is of Islay	C,E.F*,I,M,R*
293.0	SY	Svinoy Lt	Norway	C,E*,F*,I*
293.5	RO	Cabo Silleiro Lt	N.Spain	E*
294.0	KU	Kullen High Lt	Sweden	C,E*
294.0	PH	Cap d'Alprech	France	C,D,E*,G,H,O,P,Q
294.5	KA	Kaybolovo Lt	Estonia	E*,H*
294.5	KC	#Old Hd of Kinsale	S.Ireland	E*
294.5	MH	Mohni Lt	Estonia	E*
294.5	NG	Pikasaare Ots	Estonia	E*,H*
294.5	PA	Pakrineem Lt	Estonia	E*,H*
294.5	PS	#Pt.Lynas Lt	Anglesey	E,I
294.5	PT	#Souter Lt	Durham	C,F*
294.5	SN	Sletnes Lt	Norway	E*
294.5	UK	Sunk Lt V	Off Essex	D,G*,L*,O,P,Q
295.5	CB	La Corbiere Lt	Jersey CI	A,D,E*,G,J*,O,P
295.5	RE	La Rochelle	France	E*
296.0	BH	Blavandshuk Lt	Denmark	B,C,D,E*,F*,G*,H,I*,P,Q
296.0	GR	Georee Lt	Holland	H,P
296.0	KN	Skrova Lt	Norway	E*,G*
297.0	FG	Pt de Barfleur Lt	France	A,D*,E*,G*,H,I*,J*,O,P,Q
297.5	MA	Mantyluoto	Finland	E*
297.5	PS	Cabo Penas Lt	N.Spain	E*,F*,H*
298.0	GX	Ille de Groix	France	D,E*,G,O,P,Q
298.0	TA	Cabo Gata	S.Spain	E*
298.5	RR	Round Is Lt	Is Scilly	A,B,C,D*,E,G,I,L*,O,P,Q,R*
298.5	SW	Skagen	Denmark	C,E*
298.8	DV	Djupivogur	Iceland	E*,Q
298.8	HD	Hornbjarg	Iceland	E*
299.0	AD	Ameland Lt	Holland	C,D,E,G,H,L,O,P,Q
299.0	BN	Les Baleines	W.France	D*,E*,H*,P
299.0	O	Tarifa	S.Spain	E*
299.0	UN	Understen Lt	Sweden	E*,H
299.5	NP	Nash Pt Lt	S.Wales	A,D*,E,G,O,P,Q
299.5	SK	Skomvaer Lt, Rost	Norway	E*,F*
299.5	VR	Utvaer Lt	Norway	B,C,E*,F*,H*,P
300.0	MZ	Mizen Head	S.Ireland	A,D,E,G,I*,P,Q
300.0	TI	Cap d'Antifer Lt	N.France	H,J*,L*,Q
300.5	DU	Dungeness Lt	Kent	D,G*,J*,L*,O,P,Q
300.5	ID	Ilichevsk	Ukraine	E*
300.5	LA	Lista	Norway	B,C,E*,F*,Q
301.0	CA	Pt de Creach	France	D*,E,H,P*
301.0	ER	Eierland Lt	Holland	C,E*,H,P*
301.1	HA	Pt. del Hank	Morocco	E*
301.1	RG	Raufarhoefn	Iceland	E*,M*
301.5	KD	Kinnards Hd Lt	NE.Scotland	C,E*,G*,O,P
301.5	L	Torre de Hercules	N.Spain	H*
301.5	OB	Hoburg	Sweden	E*,H*
302.0	RB	Cherbourg Ft W Lt	France	A,D*,E,G,J*,O,P,Q
303.0	FB	Flamborough Hd Lt	Yorkshire	A,B,C,D,E,F*,G,L*,O,P,Q
303.0	FV	Falsterborev Lt	Sweden	C,E*
303.0	YE	Ile d'Yeu Main Lt	France	A,C*,D*,E*,H,O,P
303.0	MY	Myggenaes Lt	Faeroes	B
303.5	BJ	Bjornsund Lt	Norway	C,E*,H
303.5	FN	Feistein Lt	Norway	C
303.5	IA	Llanes Lt	N.Spain	E*,H*
303.5	VL	Vlieland Lt	Holland	E*,G,H,L*,O,P,Q
304.0	PS	Pt Lynas Lt	Anglesey	B,C,D*,E,I,L*,O,P,R*
304.0	SB	Sumburgh Hd Lt	Shetland Is	F*
304.5	MY	Cabo Mayer Lt	N.Spain	D*,E*,P,Q*
305.0	BA	Estaca de Bares	N.W.Spain	G*
305.0	FP	Fife Ness Lt	SE.Scotland	C,E,F*,L*,O,P
305.0	GL	Ile de Giraglia Lt	Corsica	E*,M*
305.5	AL	Pt d'Ailly Lt	France	A,C*,,D*,E,G,H,I*,J*,L*,P,Q
305.7	DA	Dalatangi Lt	Iceland	E*,H*
306.0	EC	Elizabeth Castle	Jersey	A,P
306.0	FN	Walney Is Lt	Off Lancs	C,E,I,K,O,P*,Q,R*
306.0	TN	Thyboron	Denmark	C,F*
306.5	GJ	Le Grand Jardin Lt	France	A,D*,H,P
306.5	KL	Kolkasrags	Estonia	E*,H*
306.5	KR	Kubassaar	Estonia	E*,H*
306.5	MV	Morzhovskiy	Arctic	H*,P*
306.5	OR	O.Osmussaar	Estonia	E*
306.5	RS	Ristna	Estonia	E*,H*
306.5	SY	Sorve	Estonia	E*,H*
306.5	UT	Utsira	Norway	C,D*,E*,F*,H*,L*,N
307.0	GL	Eagle Is Lt	Ireland	C,D*,E,F*,I,M
308.0	GR	Grimsey	Iceland	F*,H
308.0	RC	Cabo Roca	Portugal	E,H*
308.0	RD	Roches Douvres Lt	France	A,C,D*,E*,G*,H,J*,L*,O,P,Q
308.5	NZ	St Nazaire	France	D*,E*,P
309.0	MU	Kobenhaven	Denmark	E*
309.5	BA	Punta Estaca Bares	N.Spain	E*,F*,H*,I*,L*,P
309.5	FH	Fruholmen Lt	Norway	E*
309.5	MA	Marstein Lt	Norway	C,E*,F*,H*,P
309.5	PB	Portland Bill Lt	Dorset	A,D*,E*,G*,J*,L*,O,P,Q
309.5	WE	Wangerooge Lt	N.Germany	E*
310.0	ER	Pt de Ver Lt	N.France	A,D*,E*,G*,H*,J*,L*,O,P,Q
310.0	SG	Sjaellands	Denmark	E*,I*
310.5	BO	Bokfjord Lt	Norway	E*
310.5	SG	Sjaellands N Lt	Denmark	C
311.0	GD	Girdle Ness Lt	NE.Scotland	C,E*,F*
311.0	NF	N.Foreland Lt	Kent	A,D*,G*,I,J*,L*,O,P,Q
311.5	LP	Loop Hd Lt	S.Ireland	D*,E,F*,I
312.0	HO	Tennholmen Lt	Norway	E*,G*
312.0	OE	Oostende	Belgium	D*,E*,G,H,L*,O,P,Q,R*
312.0	UH	Eckmuhl Lt	France	D*,E*,M*
312.5	AK	Akmenrags	Latvia	E*
312.5	AT	Mys Aytodorskiy	Ukraine	H*
312.5	BK	Baltijsk	Latvia	E*,F*,H*
312.5	BT	Mys Taran Lt	Latvia	E*,H*
312.5	CS	Calais Main Lt	France	D*,G,H,O,P,Q
312.5	KA	Klaipeda Rear Lt	Lithuania	E*,H*
312.5	LB	Liepaja	Latvia	E*,H*
312.5	VS	Cabo Estay Lt	N.Spain	Q*
312.5	WW	Ventspils	Latvia	E*,G*,H*
312.6	SR	Skardhsfjara Lt	Iceland	E*,H*
313.0	HA	Halten Lt	Norway	D*,E*,F*
313.0	PA	Cabo de Palos Lt	S.Spain	D*,E*,H*
313.0	TY	Tory Is Lt	N.Ireland	C,E,I,M
313.5	CM	Cromer Lt	Norfolk	A,B,C,D*,G,L*,O,P,Q
313.5	OG	Olands Sodra Grund	Sweden	E*
313.5	PQ	Porquerolles	S.France	E*,H*
313.5	BR	Cap Bear Lt	S.France	E*,H*
314.0	HK	Hekkingen Lt	Norway	E*
314.0	VG	Ile Vierge Lt	France	A,B,C*,D*,E,F*,G*,H*,I,J*, L*,M*,O,P,Q,R*
314.5	SK	Strandhofn	Iceland	E*
314.5	TL	Punta D.Penna	Italy	D*,E*,F*,H*
315.0	SL	Sletterhage	Denmark	C*,E*,H*,L*,P
316.0	IN	Ingolfshofdhi Lt	Iceland	D*,E*
319.0	LEC	Stavanger	Norway	A,B,C,D*,E,F*,G,I,J*, L*,M,O,P,Q*,R*
367.0	JV	Jakobshavn	Greenland	E*
372.0	DZN	Prins Chris's Sund	Greenland	D*,E*,H*,R*
381.0	AB	Akraberg	Faeroe Is	C*,D*,E*,G*,H*,R*
404.0	NL	Noslo	Faeroe Is	C*,D*,F*,G*,H*

Note: Entries marked # are calibration stations. Entries marked * were logged during darkness. All other entries were logged during daylight.

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B: Leslie Biss, Knaresborough.
C: Kenneth Buck, Edinburgh.
O: Steve Cann, Southampton.
E: Robert Connolly, Kilkeel.
F: Geoff Crowley, Aberdeen.
G: John Eaton, Woking.
H: Jim Edwards, Bryn.
I: Albert Moore, Douglas, IoM.
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K: Clare Pinder, Appleby.
L: Peter Rycraft, Wickham Market.
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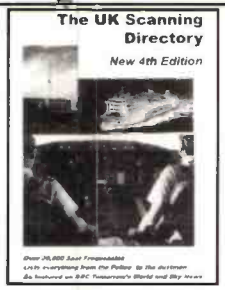

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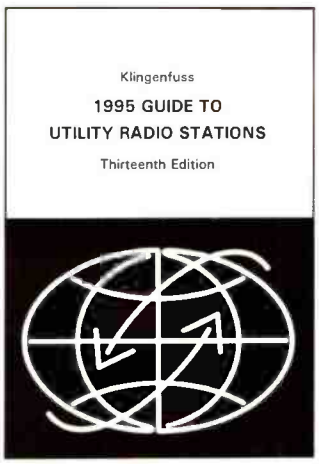

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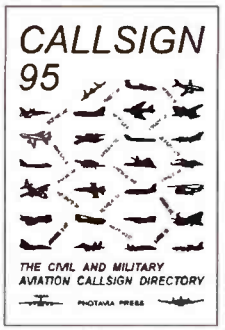

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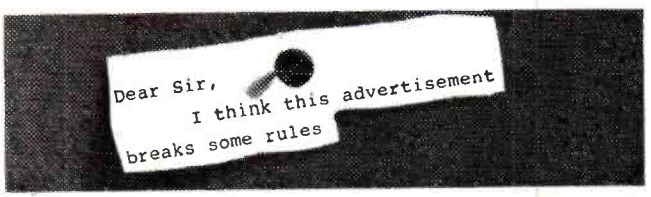

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Audit Bureau of Circulations Ltd., Black Prince Yard, 207-209 High Street, Berkhamsted, Herts., HP4 1AD. Tel: 0442 870800 Fax: 0442 877408

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

LM&S

Long, Medium and Short Waves

So, here we are again at the end of another year of DXing - a year, perhaps, of some unexpected 'finds' and of one or two disappointments. But one of the joys of our hobby is that there is always something to look forward to, so perhaps 1995 will be the year when you finally capture that long sought, elusive signal!

In the meantime my message to you is a simple one - Happy Christmas and good listening in the New Year.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, 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 Radioropa, a German commissioned radio station. He has heard their broadcasts in German at 1430UTC.

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. At 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 sports programme at 0105, during which their signal peaked a remarkable 44343. He found the reception of WBBR in New York on 1130 so good at 0109 on September 23 that he was able to, "just sit down and listen to the programme"!

The broadcasts from Harbour Light, Grenada on 1400 were heard at 2332 by **Roy Merrall** in Dunstable on September 14., their signal was SIO122. At 2337 he logged WTOP in Washington on 1500 as SIO222, but their ident was not clearly heard. On September 17 he listened to a sports programme by WSSH on 1510, which peaked SIO323 at 2310. Conditions were less favourable on September 20. Weak signals were received around 0100 from CJYQ St.John's on 930 (SIO122); CHUM Toronto on 1050; also WBAL Baltimore on 1090. Roy found that transatlantic signals were detectable right across the band on September 23, but most of them did not rise above the intelligibility threshold. He did get a clear ident from WVEI in Worcester on 1440 at 2359 (SIO233). He listened again on September 25 and heard at 0140 WINS in New York on 1010 (SIO222).

Over in Co.Down **Robert Connolly** (Kilkeel) checked the band on several nights prior to September 20. He logged VOCM in St.John's on 590 as 21221 at 0040; WINS 1010 as 21221 at 0100; WEVD 1050 as 22222 at 0115; CJYQ 930 as 2222 at 0135; CKOC in Hamilton 1150 as 22222 at 0120; WKNR in Cleveland 1220 as 21221 at 0145; CKVD Clarenville 710 as 22222 at 0215; CBY Corner Brook 990 as 22222 at 0225.

The band was also searched at night in the Ukraine by **Sergi Olijnyk** (Kalush). At 0200 he picked up for the first time a broadcast from R.Vibracion (YVSY) in Carupana, Venezuela on 1470.

The sky waves from stations in other distant places also reached the UK after dark. Especially good conditions were observed on September 22 by **George Millmore** in Wootton, IoW. Around 2300 he picked up the signals from Esfahan, Iran on 1467, their 200kW transmission rated SIO222.

Roy Merrall suspects there was some unusual ionospheric activity on September 21, 22 & 23. Around 1800 each day, 1566kHz came alive with mixed Arabic, Hindi and Korean. He was able to establish that they were coming from RTV via Sfax; AIR via Nagpur; also FEBC via Cheju, Korea! AIR broadcast news bulletins in English at 2130 and/or 2230 and direct references were made to FEBC during their religious broadcasts. They gave a PO Box number in Seoul.

Further to the reports of R.Free Europe on 1593 (see LM&S, November '94 *SWM*), Roy Patrick has observed that VOA now takes over at 2130 with a programme in Serbian. He rated their signal 35333.

Along with others, **Eddie McKeown** (Newry) has been listening to the relay of R.Nederlands via Bolshakovo on 1386. He logged their 2500kW transmission in English to Europe as 45333 at 2118.

Whilst on holiday in St.Ives, Cornwall **Simon Hockenhull** (E.Bristol) found the BBC R-4 2kW transmission from nearby Redruth on 756 suffered co-channel interference from the DLF Braunschweig transmitter (800/200kW) well before dusk. It was completely swamped by sunset. Reception of the BBC R-4 l.w. transmission from Droitwich on 198 was also poor after dark, because the sky wave interfered with the ground wave and resulted in phase distortion.

Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	H*
153	Donebach	Germany	500	A*,D,E*,G,H,I*,J,K,L,M
153	Brasov	Romania	1200	E*,G*
162	Allouis	France	2000	A*,D,E,G,H,I*,J,K,L,M
171	Nador Medi-1	Morocco	2000	C*,H*,I*
171	Kaliningrad	Russia	1000	A*,E*,G,H*,I*,J,M
177	Oranienburg	Germany	750	A*,G,J,L*,M
183	Saarlouis	Germany	2000	A*,D,E,G,H,I*,J,K,L,M
189	Caltanissetta	Italy	10	F*
198	Droitwich BBC	UK	500	A*,D,E,G,I*,J,K,L,M
207	Munich	Germany	500	A*,C*,E*,G,H,I*,J,L*,M
207	Azilal	Morocco	800	C*,H*
216	Roumoules RMC	S.France	1400	A*,C*,D,E,G,H,I*,J,L,M
216	Oslo	Norway	200	D*,F*,I*
225	Raszyn Resv	Poland	?	A*,C*,D,E*,G,H*,I*,J,L*,M
234	Beidweiler	Luxembourg	2000	A*,E,G,H,I*,J,K,L,M
234	St.Petersburg	Russia	1000	I*
243	Kalundborg	Denmark	300	A*,E*,G,H,I*,J,L,M
243	Alma-Ata	Kazakhstan	500	F*
243	Erzurum	Turkey	200	F*
252	Tipaza	Algeria	1500	C*,D*,G*,L*
252	Atlantic 252	S.Ireland	500	A*,C,D*,E,G,H,I*,J,K,L,M
261	Burg(R.Ropa)	Germany	200	A*,B,G*,H,I*,L*,M
261	Taldom Moscow	Russia	2000	E*,I*,H*
270	Topolna	Slovak Rep	1500	A*,B*,E*,G*,H*,I*,J,L*,M
279	Ashkhabad	Turkmenistan	150	F*
279	Minsk	Belarus	500	A*,E*,G*,H*,I*,J*,L*

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

Listeners:

A:	Geoff Crowley, Aberdeen.	G:	George Millmore, Wootton, IoW.
B:	John Eaton, Woking.	H:	Fred Pallant, Storrington.
C:	Simon Hockenhull, St.Ives, Cornwall.	I:	Harry Richards, Barton-on-Humber.
D:	Sheila Hughes, Morden.	J:	Bill Rowley, Colchester.
E:	Eddie McKeown, Newry.	K:	Tom Smyth, Co.Fermanagh.
F:	Roy Merrall, Dunstable.	L:	Andrew Stokes, Leicester.
		M:	Phil Townsend, E.London.

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 (11m)** 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 broadcasts to Europe from UAER, Dubai on 21.605 (Eng 1030-1055, 1330-1355) can usually be heard here, but sometimes they fade into the noise. They were rated 35233 at 1030 by **Darren Beasley** in Bridgwater and SIO454 at 1330 by **Kenneth Buck** in Edinburgh.

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 Rimavska Sobota 21.705 (Eng to Aust 0830-0857) 45444 at 0830 in Newry; R.Australia via Darwin 21.725 (Eng to Asia 0630-1100) 24523 at 0944 by **David Edwardson** in Wallsend and 34423 at 1031 by **Leo Barr** in Sunderland; DW via Julich? 21.680 (Eng to SE.Asia 0900-0950) 24332 at 0945 by **Rhoderick Illman** in Oxted.

After mid-day RFI via Montsinery 21.645 (Sp, Fr to Latin Am 1300-1655) was rated 33333 at 1300, 21.685 (Fr to W.Africa 1600-1757) 34333 at 1614, via ? 21.765 (Fr to ? 1900?-2100?) 43333 at 2006 and via Allouis 21.685 (Fr to W.Africa 1200-1555) 24332 at 1521 by **Fred Pallant** in Storrington; HCJB, Quito 21.455 (Eng, u.s.b. + p.c.) SIO222 at 1335 by **Phil Townsend** in E.London; BBC via Limassol 21.470 (Eng to E.Africa 1400-1615) 44444 at 1412 by **John Eaton** in Woking, via Ascension Is 21.660 (Eng to C/S.Africa 1100-1700) 34443 at 1556 by **Andrew Stokes** in Leicester and via Meyerton 21.470 (Eng to E.Africa 1615-1700) 45434 at 1638 in Storrington; R.Portugal Int via Sines 21.515 (Port to M.East, India? 1400-1600) 34223 at 1430 in Newry; WYFR via Okeechobee 21.525 (Ar, Eng, Fr, Ger, Port to Africa 1600-2045?) 23332 at 1616 in Storrington; Monitor R.Int via WSHB 21.640 (Eng, Fr to Africa? 1700-1957) 24332 at 1819 in Oxted; VOA via Greenville 21.485 (Eng to Africa 2000-2200?) 34443 at 2000 in Storrington.

Daily variations in propagation were also observed in the **17MHz (16m)** band. During the morning Slovak R.Int via Rimavska Sobota 17.485 (Eng to Aust 0830-0857) was 55444 at 0835 by **P.Guruprasad** in Velore, India; BBC via Kranji 17.830 (Eng to SE.Asia 0900-1030) was 24222 at 0900 in Barton-on-Humber; Channel Africa, Johannesburg 17.810 (Eng to Africa 1000-?) 31322 at 1002 in Newry; AIR Delhi 17.387 (Eng to Pacific areas 1000-1100) 22222 at 1010 in Kilkeel; R.Moscow Int 17.710 (Eng WS) 44444 at 1010 in Storrington; R.Pakistan, Islamabad 17.900 (Eng to Eu 1100-1120) 54444 at 1100 by **Chris Shorten** in Norwich; Israel R, Jerusalem 17.575 (Eng to Eu? 1100-1130?) 34433 at 1106 in Sunderland; DW via ? 17.800 (Eng to W.Africa 1100-1150) 23433 at 1120 in Bridgwater.

After mid-day, the Voice of Greece, Athens 17.520 (Gr to N.Am? 1300-?) was SIO334 at 1335 in E.London; HCJB Quito 17.490 (Eng u.s.b. + p.c) SIO254 at 1330 in Edinburgh; Africa

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	F*,J*
531	Ain Beida	Algeria	600	G,J*
531	Torshavn	Faeroe Is.	100	M
531	Leipzig	Germany	100	E*,F*,J*,K*,N*
531	RNE5 via ?	Spain	?	A*,G*
531	Beromunster	Switzerland	500	F,J*
540	Wavre	Belgium	150/50	G,J*,K,N,O
540	Sidi Bennour	Morocco	600	E*,G*
549	Les Trembles	Algeria	600	A*,G*,J*
549	Thurmau (DLF)	Germany	200	E*,G*,J*,K,N,O
549	Quarayyat	S. Arabia	2000	F*
558	Espoo	Finland	100	E*,G*,J*
558	Tirgu Jiu	Romania	200	G*
558	RNE5 via ?	Spain	?	G*,J*,L*,N*
567	Berlin	Germany	100	E*
567	Tullamore(RTE1)	Ireland (S)	500	B,D,G,J*,K,L,N,O
567	RNE5 via ?	Spain	?	J*
576	Muhlacker(SDR)	Germany	500	A*,D,E*,G*,J*,O
576	Schwerin(NDR)	Germany	250	F*
576	Riga	Latvia	500	G*
576	Barcelona(RNE5)	Spain	50	A*,G*,N(
585	Orf Wien	Austria	600	J*
585	Paris(FIP)	France	8	D,E*,G,O
585	Madrid(RNE1)	Spain	200	G*,J*,K,N*
585	Dumfries(BBCScot)	UK	2	J*
594	Frankfurt(HR)	Germany	1000/400	E*,G*,J*,K,N*,O
594	Muge	Portugal	100	A*,G*,J*
603	Sevilla(RNE5)	Spain	60	E*,G*,J*,L*
612	Athlone(RTE2)	Ireland (S)	100	B,G,J*,K,N*,O
612	Sebaa Aioun	Morocco	300	E*
612	RNE1 via ?	Spain	10	G*,J*,L
621	Wavre	Belgium	80	E*,G,J*,K,N,O
621	Batra	Egypt	2000	F*
621	Barcelona(OCR)	Spain	50	G*,J*
630	Vigra	Norway	100	A*,G*,J*,N*
630	Tunis-Ojedeida	Tunisia	600	E*,G*,J*
639	RNE1 via ?	Spain	?	E*,G*,J*,K*,N*
648	RNE1 via ?	Spain	10	E*,J*
648	Orfordness(BBC)	UK	500	A*,B*,G, J*,K,N*,O
657	Napoli	Italy	120	E*L*
657	Madrid(RNE5)	Spain	20	G*,K*
657	Wrexham (BBCWales)	UK	2	A*,J*,N
666	Bodensees'dr(SWF)	Germany	300/180	A*,E*,J*
666	Lisboa	Portugal	135	G*,J*
675	Marseille	France	600	G*,J*
675	Lopic(R10 Gold)	Holland	120	E*,G,J*,K,N,O
684	Sevilla(RNE1)	Spain	500	E*,G*,J*,K*,N*
684	Avala(Beograd-1)	Yugoslavia	2000	A*,G*,J*,K*
693	Droitwich(BBC5)	UK	150	G,J*,K,N*,O
702	Flensburg(NDR)	Germany	5	E*,F*,G*,J*
702	Presov	Slovak Rep.	400	F
702	Zamora(RNE1)	Spain	10	F,G*,J*
711	Rennes 1	France	300	B,G,J*,K,N*,O
711	Heidelberg	Germany	5	E*
711	Laayoune	Morocco	600	G*,J*
720	Langenberg	Germany	200	F,G,J*,K*
720	Lisnagarvey(BBC4)	Ireland (N)	10	G*,J*,L,N*
720	Norte	Portugal	100	E*,G*,J*
720	Lots Rd,Ldn(BBC4)	UK	0.5	G,K,N,O
729	Putbus/Bergen(NOR)	Germany	10	F*
729	Cork(RTE1)	Ireland (S)	10	F,G*,J*
729	RNE1 via ?	Spain	?	E*,G*,J*,N*
738	Paris	France	4	G
738	Poznan	Poland	300	G*
738	Barcelona(RNE1)	Spain	500	E*,G*,J*,N*
747	Flevo(Hilv2)	Holland	400	E*,G,J*,K,N,O
747	Cadiz(RNE5)	Spain	10	G*,J*
756	Braunschweig(OLF)	Germany	800/200	B*,E*,G*,J*,K*
756	Bilbao(EI)	Spain	5	G*
756	Redruth(BBC)	UK	2	G
765	Sottens	Switzerland	500	E*,G*,J*,K*,N*
774	Abis	Egypt	500	G*
774	RNE1 via ?	Spain	?	E*,G*,J*,K*,N*
774	Plymouth(BBC)	UK	1	L
783	Burg	Germany	1000	E*,J*,K*,N*
783	Miramar(R.Porto)	Portugal	100	E*,G*,J*
783	Dammam	S. Arabia	100	G*
783	Tartus	Syria	600	F*
792	Limoges	France	300	J*
792	Lingen(NDR)	Germany	5	E*
792	Sevilla(SER)	Spain	20	G*,J*,K*,L*,N*
801	Munchen-Ismaning	Germany	300	E*,G*,J*,K*,N*
801	RNE1 via ?	Spain	?	G*,L*
810	Madrid(SER)	Spain	20	E*,G*,J*
810	Westerglen (BBCScot)	UK	100	B*,G*,J*,L,N*,O*
819	Toulouse	France	50	E*,K*
819	Rabat	Morocco	25	J*
819	Warsaw	Poland	300	G*,J*,K*,L*
828	Hannover(NDR)	Germany	100/5	J*
837	Nancy	France	200	G,J*,L*
837	COPE via ?	Spain	?	E*,J*,K*
846	Rome	Italy	540	G*,J*,K*,N*,O*
855	Berlin	Germany	100	G*
855	R.Bucharest	Roumania	750	E*
855	RNE1 via ?	Spain	?	G,J*,N*
864	Santah	Egypt	500	F*
864	Paris	France	300	E*,G,J*,K
864	Socuellamos(RNE1)	Spain	2	A*,J*
873	Frankfurt(AFN)	Germany	150	B*,E*,G*, J*,K*,N*
873	Zaragoza(SER)	Spain	20	G*,J*,K*
882	COPE via ?	Spain	?	E*,G*,J*
882	Washford (BBCWales)	UK	100	B,G,J*,K,L*,N,O
891	Algiers	Algeria	600/300	A*,E*,G,J*,K*,N*
891	Huisberg	Netherlands	20	G*,J*,K
900	Milan	Italy	600	E*,G*,J*,K*
900	COPE via ?	Spain	?	G*,J*,N*
909	Bournemouth(BBC5)	UK	0.025	G
909	B'mans Pk(BBC5)	UK	140	K,N*,O
909	M'side Edge(BBC5)	UK	200	J*
918	Plesivec(Sloven'nR)	Yugoslavia	600/100	E*,G*,J*,N*
918	Madrid(R.Int)	Spain	20	G*,J*,K*
927	Wolvertem	Belgium	300	G,J*,K,N,O
936	Bremen	Germany	100	E*,G*,J*,K*
936	Venezia	Italy	20	J*
936	RNE5 via ?	Spain	?	J*
945	Toulouse	France	300	G*,J*,L*
954	Madrid(CI)	Spain	20	E*,G*,J*,K*,N*
963	Pori	Finland	600	E*,G*,J*,K*,O*
963	Tir Chonaill	Ireland (S)	10	G*
972	Hamburg(NDR)	Germany	300	E*,G*,J*,K*,N*
972	RNE1 via ?	Spain	?	G*
981	Alger	Algeria	600/300	A*,E*,G*,J*,N*
981	Megara	Greece	200	A*
990	Berlin	Germany	300	E*,L*
990	R.Bilbao(SER)	Spain	10	G*,J*,K*
999	Schwerin (RIAS)	Germany	20	E*,F,J*
999	Torino	Italy	20	F
999	Madrid(COPE)	Spain	50	F,J*,L*
1008	Las Palmas(SER)	G.Canaria	?	E*,F*,J*
1008	Flevo(Hilv-5)	Holland	400	G,K,N,O
1017	Rheinsender(SWF)	Germany	600	E*,G*,K*,N*
1026	Graz-Dobl	Austria	100	E*
1026	SER via ?	Spain	?	G*,J*
1035	Tallinn	Estonia	500	G*,J*
1035	Lisbon(Prog3)	Portugal	120	E*,G*
1044	Sebaa-Aioun	Morocco	300	J*
1044	S.Sebastian(SER)	Spain	10	E*,J*,N*
1053	Tanger	Morocco	600	F*
1053	Iasi	Romania	1000	B*,F,G*
1053	Zarogoza(COPE)	Spain	10	E*,F,G*
1062	Kalundborg	Denmark	250	G*,J*,K,O
1062	Cagliari	Italy	25	F*
1062	Norte	Portugal	100	E*
1071	Brest	France	20	B,E*,G
1071	Lille	France	40	N*,O
1071	Riga	Latvia	50	G*
1071	Bilbao(EI)	Spain	5	G*
1080	Katowice	Poland	1500	G*
1080	SER via ?	Spain	?	E*,G*,J*,K*
1089	Durres	Albania	150	F*
1089	Krasnodar	Russia	300	E*,F*
1089	St.Petersburg	Russia	20	F*
1098	Nitra(Jarok)	Slovakia	1500	B*,E*,G*, J*,K*,N*
1098	RNE5 via ?	Spain	?	G*
1107	AFN via ?	Germany	10	K*,N*
1107	RNE5 via ?	Spain	?	E*,G*,J*,K*
1116	Bari	Italy	150	G*,K*
1125	La Louviere	Belgium	20	G*
1125	Deanovec	Croatia	100	J*
1125	RNE5 via ?	Spain	?	G*,J*,K*,N*
1125	Llandrindod Wells	UK	1	J*
1134	Zadar(Croatian R)	Yugoslavia	600/1200	E*,G*,J*,K*,O*
1134	COPE via ?	Spain	2	G*
1143	AFN via ?	Germany	1	J*
1143	Messina	Italy	6	E*,G*
1152	RNE5 via ?	Spain	10	E*,J*
1161	Strasbourg(Flnt)	France	200	E*G*,J*,N*
1179	SER via ?	Spain	?	J*
1179	Solvesborg	Sweden	600	B*,C*,E*,G*, J*,K*,N*,O
1188	Kuurne	Belgium	5	E*,G,K,N*,O
1188	Reichenbach(MDR)	Germany	5	F*,J*
1188	Szolnok	Hungary	135	G*,J*
1197	Munich(VOA)	Germany	300	E*
1197	Virgin via ?	UK	?	B,G,J*,K,N,L,O
1206	Bordeaux	France	100	E*,G*
1206	Wroclaw	Poland	200	G*,J*,K*
1215	Virgin via ?	UK	?	B,G,J*,K,L,N,O
1224	Vidin	Bulgaria	500	G*,J*
1224	Virgin via ?	UK	?	J*
1233	Liege	Belgium	5	E*,G*
1233	Virgin via ?	UK	?	G*,J*,K,N
1242	Virgin via ?	UK	?	J*,N
1251	Marcali	Hungary	500	E*,G*,J*,N*
1251	Huisberg	Netherlands	10	G*
1260	SER via ?	Spain	?	E*,K*
1260	Guildford (V)	UK	?	G
1269	Neumunster(DLF)	Germany	600	E*,G*,J*,K,N*,O
1278	Strasbourg	France	300	G*
1278	Dublin/Cork(RTE2)	Ireland (S)	10	B,G*,J*,K*, L,N*,O*
1287	RFE via ?	Czech Rep.	400	E*,G*,K*,N*,O*
1287	Lerida(SER)	Spain	10	E*,F*,G*,J*
1296	Valencia(COPE)	Spain	10	E*,G*,J*
1296	Orfordness(BBC)	UK	500	G*,J*,K,N,O*
1305	Rzeszow	Poland	100	E*,K*,L*
1305	RNE5 via ?	Spain	?	J*
1314	Kvitsoy	Norway	1200	B*,E*,G*,I, J*,K,N,O
1323	Wachenbrunn (RMWS)	Germany	1000/150	E*,J*,L*,N*,O
1332	Rome	Italy	300	E*,G*,K*
1341	Lakihegy	Hungary	300	K*
1341	Lisnagarvey(BBC)	Ireland (N)	100	B*,G*,J*,K*,L,O*
1341	Tarrasa(SER)	Spain	2	G*
1350	Nancy/Nice	France	100	E*,G*,J*,K*,N*,O
1350	Cesvaine/Kuldiga	Latvia	50	G*
1359	Arganda (RNE-FS)	Spain	600	E*,G*,J*
1368	Foxdale(Manx R)	IOM	20	B,G*,J*,K*,L*
1377	Lille	France	300	E*,G,J*,K,N,O
1377	Ukraine	Ukraine	50	F*
1386	Bolshakovo	Russia	2500	B*,C*,E*,G*,I*, J*,K*,N*,O
1395	Lushnje(Tirana)	Albania	1000	C*,E*,G*,J*, K*,N*,O*
1404	Ajaccio	France	20	E*
1404	Brest	France	20	B,C*,G,J*,K*,N*
1413	RNE5 via ?	Spain	?	E*,G*,J*,L*,N*
1422	Alger	Algeria	50/25	J*
1422	Heusweiler(SR)	Germany	1200/600	E*,G*,J*,K,N*
1431	Nikolayev	Ukraine	400	E*,F*,J*
1440	Marnach(RTL)	Luxbourg	1200	G,J*,K,N,O*
1440	Damman	S. Arabia	1600	A*,E*,F*,G*,J*
1440	Jagodina	Yugoslavia	20/10	E*
1449	Berlin	Germany	5	E*
1449	Redmoss(BBC)	UK	2	E*,J*,N*
1458	Lushnje(Tirana)	Albania	500	J*,K*
1467	Esfahan	Iran	200	G*
1467	Monte Carlo(TWR)	Monaco	1000/400	E*,G*,J*,N*
1476	Wien-Bisamberg	Austria	600	E*,G*,J*, K*,N*,O*
1485	AFN via ?	Germany	1	F*
1485	SER via ?	Spain	?	G*,J*,N*
1494	Clermont-Ferrand	France	20	G*
1494	Al Karanah	Jordan	1000	F*
1494	St.Petersburg	Russia	1000	C*,E*,J*
1503	Stargard	Poland	300	G*,J*
1503	RNE5 via ?	Spain	?	A*
1512	Wolvertem	Belgium	600	B*,C*,E*,G,J*, K,L*,N*,O
1512	Jeddah	S. Arabia	1000	F*
1521	R.Beijing	China	500	F
1521	Kosice(Cizatice)	Slovakia	600	E*,G*,J*,K*
1521	Ouba	S. Arabia	2000	F*
1521	R.Manresa(SER)	Spain	2	G*
1521	Kazan (R.Moscow)	Russia	20	F*
1530	Vatican R	Italy	150/450	C*,E*,G*, K*,N*,O
1539	Mainflingen(DLF)	Germany	700	B*,E*,G*,J*, K*,N*,O*
1557	Nice	France	300	K*,N*
1557	Cyclops(DW)	Malta	600	H*
1566	Nagpur	India	1000	F*
1566	Cheju (FEBC)	Korea	250/100	F*
1566	Mayak	Russia	?	F*
1566	Sarnen	Switzerland	300	J*
1566	Sfax	Tunisia	1200	F*,G*
1575	Genova	Italy	50	E*,J*,N*
1575	SER via ?	Spain	5	G*
1584	SER via ?	Spain	2	G*
1593	Matruh	Egypt	10	F*
1593	R.Free Europe	?	100?	E*,F,I*,M*
1593	M.Cluc	Romania	14	G*
1593	Dnipropetrovsk	Ukraine	5	F*,N*
1602	Vitoria(EI)	Spain	10	G*,J*
1611	Vatican R	Italy	15	L*,O

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

Listeners:
A: John Eaton, Woking.
B: Simon Hockenhull, St.Ives, Cornwall.
C: Sheila Hughes, Morden.
D: Rhoderick Illman, Oxted.
E: Eddie McKeown, Newry.
F: Roy Merrall, Dunstable.
G: George Millmore, Wootton IoW.
H: Sergei Olejnik, Kalush, Ukraine.
I: Roy Patrick, Derby.
J: Martin Price, Shrewsbury.
K: Bill Rowley, Colchester.
L: Tom Smyth, Co.Fermanagh
M: John Stevens, Largs.
N: Andrew Stokes, Leicester.
O: Phil Townsend, E.London.

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R	I	7.50	A,C,H,K,L,M,N,P,Q,R
585	R.Solway	B	2.00	G,I,K,M
603	Cheltenham(CD603)	I	?	H,K,P,R
603	Invicta SG (Coast)	I	0.10	A,C,H,L,N,Q,R
630	R.Bedfordshire(3CR)	B	0.20	A,H,K,L,M,N,P,Q,R
630	R.Cornwall	B	2.00	H,I,R
657	R.Clwyd	B	2.00	A,H,I,K,M,P,Q,R
657	R.Cornwall	B	0.50	D,H
666	DevonAir R	I	0.34	D,H,R
666	R.York	B	0.80	A,I,K,M,N,P,Q,R
729	BBC Essex	B	0.20	A,C*,H,K,L,M,N,P,Q,R
738	Hereford/Worcester	B	0.037	H,K,M,P,Q,R
756	R.Cumbria	B	1.00	G,I,M,O*
756	R.Maldwyn	I	0.63	H,K,R
765	BBC Essex	B	0.50	A,C,H,K,L,M,N,P,Q,R
774	R.Kent	B	0.70	A,C,H,K,L,N,Q,R
774	R.Leeds	B	0.50	I,M
774	Gloucester(3CSG)	I	0.14	H,K,P
792	Chiltern(S.Gold)	I	0.27	A,C*,H,K,L,M,N,P,Q,R
792	R.Foyle	B	1.00	G*
801	R.Devon & Dorset	B	2.00	D,H,K,Q,R
828	Chiltern(S.Gold)	I	0.20	A,L,M,P,Q,R
828	R.WM	B	0.20	K
828	2CR(Cl.Gold)	I	0.27	H
837	R.Cumbria/Furness	B	1.50	I,K
837	R.Leicester	B	0.45	A,H,K,M,N,P,Q,R
855	R.Devon & Dorset	B	1.00	H
855	R.Lancashire	B	1.50	G,I,M
855	R.Norfolk	B	1.50	A,L,M,N,Q,R
855	Sunshine R	I	0.15	K,R
873	R.Norfolk	B	0.30	A,H,K,N,P,Q,R
936	Brunel R(Cl.Gold)	I	0.18	H,K,L,R
945	R.Trent(Gem AM)	I	0.20	A,H,I,K,M,N,P,Q,R
954	DevonAir(Cl.Gld)	I	0.32	H,L,R
954	R.Wyvern(WYVN)	I	0.16	A,H,K,L,R
990	WABC(Nice & Easy)	I	0.09	K,R
990	R.Aberdeen	B	1.00	A
990	R.Devon & Dorset	B	1.00	H,L,R
990	Hallam R(Gt.Yks)	I	0.25	A,K,M,N,R
999	R.Solent	B	1.00	A,H,L,Q,R
999	R.Trent(Gem AM)	I	0.25	A,K,M,N,P,R
999	Red Rose(Gold)	I	0.80	I
1017	Beacon R(WABC)	I	0.70	I,K,M,P,R
1026	Downtown R	I	1.70	I,O
1026	R.Cambridgeshire	B	0.50	A,B,L,M,N,P,Q,R
1026	R.Jersey	B	1.00	H,L,R
1035	Country 1035	I	?	A,C,E,H,J*,K,L,N,Q,R
1035	NorthSound R	I	0.78	A*,G*,J*,M
1035	R.Sheffield	B	1.00	I,M,O*,P
1035	West Sound R	I	0.32	G
1107	Moray Firth R	I	1.50	A,G*
1116	R.Derby	B	1.20	A,G*,I,K,M,N,P,Q,R
1116	R.Guernsey	B	0.50	H,L,R
1152	BRMB(Xtra-AM)	I	3.00	K,P
1152	LBC(L.Talkback R)	I	23.50	A,C*,H,L,N,Q,R
1152	Piccadilly R(Gold)	I	1.50	I,K
1152	R.Broadland	I	0.83	A,G*,N,R
1152	R.Clyde(Clyde 2)	I	3.06	S
1161	Brunel R(Cl.Gold)	I	0.16	H,L,R
1161	R.Bedfordshire(3CR)	B	0.10	A,L,N,P,Q,R
1161	Southern Counties R	B	1.00	A,C,H,L,N,R
1161	R.Tay	I	1.40	G*,K,O*
1161	Humberside(Gt.Yks)	I	0.35	I,K,M
1170	GNR Teeside	I	0.32	G*
1170	Hi Wycombe 1170AM	I	?	L,Q,R
1170	Portsmouth(SCR)	I	0.12	H,R
1170	R.Orwell(SGR)	I	0.28	A,C,N
1170	Signal R(S.Gold)	I	0.20	I,K,P
1170	Swansea Sound	I	0.58	D
1242	Invicta Snd(Coast)	I	0.32	A,C,L,Q,R
1242	Isle of Wight R	I	0.50	G*,H
1251	Saxon R(SGR)	I	0.76	A,G*,K,L,N,Q,R
1260	Brunel R(Cl.Gold)	I	1.60	D,G*,H,O*
1260	Marcher Snd(Gold)	I	0.64	G*,I,K
1260	Sunrise R	I	0.29	N,P,Q
1260	R.York	B	0.50	M
1278	Bradford(Gt.Yks)	I	0.43	B*,G*,H,K,M
1305	Barnsley(Gt.Yks)	I	0.15	K,M,P
1305	Red Dragon(Touch)	I	0.20	H,R
1323	R.Bristol(Som.Snd)	B	0.63	O*,R
1323	Brighton(SCR)	I	0.50	A,C*,H,L,N,Q,R
1332	Hereward R(WGMS)	I	0.60	A,G*,K,L,M,N,P,Q,R
1332	Wiltshire Sound	B	0.30	G*,H,K,L,R
1359	Essex R(BreezeAM)	I	0.28	A,L,N,Q,R
1359	Mercia Snd(Xtra-AM)	I	0.27	K,P
1359	R.Solent	B	0.85	G*,H
1368	R.Lincolnshire	B	2.00	C*,M,N,P
1368	Southern Counties R	B	0.50	H,L,Q,R
1368	Wiltshire Sound	B	0.10	H
1413	Sunrise R	I	0.125	F,H,N,O*,Q
1431	Essex R(BreezeAM)	I	0.35	A,C,G*,H,K,L,N,Q,R
1431	R 210(Cl.Gold)	I	0.14	G*,H,K,L,R
1449	R.Peterboro/Cambs	B	0.15	A,C*,G*,H,K,L,M,N,P,R
1458	Fortune	I	5.00	G*,I,K
1458	R.Cumbria	B	0.50	A,G,I
1458	R.Devon & Dorset	B	2.00	D,H,R
1458	Sunrise R	I	50.00	C,G*,H,M,N,Q,R
1476	Guildford(M.Xtra)	I	0.50	A,G*,H,L,N,Q,R
1485	R.Humberside	B	1.00	A,C*,G*,M,N
1485	R.Merseyside	B	1.20	G*,I,K,O
1485	Southern Counties R	B	1.00	A,H,L,N,P,Q,R
1503	R.Stoke-on-Trent	B	1.00	A,C*,G*,H,I,K,M,P,R
1521	Reigate(M.Xtra)	I	0.64	A,G*,H,K,L,N,O*,Q,R
1530	Huddersfld(Gt.Yks)	I	0.74	G*,I,K,M
1530	R.Essex	B	0.15	A,H,L,N,Q,R
1530	R.Wyvern(WYVN)	I	0.52	G*,H,K
1548	Capital R(Cap G)	I	97.50	A,C,D*,H,L,N,O*,Q,R
1548	R.Bristol	B	5.00	D,G*,H
1548	Liverpool(City G)	I	4.40	G*,I,K
1548	R.Forth(Max AM)	I	2.20	N*
1548	Sheffield(Gt.Yks)	I	0.74	M
1557	Chiltern R(Gold)	I	0.76	G*,K,M,P
1557	Southampton(SCR)	I	0.50	H,L,R
1557	R.Lancashire	B	0.25	G*,I,K
1557	Tendring(Mellow)	I	?	A,C,N
1584	Kettering(KCBC)	I	0.04	A,N,Q,R
1584	R.Nottingham	B	1.00	A,G*,H,I,M,O*,P,R
1584	R.Shropshire	B	0.50	H,K
1584	R.Tay	I	0.21	K
1602	R.Kent	B	0.25	A,C,G*,H,K,L,N,Q,R

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

Listeners:
A: Clive Boutell, Dovercourt.
B: John Eaton, Woking.
C: Arthur Grainger, Ashford.
D: Simon Hockenhull, St.Ives, Cornwall.
E: Sheila Hughes, Morden.
F: Rhoderick Illman, Oxted.
G: Eddie McKeown, Newry.
H: George Millmore, Wootton, IoW.
I: Albert Moore, Douglas, IoM.
J: Roy Patrick, Derby.
K: Martin Price, Shrewsbury.
L: Martin Price, Orpington.
M: Harry Richards, Barton-on-Humber.
N: Bill Rowley, Colchester.
O: Tom Smyth, Co.Fermanagh.
P: Andrew Stokes, Leicester.
Q: Phil Townsend, E.London.
R: John Wells, East Grinstead.
S: Julian Wood, Elgin.

No.1, Gabon 17.630 (Fr to W.Africa 0700-1600) SIO333 at 1416 by **Bill Clark** in Rotherham; RFI via Montsinery 17.860 (Fr to C.Am 1430?-1555) 35553 at 1449 in Woking; WYFR Okeechobee 17.760 (Eng to N.Am 1400-1700) 32222 at 1506 in Storrington; WEWN Birmingham 17.510 (Ar to N.Africa? 1500-1600) 33333 at 1545 by **Peter Pollard** in Rugby; R.Nederlands via Bonaire? 17.605 (Eng to W.Africa 1830-2025) 45444 at 1840 by **Michael Griffin** in Ross-on-Wye; R.Havana Cuba 17.760 (Eng to Eu 2100-2200) 44444 at 2115 by **Ross Lockley** in Stirling.

Rather more reliable conditions were noted in the **15MHz (19m)** band. R.Australia was logged from Carnarvon on 15.530 (Eng to N.Asia 0600-0900) as 45434 at 0840 in Velore & 15.170 (Eng to N.Asia 0900-1200) 43343 at 1101 in Newry; 15.530 from Darwin (Eng to S.Asia 1100-1300) 43434 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) 32333 at 0743 in Leicester and via Masirah Is 15.310 (Eng to S.Asia 0900-1400) SIO222 at 1107 by **Clive Boutell** in Dovercourt; R.Austria Int via Moosbrunn 15.450 (Ger, Eng to Aust 0800-1100) 32222 at 0830 by **Clare Pinder** in Appleby; Voice of Greece, Athens 15.650 (Gr, Eng to Eu, Asia, Far East 1000-1050) SIO444 at 1000 in Rotherham; R.Norway Int, Oslo 15.165 (Norw to ? 1000-1029) SIO444 at 1020 by **Philip Rambaut** in Macclesfield; UAER, Dubai 15.395 (Eng to Eu 1030-1100) 43543 at 1040 in Bridgwater.

In the afternoon, UAER, Dubai 15.395 (Eng to Eu 1330-1400) was SIO222 at 1330 by **Tom Smyth** in Co.Fermanagh; WWCR Nashville 15.685 (Eng to Eu 1000-2100?) 45444 at 1442 by **Vera Brindley** in Woodhall Spa; World Voice of Adventism via WCSN 15.665 (Eng to Eu 1500-1655) 44444 at 1530 by **George Tebbitts** in Penmaenmawr; DW via ? 15.140 (Eng to C.Africa 1500-1550) 33443 at 1532 in Ross-on-Wye; LJB via Sabrata 15.415 (Ar to Eu) SIO444 at 1540 by **Leslie Biss** in Knaresbrough; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) SIO333 at 1600 in E.London; R.Pakistan, Islamabad 15.675 (Eng to M.East 1600-1630) SIO444 at 1601 in Edinburgh; VOA via Morocco 15.410 (Eng to Africa 1600-2200) 34423 at 1640 in Barnet.

Later, HCJB Quito 15.350 (Eng to Eu 1700-2000) was heard clearly by **Laurence Mason** in Hassocks; Voice of Vietnam, Hanoi 15.010 (Eng, Fr, Sp to Eu 1800-2130) 54444 at 1800 in Norwich; Monitor R.Int via WCSN 15.665 (Eng, Cz, Ger to Eu 1800-2000) 44433 at 1819 in Oxted; RNB Brasilia, Brazil 15.265 (Eng, Ger to Eu 1800-2020) 43243 at 1830 in Newry; WINB Red Lion 15.715 (Eng to Africa, Eu 1600-1900) 23332 at 1857 in Woking; VOA via Greenville? 15.580 (Eng to Africa 1800?-2200) heard at 1915 in Storrington; R.Nederlands via Bonaire? 15.315 (Eng to W.Africa 1830?-2025) heard at 1930 in Hassocks; KTBN via Salt Lake City 15.590 (Eng to N.Am 1600-0000) 34433 at 2000 in Stirling; RCI via Sackville 15.325 (Fr, Eng to Eu 2000-2200) 45444 at 2021 in Barton-on-Humber; BBC via Ascension Is 15.400 (Eng to Africa 2100-2300) 43333 at 2100 in Storrington; KCBI Dallas 15.725 (Eng to N/C.Am) 32332 at 2200 in Kilkeel.

There is also plenty to interest the listener in the **13MHz (22m)** band! R.Australia's broadcasts to Asia from Darwin on 13.605 (Eng 0900-1000, 1100-1200) can usually be received here. They were logged as 35553 at 1107 in Wallsend. Also heard in the morning were R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eu 0400-1800), noted as SIO333 at 0745 by **Francis Hearne** in N.Bristol; SRI via Sottens? 13.685 (It, Eng, Fr, Ger, Port to Australia, S.Pacific 0830-1100) 55455 at 0909 in Newry; BBC via Rampisham 13.745 (Russ? to CIS 1030-1130, 1230-1400) SIO333 in Macclesfield.

After mid-day, WYFR via Okeechobee 13.695 (Fr to Canada 1100-1300, Eng to N.Am 1300-1400) was SIO333 at 1220 in Knaresbrough; SRI via Sottens? 13.635 (Eng, Fr, It, Ger to SE/S.Asia 1300-1500) SIO333 at 1300 in Co.Fermanagh and 55334 at 1315 in Velore; UAER, Dubai 13.675 (Eng to Eu 1330-1400) SIO444 at 1330 in Edinburgh; R.Prague, Czech Rep 13.580 (Cz? to Eu 1500-1527) 32442 at 1522 in Woking; R.Nederlands via Flevo 13.700 (Eng to S.Asia, M.East 1330-1625) 33333 at 1600 in Penmaenmawr; R.Pakistan, Islamabad 13.590 (Eng to M.East 1600-1630) 54444 at 1610 in Norwich; VOA via Selebi-Phikwe 13.710 (Eng to Africa 1600-?) 34322 at 1643 in Sunderland.

Later, Monitor R.Int via WCSN? 13.770 (Eng to Eu 2100-2157) was 35333 at 2155 in Bridgwater; WHRI South Bend 13.760 (Eng to E.USA, Eu 1700-0000) 45344 at 2129 in Barton-on-Humber; WEWN Birmingham 13.615 (Eng to Eu 2000-2200?) SIO222 at 2132 by **Julian Wood** in Elgin; WJCR via Millerstown 13.595 (Eng 24hrs) 45444 at 2200 in Stirling.

Good reception from many areas was noted in the **11MHz (25m)** band. R.Australia's broadcasts reached the UK on 11.660 from Carnarvon (Eng to S.Asia 1430-1800), rated 32322 at 1548 in Oxted; also on 11.695 from Shepparton? (Eng to Pacific) SIO444 at 1555 in Edinburgh.

The occupants of this band in the daytime include the BBC via Masirah Is 11.760 (Eng to M.East 0300-0815), logged as 55454 at 0500 in Velore; HCJB Quito 11.835 (Eng to Eu 0700-0830) 34433 at 0740 in Sunderland; Slovak R.Int, via Velke Kostolany 11.990 Eng to Aust 0830-0857) 44444 at 0830 in Newry; ERA Thessaloniki, Greece 11.595 (Gr to Eu 1000-2255) SIO333 at 1030 in Knaresborough; VOA via Greenville 11.915 (Eng to C.Am, Caribbean 1000-1200) SIO222 at 1040 in Macclesfield; R.Romania Int, Bucharest 11.940 (Eng to Eu 1300-1400) SIO322 at 1300 in Co.Fermanagh; Voice of the Mediterranean, Malta 11.925 (Eng, Ar

Tropical Bands Chart

to N.Africa 1400-1600) 34433 at 1404 in Ross-on-Wye; KTWR Agana 11.580 (Eng to S.Asia 1445-1700) SIO322 at 1520 in Rotherham; R.Pakistan, Islamabad 11.570 (Eng to Eu 1600-1630) SIO344 at 1600 in E.London.

Those noted in the evening were REE Madrid 11.775 (Eng to Africa 1900-2000), logged as 55544 at 1900 in Stirling; R.Romania Int, Bucharest 11.940 (Eng to Eu 1900-1955) 43333 at 1900 by **Sheila Hughes** in Morden; AIR via Bangalore 11.620 (Hi, Eng to Eu 1745-2230) 34454 at 1933 in Leicester; R.Globo, Rio de Janeiro 11.805 (Port 0900-0330) 24433 at 2012 in Storrington; RAI Rome 11.800 (Eng to Eu 2030-2045) 33222 at 2035 in Rugby; R.Kuwait via Kabd 11.990 (Eng to Eu 1800-2100) 45444 at 2050 in Woodhall Spa; R.Japan via Moyabi 11.925 (Eng to Eu 2100-2155?) 53333 at 2103 in Norwich.

Some of the **9MHz (31m)** broadcasts are intended for European listeners. Those noted came from HCJB Quito 9.600 (Eng 0700-0830), rated 55555 at 0700 in Appleby; SRI via Lenk? 9.535 (Eng 1330-1400), clearly heard at 1330 in Hassocks: Polish R, Warsaw 9.525 (Eng 1300-1355) 33333 at 1350 in Penmaenmawr; R.Pyongyang, Korea 9.325 (Eng 1500-1550 [also to M.East, Africa]) 34233 at 1545 in Rugby; R.Prague, Czech Rep 9.420 (Eng 1800-1827) 33333 at 1800 in Storrington; VOIRI Tehran, Iran 9.022 (Ger 1730-1830) SIO423 at 1820 in Knaresborough; R.Bulgaria, Sofia 9.700 (Eng 1900-2000) 53543 at 1905 in Bridgwater and (Eng 2200-2300) SIO333 at 2245 in N.Bristol; VOA via Gloria 9.760 (Eng 1700-2100 [also to N.Africa, M.East]) 55555 at 1931 in Leicester; Israel R, Jerusalem 9.435 (Eng 2000-2030 [also to N.Am]) SIO444 at 2000 in Co.Fermanagh; China R.Int, Beijing 9.920 (Eng 2000-2155) 34232 at 1951 in Oxted; UAER, Abu Dhabi 9.770 (Eng to NW.USA 2200-0000) SIO454 at 2201 in Edinburgh; AIR via ? 9.950 (Eng 2045-2230) 44444 at 2220 in Kilkeel; BBC via Skelton 9.410 (Eng 0300-2300 [also to N/C.Africa]) 55555 at 2300 by **Bill Griffith** in Calvi, Corsica.

While beaming to other areas SRI via Fr.Guiana 9.885 (It, Eng, Fr, Ger, Port to Aust, S.Pacific 0830-1100) was 55555 at 0920 in Newry; WEWN Birmingham 9.985 (Sp to Am 1100-?) SIO211 at 1059 in Macclesfield; BBC via Kranji 9.740 (Eng to S/SE.Asia 0900-2200) 22222 at 1114 in Woking; R.Australia via Darwin 9.610 (Eng to S.Asia 1100-1430) 24242 at 1201 in Barnet and 53344 at 1200 in Velore and via Carnarvon 9.770 (Eng to Asia 1430-1630) 32333 at 1500 in Woodhall Spa; R.Mediterranee Int via Nardor 9.575 (Fr, Ar to N.Africa, S.Eu 0500-0100) SIO433 at 1600 in E.London; AWR (KSDA) Agat, Guam 9.370 (Eng to Asia 1500-1700?) 32222 at 1615 in Morden; Africa No.1, Gabon 9.580 (Fr to C.Africa 0430-2300) 33343 at 1947 in Storrington; R.Cancao Nova, Brazil 9.675 (Port 24hrs) 32222 at 2140 in Morden.

Good reception of R.Australia's **7MHz (41m)** broadcast has been reported by listeners in the UK. Their transmission from Carnarvon on 7.260 (Eng to S.Asia 1430-2100) was 32322 at 1548 in Oxted, SIO333 at 1700 in Co.Fermanagh, SIO444 at 1900 in Edinburgh and 34242 at 1950 in Woking.

Also mentioned in the reports were R.Japan via Skelton 7.230 (Jap, Eng to E.Eu 0500-0800) 34333 at 0701 in Sunderland; Monitor R.Int via WCSN? 7.535 (Eng to N.Am?) 35543 at 0920 in Wallsend; BBC via Kranji 7.105 (Tam to N.Asia? 1500-1700) 54444 at 1550 in Velore and via Woofferton 7.325 (Eng to Eu 2000-2200) SIO432 at 2150 in Rotherham; Slovak R.Int via Velke Kostolany 7.345 (Eng to W.Eu 1930-1955) 53543 at 1930 in Storrington; R.Budapest, Hungary 7.220 (Eng to Eu 2000-2030) 55555 at 2005 in Norwich; AIR via Aligarh? 7.412 (Hi, Eng to Eu 1745-2230) 33333 at 2029 in Leicester.

In the **6MHz (49m)** band R.Japan via Skelton 5.975 (Jap, Eng to Eu 0500-0800) was SIO333 at 0715 in N.Bristol and 6.155 (Eng to Eu 2300-0100) 44444 at 2300 in Appleby; SRI via Lenk 6.165 (Eng to Eu 1330-1400), clearly heard at 1330 in Hassocks; RTL via Junglinster 6.090 (Fr to Eu 24hrs) 44444 at 1405 in Rugby; R.Austria Int, via Moosbrunn 6.155 (Ger, Eng, Fr, Sp to Eu 0400-2300) SIO322 at 1407 in Rotherham; BBC via Kranji 6.140 (Tam to N.Asia? 1500-1700) 45333 at 1550 in Velore and via Antigua 5.975 (Eng to C/S.Am 2100-0600) 44444 at 0005 in Kilkeel; China R.Int, Beijing 6.950 (Various, Eng to Eu 2000) SIO333 at 1700 in E.London; R.Prague, Czech Rep 5.930 (Eng to Eu 1800-1827) heard at 1800 in Storrington; R.Denmark via RNI 5.960 (Da to Eu 1931-1955) 54554 at 1931 in Bridgwater; REE via Noblejas? 6.125 (Eng to Eu 2100-2200) SIO222 at 2100 in Co.Fermanagh; R.Budapest, Hungary 6.110 (Eng to Eu 2200-2230) 32233 at 2225 in Rugby.

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1815	C,E,F,K,M
2.325	ABC Tennant Creek	Australia	1808	C,E,F,K,M
2.485	ABC Katherine	Australia	1809	C,E,F,K,M
2.560	Xinjiang BS, Urumqi	China	0011	K
2.850	KCBS Pyongyang	N.Korea	2108	K
3.200	TWR Manzini	Swaziland	1844	F,K
3.205	AIR Lucknow	India	1637	F
3.210	Em.Nacional, Maputo	Moz'bique	1958	C,F,L
3.220	R.HCJB Quito	Ecuador	0351	J
3.220	Channel Africa	S.Africa	0251	K
3.220	R.Kara, Lome	Togo	2032	B,C,F,M
3.223	AIR Simla	India	1709	F,K
3.230	SABC Oranje Meyerton	S.Africa	2048	C,K
3.240	TWR Shona	Swaziland	1810	F,K
3.245	AIR Lucknow	India	1705	F,K
3.255	BBC via Maseru	Lesotho	1830	F,M
3.270	SWABC 1, Namibia	SW.Africa	1810	B,C,D,F,L,M
3.277	AIR Srinagar	India	1720	B,F,K
3.290	SWABC 2, Namibia	SW.Africa	1855	C,F,O
3.310	Channel Africa	S.Africa	1938	F
3.315	AIR Bhopal	India	1649	B,K,L
3.320	R.France Int. via ?	France?	1949	K,M
3.325	FRCN Lagos	Nigeria	2228	B,D
3.335	CBS Talpei	Taiwan	1810	C,E,F,G, K,L,M
3.355	AIR Kurseong	India	1648	D,F,K
3.356	R.Botswana	Gabarone	1812	C,M
3.359	RTV Malagasy	Mad'scar	1756	F
3.365	R.Rebelde, La Julia	Cuba	0110	B
3.365	GBC R-2	Ghana	1915	B,C,D,E, J,K,N,O
3.365	AIR Delhi	India	1732	D,F,K
3.370	R.Beira	Moz'bique	1844	F
3.375	R.Nacional S.Gabriel	Brazil	2200	B,K
3.375	RRI Medan	Indonesia	2056	C
3.377	R.Nacional, Mulenvos	Angola	1905	F,K
3.380	R.Malawi	Malawi	1824	F
3.395	RRI Tanjungkarang	Indonesia	2240	B
3.395	BBC via Meyerton	S.Africa	1656	K
3.915	BBC via Kranji	Singapore	1635	C,F,G,J,K,R
3.945	Vatican Radio	Italy	1700	I,J,R
3.950	Qinghai PBS, Xining	China	2225	B
3.955	BBC via Skelton	England	2300	H,J
3.955	R.Budapest	Hungary	1818	C,J,K,O,P,R
3.955	Kazakh R, Novosibirsk	Kazakhstan	1820	J
3.965	RFI Paris	France	2035	B,C,D,I, J,O,R
3.970	RFE Munich	Germany	2145	J
3.980	VOA via Munich	Germany	1925	B,I,J,L, M,O,P,R
3.985	China R via SRI	Switzerland	2113	A,B
3.985	SRI Beromunster	Switzerland	1914	C,I,J,Q,R
3.995	DW via Julich	Germany	2143	B,C,O, J,N,O,Q
4.035	Xizang PBS, Lhasa	Tibet	2345	K
4.190	CPBS Minority Sce	China	2151	K
4.330	Xinjiang BS, Urumqi	China	0016	K
4.460	CPBS 1, Beijing	China	2107	C,K
4.500	Xinjiang BS, Urumqi	China	0011	K
4.735	Xinjiang, Urumqi	China	2303	B,J
4.750	Xizang BS, Lhasa	Tibet	2350	K
4.755	R.Educ CP Grande	Brazil	0055	B,C,J
4.760	AIR Port Blair	India	1653	F
4.760	ELWA Monrovia	Liberia	1914	C,F,M,Q
4.765	R.Integracao	Brazil	2310	B,J
4.765	Brazzaville	PR.Congo	1907	C,J,M,O,Q
4.770	Centinela del Sur	Ecuador	0209	J
4.770	FRCN Kaduna	Nigeria	0315	C;O
4.775	TWR Manzini	Swaziland	1630	F
4.777	R.Gabon, Libreville	Gabon	2114	C,J
4.783	RTM Bamako	Mali	2200	B,D,M,O
4.790	Azad Kashmir R.	Pakistan	1707	F
4.790	TWR Manzini	Swaziland	1800	F,L,M
4.800	AIR Hyderabad	India	1656	F
4.800	LNBS Lesotho	Maseru	1850	C,F,J
4.805	R.Nac.Amazonas	Brazil	0120	B,O
4.810	R.San Martin Tara	Peru	0115	B,J
4.815	R.diff TV Burkina	Ouaga-dougou	2042	B,C
4.820	La Voz Evangelica	Honduras	0030	B,J,O
4.820	AIR Calcutta	India	1701	F
4.820	Xizang, Lhasa	Tibet	2345	K
4.825	R.Cancao Nova	Brazil	0213	D,J
4.830	R.Botswana, Gaborone	Botswana	1934	C,J,L,O
4.830	R.Tachira	Venezuela	0208	B,E,J
4.835	R.Tezulutlan, Coban	Guatemala	0110	B
4.835	RTM Bamako	Mali	2014	B,C,I,J, M,O,Q
4.840	AIR Bombay	India	1652	B,F,O
4.845	R.Fides, La Paz	Bolivia	0055	B,J
4.845	ORTM Nouakchott	Mauritania	1930	B,C,D,G,J
4.850	R.Yaounde	Cameroon	2132	C,J,O
4.850	AIR Kohima	India	0130	B
4.860	AIR Kingsway (Feeder)	India	1636	C,O,F
4.865	PBS Lanzhou	China	2230	B,C,D,I
4.865	L.V. del Cinaruco	Colombia	0115	B
4.870	R.Cotonou	Benin	2133	B,I,J,O
4.875	R.Roraima, Boa Vista	Brazil	0030	B
4.880	R.Nac.Espejo, Quito	Ecuador	0135	B
4.885	R.Clube do Para	Brazil	0125	B,J
4.885	R.Difusora Acreana	Brazil	0020	B,J
4.885	KBC East Sce Nairobi	Kenya	1843	C,M
4.890	RFI Paris	via Gabon	0357	J,Q
4.895	Voz del Rio Arauca	Colombia	2350	B
4.895	Pakistan BC	Pakistan	1742	F
4.900	SLBC Colombo	Sri Lanka	1716	F
4.905	R.Nat.N'djamena	Chad	2055	C,J,O
4.910	V. de la Mosquitia	Honduras	0137	K
4.910	AIR Jaipur	India	1654	F
4.910	R.Zambia, Lusaka	Zambia	1935	C,F,M
4.915	R.Difusora, Macapa	Brazil	0030	B
4.915	GBC-1, Accra	Ghana	2026	B,C,D,I,J, M,O,Q
4.915	KBC Cent Sce Nairobi	Kenya	1842	M
4.915	R.Cora, Lima	Peru	0347	C
4.920	AIR Madras	India	1731	F
4.925	R.Difusora, Taubate	Brazil	0025	B,D
4.935	KBC Gen Sce Nairobi	Kenya	1915	M
4.940	R.Abidjan	Ivory Coast	0025	O
4.945	Channel Africa	S.Africa	1726	F,K,L
4.950	R.Nacional, Mulenvos	Angola	2017	C,F,M
4.955	R.Cultura, Campos	Brazil	0030	B
4.955	R.Marajoara, Belem	Brazil	0218	J
4.960	Mulenvos	Angola	2017	M
4.960	AIR Delhi	India	0050	B
4.966	R.San Miguel, Cusco	Peru	0035	B
4.970	PBS Xinjiang	China	0016	K
4.970	R.Rumbos, Caracas	Venezuela	2330	B
4.975	Fujian 1, Fuzhou	China	0040	B
4.975	R.Uganda, Kampala	Uganda	2018	J,M
4.980	Ecos del Torbes	Venezuela	0016	B,C,E,J, N,O,Q
4.990	AIR Ext.Service	India	0045	B
4.990	FRCN Lagos	Nigeria	2017	B,M
4.995	R.Andina, Huancayo	Peru	0009	K,L
5.005	R.Nacional, Bata	Eq.Guinea	2044	M
5.005	R.Nepal, Kathmandu	Nepal	1701	F,K
5.010	R.Garoua	Cameroon	2019	B,C,G,J,M
5.010	Es.Radiofonicos Pop	Ecuador	0032	K
5.010	AIR Thiru'puram	India	0040	B
5.020	PBS-Jiangxi Nanchang	China	2345	K
5.020	Ecos del Atrato	Colombia	0345	K
5.020	Voz del Upano, Macas	Ecuador	0050	B
5.020	La V du Sahel, Niamey	Niger	1947	D,F,J,M,O
5.021	Hanoi	Vietnam	2227	F
5.025	R.Parakou	Benin	1839	D,M
5.025	R.d'Transamazonica	Brazil	0040	B
5.025	R.Rebelde, Habana	Cuba	2315	B,J,K
5.025	R.Uganda, Kampala	Uganda	2029	C,M,O
5.030	AWR Latin America	Costa Rica	0329	C
5.030	R.Catolica, Quito	Ecuador	0543	C
5.030	Tonga BC	Tonga	0045	B
5.035	R.Educacao Rural	Brazil	0045	B
5.035	R.Bangui	C.Africa	2029	C,J,M,Q
5.040	Voz del Upano, Macas	Ecuador	0647	B,C
5.040	R.Maturin	Venezuela	0615	B,K
5.045	R.Cultura do Para	Brazil	0050	B
5.047	R.Togo, Lome	Togo	2020	B,J,M,O
5.050	Voice of the Strait	China	2200	K
5.050	R.Tanzania	Tanzania	2028	C,J,M
5.055	R.Difusora, Caceres	Brazil	0325	C
5.055	RFO Cayenne (Matoury)	F.Guiana	0340	B,C,J,K
5.055	TWR Manzini	Swaziland	1658	K
5.060	PBS Xinjiang, Urumqi	China	2340	B
5.065	R.Candip, Bunia	Zaire	1711	K
5.075	Caracol Bogata	Colombia	0332	B,C,J,Q
5.090	Taiwan 2 Sce, Beijing	China	2210	K
5.097	R.Eco, Iquitos	Peru	0330	K
5.125	Taiwan 1 Sce, Beijing	China	2013	K
5.163	CPBS 2, Beijing	China	2100	K
5.240	Xizang, Lhasa	Tibet	2330	K
5.275	WYFR Oakland, CA	via Taiwan	1525	K
5.320	CPBS 1, Beijing	China	2145	K
5.420	PBS Minority Sce	China	2152	K

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Delta One 934MHz transceiver with 'S' meter, good condition, boxed, £215. Global ATU1000, boxed, £45. Pre-selector 1040B MFJ, boxed, £45. Prices include P&P UK. Also UHER CR240 portable cassette, £100. Paul, Bucks. Tel: (01844) 237131.

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ERA Microreader, V 4.1 tutor, RTTY, AMTOR, SITOR, demo tape & manual, £95. *Klingenfuss Utility Guide* 1991, £3 plus P&P. *Passport To World Band Radio*, £2 plus P&P. Tel: Dorset (01202) 891948.

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Icom IC-R7100 wide band receiver, high specification, 25-19999.9999MHz, s.s.b. (l.s.b. u.s.b.) a.m. (normal, wide), w.f.m., f.m.(normal, narrow). Boxed and in mint condition with accessories. Tel: Southampton (01703) 243347.

Icom IC7000, £700. IC-R70, £550. JRC NRD525, £725. Scanner SX-400, £80. SX-200, £70. Bearcat 220, £125. Yaesu aerial matcher, £25. CDR antenna rotator, £200. Wartime R1155, £140. Many other items. Steve Blackett, County Durham. Tel: (01325) 283771 or mobile (0374) 914630 anytime.

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Icom R7000 v.h.f./u.h.f. scanner, little used, immaculate, £675. Tel: Inverness (01463) 232197 evenings.

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ICS FAX1, RTTY, NAVTEX, FAX receive terminal unit, includes cables and manual, in excellent condition, £100. No offers please. Tel: Oxford (01865) 63000.

JPS NIR-10 (V.3) noise/interference/bandpass, d.s.p. filter, reduces/illiminates white, ignition, powerline, computer noise, bandpass mode, steep skirts, adjustable centre frequency/bandwidth, RTTY, Morse, s.s.b., boxed, mint, with manual, £275. Tel: Middlesex 0181-570 5603.

Kenwood R2000 VC10, c.w. filter, Global ATU1000 v.l.f. converter. Dipole Marconi '7' Dressler ARA30 active antenna. Other bits and pieces, buyer to collect, £200 the lot. Bill Humphrey, 6 Woodhouses, Bishop Auckland, Co. Durham DL14 0LL. Tel: (01388) 605468.

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Ferrite rod aerials, must be $^1/_2$in in diameter, no more or less, must be six inches long or more. Peter Tankard, Sheffield. Tel: (0114) 2343030 anytime.

Manual for FRG7 0.5 to 30MHz receiver, any condition, or photocopies wanted, will pay costs, please 'phone with details. Alan, Manchester. Tel: 0161-303 8829.

Sony CRF230, mint, alternatively not working for spares/repair. Stereo decoder module plus other accessories required. Local collection/delivery or national carrier. Full description and details to: Webb, 89 Stoke Road, Bromsgrove, Worcestershire B60 3EP.

Telford communications v.h.f. TX, 2m type TC10 circuit or unit for spares. G2UK, 21 Romany Road, Oulton Broad, Lowestoft, Suffolk NR32 3PJ. Tel: (01502) 565726.

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SWM DECEMBER 94 TP

Short Wave Index Volume 52

January to December 1994

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Short Wave Index Volume 52 (Continued)

SATELLITE TV NEWS by Roger Bunney
45 Jan, 50 Feb, 51 Mar, 43 Apr, 51 May, 44 June, 57 July, 48 Aug, 58 Sept, 57 Oct, 56 Nov, 52 Dec

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37.000-224.995	5.0kHz	n.f.m.
225.000-400.000	12.5kHz	a.m.
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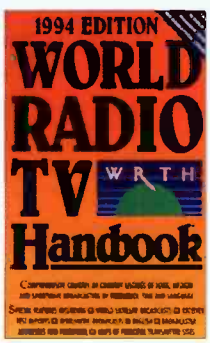

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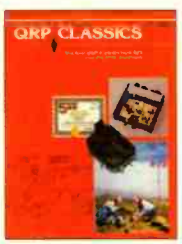

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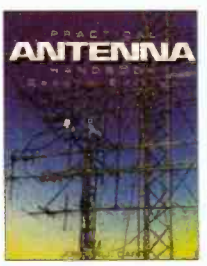

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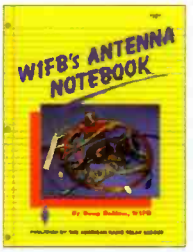

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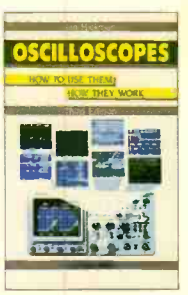

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