FOR THE RADIO LISTENER

shortwave magazine

October 1992 £1.75 ISSN 0037 - 4261

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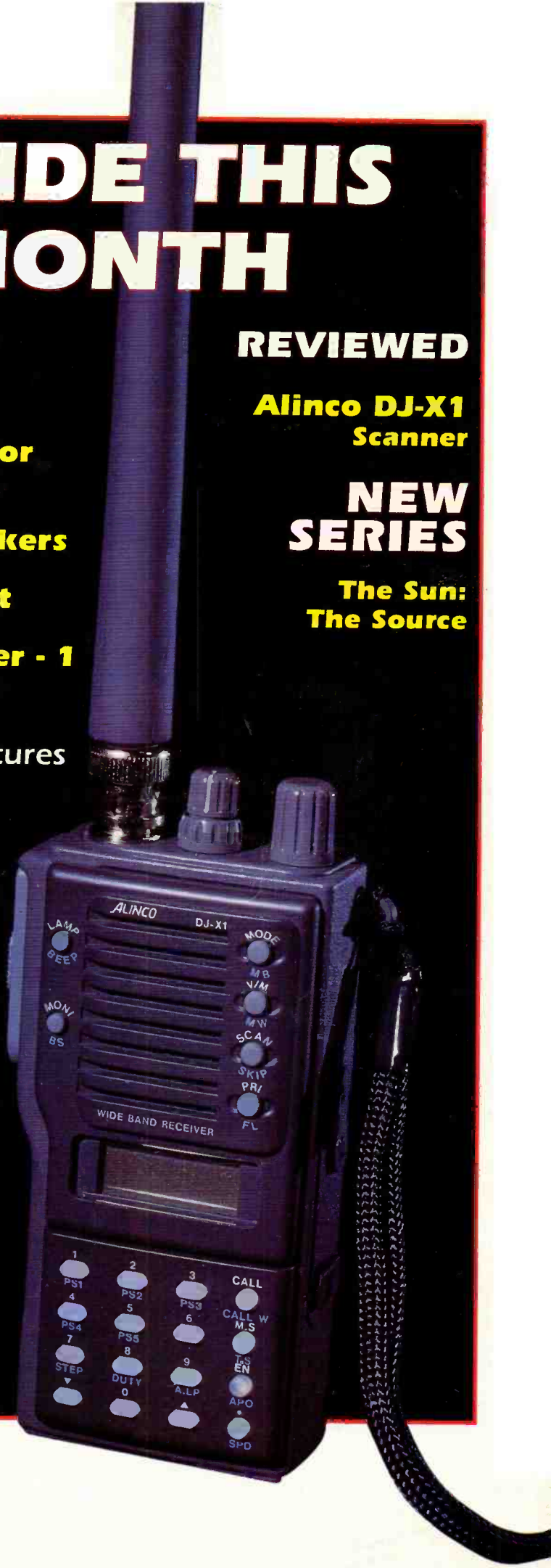

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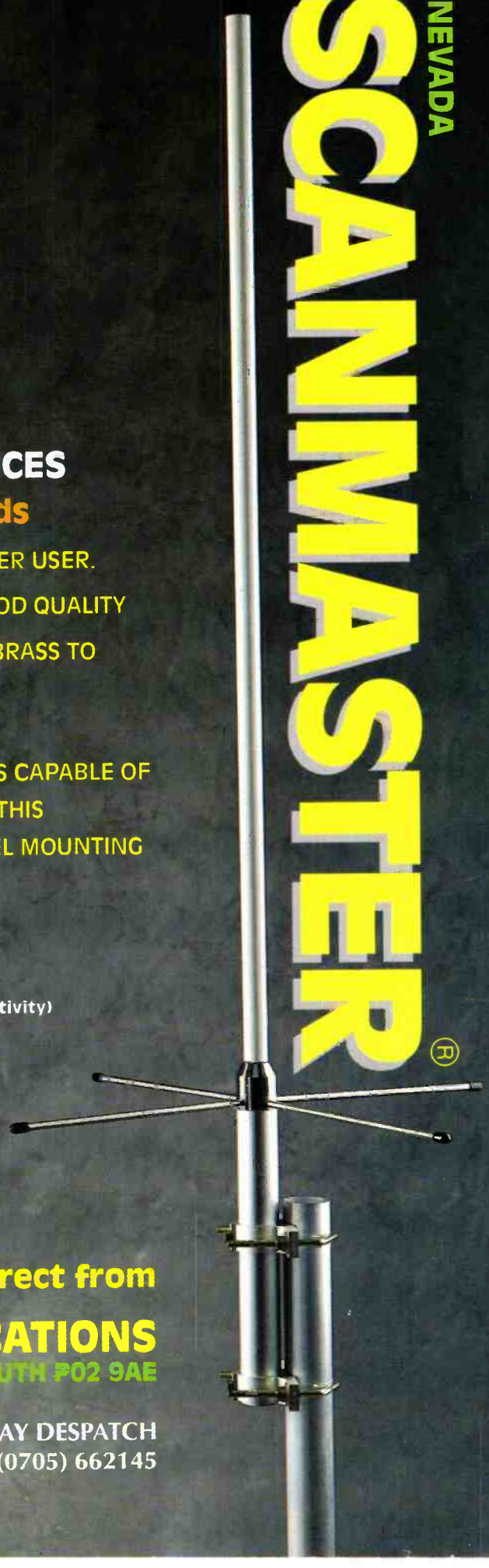

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short wave magazine

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Cover:
Mike Richards looks at the latest trend in hand-held scanners, to make them as small as possible! The Alinco DJ-X1 shown on the front cover this month sets new standards in miniaturisation. Turn to page 24 for Mike's review.

features

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editorial

The unsavoury affair of the 'Dianagate' tapes has given a totally false impression of the radio listening hobby. From my contacts with the media it is obvious that the difference between a licensed amateur - ham- and a listener is just not understood.

What is worse, though, is the unwelcome attention that the stupid, and illegal, actions of one person has brought upon our hobby by the mass media.

I just hope that sense prevails and that authority realises that the present laws are sufficient to deal with this type of infringement. It would be sensless to try to ban scanners because of the stupidity of a mindless and greedy handful of users.

Short Wave Magazine will continue to encourage responsible listening within the spirit of the law.

SWM SERVICES

Subscriptions

Subscriptions are available at £21 per annum to UK addresses, £23 in Europe and £25 overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £36(UK) £39 (Europe) and £41 (rest of world).

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.

Back Numbers and Binders

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

Binders, each taking one volume 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 p.c.b.s, back numbers, binders and items from our Book Service should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Enefco House, The Quay, Poole, Dorset BH15 1PP,** with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling.

Credit card orders (Access, Mastercard, Eurocard or Visa) are also welcome by telephone to Poole (0202) 665524. An answering machine will accept your order out of office hours. You can also FAX an order, giving full details to Poole (0202) 666244.

letters

IF YOU HAVE ANY POINTS OF VIEW THAT YOU WANT TO AIR PLEASE WRITE TO THE EDITOR. IF YOUR LETTER IS 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

The front page story on the *Sun* newspaper for Monday 24 August '92 filled me with some dismay. No, not the story of a certain tape, but the way in which it found its way to that newspaper. Surely an ex-bank manager has more intelligence than to risk prosecution? He has made use of information (for gain?) that is contrary to the law. If we all went about telling all and sundry of what we hear or heard, our hobby could possibly be outlawed, or at most the sale of equipment made difficult. As we do not pay a licence to listen, surely individuals, companies, emergency services, etc., have as much right of privacy whilst on radio as off.

If the gentleman censored is a reader of your magazine (and if he isn't he should) and I certainly hope he is, let me give him some advice: enjoy this fascinating hobby with its borderless world, investigate all and any frequency you care to - BUT - whatever you hear of a delicate nature (and we all do at times) KEEP IT TO YOURSELF!!

R Pratt, Portsmouth

Dear Sir

I have always regarded my hobby of short wave listening as enjoyable and one that neither polluted the environment nor did anyone harm. By the irresponsible actions of one 'scanner' it could well be that the hobby will now be put under the public gaze of the media.

I am sure that we have all, at some time or another, stumbled across conversations on the airwaves. I am also sure that the vast majority of us have done the right thing and turned the dial on. I can see no reason to tape other people's conversations. To then agonise for two years over what to do with the tape (as reported in one national tabloid) and then pass it to a newspaper is incomprehensible. Was there no thought to erase the tape straight away?

As *SWM* is the leading magazine devoted solely to listening, I feel that you should take a strong and dare I say, moral stance on this issue. After all, how would any of us feel if our sensitive and CONFIDENTIAL 'phone calls were blazoned over the front pages of the newspapers?

Lastly, I would point out that it is illegal to listen to mobile 'phones and under the Telecommunications Acts punishable with hefty fines and imprisonment.

Ron Galliers
London

Dear Sir

I do not normally put pen to paper to write to magazines unless in anger or frustration, but I felt I must say a word or two in praise after reading and enjoying your August '92 issue of *SWM*. With particular reference to mods. Although the articles did not cover any equipment that I possess I am always pleased to read about ways to improve the listener's lot with relatively straight-forward modifications.

All praise to the authors who thought the problems worthy of research in the first place.

Steve Hicks, Paignton

letters

Dear Sir
My main interest these days is Long Wave maritime Beacons (DX). Why beacons some people ask? My answer is like the mountaineer, 'because they are there'. With ordinary DX the station has to be transmitting for you to have any hope of logging it, but beacons are there 24hrs a day.

I look forward to Brian Oddy's Maritime Beacons page, also 'Long, Medium & Short' and Ron Ham's 'Propagation' report. The list of DXers and their equipment I find of great interest. In fact, it was partly on the evidence of this list in Short Wave Magazine that I based my decision to purchase a new HF-225 receiver from Lowe recently. This little receiver keeps appearing with predictable regularity in these lists. So I assumed that it must have something going for it. A correct assumption, I am glad to say. The HF-225 may be small in size, but Lowe have certainly managed to get a gallon into a pint pot.

Kelvin Sutherland
Llangefni

Dear Sir
I have been a s.w.l. for many years and occasionally have spurts of interest in v.h.f. airband listening. Until recently, my listening to v.h.f. was done on a WIN108 receiver, which I was pretty happy with. I work in the Meteorological Office at Wellington Airport which is one of three international airports here in NZ. However, after reading the review a few months ago on the Yupiteru VT-225, I traded the WIN108 and I must comment on the 225's performance.

It is superb to say the least. I live some 40km from Wellington Airport in a hilly situation in so much as I am surrounded by them and use a half wave vertical folded dipole fed with coaxial cable. The dipole is about 10m off the roof and the results are just great (I cut the dipole to 120MHz). The local tower booms in on 118.8MHz - my best so far is a Qantas 767 some 279nm distant inbound from Australia at FL350...and there was a hill in the way!

A superb receiver for anyone keen on the airband. I also monitor h.f. oceanic frequencies and at this time of year the North Atlantic traffic is received well about our dinner time 5pm (0500UTC) on the 5MHz band. So is RAF VOLMET at West Drayton on 11.200MHz - it is audible for most of the day (2200-0600UTC).

Does anyone have any success with South Pacific h.f. in the UK? I would be pleased to correspond with anyone with similar interests. My h.f. gear is all Drake, R7A plus R8 plus various long wires.

Steve Rawdon
New Zealand

Dear Sir
Here is a servicing aid that I first made during the war ad in the RAF serviced, amongst others, the R1155 receiver. I called it my 'Tuning Stick'. It was always being borrowed as it was so useful!

Basically it was a 6mm diameter x 120mm rod (wood or plastics) with a ferrite slug glued to one end, and a brass rod 5mm diameter x 20mm long glued to the other, the threads on the ferrite core should be filed off. To use it, switch the receiver on and tune to the l.f. end of the band being checked. Slowly insert the 'stick' into the relevant coil. If at one position the output increases using the ferrite end, more inductance is needed. If output increases using the brass end, less inductance is needed. At the h.f. end of the band, ferrite means higher trimmer capacitance is needed, brass means lower capacitance is needed. It will also give a good indication of i.f. tuning, etc. With all these checks, if you only get a decrease in output then leave well alone, it's all in tune and you have checked it over without altering any of the existing adjustments!

E.F.C. Owen
Reigate

Dear Sir
Your reader Richard Gosnell (*SWM* June 1992) indulges in the popular sport of 'Beeb bashing' without being aware of the salient facts.

First of all, his comments about reception of BBC Radio Three on medium wave are now academic, as this service closed down at the end of February.

Secondly, the frequency changes which took place in November 1978 were the result of a conference held by the International Telecommunications Union. Every country had to make concessions and the loss of a high power medium wave frequency for Radio 3 in the UK was one of them.

Mr Gosnell is very naive if he believes that more than a handful of French listeners ever tuned in to BBC Radio Two. Furthermore, it is not the purpose of BBC domestic radio to 'sell' anything to listeners outside the country. That's what the BBC World Service is for.

International radio regulations do not permit the British authorities to 'nip in' to a frequency slot allocated to another country. A British station operating on 177kHz would most probably cause severe interference to reception of Europe I on 183kHz in parts of the latter's service area.

The subject of frequency allocation procedures is often misunderstood by the ordinary listener. It is not a case of making a 'bid' for a frequency - every country is entitled to a share of the available spectrum space. Thus tiny Liechtenstein has a 500kW allocation on 1386kHz which it has so far not used.

Finally, the good news for Mr Gosnell is that there are indeed plans for a post-Maastricht pan European station on medium wave. The bad news for Mr Gosnell is that it will not be based in the UK, but in another European country using an existing frequency allocation.

Andy Sennitt, Editor, *WRTH*

Dear Sir
With reference to the 'hams' phonetic alphabet mentioned by J.A. Thompson (Aug *SWM*). In my early days of s.w. listening I seemed to remember Holland and Italy being regularly used as H and I. Thus I looked up an old RSGB *Amateur Radio Handbook* (kept for sentimental reasons) and found the following list under Chapter Twenty entitled "The Newcomer to Amateur Radio".

A - America	J - Japan	S - Santiago
B - Boston	K - Kentucky	T - Turkey
C - Canada	L - London	U - University
D - Denmark	M - Mexico	V - Victoria
E - England	N - Norway	W - Washington
F - France	O - Ontario	X - X-Ray
G - Germany	P - Portugal	Y - Yokohama
H - Holland	Q - Quebec	Z - Zanizibar
I - Italy	R Radio	

The Handbook was the 10th printing Jan 1944 (purchased 1946) which shows up my age, though I hasten to add that my first s.w. listening began when I was 12 years old!

Alan J Thorndyke, Enfield

Dear Sir
I am very glad to see that *SWM* now found room for poetry (*SWM* August '92 page 16). The full poem is:

"The common cormorant or shag
lays eggs inside a paper bag
the reason you will see no doubt
is to keep the lightning out
but what these unobserved birds
have never noticed is that herds
of wandering bears may come with buns
and steal the bags to hold the crumbs".

There is no punctuation in the poem and it is best recited in a single breath.

Rev D Leak, Stoke-on-Trent

junior listener

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

Dear Santa!

If you're thinking of asking for a new radio for Christmas this year, then an item in *Euro DX* could be of interest to you.

They looked at the SRX-50 from Lowe Electronics. It is sourced in the Far East and covers long, medium and v.h.f. f.m. as well as short wave (from 5.9 to 15.5MHz). The set is a digital synthesised receiver, with a good sized liquid crystal display that provides frequency readout, clock and alarm status. There are 20 memory channels divided equally between the four wave bands and these are accessed by a novel round keypad on the front of the set. This control does set the radio apart from the majority of radios suitable for the short wave listener.

The European DX Council, publishers of *Euro DX*, put one of the radios through its paces and say that it appeared to perform well. Weak signals were pulled in without difficulty and the bandwidth filter fitted for a.m. reception seemed ideally suited for broadcast listening. Audio quality through the loudspeaker was good and the display was easy-to-read.

The most remarkable thing about the SRX-50, according to *Euro DX* is the price, just £39.95.

For more information on the SRX-50, contact Lowe Electronics Ltd, Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (0629) 580800.

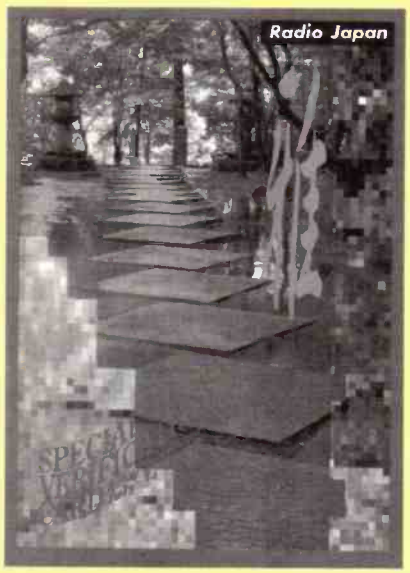
Did You Know

Guess what! There were 33 280 Amateur Radio A Licences issues in the 12 months to March this year, which was 326 more than the previous year. But, there were 192 fewer Class B licences issued this year, 27 728. As far as Novice Licences go, there have been 46 Class A and 378 Class B types issued up to March 1992. Citizens' Band Radio licences outstrip those figures, 64 944 licences issued!

These are just a few of the 229 446 licences that the Radiocommunications Agency issued in 12 months!

Radio Japan

How do you fancy being heard on Radio Japan? If you write to the programme *Hello from Tokyo,* it could happen. This programme is very much a listener orientated one. During the 39-minute programme, listeners' letters are read, questions answered and some may receive a 'phone call from the presenters!



You should write to them with your question, music requests and any comments and suggestion (all briefly) as well as your name and address and telephone number. Send your letter to: Hello from Tokyo, Radio Japan, NHK, Tokyo 150-01, Japan. The programme is heard every Sunday on the General Service at 0515, 0715, 1115, 1415, 1715 and 2315UTC.

July 1 marked the official start of radio Japan's relay transmissions from the BBCs Skelton transmitting Station in England. They are sending out two new kinds of verification cards to commemorate the start of the Skelton relay broadcasts.

JOTA

The 35th Jamboree On The Air will be held from October 17 - 18. This is a world-wide event for the Scouting movement, although Girl Guides and Girl Scouts are invited to join in too. To find the groups of scouts, it is best to listen on the World Scout Frequencies. First the single sideband ones: 3.74, 3.94, 7.09, 14.29, 18.14, 21.36, 24.96 and 28.99MHz, then the c.w. (Morse) ones: 3.59, 7.03, 14.07, 18.08, 21.14, 24.91 and 28.19MHz. Many participating groups will have special callsigns and will be issuing special QSL cards, so keep listening.

Have A Go

If you've never tried entering a contest before, then why not give this one a go. It's over several days and at various times:

November 1 1900-2300UTC
November 2 1999-2100UTC
November 3 2100-2300UTC
November 4 1900-2100UTC
November 5 2100-2300UTC
November 6 2200-0000UTC
November 7 0000-0200UTC
November 8 0000-0400UTC

Obviously, not many junior listeners will be allowed to listen on all of the days, but perhaps some of the older 'junior' listeners may like to.

Frequencies are between 3.2 and 5.850MHz and utility, amateur, standard frequency and time signal station WILL NOT COUNT.

At least 8 stations every day are to be logged for at least 30 minutes, the details of the programmes heard will receive extra points.

Each entrant must compile the listening log with the following details for each station: name, town, country of the station, day and time in UTC, frequency, details of the programme heard, receiver and antenna used, quality of reception using SIO code.

You will receive 20 points for each correct station logged with extra points for all correct programme details reported for each logged station. Please note, 20 penalty points are awarded for every incorrect station included in the log, so go careful!

To enter, you must sent 6 IRCs or US$6 with your log to: Co. RAD, Marco Cerruti, PO Box 146, 1-13100 Vercelli, Italy before December 31.

The winner will receive a copy of the 1993 *WRTH* amongst other things. All participants will receive a complete result list and a certificate which will show your ranking and the total number of points.

Good Luck.

news

HCJB

October is letter month. If you would like a copy of their 1993 calendar, you simply have to write in and ask for one. Just make sure your letter is postmarked October.

HCJB, Casilla 691, Quito, Ecuador.

Making Waves

Making Waves is an exhibition that tells the story of radio from the 19th Century to the present day. Topics include radar, satellite exploration, amateur radio, radio control, pioneer electronics and the changing fashions in the designs of radio casings from the 1920s to 1940s.

Hands-on exhibits include a Morse code key set up to send messages from one display room to another and a modern 'crystal' wireless set. Admission to the museum is free and the open times are:

Monday - Friday 10am - 1pm and 2pm - 5.30pm
Saturday 10am - 1pm, and 2pm to 5pm.

Walthamstow Central tube station, Victoria line is just five minutes away from the museum.

Vestry House Museum, Vestry Road, London E17 9NH. Tel: 081-509 1917.

Frequency Changes

From October 4, Radio New Zealand International have some frequency changes.

1650-1849UTC 9.675MHz Sunday - Friday
1850-2138UTC 15.120MHz Sunday - Friday
2139-0658UTC 17.770MHz Daily
0659-1207UTC 9.700MHz Daily
1208-1649UTC 9.510MHz Occasional Use

Happy Birthday

1932 was obviously a momentous year. First, September saw the launch of *Practical Wireless* and the start of Roberts Radio. November saw the start of the BBC World Service, it was called the Empire Broadcasting Service in those days. May of that year saw the BBC move into Broadcasting House (you can read more about that later).

So, *Short Wave Magazine* would like to wish all these a very happy Diamond Jubilee.

New Shop

Mike Haydon, previously of Waters & Stanton Electronics, has told us about the opening of Haydon Communications, 132 High Street, Edgware, London HA8 7EL. It's a retail and mail order company that will be stocking all leading brands. Mike welcomes old and new friends and customers to the Open Day on September 26.

Haydon Communications, 132 High Street, Edgware, London HA8 7EL.

Military Wireless ARS

The Military Wireless Amateur Radio Society has been formed with the callsign G0PTZ by licensed radio amateurs and s.w.l.s who are interested in Navy, Army and RAF radios with a view to circulating information between members, visiting radio meets/fairs and holding special event radio stations (by licensed members using modern amateur radio equipment).

Members will be able to send lists of sales and wants to the Secretary, who will collate these into a master list and send a copy to each member. The yearly subscription will be £5.

Membership forms are available by telephoning. (0705) 250463.

Radio Award

The Royal Air Force Amateur Radio Society 'Affiliated Clubs Award is designed to promote interest in RAFARS, to encourage activity between their affiliated club station and all other radio amateurs.

The award is available to all s.w.l.s and licensed amateurs who have heard, or made, simplex contacts with **10** RAFARS affiliated club stations on or after 1 January 1992. Where a club station has more than one callsign, then both may be claimed if heard or worked. The call G3RAF may be claimed **once** only and up to a maximum of three RAFARS sponsored special event stations may be used in the claim.

To claim the award, log extracts, which must included callsign, date, time, frequency, mode and RAFARS number of the stations, should be submitted to:

Awards Manager, Dave Bloomfield, 8 Sunningdale Drive, Boston, Lincs PE21 8HZ.

The cost of the award is £1.50 and should be submitted with the claim, cheques should be made payable to RAFARS.

For a copy of the list of RAFARS affiliated club station callsigns, send an s.a.e. requesting the current list to the Awards Manager.

Maplin in South Africa

Maplin Electronics are going to launch Maplin (South Africa) in November. About 9000 British electronics magazines are distributed in Southern Africa each month and Maplin plan to help these readers source components for their projects. They will distribute 10 000 Southern Africa editions of the new 1993 catalogue throughout South Africa, Namibia, Botswana, Lesotho and Swaziland. These will include a Rand Price Supplement as well as details of how to order goods from the new service.

Orders received by mail, telephone, FAX or electronics mail will be transferred at the end of each working day to their UK offices, where the goods will be despatched within 24 hours to London's Heathrow Airport. Therefore customers should expect to see their orders within 7 to 10 days.

Hans Moeller. Tel: 010 24 511603.

Prosecution

The Radiocommunications Agency have told us about a recent prosecution. A suspected forged Radio Amateurs' Examination pass slip was passed to the Agency by the Radio Amateur Licensing Unit. The case eventually went to Court and the defendant pleaded guilty to sections one and three both of the Forgery and Counterfeiting Act 1981. The defendant was given a conditional discharge of twelve months and was ordered to pay £50 costs. The hearing took place on August 12 at Cardiff Magistrates Court.

news

Free Frequency List

For a limited period only, J&J Enterprises are giving away free a comprehensive UK frequency list with their popular Scancat PC radio controller program. The disk contains four Scancat frequency files and a 56K ASCII file that lists hundreds of interesting spot frequencies between 69 and 950MHz. Both formats are provided so that it can either be read with a word processor or used to control a scanner of h.f. receiver with the Scancat program.

Scancat is designed to be used on a PC compatible computer and gives the user total control when used with any radio that has an interface (most popular scanners and h.f. receivers have one nowadays). When used with some radios it can even be used for spectrum analysis!

Scancat is only available direct from J&J in America, but a quick 'phone call of FAX with your credit card number will get you the program and frequency list. You could also send an international money order to **J&J Enterprises, 4001 Parkway Drive, Bossier City, LA 71112, USA. Tel: 0101 318 631 3081 or FAX: 0101 318 631 3082 (1400-2100UTC).**

The price is $49.95 plus $7.50 for post and packing ($5 plus $2.50 for a demo disk).

RAE Course

The Poverest School, Poverest Road, Orpington, Kent is holding an RAE course on Wednesday evenings from 7.30 to 9.30pm. The course started on September 23, but there may still be places available.

Contact, **A.E. Betts. Tel: (0689) 831123.**

BH '92

BH '92 - The BBC Radio show is being staged to celebrate 70 years of BBC radio broadcasting and 60 years of Broadcasting House. It's open until October 4, so you still have time to get and see it.

It offers an opportunity for listeners to look behind the doors of Broadcasting House. There is an exhibition of the milestones of radio history through the years, practical demonstrations, there's a chance to meet radio personalities as well as a multi-media show using the latest audio visual and lighting technology (this is on eight times a day).

Tickets for BH '92 are £3.50 for adult and £2.50 for children 5 - 16, senior citizens, students, UB40s, registered disabled and parties of 10 and over. Family tickets for two adults and two children are £10.

Tickets can be purchased from: **BBC Radio Show, PO Box 5012, London W12 6RS.** Or **081-752 4666** for credit card orders. In person from the **BBC Radio Show Shop** in the Portland Place entrance of Broadcasting House.

Doors open at 9.30am and the last show is 7.15pm.

QSL Manager

DL4DBR is offering an English language QSL Manager Service of DX station. He's had his licence for over 24 years and uses an IBM compatible computer, the Matrix Druckler Star LC 24-200, different data - both radio amateurs and text processing programs.

If you are interested in this, contact: **Teddy Barczyk DL4DBR, Pappelstr. 34, D-W,5800 Hagen 1, Germany.**

Help Required

As part of a display at the South Yorkshire Air Museum, Ken Smith is trying to recreate a High Frequency Direction Finding cabin as used by the RAF in WWII. There appear to be quite a number of sets used for different specific purposes that he cannot, as yet, identify beyond a Marconi/Adcock Direction Finder.

If anyone has experience in this area and thinks they an help, please contact: **Ken Smith, 132 Furniss Avenue, Dore, Sheffield S17 3QP.**

Kenwood & Lowe Plan Expansion

"For many years the name Lowe has been closely linked with Kenwood amateur radio products and this will remain so into the future. We have always been the largest Kenwood retailer and intend to keep that position", said John Wilson, Director of Lowe.

Lowe and Kenwood have worked out a new distribution arrangement and have a new shop open in Leeds and there's another planned for the Oxford area soon.

DXTV News

The splitting of Czechoslovakia into separate republics has produced changes in the broadcasting regime that will in the course of time produce additional TV stations. Slovakia already has the 'Medium 5' and 'Perfex' groups which will both use the TA3 network transmitters (set up in 1991 to relay satellite programming). The groups have U.S. financial backing and transmitting franchises will initially run for 3 years. Meanwhile across the border in the Czech Republic there have been 20 applications for licences which will be awarded this coming year with access to the OK3 network (similar to TA3).

Moves in Hungary to announce the new Broadcasting Bill have been postponed due to political uncertainty. At least three new channels would have been made available to independent TV broadcasters.

Proposed changes in Holland with the government offering existing broadcasting companies a 10 year licence subject to mutual co-operation in providing a three channel Dutch service, two being popular programme channels and the 3rd a minority interest cultural channel. The Belgian based Filmnet group - well known for their satellite film channels have been granted a domestic broadcasting licence for Holland. The new service - part encrypted - will start late Autumn 1992.

The Moscow Independent Broadcasting Company is to combine with Atlanta based Turner Broadcasting Systems in providing a commercial TV channel (ch.R6) in Moscow. Both participants will hold 50% ownership of the mainly Russian programme station, though will include certain US programme material, films etc. Commencement date is unknown.

Norway is playing host to the programmes of the Democratic Voice of Burma. Transmissions into Burma are on 17.840MHz at 2100-2300 Burmese time.

HDTV, always thought the domain of satellite transmissions due to the excessively wide bandwidth required has been transmitted within the 8MHz bandwidth of a conventional terrestrial transmitter. A Scandinavian research group have demonstrated the new digital HDTV system - known as HD-Divine - to the Amsterdam IBC. Broadcast engineers feel that this could spell the end for MAC! A complicated method of encoding, a report quotes 'The clever part of the HD-Divine system is its use of hybrid discrete cosine transform coding to compact the amount of data needed to transmit the motion vectors themselves. This runs in addition to the 40:1 compression of the raw data from 900Mbits/second to just 27Mbits/s.' Meanwhile back at the ranch the NHK Tokyo have come up with their own digital HDTV system, very similar to the 'Divine' system. (quote from *International Broadcasting*, August 1992).

Most of the 'La Cinq' transmitters in France are off the air pending the opening of the ARTE network September 28th. It appears that several private transmitters formerly carrying 'La Cinq' have been transmitting 'Canal J' and 'Canal Jimmy' (satellite programmes). These have in turn been received in Switzerland and transmitted over 22 Swiss cable systems without permission, it is likely that Canal Plus will encrypt the programmes in Nagravision shortly.

A new area now has TV for the first time - the New Hebrides Island of Vanuatu, SW Pacific now has its own TV transmitter. Based in Port Villa, 'Our Television Station' as the service is called was commissioned with help from the French network Canal RFO. The first programmes to be seen were of the Barcelona Olympics. The population - scattered across 63 islands - is 165,000 - previously only two radio stations provided broadcast entertainment.

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We also insist on telling the truth about them, and there are a couple of basic rules to observe. First, I know that they say the scanners will cover from 500kHz to 1300MHz, but if you think that they will perform on short wave – forget it. They are all barely adequate (except the AR-3000A but that's in a class of its own). Secondly, if you want to particularly listen to airband, for goodness sake buy a dedicated airband scanner because it will handsomely out-perform all of the wide frequency range receivers, (except again the AR-3000A).

Currently top of the shop are the VT-225 and VT-125 from Yupiteru. Daft name, but good gear. The VT-125 is VHF airband only, and the VT-225 gives both VHF and UHF airband. Prices are good at £149 for the 125 and £229 for the 225.

For wide range scanning, the MVT-7000 has established a good reputation for styling, ease of use, and good performance. Full coverage and 200 memory channels. Nice one. £289.

The new AR-1500 from AOR is interesting, because it is the first hand-held to offer a BFO for receiving SSB on short wave. (It covers 500kHz to 1300MHz by the way). My first reaction to its announcement was less than enthusiastic, but even I will say that it can make a reasonable job of SSB even though it is a long way from being a short wave receiver. Small and handy, the AR-1500 comes in at £279.

The AR-3000A – now this does stir the blood because it is an amazing achievement. To pack such a receiver in such a small package takes a lot of engineering, but the performance is excellent, and I can recommend it – only snag is the price, but for £765 it's a H*** of a good radio.

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grassroots

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Send all details of your club's up-and-coming events to: Lorna Mower, Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP. Please tell us your County and keep the details as breif as possible

rallies

October 4: The Blackwood Rally will be held in the Oakdale Community College, Blackwood, Gwent. Doors open at 10.30am. Admission £1. There will be traders, a Bring & Buy, videos, raffle and talk-in is in S22. **Norman Davies, QTHR. Tel: (0495) 227550.**

October 4: The Wincanton Radio Rally will be held at Wincanton Race Course, Somerset. Doors open at 10am and admission is 50p. Talk-in is on S22. There will be two halls of radio equipment, computer and electronics surplus with a radio car boot sale outside. **Norman G4YXX. Tel: (0749) 850432.**

***October 4**: The Great Lumley Amateur Radio Rally will be held in the Community Centre, Great Lumley, n r Chester-le-Street, Co. Durham. Doors open at 10.30 for the disabled and 11.00 for everyone else. Admission is £1 and includes a programme. Refreshments will be available and there will be the usual traders and a Bring & Buy stand. Talk-in on S22 by GX6GLR. **Barry G1JDP 091-388 5936.**

***October 23/24**: The 21st Annual Leicester Amateur Radio Exhibition will be held at the Granby Halls, Leicester. Doors open at 10am each day (9.30am for the disabled). All the usual facilities. **Frank G4PDZ. Tel: (0533) 553293 business hours or (0533) 871086.**

***October 31/November 1**: The Sixth North Wales Radio & Electronics Show will be held at the Aberconwy Conference & Exhibition Centre, Llandudno. Bring & Buy stand and a good range of traders from both radio and computing sides of the hobby. Doors open to the public at 10am on both days. **B. Mee GW7EXH, Tel: (0745) 591704.**

November 8: The 2nd Barnsley Amateur Radio Rally will be held in the Willowgarth Senior High School, Brierley Road, Grimethorpe, Barnsley. There will be a large Bring & Buy, a good selection of traders, a licensed bar, catering and free car parking for over 1500 cars. Doors open 11am (10.30am for the disabled). **Ernie G4LUE. Tel: (0226) 716339** between 6 and 8pm.

***November 15**: The Bridgend & District ARC are holding their rally at the Bridgend Recreation Centre. Doors open 11am, 10.30 for wheelchair operators. There will be a Bring & Buy, canteen and large bar/rest room. The swimming pool is available for the family as is the rest of the Recreation Centre. **Charles Sedgebeer. Tel: (0656) 860434.**

November 22: The Bishop Auckland Radio & Computer Rally will be held in the Spennymoor Leisure Centre. **Mike Shield. Tel: (0388) 766264.**

November 28: The Greater London Amateur Radio & Computer Show will be held at Harrow Leisure Centre, Christchurch Avenue, Harrow, Middlesex. Doors open from 10.30am to 4.30pm. **CLPK. 18 Litchfield Close, Clacton-on-Sea, Essex CO15 3SZ.**

* Short Wave MAgazine & Practical Wireless in attendance

AVON

RSGB City of Bristol Group: last Mondays, 7pm. The Small Lecture Theatre, Queens Building, University of Bristol, University Walk, Bristol. October 26 - AGM. Dave Coxon G0GHM. (0275) 855123.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. October 7 - History of SBARC Exhibition, 14th - ATV Activity Evening, 21st - Home-brew 2nd Evening for Terry's Trophy, 28th - PC Shareware Exchange Evening. Len Baker. (Whitchurch) 832222.

CHESHIRE

Chester & DRS: Upton Recreation Centre, Cheshire County Sports & Social Club, Plas Newton Lane, Chester. David Hicks. (0244) 336639.

DERBYSHIRE

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. October 7 - Junk Sale, 14th - Video Show, 21st - The Morse Test Service by G4HDP, 28th - The Gas Distribution System by Mr O.K. Smyth of British Gas. Richard Buckby. (Ambergate) 852475.

DEVON

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. October 23 - Talk and Slide Show of Mont Blanc by G4FLW. Walt G3HTX. (0803) 526762.

EAST SUSSEX

Hastings E&RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey Close, Hastings. October 21 - Junk Sale. Reg Kemp. 7 Forewood Rise, Crowhurst.

GREATER LONDON

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. Chiswick Town Hall, Heathfield Terrace, Chiswick, W4. October 20 - The Real Radio Industry - Pre War by Len Salaman. Colm Mulvany G0JRY. 081-749 9972.

Edgware & DRS: 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. October 22 Morse Training Evening. Hank Kay G0FAB. 081-205 1023.

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. October 8 - Junk Auction. Brian Shelton G0MEE. 081-360 2453.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. October 9 - Desert Island Radio, 30th - AGM. Chris Frost. 081-397 0427.

HAMPSHIRE

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. October 1 - AGM. S.W. Swain. (0705) 472846).

Three Counties RC: Alternate Wednesdays, 7.30pm. The Railway Hotel, Liphook, Hants. October 7 - Steam Engines by M.J. Mason, 21st - Satellite Communications Equipment Demo by Martelec Communications Ltd. Kevin G8GOS. (0420) 83091.

HERTFORDSHIRE

Dacorum AR & TS: 1st (informal) & 3rd (formal) Tuesdays, 8pm. The Heath Park, Cotterells, Hemel Helpstead. October 20 - A Visit to County Cables, Maylands Avenue, Hemel Hempstead followed by a talk on Cable TV by David Mason, Network Technician for County Cable. Dennis Boast. (0442) 259620.

Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. October 1 & 15 - Informal & Project Night, 29th - Talk by Dennis G4IZU (former *Mastermind* contestant). Roy G4UNL. 081-804 5643.

HUMBERSIDE

Goole R & ES: Most Fridays, 7.30pm. West Park Pavilion, off Airmyn Road, Goole. Last Fridays. The Black Swan Inn, Asselby. October 2 0 G0OLE On Air Night, 9th - Construction Competition, 16th - PSUs by G8ZCS, 23rd - Junk Sale, 30th - Social Evening. Steve Price. (0405) 769130.

KENT

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. October 20 - Junk Sale. Geoffrey Milne. 081-462 2689.

Maidstone YMCA ARS: Alternate Thursdays. YMCA Sports Centre, Melrose Close, Maidstone, Kent. October 9 & 23rd - RAE, 30th - Junk Sale. C.L. Roberts. (0622) 670936.

Sevenoaks & DARS: Sevenoaks DC, Council Offices, Argyle Road, Sevenoaks. October 19 - More Medical Electronics by Peter Donaldson. West Dulwich.

West Kent ARS: 3rd Fridays, 8pm. The School Annex, Albion Road, Tunbridge Wells, Kent. October 16 - Aerials by G1OMH. John Taylor G3OHV. (0892) 664960.

LANCASHIRE

Preston ARS: Alternate Thursdays. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood. October 1 - RSGB Zone A, 15th - General Discussion Evening, 29th - The Dalesway by Mr Moore . Eric Eastwood G1WCQ. (0772) 686708.

NORFOLK

Dereham ARC: 8pm. St Johns Ambulance Hall, Yaxham Road, Dereham. October 8 - Night on the Air. Mark Taylor G0LGJ. (0362) 691099.

NOTTINGHAMSHIRE

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. October 1 - A Talk by The Local Crime Prevention Officer. Mary G0NZA. (0623) 755288.

ARC of Nottingham: Thursdays, 7.30pm. Sherwood Community Centre, Mansfield Road, Nottingham. October 12 - Activity Night, 8th - Forum, 15th - Portable Operating by G0CRZ, 22nd - Amateur Radio Observation Service by G3STG, 29th - Activity Night. Rex Beastall. (0602) 733740.

South Notts ARC: Fridays, 7pm. Highbank Community Centre or Fairham Community College, Farnborough Road, Clifton Estate, Nottingham. October 2 - Open Forum, 9th - Construction, 11th - Foxhunt on foot, 16th - ATV by G8BWC, 23rd - On the Air, 30th - Junk Sale. Ray G7ENK. (0602) 841940.

OXFORDSHIRE

Oxford & DARS: 2nd & 4th Thursdays, 7.45pm. British Legion CLub, Haddow Road, Crotch Crescent, Marston Road, Oxford. October 22 - Mountineering & Rock-climbing: Why do it?! by Dr Mike Leask. Terry Hastings. (0865) 863526.

SOUTH YORKSHIRE

Barnsley & DARC: Mondays, 7.15pm. Darton Hotel, Station Road, Darton, Barnsley. October 5 - CTCSS V 1750 by G8OWN. Ernie G4LUE. (0226) 716339.

WARWICKSHIRE

Stratford upon Avon & DARS: 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford-upon-Avon. October 12 - Work of the EMC Committee by G8SOZ, 26th - An Evening with Herb OZ7SM. A. Beasley G0CXJ. 060-882 495.

WEST MIDLANDS

Sandwell ARC: Mondays, 8pm. The Broadway, Warley, West Midlands. Victor Holyoake. 021-552 4619.

YORKSHIRE

Bridlington & DARS: Alternate Thursdays, 7.30pm. Combined Cadet Building, Bridlington Upper School, Bessingby Road, Bridlington. October 1 - HF Antennas by G3PWN, 15th - The Capacitor by G1YVL.

The Sun - the Source

Part 1

Radio wave propagation is a fascinating business. Many amateurs specialise in this area to a very high degree, whilst others - like Kevin Fox G4MDQ - use it as a means to an end, such as finding a suitable path to a particular country at a given time.

Chasing the Greyline around the globe is also good fun too and often produces astounding results. So, what has this all got to do with the sun? Well, many amateurs are vaguely aware of the various forms of radio wave propagation - don't worry if you're not; most of them will be explained in this series - but many are none too certain what causes it all. Most articles on radio wave propagation I've read in the past seem to concentrate exclusively on the earth and its multi-layered atmosphere. Whilst this is of course important, the real story starts 150000000km (93000000 miles) away and over 1000000 years ago. Of course I'm talking about the sun. All radio wave propagation on planet earth is subject to the actions and reactions taking place on Sol. So; just exactly what is happening on and within the sun? This series explains the 11-year sunspot and the 22-year magnetic cycles, solar oscillations, sunspot formation, development and growth, aurorae, and the many types of solar flares. I will also explain how these various solar phenomena effect h.f. and v.h.f./u.h.f. radio wave propagation and in what way. Finally, the series concludes with some methods of creating your own propagation predicting system, and discusses one computer program dedicated to short wave radio propagation: the Miniprop Shareware computer program.

The Earth / Sun Link

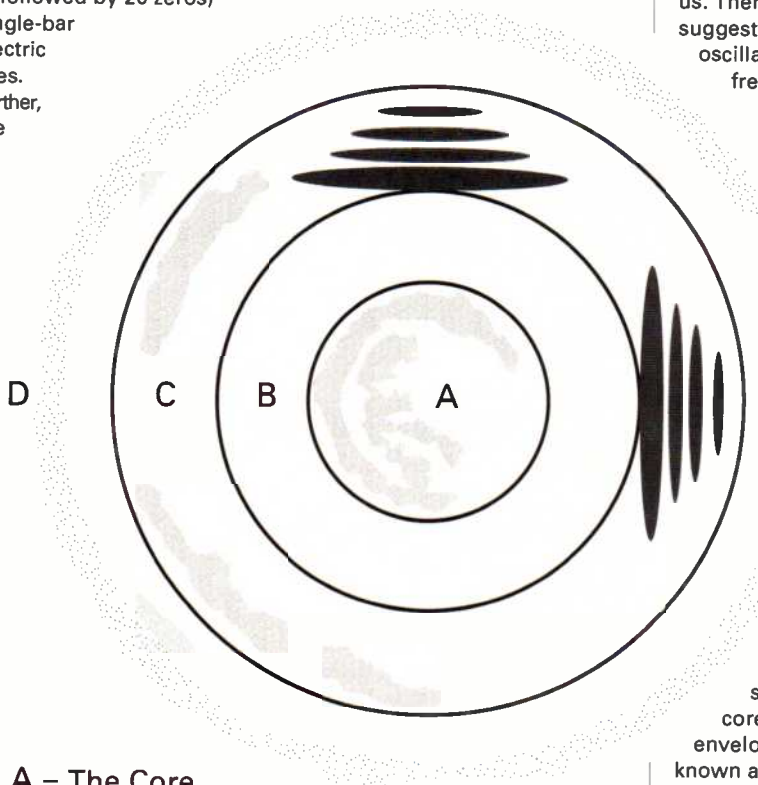
The sun is the closest star to earth. On average it's 150000000km (93000000 miles) away. It is also huge, quite the biggest and most massive object in our solar system. As yet we have no idea where the Heliopause (the end of the sun's influence) occurs, although we do know that it does extend well beyond the orbit of Pluto - 5880000000km (3675000000 miles) away. You can place 110 earths side-by side along the sun's equator, and fill its volume with another million. Luckily for us, our sun has been remarkably stable (given the odd hiccup such as the Ice Ages). It's been shining steadily for 4.6 billion years, and is expected to continue for at least another 4.4 billion before it begins its death throes, even though it is using up its nuclear fuel at the rate of 7 million tons a second. Each and every day the sun generates enough power to run 100 million million million (1 followed by 20 zeros) single-bar electric fires. Further, the sun has a very delicate balancing act to maintain: pressure from within the sun causes it to swell outwards, whilst its own gravity field squeezes it all back in again. This balance is often disturbed locally, such as in solar flares, more of which later on. First I would like to explain how the sun actually works. This then gives you background for me to fill-in the details.

The Sun's Construction

The Core: Starting at the centre we have the core, (**Fig. 1.1**). The core is the sun's 'engine room' where all of its power is generated via a process known as 'proton-proton nuclear fusion'. The sun is actually a huge ball of Hydrogen and Helium gases, in the ratio of 3:1 plus 1% of other, heavier metals which form the minuscule hard centre of the core. Temperature in the core is around 15 million degrees. Proton-proton reactions need a temperature of at least 10 million degrees C. to begin.

In the proton-proton fusion reaction, atoms of Hydrogen are fused together with Helium. This liberates fantastic amounts of energy, mostly light and heat, although the sun has a complete output which virtually covers the whole of the electro-magnetic spectrum, from the longest radio waves up into the shortest and most lethal gamma rays from which earth's atmosphere protects us. There is evidence to suggest that the sun also oscillates at audio frequencies as well- imagine what the roar of the sun must sound like if it were possible for sound waves to travel in a vacuum. Rather surprisingly, the sun contains over sixty percent of its mass within two percent of its total volume; the 200000km diameter core.

The Radiative Zone: Completely surrounding the sun's core is a 400000km deep envelope of unused fuel, known as the Radiative Zone. (**Fig. 1.1**). Pressure and density are so great here that, unlike your central heating radiator or gas fire, convection currents to carry the heat



A = The Core
B = The Radiative Zone
C = The Convective Zone
D = Chromosphere/Corona

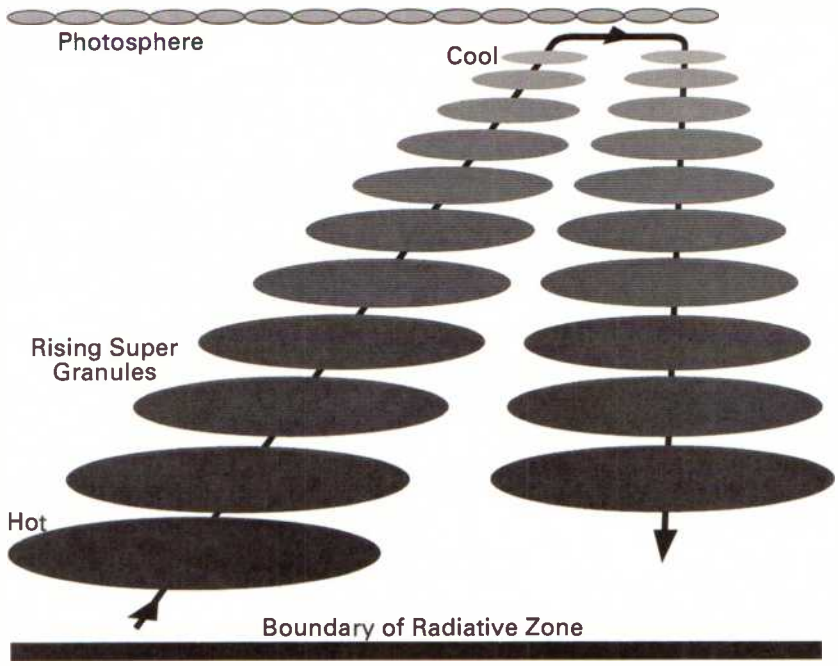
Fig. 1.1.

away from the core are impossible. The density in the Radiative Zone is just too great to allow any movement of the gas particles relative to each other.

Yet the heat has to get away from the core somehow, else the sun would eventually overheat and explode! The sun transports its newly generated power away from the core, and eventually to the surface using the Random Walk process. What happens is that the dense material nearest to the core in the Radiative Zone absorbs the energy and then re-transmits it to its nearest neighbour, gradually moving away from the core. This is a very slow process indeed, the energy takes over one million years to complete the journey through the Radiative Zone to the surface of the sun.

The Convective Zone: At a depth of 72000km below the surface of the sun (the photosphere) lies the Convective Zone. Its name should give you a pretty good idea as to what happens here. Whereas in the Radiative Zone pressure and density were just too great to permit any movement of the gas particles, in the Convective Zone the pressure, density and temperature are much reduced. Therefore, normal convection currents may now collect the solar energy and transport it to the photosphere. At the boundary of the Radiative/Convective Zones, super-granules of viscous material collect the heat energy from the Radiative Zone and then begin their journey upwards to the photosphere, just like gas-filled balloons. As the super-granules move up through the Convective zone, each granule becomes smaller and cooler the nearer they get to the surface. On reaching the photosphere the granule - by now a mere 800km long - gives up the energy it's carried from deep within the sun into the solar atmosphere. As the granule loses its heat, it becomes both cooler and denser. As cool matter has greater density than warm, the granule survives for around five minutes on the surface before slowly sinking back into the depths of the sun, ready to begin the next cycle. (**Fig. 1.2**).

Fig. 1.2.



The Photosphere: The photosphere is the actual surface of the sun, the bit we can see (in cloudy weather) as a disk-shaped object. It forms the barrier between the opaque Convective Zone and the transparent solar atmosphere. The heat and light we receive here on earth although originating millions of years ago from the core is transmitted into space in all directions from the surface of the sun. The photosphere when viewed using special apparatus on a telescope (**never ever use a telescope to look directly at the sun**) looks like a ball covered in grains of rice. Any good book on astronomy will usually have a close-up picture of this. The 'grains of rice' are actually the super-granules which, having delivered their energy, are about to sink back into the depths of the sun to collect more. We shall be returning to the photosphere quite a few times as the series progresses because it is on the photosphere or just beneath it where all the interesting things happen, such as sunspot formation and solar flares.

The Chromosphere: Surrounding the sun is an atmosphere, much like on earth, except that it's much more tenuous and a good bit warmer! The solar temperature, which began at some 15 million degrees in the Core, dropped to 6000 degrees on the photosphere now starts climbing rapidly. Close to the photosphere the chromosphere's temperature rises to 5 million degrees C. and can reach 8 - 10 million degrees within the solar corona - the outermost and most tenuous part of the chromosphere. The shape and size of the solar corona tells us much about the state of the current sunspot cycle. At sunspot minima it streams away from the globe of the sun, spreading out considerably 'east' and 'west'. At sunspot maxima the corona is a tightly contained ball closely surrounding the sun.

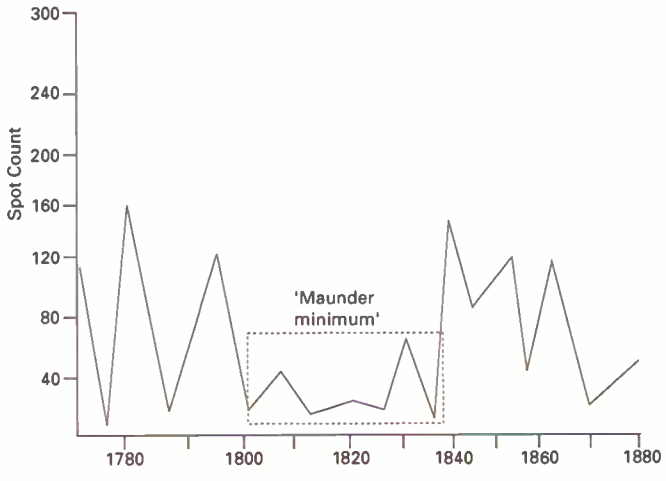


Fig. 1.3.

Solar Oscillations

The sun is continuously oscillating, or vibrating, at periods between 5 - 30 minutes. There are little understood longer oscillation periods too. Whereas the short term oscillations appear to be tidal effects on the surface on the photosphere; the longer oscillations affect the whole of the sun's globe. The amplitude (height) of the disturbances appears to be around a few kilometres. But there is some evidence to suggest that the sun undergoes periods of much longer, and more violent oscillations, possibly centuries or even millennia apart. This could be a partial explanation as to why some sunspot peaks in a particular cycle are much higher that those of another cycle.

This has been a great simplification of a complex subject, but at least you now

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DRAKE R8E – *BEST FROM THE USA*

Now available from SMC the new DRAKE R8E communications receiver. These receivers utilise the very latest in technology to meet the demanding requirements of today's listeners. Conveniently located front panel controls allow for rapid operator programming and ease of use. The R8E receiver covers 0.15-30MHz and with the optional VHF converter will also cover 35-55MHz and 108-174MHz. The large clear LCD display gives the operator full information about the current receiver status.

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ICF-SW77

AIR 7

AOR

SMC are pleased to be able to offer a large number of models from the very comprehensive AOR range which includes both hand portables and mobiles/base stations.

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

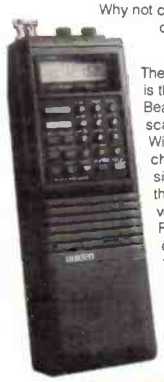
The top of the range model must be the AR3000 which covers 100kHz–2036MHz without any gaps. The sensational AR1500 is already a best seller, it's easy to understand why! With coverage from 500kHz – 1300MHz and complete with SSB. Try one today you'll see why they are a best seller. Last but not least is the AR2000 which is an extremely flexible handheld scanner covering 500kHz–1300MHz.

Why not contact us today for more details of the AOR range.

AR3000

BEST SELLER

AR1500



The Bearcat 200XLT is the cream of the Bearcat handheld scanner range. With 200 memory channels and simple operation these are proving very popular. Frequency coverage 66-88, 118-174, 406-512 and 806-956MHz.

200XLT

The compact HX850E is a basic scanner with a few memories. Ideally, suitable for a novice in the scanner market. AM/FM modes and a frequency coverage of 60-89, 118-136, 140-174 and 406-495MHz.

HX850E

**** UNBEATABLE VALUE ****

- *Free Finance on selected items, subject to status. Details available on request.*
- *Up to £1000 instant credit, a quotation in writing is available on request, subject to status.*
- *Yaesu Distributor Warranty, 12 months parts and labour.*
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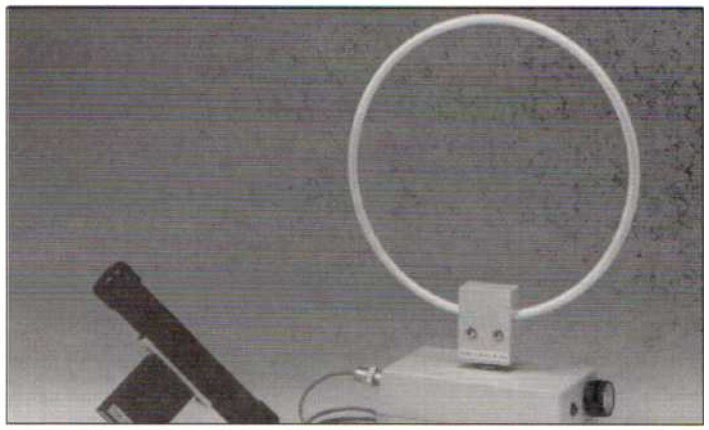
AOR ~ AERIAL VIEW

A range of aerials are now available from AOR with coverage from
Low Frequencies ~ Upper UHF in portable, set-top, base and mobile configurations:

The **LA320** is an ultra-compact active loop aerial specifically designed to provide reception when located in-doors. Coverage is from 1.6 ~ 15 MHz with **optional elements** available for 0.2 ~ 0.54 MHz and 0.54 ~ 1.6 MHz. The aerial elements may be rotated in order to achieve maximum receive signal strength while minimising (nulling out) the effects of unwanted interfering local terrestrial signals. The vari-cap tuning featured in the LA320 also adds valuable selectivity to your receiver's front end stages. Ideal for Hotel room use while travelling etc.

LA320 £89.00 inc. VAT
320L Element 0.2 ~ 0.54 MHz £19.62 inc. VAT
320M Element 0.54 ~ 1.6 MHz £19.62 inc. VAT



LA320

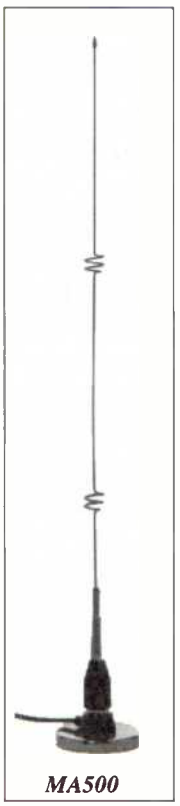
The **WA7000** is a new ultra-wide range external receiving aerial designed for areas where space is a problem and provides coverage from VLF ~ SHF. A MOS power FET amplifier is utilised on the lower bands to provide superior performance in the HF 30 kHz ~ 30 MHz range, the useable coverage of the aerial being 30 kHz ~ 2 GHz. The top whip has loading coils tuned around 150 & 800 MHz to enhance performance of the VHF & UHF bands where the aerial is passive. The aerial is very compact being just under 800mm in total height. Approximately 15m of terminated coaxial cable is provided ready to plug in and start using. The aerial is powered by 12V DC @ 100mA (mains power supply provided), this being fed up the coaxial cable. A small interface box is included for connection to the power supply, this is fitted with a BNC patch lead ready to plug into the AR3000A or similar receiver. 'V' bolts and clamps are included to ease installation however a small additional support pole will be required.

WA7000 £169.95 inc. VAT

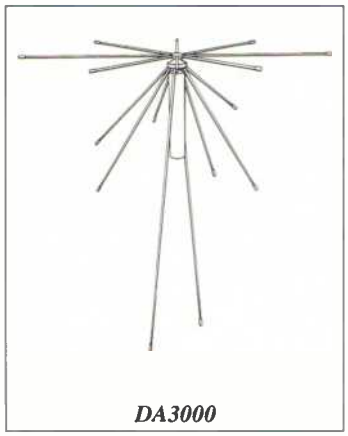
WA7000

The **MA500** is a wide band VHF ~ UHF mobile whip aerial mounted on a magnetic base. Useable coverage is 25 MHz ~ 1300 MHz with the loaded whip element being peaked around 150 & 800 MHz. The magnetic base has a diameter of about 85mm and the magnetic attraction is very strong.
The aerial is mounted on a PL259 plug ready to screw onto the magnetic base's SO239 socket. Approximately 4m of high quality RG58/U 50 OHM coaxial cable is provided which is fixed into the magnetic base at one end and terminates into a BNC plug at the other ready to plug into most AOR receivers (and most other brands). The total height of the aerial including the base is approximately 720 mm.

MA500 £44.95 inc. VAT



MA500



DA3000

DA900 Very popular wide band VHF ~ UHF loaded set-top flexible whip with a BNC connection, as supplied with the AR2000. Length approximately 245mm. **£8.00 plus £1.00 P&P inc. VAT.**
RA2001 Telescopic VHF ~ UHF whip on a right-angle BNC plug, length approximately 700mm. As supplied with the AR3000A. **£9.92 plus £1.00 P&P inc. VAT.**
SW-Wire 5m aerial wire for shortwave listening, terminated in a BNC plug. As supplied with the AR1500 but suitable for many receivers. **£5.00 plus £1.00 P&P inc. VAT.**

The **DA3000** is a well designed 16 element wide band discone aerial for external mounting. It offers an exceptionally wide frequency coverage from 25 MHz ~ 2 GHz. The 16 elements are made of Stainless-Steel to reduce the effects of weathering. The aluminium support mast is 300mm in length, 'V' bolts and clamps are provided however a small additional support pole will be required. The aerial termination is protected from rain etc. by careful design, the high quality TNC connector is concealed within the support mast. The DA3000 stands approximately 1040mm high and the radius is approximately 450mm, the weight is 1.1 kg.

Chris Lorek's conclusions from a recent review...
"It provided a good performance across a wide frequency range"...
"I'd certainly recommend it"...
DA3000 £69.00 inc. VAT

Access VISA

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know what the individual parts do, and how the sun generates its energy. You also have some reference points to work from as I now move on to discuss the formation of sunspot groups.

A Brief History of Sunspots

In the seventeenth century detailed records of the number of visible sunspots began to be recorded - (**Fig. 1.3**). A Danish astronomer, named Horrebow began plotting these observations, and discovered a fairly regular cycle of 22 years in the sun's peak-to-peak activity, from maximum to maximum activity. By the way, prior to this the church of that time decreed that nothing so sacred as the sun could be blemished by imperfections such as spots, therefore the were no such things as sunspots, merely 'black clouds' passing between the earth and the disc of the sun! A problem Galilaeo could have related to quite well.

The Revolving Universe

We know that earth revolves on its axis in a twenty-four hour period because it gets dark at night, growing lighter as the unlit portion moves into line with the sun. In actual fact everything in space is revolving around itself and everything thing else: the earth rotates around the sun, the sun rotates about itself and the Milky Way galaxy (ours) and the galaxy rotates around all the other galaxies! It's the sun's own rotational periods (note the pleural) which are at the heart of sunspot formations. At the sun's 'equatorial' region the rotation period is approximately 26 days (compared to earth's 24 hours). The reason for this is that the sun is both much bigger and has a lot more mass than earth, therefore it spins more slowly. However, as the sun is **not** a solid object, but a ball of gas, the rotation periods vary with latitude, just as a soft clay ball on a potter's wheel, when spun quickly, tends to bulge outwards at the centre, making the ball appear a flattened sphere, or as astronomers call it, an Oblate Spheroid (flattened polar regions-bulging centre). The sun is an oblate spheroid with a rotation period of 26 days at the equator (where it's spinning fastest), at latitudes ±45 degrees from the equatorial region 28 days, and at latitudes ±75 degrees 30 days. So. 26, 28 and 30 days, this produces some pretty weird effects in and on the surface of the sun.

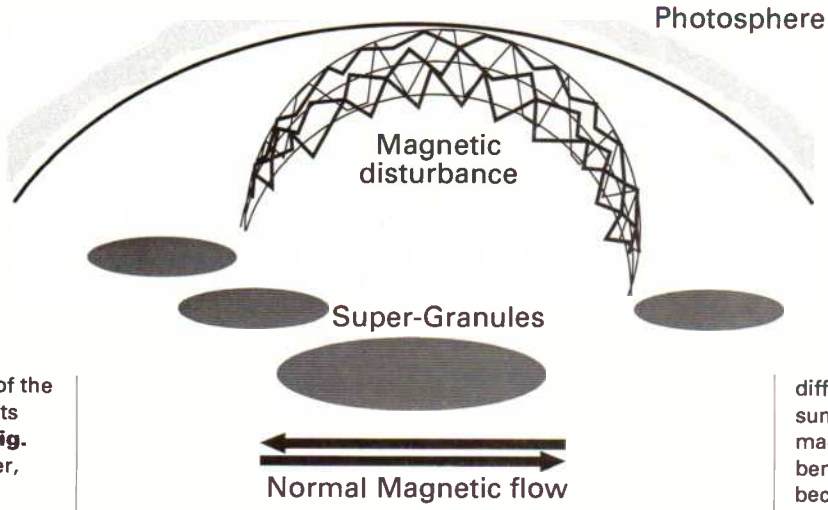

Fig. 1.4.

Lines of Magnetic Force

Due to the differential rotation of the sun's surface, lines of magnetic force lying just beneath the photosphere become twisted and knotted, inducing areas of powerful magnetic disturbance (**Fig. 1.4**). The super granules carrying heat away from the sun's core slam into these areas of magnetic chaos and find their upwards progress blocked. Their own upwards inertia helps to twist and kink the magnetic field lines even more. As yet, earth-based observers will see little happening on the photosphere except (and with the appropriate equipment) bright clouds of hydrogen gas, known as Faculae, forming around the site of the magnetic disturbance, acting like cosmic vultures awaiting the arrival of a sunspot.

Eventually the build-up of magnetic forces is just too

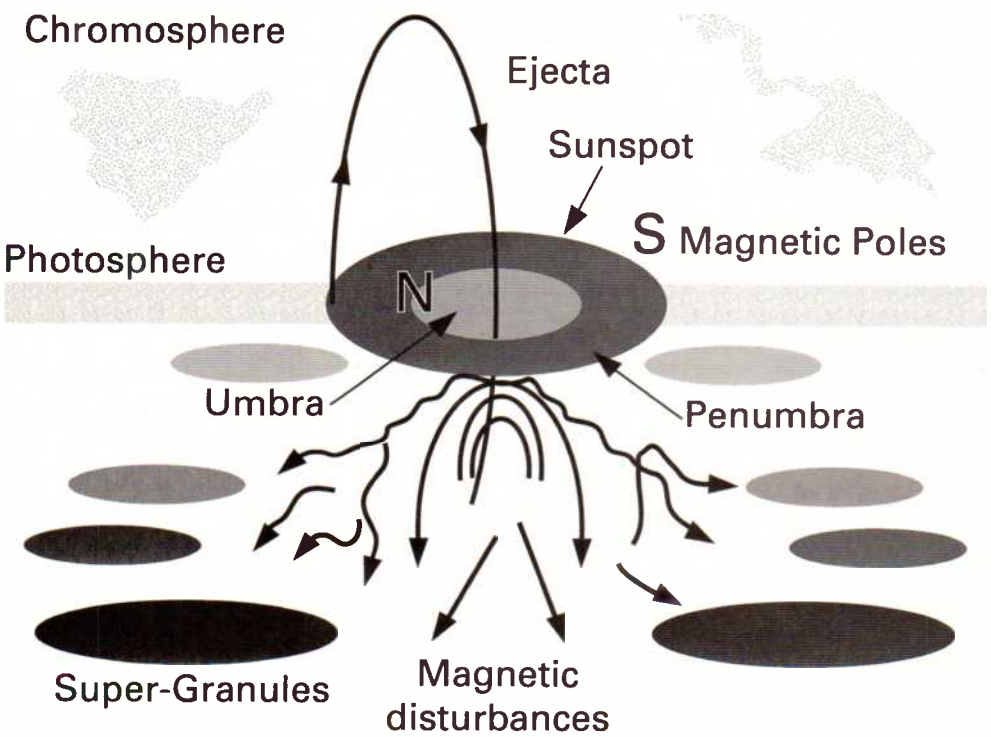

Fig. 1.5:
Local magnetic disturbances deflect the rising super-granules away from the site of the sunspot pore, making it cooler than the average temperature. Solar material is ejected up along the magnetic field lines from penumbra back into the umbra, releasing large amounts of energy.

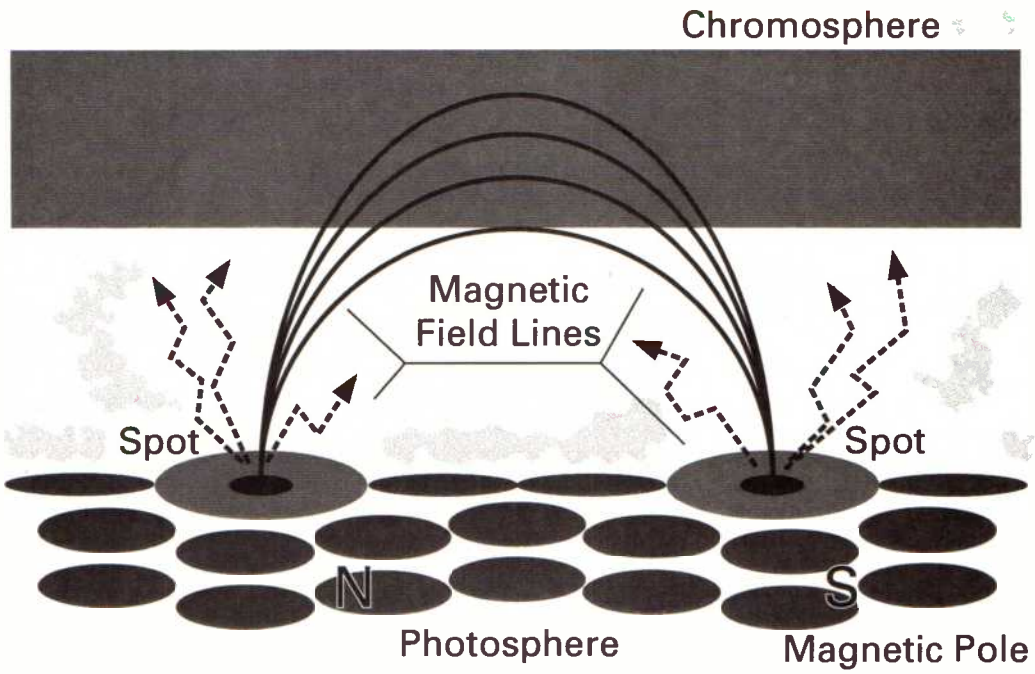

Fig. 1.6.

strong for the photosphere to contain, and so a 'hole' is punched through the surface by the magnetic field lines. The rising granules carrying the energy from the core are deflected around to the outer edges of the magnetic anomaly, which keeps the site of the embryo sunspot around 1000°C. cooler than the usual surface temperature. That's why a sunspot appears as a dark blotch against the photosphere. If you could see a sunspot pore without the bright background of the sun, it would shine far brighter than any man-made illumination! A sunspot consists of two parts; the faint, greyish 'shadow', known as the Penumbra surrounding a black centre called the Umbra. The spot forms a shallow disc-like depression on the surface of the sun, with the magnetic field lines reaching high into the lower regions of the chromosphere. Meanwhile the granules carrying their heat must complete their journey. Following the lines of least resistance, they flow around to the edges of the Penumbra and are then caught up in the out-flowing magnetic field lines, and are thrown high into the solar atmosphere before falling back (as they cool) into the centre of the sunspot umbra. Such a sunspot is known as Unipolar: the Penumbra forms one magnetic pole whilst the umbra the other. Only whilst this cyclic exchange of gases and magnetic field lines is allowed to flow from Penumbra to Umbra can the spot exists - more of this in a while. (**Fig. 1.5**). Often the severely disturbed magnetic field lines punch through the photosphere in more than one place at a time. Where and when this happens we get a Bipolar grouping, where, instead of the Penumbra/Umbra of a single spot providing both magnetic poles, one spot in a bipolar group will act as one magnetic pole whilst another spot in the grouping will be the opposite (**Fig. 1.6**). Obviously in bipolar groupings, the magnetic and other forces involved are not merely doubled! Their awesome power can throw ejecta many thousands of miles up into the chromosphere/corona, and in a severe magnetic 'storm' may even exceed the sun's escape velocity, throwing solar material off the sun altogether, causing a major solar eruption (flair) and chaos on earth!

22-Year Magnetic Cycle

Sunspots are carried around by the sun's own rotation, which is actually westward to eastward, but east to west as we see it on earth. A sunspot grouping will take something like two weeks to complete the journey from western to eastern limb of the sun's globe. In a bipolar group the most westerly (easterly as we see it) spot is called the leader; it will form before the more easterly, following spot or spots and persist after the following spots have disappeared. Each 11-year sunspot cycle is given a number. For example, we're currently in Cycle 22 . As the cycles change, then so does the polarisation of the Leader spots. For example, during Cycle 21 the Leaders were all negative, whilst the follower spots were positive. In Cycle 22 the Leaders are positive and the followers negative. This is the 22-year magnetic cycle. No-one is yet sure what effect this has on the intensity of solar activity or spectral output of the sun. As previously stated a sunspot may only persist whilst the magnetic disturbance exists, and the cyclic exchange of solar ejecta from group to group via magnetic flux tubes is strong enough. On average this appears to be around fifteen days; however some groups have been recorded over numerous solar rotations (approx. 28 days, remember?), indicating the severity of the magnetic disturbance. This is an important feature for radio wave propagation because if the group responsible for the anomalous propagation conditions persists for more than one solar rotation, the same conditions may repeat themselves twenty-eight days later, when the solar flair and the earth are once again lined-up, giving you a second bite at the cherry; and a crack at another aurora or enhanced 'E' layer ionisation. ■

We now have a working idea of how a sunspot group is created. Next time we'll be looking at what effects sunspots cause in the solar atmosphere, how these effects travel earthwards and what they do once they hit earth's ionosphere.

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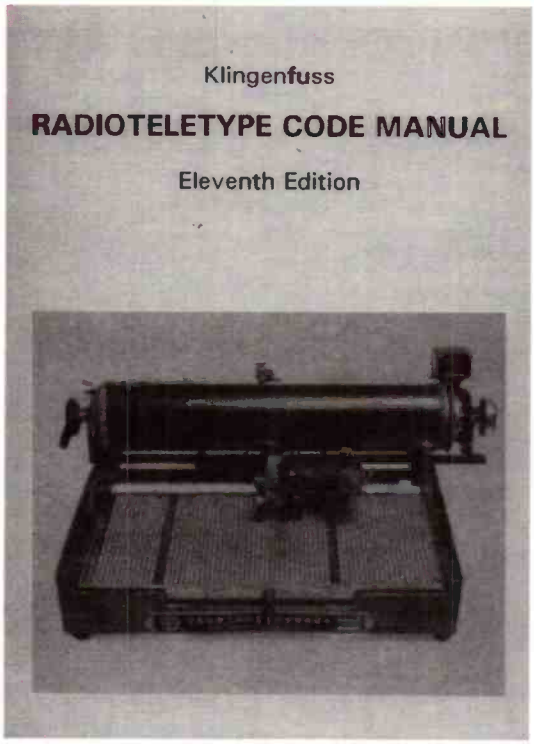

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NOTE:– we recommend 5D for use with most scanners.

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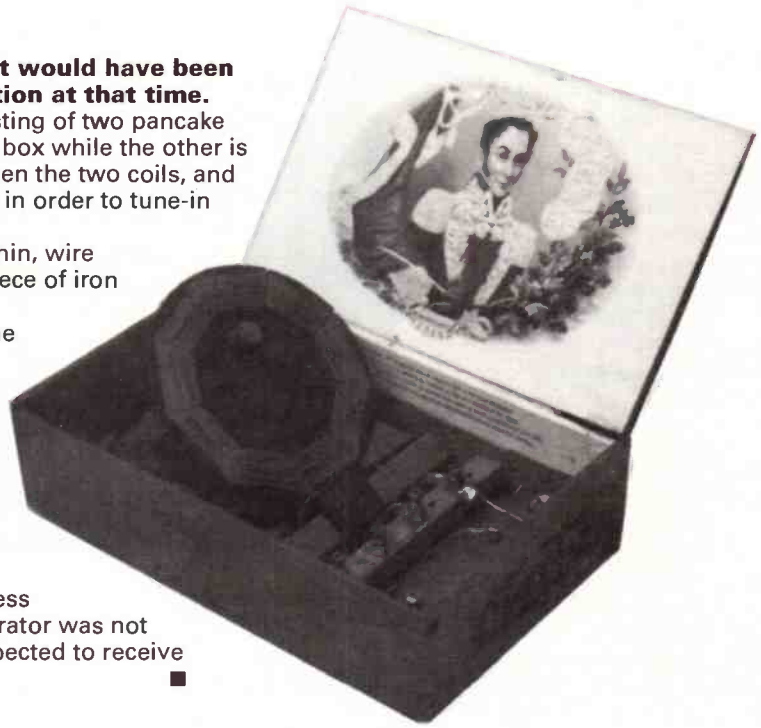
1923-style Cigar Box Crystal Set

Eric Westman constructed a crystal receiver in a cigar-box, after an interval of almost 70 years, from instructions published in the long-defunct Popular Wireless *magazine*



When the original crystal set was built it would have been considered the last word in miniaturisation at that time.

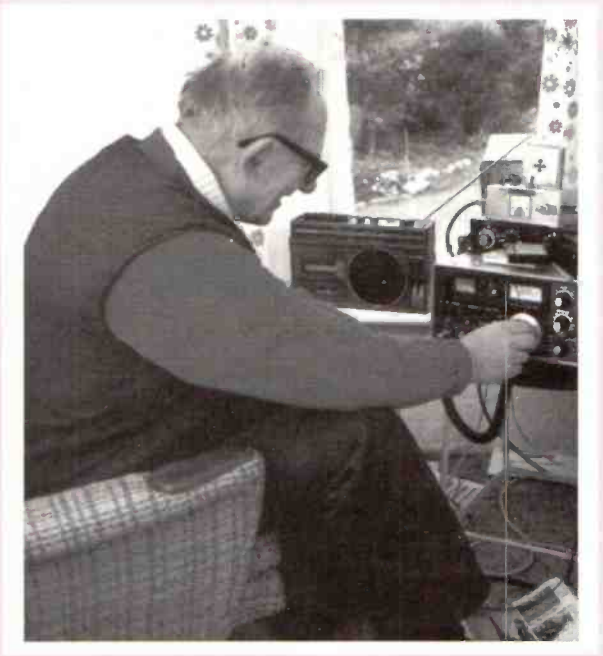
Tuning is by means of a variometer consisting of two pancake coils, one of which is fixed to the base of the box while the other is hinged to it. This enables the coupling between the two coils, and thus their combined inductance, to be varied in order to tune-in the required station.

Rectification (detection) is by means of a thin, wire 'catswhisker' delicately bearing on a small piece of iron pyrites or other crystal. A deviation from the original specification is the replacement of the very rudimentary crystal detector by a more sophisticated component concocted from a spring clothes-peg, as described in another issue of the same magazine! It gives very fine adjustment, superior to that of many commercially made detectors.

At Weston-super-Mare in Southwest England, using an indoor antenna, the cigar-box crystal set receives Radio 5 at strong headphone volume, and two other stations less loudly. Tuning is very broad: in 1923 the operator was not concerned with selectivity since he never expected to receive anything more than one station. ■

Narrow Filter Morse Reception

John Worthington GW3COI uses his ears in his profession. Here he offers some advice on overcoming the sometimes painful effects encountered during long sessions of listening to Morse.



There is no doubt that modern c.w. filters are very good indeed when compared with those used in the classic receivers of yesteryear, but the human ear is, as yet, un-improved, leaving one of the main snags unsolved. I refer to the tiring and in some cases painful effect of reading Morse for long periods, producing a note that is on the point of ringing. There are a few ways in which some relief can be obtained. Many operators vary the pitch of the received note on their i.r.t. (incremental receiver tuning) if they are using a transceiver and those using separates can, of course, vary their receiver tuning without hindrance. Doing this avoids the wear and tear on the ear's nerves that a single, unvarying, frequency will soon accomplish. But it still does not eradicate the discomfort. Indeed, some hapless operators experience pain, dive for the audio gain and are obliged, as a result, to ask for repeats.

Spread of Frequencies

Another obvious way to stop the strain is to open up the received bandwidth and let in other signals and noises. This has the effect of giving the ear a spread of frequencies which is much easier to listen to, but then the brain is forced to work overtime sorting out the wanted signal.

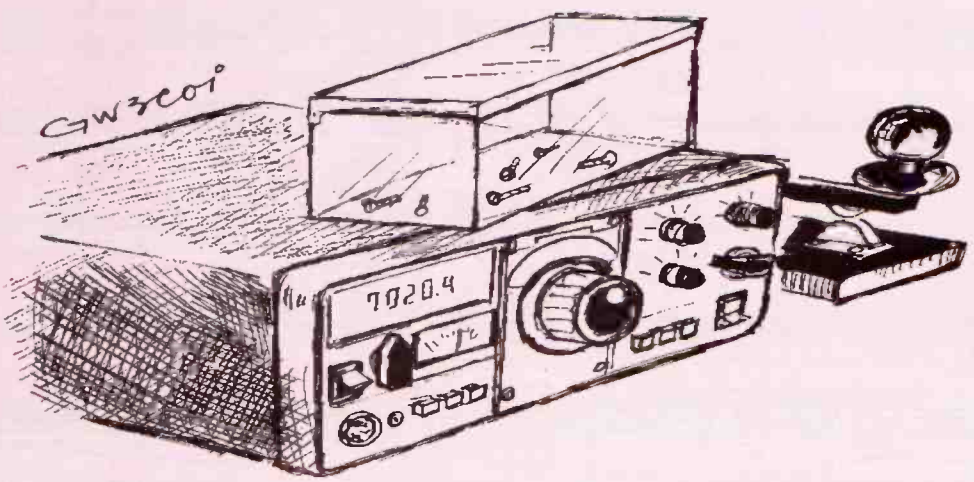
Yet another way to prevent ear drilling is to swap your cans for a speaker or *vice versa*, since the unaccustomed point source of the c.w. sounds different enough to give the worn ear parts a rest.

Then again, a change of head position can sometimes give a more comfortable note when reading from a speaker - of course, this idea may be carried out by moving the speaker to various positions. It is a little known fact that over very short distances audio frequencies assume fixed paths where ones of even tiny magnitude are audible by careful positioning of the head - incidentally, this practice is part of the piano tuner's 'stock-in-trade tricks'.

Chocolate and Nut Creations

However, if you ever want another idea to try here is a method I came across by accident some years ago. I was in QSO on the low end of 40m one day and by chance there was a thin, transparent, plastics box with a hinged lid - originally made to contain those excellent milk chocolate and nut creations with a foreign-sounding name - resting on top of the upward facing speaker of my TS120. I use a few of these boxes to hold small components or screws, which this one was doing, when I noticed that it was resonating nicely with the received signal (via a very narrow filter). I manoeuvred the position of the box until, instead of the sharp tone of the FT101, or whatever it was sending to me, I was getting a very easy-on-the-ear buzz. Suffice it to say that since that day I have found this simple device quite a boon.

It is essential that you use the identical chocolate box because no others I've tried are thin enough to respond to low levels of audio. There is no need to fill the box with components, etc - it seems to work best with about half-a-dozen small screws in it! ■



First Aid

I am trying to find a manual for the Bearcat BC 20/20 FB and wonder if any *SWM* readers could help?

Mr Wallace Smith, 15 Banks Crescent, Heysham, Morecambe, Lancs LA3 2SG.

Can anyone help with the supplier of the following double-tuned 455kHz i.f. transformers for valve receivers, any make, of which I require two.

Gerald Bramwell, 43 Beechfield Road, Manchester M27 1RA.

Three weeks ago my home was broken into and my DR49 was taken, along with many other items. I can replace my TV and video, but I am having great difficulty in finding another DR49. Perhaps another reader can help me to replace my old friend, as I can't seem to locate one myself.

Paul Vernon, 19 The Beeches, Sandwich Road, Eccles, Manchester M30 9DX,

A few weeks ago we had some very bad weather, gale force at times, and this lasted for 2 or 3 days. During that time my Tatung TMR7602 went 'haywire'. It started switching from a.m. to f.m. and the digital read-out was jumping all over the place. I tried my receiver two or three times during the rough weather, but still the same so I gave it up as a bad job. After the weather cleared up I tired the set again and everything was fine. Anyone got any suggestions?

Keith Tetlow, 7 Upton Walk, Ashton-under-Lyne, Lancs OL7 0TE.

I have been a short wave listener for many years as well as a collector of valve operated receivers with a preference for communications receivers. One special receiver I wish to restore was manufactured by EMI Sales and Service Ltd, Type RR20. It covers 13, 16, 19, 25 and 31m as bandspread bands plus 9.5 to 3.2MHz and m.w. and l.w.

This receiver has a bit of history attached to it, as it was originally installed in the special White Train, which transported the Royal Family around South Africa during their three month visit in 1947. Any details, from a circuit diagram to a service manual are needed.

Also required are service details and circuits for a Hallicrafter models S38, S38D and S40. Next, does anyone know how to make the Icom IC740 receive out of band? Finally, my Philips D2999 has limitations and I would like to add a r.i.t. control to enable s.s.b. reception to be improved as well as scan other bands other than the broadcast ones.

Neil Bousfield, 3 Willasdale Place, Bonnie Doon, East London 5241, South Africa.

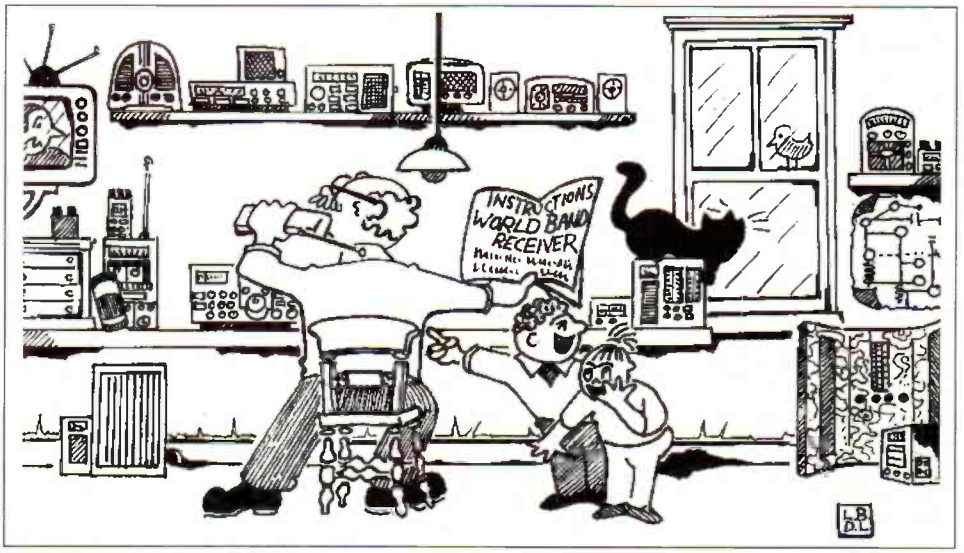
Despite only using a Saisho SW/2000X portable with a 40m wire, I can get brilliant f.m. airband reception and can often identify everything I hear.

One such station is a weather station called 'Scottish VOLMET' on a frequency of approximately 128MHz. It has an introduction of "This is Scottish VOLMET", before each 'round' of destination. The destinations, all nine of them are as follows: Aberdeen, Belfast, Edinburgh, Glasgow, Inverness, London (Heathrow), Prestwich. Stornoway, Sumburgh.

There are updates for each report every one and a half hours (1320, 1450, 1520, etc) with no gaps.

I would be grateful if readers of SWM could tell me a little more about this station. I would like to know more about the station. I would like to know its transmitting location, history or anything else.

Alan Batty. 31 Brae Crescent, Mintlaw, Aberdeenshire AB42 8FD.



"I perfectly understand the synchronised detection system and temperature compensated crystal oscillator, and I have no problem with the triple-loop synthesised circuitry, but I wonder if you'd mind explaining where the on/off switch is please?"

Listen With Grandad

By Leon Balen and David Leverett

Alinco DJ-X1 Sc

The first thing that struck me as I took the DJ-X1 out of its packing was its miniscule size. Without the battery it measures an amazing 125 x 60 x 27mm ! Even with the battery attached, this only increased the depth to 43mm. Despite this tiny exterior the DJ-X1 is packed with a host of features designed to make life easy for the listener. The main operational frequency range extends from 2MHz right through to 905MHz. However, you could set the DJ-X1 to receive an extended range of 100kHz to 1299MHz, though the performance is not guaranteed. So that you can resolve as many signals as possible the DJ-X1 includes three receive modes - narrow f.m., wide f.m. and a.m. Having whetted your appetite, let's now take a closer look at just how this attractive receiver performs.

Handy Size

As the DJ-X1 is designed for portable operation it was no surprise to find that it's completely self contained. It fitted extremely comfortably in my left hand leaving my right hand free to use the main keypad. There were also three buttons on the side panel that were well placed for operation by thumb. In the interests of robustness and a pleasant feel, all the push buttons were rubber coated. The buttons also had a good feel with a positive mechanical click as they were pressed.

One of the acid tests of any receiver is to see just how many of the features can be used without reference to the manual. This crude but simple test is a very effective way to evaluate the logic of the panel markings and operational procedures. The DJ-X1 fared very well in this test and I was able to select operating frequencies, modes and frequency steps with no problems at all. Although I could start the receiver scanning, I couldn't easily work out how to use the memories. I was not surprised at this as all manufacturers appear to use slightly different systems.

Excellent Manual

At the end of the day, all was fine due to the excellent manual supplied with the DJ-X1. This used lots of diagrams and covered all the features in plenty of detail. Once I had read the manual the panel abbreviations became obvious and I didn't have to keep referring back to the manual. There were only two rotary controls both of which were mounted on the top panel. The centre control was a dual concentric unit providing adjustment of the volume and squelch threshold. The spacing between this control and the rotary tuning knob was inevitably quite tight and could prove a problem for anyone with fat fingers! When using this control myself I found I occasionally altered the squelch when changing the volume levels. This was not a serious problem though.

The very neat shape of the DJ-X1 had an added advantage when working in noisy conditions. Although you could use the 3.5mm external speaker jack to connect an earpiece, I found just holding the receiver to my ear was very effective. Incidentally, the frequency and mode information was displayed by a very clear liquid crystal unit in the centre of the front panel. The main characters were approximately 5mm high and I found these very easy to read. There was even a good backlight system for use in poor light. For its power supply, the DJ-X1 used a clip-on battery pack holding six AA cells. An alternative was to use one of the optional NiCad battery packs. These were available in two versions featuring a capacity of 400mAh or 700mAh. The main attraction of the 400mAh unit was its small physical size. Both of these batteries could either be used with a standard fifteen hour charger or a handy one hour rapid charger. It was pleasing to see such a good range of battery options available from the manufacturer. If you wanted to operate the DJ-X1 from an external source there was a standard coaxial socket provided on the side panel. Alinco also supply a good range of optional power leads, some of which even include a noise filter.

Antennas

On the antenna front there were two 'rubber duck' types supplied as standard. Whilst one covered the 500kHz to 150MHz band, the other handled the band from 100MHz up. This overlapping frequency range helped to reduce the number of antenna changes required. The two antennas were about the same length at approximately 190mm each. However, the construction was quite different with the l.f. antenna being very fat and probably helical, whilst the higher frequency unit appeared to be a simple rubber covered whip. It's worth noting at this point that both of these antennas used a standard BNC connector on the receiver. This type of connector is an excellent choice and provides a handy point for connecting an external antenna.

Technical Tests

I put the DJ-X1 through my usual range of basic tests to verify that it confirmed with it's specification. The sensitivity is perhaps the most obvious test and one that many people use as a yardstick when comparing receivers. In fact this is not really a good way to compare receivers as an oversensitive receiver can cause problems. The DJ-X1 proved to be extremely sensitive throughout its frequency range.

All my tests were using my own standard which measured the sensitivity in µV p.d. for 12dB SINAD. In case you are not familiar with the terms, p.d. is potential difference and is in effect the voltage that you would measure across the antenna socket assuming a 50Ω load and source. The 12dB SINAD means a ratio of 12dB between the Signal and the Noise And Distortion. This figure is chosen as it represents a signal that would just achieve a readability rating of 5.

The DJ-X1 showed a remarkably high sensitivity with a best result of 0.12µV using narrow f.m. for all frequencies between 150 and

anning Receiver

The latest trend in scanners seems to be to make them as small as possible. The Alinco DJ-X1, reviewed here by Mike Richards, sets new standards in miniaturisation.

450MHz. In fact the worst narrow f.m. performance was a creditable 0.3µV. The a.m. mode was most likely to be used for air band communications so I based my measurements in that band. With a modulation level of 40% the DJ-X1 returned a sensitivity of 0.6µV. This again was very good. Even the wide f.m. sensitivity returned a creditable 1µV. Although this high sensitivity was useful when using inefficient whip antennas, there was a penalty to pay when using an external antenna or operation close to strong signals.

Because the front end of most scanners is wide open and features little bandpass filtering, strong out-of-band signals get straight through to the mixer. With such a high sensitivity any strong signals cause distortion and intermodulation products in the mixer. The decrease the readability of the wanted signal and can even completely obliterate it.

Simple Solution

Fortunately a simple solution is available that is effective in most cases. That is to fit an attenuator in the antenna lead. This can be done quite easily with the BNC socket as there are several manufacturers that produce in-line BNC attenuators. When used with my externally mounted discone I found that 20dB of attenuation was usually about right. My personal view is that the DJ-X1's sensitivity was set a little too high.

All the remaining parameters met or exceeded the specification. The only other area that was a bit below

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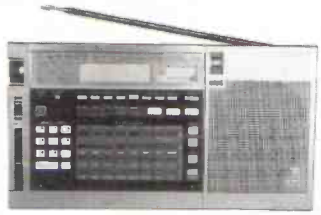

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par was the audio distortion. This measured typically between 5 and 8% which was rather higher than I would have expected. The effect for the user is a slight loss of clarity in the final signal. When considering these performance figures it's remember that most of the limitations are directly associated with minaturisation and the compromises that have to be made to minimise component counts.

Advanced Features

As I mentioned earlier, manual tuning the DJ-X1 was done with the rotary control on the front panel. As with most digital tuning systems the frequency changed in user selectable steps. With the DJ-X1 there was a very wide adjustment range of 5, 9, 10, 12.5, 20, 25, 30, 50 and 100kHz. To help with rapid manual tuning the three function keys on the side panel increased the tuning rate. The values available were 100kHz, 1MHz and 10MHz so making frequency changes very rapid indeed. The DJ-X1 also included the now standard direct entry mode where frequencies re entered via the keypad.

The memory features of the DJ-X1 were extremely comprehensive. There were a total of 100 memories that were split into main and sub groups of 40 memories each. The remaining 20 memories were used to hold receive data and programme scan frequency ranges. As you would expect with a modern scanner, storing and retrieving frequencies was very simple and individual channels could be locked-out where necessary. In addition to all the normal scan modes, the DJ-X1 featured a mode scan. This gave the option of scanning all memories programmed with a particular mode. I found this very useful for plucking out a.m. air band frequencies from a host of other memories.

For use with those favourite frequencies there was a primary and call channel mode. The primary channel provided automatic monitoring of a specific channel. The call channel on the other hand retrieved the contents of the call channel at the press of a single button. Both of these features were extremely useful. With any portable equipment battery life is an important consideration. The DJ-X1 handles this aspect with two battery saving features. One is a straightforward battery save mode that was activated after about five seconds of no signal conditions. The proportion of receive to standby time was pre-set at 1:4. For those, like me, who forget to turn things off, the auto power-off was a boon. This shut the receiver down after 30 minutes of inactivity. ■

Specification

Frequency Range:	2-905MHz (100kHz-1299.995MHz display)	
Modes:	a.m., narrow f.m., wide f.m.	
Freq. Steps:	5, 9, 10, 12.5, 20, 25, 30, 50 and 100kHz	
Ant. Impedance:	50Ω	
Supply:	6-15V d.c.	
Consumption:	24mA to 300mA	
Operating temp:	-10 to +60°C	
Receive system:	a.m./f.m.	triple superhet
	wide f.m.	double superhet
Sensitivity:	a.m.	3-25MHz +4dBµV
		25-905MHz -2dBµV
	n.f.m.	2-25MHz -2dBµV
		25-905MHz -8dBµV
	w.f.m.	2-25MHz +16dBµV
		25-905MHz +10dBµV
Selectivity:	a.m.	15kHz or over/ (6dB)
	f.m.	15kHz or over (-6dB)
	w.f.m.	150kHz or over (-6dB)
Audio output:	0.15W at 10% distortion (8Ω)	
Dimensions:	110 x 53 x 37mm	
Weight:	370g with dry cell battery case	

Summary

There can be no doubt that the DJ-X1 is packed with useful features designed to make life easy for the listener. This versatility combined with its compact form makes the DJ-X1 a powerful contender in the utility market. Although its high sensitivity can be a boon when operating, you could have problems with external antennas if you don't use an attenuator. Despite this shortcoming, I'm sure the DJ-X1 will prove very popular with those requiring a versatile portable scanner. The DJ-X1 costs £249 inc VAT and carriage and can be obtained from :

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

who kindly loaned the review model.

Abbreviations

a.m.	amplitude modulation	kHz	kilohertz	V	volts
BNC	coaxial connector type	mA	milliamperes	W	watts
d.c.	direct current	mAh	milliampere hours	w.f.m.	wideband f.m.
dB	decibels	MHz	megahertz	µV	microvolts
dBµV	decibels referred to 1µV	mm	millimetres	µV	microvolts
f.m.	frequency modulation	p.d.	potential difference	Ω	ohms
g	grams	SINAD	SIgnal to Noise And Distortion	°C	degrees Celsius

The R209 - An Old Warhorse

In these days of almost universal use of all mode, black box transceivers, generally requiring serious negotiation with one's bank manager before purchase, there are still one or two pieces of equipment demobbed by the MOD from time to time that are of interest to the impoverished amateur or listener. Such an item is the R209 which, while lacking many of the refinements normally considered essential to cope with the crowded band conditions of today, nevertheless provides a cheap introductory receiver for the h.f. and l.f. bands. It requires little or no modification to get it going and is thus ideal for newcomers and beginners. Tom Harrison takes a look at this old warhorse.

The R209 is a general coverage communications receiver of around 1960 vintage and was used, in association with various separate transmitters, to provide general h.f. communications for the Army. It is self-contained, i.e. with its own power pack built in, and does not require interconnection to any other units to perform as a receiver. It appears in a number of Marks, which differ principally in the power source they can use, early models requiring 6V d.c. input while later versions can accommodate 12V or 24V d.c. or 110/240V a.c., selected from a panel switch. There are other, less obvious, minor differences between models.

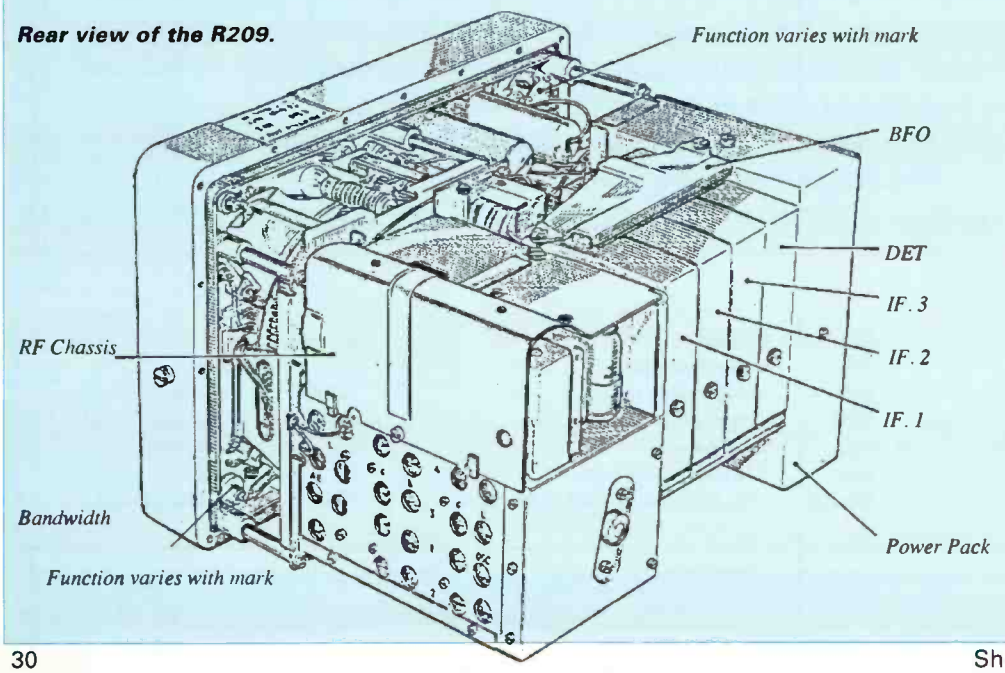
Frequency coverage is from 1 to 20MHz (actually 21.35MHz with dial overshoot) in four ranges - see Table 1. Reception of a.m., c.w./s.s.b. and f.m. is provided. The main dial is calibrated directly in frequency with an auxillary vernier scale operating inthe drive train for logging. Controls are provided fro tuning, a.f./r.f. gain, bandswitching, antenna trimming, b.f.o. tuning and power on/off. On some models the input voltage is selected also. There is a built-in speaker and socket for headphones. The layout is shown in the photographs and **Fig. 1**.

Miniature Valves

Electrically, the set is a single conversion superheterodyne with an i.f. of 460MHz, with one r.f. Stage, Mixer and separate local oscillator, three i.f. amplifiers, detector/limiter, b.f.o. and audio output stages. The oscillator supply has a voltage stabiliser. The built-in power supply uses a non-synchronous vibrator when fed from a d.c. source and all stages use miniature valves of the 1.4V heater type. The block diagram is shown in **Fig. 2**. When fed from a 12V d.c. supply, the unit takes about 1.5A.

Construction is robust with both front panel and casing of diecast aluminium and although classed as lightweight, this is obviously a relative term in military parlance! It is, in fact, waterproof and almost completely airtight, not a normal requirement for amateur radio equipment. The r.f./Mixer/Oscillator Unit, with associated bandswitch and tuning drive is mounted directly onto the front panel for rigidity and stability while the three i.f. stages, the b.f.o. and detector stages are each built in self contained units that plug into a set of interconnecting busbars, the idea being that servicing in the event of a fault will be made easier - see photographs. The admirable concept does not extend, however, to the audio output stages that are on a small sub-chassis buried in the middle of the works, with very poor accessibility for reparis. The power pack is in a robust screened box, itself bolted to the front panel and to the other sub-assemblies to give a very rigid constrction.

Rear view of the R209.



Conventional Practice

Electrically speaking, the r.f., mixer, oscillator and i.f. stages all follow the conventional valve practice current at the time of production, with the individual valve heaters deriving their 1.4V through droppers from a common 6V supply. There are a few odd points worth noting, however.

1: The first r.f. stage valve may be a CV131/EF92 that runs at 6.3V heater voltage rather than a 1T4 that requires 1.4V. This depends on the Mark number of the set.

2: AVC is applied to the r.f. and first and second i.f. stages only. When receiving c.w., the gain of the third i.f. is controlled by the 'volume' control, which

is a 2-gang potentiometer, by applying a varying negative voltage to the valve control grid, this negative voltage being derived from the b.f.o. stage grid leak, which develops a negative voltage when the valve is oscillating - a clever trick, indeed!

3: The detector stage is, in fact, configured as an amplifier limiter and discriminating diode for f.m. reception but becomes a simple a.m. or c.w. detector when the stage h.t. is switched off. (However, in the author's example, the f.m. detector only operates properly on strong signals).

4: The output stage uses two valves as a self-driving push-pull output stage, which incorporates a negative feedback filter peaked at 950Hz when c.w. is selected.

Smooth

Performance is what one would expect from a receiver of this vintage. Sensitivity is quoted as from 3.5 to 5.0µV for 20dB signals to noise ratio depending on range with selectivity 5kHz at 6dB down. Image-rejection ranges from 80dB at 1MHz to 20dB at 20MHz due to the 460kHz i.f. frequency. Audio output level is quite low at about 50mW. The b.f.o. is tuneable over ±1.5kHz round the centre frequency.

Mechanically, the tuning drive is very smooth and free from backlash and the bandchange switch is very positive. Only the band in use is uncovered on the dial, by means of a shutter operated by the bandswitch. Actual dial calibration is not particualry detailed or accurate but the vernier logging scale assists frequency re-setting.

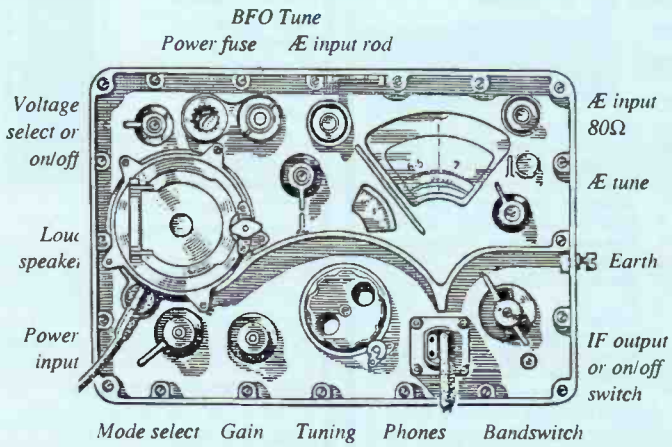
The main limitation is the stability and tone of the local oscillator when operating on the 12-20MHz range. CW signals are not too bad as 12MHz, but definitely T2 at 20MHz. However, this is hardly surprising with a local oscillator working at this frequency. It's perfectly satisfactory for a.m. reception but tuning c.w. or s.s.b. on the 14 or 18MHz bands requires a fair amount of effort and it would not be reasonable to dive into the ARRL CW Contest with this old lady.

All that having been said, performance on the three lower ranges is quite adequate although lacking in selectivity for 'busy band' operation - and you can always build a separate convertor for the h.f. bands.

Can it be improved? Well, assuming you would want to do so, the answer is 'yes', but not easily. The vibrator power pack could be replaced with a standard mains input unit but the physical construciton of this would have to match the original, to preserve the structural integrity of the sub frame construction. Each of the i.f. stages could be converted to use a more easily obtainable valve - say an EF91/6AM6 or similar - but the power supply would have to be modified to cope with the extra heater load. The detector for c.w./s.s.b. - the f.m. detector installed is not really much use. (These latter modifications would be quite easy to carry out since the separate stages can be unplugged from the main assembly for maintenance.) The most desirable improvement would be to increase the audio output to a watt ot two and drive and external speaker but this would be difficult to implement, as the audio stages are well hidden inside the works and the power supply would certainly have to be beefed up to supply the extra power required. Better - and easier - to feed an external audio amplifier from the headphone socket.

My own view would be to leave well alone and preserve the set as an incrument to the Signal Officer in Chief (Army) of the Ministry of Defence and the countless squaddies who used it to get the football results from home via the BBC World Service while sweating away in some 'far flung corner of the Empire'!

Anyone who wants more information on the circuit diagram should contact the author via *SWM*. ■



Front view of the R209.

Table 1: Frequency Coverage.

Band		MHz	
1	12.0	-	20.0
2	5.5	-	12.5
3	2.3	-	5.6
4	1.0	-	2.3

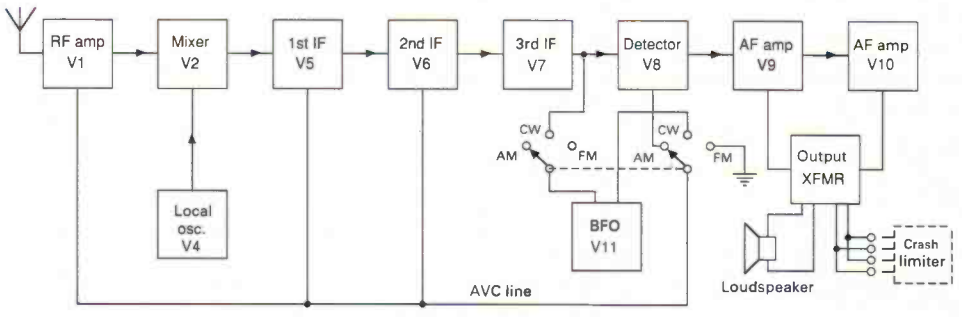
Table 2: Valves.

V1	CV131	EF92*	r.f. amplifier
V2	CV782	1R5	mixer
V3	CV284	75B1	neon stabiliser
V4	CV785	1T4	local oscillator
V5	CV785	1T4	1st i.f.
V6	CV785	1T4	2nd i.f.
V7	CV785	1T4	3rd i.f.
V8	CV784	1S5	2nd detector (a.m. & c.w.)
V9	CV785	1T4	a.f. output
V10	CV784	1S5	a.f. output & a.v.c. delay
V11	CV784	1S5	b.f.o.

*V1 may be 1T4/DF91/CV785 in early marks.

Abbreviations

a.c.	alternating current
a.f.	audio frequency
a.m.	amplitude modulation
b.f.o.	beat frequency oscillator
c.w.	continuous wave (Morse)
d.c.	direct current
dB	decibels
f.m.	frequency modulation
h.f.	high frequency
i.f.	intermediate frequency
kHz	kilohertz
l.f.	low frequency
MHz	megahertz
mW	milliwatts
r.f.	radio frequency
s.s.b.	single sideband
V	volts
µV	microvolts



Block diagram of the R209 receiver.

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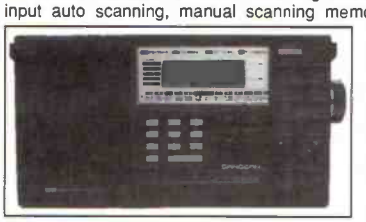

★ Built-in clock and alarm. Radio turns on automatically at preset time and frequency. ★ Large digital frequency display. ★ Fourteen memories – nine memory channels for your favourite station frequencies. Last setting of mode and waveband stored in five memories. ★ Direct press-button access to all 12 shortwave broadcast bands. ★ Two power sources – battery or AC mains adaptor. ★ General coverage of all AM bands in LW/MW/SW (dedicated broadcast band coverage on all versions), plus of course the FM band for quality sound broadcasts in headphone stereo. ★ SLEEP function turns the radio on or off after an adjustable time of 10-90 minutes. ★ Separate BASS and TREBLE controls for maximum listening pleasure. ★ External antenna jack for better reception. ★ Adjustable RF GAIN control to prevent overloading when listening close to other strong stations or if there is interference. ★ New improved wide/narrow filter (6/2.7kHz) ★ BFO control (Beat Frequency Oscillator) enables reception of SSB/USB/LSWB (single side band) and CW (Morse Code) transmissions. ★ Illuminated display to facilitate night-time use. ★ Designed for both portable and desk top use. ★ Five dot LED signal strength indicator.

DIMENSIONS: 29.2cm×16.0cm (11.5in×6.3in×2.36in).
OUTPUT: 1200mW (10%THD) WEIGHT: 1.7kg (3.75lbs) without batteries. Wide/narrow filter switch.

£109.95 + £5 check, test and p&p.

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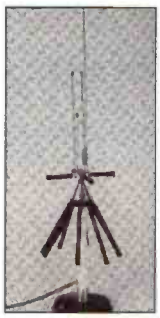
Desk Top Antenna Model Desk 1300



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★ 200 Memory channels
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EACH SET IS SUPPLIED COMPLETE WITH:- Full set of high power NiCads, AC charger, DC power lead and carry strap.....**£289**

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This new model is the mobile version of the popular MVT 7000 Handheld above.

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THIS RADIO IS ESPECIALLY SENSITIVE AT UHF FREQS. Set is supplied with mains power unit.....**£299**

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★ AM/FM/WFM
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A Product Detector for the RA17

Ian Keyser's Racal RA17 receiver had been stored in the roof for three years, not because it was inferior but it was big and lacked a product detector. It was duly extracted from store and dusted off to see what could be done to rectify this omission.

When operating the RA17 the first thing that is noticed is the smooth tuning - rather rapid at 100kHz per turn of the knob - but with a knob that size, tuning is no problem. On switching the b.f.o. on the a.g.c. meter goes almost full-scale and the i.f gain of the receiver reduces accordingly. Tuning in to strong s.s.b. stations distortion is evident and it is necessary to back off the r.f. gain to reduce this distortion.

A product detector would cure these problems and would transform the receiver from a nice set to one that is a delight to operate. But how can we do it with the minimum of fuss? My first idea was to use the b.f.o. valve itself as the prodict detector This would have been ideal as it would only have only needed a few extra components. Then I tried to extract the b.f.o. unit!

It was obvious that, although it could be done, it was doubtful if it could be managed by many others. I could see myself sitting there for months doing b.f.o. mods to RA17s, with a queue forming down the road of blokes hugging their RA17s! Another method had to be found.

With any modification there are, almost always, drawbacks if we are not to add stages and that this was almost certainly going to be one of these cases. What could we do without? Not a.m. But the noise limiter is not important since the existing circuit is very poor, anyway. Investigation showed that the noise limiter used the same valve as the envelope detector. This would not be a problem as we can replace the envelope detector with a semiconductor diode and perhaps even use a semiconductor for the noise limiter as well. That leaves the B7G socket free to be the new home for the product detector valve.

The usual problem when adding a product detector to a receiver designed for a.m. is that there is far too much signal for the product detector to handle. The RA17 is no exception to this -there are volts of i.f signal available! The maximum signal that any grid can handle without envelope detection will be in the order of a volt, and to be safe it is better to keep the level to a fraction of this. For this purpose I included a 10:1 voltage divider to feed the grid of the valve. The valve I decided to use is the ECC91 double-triode, one section as a product detector. The audio signal is filtered from the anode signal and fed to the audio stages via the spare pole on the b.f.o. switch. This selects the a.m. output when the b.f.o. is off, and the product detector output when the b.f.o. is on.

Nothing has been said yet about how to retain the a.m. output. The diode is replaced by a germanium diode between the output of the i.f. transformer (yellow wire) and ground. The anode of the diode goes to the transformer and the cathode (marked with a band) to ground. The derived a.m. audio is extracted from the tagstrip as before.

After the modification was completed it was decided to try using a semiconductor diode for the noise limiter, but the results were so disappointing that the method was not included in the step by step directions. For those who wish to experiment, the diode is wired between tags 3 and 4 on the tagstrip and the a.m. audio is taken to the switch from tag 4 instead of tag 3.

The Modification Step-by-Step

1. First remove the top and bottom covers of the set and with the set upside down locate V21 valve base.

2. You will notice two yellow wires attached to pin 7, one coming from the b.f.o. unit, this becomes the b.f.o. input to the detector. The other is connected to the i.f transformer L78. Remove this latter wire completely. Disconnect the other yellow wire from pin 7 and reconnect it to pin 6. Add a 100kΩ 0.125W resistor between pin 6 and the earth tag to be found near pin 7.

Continued on page 35

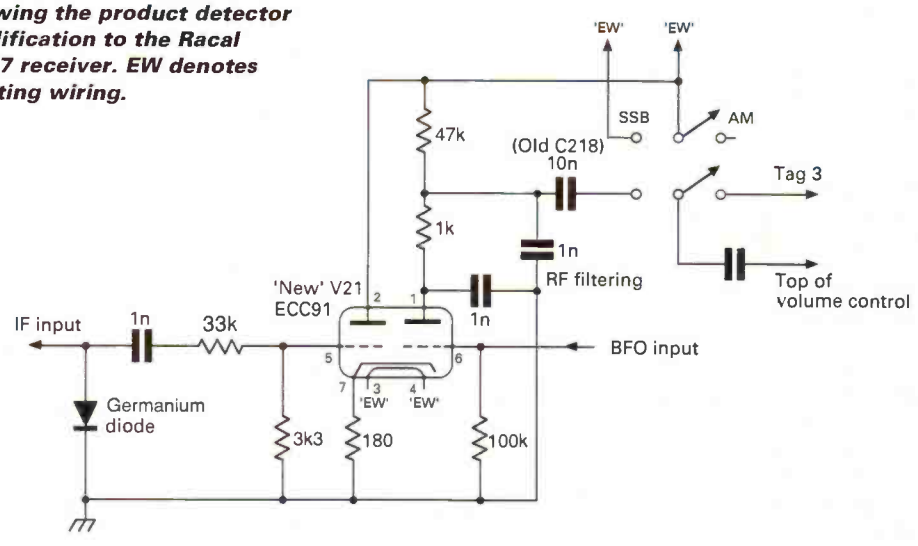


Fig. 1: Circuit diagram showing the product detector modification to the Racal RA17 receiver. EW denotes existing wiring.

Frequency Markers for Valve

The dial calibration on older valved receivers can be most easily checked by the use of a crystal frequency marker. In this article Richard Q Marris G2BZQ explains how to fit one of these useful circuits.

Many short wave listeners have older all-valve h.f communications receivers, many of which are classics giving excellent performance, even when unmodified. They are usually rather large and somewhat heavy; but very reliable and easy to service. Everything is get-atable, and there is usually room to install your own extras and modifications. Replacement valves are low-cost and easily obtainable.

So, one of these receivers, in good condition, is well worth having. They usually suffer from the problem of the odd kilohertz or so of drift during the 15 minute warm-up from initial switch-on. Most have calibrated frequency dials, either amateur bands only or general coverage. Some, such as the National HRO, have calibration tables.

To check, or compensate, for calibration errors, it is advisable to have a frequency marker. A look at the receiver's dial will show that a marker every 100kHz will be the best option, so that a 100kHz crystal calibrator will do the trick, giving harmonics every 100kHz from l.f to lower v.h.f. Furthermore h.f. amateur band edges are a multiple of 100kHz, e.g. 7.000, 14.000MHz, etc.

Various 100kHz crystal calibrator designs can be operated from the receiver's own h.t and heater power supplies. The latter will be 6.3V a.c. (possibly 12.6V a.c) unless it is a cheap and cheerful affair without a mains transformer, in which case it should not be used for this purpose.

Transistorised Crystal Calibrators

Many simple textbook designs exist. They usually need only a few d.c volts and milliamps, obtainable from the receiver's a.c. heater supply using straightforward rectifier and smoothing circuits. The output from the calibrator, should be connected to the receiver's antenna input, through a 10 or 20pF ceramic capacitor. A push-button calibrator ON/OFF switch should be placed in the calibrator supply line, which when depressed will provide harmonics, at 100kHz spacing, every 100kHz up to 30MHz or more.

Valved Crystal Calibrators

The simple, basic, valved 100kHz crystal oscillators shown in **Fig. 1**. A small triode valve is required and half of an ECC80, 81 or 85 double-triode would be ideal. The centre-tapped heaters of these valves can be connected for either 6.3V or 12.6V a.c. The h.t requirement is only a few milliamps and can come from the lowest receiver h.t., which will be 120 - 150V d.c. and often regulated. Do not use the main h.t. line, which will be around 250 - 275V d.c. Often these valved RXs have an auxillary h.t. and 6.3 V a.c. power socket, intended for adding an external pre-amplifier or converter. In that case power connections should be made via this socket. The output of the calibrator should be connected to the receiver's antenna input. A push button switch, S1, labelled Cal ON/OFF, should be fitted as described above. Remember that this switch and all capacitors should be rated for at least 350V d.c. working, for safety reasons.

Ex-military, 100kHz crystals are readily available for as little as £1 each. They are robust and made to high standards, though a trifle bulky. Otherwise new crystals are readily available from a variety of sources.

The Heathkit CL-1 Crystal Calibrator

One of the nicest little valved calibrators was the Heathkit CL-1, which was introduced in the 1960s, for use with the Heath RA1, RG1, and other RXs. It measures 54 x 54 x 84mm and is mounted on an Octal plug which is inserted into a corresponding Octal socket on the RX chassis. A red CAL push-button and CAL ADJ knob appear on the RX front panel.

One of the mysteries of life is that many Heathkit receiver users do not have a CL-1 calibrator. Others may well have a CL-1 but not have a Heath receiver. For these folk the circuit in **Fig. 2,** together with the RX socket connections in **Fig. 3** are offered. From these it should then be possible to either make up a calibrator unit for the Heath receivers or to use the CL-1, if you already have one, with other makes of receiver. Unfortunately, Heathkit equipment is no longer available new, but there must be a lot of it laying around waiting to be put to use.

The circuit shown in **Fig. 2** could be assembled on a piece of circuit board and fitted to an Octal plug. Remember that all components must be suitably rated, i.e. 350V d.c. for safety. Resistors should be at least 0.5W to ensure that they to run cool.

Calibrator Adjustment

Adjust the 50pF preset trimmer, (C1 in Fig. 1, C2 in Fig. 2), to about halfway. With the receiver and calibrator switched

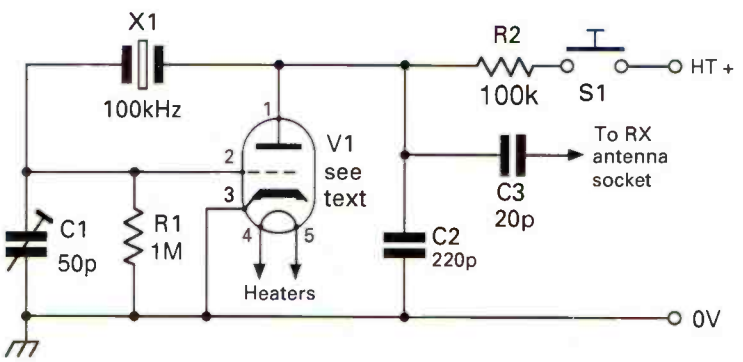


Fig. 1: Simple, basic 100kHz crystal oscillator.

d Communications Receivers

on and up to operating temperature, tune to a standard frequency station, such as WWV on 10.000, 15.000 or 20.000MHz. Zero-beat the signal and adjust the 50pF trimmer on the calibrator for zero beat as well.

If the receiver is amateur bands only, this operation can be achieved by coupling the antenna connector of the receiver to a general coverage RX and using the latter to tune to the standard frequency station.

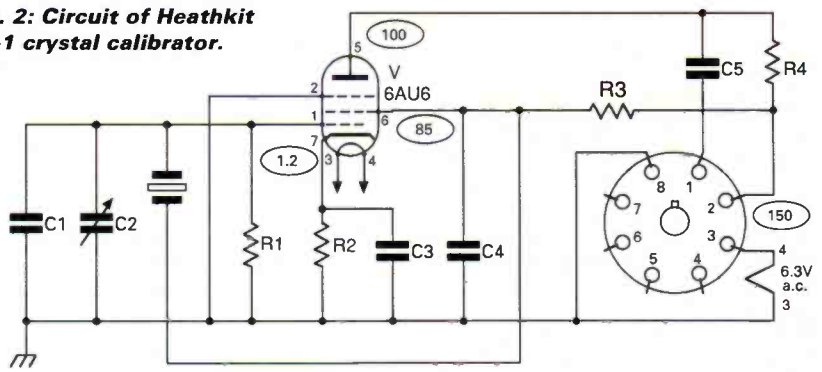
Alternatively, of course, the calibrator can be adjusted to any other frequency standard, if you can get access to one! ■

Sources of crystals

J. Birkett, 25 The Strait, Lincoln LN2 1JF.

Quartzlab Marketing Ltd., PO Box 19, Erith, Kent DA8 1LH.

Fig. 2: Circuit of Heathkit CL-1 crystal calibrator.



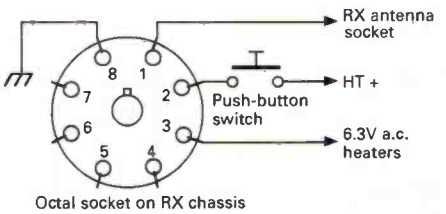


Fig. 3: Octal socket connections.

Abbreviations

a.c.	alternating current
d.c.	direct current
kHz	kilohertz
MHz	megahertz
mm	millimetres
pF	picofarads
RX	receiver
V	volts
W	watts

Continued from page 33

3. With the exception of pins 3 and 4 remove all other wires and connection to the pins, but leave the central 'pillar' connected to the earth tag.

4. Connect a 180Ω 0.25W resistor between pin 7 and the earth tag.

5. Connect a 3.3kΩ 0.125W resistor between pin 5 and the earth tag.

6. Wire a 33kΩ 0.125W resistor and a 1nF 350V ceramic capacitor in series between pin 5 and the pin of the i.f transformer pin from which you removed the yellow wire.

7. Connect a germanium diode between this same i.f transformer pin and ground, with the cathode (red band) to ground.

8. Connect a 300mm length of red wire to pin 2 and neatly route it to the b.f.o. switch Connect it to the centre connection which has already got a wire connected to it, trimming it to the right length, of course. The other section of the switch will be used to switch the audio signal.

9. Connect a 1nF 300V ceramic capacitor between pin 1 and the earth tag.

10. Join a 1kΩ and 47kΩ 0.25W resistor in series, with the shortest possible leads, so that the two resistors are alongside each other. Onto this junction twist one leg of a 1nF 300V ceramic capacitor, again using the shortest possible lead length.

11. Trim the free ends of the 1kΩ and 47kΩ resistors to about 5mm and holding the resistors vertically, solder the 1kΩ to pin 1 and the 47kΩ to pin 2. Ensure that the red wire does not become disconnected from pin 2.

12. Solder the free end of the ceramic capacitor to the central pin of the valve holder (earth).

13. Connect a 10nF capacitor to the junction of these two resistors and the 1nF capacitor. This is the product detector a.f. output signal.

14. Remove the earth braids from tag 2 on the terminal strip on the mainframe and solder them to the earthy end of C182.

15. Remove earth wire from tag 2 and solder tag.

16. Remove C218 from tags 1 and 4 and solder it between the audio output of the product detector (see stage 13) and tag 2. It will be necessary to increase the lead length using insulated connecting wire.

17. Using screened cable, connect the centre tag of the unused side of the b.f.o. switch to tag 1, the top switch contact (that is the one nearest to you while the set is upside down!) to tag 2 and the bottom switch contact (the difficult one to get to) to tag 3.

That completes the product detector modification. When the b.fo. switch is tuned on the power is applied to the product detector and the audio output from the product detector is applied to the volume control. With the b.f.o. turned off the a.m. detector output is switched to the volume control.

With the product detector selected, s.s.b. can be tuned in with ease without having to resort to the r.f. gain pot, and the b.f.o. no longer overloads the a.v.c. circuit.

A few hours work at most transforms this set into one that is a delight to operate on the amateur bands. ■

The 2-volt Valves

of the Twenties and Thirties

Many enthusiasts are taking and increasing interest in the older Wireless Receivers. Some are restoring old 1920/1930s RXs found in Granny's attic. Others are scavaging parts together to build replicas from the golden era of wireless. Richard Q Marris G2BZQ looks at the 2-volt valves from the 20s and 30s.

There were designs by such authors as F. J. Camm, the long reigning Editor of *Practical Wireless* and writer of many books. Then there was Scott-Taggart and his ST series designs that appeared in *Wireless Constructor*, *Popular Wireless* and *Wireless World* as well as other magazine designs. To this must be added the many kits, and designs, from such firms as Lissen, Cossor, Mullard, Telsen and Eddystone - the latter two published their own magazines full of designs.

Most of the above used the British 4-pin 2V valves, which were directly heated with an accumulator and a 120V h.t battery (with voltage taps) plus a 9V Grid Bias battery. There were also 4 and 6V valves using the same valve bases. The 4-pin 2V valve (which sometimes has a fifth pin and/or top-cap) used the simplest possible pin/interconnection configuration, meaning that one did not have to look up the valve connections. The most usual are shown in **Fig.1**. All these valves used a large glass envelope cemented into a moulded, pinned base. Those with the anode connection at the valve top either had a screw terminal or plated brass cap onto which a spring clip was pushed to make connection.

These valves should be handled with care, as the glass envelope can come loose in the moulded valve base. The top cap also works loose. Both can be carefully refixed with adhesive.

There is a right and wrong way of pulling these valves out of the valve holders (**Fig. 2**)

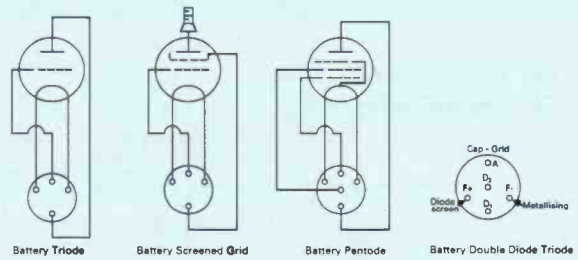


Fig. 1: Connections for 4-pin, 2V, battery valves. Taken from* Radio Receiver Servicing *by E.G.J. Lewis 1945.

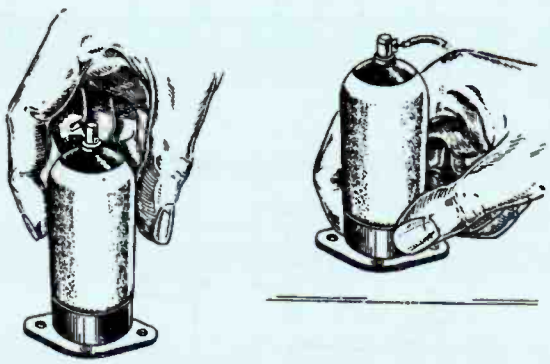


Fig. 2: The wrong way to remove a valve is shown on the left. The correct way, by gripping the valve's base, is shown in the right. Taken from* Everyman's Wireless Book *by F.J. Camm.

Pulling the valve out of the valve holder by the glass is wrong. Pulling it out by the moulded base is correct.

Many enthusiasts when finding an old 1920/30s wireless (they did not call them radios then!) are mystified by the array of leads terminating in various coloured Wander plugs. **Table 1** shows the various Wander plug colours to tap the necessary h.t and grid bias from the dry batteries. Low tension positive is shown as pink, but was, as far as can be remembered, only rarely used when taking the l.t. from a dry battery. With the usual RX, using 2V valves, the l.t. negative leads terminated in a black spade terminal and the l.t. positive in red. The spade terminals being inserted under the screw terminals on the accumulator.

It should be noted that Wireless RXs of America and other countries usually had different Wander plug colour schemes. **Table 2** shows the US colour coding.

In conclusion it may be of interest that these 2V RX valves were used for purposes for which they had not been designed.

Some enthusiasts removed moulded valve base by unsoldering the wires to the pins and softening the cement. The resultant glass envelope with wire connections only were then wired into simple 5m and similar circuits.

Amateurs used the valves in QRP transmitters. The writer was given a box of l.f. triodes, mostly Mullard PM2 or similar. A small portable cum QRP TX was built for 40m c.w., powered by a 2V accumulator and a 120V h.t battery. This produced 2 or 3W in a crystal oscillator, keyed, one-valve **TX**. It was then decided to try QRO and 200V was applied to the valve anode.

Spectacular

The results were interesting and spectacular. The interior glowed (with key down) an angry dull red. Some valves lasted for a few months and others packed up right away under this treatment. When keying the TX an eye was kept on the abused valve and when the interior started turning a spectacular mauvish/white, the valve was whipped out and replaced, mid-QSO, with a few seconds pause. Try that with a modern transistorised TX! ■

Table 1. Wander Plugs

Highest positive h.t.	Red
2nd highest postive h.t	Yellow
3rd highest positive h.t.	Green
4th highest positive h.t.	Blue
l.t. positive	Pink
Common negative and g.b. positive	Black
Max g.b. negative	Brown
2nd g.b. negative	Grey
3rd g.b. negative	White
Any additional lead	Violet
Any centre tap	White

Table 2. American Battery Connections

Highest positive h.t. (+*B*max)	Red
2nd highest postive h.t (+*B* int.)	Maroon & Red
3rd highest positive h.t.(+*B* det.)	Maroon
Negative h.t. (-*B*)	Black + Red tracer
Positive l.t. (+*A*)	Yellow
Negative l.t. (-*A*)	Black + Yellow tracer
Positive g.b. (+*C*)	Green
Max negative g.b. (-*C* max.)	Black + Green tracer
2nd negative g.b. ((-*C* low)	Black & Green
High potential loudspeaker lead	Brown
Low potential loudspeaker lead	Black + Brown tracer

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R1.....100kHz-1300MHz AM/FM.....**£349.**
AR3000A..100kHz-2036MHz All-mode.....**£765.**
AR1500.....500kHz-1399MHz All-mode.....**£279.**
AR2000.....500kHz-1300MHz AM/FM.....**£269.**
MVT7000..8MHz-1300MHz AM/FM .....**£289.**
MVT8000..8MHz-1300MHz AM/FM .....**£299.**
DJX1.....500kHz-1300MHz AM/FM.....**£249.**

HF Receivers:

R5000.....100kHz-30MHz All-mode (VHF OPT) .....**£925.**
R71.....100kHz-30MHz All-mode (FM OPT).....**£875.**
R72.....30kHz-30MHz All-mode (FM OPT).....**£659.**
R2000.....150kHz-30MHz All-mode (VHF OPT) .....**£549.**
HF225 .....30kHz-30MHz All-mode (FM OPT).....**£429.**
HF150 .....30kHz-30MHz All-mode .....**£329.**

VHF/UHF Receivers:

R7100.....25MHz-2GHz All-mode .....**£1120.**
FRG9600...60MHz-905MHz All-mode .....**£520.**

Airband Receivers:

R535.....Signal airband receiver .....**£269.**
WIN108.....108MHz-142.1MHz AM.....**£149.**
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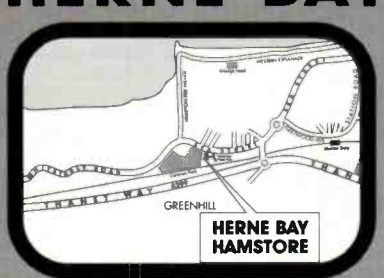

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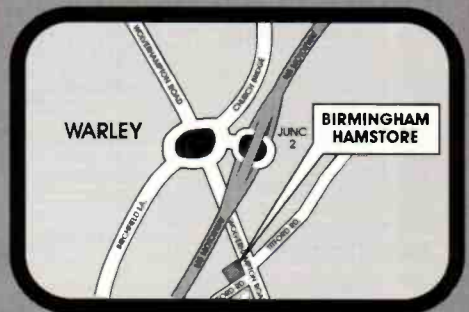

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The Mk 123 Spyset

World War II changed the world of espionage in a flash. Carrier pigeon and courier ceased to be the mainstay of clandestine communications and high frequency radio became the backbone of covert contact with operational units behind enemy lines. June Stirrat traces the history of the Mk 123 Spy Set.

Danish sources state that, in all, about 50 operators were active in Denmark during World War II. One clandestine station of particular importance was the 'Transit Station' which relayed messsages between London and the Polish Resistance. Some of the radio traffic sent was crucial to the survival of the Resistance and ultimately devastating to the Gestapo. Danish Resistance called for urgent assistance from the Allies on several occasions when their networks ran the risk of being overrun by the Gestapo.

The most spectacular Allied action was a bombing raid on 21 March 1945, when 18 Mosquito bombers and 24 Mustang fighters flew low across Denmark from the west, reached Copenhagen before the alert was sounded and then completely destroyed their target, the Danish Gestapo General Headquarters, in an absolute inferno. None of these operations could have been mobilised without clandestine radio contact.

In a remarkable way, all the technical ingredients required for radio espionage had come together just in time to meet the demands of World War II. The high frequency part of the radio spectrum had been discovered and its nature was, by then, well explored.

A range of reliable thermonic valves, passive components and circuits had been developed. The superheterodyne receiver was well researched and stable crystal oscillators were well understood. Everything of importance was ready to get underway.

Wartime spysets bore a remarkable resemblence to portable amateur equipment of the pre-war age and had little in common with other military equipment. A simple receiver tuned between roughly 3 and 15MHz with a simple crystal controlled c.w. transmitter covering the same range. These, together with a power supply, were built into a single box that also held a Morse key, headphones, antenna wire and possibly a spare, loaded revolver.

The use of Morse code was as absolute must. The only other option would have been a.m. voice transmission and this would have presented size problems and been much less effective in the field.

Ghost-like Existence

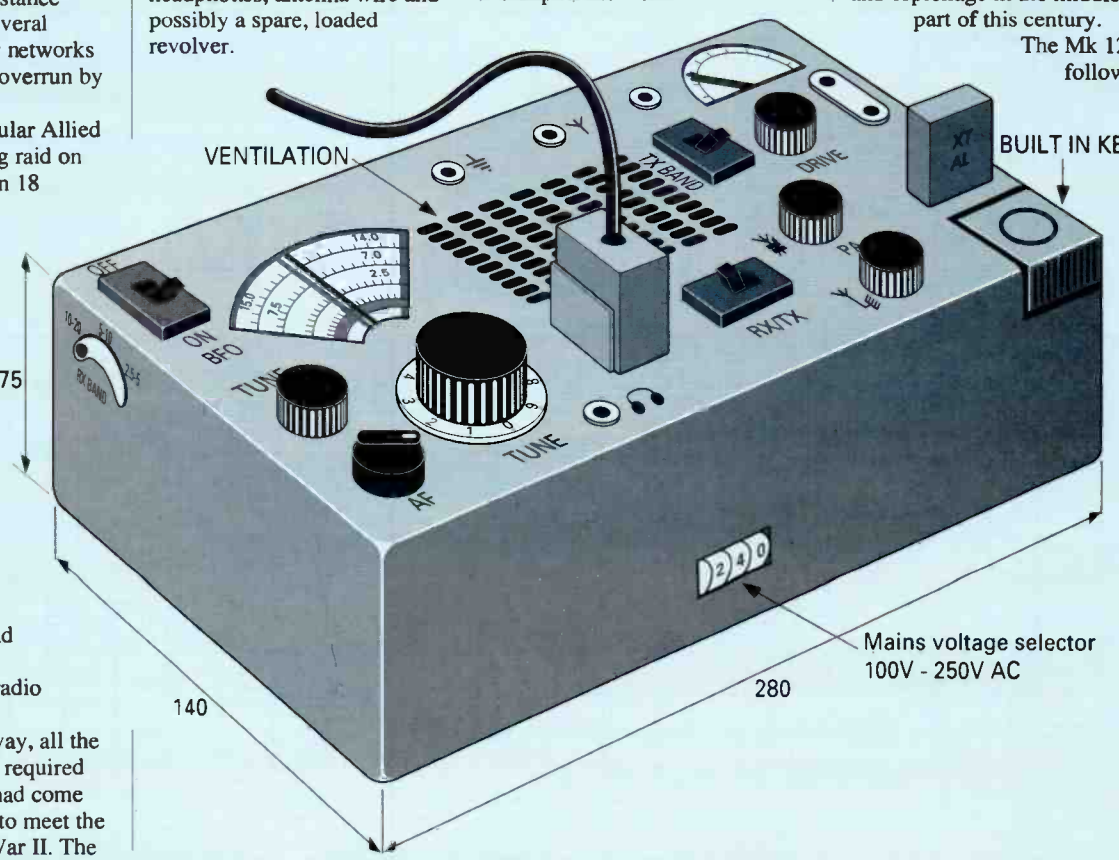
The best-known wartime spyset is the B2 'Polish Suitcase' radio. However bulky, heavy suitcase-size radios, built into wooden boxes did not serve the best interests of espionage in the field. For such a ghost-like existence, something much smaller was required. A set which would fit into a briefcase or shopping basket. Something which could be moved from place to place with a measure of civilian innocence and concealed with relative ease.

This was no easy task because valves and other components were large. Compact equipment called for considerable constructional skill and once made, sets were difficult to repair because components were hard to get to.

A Danish engineer overcame these difficulties and constructed a miniature set called 'The Telephone Directory', so named because of its size and shape. This was a style which was to be followed when World War II came to an end and emergency production pressure ceased. Careful design work continued behind the scenes on a miniature, off-the-shelf, super spyset to fill the role of the B2.

The beautifully engineered Mk 123 set resulted. Its simple, but effective, valve circuits have long been obsolete, but its top-grade construction remains an everlasting monument to both egineering product design and espionage in the middle part of this century.

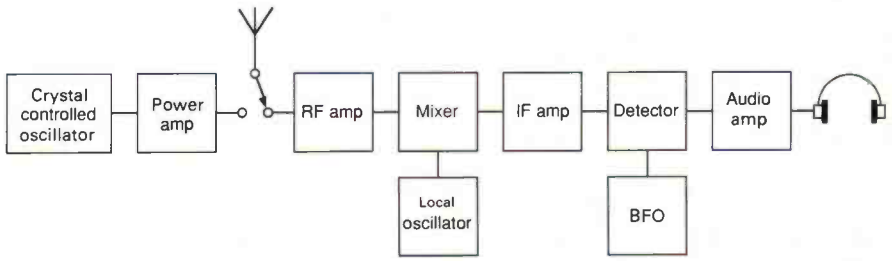
The Mk 123 follows



the standard style of early spysets. The receiver tunes 2.5 - 5MHz, 5 - 10MHz, 10 - 20MHz and resolves c.w. signals with b.f.o. There are seven subminiature valves in the single conversion superhet circuit which uses an i.f. of 465kHz. Receiver tuning is exceptional for a valved set of this size, with a reduction ratio of 1:40 through a set of miniature gears that are fingertip sensitive and free from backlash. As is always the case with a set of this type, the dial is open and easy to tune at the l.f. end of each band and cramped and difficult to set at the h.f. end. This means the set can be retuned to within about 1kHz at 3MHz while it is difficult to reset the dial within 100kHz at 19MHz.

The receiver was designed for a.m./c.w. reception on bands a lot less crowded than they are today. Even so, it can still give a good account of itself on the c.w. segments of 80, 40, and 20m, as well as being very useful for broadcast listening. However the absence of an r.f. gain control makes s.s.b. reception difficult, although not impossible.

There is no 'net' facility. This suggests that the set was designed for split frequency working, possibly back to a high-powered base station. Although designed for headphones, there is enough a.f. output to drive a small speaker.



Block Diagram of the Mk 123 Spyset.

The transmitter consists of two stages. A crystal controlled oscillator/doubler, followed by a power amplifier. The oscillator is an electron-coupled Colpitts circuit and the 5A/163K pentode will double the crystal frequency when required. The oscillator output voltage is then amplified by a 5B/251M p.a. valve.

Signals are sent by keying the oscillator. When the key is depressed, bias is reduced and the oscillator comes into action. This keying method will only cope with hand-sent Morse up to a rate of 40 w.p.m. This means that high-speed keyers could not be used to reduce 'on air time' in a hostile environment.

Although an external Morse key can be plugged int the set, a delightful, precision, miniature Morse key is built into one corner of the transmitter module. However an expediency antenna and a poor earth connection cause 'hot spots' on the metalwork, so painful r.f. finger burns can be an occupational hazard using this built in key. Break-in keying is not provided and RX/TX switchover is by means of a simple, hand-operated, wafer switch on the top of the set.

The 123 set was designed for occasional and emergency use. The RX/TX switch contacts carry several hundred volts and will burn out if the set is put into the round clock use for any length of time.

Power Supply

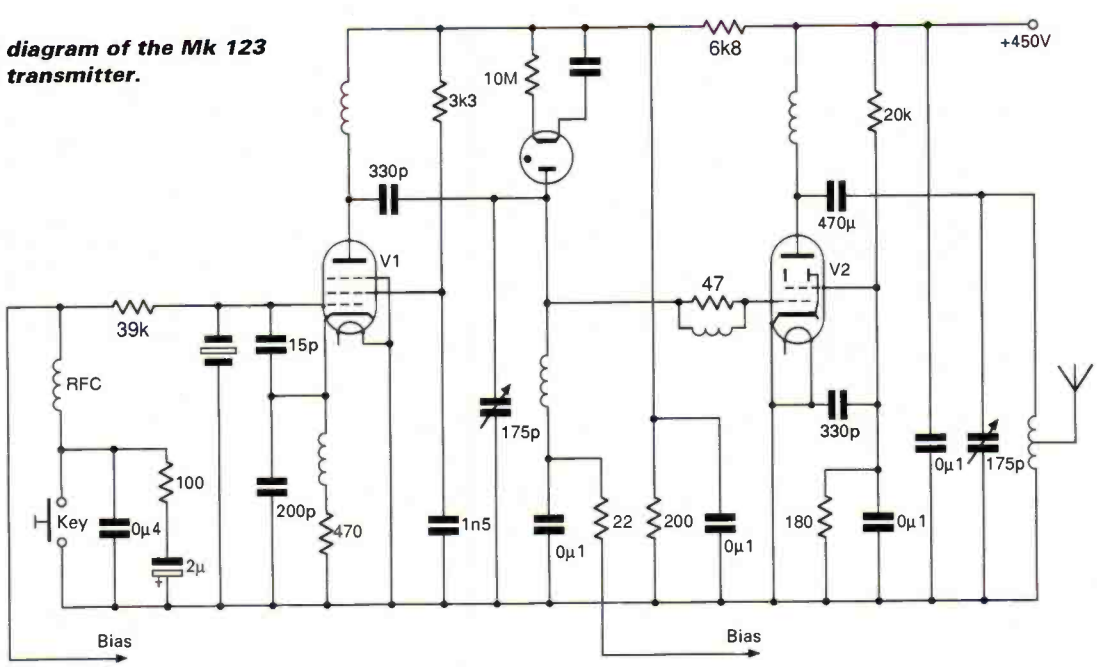
The mains power supply unit accounts for one third of the set's size and almost all of its weight. It is reasonably safe to say that the weight of the power supply module was one factor which set the r.f. power output upper limit at 25W. The other factor was the mains power or battery supply likely to be available in the theatre of operation.

The MK 123 set draws about 33W from the power source when in receive mode and this rises to 90W when the transmitter is keyed.

Before the consumer revolution of the fifties, there were few electrical appliances in the average European home and little need for power circuits to be provided. Domestic lighting circuits often only supplied 100-200W of mains power to each house or apartment - enough for a couple of light bulbs and a domestic radio.

Spysets were often plugged into a light fitting and the Mk 123 came with an adaptor for

Circuit diagram of the Mk 123 Spyset transmitter.



this purpose. To be on the safe side, the clandestine operator of old would not have wanted to draw more power from the mains supply than the room in use would normally require for its lighting. To do otherwise was to risk blowing a fuse in the mains supply.

Operating from a lighting circuit had another disadvantage. Everytime the keywas depressed, a surge current was drawn from the mains and this would cause a voltage drop along the whole line. When the key was released, the line voltage would return to normal again.

Flickering Lights

This meant that the domestic lighting in adjacent rooms would flicker in tandem with the Morse transmission. At best, this would place civilian nerves on edge, at worst it would betray the stations existence to an enemy agent or informer.

If no lighting circuit was available, or if lighting flicker was likely to cause problems, the spyset could be operated from a car battery using a voltage invertor.

The average car battery will power a spyset for a couple of hours if it is reasonably charged. Charging a car battery was something of a problem for early clandestine operators. It involved either knowing a friendly garage, running a car engine and using scarce petrol to turn a dynamo, or turning a dynamo over by hand.

A hand generator was supplied with the Mk 123, where a spare pair of hands could be found to turn it. The set runs at about the upper limit for hand-generated power.

Thought and Care

Considerable thought and care went into the way in which the Mk 123 set was put together. The RX, TX and p.s.u. are each constructed as seperate modules, each exactly the same size. The modules are mounted, side by side, on a single base plate with the RX on the left, the TX on the right and the heavy p.s.u. in the middle to balance the weight in a natural way.

A set which rocked slightly on an uneven table top would have been irritating to use with the built-in key. To solve this minor problem before it arose, the base plate was made with three metal feet to give the set a firm triangular balance on any operating surface.

Neat Construction

All of the controls and sockets are mounted on the modules themselves and the five-sided case cover, which fits over the top of the set, is cut, puched and stamped to present them to the operator. The metalwork is well finished and this, together with the neat construction, gives the set a professional appearance.

With the exception of the mains voltage selection thumb wheels and the receiver bandswitch lever, all of the controls and sockets are mounted on the flat, top panel of the set. It is operated by leaning over it. The Mk 123 is very convenient to operate, for the right handed telegraphist at least, and todays QRP constructors may find it worthwhile to consider this style of layout.

Random antenna wires and poor earthing arrangements can easily cause the p.a. valve to overheat and burn out. To protect the set from this, in a very simple and direct way, a rubber sleeve is fitted over the p.a. valve.If the valve starts to overheat, the rubber sleeve will melt, smoke and burn, thus ensuring that the operator switches off the set immediately out of instinct.

Novelty Station

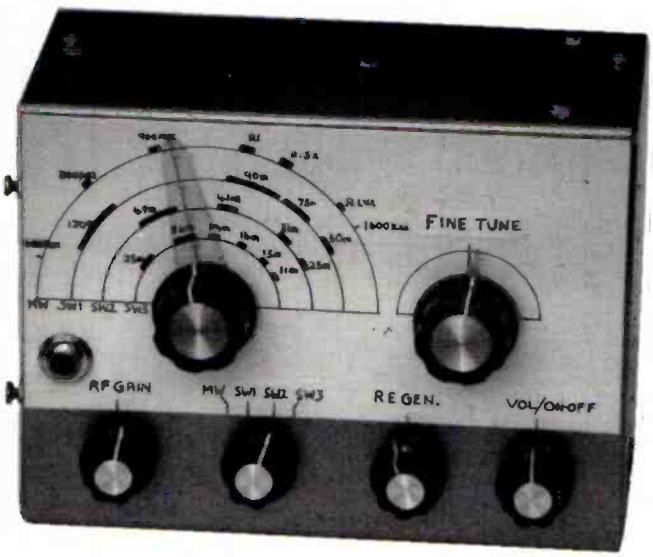
So long as the museums and collectors have their share, this set remains of interest to the operating amateur as a novelty or portable station. Crystal control and cramped receiver tuning is a drawback, but the greatest drawback is the lack of break-in keying.

There is no room for a modification of this sort inside the set as it stands and the p.s.u. module would have to be removed and rebuilt as a more open unit with extra circuits and switching. ■

Abbreviations

a.m.	amplitude modulation
b.f.o.	beat frequency oscillator
c.w.	continuous wave (Morse)
h.f.	high frequency
kHz	kilohertz
l.f.	low frequency
m	metres
MHz	megahertz
p.a.	power amplifier
p.s.u.	power supply unit
QRP	low power operation
r.f.	radio frequency
RX	receiver
s.s.b.	single side band
TX	transmitter
W	watts
w.p.m.	words per minute

A Simple Three-Valve Short Wave Receiver Part 1



Although the O-V-O receiver works extremely well it has, as would be expected with such a simple design, some limitations, these mainly relating to the rather low level of volume available on weak stations.

With only a modest increase in complexity and cost this limitation can be successfully overcome with some additional benefits thrown in as well. Amongst these are: better selectivity, smoother 'reaction' (regeneration) and much less sensitivity to the effect that the antenna has on regeneration and tuning settings. This produces a receiver which is rather more satisfactory to use and a little less of a novelty, therefore doing a little better justice to the simple valved t.r.f. circuits that were used in the past. It can, in no way of course, seriously rival the results obtainable from a complex modern receiver, but it is often not appreciated that a well designed t.r.f. can approach the performance of a simple superhet provided it is adjusted carefully.

Practical Advantage

One of the main disadvantages of the t.r.f. is that it is somewhat fiddly to operate. Nevertheless, there are some real practical advantages that a basic receiver of this type can offer over a more sophisticated one. Among them are: excellent signal to noise ratio, which helps offset the effect of poorer sensitivity, together with freedom from the noise and spurious signals that complex receivers can be plagued by. Also, from the constructor's point of view, in particular a beginner to electronics, the relative simplicity of the circuitry makes it easier to build and comprehend. Additionally, the completed receiver will require no alignment. With a correctly working receiver in skilled hands excellent results can be obtained. There is also a considerable satisfaction upon tuning in to a signal,in 'tweaking', through judicious adjustment of r.f. gain, regeneration, etc., for optimum results. Finally,at least in the author's opinion, the added bonus of the cosy glow of a valve makes the reception of radio waves all the more magical!

A Small Admission

Anyone reading the above introduction to this project could be forgiven for thinking that the writer is an 'old timer' wallowing in the memories of a bygone era, when circuits were circuits (man-sized) and men were men.

Guilt shames me into admitting that, in this particular case, the man was firmly a mouse.In the early 60s when I started my career in electronics I thought the circuits of the day were big,ugly and onerous.

Also, I vehemently detested the valves themselves. To me, a well seasoned coward by nature, the word valve was synonymous with the fear. The high voltages, heat and general huff and puff associated with them and their circuitry was a never ending cause of anxiety for me in my day-to-day work as a service engineer. Fortunately, the overwhelmingly strong lure of electronics as a whole saw me through these earlier years until, mercifully, the 'aggressive' valve increasingly gave way to the infinitely more petite and docile transistor.

I did not mourn the passing of the valve. Since my earliest dabblings in electronics my first love has always been radio and throughout the years I've designed, built or collected many types of radio ranging from simple t.r.f. types - transistorised of course! - to all-singing, all-dancing, digitally synthesised multibanders, scanners, etc., all of which, I hasten to add, have given me immense pleasure. Some of the home-constructed receivers were built from designs found in early radio magazines. With these simple circuits I seemed, subconciously, to be trying to recapture the wonderment and excitement I had felt as a youngster, when first introduced to the hobby of radio, through the acquisition of a crystal set - this having been hard bargained for and eventually secured by the 'swap' of a well used 'electric' motor.

Needless to say the valved circuits in these early magazines were ignored. Then the constructional article by Ron Pearce appeared in *SWM* and finding myself tiring a little of the endless permutations of transistor and i.c. designs I decided to have a go. After all, the construction of a circuit with a 50V d.c. power supply hardly requires death defying courage, does it? The rest, as they say, is history. When built, this little valve circuit immediately evoked the original, long-lost thrill of 'wireless' reception. I now have a large, and much gloated over, 'valve box', which regularly receives new and increasingly diverse occupants and posesses an ever increasing number of home-made valved radios in various stages of 'development'. The question now frequently asked is: why do you take your valves out of their boxes and polish them

It is an undeniable fact that simple valved radios belong firmly to the past and are now part of radio history. The reason for this excursion by Brian Adkinson into nostalgia is that a number of readers showed an interest in the one-valve radio used by Ron Pearce, details of which were published in the September '90 issue of *Short Wave Magazine*.

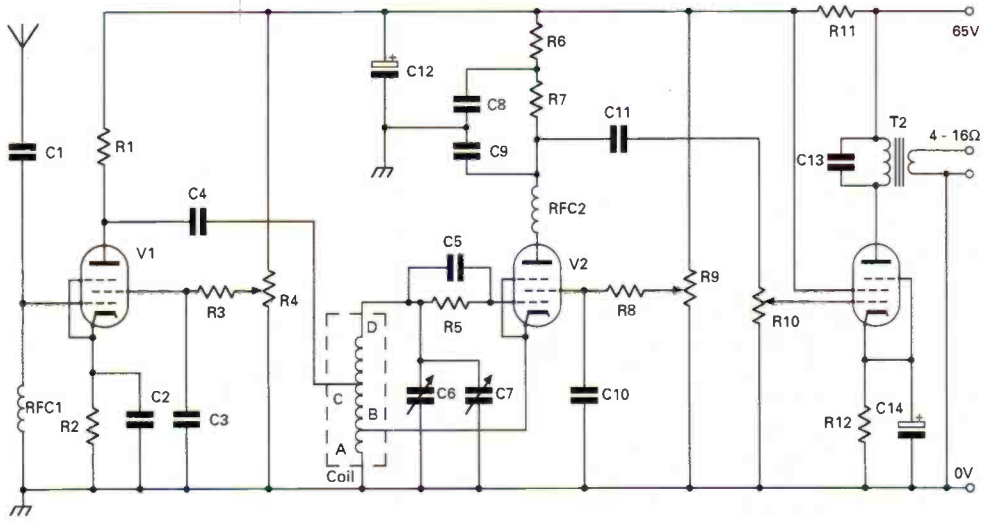


Fig. 1.1: The circuit diagram of the simple three-valve receiver.

once a week? Because it makes them work better dear...

It has taken me nearly 30 years to finally appreciate the virtues of the valve and it is no small irony that this particular article should have been written by this particular author!

The Circuit

One of the things I like most about valves is the diversity of types available for the constructor experiment with.

Unlike transistors there is rather more choice than just "Silver or black? Three legs or four, Sir?" This is an oversimplification, of course, but basically true. I think. valves had a much longer period of evolution, during which time all sorts of designs and styles emerged.

For example, valves suitable for experimentation in radio receivers can range from tiny 'hearing aid' types, barely 25mm long and the diameter of a pencil with a heater of 0.6V at 10mA, to large Octal based types with heaters of 117V at 90mA (over 10W being dissipated just for the heater!). The latter valve being American and designed to run directly off the American mains supply. Of course, there are the many 'multiple' valves that appeared, containing, effectively, two or three valves in one envelope.

For this particular project I decided to chose another 'Acorn' valve, this time the 954, a pentode version of the 955 that was used in Ron Pearce's 'O-V-O'. The addition of a suppressor and screen grid on the 954 require that there are a further two connection points, in addition to the original five. These are accomodated at the top and bottom of the glass envelope making the valve resemble a small glass Sputnik! The 954 is, nevertheless,well suited to a receiver of this type, being readily available, inexpensive and having a good performance at low anode voltages. This design does not pretend to give the best performance that can be obtained from a t.r.f. but, with just three valves and a handful of other components, it can still give a creditable account of itself. The additional circuitry that provides the improvement in performance in this radio is an untuned r.f. amplifier and audio amplifier stage.

Referring to the main circuit diagram (**Fig. 1.1**) it will be noted that V2 performs the function of regenerative detector as in the original one-valve receiver, although the method used to obtain regeneration is slighty different, to allow for the use of a simpler coil design. Frequency coverage is approximately 600kHz to 32MHz in four switched bands. Switched coils were chosen in preference to plug-in types because they are easier to make, there being no necessity to procure or produce a coil former with a 'plug' base. Also, there is the obvious advantage of convenience when changing wavebands. As there is only one coil being switched into circuit at any one time the switch itself and associated wiring can be quite simple. The addition of V1 provides some amplification of the signal prior to the detector stage, which is untuned and hence wideband. A tuned r.f. stage would have given greater gain, but was rejected for two reasons. First, it would have added considerably to the complexity of the circuit, requiring an additional set of matched coils to be wound with the attendant switching for them and it would also have greatly increased the risk of instability, due to the close proximity of the two resonant circuits, unless very careful attention had been paid to screening between them.

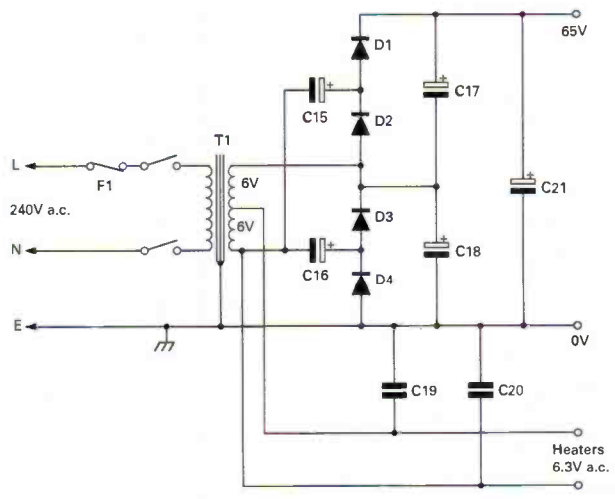


Fig. 1.2: The circuit of the power supply.

Continued over

Inherent Stability

An untuned r.f. stage delivers a smaller, but still worthwhile, amount of gain and has the advantage of inherent stability whilst still retaining the benefits of isolation of the antenna from the tuned circuit. This isolation completely removes the effect of antenna capacitance on the tuned circuit which can so easily disturb critical tuning and regeneration settings. Only a small movement of the antenna or lead-in wire is sufficient to upset carefully set adjustments. A further advantage of this isolation is the prevention of oscillations from the detector stage being coupled back to the antenna and effectivly turning the radio in to a transmitter, should the regeneration be advanced excessively.

The final valve V3 is simply an audio amplifier stage that allows enough volume to be delivered to the headphones to necessitate the inclusion of a volume control. In fact, a loudspeaker can be used, if desired and the details will be included for those who wish to do so. It must be emphasised that the audio power available for this is less than 100mW and although it won't exactly blow your socks off, it can be quite usable under quiet, ambient conditions on weak signals and surprisingly loud on stronger ones. The audio quality is very good due to the relatively wide bandwidth of this type of receiver. Naturally, the selectivity suffers as a result, but it can, to a considerable extent, be controlled by the use of the regeneration and r.f. gain controls.

Improving Selectivity

Looking at the circuit in a little more detail it will be seen that antenna signals are coupled to the control grid of V1 via C1. Potentiometer R4 is the r.f. gain control and varies the gain of V1 by altering its screen grid potential. The now amplified signal is coupled to the 'Antenna' tap (C) on the coil. Coupling the signal in to a tap part way down the winding helps improve selectivity, albeit with a small reduction in coupling effiency. For clarity, only one coil is shown on the main circuit diagram, the coils normally being switched to points B, C and D via switch S1.

The complete 3-valve receiver with optional add-on loudspeaker unit.

The complete winding of the coil, combined with variable capacitors C6 and C7, form the tuned circuit. Variable capacitor C6 is the main tuning capacitor and C7 gives 'fine tuning'. Valve V2 serves the dual role of detector and amplifier with the r.f. signal being coupled to its control grid via C5.

The positive feedback, necessary for regeneration to occur, is supplied by the cathode of V2 and fed back into the tuning coil through tap B. The regeneration control R9 alters the gain of V2 in a similar manner to that achieved in the preceeding r.f. stage. The adjustment of this control fulfills the requirement of bringing V2 just to the point of oscillation where sensitivity and selectivity are at their greatest.

Under these conditions V2 acts as a *Q*-Multiplier, thereby greatly enhancing the otherwise broad selectivity obtained from the tuned circuit. The now considerably amplified and demodulated signal is coupled via C1 to the volume control. V3 is configured as a conventional audio 'power amplifier' stage. Capacitor C13 is a classic valve circuit 'tone correction' capacitor. The value chosen here gives plenty of 'top', which I prefer, but can be increased in value to suit personal preferences.

Power Supply

The power supply section (**Fig. 2**) is a straightforward voltage multiplier arrangement, generating some 65V h.t. (80V off load) plus the 6V required by the valve heaters. These supplies have been conveniently derived from a standard low voltage transformer.

Incidentally, this type of power supply can form the basis of a unit to operate other low power valved circuits, the original type of 'valve' h.t./l.t. transformers being rather hard to come by now. ■

YOU WILL NEED

Resistors

Carbon film 0.25W 5%

470Ω	1	R2
1.8kΩ	1	R12
4.7kΩ	1	R11
10kΩ	1	R8
15kΩ	1	R6
22kΩ	1	R1
33kΩ	1	R7
100kΩ	1	R3
1MΩ	1	R5

Potentiometers

100kΩ (lin)	1	R9
1MΩ (log)	1	R10 (with d.p.d.t. switch S1)
1MΩ (lin)	1	R4

Capacitors

Plate ceramic

47pF	2	C4,9
100pF	2	C1,5
2.2nF	1	C13

Polyester

10nF	1	C11
22nF	3	C2,19,20
47nF	2	C3,6
220nF	1	C8

Electrolytic

4.7µF (100V)	1	C12
22µF (100V)	5	C15,16,17,18,21
22µF (25V)	1	C14

Variable

15pF	1	C7*
200+200pF	1	C6*

Semiconductors

Diodes

1N4004	4	D1,2,3,4

Valves

954	3	V1,2,3 ***

Miscellaneous

RF Choke 4.7mH Maplin UK80B (2),RFC1,2**; Transformer 6-0-6V @ 500mA (1) T1**; Transformer 3-0-3V @ 100mA (1) T2**; 3p.4w. rotary switch (1) S2; Tagboard Maplin FL11M**; Knobs, case, wire, etc. to be detailed in text.

*** J.Birkett, 25 The Strait, Lincoln LN2 1JF**
**** Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR.**
***** Colomor (Electronics) Ltd, 170 Goldhawk Road, London W12 8HN.**
***** RST Valve Mail Order Co., 1 Mayo Road, Croydon CR0 2QP.**

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propagation

by Ron Ham
Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Congratulations to one of my regular 28MHz beacon reporters, **Gordon Foote** (Didcot) on passing the Radio Amateurs Examination with flying colours. He is grateful to the course instructors Dave Aram G8DVK, Colin Desborough G3NNG and Dr Neill Taylor G4HLX for all their help and for the way in which they communicated their particular subjects to the students. Motor-cycles also rank high among Gordon's interests, his enthusiasm for the subject and his engineering ability can be seen in **Fig. 1** where he sits proudly astride the recently renovated 1961 BSA B40.

Solar

"The monthly mean for June 1992 was 117 solar flux units," wrote **Neil Clarke** (Doncaster) who added that the month began with 99 s.f.u. reached a peak of 130 on the 17th, fell back to 108 on the 28th and then rose sharply to 123 units by the end.

In July, **Patrick Moore** (Selsey) followed the progress of a sunspot chain which crossed the sun's disc between the 9th and 16th. His projected drawing, made at 0830 on the 10th, can be seen in **Fig. 2**. Joan and I saw these spots being projected when we visited the Trundle Observatory, near Chichester around 1430 on the 12th. This observatory, formerly a military wireless station on an iron-age hill-fort, is run by the Chichester based South Downs Astronomical Society. Our visit coincided with their Open Day, when several Society members were available to demonstrate the variety of equipment on display. Joan is on the left of **Fig. 3** with Dick Barton (News Letter Editor) (centre) and Dr. John Mason (President of the British Astronomical Association) while the solar projection telescope was being adjusted. Note the box and screen, by Dick's hand, below the eye-piece. Briefly, the suns image and any spots appear on the screen. The latter is a piece of copy paper that rests snugly at the base of the projection box.

	June					July																				
Beacon	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
DF0AAB		X						X	X	X	X	X	X	X							X				X		X		X	
DK0TEN								X	X	X	X			X		X	X							X	X	X			X	
DL0IGI		X	X	X			X	X		X	X			X		X					X	X	X	X	X	X		X	X
EA3JA											X	X	X	X						X						X	X	X	X	X
HG5GEW		X	X																											
IY4M		X	X	X			X	X	X	X	X	X	X	X			X			X	X	X			X			X	X	X
LA5TEN	X	X	X					X	X	X	X	X	X	X	X						X				X					X
LU1FHH																										X		X		
OD5TEN															X		X		X		X				X	X				
OK0EG		X					X	X	X	X	X			X	X	X	X		X	X	X	X	X	X	X	X	X		X	X
OH2TEN	X	X	X				X	X	X	X	X	X	X	X	X		X	X	X		X	X	X		X	X	X	X		X	
PT7BCN	X	X													X	X	X														
PY2AMI	X	X	X												X	X			X							X		X			
SK2TEN																					X	X			X	X	X			X	
SK5TEN		X	X					X	X	X	X	X	X	X					X		X	X	X		X	X	X			X	
YO2X										X														X							
Z21ANB						X			X					X		X	X	X	X	X	X			X		X		X			
5B4CY	X		X			X	X	X	X	X	X	X	X	X	X	X			X		X	X			X	X		X		X	

Fig. 4.

Fig. 3.

Fig. 1.

Ford White (Portland) also sent drawings of this chain as he observed it at 1737 on the 11th and 1445 on the 12th. **Ted Waring** (Bristol) counted 44 sunspots on the 2nd and 7 on the 21st. **Fred Pallant** (Storrington) reports 'very high background noise on 28MHz' on the 11th and 19th and a 'pronounced echo' on the signal from the Spanish beacon, EA3JA, around 1800 on the 24th.

Propagation Beacons

Firstly, my thanks to Gordon Foote, **Cmdr Henry Hatfield** (Sevenoaks), **Ted Owen** (Maldon), Fred Pallant, **Ern Warwick** (Plymouth) and Ford White for their 28MHz beacon logs from which I prepared our monthly chart, **Fig. 4**. A new beacon this time in Tripoli, OD5TEN, on 28.180MHz was heard on the days shown by Fred Pallant, Ern Warwick and Ford White and another, SK2TEN on 28.294MHz, was copied by Ted Owen and Fred Pallant.

Fred found the band almost dead throughout the day on June 30 and the mornings of July 4 and 11. Gordon Foote and Ern Warwick reminded me that auroral, solar and magnetic information is frequently being transmitted by the German beacon DK0WCY on 10.144MHz.

Sporadic-E

"15 days of [Sporadic-E] activity in July as compared to 16 in June", wrote **Richard Gosnell** (Swindon). Among the stations he logged during his propagation studies, were amateurs from Finland and Norway and beacons from Scotland (GB3RMK) and Portugal (CT0WW) on the 50MHz band on the 5th and 18th respectively He also logged 27MHz CB traffic from Scotland on the 18th, East European broadcast stations, between 68 and 73MHz, on the 3rd, 7th, 22nd and 25th and Scandinavian stations around 87.6MHz on the 5th.

Tropospheric

During the tropospheric opening on July 6, **George Garden** (Edinburgh), using his DX gear at his father's home in Laurencekirk, was surprised to receive strong signals from Denmark in Band II. That's because, said George, "we are low down and a hill screens us from the coast". He added, that reception was steady in the morning but fading in the afternoon and reports that as the signal faded on 99MHz, it came up very strong on another spot higher up the band and visa versa. Other related information and a chart showing the daily changes in atmospheric pressure, covering the period June 26 to July 25, can be seen in my DXTV column elsewhere in this issue.

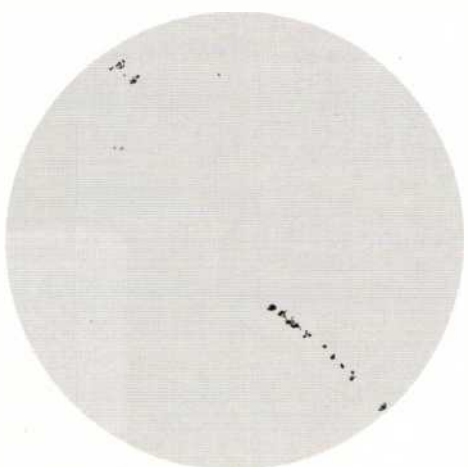

Fig. 2.

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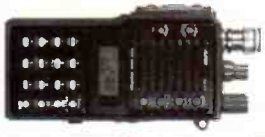

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ssb utility listening

Peter Rouse GU1DKD, Barcroft, Rohais de Bas, St Andrews, Guernsey, C.I.

The postbag went mad this month. You have all obviously decided to really make me work after my six months off.

The Leicester Show

First some news. Graham Tanner and I will not only be at the Leicester Show, Granby Halls on October 23/24, but we will be running an s.s.b. clinic on the *Short Wave Magazine/Practical Wireless* stand. In addition to answering any questions you may have, we will also be demonstrating some receivers, gadgets and antennas. It will be an ideal opportunity for some of the newcomers or less technically minded to pick-up a few tips and we are specifically aiming it at that sector. It is quite clear from the postbag that quite a few readers could hear a lot more if they optimised their receiving systems and learned a few listening techniques. We will be demonstrating receivers that range from simple portables through to the more exotic types. The clinic will run from 10am to midday and from 3pm to 5pm on each of the two days.

Now on to the nitty gritty.

Civil Air Patrol

For some time now I have been in regular contact with **Don Schimmel** who writes a similar column to mine in the American magazine *Popular Communications*. Don has very kindly sent me the very latest list of active frequencies for the Civil Air Patrol. As I mentioned a couple of months ago this is a volunteer service that helps during emergencies, civil disasters, search and rescue operations, medical evacuations, etc. The current frequencies in megahertz are:

2.371	4.582	7.920
2.374	4.585	11.975
4.273	4.601	14.902
4.466	4.804	20.873
4.469	4.627	26.217
4.506	4.630	26.620
4.509	7.635	

Thanks to everyone who sent frequencies in, although it was interesting to note that no-one claimed to have logged any CAP communications. They are out there and active using s.s.b., so keep an ear open for them. I have stuck to Don's list because as the man on the spot he should know what's what. Callsigns usually consist of one or two words and typical examples are Jayhawk, Wigwam, Red Star, etc.

USAF

Paul H of Newbury has filled in a few gaps by answering some questions raised in previous issues. The USAF's Military Airlift Command, MAC, has changed its name to the Air Mobility Command and the MAC callsign prefixes are now REACH. The USAF use of the abbreviation DV stands for distinguished visitor. Tony Duggan adds that Strategic Air Command (SAC) and Tactical Air Command appear to have merged and the callsigns Mystic Star and Giant Talk have been replaced by Scope Signals.

Ron Galliers of London believes that the USAF are co-ordinating airlifts into war-torn Yugoslavia from Lahr in Germany, but I suspect the operators are in fact Canadian (it's a RCAF base). Ron is one of several readers including **Tony Duggan** who have been monitoring activity and says that the primary frequency appears to be 11.233MHz and the secondary 9.006MHz. RAF Hercules aircraft have been using the prefix 'United Nations' followed by a number when flying into Sarajevo. Ron also asks if anyone recognises the callsign QUID. He thinks it may be a KC-135 tanker.

Submarine Exercise

Phillip Murphy monitored a rescue on 5.680MHz on May 6 involving a submarine. He says nothing ever appeared in the media and wonders if it was an exercise. Judging by the comments made in the transmissions, I would say yes because it would have attracted major headlines if it had been for real.

Maritime Services

Keith Elgin submitted a long list of USAF loggings including VIP flights. He also mentions an unusual station in the Caribbean covered by Larry Van Horn in the American Magazine *Monitoring Times*. Apparently a one-man weather service is provided for yachts in the area under the callsign Southbound 2. Listen out on 12.353 or 6.224MHz between 2300 and 0000UTC. Keith says the lower frequency is easily received in the UK.

And now Coastal Control. One reader, who is very highly placed, tells me that this is the Admiralty (Navy). Once initial contact has been made, the base and ship move to a working frequency. Why does everyone have trouble finding the working frequency? The reason would appear to be that after a very brief chat, the operator switch to RTTY (usually 100 baud synchronous) so by the time you have spun the dial all you hear is the usual jingle-jangle and no more voices.

Another mystery cleared up concerns Alligator Playground. Apparently, Alligator refers to the Link 2 computer data system used initially by the US Navy, but I assume adopted by other as well. 'Going to Alligator Playground' is simply a reference to changing to digital communications and the 'Playground' part means the stations that form the net.

Antarctic Frequencies

Now, I did promise some frequencies for the various Antarctic bases because activity will start to build up now that their spring season is underway and supply ships can get in and out again. I am grateful again to Paul H who has submitted a list that is a little more comprehensive than my own. First, the British stations can be found on the following frequencies: 4.067, 9.106 and 11.055MHz at about 1130, 1730 and 2330UTC. The callsigns are: Bird Island ZBH22, Signy Island ZHF33, Faraday Base ZHF44, Rothera ZHF4S, Halley VSD and Fossil Bluff uses it actual name QSLs (allow a couple of years for a reply) can be sent via the Postmaster General, Port Stanley, Falkland Islands.

The Americans have a very large presence (almost as many as the penguins) and field crews talk back to base stations on 2.830, 4.768, 7.993, 8.974 and 11.553MHz. Ships serving the bases are on 2.025, 3.237, 3.319, 8.194 and 12.429MHz. Air support can be found on 8.997MHz primary and 13.251MHz secondary. Additional air to ground communications have been logged on 4.718, 5.726, 6.708 and 11.255MHz. Ship to air communications are on 3.102 and 5.696MHz.

In addition you can listen out for McMurdo centres on 5.726, 6.835, 8.997 and 11.255MHz. Christchurch in New Zealand has also been known to work Antarctic stations on 8.997 and 11.255MHz. Finally, supply aircraft operating out of Punta Arenas in Chile will appear on 4.669, 6.649 and 10.024MHz.

Now I warn you that although there are loads of frequencies to check it is not easy to pick-up these stations. All sorts of quirky things are known to happen to radio signals close to the poles and the path from that end of the world to Europe does not appear to be a particularly good one on any band at any time. However, if you want a challenge and a change from all the easy UASF stuff, here's an area to get your teeth into. Activity should stay fairly high during their summer, which lasts through until our late winter.

Keep the dial spinning and see you at Leicester if you can make it.

bandscan

EUROPE
Peter Shore

Four international broadcasters on the European continent now use the popular Astra satellite system to augment their terrestrial transmission network. I've just got hold of a small Astra antenna marketed by Revox and have thoroughly enjoyed listening to Swiss Radio International's *Swiss Short Wave Merry-Go-Round* in high fidelity, whilst *Media Scan* each Tuesday on Radio Sweden can also be heard in studio quality. Deutsche Welle and Deutschlandfunk are also carried on Astra with English and other language programmes. The Revox AS2000, pictured here, is probably the most compact satellite antenna on the market. With a size of just 240mm, it can be placed relatively unobtrusively in a south facing position, either wall or floor mounted. Watch for a more in-depth analysis in a future issue of *SWM*.

The IC-1000 for receiving high power TV satellites, such as TV-SAT 2 and TDF 1/2. The diameter of the antenna is only 280mm.

Radio Netherlands is reported to be investigating using Astra and BBC World Service, currently on Eutelsat II f1, mainly for re-broadcasters and cable networks, is also looking into the feasibility of Astra delivery. According to market research, Astra is now the most popular satellite for Europe, with the highest penetration of individual household dishes. This was one of the reasons Radio Luxembourg's English service dropped its medium wave transmission to Europe earlier this year; listeners' expectations of quality had increased to such an extent that poor quality monaural sound with fading was no longer acceptable. Luxie is now heard with high quality stereo sound over the whole Continent. Other stations are sure to follow this path.

Experimental DAB

And with Digital Audio Broadcasting - DAB - just around the corner, listeners will continue to expect more and more in terms of quality and programme choice. Experimental DAB services using frequencies in the old v.h.f. 405 line television band are likely to start in Germany by 1995 fed from a terrestrial transmission network. But by early next century (which really is not all that far in the distance), satellite DAB direct to domestic portable receivers will be a reality. Germany already has a digital radio system, known as DSR, fed from the German *Kopernikus* satellite carrying sixteen programme channels. What will happen to traditional international radio stations in the coming years? They must react and make their programmes more interesting and presentation more snappy to avoid the fate of the dinosaurs befalling them...!

Mind you, finding new ways of reaching audiences is not always plain sailing. BBC World Service inaugurated an 18 hour-a-day music and news service for Paris in conjunction with a French media company. But the f.m. frequency which was allocated has been withdrawn and in mid-September the service goes off the air. Meanwhile, Africa No 1, the Gabon-based broadcaster (which is majority owned by a large French media group) has acquired an f.m. frequency and will be transmitting its diet of music and news to the French capital in a few weeks time.

Lithuania

Changes to presentation and content do not always go down well with broadcasters who have worked in the same station for many years. Radio Netherlands changed its English language format earlier this year, with three hour English transmissions instead of 55 minute blocks. Tom Meyer, presenter of *Happy Station* and its Spanish sister programme *Estacion de la Alegria* is particularly disenchanted with the changes and is leaving the station in the next few weeks. Pete Myers will take over the *Happy Station* programme, but we can expect to see more news and current affairs in the Sunday schedule.

A British company is planning a radio station in Lithuania. Baltic Radio International intends to build a 200kW medium wave transmitter on the Lithuanian coast which will beam English language programmes into Scandinavian countries including Sweden which has no commercial radio at the moment. Advertising revenue is intended to fund the operation. Paul Rusling, a former member of the pirate operation Laser 558 is involved with the project and says the station will be on the air early next year. There are also associated plans to donate a lower powered transmitter to the Lithuanian authorities which may replace the existing inefficient 500kW transmitter and antenna used on the 666kHz frequency.

If you wondered why Radio Norway International's transmitters were carrying Burmese language programmes, here is the answer. No, Oslo has not started a new foreign language service! Programmes produced by the Burmese government in exile are being transmitted each day at 1430UTC on 17.84MHz from the Kvitsoey transmitting station. The broadcasts of the Democratic Voice of Burma are likely to be heard until at least the end of September when the present agreement between the Norwegian government and the Burmese opposition ends. Burma is currently controlled by a military regime which refused to acknowledge the results of democratic elections which should have handed power to the opposition led by Nobel peace prize winner Aung San Suu Kyi.

Radio Havana Cuba is no longer relayed by transmitters in the former Soviet Union. It seems that the last broadcast via non-Cuban facilities was in late June on 17.815MHz at 2000. Radio Moscow International no longer benefits from relays to North America by Cuban transmitters. Listen out for Havana at 2000 on a rather poor 17.705MHz.

Relays

Radio Japan is now on the air from BBC World Service transmitters at Skelton in Cumbria. English from the UK site is heard to Europe at 0500 to 0600 on 9.77 and 9.695MHz, 0700 to 0800 on 9.77 and 9.67MHz and 2300 until 2400 on 6.16 and 6.025MHz. Relays from Africa No 1 transmitters in Gabon continue in addition to the BBC relays. Meanwhile the BBC is trying to get hold of some air time on the expanding NHK site at Tokyo Yamata to transmit into China and other parts of East Asia until its new facility is opened in Thailand which may be completed by 1996.

Anyone interested in the history of BBC Broadcasting House in central London will want to visit the BH'92 exhibition which celebrates the 60th anniversary of the world's first purpose-built radio centre. The exhibition is open daily between 0930 and 1730 from August 22 until October 4 and admission costs £3.50 for adults, £2.50 for concessions. A comprehensive audio-visual presentation recounts the history of BBC domestic and overseas broadcasting and a tour of the bowels of the building will include the spectacular art deco Concert Hall.

Vatican Radio has started broadcasting in Estonia again after many years. The broadcasts follow Finnish at 1900 on 7.365 and 6.185MHz and 0420 on 9.755 and 7.365MHz.

The new Costa Rican transmitting station of Radio Exterior de Espana is now testing between 2200 and 0500 on unspecified frequencies in the 6, 9 and 11MHz bands. within the next few weeks, tests in the 60m (5MHz) tropical band are also expected. Reports can be sent to Radio Exterior de Espana, Aptd 156 202, 28 080 Madrid, Spain.

A round-up of the English schedules of some European broadcasters:

Albania
0330-0400 on 11.825 and 9.58MHz
1430-1500 on 9.76 and 7.155MHz
2200-2230 on 9.76 and 1.395MHz

Croatia
On daily on 6.21 and 9.83 with some availability on 13.83MHz.

Lithuania
2130 on 9.71 and 9.675MHz
2300 on 11.885 and 13.645MHz
Reception reports continue to be requested by Radio Vilnius, Vilnius, Lithuania.

Poland
A new English transmission can be heard at 1830 on 9.525 and 7.145MHz, although it is a repeat of the broadcast heard at 1700.

Yugoslavia
From its Belgrade studios, Radio Yugoslavia (when will it be Radio Serbia, I wonder?) operates at 1830-1900 and again 2100-2130 on 7.20 and 6.10. There is a fortnightly *Radio Hams Corner* on alternate Fridays at 2120.

International Broadcasters on Astra:

Deutsche Welle: 11.229GHz, audio sub carriers on 7.38 & 7.56MHz.

Deutschlandfunk: 11.288GHz, audio sub carriers on 7.38, 7.56, 7.74 & 7.92MHz.

Radio Luxembourg: 11.391GHz, audio sub carrier on 7.38 & 7.56MHz.

Swiss Radio International: 11.332GHz, audio sub carrier on 7.20MHz.

Radio Sweden International: 11.597GHz, audio sub carrier on 7.74MHz.

satellite tv news

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

As I pen these words in mid August, the dust settles on the satellite downlinks following the many programme feeds out of the Barcelona Summer Olympic Games. Ku and Telecom Bands (11/12GHz) seemed to have Olympics flying everywhere and the now rather too quiet a spell seems rather an anti-climax. A press release from Eutelsat, Paris indicates over 3000 hours of Olympic transmissions on 15 transponders via 3 satellites were carried through the Eutelsat group alone! I suspect this lull will not last too long, with the UN vote backing a limited military involvement in war-torn Yugoslavia, army ground action is likely to follow and like the Gulf Conflict the SNG units (Satellite News Gathering) will surely follow. To example this comment, tonight a low power EBU feed out of Sarajevo was seen at 11.057GHz over Intelsat 601 27°W (14/08/92) - an unusual choice since most feeds seem to opt for the Eutelsat II F3 bird at 16°E.

Relatively Quiet

Olympics excepted, the past 4 weeks have been relatively quiet. Race Course meetings for SIS seem to have terminated over Intelsat 502 21°W with a complete absence of horse racing, instead SIS have appeared over the Eutelsat I F4 7°E from time to time at 11.51GHz horizontal. During the period SIS appeared at Newcastle, Redcar and at 11.45GHz horizontal from Kirsk. The arrival of Intelsat K at 21°W may account for the lack of the decaying incumbent in recent weeks, 'K' has been testing on unmodulated carrier - tonight at 11.605GHz - but so far no vision has been seen. 'K' will operate at both Ku and (new for Intelsat) the Telecom band.

PanAmSat PAS-1 at 45°W is very weak here in Central Romsey since my dish 'looks' through the next door's wardrobe, PAS being below roof eyeline and the signal that is received is mainly diffracted from the roof ridge tiles. **John Locker** (Liverpool) can however 'see' PAS-1 and logged Ku Band NASA communications for the recent *Atlantis* Shuttle expedition via PAS-1!

Odd goings on too via the Gorizont (CIS) satellite at 11°W (Statsionar 11), rarely active on her Luch 11.512GHz circular polarised transponder, the bird fired up for several days with the familiar (to TVDXers!) electronic 0167 test-card, then on the 11th at 2130BST played out poor quality programming - resembling a well used VHS tape - followed at about 2200 with a live relay of the C Span feed ex USA showing proceedings in Congress! Most odd, the following day only the test card was carried, which then resumed to an unmodulated carrier. Meanwhile Gorizont 15 (Stat 4) at 14°W continued her VISNEWS feed out of Moscow also 11.51GHz (the standard frequency for the on-board Luch test transponder).

With Yugoslavian SNG feeds likely to build up in the coming weeks, Eutelsat II F3 16°E was carrying a live news report in an unknown language (August 12 at 1730 11.58GHz horizontal), during the preparations for this one-way news insert, the camera casually panning around the site zoomed in on the 'flyaway' SNG kit, a bank of aluminium flight cases perhaps 2m high controlling the video/camera output and Ku band transmitting/receiving gear. Two dishes were visible which now seems to be the standard field rig, a conventional Ku band dish for the business end of the operation with a smaller dish aligned on an Immarsat bird for direct international dialing telephone contact back to base and to provide a 2-way circuit for talk-back and reporter cueing when involved with live reports. These techniques were pioneered during the Gulf War and several broadcast equipment companies now provide adapted Immarsat hardware for use in the live TV environment.

Interesting to see a continuous 525-line NTSC feed up and running with Olympic traffic for the American NBC network, New York over Intelsat 515 18°W, when no sporting events were carried then various test cards were fed over the circuit. Another sporting even was the German Grand Prix from Hockenheim, the AKK mobile satellite uplink crew were operating this day

Doordashan TV via Arabsat 1C-31°W in C Band, received in Maidenhead by Des Sherwell.

feeding into 'RTI', can anyone identify 'RTI'?

A couple of letters from **Ian Waller** (Lincoln, Ian works in the 'trade' at Lincoln Satellite) - his first letter notes reception of the Conus Ku band beam ex PanAmSat (PAS-1) 45°W, this satellite has 2 Ku band transponders on 11.76 and 11.82GHz (actually in the DBS band) beaming solely to the USA and covering from the Eastern seaboard through the mid-west to the Rockies - back radiation into Europe is theoretically nil - with some nearby tree surgery Ian resolved weak signals from both transponders, together with a C Band (4GHz) Latin American beam leased to Peru. Ian also reports that ARABSAT 1B has been on the move and (at the time of writing) has parked at the Arabsat 1C slot at 31°E. Arabsat 1A also moved East earlier this year due to exhaustion of her station keeping fuel. With a reshuffle of TV transponders we now have - all in C Band - Egypt, Morocco, Kuwait, ASBU and Mauritania on Arabsat 1B, on 1C Saudi 1 and 2, CNN, Omani TV and CFI (Canal France International). The Indian channels have disappeared which may have been re-assigned to the recently launched INSAT 1B bird. The icing on Ian 's cake happened August 12, again C Band, with reception of the TDRSS satellite at 41°W with ident 'Columbia TRDSS 525/NTSC 6.2, 6.8 subs Tr.4'.

La Cinq, the terrestrial TV channel that 'went bust' earlier this year is being replaced with a Franco-German cultural channel called 'ARTE' has been on downlink tests during August from the new Telecom 2B bird at 5°W, programmes are expected to start officially September 28. Reader Jean-**Louis Dubler** (Montreux) writes that the programmes have a yellow filter over the pictures and across centre frame is the inlay panel - 'Test Transmission' (in French). The terrestrial transmitters are currently off the air.

From Finland

Finally, exiled 17 year old Buckinghamshire Brit **Timo Newton-Symes** pens from Helsingfors 83, Finland. Timo's father works in Finland and the family have moved over as well, complete with Timo's 800mm dish to complement a recently added 1.5m prime focus dish, operating with his new Nokia SAT-2200 D2-MAC/PAL satellite receiver. The larger dish uses a 0.9dB noise Ku LNB with a Telecom LNB alongside for the Scandinavian satellite Tele-X at 5°E. Astra 1A, B at 19°E is very poor and the locals advise that a 1.8 or 2.4m dish should be used. Astra 1A horizontal channels are received sparklie free though all verticals are extremely poor. Other than a few German channels all Astra 1B channels are virtually non existent. Timo's smaller dish is fitted with a 1.4dB/1.2dB noise LNBs for Ku/Telecom bands respectively. Eutelsat II F1 13°E is watchable, Tele X is noise free, INTELSAT VA F12 1°W watchable and Telecom 2A at 8°W is acceptable quality. Trees prevent reception further to the west.

In Finland large dishes are everywhere with most houses and flats in Timo's area sporting a dish of some description. The interest in satellite TV reflects on the quality (or lack) of Finnish TV programming - at least that is what Timo suggests. Despite the Videocrypt encryption on Sky channels for copyright protection and the regular issue of restricted smart cards, the Swedish TV listing *Pa TV Guiden* lists all Sky programming and movies! Timo is able to locate occasional copies of *Short Wave Magazine* in Finland - *SWM* obviously reaches those parts that no other magazine can!

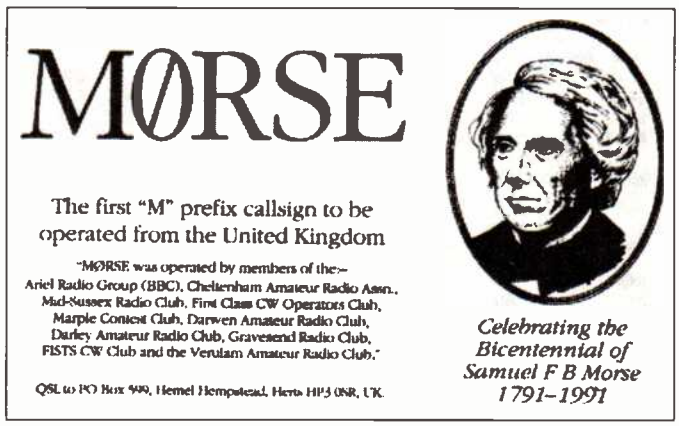
The NHK video feed to Europe over PAS-1 at 45°W (525-line NTSC) on Darren Loxley's 1.2m dish in Sheffield.

A convenient test pattern telling all, the German Grand Prix feed on July 25.

amateur bands round-up

Paul Essery GW3KFE, PO Box 4, Newtown, Powys SY16 1ZZ

If one is to get the best out of one's hobby, one needs to explore it; not necessarily spending money but rather 'bodging' along until one stumbles over a mode in which one is really interested. For example, I can obtain a passable SSTV picture by way of an old monochrome TV that was rescued from its last resting place, plus a 48K Spectrum which was about to go in the dustbin when the owner got tired of it. Software came out of a newsletter from a decade ago. The connectors mainly came from the junk box (though to be sure a couple were expensive on the local market at 50p each!) and the wire used was 'filleted' from some other junk. So - for a pound I had a tolerable SSTV set-up with which I could decide whether I liked the mode enough to take it further. The same set-up can be persuaded to look at RTTY and c.w. by a mere change of software and an added audio filter. Ask around the local club, and it's long odds someone still has the requisites stowed away in their loft!



The Bicentennial of Samuel Morse was celebrated with the first 'M' prefix station operated from the UK.

Penguin Island

These thoughts were initiated by a letter from **Ron Pearce** in Bungay, who recently rescued an old AR88D from a neighbour's shed where it had been communing with the mice and spiders for many years. Given a clean-up and de-spidering inside and out, it promptly played like a good 'un! On 21MHz 9H1EL, TI2CF & HK6PSA, on 14MHz 9K2IC, ZS5GRG (Penguin Is), K2JP, and on 18MHz 9H1KK, VE1XG, ZA1M, 4X4FR, PJ8AD & CU1AC. Just a reminder that the older and simpler receivers are not to be sneezed at, and particularly so when one is just 'getting one's feet wet' in the hobby. To be sure, though, an AR88D is complex compared with Ron's usual one-transistor jobs! On the other hand, far easier to operate than a modern push-button wonder.

Still in the same general area, a letter from **Denis Pepper** in Folkestone. Denis is struggling with the Morse, but philosophises 'Perhaps, then, there is some value in struggling, as maybe it sorts out the single-minded sheep from the less-enthusiastic goats'.

Simon Griggs in Chelmsford is now up to 117 countries and is finding it harder to scratch up new ones. Since the DXCC 'possible' is over 320 current countries and over 350 for the All-Time Post WWII, there's a way to go yet! Looking over the list for this time, though, I can't help thinking that a switch, say, to breakfast-time listening would be useful, since Simon listens mainly late at night into the small hours, with the odd foray in the afternoon.

Looking at Simon's list, on Top Band I note SV8ZS at 0244 on 1.829MHz, ZB2FK (0047 on 1.838MHz) & HB9FAF all on c.w. Up to 3.5 where W2HCW in QSO with PY1HY were found on 3.790MHz at 0239 & K6XD on 3.882MHz at 0414. This brings up a point; while my 80m band runs from 3.5-3.8MHz, the Region 2 allocation covering N. America is 3.5-4.0MHz; likewise on 40m they have 7.0-7.3MHz while we are down to 7.0-7.1MHz. Thus, on these bands it is worth looking beyond the UK allocation. To revert to the list, on 7MHz SV1BKW, UA9CBM, LU3CC (s.s.b.), 9A2SY, K2FL, PY7ZK, A45XD & TK/DL7HZ. A visit to 10MHz saw ZA1TAQ & OH1MA/OH0, so a further move to 14MHz came up. Here we find - sideband unless indicated otherwise - YS1EJ, SV7BAY, HP1BPH, T53UN, HK3JHA, VP9BB, HZ1ZS, UF6FJ (c.w.), K4FD from the Kennedy Space Centre, WA3NAN, OD5ZZ, 4X1AD, HR8HMD, ZC4DG, TA4C, XE1CI, 9K2MU, UA9SAB, UM8MQ (c.w.), 9H3WR (c.w.), W1AW (c.w.), VU2RAK, UJ8RA, HK3RIF, CN8LGPT7WX (c.w.), UL7JEG, 9K2TC, OD5/SP7LSE (c.w.), VKs, JR4SAY, A71BV, HI8OMA, 9K2IC, W6PFS/MM, HR2BDC, D2FGC, KA1EKR, VU2JJQ & TL8IM. On 21MHz the take included UF6FN, EA8AF, YC3FFBUF7FWW, all c.w., PT7WX, CN8HB, and c.w. from LU8MAH, 4X6VK & EA8AT.

Autofax

On to **John Scott** now, in Glasgow's Kingspark. John has some software called Autofax and uses this with his R2000 and KAM to receive FAX images; John sent a picture to demonstrate how well the software works. Other activities included building a notch filter for the receiver from a Maplin kit, and finding it a useful adjunct to the R2000 receiver; and a major revamping of the antenna which thanks to a co-operative neighbour is now in the region of 35-40m in length - as John says, he is in the process of turning his home into an antenna farm! On the bands, John notes 7MHz signals from GS3ZET up in the Shetland - this is the Lerwick club call - GB4HQ, GB400CU, GB50RAR & GB4SSB. W4IBX was picked up in s.s.b. on 21MHz, while 14MHz showed with 4J1FS (Malyj Visotskij), AM25TSV, VK7EK, VK6LC, VE7XN, PY4AH, OY1HJ (Faeroe Is, not Iceland), K4XS, W2MQ, WB4JEM, AM4KK, 3A2HB, ZP6HR, VP5JM (Turks & Caicos Is), ED3BI, K4VUD, KP4GY, WA1DVE, FM5CD, CT1BWW, W1FDH, W4HAW & VE1UW.

Snippets

John Collins in Birmingham notes that the FCC has been cracking down on deviant amateurs in USA - would that this would happen in UK! John believes some $1000 fines have been dished out. Another snippet is that there are hints that Box 88 Moscow will close; probably that it will be the Central Radio Club for Russia but certainly not for the rest of the old USSR. Already nine of the old USSR countries have been or are becoming separate members of ITU and IARU. Incidentally, John has an Eddystone 870A with which on 7MHz - the favourite band - he mentions 4U1UN, YT3RD in Slovenia (QSL direct to the 1992 Call Book address), PS8RA, VY2BB (via VE7AR), AM6AAX, EH92G, FK8DH, 9A2NH, 4Z4ML, YI1MH, VE1LDD, ZP3AB, HK1HHX & TK5BF/F who is said to QSL via FK8DH.

Gerald Bramwell up in Manchester has a Trio 9R59DS plus home-brew antenna tuner, and home-brew accessories; outside he has about 10m of wire. The indoor kit shares the living room, as Gerald puts it, with the XYL and the TV. Despite his enormous list and operating times, Gerald notes an absence of Ws on 7MHz. I have already partly answered this one above, but in more detail, 7.0-7.15 is down for c.w./RTTY. and 'phone starts at 7.150 up to 7.3MHz. To revert to the list on Top Band it is all European, and two thirds are c.w., including a Big Name by way of ON4UN.

On 3.5MHz Gerald copied a couple of RTTY stations and some c.w. too, but his DX offerings included 4X1EL, ZS4TX, A22BW, VK2CWG, 9M2AX, 9M8PV (c.w.), EA8VV, 7X2BK, PT7SK, PU9TKD, VK3DZM, ZS6P, VK6LK, ZS6IR, 5H0ROA, PY2BW, ZP6HR, 4X4MS, ZL1CCR, ZL1IU, 9Q5PL, 7P8EG, 9X5NH, HF0POL, ZP6SC, PY2PD, Z21HS, PY2ZZ, 7Q7XX, EA8AOQ, 7Q7JL, DU9RG, VK6ACY & YB6GS. The crop on 7MHz - neglecting Europe - includes CX1TE, CE3RLT, A71BV, LU6QI, CE4LFO/3, ZS5JM, PT7SK, 5B4LA, LU3TAM, CE3FIP & EA8BYL. There are lots of RTTY signals to the 14MHz list, of which we note in particular, 8P6SM, CN8CL, JH1AEP, EA8BUS, OX/HB9DCQ/P, EA8AB, 9Y4VU, 5U7M, TA5C, ZP6XD, RB0HZ, RF6RC, R1O, 4K5ZI, VE2VO, WB4FTN, NZ1U, N4LIH, W5RRK & W5JE while sideband accounted for 4M3U, YV5PLR, LU8ESU, CO7QP, PY5ZJ, TU2WE, TI2JJP, 9K2MC, LU1IFY, AM9UA, PP9DA, OD5ZZ, FM5FM, 9K2MU, DG6YG/HI3, SU1AY & OD5/SP1MHV. On 18MHz W1AW was copied on RTTY, plus East Coast W phone stations, TA1AL, 7X2DG, EA8BWN, 5T5EV, 5N0CEP, CO7JC, JA5MHD, 4X4FR, KP2J & KP4CKY. Lots of RTTY was copied from Ws, UZ9CWN, Europeans, J73WW, 5H0ROA, 8P6SM, 9Y4VU, PJ2MI, ZP6XD; PJ2AM on c.w., plus 'phone from assorted Yanks, OD5ZZ, HH2PK, LU3DIE, PT7BI, PY7EC, CQ3B, OD5SK, CO8AJ, 5H0ROA/A, LU1NH, HI8MEQ, CE2ZN, WP4GKI, HI8FHD, OA4BCZ, PT2VD, LU1DF, EA9KQ, HK0NZY, ZD8HYI, EA8YC, CX7BF & HH2Z. 24MHz found EA8/DJ3OS and on 28MHz VE1XDX, ZZ4Z, PT7WZ & c.w. from NP2I.

Snake Island

Now to **Ted Trowell** in Sheerness; Ted notes ON7BW for a rare 'phone one on Top Band, plus c.w. from HB0/DL1FZ/P on Top Band; otherwise it was c.w. all the way, with 14MHz pickings like P30ADA, RY9TI, RY5K, W5FO, WB4TDH, 9A2DS, AM25DWX/6, VU2NBT; while 21MHz came up with ZC4SXW, UX9C, ZF2NE, PP7JR, K2LE, VY6QST, UA9SA, YC2HAX, ZA1HS, PP2AR, LU9CV, UI8GA, R4AKD, UL2M/UA9SAW, UB4MXQ, AP/WA2WYR, P30ADA & ZD8LII. On the other hand, neither 24 nor 28MHz have been productive.

Vince Cutajar is in Malta, where he trolls through the 18 and 24MHz bands; on the former he found J28YC, 4K5ZI (Snake Island), 9A2LH, 5H0ROA (Zanzibar Island), 9A2ER, HK5LEX, ZL1BIL & 5T5EV, while 24MHz yielded J5UAI, IM0/IK2AEQ, 5H0ROA, 5T5EV & TY1IJ.

Finale

That's the lot for this time. Deadlines are: October 10, November 7, and December 1 - for the latter, early input would be appreciated, against the Christmas rush period.

airband

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

Receiver problems have often cropped up in the last few issues. In August I mentioned the Sony Air-8 and advised prospective purchasers to check that the version they were getting would cover the 136-137MHz extension. A reader from Belgium has now written in to explain that the Air-8 is the USA version of the Air-7. Why different names for the same equipment? A Sony spokesman used the expression 'Grey import'. Now, what does he mean by that? The receiver's specification doesn't mysteriously change when it's imported. If it's the same equipment, by the same manufacturer, what problem can there possibly be? The lower price is certainly interesting. I wonder what the marketing departments of multi-nationals have in mind when choosing their model numbers? I leave you, the reader and potential purchaser, to ponder more deeply.

Often mentioned here is the possibility of image reception where a frequency twice the i.f. away from the wanted one can also be heard. This worries **Ken Toone** (Solihull) who has worked out that a v.h.f. f.m. broadcast could theoretically interfere with an aeronautical transmission, the worst case affecting, I suppose, 121.5MHz. I am happy to report that this is not a serious problem with equipment designed for relatively narrow coverage, such as the receivers found in aircraft and at air traffic control facilities. Image reception is prevented by adequate pre-mixer selectivity. In other words, the first part of the receiver that the signals enter must be able to discriminate against frequencies that could give rise to an image response. Wideband scanners are less able to deal with this problem than purpose-built professional equipment since the latter only needs to cover a much narrower part of the spectrum.

There is another problem not mentioned by Ken. The navigation band 108-117.95MHz is susceptible to interference in a different way. If a strong signal appears close to the wanted one, the receiver will have difficulty in discriminating against it. A variety of interference effects can be caused. For this reason the adjacent 100-108MHz guard band was originally only allocated to low-power transmissions such as police communications. These days, commercial interests exert more influence and it now seems necessary to provide a v.h.f. channel to just about any 'local' radio station that wants one. Hence the low-powered communications services have moved out, and the high-powered broadcasters are moving in to the guard band. Will aeronautical navigation facilities be dangerously affected by this? Notwithstanding all the theoretical predictions, eventually only time will tell.

Follow-Ups

Further comments on LATCC off-peak operations come from **H.R. Edwards** (New Malden). As mentioned in July, one controller might work two frequencies when things are quiet. This is called 'bandboxing'."To prevent aircraft calling on the second frequency when the controller is already engaged on the first, aircraft transmissions from the first frequency must be relayed on the second one (and vice-versa). So on each frequency, aircraft 1 will hear both the controller and aircraft 2. Aircraft 1 will not be aware that aircraft 2 is actually on a different frequency, but being worked by the same controller. Because of the larger piece of airspace covered by the controller at this time, it is vital that the position of each aircraft is made clear during the initial call on frequency.

Your Questions Answered

Frank Hermann (Hull) raises some general points about aeronautical radio in his area. Geographically, Frank lives to the north of East Anglia, the dividing line being the Humber. Eastern Radar (135.275 & 299.975MHz) serves the East Anglia area and has its antennas at Trimmingham, Norfolk. The controller is located back at the London Air Traffic Control Centre, West Drayton, just north of Heathrow Airport. Land lines connect the two. Hence, the Trimmingham installation (which is remotely operated) is called a relay station.

Also close to Frank is Ottringham (N53°41.87' W000°06.13') that lies between Hull and Withernsea. Three radio navigation beacons are here. Each can be received by aircraft and give rise to displays on instruments in the cockpit. Such beacons transmit continuously and are unattended; it is up to the pilot to tune them in and make suitable use of them whenever necessary. At Ottringham there is an n.d.b. on 398.5kHz and a v.o.r. on 113.9MHz. Both give out the Morse identification letters OTR (dah-dah-dah, dah, di-dah-dit). There is also d.m.e. on channel 86X (1173MHz). There is no relay station at Ottringham, nor is there any radar.

So, how do you keep track of all these frequencies? There are two good official sources and both sell to the public by post. The publications are re-issued very regularly and this means that they will be more up-to-date than other sources. I recommend getting your information from these two books; other information sources will be less direct and possibly out of date. So, here are both suppliers. The books to buy are the *En Route Supplements* covering your area of interest. For civil operations: Aerad Customer Services, Building 254, PO Box 10, London (Heathrow) Airport, Hounslow, Middlesex TW6 2JA. Tel: 081-562 0795 (Europe and Middle East Supplement covers the UK). For u.h.f. coverage: 1 AIDU, RAF Northolt, West End Road, Ruislip, Middlesex HA4 6NG. Tel: (081) 845 2300 ext 7209 (British Isles and North Atlantic covers the UK).

Concorde

Although the transatlantic routing for Concorde is different to that taken by other aircraft, **K.T. Green** (Bradwell) will be interested to learn that the frequencies are the same. Strictly speaking, Concorde's full callsign would be something like 'Speedbird Concorde Alpha Charlie Heavy', which is unmistakeable but quite a mouthful! The 'Heavy' suffix means that a large vortex wake is generated and the next aircraft behind needs adequate separation. Notice the last two letters of the registration appearing in the callsign.

Taking the example of a British Airways Concorde flight from Heathrow, the general attitude is that passengers paid extra for a faster flight. The aircraft will depart from the runway that provides for minimum taxy time, accepting a downwind take-off if necessary (and if the tail wind component is not too great). Climb out (subsonic) is to the west, such as along airway G1, calling LATCC on frequencies such as 132.8, 133.6 or 132.6MHz. Along the way, Shanwick is also contacted for oceanic clearance (127.65MHz). The supersonic routes are constant and direct, unlike the North Atlantic Organised Track System flown by subsonic aircraft and which changes twice a day to allow for wind variation at the appropriate flight levels. At the MALBY reporting point, the flight turns towards the supersonic acceleration point which is south of Swansea over the Bristol Channel. Oceanic entry is at 8°W and track SM is likely to be taken. About this time h.f. communications are also established, probably on the NAT-C network (2.872, 5.649, 8.879, 11.336 & 13.306MHz).

Arrivals on track SN call LATCC from about 12°W on 132.6 and might later hand off to 132.8 or 133.6MHz before eventually contacting Heathrow Radar in the usual way. If you want to see where the supersonic tracks start, try *Air Traffic Control* by Graham Duke (Ian Allan).

Frequency and Operational News

The CAA GASIL (7/92) mentions frequency changes at Gloucestershire where Tower is now on 122.90 (the old Radar frequency) and Approach/Radar is now on 125.65MHz (the old Approach/Tower frequency). London (Stansted) has a new Tower/Homer (direction finder) frequency of 123.80MHz.

I hope that pilots reading this column will always consult their NOTAMs which are more up-to-date than is possible with a monthly magazine. There are two sorts of NOTAM. System NOTAM (Class I) appears urgently by the Aeronautical Fixed Telecommunication Network and NOTAM Class II (AIP Supplements) are less immediate and so are distributed by post. The *Aeronautical Information Publication* (AIP) is the official way of promulgating the facilities and regulations that apply in UK airspace.

On the display scene, **Graham Tanner** (Harlington) supplies the Grasshoppers frequency as 281.8MHz. This Dutch team flies a very artistic demonstration of Alouette IIIs in close formation, like an aerial ballet. The Red Arrows (no introduction needed!) can still talk on their old 243.45 instead of the new 242.2MHz whilst displaying. Duxford were on 123.50 but should have changed to 122.075 or 128.075; additionally, 134.85MHz has been used during displays. Henlow's display Tower was on 121.1 and 369.4MHz. Thanks for the information, which was from **H. Perry** (Bedford) and **G.A.**

Shackleton MR Mk 3, Natal, South Africa. (R.J. Wheeler)

CONTINUED ON PAGE 55 ➡

scanning

Alan Gardener
PO Box 1000, Eastleigh, Hants SO5 5HB.

Bill Jessop of Humberside takes a keen interest in the v.h.f. marine band and wonders if I could tell him what frequencies are used by the land based Coastguard rescue teams which he has seen driving around in very distinctive blue and yellow painted Landrovers. This is not quite as easy to answer as I first thought, it would seem that it does tend to vary around the coast as different teams have different commitments, however as a general rule most of them make use of the following:

156.000MHz	Ch. 0	Coastguard primary (Exclusive use).
156.300MHz	Ch. 6	Inter-ship and Search/ Rescue.
156.500MHz	Ch. 10	Pollution control and inter-ship.
156.800MHz	Ch. 16	Distress, safety and calling.
156.375MHz	Ch. 67	Coastguard secondary.
156.675MHz	Ch. 73	Coastguard occasional use.
160.600MHz	Ch. 00	Coastguard (New Exclusive use).

As well as these channels in the v.h.f. marine band they also make use of other equipment when required, for example they may wish to communicate with RAF air-sea rescue teams, mountain rescue teams, volunteer rescue groups or use specific company frequencies if they are operating in an area which is dominated by one industry. I hope that this at least partly answers your question Bill.

Marine Band Channels

Whilst we are on the subject of marine communications **Alistair Turnbull** of Dunbartonshire has written to ask me about the way in which the v.h.f. marine channels are allocated. He has noticed that there is a discrepancy in the channel numbering scheme and he wonders if there are any additional channels which are not commonly used. At a first glance the present channel numbering system does seem a bit unusual, however it has been internationally agreed upon so the same numbering scheme is used world-wide - with one or two exceptions.

The present system originated many years ago when the channel spacing was halved from 50 to 25kHz in order to double the number of available channels. The new channels slotted in-between the original ones and were numbered 60 - 88. This is the reason the channel numbers run in the order 00, 60, 01, 61, 02, 62, 03, etc., if they are listed in frequency order. Alistair wondered what had happened to the 'missing' channel numbers 29 - 59 that don't seem to appear in any lists.

I, too, noticed this apparent gap in channel numbers when I first started listing frequency allocations many years ago. I never did find out why this was the case but I suspect that it may be because the v.h.f. marine band is an international allocation. Where the channel numbering stops in this country it may well continue in others. My theory is that the UK channel numbering system ended with Channel 29 at 162.05MHz paired 4.6MHz lower in frequency with 157.450MHz - if we follow the same method of allocation simple arithmetic gives us Channel 59 at 163.55MHz paired with 158.95MHz. By the same logic Channels 89 - 120 could also be classed as 'missing' because they would occur in-between Channels 29 - 59.

Some new channels have been added since the original channel numbering scheme was devised. Good examples of this would be Ch. 37 otherwise known as Ch. M1 the Marina channel or Ch. M2 161.675MHz which is actually the Shore station transmit frequency for Ch. 81, the small boat alarm frequency of 161.275MHz which would have been the Shore station transmit frequency for Ch. 73 and finally the latest allocation a new exclusive HM Coastguard channel designated Ch. 00 on 160.6MHz, which would have been the Shore station transmit frequency paired with the existing Ch. 0. This last channel number is interesting because it serves to highlight the difficulty in slotting new channel numbers into the scheme. Because of the differences in the way channel numbers are displayed on v.h.f. marine transceivers some equipment show the existing Ch. 0 as 00 on the two digit channel display, obviously this can lead to errors in channel selection so one alternative that has been considered is to call the new channel Ch. 99. However this may clash with the 'missing' Channel 99 which would be a completely different frequency. One further complication is that some older radios cannot be re-programmed to display the new channel numbers, so use may have to be made one of the additional channel memories set aside for private use on commercial v.h.f. marine equipment, in this instance the channel may be referred to as Private 1 or P1.

In fact, in this country the 'missing' channels have been used for a variety of other purposes over the past decade or so. Some of the channels are used for private marine operations rather like the v.h.f. airband company channels. Good examples of this tend be found around 157-158MHz with several ferry operators, tug and shipping companies having dedicated simplex channels. If you live near a busy port or estuary then it may well be worthwhile checking the bands 157.45-158.525, 160.975-161.475 and 162.05-163.025MHz for marine activity. In areas away from the coast or inland waterways other sections of the band around 161MHz have been used to provide low power paging acknowledgement channels and TV company newsroom communications, whilst several years ago some of the first p.m.r. trunked radio systems were slotted into the band around 157/162MHz when there was a general shortage of new frequencies for p.m.r. operation in the larger cities. The predecessor of the current cellular telephone system, BT's System 4 also used to occupy part of the band 158.5-159.925 paired with 163.0-164.425MHz until it was switched off fairly recently. This part of the band has now been released for use by p.m.r. operators and the distinctive digital chugging transmissions of the Paknet radio data system. If any readers have further information on this subject why not drop me a line so that I can include the details in a future column.

Databases

My thanks to all those readers who have sent me details of database programs following the letter from Jim Cove I mentioned in the August issue. Several people suggested standard database programs such as 'PC-File' in its various forms and 'Masterfile' both of which are available for various machines and are relatively inexpensive.

A few readers pointed out that almost any database package can be used, the technique in this case is to pick one with a search facility that allows you to use several different linked search parameters. All the information can then be stored in just one field per record, making the import of any material possible. The advantage of doing this is that it allows you to store information in almost a free format, which is very handy if you want to try and combine several different lists. I have tried this and it does work, except when you perform a numerical sort. This is because the sort is performed on the first numeral so you end up with frequencies lower than 100MHz mixed in with higher frequencies, for example 70MHz would appear just before the 700MHz group. You can solve this by not listing frequencies below 10MHz and by including a zero ahead of any frequencies between 10 and 100MHz. Although this may not help if you are trying to import data from other sources which do not meet this requirement. Several other readers have suggested Database programs which have been produced specifically for scanner users. One such program is 'Scanner Manager' for the Atari ST this costs £10.00 and includes free upgrades or alternatively send 50p and a 3.5in disk for a demo version from: **Mr Stuart Coates, 9, Links Road, Kibworth Beauchamp, Leicester.**

Another database for PC compatibles is 'Scanmaster' this costs £8.50 and is designed to keep track of frequencies, descriptions and categories and will also allow you top keep track of what is already stored in the memories of up to 3 scanners. The author of this software is always interested to receive users comments and would be prepared to produce specific software if the demand existed. The program is available from **Clarke Computer Services, 20, Silverdale Crescent, Alderholt, Fordingbridge, Hants SP6 3JZ.**

Following another readers suggestion I checked out some of the scanner database programs available on various computer bulletin boards. Most of these originated in America and so are not ideally suited to UK frequency allocations. Two of the programs fail in this respect, 'Super Scanner' as it's sort categories are not ideal for the UK and 'Scan' which is a good simple program but cannot cope with 12.5kHz frequency steps, although the version I down-loaded had been filled with some UK frequencies which had defaulted to the nearest 5kHz increment. One other program was 'Radio Log' this is quite nice to use but unfortunately will not allow you more than one entry per frequency. All of these programs can be down-loaded from the 'MICROFORCE' Bulletin Board on: (0795) 538359.

Whilst trying the various computer Bulletin Boards I was surprised at the limited amount of radio related information available. This could be due to the extensive use of packet radio for such purposes but I would have thought that the ability to store and forward files and pass messages reasonably confidentially would seem to make them ideal for swapping scanning related information. Do any readers have a favourite board which they can recommend to other scanning/computing enthusiasts?

Speech Scrambling

During the past couple of months several newspapers have mentioned the problems various police forces are having with scanner users illegally monitoring their transmissions. Some forces have now started to use analogue speech scrambling on channels that are particularly prone to monitoring by criminals. One local paper reports that the Hampshire constabulary is currently trying a pilot scheme which if successful will be adopted as standard throughout the force. The humorous side of all this is that one of the main importers of scanners has been receiving an increasing number of phone calls from people complaining that their receivers have gone faulty because they can only hear distorted or unreadable speech when tuned to 451MHz - no comment !

Odds & Ends

Just a few items in brief to round off the column this month. S.E.M are now producing a v.h.f. version of their QRM eliminator which is capable of operating over the range 130-180MHz. This is intended for use by people suffering interference to reception from computer systems. I hope to be able to include more details in a future column when they become available.

Richard Hillier of AOR UK has asked me to remind AR3000A owners to return their postcards to him in order to receive their replacement operating manual.

James Burns writes from Australia, he is trying to find a suitable stereo decoder, preferably in kit form, for use with the Multiplex stereo output of his Yaesu FRG-9600. I thought that Cirkit or Maplin used to do one, but I can't find it in their current catalogues.

My thanks to all those of you who pointed out that the u.h.f. military airband is now channelised in 25kHz steps not 50kHz as I said in last month's column - at least I now know some of you read it.

I'm still looking for information on scanning related software for Spectrum computers, the legality of taking and using your scanner abroad, communications used by racing/rally teams and national cycling events - if you can help why not drop me a line.

Finally, a bit of market research, which scanning related advertisement do you think is the least likely to sell anything? I've already made my choice! Until next month - Good listening

Airband 52 ➡

Rhodes (Christchurch); this will also be of interest to Frank Hermann. On the subject of high-energy manoeuvres, a.m. transmissions are quite wide-band and the small Doppler shift due to high-speed flight isn't sufficient to cause any reception problems during displays.

With £13 950 to spare you could enter aviation history and fly round the world in less than 24 hours (airborne). All you have to do, apart from paying up, is to sit in an Air France Concorde for the required length of time and consume 'appropriate meals', which had better be good at that price! **Anne Reed RS87871/G20126** (Cheltenham) supplies the all-daylight route as follows. Monday October 12 at 0700 local: depart Lisbon. Refuel at Santo Domingo, Acapulco, Honolulu, Guam, Bangkok and Dhahran. Tuesday October 13 at 1440 local: arrive Lisbon.

Finals

Good to know that some countries appreciate their aviation heritage. **R.J. Wheeler** (Seychelles) visited an open-air museum at Natal, South Africa, and encountered the Shackleton MR Mk.3 shown in this month's photos. Meanwhile, down near distant Gatwick Airport, an enthusiast has gathered a collection of significant aircraft including another Shackleton. This type of collection does not occur so commonly in the public sector that we can, as a nation, feel complacent about our abilities at aircraft preservation. The local council are demanding that the collection be scrapped. It has been reported in the national media that they won't give planning permission for the concrete hard standings on which the aircraft rest. So, Mr. Vallance of Charlwood, if you're reading this: accept my sympathies. From one museum curator to another. How do readers feel?

The next three deadlines (for topical information) are October 9, November 6 and November 27. Replies always appear in this column and it is regretted that no direct correspondence is possible. All letters to 'Airband,' c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex, HA8 8PS. Genuinely urgent information/ enquiries: 081-958 5113.

Shackleton MR Mk 3, Natal, South Africa. (R.J. Wheeler)

UK VHF MARINE BAND FREQUENCY ALLOCATIONS

Ch	Ship TX	Coast TX	Use
0	156.000		Coastguard/Lifeboat Private
60	156.025	160.625	Public Correspondence
1	156.050	160.650	Port Operation/Public Correspondence
61	156.075	160.675	Public Correspondence
2	156.100	160.700	Port Operation/Public Correspondence
62	156.125	160.725	Public Correspondence
3	156.150	160.750	Port Operation/Public Correspondence
63	156.175	160.775	Public Correspondence
4	156.200	160.800	Port Operation/Public Correspondence
64	156.225	160.825	Public Correspondence
5	156.250	160.850	Port Operation/Public Correspondence
65	156.275	160.875	Public Correspondence
6	156.300	156.300	Inter-ship only
66	156.325	160.925	Public Correspondence
7	156.350	160.950	Port Operation/Public Correspondence
67	156.375	156.375	Coastguard/Inter-ship/Small yacht safety
8	156.400	156.400	Inter-ship only
68	156.425	156.425	Inter-ship Port Operations only
9	156.450	156.450	Inter-ship
69	156.475	156.475	Inter-ship
10	156.500	156.500	Inter-ship/Pollution control
70	156.525	156.525	Digital Selective Calling/Distress
11	156.550	156.550	Port Operations only
71	156.575	156.575	Port Operations only
12	156.600	156.600	Port Operations only
72	156.625	156.625	Inter-ship only
13	156.650	156.650	Port Operations
73	156.675	156.675	Inter-ship U.K. Secondary Safety
14	156.700	156.700	Port Operations only
74	156.725	156.725	Port Operations only/lock-keepers/bridges
15	156.750	156.750	Port Operations/Inter-ship
75	156.775	156.775	Guard Band (not used)
16	156.800	156.800	Distress and Calling
76	156.825	156.825	Direct printing Telegraphy Distress/Safety
17	156.850	156.850	Port Operations/Inter-ship
77	156.875	156.875	Inter-ship only
18	156.900	161.500	Port Operations only
78	156.925	161.525	Port Operations only
19	156.950	161.550	Port Operations only
79	156.975	161.575	Port Operations only
20	157.000	161.600	Port Operations only
80	157.025	161.625	Port Operations only
21	157.050	161.650	Port Operations only
or	157.050	156.050	
81	157.075	161.675	Port Operations/Public Correspondence
22	157.100	161.700	Port Operations only
82	157.125	161.725	Port Operations/Public Correspondence
23	157.150	161.750	Public Correspondence only
or	157.150	156.150	
83	157.175	161.775	Public Correspondence only
or	157.175	156.175	
24	157.200	161.800	Public Correspondence
84	157.225	161.825	Port Operations/Public Correspondence
25	157.250	161.850	Public Correspondence
85	157.275	161.875	Public Correspondence
26	157.300	161.900	Public Correspondence
86	157.325	161.925	Public Correspondence
27	157.350	161.950	Public Correspondence
87	157.375	161.975	Public Correspondence
28	157.400	161.200	Public Correspondence
88	157.425	162.025	Public Correspondence
M1	157.850	157.850	Marinas
00	160.600	160.600	New Coastguard Private
?	161.275	161.275	Small Boat Alarms
M2	161.675	161.675	Marinas and yacht clubs

dxtv round-up

Ron Ham, Faraday, Greyfriars, Storrington, West Sussex RH20 4HE

Although, as you read this, another Sporadic-E season will have ended, it does not mean that Band I will have nothing to offer until the new season begins next May. None of us know what the forthcoming winter period has to offer, especially now with the current sunspot cycle on the wane. However, it's worth watching for short lived out-breaks of Sporadic-E or upper ionospheric disturbances ('F2') in the coming months. Both events can produce some fascinating television signals around 50MHz, so it's worth making daily checks on Chs. E2 (48.25MHz) and R1 (49.75MHz). But now we must look at the atmospheric happenings in June and July.

Band I

Long distance (DX) television pictures were received by **Lt. Col. Rana Roy** (Meerut, India), via Sporadic-E, on June 4, 6, 9, 16, 18-20 & 30. While those events were in progress he identified programmes and test-cards, often through multiple images, from China, the CIS and Dubai **Fig. 1**. At 1130 on the 6th, an ident at the bottom left of a film appeared to be in Chinese with a figure '2' in the top right-hand corner **Fig. 2** and an hour later Rana saw a CIS programme with the figure '1' in the lower right. Around 1940 on the 18th, on Ch. E4 (62.25MHz), "a number of Indian and foreign stations were fighting for predominance on the screen", said Rana, who also watched Arabic Teletext from Dubai on the 19th, 20th & 30th.

However, back in the UK, **Andrew Jackson** (Birkenhead) observed Sporadic-E openings daily from July 7-13 & 23-25 inclusive. His best day was the 20th when he identified pictures from Czechoslovakia (CST), the CIS, France (Canal+), Germany (ARD1), Hungary (MTV1), Italy ((RAI UNO), Norway (NRK), Spain (TVE), Sweden (SVT1), Switzerland (+PTT/SRG1) and Yugoslavia (TVB1). On the entertainment side he saw adverts from Italy and Spain on the 8th, cartoons from Spain on the 8th and 12th, *Murder She Wrote* from Italy on the 20th and 24th, music from the CIS on the 25th, Denmark on the 10th, Germany and Hungary on the 20th and Yugoslavia on the 24th. There was news from Czechoslovakia on the 20th and Yugoslavia on the 24th, swimming from Spain on the 8th, Teletext pages from Switzerland on the 20th plus a variety of test-cards.

In addition, from unidentified sources, he saw the letters 'RTC' on Ch. E3 (55.25MHz) and a film on Ch. R1 at 1445 and 1936 respectively on the 8th, a blank PM5544 test-card on Ch. E3 at noon on the 9th, the 'PTP' logo on Ch. R1, football on Ch. E2 and E3 between 1038 and 1106 on the 20th and ice-skating at 1857 on the 25th. To complete this fine haul he added the idents 'Bratislava' from Czechoslovakia and 'P6' from Yugoslavia during the morning of the 20th.

Signals from Austria (ORF) on Ch. E2a (49.75MHz) were picked-up by **Richard Gosnell** (Swindon) at 1756 on the 3rd. During the month he heard pulses on Chs. R1, R2 (59.25MHz) and R3 (77.25MHz) early on the 5th, E2 and R1 at 1755 on the 6th, R1 around 0915 on the 7th, 8th and 18th, R1 and R2 at 1709 on the 25th, E2 and E2a at 1739 on the 27th and E2 and R1 and R2 at 1750 on the 30th. A scanning receiver, with buttons pre-set to the vision frequencies of these channels, is a good early warning indicator for Sporadic-E. Another such device is a good Band II receiver because, the sound frequency for Ch. R4 is 91.75MHz and the vision and sound for R5 is 93.25 and 99.75MHz respectively.

John Woodcock (Basingstoke) received programmes and/or test cards from stations in Estonia on the 23rd, Norway on the 5th and 9th, Italy (RAI-Uno) on June 27 and 29 and July 5, Poland (TVP1) on June 27, Spain (TVE1) on June 24 and 25 and Sweden (Kanal 1-Sverige) on July 5.

As usual, there was a good haul of Sporadic-E DX from **Simon Hamer** (New Radnor). He identified signals from Romania (TVR) on the 2nd, Albania (RTSH), CIS on Chs. R1, R2, R3, R4 (85.25MHz) and R5 (93.25MHz), Greece (EPT1), Hungary (MTV1), Italy (RAI-Uno), Portugal (RTP1), Spain (TVE) and Yugoslavia (HTV) on the 4th, Denmark (DR), Finland (YLE1), Iceland (RUV), Norway (Televerket) and Sweden (SVT1) on the 5th, Austria (ORF), CIS, Germany (ARD1), Poland (TVP) and all Scandinavian countries on the 6th, Czechoslovakia (CST1), Finland, Iceland (RUV), Ireland (RTE1), Italy, Norway, Switzerland (+PTT/SRG1), Sweden and Yugoslavia on the 20th, Czechoslovakia on the 25th, Spain on the 26th and Albania, Czechoslovakia and CIS on the 27th.

In Great Sutton **Bob Brooks** took full advantage of the daily Sporadic-E activity from July 3 to 11, 16th and 20th to 31st. Spread across those days he received pictures from Czechoslovakia (CST), the CIS, Denmark, Finland, Germany, Iceland, Italy, Jordan (JTV), Norway, Spain and Sweden and, in addition to test-cards from most of them, he watched adverts from 'CST', cartoons, films and swimming from Spain, news from the CIS and Italy, Olympics from Italy and Norway and ballet, football and tennis from unidentified sources.

David Glenday (Arbroath) found Sporadic-E influencing Band I on days 5-7, 18, 20, 22, 25, 29 & 30. David's haul ranged from France to Scandinavia including such idents as Canal+, (France), LTV2 (Lithuania?), Mesager on Chs. R2 and R3 from an unidentified source and, the opening ceremony of the Olympics from Poland (TVP1).

Fig. 1: Dubai.

Fig. 2: China.

Picture Archives

Bob Brooks is a long-standing TVDXer and, as he often does, has sent photographs of three idents, one from Norway **Fig. 3** and two from Spain **Figs. 4 & 5**, that he has received in Band I between 1986 and 1991. Apart from the importance of capturing a moment in time, these past records can greatly assist our new readers.

While Rana Roy was tuning around Ch. E2 during a Sporadic-E opening at 1530 on May 8, the Dubai TV clock caption, **Fig. 6**, came up showing 1400, followed by their signature tune and an announcer. On the satellite front, **Peter De Jong** (Leiden, Holland) received Croatian TV from Zagreb **Fig. 7** and a test-card from Portugal (RTP) **Fig. 8**, via Eutelsat II-F3 on June 27 and an Asian caption, **Fig. 9**, via Astra 1D on July 9.

Weather

Rana Roy experienced, "very hot and humid weather" during the first week of July. Back here, in Norwich, "On the 20th, we had a massive electric storm," wrote **David Ashley** and continued, "The Tacolneston transmitter was hit by lightning...and part of our garden sunk eighteen inches after the soak-away did just that from the torrential rain." The slightly rounded atmospheric pressure readings for the period June 26 to July 25, **Fig. 14**, were taken at noon and midnight from the Short & Mason barograph sitting on the mantelpiece in my office at my home in Sussex. In July, I recorded 3.29in of rain, most of which fell during storms on the 3rd and 4th (1.20in) and the violent thunder storm on the 20th (1.35in). A possible water-spout was reported off Shoreham on the 4th and ball-lightning was seen near Lewes on the 20th. My hygrometer was showing 80% humidity for long periods between the 14th and 22nd.

Tropospheric

From his home in Meerut, Rana Roy, received pictures in Band III, between 0500 and 0945, from transmitters at Amritsar, Faisalabad, Jalandhar, Lahore, Marhi and Sialkot each day from June 10 to 15 and 22 to 30. He also logged evening transmissions from

Fig. 3: Norway.

Fig. 4: Spain.

Fig. 5: Spain.

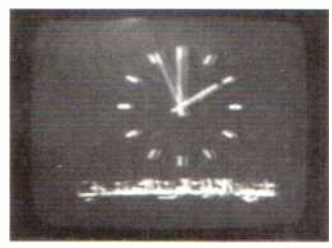


Fig. 6: Dubai.

Fig. 7: Zagrab, Croatia.

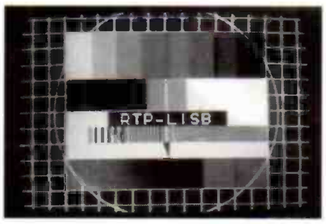


Fig. 8: Portugal, via Eutelsat-II.

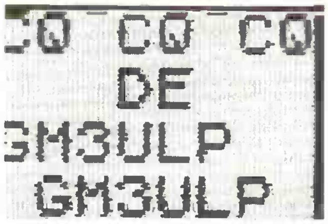


Fig. 11. SSTV. Scotland.

Fig. 12: Unidentified SSTV.

Fig. 13: Unidentified SSTV.

Fig. 9: TV Asia, via Astra 1D.

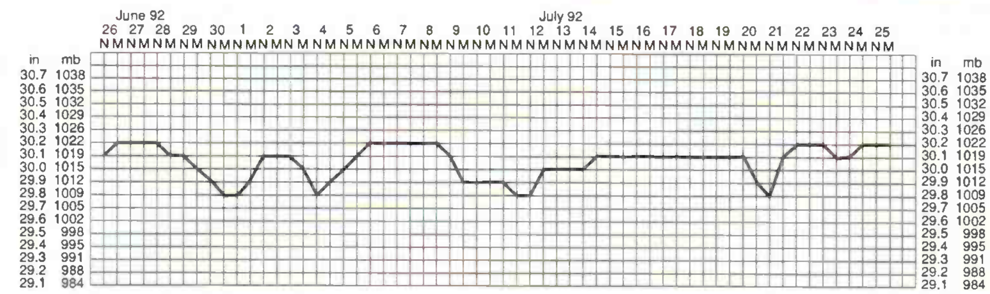


Fig. 14.

Fig. 10: Pakistan (tropo).

Amritsar, Faisalabad, Jalandhar and Marhi on days 21, 25, 27, 28 and 29. During one intense tropo-opening signals from two Pakistan stations could be seen 'floating' together, **Fig. 10**, on Ch. E5. Also, on the 29th, the 50kW station at Bhatinda over-lapped the low power station at Jammu on Ch. E12.

David Ashley found July an interesting and unusual month, "with strong DX at the beginning and end and not a lot in between." However, he logged Denmark, Germany and Holland on the 6th, Germany and Holland on the 7th, Holland on the 9th, 17th and 18th, Denmark and Holland on the 20th, Holland on the 21st and 22nd, Belgium, Denmark, Germany and Holland on the 23rd, France and Holland on the 24th, Belgium, Holland and Germany on the 25th, Holland on the 26th, Belgium, Germany, Holland and the UK (Central, Tyne-Tees & Yorkshire) on the 29th and the same, plus Denmark on the 30th and Belgium (BRT TV1 & 2 and Canal+), Denmark (TV2), Germany (ARD1 and N3), Holland and UK (Tyne-Tees) on the 31st.

During the opening on the 6th, David Glenday logged Denmark (DR) on three spots in Band III and Denmark (TV2), Germany (ARD1, NDR3, RTL+, SAT1 & ZDF) and Holland (NED1, 2 & 3) on the u.h.f. band. He also received u.h.f. signals from Belgium (BRT1 & 2) on the 29th, Denmark on the 1st, 2nd and 5th, Germany on the 2nd & 3rd and Holland predominantly on days 2, 3, 15, 29 and 31.

While in Laurencekirk on the 6th, **George Garden**, noted that the outermost ridge of "a high pressure system over the UK," was "just clipping the coastal areas of North-West Europe." Around 1000 he received colour pictures from the Black Hill transmitter in Central Scotland. Although the signals were subject to periods of deep fading, they remained there for most of the day.

During the same opening Simon Hamer received pictures from stations in Denmark (DR) and Germany (ARD1) in Band III and Belgium, Denmark (TV2), France, Germany (ARD1, NDR3, RTL+, SWF3, West 3 & ZDF), Holland and Ireland on the u.h.f. bands. Next day, on Band III, Andrew Jackson logged test-cards from Belgium's RTBF1 and BRT1 on Chs. E8 and E10 respectively and watched cycling on the former and a wildlife show on the latter. He also received signals from France on Ch. L5 and England, Border TV on Chs. 43 and 48. Recently, Andrew added a Jaybeam DY-10 antenna and new coaxial feeder to his station and quickly noticed a slight improvement in signals.

SSTV

Throughout July, **John Scott** (Glasgow) kept watch for slow-scan television signals on the v.h.f. and u.h.f. bands and was rewarded with a 'CQ' caption from GM3ULP, **Fig. 11**, on 144.50MHz. Although John found signals around 14.230MHz few and far between, he did copy an ident picture from Spain and a 'WANTED' label, **Fig. 12** and an attractive buildings scene, **Fig. 13**, from unidentified sources. The horizontal lines on the upper areas of **Figs. 12 & 13** were caused by interference.

info in orbit

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

July and August have seen METEOR 3-4 continue with its regular WEFAX transmissions on 137.30MHz both in sunlight and in the dark. Using a simple scanner, these powerful signals can be easily heard. METEOR 2-19 remained operating on 137.85MHz until around July 22 when, as expected, it was switched off. For those not fully aware of the vagaries of the satellites of the Commonwealth of Independent States (CIS - formerly Russia) the two polar orbiters METEORS 2-19 and 2-20 have been alternating their operations.

Like others in this series, their orbits are not sun-synchronous, so the plane of each orbit slowly rotates, relative to the night/day terminator. So the illumination of the solar panels on the satellites is always changing - increasing to a maximum and then reducing again, and so the ground controllers invariably change over to another WXSAT having an orbit that has, by then, moved into a more favourable position. METEOR 2-18 and earlier ones seem to have lost favour, so it was not a surprise to see METEOR 2-20 come back on around 1514UTC on July 21. This satellite was still showing faults seen before - missing phasing bars and grey scale. A few days later it was switched off, leaving no WXSAT using 137.85MHz. The MAGION 3 satellite still operates on this frequency, but of course it does not provide picture data.

So, for several days in August there was only one CIS WXSAT - METEOR 3-4, until 1345UTC on 10th when **Brian Dudman** of Harrow picked up the 137.40MHz tones of METEOR 3-3. Brian has been recording many of the overnight passes of METEOR 3-4 and has been very impressed with the clarity of the overnight infra-red pictures. For those using a scanner without picture decoding, you can hear the different tones of 3-4 when it transmits i.r. During summer nights as it goes near the poles it switches over to visible light and so there is a dramatic change in the sound of the signal.

Chinese WXSAT

Whilst browsing through Bulletin Board information sent to me by **Paul Wilson** of Macclesfield I was pleased to see a reference to an imminent launch of the third Chinese polar orbiting satellite FENGYUN 1-3. Previous years have seen two earlier attempts to operate FENGYUN satellites but unfortunately both became unstable after just a few weeks. This latest launch is anticipated during late August and so we must hope that all goes well.

Letters

Tim Norris G6FKY of London asked about copyright on the information received from the WXSATS. As I understand them, the rules are fairly clear - amateurs are freely able to receive pictures (and other types of information such as h.f. utility transmissions) but current data must not be sold or given to the media. So a picture of you with your super system showing the weather displayed on your computer (or whatever else you use) is perfectly OK.

The meteorological office and the European Space Agency have copyright but we are permitted to receive the data as described.

One or two correspondents have sent in lengthy letters full of interesting points and questions. Because of the general interest in some queries I shall cover more detailed answers in the column. I'm never quite sure how to respond to the question "Can you give me all the information that you have about WXSATS"(!) Even my forthcoming book cannot include everything that was collected over several years!

ICOM Modifications

A couple of months ago I mentioned the work of Ray Howgego who has modified his Icom R7000 to receive the WXSATS. Several readers showed interest in Ray's work and he has recently sent me some further information, this time on his antenna project. He has been experimenting with a modified form of the Lindenblad antenna design which he reports gives "quite spectacular results". I will try to produce Ray's most interesting diagram for next month's column.

Peter de Jong, a regular Dutch correspondent, has been using his satellite pictures to make a careful study of the weather circulation patterns over Europe as well as noting the operations of the various WXSATS. He also sent me some very attractive brochures from Space Exhibitions that he has visited, and a clear picture of Iceland (see **Fig. 1**) - many thanks Peter.

Rob Fulford of Exeter has set up a receiving system but finds that living near to Exeter Hospital causes severe interference, and he has paging interference as well! Its either change hobby or change address? **John Green** of Weybridge was staying in Indiana, USA and was able to visit the 92 Dayton Hamvention and attend the session on WXSATS. He described the fascinating talks given by many well-known American names, plus a brief talk by Dave Cawley from Timestep here in Britain. It seems that many of the meetings involved discussions on HRPT (high resolution imagery).

Computer Monitors

Des Thompson G8SBU of Exmouth is one of many writers who have asked for some information on monitors, and the types that can display satellite pictures. There are a number of types (standards) that have evolved during the last ten or so years. It is important to understand that the actual monitor is powered by a graphics card, usually situated inside the computer. The card and monitor must be fully compatible to display the best possible picture. It is often possible to 'upgrade' by purchasing a new card, fitted with more memory, which may be able to make better use of the monitor that you have. Similarly, you can 'upgrade' the monitor.

Fig. 1: Iceland; Meteor 2-20 April 1992 by Peter de Jong.

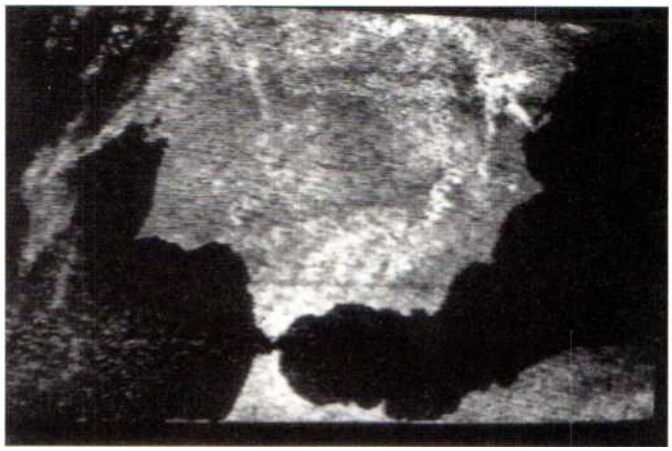


Fig. 2: Spain; NOAA 11 by Roger Ray.

Pixels: Each pixel (picture element) on a monitor is illuminated by an electron beam, and in a black-and-white monitor there is one beam per pixel. Colour monitors need three beams (red, green and blue) per pixel. The intensity of each beam must also be defined, and so the more pixels that are used to display a picture, the greater are the memory requirements of the card used to control the monitor. Such cards may have memories of between 256Kb and 1Mb RAM, and this memory is only used to hold pixel information and should not be confused with the program RAM which will generate the picture. The dimensions of the pixel (screen dot) should be about 0.3mm for the clearest pictures.

CGA: The CGA (Colour Graphics Adapter) was one of the earlier types, introduced in 1981 as an IBM standard. This adapter has a small choice of modes - 320 by 200 pixels, each pixel having one of four colours, or 640 by 200 pixels, each pixel having one of two colours. This type is unsuitable for satellite pictures. Some portable computers still use CGA monitors.

EGA: The EGA (Extended or Enhanced Graphics Adapter) originally supported 320 by 200 pixels, each then having one of 16 colours. Recent EGA cards provide 16 out of 64 colours at the higher resolution of 640 by 350 pixels. Modern WXSAT software really needs better than this for optimum results.

VGA: The VGA (Video or Versatile Graphics Array) provides a greater choice of 320 by 200 pixels with 256 colours, or 16 colours for 640 by 480 pixels, which is the full resolution. A choice of 256 colours implies a total of 64 grey levels (because each grey level consists of the three individual colours having identical intensities) and so for WXSAT purposes VGA normally means 64 grey levels.

SVGA: The SVGA (Super VGA) monitor is currently at the top end of the scale, although computer experts reading this will also be aware of yet further developments! SVGA offers 800 by 600 pixels, each of which can be illuminated by any one of 256 colours which are themselves selectable from a palette of 262144. Of course this does depend on the software allowing such choices. A satellite picture program does not really need to offer the same choices as an arts program! Some people also buy arts programs to further enhance their images.

Interlacing: Most desk top computers now come with SVGA monitors and the only remaining variables are the 'interlaced/non-interlaced' type and the amount of memory on the card. With so many pixels to display, the monitor has to handle vast amounts of data very quickly. It is expensive to design monitors to do this properly, and so 'tricks' are used! An interlaced monitor draws just half the screen (alternate lines) in one pass, and then interlaces (fills in) the remaining half on the next pass. Using this trick a monitor can show up to 1024 by 768 pixels, but the price of this 'trick' is that the picture will appear to flicker because your eye is not fully deceived. A non-interlaced monitor can display the full screen in every pass, but of course such monitors are more expensive. Good software may allow you to choose the display resolution for your satellite pictures.

Fig. 3: Middle East; METEOSAT by Pete Beardmore.

Fig. 4: Iceland METEOR 2-19 by Brian Dudman.

More Letters

Ashley Thomas of Chantry High School in Worcester sent me a colour print-out from the school's METEOSAT demonstration tape. I don't have any further details of their system, but for pictures submitted for publication it seems that black-and-white pictures reproduce rather better than colour prints. **Mick Baldwin** of Chatham has a Maplin receiver, decoder and framestore and requested some general information on WXSATS. I haven't had any reports from people operating a complete Maplin system so perhaps Mick could let us know how he progresses.

Peter Lee G4GEW was using a RIG framestore but has moved over to a PC running Timestep Weather System's PROsatII. He reports getting bands interfering with both METEOR and NOAA images. His description sounds like paging interference but it may be possible for Peter to have his receiver modified to minimise this. **Peter Beardmore** of Kettering has sent me some METEOSAT pictures after image manipulation with his computer. The laser printer gives excellent quality hardcopy and Pete's program allows him to scale the whole disk as required - see **Fig. 3.**

Bulletin Boards

Several UK and foreign readers have requested a listing of BBS. RIG and Timestep operate a BBS containing the latest Kepler elements for the WXSATS. It is on 0440-820002. The Prometheus system, set up by Barry Spencer, now includes radio astronomy, rockets and Kepler elements - courtesy AMSAT-UK. To use the system you need a terminal/micro running the Viewdata emulation and the number is 081-300-7177. For American readers (or wealthy British ones) the American Celestial Bulletin Board carries the most recent Kepler orbital elements from the NORAD two-line element sets. Documentation and tracking software are also available. It may be accessed 24 hours/day at 300, 1200, 2400, 4800, or 9600 bps using 8 data bits, 1 stop bit, no parity.

New METEOSAT Schedule

As mentioned last month new schedules came into operation on 1 August for both METEOSAT 3 and 4. The changes to the schedules for 4 were minimal, the main change being the transmission of some more primary data imagery obtained by METEOSAT 3. Test transmissions had been going on for some weeks; I noticed pictures being transmitted when none were scheduled, though I was initially confused because the visible imagery was sent reversed! It appeared to be water vapour images showing a 'phase', rather like the crescent moon! Because water vapour images are whole disk (like the infra-red images) I could not identify them until I tried the inverse option on the software, and then all was revealed.

METEOSAT 3

The changes to the transmission schedule were so major that regular monitors need to contact the operators - see the address given last month. The following details will enable monitors to identify a number of picture transmissions. From 0014 to 0030UTC a sequence of the main infra-red images (L1D to L4D) is broadcast and this sequence repeats every three hours. From 0214 to 0230UTC a further sequence of infra-red and/or visible images (L1D to L4D becoming L1D to L4C) is broadcast and repeated every three hours. For those not too familiar with this terminology, the whole disk is divided into six main sectors (numbered suitably!). The L refers to the Lannion ground station, D means infra-red (or thermal image) and C means a visible image. Another sequence of transmissions occurs at 42 minutes past most hours, but these contain varying images according to the time of day.

Primary Data Systems

Although few people have Primary Data systems I propose to include an occasional piece on what is going on in this field because I do receive calls from people requesting descriptions of the images and hardware. Basically, WEFAX and Primary Data both originate from every scan of METEOSAT. The high resolution data is transmitted for PDUS system reception requiring very high specification hardware, and a degraded picture is transmitted as WEFAX. As far as I know, the Timestep PDUS unit remains the only one available at levels approaching hobbyist prices.

Several people have acquired or built Primary Data User Systems and so I welcome any reports from such users. However, our WEFAX reports will remain the mainstay of the column. The high resolution, full disk images from METEOSAT 4 are broadcast once per day at 1130UTC and they allow an examination of the drought areas in the continent of South Africa, and reveal what seem to be several examples of dried up river beds. The whole disk images obtained from METEOSAT 3 and retransmitted once per three hours also show surprisingly clear views of much of the Amazonian river and its tributaries. I suspect that the images actually transmitted by METEOSAT 3 itself may be more detailed than the ones re-transmitted by METEOSAT 4.

GOES Goes

As mentioned a couple of months ago, GOES 2 has now been drifted further westwards from its former position near the western horizon as seen from the UK and it is now out of our reception range. GOES 2 is classed as a Stand-by spacecraft and will arrive at its new position of 137°W around September 25. As of early August it had reached 82°W. It will not be used for WEFAX transmissions when it arrives on site, but will be used for other data transfer purposes.

American Monitors

SWM has a world-wide circulation and there are groups of American amateurs collecting imagery from some of the geostationary WXSATS who might read this column, as well as the magazines published in the USA. The Americans have easy access to both GOES east (currently GOES-7 from position 111°W) and west transmissions (from GOES 6 at 130°W) as well as those from METEOSAT 3, currently located at 50°W, but due to be moved to 75°W in 1993.

Kepler Elements

Print-outs of the latest elements are available - just send me an s.a.e. All currently active weather satellites are included, together with their normal transmission frequencies. This data originates from NASA.

Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz
NOAAs 10, 12 on 137.50MHz
METEOR 2-19 or 2-20 on 137.85MHz
METEOR 3-4 or 3-5 on 137.30MHz
METEOR 3-3 on 137.40MHz
FENGYUN 1-3 possible 137.80 or 137.04MHz

decode

Mike Richards G4WNC
200 Christchurch Road, Ringwood, Hants BH24 3AS.

Alan France of Shrewsbury has been included in my Pen Pal section, but also has a query that I'll answer here. Having just got started on the more complex modes he's unsure of the meaning of some of the terms. Examples he quotes are: betas, sync, phasing and idles. Well, these are all terms associated with error correcting modes such as SITOR.

One of the main difference between these modes and simple RTTY is that they are synchronous transmissions. In simple terms, this means that they always have to send some form of data, even when there's no message to send. Because of this, the code used has some extra characters added. These, not surprisingly, are called idles because they are sent when the station is idling! The specific idle character that's sent to fill the gaps is called a beta. So when a station is idling, some operators would say it's sending idles whilst others may say the signal's all betas.

The term sync is an abbreviation for synchronisation and describes the process SITOR stations have to go through at the beginning of a transmission. Because the SITOR system operates by having two stations locked together, messages can't be sent until this lock or synchronisation is complete. To achieve synchronisation, the originating station sends a special phasing signal.

Finally, RQ is the name given to the signal that's used to request the re-transmission of lost information.

Paul Charlton is a regular contributor and has recently come up against an interference problem with his computer. From his description of the problem, it seems that computer generated noise is being picked-up by the feed from his long wire antenna. The solution is to use a coaxial feeder for the lead-in. By far the best way to achieve this is using the Magnetic Long Wire Balun from Lowe Electronics. This neat, though expensive, piece of kit has proved to be very effective in solving this type of interference problem. The latest price I have is £36.00 including VAT, but see Lowe's advert for more details.

Continuing on the subject of interference, **Mark Pepper** of Camberley has been working on curing his own interference problems. The solution came when he fitted a coil and capacitor in the audio lead between his receiver and computer. The details of this modified lead are shown in **Fig. 1** for those who may wish to experiment. One important point to note is that there is no direct connection between the screen of the receiver cable and that of the computer. This may well be the clue to its success.

Robert Hall of Capetown RSA is a well-known utility listener and has written with a question. It concerns the SAAM Molodezhnaya station on 18.4884MHz. This station used to transmit regular FAX broadcasts, but has now changed to a RTTY mode. Robert has tried analysing the signal with his M-7000 decoder and it appears to be ARQ-S4. Can anyone out there verify this or supply any additional information.

Gerry Calder of Eastleigh is also seeking help with station identity. He has discovered a batch of frequencies that he's unable to decode. The frequencies in question are: 4.331, 6.440, 6.489, 6.756, 7.647 & 8.315MHz. I analysed these with the Code-3 and they all show-up as 75 baud signals with a shift of 850Hz. One of the odd characteristics of these signals is the occasional long marks. Having refered to the Hoka tape of Strange RTTY Signals, the signals are most likely to be NATO encrypted broadcasts with pseudo random keying. If you have any further information, please drop me a line with the details.

Jim Richardson of Fife currently uses a Lowe HF-125 receiver for his utility monitoring. For decoding he uses the impressive Spectrum FAX system from Technical Software driving a Citizen 120D+ printer. One of his favourite broadcasts is the GOES satellite images that are sent from Virginia via Keflavik in Iceland on 9.318MHz. I've shown one of Jim's GOES images on page 62.

Another regular contributor to 'Decode' is **Tony Leavesley** of York. As he lives in a listed building in the centre of the city, he had all manner of problems setting-up an effective station. In addition to all the restrictions of living in a listed building, Tony was surrounded by man-made interference. The final solution was to buy the NRD-535D receiver and erect an assortment of antennas. These include a Datong AD270 active antenna, a 30m long wire and a 20m loft mounted long wire. The long wire antennas are fed using the Lowe Magnetic Long Wire Balun. Tony reports that this balun proved to be very effective in reducing the local interference. He has also found the noise blankers on the NRD-535 to be extremely effective. For decoding, Tony's station is extremely well equipped featuring Hoka Code-3, Comar PC HFFAX, Comar PC SWL, ICS PK-232 + PC Pakrat II, G4BMK Multyterm, ERA Microreader and ICS FAX-1! Incidentally, Tony uses a Canon bubblejet printer with his FAX-1 to give very good results. The only problem is that it's slower than a matrix printer and only accepts sheet paper.

Beginners Frequency List

I have been aware, for a while, that there's a need for a specialised frequency list that's customised for beginners. The only problem I've had is finding time to put one together. Fortunately, **Day Watson** of Clevedon had realised the need for this type of list and has put a lot of effort into compiling and editing the necessary data. Day has kindly submitted this list to me and, after some minor processing, it's now ready for despatch. One of the main differences between this list and the more conventional frequency lists, is the presentation style. Instead of the list being sorted in frequency order, it's arranged in chronological groups. This has been done to overcome one of the most common complaints I hear about frequency lists. Beginners are often very dissappointed when they find that most of the vast range of frequencies in their lists are inactive. The idea with the beginners list is that you first of all decide when you're going to listen, then look up the stations that are active at that time. I know it seems logical, but the only list I know of that attempts this, is the chronological list of press stations in the Klingenfuss Guide. The list Day has created is divided into four main groups - morning, mid-afternoon, late afternoon and finally early evening and late evening. Within each section, the stations are listed in one hour groups. Defining the list to this level gives the newcomer the best possible chance of finding active stations. In addition to the basic list, Day has put together some useful notes about the stations and their operational practice. The final section of the list contains a concise introduction to the way ARQ modes A and B are used by the maritime services. If you would like a copy of this list, just send three first or second class stamps to the address at the head of the column. I think we all owe Day Watson a vote of thanks for his work in producing this invaluable list.

Arabic Decoding

Following my hearing that activity had been noted on TASS frequencies, I set about monitoring all the old frequencies for more information. There were several with carriers up and I finally managed to catch a transmission from the station on 14.7MHz. The only snag was that, although my Code-3 system confirmed that the signal was definitely RTTY, the screen print was jibberish. As I've had letters from some of you asking why this happens, I thought I'd take this opportunity to explain. In this case I needed to decode the data in order to identify station. Once I'd confirmed that the station was sending genuine RTTY, I had my suspicions that the broadcast was in a language other than English. I then needed to set about establishing exactly what language was being used and find a way to interpret it. To give you an idea of the type of jibberish I was receiving, here's an extract: tb&#6nnnnzczcgggg(((15 # vxybi tvcdc,# kqd% lrcr% ihrbr 49#2# tb&00 xqe iynbm)vxybi tvcdc, f: kqdo@ vobxh% gzy% vo: drnjb.....

As you can see, it didn't make a lot of sense! A clue to the fact that it's real RTTY is in the characters group nnnnzczc. The first part (nnnn) is a standard end of message code while (zczc) is used to mark the start of a message. So you can see this is a good point to start examining the signal as it marks the end of one message and the start of another. Having established this important point we now need to establish the language in use. This potentially difficult problem is eased by the Klingenfuss *Radioteletype Code Manual*. This invaluable little book includes sections that describe the various telegraph alphabets in great detail. With these codes, Arabic and Cyrillic characters replace the normal Latin characters that we normally use.

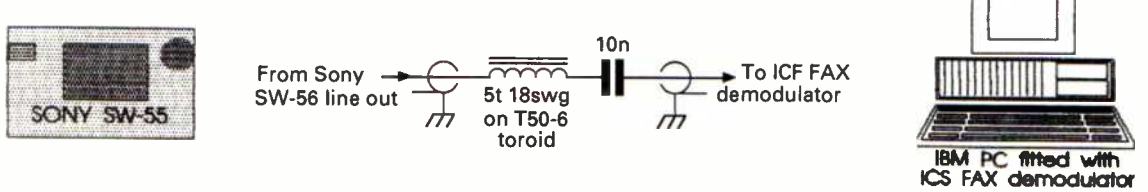


Fig. 1.

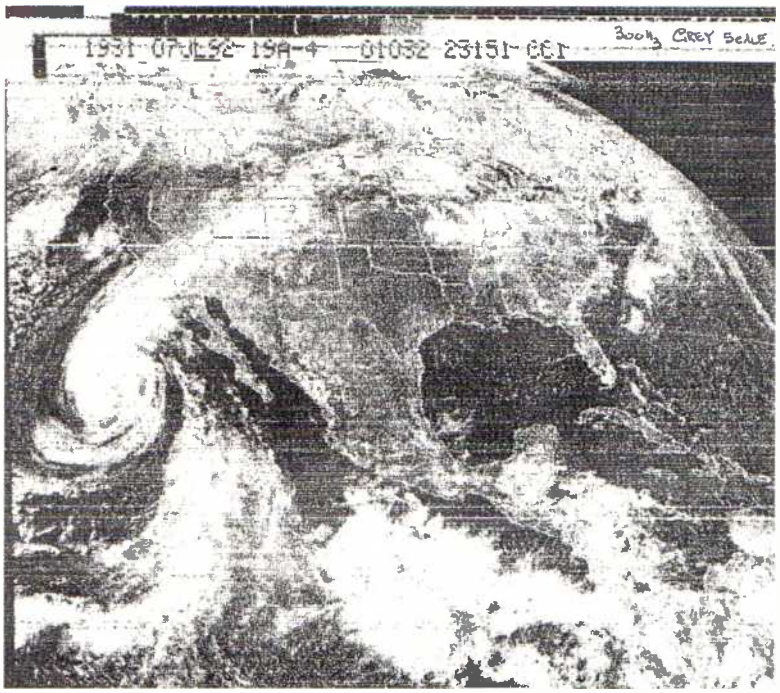


Fig. 2. GOES image from Jim Richardson.

With the Cyrillic alphabet there is an additional complication as the standard RTTY five unit code doesn't have enough combinations to handle the number of characters in the Cyrillic alphabet. The solution is to have a third shift, the code being known, fairly obviously, as third shift Cyrillic. Those who are familiar with some of the basics of RTTY will know that English transmissions use just two shifts to cover the alphabet - figure shift and letter shift. This means that every received character has one of two possible meanings. The precise interpretation being dependant on the last shift character. With Cyrillic there are three shift characters and so three possible interpretations of each received character.

Moving on to try and identify the language used in our example, I started by checking out the introductory notes for each section of the Code Manual. These provide some vital hints for identifying the language. For example the third shift Cyrillic section points out that when receiving this system with a conventional decoder, you will only receive letters with no figures. This simple gem of information immediately eliminates Cyrillic as the language in our example. My next choice was to check the notes for Arabic, as this is another common language on h.f. RTTY. The most significant information was that when receiving Arabic on a standard decoding system, a large proportion of the words would start with v. Another point was that figure shift characters would appear mainly at the end of words. This is because most of the letters represented by figure shift characters are naturally placed at the end of Arabic words.

The final strong clue came from the fact that underlinings and dashes are sent as xxxxxx. Although not appearing in the extract I showed earlier, there were several of these groups in other parts of the message. At this point I was feeling quite confident that I was dealing with a standard Arabic RTTY transmission, originating somewhere in the Middle East. It was here that the *Radioteletype Manual* really came into its own. The final section of the Arabic chapter contains a glossary of English translations of commonly used Arabic words. From this I was able to check through my received message and find matching words. When carrying out this exercise there are a few points to watch out for. Probably the most confusing is the way some of the punctuation symbols are displayed on your screen or printer. An example of this is the ! and # characters. My printer output these as % and _ respectively. This is not too much of a problem, providing you know about it! Just to give you a practical example of how the decoding works here's a sample from the signal in question. Signal: vlmbjcy vabry% f: #29# zibe 7419

Translation: Republic presidency of 18 February 1963. Good isn't it? All you do is look-up the received text in the Klingenfuss tables and write down the English translation. However, I ought to explain how numbers are sent and, more particularly, how 7419 in this example becomes 1963! It's actually very simple, first you have to read the numbers right to left, as with all Arabic text. So 7419 becomes 9147. The next step is to compliment the numbers by subtracting them from 10, so giving 1963 - easy when you know how! Here are a few more key words that I was able to decipher.

ymab = Ramadan
vo: = which
vhyic! = Arabic
vuty! = outbreak

If, like me, you find this are of decoding fascinating, you could try building your own look-up tables. The way to do this is to find a press station that broadcasts in two languages. In many cases the two broadcasts will be largely the same. A good station to try is MENA in Cairo. They broadcast in Arabic on 5.22, 10.15 and 15.845MHz with English and French on 15.935MHz. In order to make your list as accurate as possible you'll have to store and compare a lot of broadcasts. For all the computer enthusiasts out there, processing the received data could be speeded-up considerably with the aid of a simple computer program. If you've developed one, I'd be very interested to hear about it. What never fails to amaze me, with this form of decoding, is just how much of a foreign language broadcast can be decoded into some form of comprehensible detail.

Pen Pals

Regular readers may remember I suggested that it might be useful to have a pen pal section in the column. The object being to put people in contact who are using similar equipment. This should help listeners to get the best out of their equipment by encouraging the exchange of ideas. The first to take me up on this offer is **Alan France** of Shrewsbury. He has recently set himself up with a Wavecom 4010 decoder and is busy learning how to use to get the best from it. In order to protect Alan's privacy, could you direct your letters to me. I will then collate them and pass them on to Alan. If you would like to join-in and swap ideas with people running similar equipment to yourself, just drop me a line and I'll do the rest. Just a word of warning, if I'm inundated with letters, you may have to wait a while for a response.

Frequency List

You'll all no doubt be pleased to hear that I've recently overhauled my main frequency list. If you would like a copy, just send three first or second class stamps to the address at the head of the column. This month's frequency list follows the standard format of: frequency, mode, speed, shift, callsign, time and notes. My thanks to the following who have contributed to this list: **John Coucher, Lee Williams,** Paul Charlton, Robert Hall and Day Watson.

4.212MHz, FEC, 100, 170, -, 2105, St Lys Nav info
5.112MHz, RTTY, 75, 400, 4OC3, 2117, Belgrade press
6.307MHz, RTTY, 50, 170, -, 2100, Russian
6.759MHz, c.w., -, -, -, 2103, unid WX data
6.842MHz, RTTY, 75, 400, -, 2025, 5 letter groups
6.901MHz, FEC, 100, 170, -, 2100, Irish Navy?
6.972MHz, RTTY, 50, 400, YOG59, 2200, Rompress
7.5915MHz, RTTY, 50, 400, FDY, 2030, Tanjug - French
7.69MHz, RTTY, 50, 400, TUH, 2132, Abidjan Air
7.915MHz, RTTY, 50, 400, -, 2127, Spanish News
8.537MHz, c.w. -, -, -, 2000, Athens Radio
10.2154MHz, RTTY, 100, 800, HZN46, 1955, Jeddah met
10.5139MHz, 50, 400, -, 2020, Swiss Radio Int
10.685MHz, RTTY, 50, 400, -, 1300, Bracknell Met
11.1317MHz, RTTY, 50, 400, -, 1530, Xinhua French
12.148MHz, FEC, 100, 170, -, 2000, Warsaw gen info
12.2145MHz, RTTY, 100, 400, _, 0817, Czech Diplomatic service
12.2272MHz, RTTY, 75, 400, - 1400, Xinhua
13.8171MHz, RTTY, 72, 850, CXR, 1158, Montevideo Naval
14.9105MHz, RTTY, 75, 400, -, 1430, Yugoslav embassy
14.93MHz, RTTY, 50, 400, -, 1200, APS
14.9891MHz, ARQ-342, 96, 400, TNL77, 1130, AFTN Brazzaville
15.705MHz, RTTY, 50, 400, YZJ6, 1219, Tanjug Belgrade
18.0538MHz, RTTY, 75, 400, -, 1250, TANJUG
18.1737MHz, RTTY, 50, 400, STK, 1525, Khartoum Air
18.5975MHz, ARQ, 100, 170, -, 1324, Spanish Embassy
18.710MHz, FAX, 120, 576, RIZ59, 1330, Moscow Met

long medium & short

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

At this years World Administrative Conference (WARC) it was decided to allocate a band of frequencies to the Broadcasting Satellite Service-Sound (BSS-Sound). They will carry international sound broadcasts to listeners within the footprint of a satellite. The use of Digital Audio Broadcasting (DAB) techniques will result in high-fidelity sound.

The launch of the first satellite, to be known as AfriStar-1, is planned for 1995. Receivers capable of decoding the DAB satellite signals will be produced and marketed under the name Starman. Provided they are inexpensive this could be the mode of the future!

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during the four week period ending July 31.

The conditions that enabled R.Monte Carlo's broadcasts via Roumoules on 216kHz to reach Canada at 0300UTC on June 2 were not evident during July. Despite diligent searching at night, **Alan Roberts** (Quebec) was unable to detect any trace of l.w.transatlantic signals. Nevertheless, he is continuing to check the band.

Many l.w. stations in Europe were noted in the UK reports. **Scott Caldwell** (Warrington) checked the band after dark and he heard, for the first time, Konstantinow, Poland on 225 (2000kW) rated 54555 at 2345.

Medium Wave Reports

In his search for a good location for m.w. transatlantic DXing, **Sid Morris** (Rowley Regis) decided to try Walbury Hill in Berkshire, which is approx 310m a.s.l. It is not known if the propagation conditions were favourable on July 4, but only one Canadian and one USA station were heard. At 0145 he picked up CKCM in Grand Falls, NF on 620kHz, their signal rated SIO344. Later, he logged WKNR Cleveland, OH 1220 as SIO434 at 0225.

In Congleton, **Tim Bucknall** commenced his listening watch before midnight. At 2356 he heard a broadcast on 1610 that may have originated from the Caribbean Beacon, Anguilla, but no ident could be obtained. An unidentified signal was also heard on 1220 at 0009. CJYQ in St.John's, NF on 930, which is often used by DXers as a pointer to conditions, became clearly audible at 0036. Later, weak signals were heard on 1210 at 0043; also on 590 at 0055, possibly from VOCM in St.John's, NF.

The broadcasts from CJYQ on 930 were also heard at 0035 by **Jim Willett** in Grimsby. He rated their signal SIO333. It was not until 0125 that the first signal from the USA became audible, it was WINS in New York on 1010. Later, he logged CKCM in Grand Falls, NF 620 at 0210; WNEW in New York 1130 at 0320; also CHAM in Hamilton, ON 820 at 0350, all SIO222.

Good reception from stations in N.Africa and S.Europe was noted after dark by **George Millmore** in Wootton. He heard for the first time Venezia, Italy on 963 (20kW) rating it SIO333. He also found reception good from the north and was surprised by the SIO545 signal at 2230 from BBC R.Scotland on 810, which is shared by Westerglen (100kW), Burghead (100kW) and Redmoss (5kW). In contrast, reception from E.Europe were mostly poor.

Whilst checking the m.w. local radio scene in E.Grinstead, **John Wells** has noticed that ILR Tendring R. (Essex) on 1557, which adopted the name 'Mellow 1557', now uses the slogan 'Action 1557'. John has obtained from BBC Engineering some information on the closure of their m.w. outlets: R.WM 828, GMR 1458 and R.WM 1458 will close by October '92. GLR 1458 by October '93. The following may close on a date to be agreed: R.Essex 729, R.Hereford & Worcester 738, R.Sheffield 1035, Wiltshire Sound 1332 & 1368, R.Stoke-on-Trent 1503. All Radio 1 m.w. outlets will close by late 1993.

Medium Wave Chart

Freq kHz	Station	Country	Power kW	Listener
520	Hof-Saale	Germany	0.2	I*
531	Ain Beida	Algeria	600	J*
531	Leipzig	Germany	100	I*,L*
540	BRT-2 Wavre	Belgium	150/50	B,C,I*,J,L,O,P*
540	Sidi Bennour	Morocco	600	J*
549	Les Trembles	Algeria	600	I*,J*
549	DLF Bayreuth	Germany	200	B,C,D*,I*,J*,L
558	Valencia	Spain	20	I*,J*
567	Berlin	Germany	100	I*
567	RTE-1 Tullamore	Ireland (S)	500	B,C,D,J*,L,N,O
576	Stuttgart	Germany	500	I*,J*,L*
585	FIP Paris	France	8	B,I*,J*
585	RNE-1 Madrid	Spain	200	E*,I*,J*,O*
585	Gafsa	Tunisia	350	J*
594	Frankfurt	Germany	1000/400	B,I*,J*,L*
594	Oujda-1	Morocco	100	J*
594	Muge	Portugal	100	I*,J*
603	Sevilla	Spain	20	J*
603	BBC-R4 Newcastle	UK	2	B,E,I*,N
612	RTE-2 Athlone	Ireland (S)	100	B,E,J,L,N
612	Lerida	Spain	10	I*
612	Tallinn	Estonia	100	J*
621	RTBF-1 Wavre	Belgium	80	B,C,I*,J*,L*,O
630	Vigra	Norway	100	I*
630	Tunis-Djedeida	Tunisia	600	J*
639	Praha	Czechoslovakia	1500	I*
639	La Coruna	Spain	100	B,D*,E*,I*,J*
648	BBC Orfordness	UK	500	B,I*,J,L,O,P*,Q
657	Burg	Germany	250	I*
657	RCE-2 Madrid	Spain	20	J*
657	BBC-R.Wales	UK	2	E,I*,L
666	Bodenseesender	Germany	300/180	I*,L*
666	Lisboa	Portugal	135	J*
666	R.Vilnius	Lithuania	500	A*
675	Marseille	France	600	D*,I*
675	Hilversum-3 Lopic	Holland	120	B,C,G,J,L,O,P
684	RNE-1 Sevilla	Spain	250	D*,E*,I*,J*,L
684	Beograd	Yugoslavia	2000	G*
693	Berlin	Germany	250	I*
693	BBC-R5 Droitwich	UK	150	L,O,P
702	Aachen/Flensburg	Germany	5	I*
702	Monte Carlo	Monaco	300	I*
711	Rennes 1	France	300	B,D*,E*,I*,J,L,O
711	Laayoune	Morocco	600	J*
720	BBC-R4	Ireland (N)	10	E
720	Norte	Portugal	100	I*,J*
720	BBC-R4 London	UK	0.5	B,J
729	Leipzig	Germany	5	I*
729	RTE-1 Cork	Ireland (S)	10	B,E*,I*,J*,L
729	Oviedo	Spain	50	E*,I*,J*
738	Paris	France	4	J
738	Poznan	Poland	300	J*
738	RNE-1 Barcelona	Spain	250	E*,I*,J*
747	Hilversum-2 Flevo	Holland	400	B,C,D,G,I*,J,L,M,O,P
747	Gobabis	Namibia	100	F*
756	Brunswick	Germany	800/200	B,I*,J*,P*
756	BBC-R4 Redruth	UK	2	J
765	Sottens	Switzerland	500	B,I*,J*
774	BBC-R4 Enniskillen	Ireland (N)	1	I*,N
774	RNE-1 S.Sebastian	Spain	60	B,I*,J*
783	Burg	Germany	1000	B,I*,J*,L*
783	R.Porto, Miramar	Portugal	100	I*
792	Limoges	France	300	I*
792	Sevilla	Spain	20	E*,I*,J*
801	Burgos	Spain	10	I*,J*
810	SER Madrid	Spain	20	I*
810	BBC-Scot.	UK	100	B,E,I,J,L,N,P
819	Sud-Radio	Andorra	900	B
819	Bordeaux	France	20	I*
819	San Sebastian	Spain	5	J*
828	SER Barcelona	Spain	20	E*,I*
837	Nancy	France	200	C*,I*
837	R.Popular, Sevilla	Spain	10	E*,I*,J*
846	Rome	Italy	540	E*,I*,J*,L
855	Murcia	Spain	125	E*,I*,J*,L
864	Paris	France	300	B,E*,J,O
864	RNE-1	Spain	10	G*,I*
873	AFN via Frankfurt	Germany	150	G*,I*,J*,L,Q
873	Zaragoza	Spain	20	E*,J*
873	R.Ulster	UK	1	I*
882	COPE Malaga	Spain	5	I*
882	BBC-Wales	UK	100	B,D,E,G,I*,J,L,N,O
891	Algiers	Algeria	600/300	D*,G*,I*,J*,L*
891	Hutsberg	Holland	20	J
900	Milan	Italy	600	A*,D*,E*,I*
909	BBC-R5	UK	140	B,L
909	BBC-R5	UK	200	D
918	R.Intercont.	Spain	20	E*,I*,J*
927	BRT-1 Wolvertem	Belgium	300	B,C,E*,I*,J,L,O
936	Bremen	Germany	100	I*,L*
936	Venezia	Italy	20	J*
936	SER Lerida	Spain	2	I*
945	Toulouse	France	300	E*,I*,J*
954	Dobrochov	Czechoslovakia	400	I*
954	RCE Madrid	Spain	20	G*,J*
963	Sofia	Bulgaria	150	I*
963	Pori	Finland	600	G*,I*,J*,K*,L
963	Paris	France	8	J*
972	R.Botswana	Botswana	50	F*
972	Hamburg	Germany	300	B,D*,I*,J*,L*
972	Nikolayev	Ukraine	500	E*
981	Alger	Algeria	600/300	E*,J*
990	Berlin	Germany	300	I*
990	SER R.Bilbao	Spain	10	E*,I*
990	BBC-Tywyn	UK	1	B,E
999	R.Popular, Madrid	Spain	20	E,I*
1008	Hilversum-5 Flevo	Holland	400	B,E*,G,I*,J,L,M,O
1008	Malaga	Spain	?	J*
1017	Rheinsender	Germany	600	I*,J*,L*
1017	RNE-5 Burgos	Spain	5	I*
1026	Graz-Dobl	Austria	100	I*
1035	Prog.3 Lisbon	Portugal	120	I*,J*
1044	Dresden	Germany	250	I*,J*
1044	Sebaa-Aioun	Morocco	300	J*
1044	San Sebastian	Spain	10	I*
1053	COPE Zarogoza	Spain	10	I*
1053	BBC-R1 Droitwich	Uk	150	L,N,O
1062	Kalundborg	Denmark	250	E*,I*,J
1071	Brest	France	20	B,I*,J
1071	Lille	France	40	O
1080	Katowice	Poland	1500	I*,J*
1089	BBC-R1	UK	150	L
1089	BBC-R1	UK	50	B
1098	Nitra	Czechoslovakia	1500	J*
1098	RNE-5	Spain	10	I*
1107	AFN via Munich	Germany	40	I*
1107	RNE-5 Barcelona	Spain	20	I*
1107	BBC-R1 Wallasey	UK	0.5	E
1116	SER-Pontevedra	Spain	2	I*
1125	La Louviere	Belgium	20	I*,J,O
1125	RNE 5	Spain	10	J*
1125	BBC	UK	1	B,E
1134	Valencia	Spain	10	J*
1134	Zadar	Yugoslavia	1200	G*,I*,L
1143	AFN via Stuttgart	Germany	10	D*,I*
1143	Messina	Italy	6	J*
1143	Kaliningrad	Russia	150	I*
1161	Stara Zagora	Bulgaria	500	I*
1161	Strasbourg (F.Int)	France	200	L
1179	Santiago	Spain	10	I*
1179	Solvesborg	Sweden	600	B,D*,E*,I*,J*,L,O*
1188	Kuurne	Belgium	5	B,I*,J,O
1197	VOA via Munich	Germany	300	I*
1197	Vitoria	Spain	5	J*
1206	Bordeaux	France	100	E*,I*
1206	Wroclaw	Poland	200	J*
1215	Kaliningrad	Russia	500	I*
1215	COPE Castellon	Spain	2	I*
1224	Vidin	Bulgaria	500	I*
1233	Melnik	Czechoslovakia	400	I*
1251	Marcali	Hungary	500	I*
1251	Huisberg	Netherlands	10	I*
1260	Valencia	Spain	20	I*,J*
1269	Neuminster	Germany	600	D*,E*,G,I*,J*,L
1278	RTE-2 Dublin/Cork	Ireland (S)	10	A*,B,E,I*,J*,L
1287	Litomysl/Libice	Czechoslovakia	300/200	I*,J*
1296	San Sebastian	Spain	5	I*
1296	BBC Orfordness	UK	500	I*,J
1305	Rzeszow	Poland	100	I*
1305	Orense (RNE5)	Spain	5	I*
1314	Kvitsoy	Norway	1200	C,I*,J*,L,M
1323	R.Moscow	Germany	150	I*
1332	Rome	Italy	300	I*,J*
1341	BBC-Ulst.	Ireland (N)	100	B,E,J*,L
1350	Nancy/Nice	France	100	I*,J*,L
1359	Berlin	Germany	250/100	I*
1368	Manx Radio	IOM	20	E,I*,N
1377	Lille	France	300	B,C,D*,I*,J,O
1386	Kaliningrad	Russia	500	I*,J*,L
1395	R.Tirana	Albania	1000	I*,J*,L
1404	Brest	France	20	B,I*,J*
1413	RCE Zaragoza	Spain	20	I*,J*
1422	Heusweiler	Germany	1200/600	D*,I*,J*,L*
1431	Dresden	Germany	250	I*
1440	RTL Marnach	Luxembourg	1200	H,I*,J
1449	Berlin	Germany	5	I*
1449	BBC-R4 Redmoss	UK	2	I*,N
1467	TWR Monte Carlo	Monaco	1000/400	G*,I*,J*,L,Q*
1476	Wien-Bisamberg	Austria	600	I*,J*,L
1494	Clermont-Ferrand	France	20	I*,J*
1494	St.Petersburg	Russia	1000	I*
1503	Stargard	Poland	300	I*,J*
1512	BRT Wolvertem	Belgium	600	D*,G*,I*,J,L,O
1521	Kosice	Czechoslovakia	600	G*,I*,J*
1530	Vatican R	Italy	150/450	G,I*,J*,P*
1539	Mainflingen	Germany	700	D*,I*,J*,L
1557	Nice	France	300	I*
1566	Samen	Switzerland	300	I*
1575	Burg	Germany	250	I*,J*,L
1593	Langenberg	Germany	400/800	B,C,D*,I*,J*,L*,P*
1602	SER R.Cartagena	Spain	2	I*
1611	Vatican R	Italy	5	I*,P*

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

Listeners:
A: Leo Barr, Sunderland.
B: Darren Beasley, Bridgwater.
C: Vera Brindley, Woodhall Spa.
D: Scott Caldwell, Warrington.
E: Ron Galliers, N.Wales.
F: P.R.Guruprasad, Swartruggens, S.Africa.
G: Sheila Hughes, Morden.
H: Rhoderick Illman, Oxted.
I: Eddie McKeown, Newry.
J: George Millmore, Wootton IOW.
K: Ken Milne, Basingstoke.
L: Sid Morris, Rowley Regis.
M: Harry Richards, Barton-on-Humber.
N: Tom Smyth, Co.Fermanagh.
O: Phil Townsend, E.London.
P: Ted Walden-Vincent, Gt.Yarmouth.
Q: Michael Williams, Redhill.

long medium & short

Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R.	I	7.50	B,D,H*,K,L,O,P,Q*
585	R.Solway	B	2.00	O,F,L*
603	Invicta Snd(Coast).	I	0.10	B,O,H*,K,L,N,O P,Q*
630	R.Bedfordshire	B	0.20	B,C,D,K,L,N,O,P
630	R.Cornwall	B	2.00	B,K,P
657	R.Clwyd	B	2.00	B,O,K,L,N,O,P
657	R.Cornwall	B	0.50	B,K
666	DevonAir R.	I	0.34	B,O,H,J*,K,P
666	R.York	B	0.80	O,E,H,J*,L*,O,P
729	BBC Essex	B	0.20	C,D,K,N,O,P
738	Hereford/Worcester	B	0.037	B,D,K,L,N,P
756	R.Cumbria	B	1.00	J*,M
765	BBC Essex	B	0.50	B,C,L,N,O,P
774	R.Kent	B	0.70	K,N,O,P
774	R.Leeds	B	0.50	C,E
774	Severn Sound (3CR).	I	0.14	B,K,L,P
792	Chiltern R.	I	0.27	B,K,L,N,O,P
792	R.Foyle	B	1.00	A*
801	R.Devon	B	2.00	B,F,H,J*,K,L*,P
828	Chiltern Radio	I	0.20	B,N,O,P
828	R.Aire(Magic 828)	I	0.12	E
828	R.WM	B	0.20	B,L
828	2CR	I	0.27	B,K,P
837	R.Cumbria	B	1.50	E
837	R.Furness	B	1.00	J*
837	R.Leicester	B	0.45	B,F,H,K,L,N,O,P
855	R.Devon	B	1.00	B,F,K,P
855	R.Lancashire	B	1.50	E,F,J,L*
855	R.Norfolk	B	1.50	C,H,N,O,P
873	R.Norfolk	B	0.30	H,K,L*,N,O,P
936	GWR (Brunel R.)	I	0.18	B,K,L,P
945	R.Trent (GEM-AM)	I	0.20	B,C,E,F,K,L,M,O,P
954	DevonAir R.	I	0.32	B,H,K,P
954	R.Wyvern	I	0.16	B,G,L,P
990	WABC (Nice & Easy)	I	0.09	E,L,P
990	R.Aberdeen	B	1.00	J
990	R.Devon	B	1.00	B,H,K,P
990	Hallam R.(Gt.Yks)	I	0.25	C,O
999	R.Solent	B	1.00	B,I,K,N,P
999	R.Trent (GEM-AM)	I	0.25	B,O,P
999	Red Rose R.	I	0.80	E,F,J,M
1017	WABC Shrewsbury	I	0.70	B,E,L,P
1026	Downtown R.	I	1.70	O,M,O
1026	R.Cambridgeshire	B	0.50	B,N,O,P
1026	R.Jersey	B	1.00	B,K,P
1035	Northsound Radio	I	0.78	O*,O
1035	R.Kent	B	0.50	B,K,N,O,P
1035	R.Sheffield	B	1.00	E,O
1035	West Sound	I	0.32	J*
1107	Moray Firth R.	I	1.50	A
1116	R.Derby	B	1.20	A,B,E,F,J*,L,O,P
1116	R.Guernsey	B	0.50	B,K,P
1152	BRMB (Xtra-AM)	I	3.00	B,L
1152	LBC (L.Talkback R).	I	23.50	B,H,K,P,Q
1152	Piccadilly R.	I	1.50	E,F
1152	R.Broadland	I	0.83	J*,M,O,P
1161	GWR (Brunel R.)	I	0.16	B,J*,K,L*,P
1161	R.Bedfordshire	B	0.10	B,N,P
1161	R.Sussex	B	1.00	H,K,P
1161	Viking R.(Gt.Yks)	I	0.35	O
1170	Ocean Sd.(SCR)	I	0.12	J*,K,P
1170	R.Orwell (SGR-FM)	I	0.28	N,O,P
1170	Signal R.	I	0.20	E,L
1170	Swansea Sound	I	0.58	B
1242	Invicta Snd(Coast)	I	0.32	H*,N,P
1242	Isle of Wight R.	I	0.50	B,J*,K
1251	Saxon R. (SGR-FM)	I	0.76	I,J*,N,O,P
1260	GWR (Brunel R.)	I	1.60	B,J*,K
1260	Leicester (GEM-AM)	I	0.29	H,L,N,O,P
1260	Marcher Sound	I	0.64	E,F,M,O
1305	Red Dragon (Touch)	I	0.20	B,J*,K,P
1323	R.Bristol (Som.Snd)	B	0.63	B,J*,P
1323	S'them Sound(SCR)	I	0.50	K,N,P
1332	Hereward R.(WGMS)	I	0.60	C,I,J*,L,N,O,P
1332	Wiltshire Sound	B	0.30	B,J*,K,M,P
1359	Essex R.(Breeze)	I	0.28	I,J*,N,O,P
1359	Mercia Snd(Xtra-AM)	I	0.27	L,P
1359	Red Dragon (Touch)	I	0.20	B
1359	R.Solent	B	0.85	K
1368	R.Lincolnshire	B	2.00	O,P
1368	R.Sussex	B	0.50	H,K,N,P
1368	Wiltshire Sound	B	0.10	B,G,J*,K
1413	Sunrise R.	I	0.125	H*,I,K,N,P
1431	Essex R.(Breeze)	I	0.35	A*,B,O,P,Q
1431	R.210 (Cl. Gold)	I	0.14	B,K,P
1449	R.Peterboro/Cambs	B	0.15	K,O,P
1458	GLR	B	50.00	B,K,P,Q
1458	GMR	B	5.00	E,F
1458	R.Cumbria	B	0.50	J*
1458	R.Devon	B	2.00	B,K,P
1458	Radio WM	B	5.00	B,G,L
1476	C'ty Snd(1st Gold)	I	0.50	B,H,J*,K,N,P
1485	R.Humberside	B	1.00	O*
1485	R.Merseyside	B	1.20	E,F,J,L,M
1485	R.Sussex	B	1.00	H,K,N,P
1503	R.Stoke-on-Trent	B	1.00	A,B,E,F,J*,K*,L O,P
1521	R.Mercury	I	0.64	B,K,N,P
1530	Pennine R(Gt.Yks)	I	0.74	E,J*,K
1530	R.Essex	B	0.15	I,K,N,P
1530	R.Wyvern	I	0.52	B,K,L
1548	Capital R. (Gold)	I	97.50	H,K,P,Q
1548	R.Bristol	B	5.00	B,J*,M
1548	R.City (City Talk).	I	4.40	E,F
1557	Chiltern R.(Gold)	I	0.76	A*,B,L
1557	Ocean Sound (SCR)	I	0.50	B,J*,K,P
1557	R.Lancashire	B	0.25	E*,F,J*
1557	Tendring R.(Mellow)	I	?	P
1584	R.Nottingham	B	1.00	A,E,H,J*,P
1584	R.Shropshire	B	0.50	A*,B,F,L
1584	R.Tay	I	0.21	J*
1602	R.Kent	B	0.25	A*,B,J*,K,N,P

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

Short Wave Reports

Conditions in the h.f. bands were rather unfavourable during much of July. Reception from many areas of the world proved to be unreliable in the 16, 13 & 11m bands.

The occupants of the **25MHz (11m)** band have been rejoined by R.Australia. Their 250kW Darwin transmission on 25.750 (Eng to Japan, N.Europe 0800-0859) is on a trans-polar (Arctic) route. Although it often reaches the UK, reception is usually poor. Daily checks by **Fred Pallant** in Storrington during early August revealed that it was frequently inaudible at 0800, just discernible by 0810 and acceptable from 0825. At best it rated 24453 at 0842. Propagation was unfavourable three days in nine. Rather better reception was noted by **Jana Arunachalam** in Thumrait, Oman, he quoted 34433 at 0825. So far, Alan Roberts has been unable to detect their signal in Quebec.

Some other occupants of the band were noted in the UK reports: UAE R, Abu Dhabi 25.690 (Ar 0900-1100) was 24432 at 0940 by **David Edwardson** in Wallsend; DW via Julich 25.740 (Ger to M.East, E.Asia 1100-1355) 15311 at 1111 by **Darren Beasley** in Bridgwater; RFI via Issoudun 25.820 (Fr to E.Africa 0700-1550) 24232 at 1310 by **Eddie McKeown** in Newry; R.Nederlands 25.940 (Du to W.Africa 1030-1115, Sun only) SIO555 at 1030 by **Kenneth Buck** in Edinburgh.

Three of Radio Australia's **21MHz (13m)** broadcasts have been reaching the UK during the morning: Darwin on 21.525 (Eng to SE.Asia 0100-0800) was 33433 at 0425 by **Kenneth Reece** in Prenton, on 21.725 (Eng to S.Asia 0900-1257) 35433 at 1245 by **Jim Cash** in Swanwick; Carnarvon on 21.590 (Eng to Pacific areas 0100-0900) 34323 at 0649 by **Leo Barr** in Sunderland.

Also heard in the morning were R.Romania Int, Bucharest 21.660 (Eng to Asia 0645-0715) 43333 at 0645 by **Chris Shorten** in Norwich; R.Japan via Moyabi 21.575 (Eng, Jap to Europe 0700-0830) 43333 at 0700 in Newry and 43132 at 0745 by **P.R.Guruprasad** in Swartruggens, S.Africa; R.Finland via Pori 21.550 (Eng to Australia 0800-0825) SIO444 at 0810 by **Bryan Kimber** in Hereford; R.Pakistan, Islamabad 21.520 (Eng to Europe 0800-0845) SIO444 at 0840 by **Bill Clark** in Rotherham; R.Japan via Moyabi 21.640 (Jap to Europe, M.East, Africa 0800-0900) 55544 at 0857 by **Richard Radford-Reynolds** in Guildford; BBC via Limassol 21.470 (Eng to M.East, E.Africa 0430-1615) 45444 at 0942 by **John Eaton** in Woking; HCJB, Ecuador 21.455 (world-wide u.s.b.+ p.c.) 31442 at 1005 in Bridgwater; SRI via Schwarzenburg 21.770 (Eng to Asia, Australasia 1100-1130) 33433 at 1100 by **Peter Polson** in St.Andrews; UAE R, Abu Dhabi 21.735 (Ar to Far East 0900-1500) SIO333 at 1115 in Edinburgh; R.Pakistan, Islamabad 21.520 (Eng to Europe 1100-1120) 33322 at 1117 in Warrington; BSKSA, Saudi Arabia 21.670 (Ind to SE.Asia 1000-1200) SIO333 at 1119 by **Philip Rambaut** in Macclesfield; R.Moscow, CIS 21.490 (Chin to C.Asia?) SIO343 at 1238 by **John Coulter** in Winchester.

Later, the BBC via Ascension Is 21.660 (Eng to Africa 0900-1745) was rated 44444 at 1410 in Thumrait; UAE R.Dubai 21.605 (Ar, Eng to Europe 0615-1645) SIO433 at 1600 by **Antonio De Abru-Teixeira** in Evesham; RCI via Sackville 21.545 (Eng to Europe 1600-1629) 44444 at 1610 by **Ernest Randall** in Dalton; R.Nederlands via Bonaire 21.590 (Eng to Africa 1730-2025) 45534 at 1815 by **Darran Taplin** in Brenchley; WCSN, Maine 21.545 (Eng to Africa 1800-2000) 44333 at 1900 by **Sheila Hughes** in Morden; R.Denmark via RNI 21.705 (Da to W.Africa, Europe 1930-1955) 44444 at 1930 by **Peter Pollard** in Rugby; RCI via Sackville 21.675 (Eng, Fr to Europe 1900-2059) 44333 at 1939 by **Rhoderick Illman** in Oxted; VOA via Greenville 21.485 (Eng to Africa 2000-2200) 32343 at 2112 by **Ken Milne** in Basingstoke; WYFR, Florida 21.615 (Eng, Ger, It to Europe 1600-2145) 43333 at 2130 by **Robert Connolly** in Kilkeel; VOFC via Okeechobee 21.720 (Eng to Europe 2200-2300) 25532 at 2225 in Wallsend.

Rather poor reception of R.New Zealand's **17MHz (16m)** broadcasts to Pacific areas has been noted in the UK. In Prenton their 100kW transmission from Rangataiki, N.Island on 17.770 (Eng 2130-0650) was 22322 at 0422 and by 0616 it was inaudible. Four of R.Australia's 16m broadcasts were logged here: Shepparton on 17.795 (Eng to C.Pacific areas 2130-0700) SIO433 at 2305 in Hereford, 17.715 (Eng to Pacific areas 0000-0830) 33433 at 0349 in Oxted; 17.880 from ? (Eng to ?) 33333 at 0500 in

Listeners:
A: Leo Barr, Sunderland.
B: Darren Beasley, Bridgwater.
C: Vera Brindley, Woodhall Spa.
D: Tim Bucknall, Congleton.
E: Scott Caldwell, Warrington.
F: Ron Galliers, N.Wales.
G: Francis Heame, N.Bristol.
H: Sheila Hughes, Morden.
I: Rhoderick Illman, Oxted.
J: Eddie McKeown, Newry.
K: George Millmore, Wootton, IOW.
L: Sid Morris, Rowley Regis.
M: Tom Smyth, Co.Fermanagh.
N: Phil Townsend, E.London.
O: Ted Walden-Vincent, Gt.Yarmouth.
P: John Wells, East Grinstead.
Q: Michael Williams, Redhill.

Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	J*
153	Donebach	Germany	500	A,B,C,D,E,G,H*,I,J,L
153	Brasov	Romania	1200	B,G*
162	Allouis	France	2000	A,B,C,D,E,G,H*,I,J,K,L,M
171	Kaliningrad	Russia	1000	B,D,G,H*,I,J*,K
171	Medi 1-Nador	Morocco	2000	J*
171	Moscow	Russia	500	F
177	Oranienburg	Germany	750	A,B,D,E,G,H*,I,J,L
183	Saarlouis	Germany	2000	A,B,C,D,E,G,H*,I,J,L
198	BBC Droitwich	UK	500	E,G,H*,I,K,L,M
198	BBC Westerglen.	UK	50	B
207	Munich	Germany	500	B,C*,D,G*,H*,J*
207	Azilal	Morocco	800	J*
216	RMC Roumoules	S.France	1400	A,B,C,D,G,H*,I,J,L
216	Oslo	Norway	200	B,G*
225	Konstantinow	Poland	2000	B,C*,G*,H*,I,J*
234	Junglinster	Luxembourg	2000	B,C*,D,E,G,H*,I,J,K,L
234	St.Petersburg	Russia	1000	G*
243	Kalundborg	Denmark	300	A,B,C,D,E,G,H*,I*,J,L
252	Tipaza	Algeria	1500	E*,J*
252	Atlantic 252	S.Ireland	500	A,B,C,D,E*,G,H*,I,J,K,L,M
261	Burg	Germany	200	D,E,H*,J
261	Moscow	Russia	2000	A,B,I,J,L
270	Topolna	Czechoslovakia	1500	B,C*,E*G*,H*,I*,J*
279	Minsk	Byelorussia	500	B,G,J*

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

A: Vera Brindley, Woodhall Spa.
B: Kenneth Buck, Edinburgh.
C: Scott Caldwell, Warrington.
D: Ron Galliers, N.London.
E: Sheila Hughes, Morden.
F: Rhoderick Illman, Oxted.
G: Eddie McKeown, Newry.
H: George Millmore, Wootton, IOW.
I: Sid Morris, Rowley Regis.
J: Fred Pallant, Storrington.
K: Tom Smyth, Co.Fermanagh.
L: Phil Townsend, E.London.
M: Michael Williams, Redhill.

long medium & short

Tropical Bands

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2114	G
2.325	ABC Tennant Creek	Australia	2030	G
2.485	ABC Katherine	Australia	2031	N
2.560	Xinjiang	China	2240	B,G
3.210	R.Mozambique	Mozambique	2208	N
3.215	R.Orange	S.Africa	2113	K,N
3.220	KCBS Wonsan	N.Korea	2315	B
3.220	R.Togo, Lome	Togo	1950	R
3.225	RRI Tanjung Pinang	Indonesia	2215	G
3.232	RRI Bukittinggi	Indonesia	2244	G
3.240	TWR	Swaziland	1828	K
3.255	BBC via Maseru	Lesotho	2102	G,K,N,O
3.270	SWABC 1, Namibia	S.W.Africa	2103	M
3.279	La Voz del Napo	Ecuador	0230	O
3.290	SWABC 2, Namibia	S.W.Africa	0505	O
3.300	R.Cultural	Guatemala	0245	G,O
3.315	SLBS Freetown	Sierra Leone	2234	N
3.320	R.Orion	S.Africa	0015	G,O
3.320	R.Suid Afrika	S.Africa	1850	R
3.325	FRCN Lagos	Nigeria	2058	K,M,N
3.365	R.Rebelde, La Julia	Cuba	0246	K,O
3.365	GBC Radio 2	Ghana	2100	B,G,K,L,M,N,P
3.370	R.Tezulutlan	Guatemala	0347	G
3.380	R.Malawi	Malawi	2100	G,K,N
3.380	R.Candip Bunia	Zaire	1930	R
3.395	RRI Tanjungkarang	Indonesia	2202	G
3.472	R.Alfonso Padilla	Bolivia	0030	R
3.950	Xinjiang	China	2159	N
3.955	BBC Skelton	England	0600	I,K
3.955	Novosibirsk rly A.Ata	CIS	2040	N,R
3.965	RFI Paris	France	1900	C,E,I,K,L,Q
3.975	BBC Skelton	England	0343	J,K
3.980	VOA Munich	W.Germany	1905	C,I,K,L,Q
3.985	R.Beijing, China	via SRI Berne	2000	I,K,L
3.985	SRI Berne	Switzerland	1837	C,I,K,L,Q
3.995	DW Cologne (Julich)	W.Germany	2157	K,L,N
4.010	Bishkek	CIS	2335	F
4.040	R.Moskva 2(Vladivost)	CIS	0049	K
4.055	R.Moskva 1 (Kalinin)	Russia	1935	C,K,L,N
4.500	Xinjiang	China	2211	G,H,K
4.600	R.Baghdad	Iraq	1930	L
4.650	R.Santa Ana	Bolivia	0115	R
4.700	R.Waira, Chota	Peru	2345	E
4.719	RRI Ujung Padang	Indonesia	2200	N
4.735	Xinjiang	China	2211	G,K,N
4.740	Ashkhabad	Russia	2302	K
4.750	R.Bertoura	Cameroon	1954	H,K,M
4.760	Yunnan Kumming	China	2200	N
4.765	Brazzaville	PR Congo	2012	A,D,E,F,K,L,M
4.770	FRCN Kaduna	Nigeria	2055	G,H,I,K,L,M,N
4.783	RTM Bamako	Mali	2131	K
4.795	R.Douala.	Cameroon	2003	F,H,K,M,N,R
4.795	R.Moscow (Kharkov)	Ukraine	1830	C
4.800	LNBS Lesotho	Maseru	2105	M,N
4.800	R.Moscow Yakutsk	Siberia	2045	K
4.805	R.Nac.Amazonas	Brazil	2224	N
4.810	R.Yerevan	Armenia	2037	K,N
4.815	R.diff TV Burkina	Ouagadougou	2050	E,F,H,I,K,M,N
4.820	La Voz Evangelica	Honduras	0345	F
4.820	R.Moskva 4 (Khanty-M)	Russia	2005	H,K
4.825	R.Cancao Nova	Brazil	0405	R
4.825	R.Moscow (Yakutsk)	Siberia	0205	K
4.830	R.Tachira	Venezuela	2320	E,G,K,N
4.832	R.Reloj	Costa Rica	0255	G,O
4.835	R.Tezulutlan, Coban	Guatemala	0347	G
4.835	RTM Bamako	Mali	2051	C,D,E,H,K,L,M,N
4.845	ORTM Nouakchott	Mauritania	2112	D,K,L,M,N
4.850	R.Yaounde	Cameroon	2040	K,L
4.850	AIR Kohima	India	2058	M
4.850	R.Tashkent 2	Uzbekistan	2229	E,K,N,R
4.865	PBS Lanzhou	China	2200	L,N
4.870	R.Cotonou	Benin	2043	E,F,G,K,L,M,N,R
4.875	R.La Cruz del Sur	Bolivia	0015	R
4.885	Voice of Kenya	Kenya	2106	M
4.890	RFI Paris	via Gabon	0400	K,R
4.895	R.Moscow (Kalinin)	Russia	2241	K
4.900	V de la Rev Conakry	Guinea	2255	F
4.905	R.Relogio, Rio	Brazil	0040	E

Freq MHz	Station	Country	UTC	DXer
4.905	R.Nat.N'djamena	Chad	2055	K,L,M,N
4.910	R.Zambia, Lusaka	Zambia	2055	M,N
4.915	R.Anhanguera	Brazil	2330	F,G
4.915	R.Ghana, Accra	Ghana	2030	E,G,I,K,M,N
4.915	Voice of Kenya	Kenya	2109	M
4.915	R.Cora, Lima	Peru	0315	R
4.920	ABC Brisbane	Australia	1949	M
4.920	R.Quito	Ecuador	0205	G
4.925	R.Nacional, Bata	Eq. Guinea	2110	N
4.930	R.Moscow	Russia	2045	K,L,N
4.935	Voice of Kenya	Kenya	2005	C,G,H,I,K,L,M,N
4.940	R.Kiev 2	Ukraine	2020	C,I,K,L,M
4.958	R.Baku	Azerbaydzhan	2050	K
4.975	R.Uganda, Kampala	Uganda	2005	K,M
4.975	R.Dushanbe	Tadzhikistan	2320	E
4.980	Ecos del Torbes.	Venezuela	0336	G
4.985	R.Brazil Central	Brazil	2330	E,K
4.990	AIR via Madras	India	0030	R
4.990	FRCN Lagos	Nigeria	2056	D,E,G,K,M,N
4.990	R.Ancash, Huaraz	Peru	0042	K
5.005	R.Nacional, Bata	Eq.Guinea	2100	F,G,I,M,N
5.010	R.Garoua	Cameroon	2056	L,M,N
5.010	R.Malagasy	Madagascar	2058	K
5.015	R.Moskva 2Arkhangelsk	CIS	1936	C
5.030	R.Impacto	Costa Rica	0020	G,R
5.035	R.Bangui	C.Africa	2111	K,L,M
5.035	R.Alma Ata	Kazakshtan	2147	K
5.040	R.Tbilisi 1	Georgia	1950	C,E,L,M,N
5.045	R.Cultura do Para	Brazil	2315	E
5.047	R.Togo, Lome	Togo	2025	E,H,K,M,N
5.050	GFBC Nanning	China	2106	M
5.050	R.Tanzania	Tanzania	2110	G,M
5.055	Faro del Caribe	Costa Rica	0240	G,K,O,R
5.055	RFO Cayenne(Matoury)	Fr Guiana	0508	K
5.075	Caracol Bogata	Colombia	2345	K,R
5.260	R.Alma Ata 2	Kazakhstan	2951	K
5.290	R.Moskva 1Krasnoyarsk	Siberia	2231	K

DXers:

A: Vera Brindley, Woodhall Spa.
B: Tim Bucknall, Congleton.
C: Scott Caldwell, Warrington.
D: Bill Clark, Rotherham.
E: Robert Connolly, Kilkeel.
F: Antonio De Abreu-Teixeira, Evesham.
G: David Edwardson, Wallsend.
H: Ron Galliers, N.London.
I: Sheila Hughes, Morden.
J: Rhoderick Illman, Oxted.
K: Eddie McKeown, Newry.
L: Sid Morris, Rowley Regis.
M: Fred Pallant, Storrington.
N: Peter Perkins, Hemel Hempstead.
O: Alan Roberts, Quebec, Canada.
P: Chris Shorten, Norwich.
Q: Phil Townsend, E.London.
R: Jim Willett, Grimsby.

Norwich; Darwin on 17.750 (Eng, Fr to S.E.Asia 0600-0900) 42443 at 0848 in Bridgwater.

During the morning R.Pakistan, Islamabad 17.705 (Ur to S/S.E.Asia 0100-0215) was 33333 at 0145 by **Tony Singh** in Hitchin; RCI via Skelton 17.840 (Fr, Eng to Africa 0500-0559) 44444 at 0540 in Thumrait; VOA via Selebi-Phikwe 17.650 (Fr to Africa 0530-0700) SIO333 at 0630 in Macclesfield; R.Finland via Pori 17.800 (Eng to Australia, SE.Asia 0800-0830) 34444 at 0800 in Sunderland; Voice of Israel, Jerusalem 17.545 (Eng, Fr to C/N.America, W.Europe 1000-1100) 44544 at 1006 in Wallsend; R.Tunis via Sfax 17.500 (Ar 0700-1800) SIO444 at 1030 in Winchester; KHBI, N.Mariana Is 17.555 (Eng to NE.Asia, Russia 0800-1200) SIO322 at 1059 in Rotherham.

After mid-day Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) was 55544 at 1315 in Guildford; RTM, Morocco 17.595 (Fr, Eng to M.East, N.Africa 1400-1700) 55334 at 1537 in Woking; RCI via Sackville, 17.820 (Eng to Europe 1600-1629) 44433 at 1600 in Warrington.

Later, the Voice of Israel, Jerusalem 17.575 (Eng, Fr to N/C/S.America, W.Europe 1900-1955) was 34344 at 1924 in Swanwick; WWCR Nashville 17.535 (Eng to Europe, USA 1400-2200) SIO344 at 1945 in Edinburgh; WSHB Cypress Creek 17.510 (Eng to Europe 1800-2200) 44344 at 1815 by **Edward Turnbull** in Gosforth; R.Nederlands via Bonaire 17.605 (Eng to W.Africa 1930-2030) 43344 at 2005 in Newry; R.Havana Cuba 17.705 (Eng to Europe 2000-2100) 44333 at 2045 in Dalton; also 17.770 (Sp to S.Europe, N.Africa 2000-2200) 22122 at 2021 by **Vera Brindley** in Woodhall Spa; VOA via Bethany 17.800 (Eng to Africa 1600-2200) 22212 at 2050 in Morden; HCJB, Ecuador 17.790 (Cz, Sw, Ger, Fr, Eng, Sp to Europe 1800-2230) 33333 at 2145 in Kilkeel; VOFC Taiwan via Okeechobee 17.750 (Chin, Fr, Ger, Eng to Europe 1900-2300) SIO444 at 2230 by **Francis Hearne** in N.Bristol.

In the **15MHz (19m)** band good reception from R.Australia has been noted in the UK. During their broadcast to New Guinea via Shepparton on 15.320 (Eng 2100-0730) their signal peaked 54444 at 2335 in Kilkeel. Also logged here were 15.240 from Shepparton (Eng to Pacific areas 0000-0930), noted as 24542 at 0650 in Wallsend and 15.170 from Darwin (Eng, Chin to Asia 0900-1400) SIO444 at 0915 in Hereford.

Programmes in a variety of languages are beamed to Europe during the day. Those noted stemmed from RFPI, Costa Rica 15.030 (Eng 1800-1200) rated 45434 at 0630 in Guildford; VOA via Selebi-Phikwe 15.600 (Eng to Africa 0500-0700) 33333 at 07645 by **Robin Harvey** in Bourne; HCJB, Ecuador 15.270 (Eng 0700-0830) 54444 at 0815 in Prenton; WCSN Scotts Corner 15.665 (Eng 1400-1600) 44555 at 1431 in Warrington; AWR via Samara 15.125 (Eng 1600-1630) 43444 at 1600 in Newry; RNB Brasilia, Brazil 15.265 (Eng, Ger 1800-2050) heard at 1800 by **Philip Davies** in Merthyr Tydfil; R.Iraq Int, Baghdad 15.210 (Eng 1800-2000) 32222 at 1802 in Woodhall Spa; R.Kuwait 15.505 (Ar 1800-0000, also to N.Africa) SIO555 at 1830 in Edinburgh; R.Korea, Seoul 15.575 (Ger, Fr, Russ, Eng, Sp, Port, It 1800-2300) SIO444 at 1839 in Rotherham; R.Damascus, Syria 15.095 (Eng 2005-2105, also to USA) 45544 at 2015 in Brenchley; Voice of Vietnam, Hanoi 15.010 (Eng, Viet, Russ, Fr, Sp 1600-0000?) 55444 at 2030 in St.Andrews; HCJB, Ecuador 15.270 (Eng 2130-2200) 55545 at 2130 in Norwich; RCI via Sackville 15.325 (Eng 2100-2159) 53553 at 2158 in Bridgwater.

Some to other areas were also logged: HCJB, Ecuador 15.155 (Eng to N.America 0030-0700), rated 23333 at 0200 in Hitchin; DW via Wertachtal 15.185 (Eng to W.Africa 0600-0650) SIO444 at 0645 in N.Bristol; R.Austria via Moosbrunn 15.450 (Eng, Ger to Australia, NZ 0800-1100) 44434 at 0840 in Sunderland; VOA via Greenville 15.120 (Eng to Caribbean 1000-1200) SIO323 at 1110 in Macclesfield; R.Finland via Pori 15.440 (Eng to M.East, E.Africa 1405-1430) 55544 in Dalton; R.Veritas Asia, Philippines 15.140 (Eng ident 1500, Pil 1505-1600) 34333 at 1558 by **Ron Galliers** in N.London; UAE R.Dubai 15.320 (Eng to N.Africa 1630-1700) 33343 at 1630 in Oxted; BBC via Woofferton 15.070 (Eng to N/C/W.Africa 0700-2315) 44434 at 1700 in Thumrait, 55444 at 1700 in Swartruggens and 55555 at 2300 by **Charles Beanland** in Gibraltar; Voice of Israel, Jerusalem 15.640 (Eng to C/S.America 2130-2200) 33333 at 2138 in Basingstoke; R.Sophia, Bulgaria 15.330 (Eng to USA 2145-2315) 34333 at 2205 in Woking; KTBN Salt Lake City 15.590 (Eng to E.USA 1600-0200) 32332 at 2240 in Morden.

The **13MHz (22m)** band is being used to advantage by R.Nederlands via Flevo 13.700 (Eng to S.Asia 0130-0230) 43433 at 0135 in Thumrait; DW via Julich 13.790 (Eng to W.Africa 0600-0650) 44333 at 0613 in Prenton; WSHB Cypress Creek, USA 13.615 (Eng to Oceania 0800-1000) 34232 at 0840 in Oxted; R.Australia via Carnarvon 13.605 (Eng, Chin to SE./N.Asia 0900-1400) 34433 at 0902 in St.Andrews; SRI via Sottens 13.685 (Eng to Australia 0900-0930) 43343 at 0903 in Newry; WYFR, Florida 13.695 (Fr to Canada 1100-1300) SIO232 at 1129 in Macclesfield; SRI via Sottens 13.635 (Eng to Asia, Australasia 1350-1530) 55555 at 1525 in Gosforth; VOA via Selebi-Phikwe 13.710 (Eng to Africa?) 44343 at 1600 in Swartruggens; R.Australia via Carnarvon 13.755 (Eng to S.Asia 1430-2100) 54333 at 1605 in Swanwick; UAE R.Dubai 13.675 (Eng to Europe 1030, 1330 & 1630) SIO222 at 1640 by **Julian Wood** in Elgin; KSDA, Guam 13.720 (Eng to S.Asia, E.Africa 1700-1900) 34323 at 1825 in Bridgwater; ISBS, Iceland 13.855 (Ic to Europe 1855-1930) 55555 at 1920 in Norwich;

R.Kuwait 13.620 (Eng to Europe, USA 1800-2100) 33223 at 2002 in Woodhall Spa; WHRI Red Lion 13.760 (Eng to Europe, Canada 1700-0000) 32333 at 1910 in Morden; RCI via Sackville 13.650 (Eng to C.Europe 1900-1959) 44444 at 1900 in Brenchley; also 13.670 (Fr, Eng to Africa 1830-1929) SIO555 at 1855 in Edinburgh; UAE R, Abu Dhabi 13.605 (Eng to USA 2200-0000) SIO333 at 2310 in Evesham; BRTN Int via Wavre 13.655 (Fr, Eng, Sp to S.America 2130-0000?) 22222 at 2338 in Rugby.

The **11MHz (25m)** band is the hub of activity for many listeners. During the morning, VOA via Bethany 11.915 (Eng to Africa 0600-0700) was 33433 at 0635 in Prenton; R.Nederlands via Bonaire, 11.895 (Eng to Pacific 0730-1030) 33333 at 0745 in Newry; HCJB, Ecuador 11.730 (Eng to Europe 0700-0830) 45554 at 0815 in Wallsend; also 11.925 (Eng to S.Pacific area 0730-1125) 24443 at 0910 in Guildford; R.Korea via Sackville 11.715 (Eng to USA 1030-1100) 33433 at 1038 in Sunderland; RFI via Issoudun 11.670 (Eng to N/C.America, C/E.Europe 1230-1300) 23333 at 1230 by **Phil Townsend** in E.London; VOIRI Iran 11.930 (Ur to E.Asia 1230-1330) 23333 at 1230 in Hitchin.

Later, R.Austria Int. via Moosbrunn 11.780 (Ger, Eng, Fr to S/S.E.Asia 1400-1700) was 43444 at 1450 in Dalton; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) 22222 at 1455 in Woodhall Spa; Polish R, Warsaw 11.840 (Eng to Africa? 1500-1555) 32333 at 1530 in N.London; Wings of Hope, Lebanon 11.530 (Eng to M.East 1400-1700) SIO232 at 1535 in Winchester; R.Pakistan, Islamabad 11.570 (Eng to M.East, N.Africa 1600-1630) 34333 at 1618 in St.Andrews and 34333 at 1613 in Swartruggens; UAE R.Dubai 11.795 (Eng to N.Africa, Europe 1600-1640) 34343 at 1630 in Oxted; Voice of Israel, Jerusalem 11.587 (Eng, Fr to C/N.America, W.Europe 1700-1730) SIO555 at 1715 in Macclesfield; RSA, S.Africa 11.885 (Eng to Africa 1500-1755) 43433 at 1729 in Brenchley; R.Sophia, Bulgaria 11.720 (Eng to Europe 1730-1900) was noted as SIO222 at 1800 by **Tom Smyth** in Co.Fermanagh.

The reception of R.New Zealand's 25m broadcasts to Pacific areas via Rangataiki, N.Island on 11.735 (Eng 1900-2130 has been poor in the UK. Their signal seldom exceeded SIO222, as noted in Rotherham at 1919 and often it was inaudible. Also logged here were ISBS, Iceland 11.402 (Ic to Europe 1855-1930), rated 54344 at 1920 in Norwich; AIR via Aligarh 11.620 (Hi, Eng to Europe 1845-2230) 45444 at 1930 in Woking; RAI Rome 11.800 (Eng to Europe 1935-1955) 55554 at 1950 in Warrington; R.Beijing, China 11.500 (Eng to Europe 2000-2200) SIO555 at 2001 in Edinburgh; R.Damascus, Syria 12.085 (Eng to Europe 2005-2105) 54545 at 2005 in Rugby; R.Sweden 11.730 (Eng to Asia, Australia 2030-2130) 53554 at 2030 in Bridgwater; R.Japan via Moyabi 11.735 (Eng to Europe 2100-2200) SIO444 at 2100 in Hereford; VOA via Tinang 11.760 (Eng to E/S.Asia, Pacific 2200-0100) SIO444 at 2215 in N.Bristol; WWCR Nashville 12.160 (Eng 2200-0200) 44444 at 2300 in Morden; BBC via Ascension Is 11.750 (Eng to S.America 2200-0330) 33433 at 2304 in Bourne; R.Bandeirantes, Sao Paulo 11.925 (Port 0700-0500) SIO222 at 0010 in Evesham; R.Havana Cuba 11.970 (Eng to USA 0000-0500) 33233 at 0030 in Kilkeel.

In the **9MHz (31m)** band R.New Zealand via Rangitaiki, N.Is on 9.700 (Eng to Pacific areas 0600-1205) 44333 at 0700 in N.London. Later, R.Australia's broadcast to E.Asia via Carnarvon on 9.540 was 33533 at 1829 in Wallsend.

Some programmes for Europe stem from R.Japan via Skelton 9.670 (Eng 0700-0800) SIO444 at 0715 in Hereford; VOIRI, Iran 9.022 (Fr, Ger, Eng, Sp, Ar 1800-2230) SIO323 at 1830 in Co,Fermanagh; Polish R, Warsaw 9.525 (Eng 1830-1855) 52333 at 1840 in Swanwick; R.Finland via Pori 9.730 (Eng 1830-1900, also to W.Africa) SIO323 at 1850 by **Michael Williams** in Redhill; Voice of Vietnam, Hanoi 9.840 (Eng 1900-1930) SIO333 at 1925 in Rotherham; VOA via Gloria 9.760 (Eng 1700-2200, also to M.East, N.Africa) 43333 at 1937 in Gibraltar; Voice of Turkey, Ankara 9.445 (Eng 2000-2050) 54444 at 2000 in Brenchley; R.Cairo via Abis 9.900 (Eng 2115-2245) 34433 at 2216 in Sunderland; BBC via Skelton 9.410 (Eng 1700-2315, also to N/W.Africa) 22232 at 2231 in Bourne.

In the **7MHz (41m)** band, WHRI South Bend, USA 7.315 (Eng to USA 0000-1100) 44343 at 0605 in Morden; RFPI, Costa Rica 7.375 (Eng 0000-1200) 45434 at 0751 in Guildford; R.Australia via ? 7.260 (Eng to New Guinea 1100-2100) SIO344 at 1920 in Edinburgh; R.Serbia, Belgrade 7.200 (Eng 1930) heard in Merthyr Tydfil; V of Nigeria 7.255 (Ha, Swa, Fr, Eng to W.Africa 0455-2300) 33333 at 1957 in Gibraltar.

Some of the **6MHz (49m)** broadcasts to Europe stem from SDR via Muhlacker, Germany 6.030 (Ger 24hrs) 44434 at 0845 in Gosforth; R.Nederlands via Flevo 5.955 (Eng 1230-1325) SIO333 at 1250 in Redhill; R.Prague, Czechoslovakia 6.055 (Eng 1700-1727) SIO323 at 1700 in Co.Fermanagh; R.Austria Int, Vienna 6.155 (Eng 1830-1900) heard in Merthyr Tydfil; R.Budapest, Hungary 6.110 (Eng 2100-2200) SIO333 at 2113 in Elgin; VOA via Woofferton, UK 6.040 (Eng 1630-2200) 44434 at 2130 in Basingstoke; R.Japan via Skelton, UK 6.160 (Eng 2300-0000) 45444 at 2300 by **Roy Patrick** in Derby.

Transatlantic DX Chart

Freq kHz	Station	Location	Time (UTC)	DXer
		USA		
1010	WINS.	New York, NY.	0125.	C
1130	WNEW.	New York, NY.	0320.	C
1220	WKNR.	Cleveland, OH.	0225.	B
		Canada		
620.	CKCM.	Grand Falls, NF	.0145.	B,C
820.	CHAM.	Hamilton, ON.	0350.	C
930.	CJYQ.	St.John's, NF.	0036.	A,C

DXers:
A: Tim Bucknall, Congleton.
B: Sid Morris, while on Walbury Hill.
C: Jim Willett, Grimsby.

Equipment Used

Jana Arunachalam, Thumrait, Oman: Panasonic RF B45 or Sony ICF-7600DS + 6m wire.
Leo Barr, Sunderland: Matsui MR4099 or Steepletone MBR7 + r.w. In loft.
Charles Beanland, Gibraltar: Sangean ATS 803 + a.t.u. + 6m wire.
Darren Beasley, Bridgwater: Philips D2935 + Hexagon loop or a.t.u. + 10m wire.
Vera Brindley, Woodhall Spa: Sangean ATS 803A + whip or r.w.
Kenneth Buck, Edinburgh: Lowe HF225 + l.w. screened loop or s.w. loop.
Tim Bucknall, Congleton: Sony ICF 2001D + AN-1.
Scott Caldwell, Warrington: Saisho 2000 or Sony ICF-2001 + 60m wire.
Jim Cash, Swanwick: Kenwood R5000 + trap dipole or Sony AN-1.
Bill Clark, Rotherham: Sony ICF-2001D + built-in whip.
Robert Connolly, Kilkeel: Sangean ATS 803A + 30m wire in loft or AN-1.
John Coulter, Winchester: Yaesu FRG-7 + r.w.
Philip Davies, Merthyr Tydfil: Yaesu FRG-7 or Orake R8E + r.w.
Antonio De Abreu-Teixeira, Evesham: Sony ICF-2001D + 12m wire.
John Eaton, Woking: Lowe HF-225 + Datong A270 in loft.
David Edwardson, Wallsend: Trio R600 + inverted V trap dipole.
Ron Galliers, while in N.Wales: Philips D2935 + a.t.u. + 25m wire.
P.R.Guruprasad, Swartruggens, S.Africa: Sony ICF-7600DA + built-in whip.
Robin Harvey, Bourne: Matsui MR4099 + telescopic antenna.
Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
Sheila Hughes, Morden: Sony ICF7600DS + loop or Panasonic DR48 + 15m wire.
Rhoderick Illman, Oxted: Kenwood R5000 + Lowe Mag.Balun + 19m wire.
Bryan Kimber, Hereford: Zenith R7000 or Realistic SX190 + 25m wire.
Eddie McKeown, Co.Down: Tatung TMR 7602.
George Millmore, I.O.W: Sangean ATS 803A or Racal RA17L + loop or r.w.
Ken Milne, Basingstoke: Matsui MR 4099 + built-in whip or 6m wire in loft.
Sid Morris, while on Walbury Hill: Sangean ATS 803A + telescopic whip.
Fred Pallant, Storrington: Trio R2000 + r.w. in loft.
Roy Patrick, Derby: Lowe HF 125 + 22m wire.
Peter Perkins, Hemel Hempstead: Kenwood R5000 + 20m wire.
Peter Pollard, Rugby: Sony ICF-2001D + AN-1.
Peter Polson, St.Andrews: Lowe HF-225 + loop or indoor Joystick.
Richard Radford-Reynolds, Guildford: Sangean ATS 803A + 10m wire.
Philip Rambaut, Macclesfield: Int.Marine Radio R.700M + r.w.
Ernest Randall, Dalton: Lowe HF-225 + 15m wire.
Kenneth Reece, Prenton: Icom R9000 + delta loop. Kenwood R5000 or JVC NRD 525 + r.w.
Harry Richards, Barton-on-Humber: Not stated.
Alan Roberts, Quebec: Lowe HF-225 + 31, 19 or 11m dipole.
Chris Shorten, Norwich: Matsui MR 4099 + 10m wire.
Tony Singh, Hitchin: Zenith 7000 or Grundig Satellit 3400 + built-in whip.
Tom Smyth, Co.Fermanagh: Morphy Richards R191 or Sangean ATS 803A + whip.
Darran Taplin, Brenchley: Yaesu FRG7700 + FRT 7700 + 35m wire.
Phil Townsend, E.London: Lowe HF225 + loop or r.w.
Edward Turnbull, Gosforth: Philips D8734 + a.t.u. + 15m indoor wire.
Ted Walden-Vincent, Gt.Yarmouth: Grundig Satellit 1400SL + r.w.
John Wells, E.Grinstead: RCA AR88D + Loop, also LW converter.
Jim Willett, Grimsby: RCA AR77 + 4m loop or Trio 9R-59DS + a.t.u. + X dipole.
Michael Williams, Redhill: Sony CFS-201L cassette radio plus built-in whip.
Julian Wood, Elgin: Kenwood R2000 + Yaesu FRT 7700 a.t.u. + 6m wire.

Station Addresses

BBC Engineering Information Dept,
White City,
201 Wood Lane,
London W12 7TS.

ILR Spectrum Radio,
Endeavour House,
Brent Cross,
London NW2 1JT.

AWR-Russia,
Box 170,
Tula-Centre 300000,
Russia.

Radio New Zealand International, Broadcasting House,
Bowen Street,
PO Box 2092,
Wellington,
New Zealand.

Atlantic Beacon (Turks & Caicos):
Christian Radio Productions,
PO Box 5321,
Ft.Lauderdale,
FL 33310, USA.

CORRECTION:
Radio CFRA,
1900 Walkley Road,
Ottawa,
Ontario,
Canada K1H8P4.

OFF THE RECORD

Andy Cadier, 28 Romney Avenue, Folkstone, Kent CT20 3QJ.

For those that missed the July 'episode' of 'Off The Record', a quick recap of the highlights. An official from the Radiocommunications Agency wrote to the Editor of *SWM* voicing an objection to the publishing of details of unlicensed broadcasting stations. He suggested dire consequences like prosecution, with unlimited fines and two years gaol should this alleged offence continue This severe attitude did seem somewhat amiss considering our Editor, who's head was on the proverbial block, had been in contact with Radiocommunications Agency, seeking advice and clarification on this very matter. Personally, I was of the opinion that the wireless telegraphy laws were directed against those who themselves were involved in illicit use of the radio spectrum. I am convinced it was never intended to inhibit journalistic reporting by a reputable publication, dealing solely with radio listening. All crimes have a victim, or a potential victim, I am left wondering who is suffering in consequence of reading details of past pirate broadcasts in *SWM*?

In an attempt to defuse our little controversy the names of suspected pirate stations will not now be mentioned, and in fact remain unidentified. It will be up to DXers to verify received stations, as you should for a QSL. The times, days of the week and frequencies will continue to be shown together with the type of programme heard by our monitors. This will place the onus on the RA to inform us which unidentified stations are unauthorised, particularly if they operate from outside the UK and are not subject to British law.

Our New Look

Because of this change in editorial policy, I will be unable to publish current pirate radio stickers, logos, or photographs which may be considered to be publicising a suspected pirate station's name. The good news is we will be increasing our coverage to include all irregular transmissions. So if you are into numbers stations, political clandestines, out of band CB type communications, or any seemingly sinister or mysterious transmissions this will be the page to be in touch with. You never know we may stumble upon answers to questions we have been asking ourselves for years!

On 186 Metres

Now, let's look at the numerous Dutch stations that operate between 1.605 and 1.630MHz, just above the official m.w. band. Reception is best, as is usual on these frequencies, at dusk and after dark. Coverage, even for these relatively low powered stations, is not restricted to areas nearest to Holland, so DX opportunities exist over most of Europe and possibly beyond. There are about 40 stations that broadcast on an occasional basis, some with programmes intended for the UK. The Dutch Radio Service (UK) is run by enthusiasts who specialise in monitoring these stations, and assisting others to do the same. There is no membership fee, for a nominal £1 you receive a list of current Dutch m.w. stations, and all the information you will need to QSL, this is sent to you directly from Sweden. There is also a QSL advice service, which ensures your report goes to the right person, and a translation department to help with station identification. Further details are available from Derek Taylor, 12 Dorman Road, Preston, Lancs PR2 6AS. Please include return postage when writing.

Pirates Return

The Caroline Movement celebrated the 25th anniversary of the introduction of the Marine Offences Broadcasting Act, which made the offshore pirates illegal.

The now dilapidated Tongue Fort, 5km off Margate.
Photo: Bob Le-Roi.

The MV *Galexy*, owned by the Caroline Movement was anchored off Walton-on-the-Naze.

A new ship-based station moored off the Essex coast, not far from where it all started in 1964, commenced broadcasting on 13 August 1992. No sieges or raids were anticipated as the organisers had a restricted service licence for 28 days. The ferryboat *Tyne Princess*, now called the MV *Galexy*, is owned by the Caroline Movement and was specially adapted for it's new role. This small vessel anchored a mile off Walton-On-The-Naze in Essex, was tendered by a local fishing boat, carrying records tapes and sightseers. A 1W (e.r.p.) medium wave transmitter on 1584kHz and the callsign Offshore Radio commenced to resurrect - with the aid of old records jingles and presenters - the sounds and memories of offshore radio.

I attended the supporters convention held on August 15 at the Naze Mariner on Walton seafront, and was most encouraged to meet *SWM* readers there, particularly **David Williams**, who had travelled from Southampton. Various ex-pirate radio personalities were interviewed by John Burch CM's promotional Manager.

Butterfly on the Wheel

This is the title of a recently published book written by Peter Moore, Station Manager of the former pirate radio vessel *Ross Revenge*. The title refers to a description made by Lord Annan in the House of Lords whilst the Broadcasting Bill was being debated on the 5 June 1990. "I particularly dislike the extraordinary amendments to the Marine Offences Act 1967, which are aimed at Radio Caroline. The amendments proposed will make it unlawful for any foreign ship on the high seas to broadcast to the United Kingdom. It will enable Police, the Army, Customs Officers and anybody who is authorised by the Secretary of State to board and search these foreign ships and to seize documents. Is this not another example of the government putting on their 'Bovver Boots'? Exceptional cases as hi-jacking or drugs could justify the seizure or detention of a foreign vessel and confer immunity on those that boarded it. I realise that the Home Office regards Radio Caroline as a maddening wasp and it is infuriated that its attempts over the years to swat it have failed. However, surely this station is not a wasp but a common or garden cabbage white. Why break a butterfly upon the wheel?"

Stirring stuff indeed, and that's just the foreword! The book relates in a light hearted manner, with the odd moment of despair, the happenings from the collapse of the 91m mast in 1987 to the return to the air after the DTI raid in 1989. There are many interesting items about transmitting antennas or lack of them. Much of the book is devoted to the successful and unsuccessful attempts to rig large antennas, some of an inappropriate design, aboard a ship whilst over 19km out at sea. I will not even attempt to explain just how large numbers of 6m galvanised sections of mast found their way from a disused farm in the back of beyond, to the deck of the *Ross Revenge*. This book also gives an insight to the disorganised state of Caroline's management, coupled with the astonishing fact that in one way or another the impossible, or at least improbable, is achieved. One is left with the distinct feeling that another twist in this long running saga is yet to come.

Butterfly Upon The Wheel is published by Offshore Echo's, PO Box 1514, London W7 2LL

OFF THE RECORD

The Radio Forts

During the 60s a number of offshore pirate radio stations operated from several derelict anti-aircraft towers constructed during the second world war. These were constructed in the Thames and towed to strategic locations in the Thames estuary and around the Essex coast. Pop pirate operators moved onto some of these structures in 1965 which the Ministry of Defence had abandoned about ten years earlier.

Broadcasting from the towers ceased in 1967 following a court decision, that contrary to previous advice, all of the forts being used for pirate radio were in fact within British Waters and subject to the relevant telegraphy legislation. Many people in South East England remember these stations with fond memories, as they were small outfits run on a shoe-string by local people, as opposed to the big ship-board stations. Invicta Radio presenter Bob Le-Roi, who started his career in broadcasting on Radio City, based on Shivering Sands Tower, sent me a picture of nearby Tongue Fort looking in a very sorry state. This tower suffered structural damage while it was being sunk on site, now the right hand leg is leaning badly.

Short Wave Irregular Broadcasts Chart

MHz	Programme Content	Day	UTC	Monitors
3.910	American Evangelical	Dly	2200	A,B,D,E
3.945	Rock/pop music	Sat	2230	C,D,F,
6.205	Listeners Letters	Dly	0900	A,B,D,E,F,
6.220	Relay of Irish f.m. Stn.	W/E	0040	A,B,C,D
6.225	Live from Dublin	Sun	1110	D
6.232	Irish DJ/Music	Sun	1052	A,C,D,E
6.232	Record requests	Sun	1206	A,E
6.232	Relay from London	Sun	0947	C,D
6.240	DJ Essex accent?	W/E	1202	A,B,C
6.262	Relay programme	Sun	1300	A,B,D
6.266	Dutch/Oldies	Sun	0030	A
6.280	Music (Try 6.242 MHz)	Sun	1203	A,C,D,E
6.288	German DJ Show	Sun	0743	D
6.290	Jack Russel Programme	Sun	0038	A,B,C,D,E
6.305	The Lady in Red	W/E	1000	A,B,D,E,F
6.400	Free Radio Show	Sun	0950	A,C,D,E,F
6.911	Irish DJ	Dly	1127	A,C,D,E
7.446	Jock Wilson Programme	Sun	0954	A,C,E
7.473	French Music	Sun	0954	A,B,C
11.400	as above	Sun	1000	E
11.413	Jock Wilson Programme	Sun	1028	E
12.255	Talk on electronics	24h	0900	A,B,E

This chart now shows the frequency, type of programme and day of the week each broadcast was heard. Readers logs including this information are very welcome. The next for deadline logs is November 1 please.

Dly = Heard on weekdays and weekends.
W/E = Monitored on both Saturday and Sunday.
B/H = Bank Holiday.
24h = Possibly a 24 hour service.

Short Wave Monitors
A Tim Bucknall, Congleton, Cheshire.
B Mark Jones, Peterborough, Cambs.
C Bob Marsh, Bexleyheath, Kent.
D Free Radio Monitoring, Halesowen, W. Midlands.
E Sid Morris, Rowley Regis, W. Midlands.
F John Robertson, Alnwick, Northumberland.

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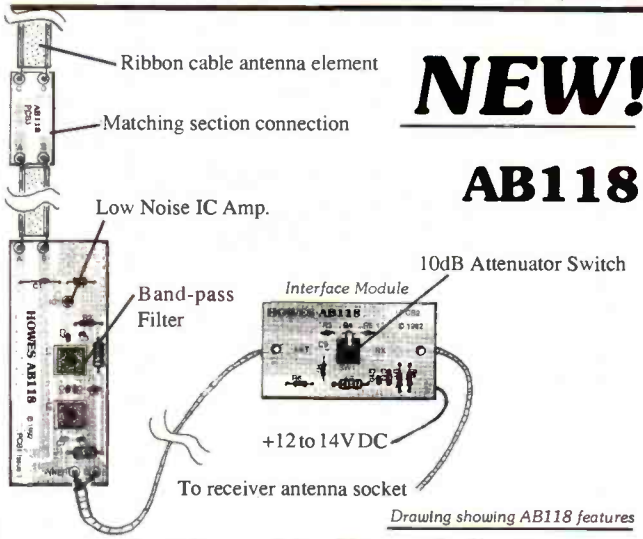

Drawing showing AB118 features

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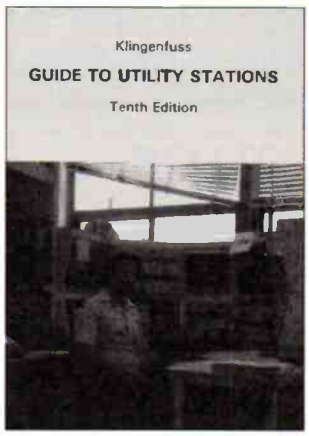

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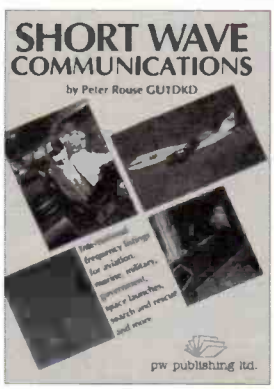

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A photocopy of this form is acceptable, but you must still send in the corner flash below, as proof of purchase.

FOR SALE/WANTED maximum 30 words

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CONTACT DETAILS maximum 12 words

			(12)

THE WORLD AT YOUR FINGERTIPS

IC-R9000 State-of-the-art communications receiver.

There is no better way to listen to the world than with the truly innovative ICOM IC-R9000, a worldwide communications receiver in a class of its own.

The receiver has continuous all-mode, super wideband coverage of 30kHz to 2GHz, with a highly advanced CRT display that indicates all signal activity within a ±25, 50 or 100 KHz range of your tuned frequency. Easy editing of the 1000 memory channels is allowed and when an RTTY/Packet terminal is connected, data can be displayed on the screen.

The IC-R9000 features include high sensitivity, intermod immunity and frequency stability in all ranges. The list of innovations available with the IC-R9000 is truly impressive and to appreciate them fully we would suggest a visit to your nearest ICOM dealer.

- All mode capability.
- Multi-function CRT display.
- Icom's innovative DDS system.
- Visual signal confirmation by spectrum scope.
- CI-V system for computer control.
- 8 advanced scan functions.
- IF shift, notch filter and noise blanker.
- Dual clock plus sleep and daily timers.
- Excellent sensitivity & frequency stability in all ranges.
- Wide variety of tuning steps.
- Optional UT-36 voice synthesizer.
- 424(W) x 150(H) x 365(D) mm.

1.

2.

The IC-R9000 shown above is the flagship receiver in the ICOM range. Other ICOM receivers to complement the IC-R9000 include: 1. IC-R100 base/mobile, 2. IC-R72 HF, 3. IC-R7100 wideband 4. IC-R1 Handheld. ICOM, so good to receive.

3.

4.

For further information about ICOM products and the location of your nearest authorised dealer please contact:
Icom (UK) Ltd. Dept SW Sea Street Herne Bay Kent CT6 8LD
Tel: 0227 741741 (24hr). Fax: 0227 741742

ICOM

HF RECEIVER TECHNOLOGY

INNOVATION DESIGN MANUFACTURE TECHNICAL SUPPORT

HF-150

Compact Communications Receiver

£329 inc VAT

Designed as a logical alternative to the Japanese 'push button portables', the HF-150 places a 'real radio' within your price reach. Whilst reflecting the Lowe approach to simplicity of operation, the HF-150 nevertheless has all the features and facilities you need. This truly is 'Real Radio'.

Frequency coverage: 30kHz - 30MHz
Modes: USB/LSB/AM/Sync. AM (Selectable S'band)
IF Bandwidths: 2.5kHz & 7kHz
Tuning: 8Hz steps with variable speed
Memories: 60 holding frequency & mode
Aerial inputs: 600 ohms, 50 ohms & Hi-Z Whip
Power: 12Vdc from mains adaptor (supplied)
Case: All-metal light alloy case
Size: 185mm(W) x 80mm(H) x 160mm(D)
Weight: 1.3kg (less batteries)

HF-235

The Professionals' Choice

£1116 inc VAT

Frequency coverage:30kHz - 30MHz
Modes: AM/LSB/USB/CW/NBFM (Sync AM optional)
Filters: 6 Input bandpass filters
Tuning steps: 8Hz - 125Hz (stepped by mode)
Construction: Fully floating chassis
Remote control: RS232C Computer interface (optional)
Memories: 30 holding a host of data
Tuning: Spin-wheel, keypad & MHz button freq. entry
Power supply: 110-120 or 220-240Vac 50Hz
Size: 483mm(W) x 88mm(H) x 320mm(D)

HF-225

Gateway to the World

£429 inc VAT

Frequencies: 30kHz - 30Mhz
Tuning: 8Hz steps.
Memories: 30 channels
Filters: IF filters for all modes fitted
Tuning: Keypad & spin-wheel
AM/FM Sync. Detector (optional)
Keypad for remote entry (optional)
Excellent quality at reasonable cost

LOWE ELECTRONICS LIMITED

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Sole appointed UK Distributor for KENWOOD Amateur Radio

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