short wave magazine

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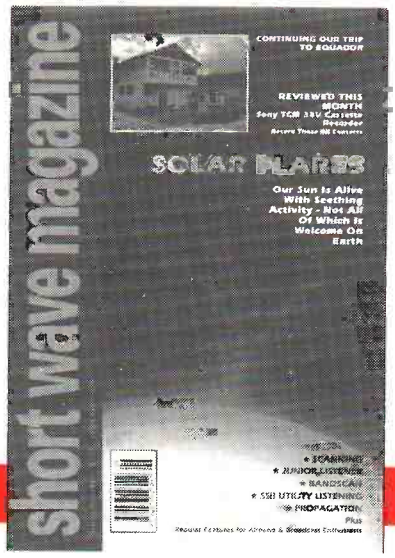
contents

REGULARS

Cover: The sun is alive with seething activity, some of which has a dramatic effect on radio waves. The cover picture is an artist's impression of an explosive solar prominence in the region of a group of sunspots. Julian Baum/Science Photo Library. The inset picture shows the studio buildings of Radio Interoceanica, Santa Rosa,Ecuador. Dick Ganderton.



...GOOD LISTENING

letters

SWM SERVICES

Subscriptions

Subscriptions are available at £21 per annum to UK addresses £23 in Europe and £22 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 £34 (UK) and £39 (overseas).

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 of the new style SWM, are available price £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.

Dear Sir

In 1938 my favourite was a set called the Paramount, very compact for its time, the size of a small loaf.

The four valves - 12K7GT (r.f. amplifier), 12SJ7GT (sharp cut-off pentode heavily biased as a detector/a.f.), 50L6GT (a.f. output), 35Z?GT (half-wave rectifier). The nominal voltage for the heaters in series was 109V, the drop from mains 240V was by resistance wire as part of flex - this had to be about 8 feet long.

A problem when servicing such a set was that the chassis could be live at full mains voltage.

Selectivity was good - except at short range! An amateur broke through both l.w. and m.w. bands every Sunday morning. He must have lived in the next street (in Croydon). His callsign, G5GQ, rings in my ears even now. If he is still alive and reads this - after 53 years, all is forgiven!

D.M. Evans
Corby

Dear Sir

I feel that I have to write and respond to the letter from John Wilson of Lowe Electronics. While I do understand what he is trying to say, I do feel that it is a little sweeping to suggest that all modern wide-band receivers are 'sow's ears'.

I currently own an AOR1000, with which I am very pleased. It performs **very** well on the v.h.f./u.h.f. bands, as one would expect, but does a creditable job on the h.f. bands too. And this is where I would like to take him to task: the v.h.f./u.h.f. is **very** good, better than the AOR 900s and 800s, both of which I have owned in the past. Now, the h.f. bands are covered well in terms of distance, i.e. 500kHz up to the 30MHz 'limit', and while I would agree that the reception is not up to that of the very expensive receivers, I did not expect it to be.

You see, I won a Racal RA17 communications receiver for serious listening and just use the AOR for those times when I am away from home. Just in case you are not sure, the Racal RA17 is not exactly portable! I do understand that there are limits on the h.f. bands, but I have still managed to pick up Radio South Africa whilst mobile and using a magmount whip tuned to about 100MHz. If such units are being sold as h.f. receivers, then the vendor is at fault; but surely people should check out what they are going to buy first? I know you will say that they don't, but I am afraid I would not part with over 200 big ones until I had done just a little checking, if only to see what else was on the market.

The upshot of this is that I am well impressed with my AOR1000 and I consider it to be 'a silk purse'.

Phil Cooper, Guernsey

Dear Sir

With regard to your article on the 'spy' stations that have been heard on short wave for many years now.

Way back in the sixties, I was interested in meteorology and as a consequence spent many hours transcribing the 'data' from these stations (usually just above 80m) in the naive hope that I could translate them.

The format is very similar to weather information sent by RTTY (6 figure identity code followed by sets of 5 figure data*). However, whilst the layout is very similar, the translation did not make any sense. So to find out where I was going wrong, I wrote to the Meteorological Office and received a reply from a senior signals officer to the effect that the messages were German river soundings which are automatically generated (rather like the speaking clock).

If you are daft enough to spend hours copying the 'data' (like I was in my teens) then there is, in fact, a repeating pattern that emerges for the 'idents' that bears out the previous paragraph.

If one also considers that if the data needs to be transmitted to a central recording area then voice transmission is as good as any other medium, particularly if the recipient is a relatively unskilled clerk. It would be interesting to consider what would be made of, for example, Radio Sonde tones (which could equally well be sent as numbers), or pager tones on 27MHz if they were heard more often, by someone not aware of industrial encoding of data.

My own feelings are that, should these particular signals actually turn out to be spies talking to each other, there is little I could do about it, as I've neither the skill at code breaking or the inclination to spend time copying the data down. Also if they've got nothing better to do than spend the hours required to read these 'messages', let them get on with it. In this day and age (certainly since the sixties) anywhere in the world is only a telephone call away and using it to contact agents could hardly attract any more attention, even if the lines were bugged.

* For anyone sufficiently interested there is an HMSO book(let) called *Meteorological Office Handbook of weather messages*, which provides both the weather information translation and some frequencies is use by Telex, FAX, voice and Morse transmissions on h.f.

Bernard Greater G4ICZ, Burton-upon-Trent

Dear Sir

John Wilson's letter in July's *SWM* concerning the current 'd.c. to GHz' scanner mania is to be much applauded. Although there may be one or two wry smiles from the more cynical members of the amateur radio trade (of which I am an ex-member!) what John has written is nevertheless first class advice. It is high time that advertising hyperbole and hi-fi like technomania is swapped for some good engineering common sense.

Stephen Prior G4SJP
Devon

letters

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

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to other magazines. The views expressed in letters published in this magazine are not necessarily those of Short Wave Magazine.

Dear Sir
If your a.m. station is plagued by interference why not try listening on s.s.b? An a.m. signal has two identical sidebands and a carrier. Single sideband (s.s.b.) only uses one of those sidebands and disposes with the carrier altogether. Communications receivers and the better quality portables offer good s.s.b. reception and usually a choice between u.s.b. and l.s.b. This means you can tune a.m. signals as if they were s.s.b. signals.
When your a.m. signal has heavy interference, determine which 'side' of its frequency has the least interference. For example R. Australia on 13.745MHz has strong interference from 13.740MHz but only slight interference from 13.750MHz. You would tune for the u.b.s. of R. Australia, i.e.. the one above 13.745MHz.
Set your receiver to u.s.b., with s.s.b. filter if separate and carefully tune so that the carrier frequency of the station you want and the frequency of the replacement carrier generated in your receiver for s.s.b. match! If there is a difference in these two frequencies you will hear a high pitched whistle, known as a heterodyne.
As the frequencies become more equal, the pitch of the whistle will drop until eventually a point will be reached where the heterodyne disappears altogether. This point is known as zero beat and you are now tuned to the u.s.b. of the a.m. signal.
Since the bandwidths of s.s.b. filters are narrow, audio quality will suffer and the signal will be a bit 'clipped'. However, listening on s.s.b. can mean the difference between audio you can understand, and a signal buried under interference.
I expect all the amateur radio operators know all about this, but I doubt if it is general knowledge.
Cliff Stapleton
Torquay

Dear Sir
You may be aware that the cutbacks consequent upon the reduced defence commitments of the US Navy are at last coming to fruition.
I monitor these using my ERA Microreader and display unit and have noted an announcement that from June 30, the following stations are closing down.
NAV COMM STA Norfolk Virginia
NAV COMM STA Key West Florida
NAV COMM STA Thurso Scotland (GXH)
NAV COMM STA ROTA Spain
This means that the best c.w. transmission that I know of on the s.w. bands i.e. GXH on 7.5055MHz will no longer be available to us.
The announcement has appeared at odd times during the transmissions so it may not be easy to verify. However, a notice to mariners is published concerning this.
Pete Dickenson
Great Malvern

Dear Sir
Many thanks for expanding the topics covered by *SWM* to include news of pirate stations; whether we approve of them or not they do exist so listeners might as well learn where the signals originate from, especially if their reception constitutes DX. I also find the 'Airband' section of the magazine interesting because I have always been keen on aircraft since my boyhood during WWII and then, around 1950, during my National Service as an RAF air radar mechanic. I listen to the airband on an Amstrad 6011 multi-band receiver using its own built-in telescopic antenna; reception here in North London is extremely good.
Although I have no satellite receiver equipment, I find Roger Bunney's 'Satellite TV News' fascinating; eventually I hope to obtain suitable equipment that will receive satellite news-link transmissions. Oddly enough, recently I was amazed to find that I was able to receive British Sky Broadcasting on q 14in monochrome television, up in my den, on u.h.f. channel 38, a snowy but watchable picture - with very strong sound - was obtainable on a fairly regular basis during the evening. I was rather bewildered when the channels appeared to change at random, but then realised that a neighbour, living two houses away, was testing his newly-installed system!
Obviously, the satellite frequencies within the band 950 to 1750MHz are not receivable at u.h.f. but after final conversion to a nominal channel 38, the typical 2 to 3mV output to the installation's television set is sufficient to radiate to neighbouring receivers, especially if used with a distribution system around the house. I assume that cable television services also can radiate in a similar way. Have any other readers experienced these effects?
Ivor Nathan
London

Dear Sir
It is always satisfying to an author when one of his offerings has sufficient impact to produce a letter from a reader. However, in the case of Mr Thomson (*SWM* August 1991), I appear to have failed in putting over my point. Yes, it is quite possible for a s.w.l. to send a basic QSL to an amateur and get a reply. This is because many of us are nice guys who want to encourage s.w.l.s. However, if you are not satisfied with the number of cards you receive back, the solution is in your hands and my article suggested some actions you could take.
As Mr Thompson's precis of my advice contains many misunderstandings, may I suggest that he re-reads my article. If he is still unclear then I will be delighted to enlighten him if he cares to write directly to me, QTHR, or to telephone me.
G.P. Stancey G3MCK
Staines.

grassroots

Club Secretaries: Send all details of your club's up-and-coming events to; 'Grassroots', Lorna Mower Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP

RAE Courses

Mansfield: West Nottinghamshire College, Derby Road, Mansfield. Monday evenings 7 to 9pm. Course tutor is Alan Lake G4DVW. For more information contact the college on (0602) 382509.

Birkenhead: The Wirral ARS at Ivy Farm, Arrow Park Road, following their high success rate in preparing candidates for the RAE, are running a course commencing early September for the May 1992 exam. Norman G3CSG and Denis G0OTD, both retired school Heads of Physics are conducting the course. Prospective candidates should contact Norman Kendrick G3CSG. Tel: 051-677 6368.

Hendon: Hendon College is offering an evening class for the RAE. They also offer evening classes in Practical Electronics (C&G), Electronics (BTEC) and Microelectronics (BTEC) as well as full time and day release courses. The RAE class is on Thursday evenings 7.30-9.30pm at the Grahame Park, Corner Mead site (near the RAF Museum) starting on Thursday September 19. Tel: 081-200 8300.

Orpington: Poverest School, Poverest Road, Orpington. Wednesday evenings, 7.30-9.30pm commencing September 18. Early enrolment is advised and you should post it to Bromley Adult Education Centre, Church Lane, Prince's Plain, Bromley BR2 8LD. Tel: 081-462 9184.

Redhill: East Surrey College, Redhill is again offering a course covering the technical aspects of the C&G 765 RAE. The course duration is 30 weeks, commencing on Wednesday September 18, 7-9pm and the cost will be £50. In the event of sufficient candidates, a Morse class may also be held, the commencement date, time and cost to be arranged. Tel: (0737) 762684.

Stockport:Reddish Vale Evening Centre, Reddish Vale Road, Stockport. The RAE course is available as 25 Monday night sessions leading up to the May 1992 exam, with the option of sitting the exam in December 1991 for those needing to re-sit a component or for students with a good knowledge of electrical theory. The lessons run from 7-9pm. A Morse course of 25 lessons for all levels of ability up to about 17 w.p.m. is also available. Several tutors will be availabe to assist. The lessons will run on Thursday evenings from 7-9pm. Tel: 061-477 3544.

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. September 17 - Wadley Loop System by G0LZJ. Paul Truitt G4WQO. 071-938 2561.

Bedford & District ARC: Tuesdays, 7.30pm. Allen's Club, Hurst Grove, Bedford. Sept 3 - Antennas & Coax by G0GBI, 10th & 24th - Social, 17th - Amateur Radio Another View by G3YUQ. Glenn G0GBI. (0234) 266443.

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. Sept 17 - Junk Sale. Geoffrey Milne. 081-462 2689.

Chestnut & DARC: Wednesdays 8pm. Church Room, Church Lane, Wormley, Nr Cheshunt. Aug 28 - Natter Night, Sept 4 - Construction Contest, 11th & 25th - Natter Night, 18th - Test Equipment by G4EYR. Roger Frisby (0992) 464795.

Coulsdon ATS: 2nd Mondays, 7.45pm. St Swithun's Church Hall, Grovelands Road, Purley. Sept 9 - Linear Amplifiers by G8MNY. Andy Briers G0KZT. 081-668 7004.

Coventry ARS: Fridays, 8pm. Baden Powell House, 121 St Nicholas St, Radford, Coventry. Aug 23 - Outdoor Operating Evening at Hartshill Hayes Country Park, 30th - Night on the Air, Sept 6 - Indoor DF Final, 13th - Night on the Air. Coventry 523629.

Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. Aug 28 - Video Show, Sept 4 - Junk Sale. Richard Buckby Ambergate 852475.

Dorking & District RS: 2nd & 4th Tuesdays, 7.45pm. Friends Meeting House, South Sreet, Dorking. Aug 27 & Sept 10 - Informal at Falkland Arms, Sept 24 - Digital Communications Part 2. John Greenwell G3AEZ. (0306) 77236.

Edgware & DRS. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. Aug 22 - SSB Field Day Briefing, Sept 12 - GX3ASR on the Air. Hank Kay G0FAB (081-205 1023).

Fareham & DARC. Wednesdays, 7.30pm. Porchester Community Centre, Westlands Grove, Porchester, Fareham, Hants. Sept 11 - /P Up Mountains by G0FIM, 25th - Junk Sale. Rod Smith G0ERS (0705) 373572.

Hastings E&RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey Close, Hastings. Aug 21 - Constructors Competition, 27th - Practical Evening. Reg Kemp, 7 Forewood Rise, Crowhurst.

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

Keighley ARS: Thursdays, 8pm. The Cricket Club, Ingrow, Nr Keighley. Aug 22, Sept 5 & 19 - Natter Night, Aug 29 - America's first 25 years in space by G4ZVD, Sept 12 - Ideas for Club Events 1992. Kathy Bradford. (0274) 496222.

Loughton & DARS: 2nd & 4th Saturdays, 7.45pm. Loughton Hall, Rectory Lane, Loughton, Essex. Aug 23 - No Meeting. Mike Pilsbury G4KCK. 081-504 4581.

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. Sept 5 - The Short Wave Broadcast Bands by G4GYU. Mary G0NZA. (0623) 755288.

Midland ARS: 3rd Tuesdays, 7.30pm. Headquarters Unit 22, 60 Regent Place, Birmingham B1 3NJ. Sept 17 - Beekeeping by G0LAI. John Crane G0LAI. 021-742 8712 (evenings).

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St John Ambulance HQ, 61 Emscote Road, Warwick. Aug 27 - VOGAD by G0IZZ, Sept 10 - DX from Sierra Leone by G0GWA, 24th - Indoor DF with G3TFA. Mike Newell Kenilworth 513073.

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. Aug 28 - Science for All by G3PTB, Sept 4 - Town & County Show final Briefing, 11th - Flying Kites with Kevin Appleton, 18th - Practical Troubleshooting by G3PTB. Jack Simpson G3NJQ. (0603) 747992.

North Bristol ARC: 3rd Fridays. S.H.E. 7, Braemar Crescent, Northville, Bristol. Sept 1 - Motorama with G0MGC. J. Chris G0LOJ. (0454) 616267.

North Ferriby United ARS Sundays, 8pm. North Ferriby United Football Club Social Room, Church Road, North Ferriby. Aug 23 - Night onthe Air, 30th - Portability My Way by G3YCC, Sept 6 - Night of the Air, 13th - Construction Competition, 20th - The Way Ahead with G4VKK, 27th - Characteristics by G3NJP. F W Lee G3YCC. (0482) 650410.

Preston ARS: Alternate Thursdays. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood. Sept 5 - The Lakeland Turnpike by Mr Gregson, 19th - A Tour of Gibraltar by Mr Watson. Eric Eastwood G1WCQ. (0772) 686708.

Rhyl & District ARC: Sept 2 - Annual Dinner, 16th - AGM. Edward Shipton GW0DSJ. (0745) 336939.

Rugby ATS: Tuesdays, 7.30pm. Cricket Pavilion, outside Rugby Maritime Radio Station. Sept 24 - Presentation of Awards & Cups. Peter Wells G0JEW. (0455) 552449.

Salisbury R&ES: Tuesdays. Grosvenor House, Churchfield Road, Salisbury. Aug 27 - Informal at the Three Crowns, Waddon, Sept 3 - Video Evening with G0MZI, 24th - c.w. operating procedures with G4POF. Bert Newman G2FIX, QTHR.

Sevenoaks & DARS: 7.30pm. Council Offices, Argyle Road, Sevenoaks. Sept 16 - Charity Cycle Ride Talk by Dave Wellman.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. Aug 28 - Fox Hunt, Sept 4 - AGM, 11th - Bristol Rally Planning Evening, 18th - Reviewing the Bristol Rally. Len Baker. Whitchurch 832222.

Southdown ARS: 1st Mondays, 7.30pm. Chasely Home for Disabled Ex-Servicemen, Southcliff, Bolsover Road, Eastbourne. Wednesdays & Fridays, 7.30pm. Hailsham Leisure Centre, Vicarage Road, Hailsham.

Stratford upon Avon & DRS: 2nd & 4th Mondays, 7.30pm. The Home Guard Club, Main Road, Tiddington, Stratford upon Avon. Sept 9 - Open evening 10 minute stories, 23rd - Converting p.m.r. equipment by G3TZM. A Beasley G0CXJ 060-822 495.

Three Counties RC: Alternate Wednesdays, 7.30pm. The Railway Hotel, Liphook, Hants. Aug 28 - Junk Sale, Sept 11 - Wines of the World by Michael J Schmidt. Dave G4VKC.

Todmorden & DARS: 1st & 3rd Mondays, 8pm. The Queen Hotel, Todmorden. Sept 2 - Japanese Morse. Mrs E Tyler. (0422) 882038.

Trowbridge & DARC: 8pm. TA Club, Trowbridge. Sept 4 - HF Beam Antennas a new approach by G0DAB, 18th - Open Evening visitor welcome. Ian Carter G0GRI. (0380) 830383 evenings.

West Kent ARS: 3rd Fridays, 8pm. The School Annex, Albion Road, Tunbridge Wells, Kent. Sept 6 - Informal meeting, 20th - Constructional Challenge. John Taylor G3OHV. (0892) 664960.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. Aug 30 - General Activity Evening, Sept 13 - Radio With Computers by G3XTC and G4XLM. Chris Frost. 081-397 0427.

Yeovil ARC: Thursdays, 7.30pm. The British Red Cross Society, 72 Grove Avenue, Yeovil. David Bailey G0NMM, QTHR.

junior listener

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

Featured Junior Listener

This month's Featured Junior Listener is **David Conway** from Swanscombe near Dartford in Kent. David is twelve years old and has been interested in short wave listening since last August. His interest started when he visited some old friends while on holiday in Yorkshire. One of these friends had become a keen DXer and David found himself drawn to the hobby.

With his interest roused, he had to wait until Christmas for his first receiver. He is now the proud owner of a Philips D1875 twelve band World Receiver. This covers the standard long, medium and v.h.f. plus nine short wave bands. Although the receiver is supplied with just a telescopic antenna, David has rigged up a 10m external antenna. This runs from his bedroom window out to the top of the garage. David's had some excellent results from this set-up and has sent me a list of loggings. His interest extends to pirates and lately to TV DXing. The TV equipment in use comprises a NEI 1451TX, 14in colour television, Antiference u.h.f. antenna and a Labgear CM7291 amplifier. Next on the list is a v.h.f up-converter. David's best result to date has been from The Netherlands with NED1, 2 and 3.

For reference books he uses *A TV-DXer's Handbook* by Roger Bunney and a 1983 version of the *World Radio and TV Handbook*.

If you'd like to be featured in this section, just drop me a line with as much detail as possible. It would also be very helpful if you could include a photo of you and your station.

Technical Help

This month I've had some technical questions from a newcomer to listening, **Jacques Desaedeleer** of Ombret in Belgium. The first concerns the use of b.f.o.s (beat frequency oscillator) to resolve single sideband signals. I first covered this back in February with a broad introduction, but it seems that there may have been some confusion. So let's straighten out one particular point - the confusion between a b.f.o. and v.f.o. The two terms have quite different meanings. The beat frequency oscillator is used specifically for resolving c.w. and s.s.b. transmissions. It can also be used for other signals that do not involve the modulation of a carrier. The variable frequency oscillator (v.f.o.), on the other hand, is, in effect, the main tuning control of your receiver. On some of the more comprehensive receivers you'll find two v.f.o.s. This allows you to rapidly switch between a pair of frequencies.

Here are a few tips on resolving s.s.b. signals. If your receiver has fine tuning steps of 200Hz or less, it's worth calibrating your b.f.o. control. To do this, start with the b.f.o. turned off and tune-in a strong a s.s.b. signal. A good place to start is the 14MHz amateur band between 14.1 and 14.3MHz. Set the tuning for maximum volume of the very distorted s.s.b. signal. Once you are happy with the tuning, turn on the b.f.o. and adjust the b.f.o. tuning knob for maximum clarity. The position of the b.f.o. tuning knob should now be noted for future reference. Reception of other s.s.b. signals is then just a case of setting the b.f.o. to the marked position and tuning with the main tuning control. Fine adjustment is then made with the b.f.o. control.

If your receiver has coarser tuning steps, you ought to use the calibration process described above for every signal. By using this system you can be sure of getting the best results.

I've one other tip, mainly for older communications receivers with separate r.f. (radio frequency) and audio gain controls. When receiving s.s.b. signals, set the audio gain to maximum and control the volume with the r.f. gain. You will find that this generally gives a better quality audio signal.

Listener's Log

George Lee of Newcastle upon Tyne wrote to me recently with a few useful ideas for newcomers to radio. One of these was a listener's log that could be used to help keep a record of stations received. This may seem pretty basic, but often the new listener is left to learn the hard way. Having looked into the matter, I've designed a listener's log that I propose to make available to all those who would like a copy. I've shown a sample of the top line in the column. As you can see it's pretty simple, but contains all the key information that you need for a useful log. If you're not familiar with the SINPO signal reporting system, check out the March Junior Listener as this contained an explanation.

You will also see that I've left plenty of room for station details. This is deliberate as, if you are to QSL successfully, you will need to make a note of the programme material as well as the station details.

As a further refinement I'm currently finishing off a QSL form. This will contain reminders of all the information you need to supply for a successful and useful QSL.

Instead of supplying a complete book of logs and QSL forms, I'll supply a few sample sheets that you can then get photocopied. If you would like some of these sheets just send your name, address and two First Class stamps to me and I will supply them by return. Incidentally, while you are writing, why not include a few details of your station and interests?

Date	Time	Frequency	Mode	SINPO	Details

Radio New Zealand

This station is very popular with short wave listeners in the UK, particularly through its regular broadcasts for DXers. They also have some very attractive QSL cards that are much sought after. I've included an example of one of their cards for you to see. Their fortnightly DX programme presented by Tony King is well worth listening out for.

The days and times are Monday 0430, Thursday 0830 and Friday at 1930UTC. The programme is called *Mailbox* and alternates with another interesting feature called *Travel Pacific*.

Tony welcomes reception reports and these should include comments on the programme, along with three IRCs. Please note that, because of the postal discount system used by the New Zealand Post Office, Tony doesn't need you to send him an envelope. Also, if you only require a programme schedule then you need send him only one IRC.

news

HCJB Ham Radio Today

Host of *Ham Radio Today*, John Beck, brings you the latest news from the world of electronics and amateur radio with practical hints to heighten your enjoyment of the hobby.

Sept 4: Propagation Notes. Angle of Radiation. Antenna Notebook, HF mobile antennas part 1. Keeping a station log.

Sept 11: Propagation Notes. LW characteristics. Antenna Notebook, HF mobile antennas part 2. Headphones.

Sept 18: Propagation Notes. MW characteristics, Antenna Notebook, HF mobile antennas part 3. Elimination of novice accent.

Sept 25: Propagation Notes. SW characteristics, Antenna Notebook. HF mobiles antennas part 4. Repairs.

0730UTC, 11.835, 15.270 & 17.790MHz

1900UTC, 15.270, 17.790 & 21.480MHz.

DSWCI

The 19th edition of the well-known DSWCI *Tropical Bands Survey* is now available. In this 23-page booklet, you will find all active broadcast stations in the 2 - 5.9MHz frequency range, listed by frequency and their power and transmission times. It is completely updated and based upon monitoring information from DXers all over the world, including 'special envoys' to rarely visited countries in Latin America, Africa and Asia. Each station is classified by a code which tells you how often the station has been reported since May 1990, world-wide and in Europe.

Tropical Bands Survey is available for 7 IRCs or 30 Danish Crowns sea mail delivery or 9 IRCs or 35 Danish Crowns airmail delivery. **DSWCI, c/o Bent Nielsen, Betty Nansens Alle 49, 1 tv, DK-2000 Frederiksberg, Denmark.**

Special Event Stations

West Midlands Fire Service will be holding their annual Muster Day and Vintage Fire Engine Rally on Sunday September 8 at Cannon Hill Park, Birmingham.

A special event amateur radio station will be in operation, with the callsign **GB0WMF**. Operation will be on both h.f. (probably mainly 7MHz) and v.h.f. The station will QSL, via the bureau, for contacts made, or for correct reception reports from listeners.

Muster Day is open to the public and has a wide variety of other events and attractions for the whole family. Entrance is free.**Bob Sayers G8IYK. Tel: 021-380 7615** during work hours.

Television News

TVR Rumanian TV has cut back on its German and Hungarian language programming by a half and is now transmitting the foreign language content over the 2nd (u.h.f.) chain, resulting in a greatly reduced coverage area, generally limited to about 160km radius of Bucharest. There have been loud protests from the Hungarian speaking minority population.

With several foreign language TV programmes available in the UK by satellite or cable, a proposed TV station in Tokyo is offering English language TV programmes across the capital, with possible expansion to include German and French. At this time five channels are available in the Japanese capital.

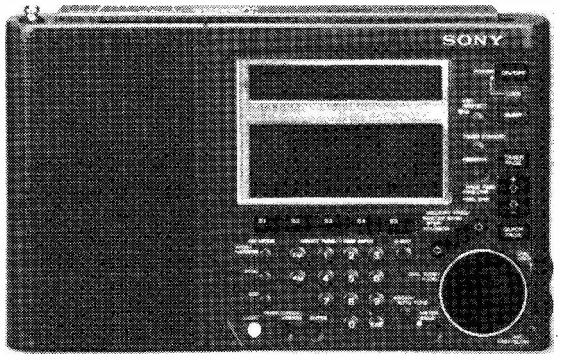
With increasing debts (nearly £120 million!) in the Danish TV2 channel there is talk of possible closure by December 91. Finance is part government grant and the rest from commercial revenue - the government have refused further aid.

With increasing losses at the French TV channels Antenne 2 and France Regions 3 (A2/FR3) there have been massive job losses and with the possibility of the two programme channels merging.

Bavarian Radio (BR) has now gone 'on-air' from Munich with an all news format station and call 'B5'.Transmitting for 18 hours daily on weekdays and 15 hours daily at the weekends, finance derived from commercials.

Nap-TV, Hungary's breakfast TV programme, formally aired over MTV-1 is now transmitted from 0600-0900 local over MTV- 2. MTV-1 is now on-air for most of the day and night.

The South Korean government is to take over the ch.A2 American Forces TV station in Seoul at the end of 1993 to provide more local TV programming, with the arrival of Korea's first satellite around 1994, another three TV networks will be possible.



New Sony Receivers

The Japanese Sony Corporation will be leading the short wave radio market once again from August when the replacement for the somewhat long in the tooth ICF-2001D (2010 in North America) is launched at the Berlin Consumer Electronics Fair.

The new model will be known as the ICF-SW77 and is comprehensively equipped. Its a.m. coverage is continuous from 150kHz to 30MHz and v.h.f. f.m. Band II is also provided with stereo output through headphones. A number of new facilities distinguish the SW77 from its predecessor, including tuning in 50Hz steps on short wave and the ability to store 162 frequencies together with 100 six-letter-long station names. Frequencies are pre-programmed at the factory for the major broadcasters such as BBC World Service, Radio Japan, Voice of America and so on. If a frequency is not known, a station name can be entered and all the frequencies will be tuned one after another. The large l.c.display shows a variety of information including the station name, frequency , memory page number and signal strength whilst a secondary display shows the clock and alarm functions. The lighting of the displays is variable, for the first time.

Reception is possible in a.m. (which has narrow and wide filters) or in s.s.b. with switchable lower and upper sideband. Synchronous detection is included, just as in the 2001D. The alarm function will control a suitably equipped cassette recorder for unattended recording.

A smaller version, the ICF-SW55 will be launched in the autumn. Similar in many respects to the SW77, this is aimed at the traveller, but still offers 125 frequency memories accessible by keying in the station name. Full s.s.b. reception is provided along with a wide and narrow filter on a.m. A timer facility will control a recorder and provide alarm functions.

The cost of the SW77 is expected to be around £350 in Europe

Eddystone User Group

The group started out over 12 months ago as a forum where Eddystone enthusiasts could exchange ideas, compare experiences, obtain technical help and locate spares. The group has grown considerably and become international. We now have members in France, Spain, Portugal, Germany, Holland, Scandinavia, Canada, South Africa and the USA. This apart from the UK and Ireland. Success like this has meant changes and from being a photocopied newsletter every two months, they are looking towards a commercially printed magazine, hopefully next year. Ideas, suggestions and short articles will be appreciated, as no successful newsletter can be the work of one man (and his wife!). Each month a particular model will be featured, information from members, free members' adverts for radio related items, hints and tips on various models services by Mr Moore, or members who write in and any sources of spares they hear about. The group already has three v.i.p. members, an ex-BBC broadcaster and writer and the owner of possibly the largest collection of Eddystones anywhere (over 120!). Not forgetting Chris Petit the MD of the Eddystone Radio Company, who has an EA12 in his shack.

It was during a visit last year to the Eddystone Radio Company where Chris took Mr Moore on a tour of the factory that he fulfilled a lifelong ambition. His interest in Eddystone receivers goes back to the post World War II era when he got his first one, his collection is now over 40, with two Panadaptors also. During his visit, he found there was no group or club for Eddystone, such as exists as for Collins, Racal, etc. Thus EUG came into being. Chris has kindly given permission for the group to use information from the company literature and manuals in their newsletter.

Photocopying and postage does not come free. This is a non-profit making group and the time to produce the newsletter is given willingly, so the annual subscription is a modest £7.50 for UK members and £10 abroad. Cheques payable to EUG please.

Hopefully, they are looking towards meeting at various rallies, even taking a stand to show off some of the 'specimens' in the collection.

Eddystone User Group, Moore Cottage, 112 Edgeside Lane, Waterfoot, Rossendale, Lancs BB4 9TR.

news

More RAE Courses

Stockport: Avondale Adult Education Centre, Heathbank Road, Edgeley, Stockport. Morse classes on Monday evenings 7-9pm and RAE classes on Tuesday evenings also 7-9pm. Enrolment in the week commencing September 16. Tel: 061-427 4730.

Manchester: North Trafford College, Talbot Road, Stretford M32 0XH. Theory classes will be Monday evenings or Wednesday mornings, Morse code on Tuesday evenings or Wednesday afternoons, Amateur Television on Wednesday mornings and the advanced Morse Code on Monday evenings. Enrolment dates are September 2-4. Tel: (061) 872 3731.

Doncaster: Doncaster College will again be running the City & Guilds RAE course from September. Classes will be on Tuesday evenings from 1800-2000. Anyone interested should contact Mike Parkin G6OSD at the School of Electrical & Electronic Engineering, Tel: (0302) 322122 ext 287 or 282. There will also be a basic practical electronics course on Wednesdays, 1800-2000, the tutor is Trevor Jones, on the same extension.

Swinton: The RAE class will be held at Wardley Adult Education Centre, Swinton and will commence about the middle of September. Further details may be obtained from William Stevenson. Tel: (0836) 668287.

London: The City of Westminster College (formerly Paddington College), will be running a RAE evening course commencing early September 191 (for May 1991 examination). Both Class A and Class B licences will be catered for (i.e. a Morse course will run concurrently). Professional College lecturers will conduct the course. Prospective candidates should contact the college - Science and Technology Dept., Ann James. Tel: 071-723 8826.

Fife: The Glenrothes & DARC is planning to run a RAE course. It will be from 7 to 9pm on Monday evenings, beginning late September. A second course in Morse code will be run during the same period on Tuesday evenings from 7 to 9pm. Both courses will be held at Balwearie High School in Kirkcaldy. Ken Horne GM3YBQ. Tel: (0592) 265789 evenings.

rallies

RALLIES 1991

August 25: Galashiels & District ARS have their Open Day at the Focus Centre, Livingstone Place, Galashiels. All the usual activities, Bring & Buy, traders, club stalls, refreshments, etc. John Campbell GM0AMB, 9 Brunton Park, Bowden, Melrose TD6 0SZ. Tel: (0835) 22686.

August 26: Huntingdonshire ARS will be holding their annual rally and Junk Sale at The Medway Centre, Coneygeare Road, Huntingdon, Cambridgeshire. Doors open 10am, rally closes at 4pm. Trade stands, Bring & Buy, components, junk and refreshments. Car boot pitches available or a second hall on standby in case of bad weather. Talk-in on S22 and GB3OV (433.125). D. C. Leech G7DIU, 4 Rydal Close, Huntingdon, Cambs PE18 6UF. Tel: (0480) 431333.

September 1: Preston ARS will be holding their 24th Annual Rally at the University of Lancaster, as in previous years. Godfrey Lancefield G3DWQ, QTHR. Tel: (0772) 53810.

***September 1**: Telford amateur radio rally will be held at the Telford Exhibition Centre, Telford Centre, Shropshire. Doors open 11am (10.30 disabled). John Bumford G0GTN, 19 Bewdley Avenue, Monkmoor, Shrewsbury SY2 5UQ.

September 8: Vange ARS will be holding their annual rally at the Laindon Community Centre, Laindon High Road/Aston Road, Laindon, Basildon, Essex. The centre is only a short walk from Laindon Station (British Rail) on the Fenchurch Street to Shoeburyness Line. Doors open from 10.30am to 4.30pm with admission at 50p. The rally will include many traders, Bring & Buy, refreshments and a free raffle. Talk-in is on S22. Approach roads will be signposted. Doris Thompson on (0268) 552606.

***September 8**: The Lincoln Ham fest will be held at the Exhibition Centre, Lincolnshire. Doors open 10.30am to 5.30pm (10am disabled). Sue Middleton, 14 Toronto Street, Lincoln LN2 5NN.

***September 8**: The Scottish amateur radio convention will be held at The Northern College of Education, Gardyne Road, Dundee. Parking available for 1000 cars. Alan Glashan GM4JCM, 35a Lochinver Crescent, Dundee DD2 4UA.

***September 15**: The BARTG Rally will be held at Sandown Exhibition Centre, Esher, Surrey. Located close to London, it is a 10-minute drive from the M25 (junction 10) and is not far from the M3, M4 and M40. Free parking for over 5000 cars. On-site catering, hot and cold meals, snack, beverages and licensed bar. Doors open 10.30am to 5pm, admission £1 for adults and OAPs, with children under 14 free if accompanied by an adult. Talk-in on S22. Peter Nicol G8VXY, 38 Mitten Avenue, Rubery Rednal, Birmingham B45 0JB. Tel: 021-453 2676.

September 15: The East of England radio rally will be held in the ICI Building, The East of England Showground, Oundle Road, Peterborough. Admission is £1, doors open 10.30am (10am for the disabled). There's a main traders' hall with bar and catering, a traders' marquee with Bring & Buy, separate outside area with flea market plus radio and electronic car boot sale. Various other attractions - Which-Kit Car Show, Caravan Club Rally, Banger Racing, Golf Driving Range & Go-Karts, Nene Park & Nene Valley Railway, acres of free parking. Nigel G1ARV. Tel: (0733) 78685.

***September 15**: The Bristol Radio Rally will be held at Brunel's Great Train Shed, Temple Meads, Bristol. D. Farr (0272) 839855.

***September 22**: The Norfolk Amateur Radio, Computer & Electronics Rally is being held in Swardesdon, about 8km south of Norwich. The rally itself will be held within the grounds of G3LDI. All normal trade stands, along with a Bring & Buy, food and drink, etc. Talk-in will be available on S21 and the gates are open between 1000 and 1600. G4ONF. Tel: (0603) 747782.

***September 22**: The Centre of England Amateur Radio Rally will be held at the British Motorcycle Museum, Bickenhill, near the NEC Birmingham (junction 6 M42). Doors open 10.30am, admission £1, OAPs 50p, children free. Over 60 trade stands in three large exhibition halls, Bring & Buy, talk-in on S22, bar and restaurant available, ample free parking, concessionary rates to visit museum. Frank Martin G4UMF. Tel: (0952) 598173.

***September 28/29**: The RSGB HF Convention will be held at the Friendly Hotel, Daventry, Northants. Featuring two lecture streams in parallel sessions throughout Sunday, which should offer something interesting for everyone. There will be the usual bookstalls, club stands, c.w. pile up competition, raffle and refreshments. Reduced rate for overnight accommodation. For more details, contact Bob Whelan G3PJT, 36 Green End, Comberton, Cambridge CB3 7DY. Tel: (0223) 263137.

September 29: The Harlow & District ARS will be holding their 33rd Amateur Radio and Electronics Rally at the Harlow Sportscentre. The Main Hall will provide a large and varied selection of traders, both old and new to the event. The studio upstairs will also have some traders along with the Bring & Buy, there will also be the usual special interest groups. Adjacent to the centre there's parking for 1000 cars. On-site reserved disabled parking is available, with full facilities inside for the disabled. Catering and licensed lounge bar. Talk-in on S22 and SU22 by G6UT. Entry is £1, with children under 14 and OAPs half price. Liz G0MDL. Tel: (0277) 364742 evenings and weekends only.

***October 6**: Great Lumley Amateur Radio & Electronics Society will be holding their rally in the Community Centre, Great Lumley, nr. Chester-le-Street, Co. Durham. Doors open 11am, 10.30am for the disabled. Trade stands, Bring & Buy (£200 value limit), refreshments available. Talk-in on S22 by GX6GLR. Admission 50p, children under 14 (accompanied by an adult) free. Barry Overton G1JDP. Tel: 091-388 5936.

October 6: Blackwood Amateur radio rally will be held at Oakdale Community College, Blackwood, Gwent NP20DT. Brian Matthews GW0JWF, 25 Manor Park, Newbridge, Gwent NP1 4RS. Tel: (0495) 243858.

October 13: The Armagh & Dungannon District ARC will be held in Gosford House Hotel, Markethill, Co. Armagh. Doors open at 12pm. Usual trade stands plus other events. For further information please contact Mr T. Hall GI0MSJ, 1 Hamiltonsbawn Road, Armagh City BT60 1DL. Tel: (0861) 523454.

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Available for demonstration at Matlock and the regional centres.

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Whatever you want to hear, the HF-225 will give you a gateway to the world Technically, the HF-225 distinguishes itself by having a low phase noise synthesiser which gives a performance not far off that of "professional" receivers. The receiver tunes in 8Hz steps and gives a smooth "VFO" feel when tuning.

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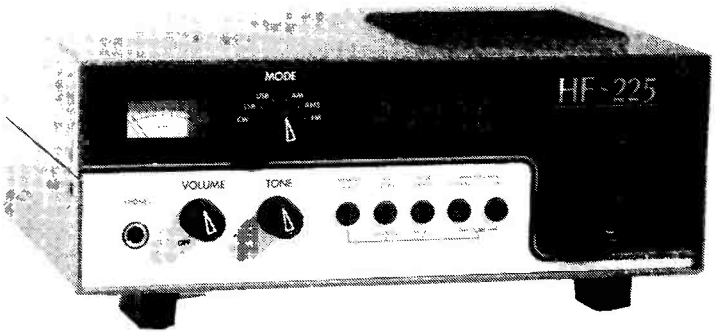
The HF-225 offers 30 memory channels. Using them has been made particularly versatile because the operator can review the memory contents whilst listening on another frequency.

The HF-225 comes complete with filters fitted for every mode - 2.2kHz, 4kHz, 7kHz and 10kHz. There is also a 200Hz audio filter for CW and if the D-225 detector is fitted, a 12kHz filter for FM.



Following its launch, the HF-225 was voted "Receiver of the Year" by World TV and Handbook.

Send for details or, better still, pop in to one of our regional centres and tune around for a while.

HF-225 30kHz-30MHz ..... **£429.00** inc VAT
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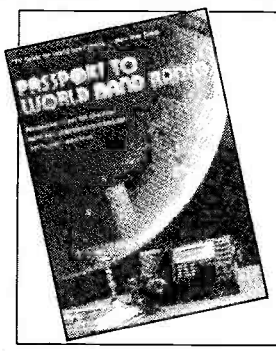

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Solar Flares: Outside Broadcasts from th

It is easy to think of the sun as a friendly, unchanging source of light and warmth for our planet. But, at times, our local star is alive with seething activity, not all of it beneficial to us. The most spectacular events are known as solar flares. As Robert Newman explains, these enormous explosions on the sun's surface are powerful enough to disrupt terrestrial radio communications, damage orbiting satellites and overload electrical power lines, as well as causing other interesting effects.

The sun is a gigantic nuclear reactor, over one hundred times earth's diameter and chiefly made up of electrically-charged hydrogen and helium gas. Deep within its core, at a temperature of around 15000000°C, hydrogen atoms are being smashed together to form helium. On the sun's vast scale, this process liberates huge amounts of energy and results in a mass loss of 4000000 tonnes per second (don't worry, there's plenty left!). This energy powers the sun and all the forms of activity on its relatively cool (5500°C) surface. While the sun's energy production is more or less constant, turmoil in its outer layers is not.

The Solar Cycle

Solar flares, along with other forms of activity on the sun, are controlled by the solar cycle. At the peak of this, roughly, eleven-year cycle there may be several flares per day - most of them minor - while at solar minimum a number of days may pass without any flares appearing. This ebb and flow of turbulence is caused by two properties of the sun - magnetism and differential rotation.

Our star possesses a magnetic field, one which is made up of individual localised fields each with a strength of 1000 gauss or more (the earth's magnetic field has a strength of about 0.1 gauss at the surface). The overall solar magnetic field can be visualised as a succession of lines of force stretching from pole to pole. Because the sun consists of electrically-charged gas or **plasma**, the magnetic field is carried by this material as it rotates. However, as it is not a solid body, the sun rotates at different speeds depending on latitude. The surface, or **photosphere**, rotates once in 25 days at the equator, once in 28 days at latitude 45° and once in 34 days near the poles. Consequently, the polar regions are being constantly lapped by the equator, causing the magnetic field, carried by the plasma, to wind up like a clockspring as the sun rotates. Eventually, after a period of about 11 years, the magnetic field lines are bunched so close to each together that they 'short-circuit'. The field strength then falls, the whole field reverses polarity and a new cycle begins. The period of this cycle is actually quite variable, sometimes as short as eight years, other times as long as sixteen.

Trouble Brews

During the time the field is being wound ever tighter, the field lines are stretched and forced closer together, all the time storing colossal amounts of energy and increasing the local field strength in their futile attempts to repel each other. In places where the local field strength reaches 10000 gauss, the repulsion between lines becomes strong enough to overcome gravity. The nearby magnetic field then tangles into a chaotic jumble, made even more complex by the electrically-charged plasma blindly following the invisible field lines as they whip around like angry snakes. In places, a line will burst up through the photsphere, forming a graceful arch over the surface. About one day later, a relatively cool sunspot will appear at each 'foot' of the loop as the magnetic field line changes the normal energy flow from the surface. The interiors of sunspots are around 2000°C cooler than the surrounding photosphere and therefore look darker by contrast. Within a short time, the magnetic arch is filled with plasma, creating a luminous horseshoe as much as 5000km high.

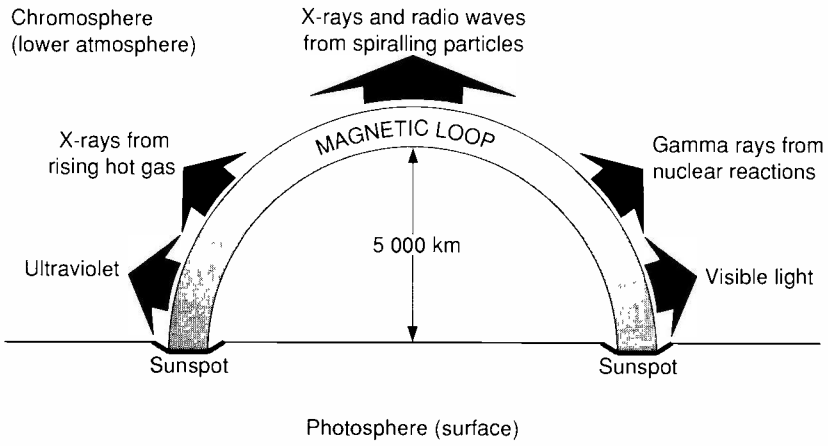
An active region containing many sunspots can be half a million kilometres long. It is from these regions that flares may explode. Occasionally, the magnetic field lines in an active region become irrevocably tangeld and crowded by the very great forces involved. They store energy like tow repelling magnets pushed together. Something has to give. The resulting explosion of energy as a magnetic loop 'snaps' and field lines disconnect and reconnect is known as a solar flare, and is the most energetic phenomenon seen on the sun.

Flares last for a relatively short time - between ten minutes and several hours - but over this period titanic forces are unleashed; a large flare releases as much energy as a ten billion megaton bomb and may cover an area of a billion square kilometres. The explosion begins at the top of a magnetic arch and brust upward through the **chromosphere** - the sun's lower atmosphere - and into the **corona** - the very hot but tenuous outer atmosphere - reaching its peak brilliance within a minute. The magnetic forces involved accelerate enormous numbers of charged particles - protons and electrons - to speeds as high as half the speed of light. Some particles spiral around magnetic field lines and collide with gas inthe solar atmosphere to produce a sharp burst of X-rays which is picked up by earth-orbiting astronomical satillites eight minutes later. The spiralling particles also produce synchrotron radiation in the form of radio waves with a wavelength of between 10mm and 1m. Flare temperatures may reach 20 billion degrees - hot enough to spark off nuclear reactions that normally occur only in the sun's core. Protons and neutrons are smashed together at sufficient speed to enable them to stick together, forming deuterium (a heavy form of hydrogen) and producing detectable gamma rays.

As the flare progresses, the magnetic loop is filled with blindingly hot plasma, causing the top of the loop to radiate intensely in X-rays while the base emits ultraviolet and visible light. The local chromosphere is heated explosively by this activity and throws off a great bubble of gas, containing as much as ten billion tons of material, which flies off into interplanetary space at 1000km per second.

The huge explosion creates shockwaves which rip through the photosphere, chromosphere and corona, setting up oscillations in the

ıe Sun



The anatomy of a solar flare. The magnetic loop forms a luminous horshoe of plasma.

plasma. The oscillations in turn produce **fast drift bursts**. These bursts are short-lived spikes of radio emission that drift, in a few seconds, from high (800MHz) to low (10MHz) frequencies. They occur between two and four minutes after the flare. Later, about ten minutes after the initial event, type II bursts appear. These are radio emissions produced in the sun's outer atmosphere as beams of charged particles are fired from the flare site at high speed by the powerful magnetic forces. As the particles ascend through the corona they stimulate electromagnetic radiation at progressively lower frequencies, starting at 300MHz. Spacecraft have detected type II emissions with frequencies as low as 300kHz coming from regions over fifteen solar diameters from the sun.

Between ten minutes and several hours after the first outburst, depending on the size of the flare, it is all over. Particle acceleration trails off and the magnetic loop, from which the upheavals originated, slumps back into its previous, relatively quiescent, state. High-energy radiation levels out as the active region calms down. Nevertheless, within the region monumental forces are still at work and may trigger off more flares in the future.

Effects on Earth

A large solar flare can have surprisingly far-reaching effects on our lives. While our planet is constantly intercepting electromagnetic radiation and charged particles from the sun, a large flare may increase the levels of these significantly. The flash of electromagnetic radiation, visible light included, takes just eight minutes to reach earth. Much of this radiation fails to make it through our atmosphere. Gamma rays, X-rays and most ultrviolet and infra-red waves are absorbed. Astronomers who wish to observe in these wavelengths must use satellites that orbit above almost all of our atmosphere.

Ultraviolet and X-ray radiation from the sun causes ionisation in our atmosphere. The layers of ions (charged atoms) together make up the **ionosphere**, a region that acts like a mirror to radio waves, thereby facilitating long-range radio communications by reflecting those waves from its underside. However, the influx of extra ultra-violet and X-ray radiation from a solar flare creates excessive ionisation in the D layer, the lowest layer of the ionosphere, causing it to absorb radio waves of high frequencies. This phenomenon is known as **fadeout** and can plague radio enthusiasts, especially at the peak of the solar cycle when flares are most common. At lower radio frequencies the reflecting property of the D layer is improved by extra ionisation, enabling low frequency radio waves generated by thunderstorms to cover large distances. These waves may be collected by radio receivers as atmospherics.

Direct radio bursts from solar flares can also be picked up by receivers on earth, not always deliberately, as one was story demonstrates.

On 12 February 1942, the German battle cruisers *Scharnhorst* and *Gneisenau* were able to slip from the port of Brest, in occupied France, through the English Channel to Germany undiscovered. British coastal defence radar had failed to detect the warships due to mysterious jamming. At about the same time, some British anti-aircraft gun radars were hit by a similar problem. Naturally enough, air chiefs, assuming that the Germans were doing the jamming, expected a big enemy air raid, but none came. It was later discovered that the radars that experienced difficulties had had their directional antenna arrays pointed toward the sun at the time. A solar flare had been causing the trouble.

Modern-day satellite TV reception can also be disturbed by direct solar radio emission, particularly if the flaring sun lies in roughly the same direction as the employed satellite.

Magnetic Flares

Solar flares are responsible for magnetic storms on earth. As we have seen, excessive ionisation in the ionosphere is created by the increase in ultraviolet radiation from the sun, the result of a solar flare. In adition to causing radio fadeouts, this excessive ionisation multiplies the normal electrical currents in the ionosphere. These currents generate their own magnetic field that modifies earth's intrinsic field. During a period of extra ionisation the effect of this ionispheric field grows, causing significant magnetic distrubances on earth. Further commotion is caused by the waves of charged particles fired away by a solar flare reaching our planet about a day later. Earth's magnetic field is permantly distorted and compressed by charged particles constantly flowing from the sun, but when a large cloud of extra particles from a solar flare arrives, our planet's magnetosphere is compressed still more. Sensitive magnetic compasses behave erratically, while electrical currents are induced in long metallic objects, such as power lines and railway lines, especially near the poles. The major oil pipeline in Alaska, for example, has safety devices fitted to protect it from possible 1000A currents induced by solar flare effects. Magnetic storms can also overload electrical power lines, causing blackouts.

Aurorae

Orbiting satellites may be swamped by clouds of charged particles from solar flares that induce large voltages across the length of a satellite and damage equipment. Furthermore, the extra particles enhance one of nature's most spectacular sights: aurorae - known in the northern hemisphere as the Northern Lights. Aurorae become brighter and more likely to occur shortly after a solar flare. They are caused by charged particles from space cascading down the earth's magnetic field lines and striking the atmosphere. An atmosphere molecule will absorb energy if a charged particle, such as a proton or electron, slams into it. The excited molecule will then re-emit the energy as light of a certain wavelength. Oxygen molecules will produce red or green light, while nitrogen molecules will generate blue. The combined light from countless billions of excited molecules form an aurora.

This normally happens near the poles, but the magnetic effects of solar flares extend the area of fluorescence towards the equator, while the increase in particles makes the glow brighter.

Despite many decades of intense study, the mechanisms that unleash activity on the sun are still far from understood by atronomers. Solar flares, the most violent form of solar agitation, are only beginning to surrender their secrets. One thing is certain though, there will be plenty more flares to observe in the future. The solar cycle, which controls activity on the sun, is reaching its peak about now. It looks as if the present maximum may be one of the highest ever recorded, so be on the lookout for radio fadeouts, magnetic storms and bright aurorae, all caused by our local star. ■

The Fifty - in the Forties

If you were told that a compact, cylindrical, metal object played a significant part in winning a war you might think that it was some kind of explosive. In one sense it was, but only in the influence it exerted on WWII electronic equipment. Jack Hum G5UM recalls the EF50 high gain r.f. pentode.

Only those readers who are full of years are likely to be able to recall the great names of the British television manufacturing industry. To a younger generation 'Bush' is the name of the American President, 'Murphy' that heavy haulage firm, 'Ultra' (pause for thought) - that must be something to do with the Secret War - decoding and all that.

When British television programmes were resumed after the Second World War these names, and many more, were widely known and advertised. There was no Japanese involvement in the British TV-making industry. Now, as is all too evident, there is virtually no British involvement. The television labs of four decades ago are shut and silent - or supermarkets.

To go back farther in time than those four decades is to recall the heady and now historical period of the mid-Thirties when the nation's first television broadcast service was initiated from Alexandra Palace in north London, selected (as was Crystal Palace later) for its commanding height above the London Plain. Even then, the characteristics of v.h.f. were sufficiently understood to make the selection of 'a good high site' an imperative, the higher the site the better the coverage.

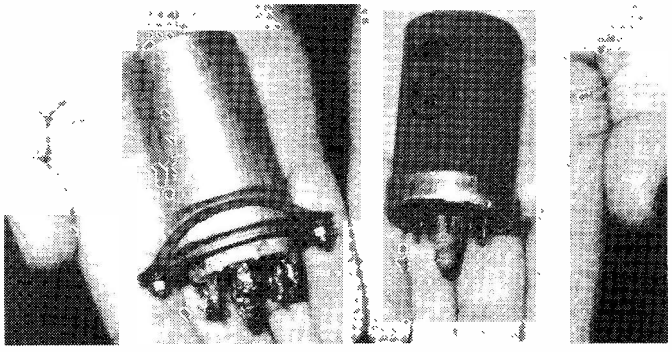
What was less understood was how to persuade the valves of that era to perform adequately in this same v.h.f. spectrum. Among radio amateurs much interesting and significant experimental work had been going on to make the valves of the day condescend to function at v.h.f. by a process known as de-basing. This was simply uncementing the base (usually made of lossy material) and connecting the active circuits directly to the lead-out wires. While eliminating the capacity-inducing valve socket, it also compelled the need to devise special mechanical arrangements to support the valve itself. Much of this work was done in the then 56MHz amateur band.

In parallel with all this activity, the valve makers were making strenuous effort to persuade their products to work at the Alexandra Palace frequency of 45MHz without the need to de-base them, which would have caused more problems than it solved where mass-produced television receivers were concerned. A clutch of de-based valves supported by lengths of string and clustered around a picture tube would look like a Heath Robinson horror.

In the few years remaining between the debut of 45MHz video signals over London and the start of the war (when rather less desirable objects were over London), the valve makers performed what then seemed to be miracles of vacuum tube design. Lower inter-electrode capcitances, higher mutual conductances (or goodness factor) and short lead-out routes between valve pins and related components were some, but not all, of the technical problems that they tackled with a considerable degree of success in those pioneering years.

Red-E

This was the time when one of the largest manufacturers announced the release of a new range of Red-E valves, distinguished by the colour of their envelopes. There was nothing inherently beneficial in painting valves red, but as a marketing ploy by Mullard it was highly effective.



The EF50 in two of its wartime manifestations. At first it had a red envelope. Later this red paint was omitted. The 'unadorned' sample is in the B9G socket, complete with retaining spring. G5UM hasn't de-soldered the pins!

One of these Red-E valves, just too late to catch the pre-war television market, was the EF50. Nothing quite like it had been seen before. It was completely enclosed in a metal can, with lead-outs so short that it required a special socket, the B9G, provided with a simple metal spring to hold the valve firmly in place to prevent it from popping out at awkward moments - a possible occurence on account of the short lead-outs and the small purchase they exerted on the socket.

Blessed with a mutual conductance (goodness factor) of 6.5, plus very low inter-electrode capacitances, it could well have claimed to be the last word in gainy r.f. pentodes of the time.

More serious applications than 45MHz television were envisaged for it when WWII started in September 1939. The potential of the EF50 for very many Service applications had not been lost on the backroom boys. They were busy on the design of communications and radar (it was RDF then) equipment ready for the moment when the balloon went up (in more than one sense).

In the ensuing six years, the EF50 was made by the million. Just one squadron of operational aircraft would absorb 500 of them, plus another 500 for spares back-up in the workshop. The requirement for the EF50 was insatiable. The organisational miracles daily wrought by the then Ministry of Aircraft Production saw that it was

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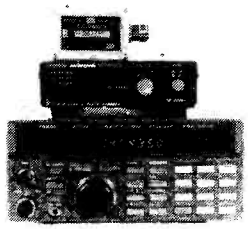

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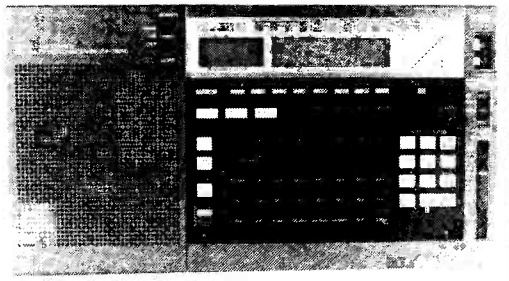

The **NRD525** is a high-class, general coverage receiver with expandability looking to the future, combining traditional technology unique to JRC with the most advanced digital technology gives superb performance whilst remaining extremely easy to use. The NRD525 covers 90kHz-34MHz and with an optional VHF/UHF converter also covers 34-60, 114-174 and 423-456MHz. Modes of operation CW, SSB (USB/LSB), AM, FM and RTTY with optional demodulator.

The **HP200E MkII** is a 1000 channel, programmable, handheld scanner. AM, FM and FM wide for commercial channels covering 500kHz-600MHz and 805-1300MHz. Supplied complete with NiCad charger, Antennas, DC cable, shoulder strap, outclip, carry case and earpiece.

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

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met. A feature of MAP's operations was to establish shadow factories for the production of aircraft. Soon the Navy and the Army started to absorb large quantities of the valve into their several systems.

Typical Artefact

Typically, a radar artefact of the period would contain the EF50 in its r.f. stages, in the mixer and local oscillator area. Strings of i.f. amplifiers in wideband circuits, capable of handling and amplifying radar waveforms, used EF50s, ending up with an EF50 cathode follower and output stages.

As radars became more powerful and larger time-base strokes were needed, the EF50 was supplanted in some pulse generating circuits by the larger EF55, which very conveniently fitted the same B9G socket.

Aside from its manifold radar applications, the EF50's merit for use in communications receivers for the Services became increasingly evident. Truly, it was a major workhorse of the war.

By mid-war, the Red-E valves lost their rubicundity. Wags said that the British had run out of red paint. Clearly, any valve would work equally well without lipstick as with it. The later few millions of the EF50 and kindred B9G valves used good, plain aluminium for their cans.

Steadily, as the end of hostilities approached, production of the EF50 under its various Navy, Army and Air Force nomenclatures was tapered off. Before long, it found its way on to the War Surplus market from 1945 and onwards and could be picked up at all manner of junk shops - even off stalls in Petticoat Lane in East London. The going price was sixpence.

Amateur Applications

At such a modest price and with stories of its versatility having gone before it, the 'fifty' was taken up enthusiastically in the late forties by radio experimenters both transmitting and receiving. I contemplated using the valve in a t.r.f. receiver if, with its lively characteristics, it could be persuaded to remain stable. It could - and the 'All EF50 TRF Receiver' was published in *SWM* in mid-1946. The article was 'lifted' by various overseas journals who seemed to think the concept was worth publicising.

The design found favour with the many radio amateurs keen to build equipment from the components they had available and who were reluctant to shell out the necessary fiver for one of the ex-Service communications receivers which, too, were becoming available. The American BC348 was generally a pound dearer than its RAF counterpart the R1144 simply because it was a better set.

At a time when £5 was a week's wage, the radio amateur thought not twice, but several times before committing such a sum towards the purchase of a high-performance ex-Service superhet. When most of the needed components for a home-built receiver were readily to hand in the proverbial junk box, do-it-yourself had considerable appeal.

In essence, the circuit of the 'All EF50 TRF Receiver' was quite simple: an r.f. stage coupled to a regenerative detector and finally an output stage that was quite capable of providing adequate signal for the headphones invariably used in amateur stations of the day. The system was at its most sensitive when the regeneration control brought the detector into mild oscillation to cease and sensitivity to drop to an extent that only powerful amplitude moduated signals were resolvable.

Constructors of the receiver developed the knack of holding oscillation at its most sensitive (just 'on'), in which condition the receiver compared favourably with a superhet for winkling out weak c.w. signals.

A set of plug-in coils gave coverage from the 160m band to the 10m band. The superstition of the day had it that switched coils were too lossy!

Would the 'All EF50 TRF Receiver' function as an i.f. strip if it were to be fed with the output from a v.h.f. converter? Indeed it did, provided an i.f. were selected at the most sensitive section of the receiver's coverage, which was around 5MHz. In this mode, the design did excellent service by accepting output from either a 144MHz converter or a 56MHz one (the converters used valves, no transistors for another dozen years).

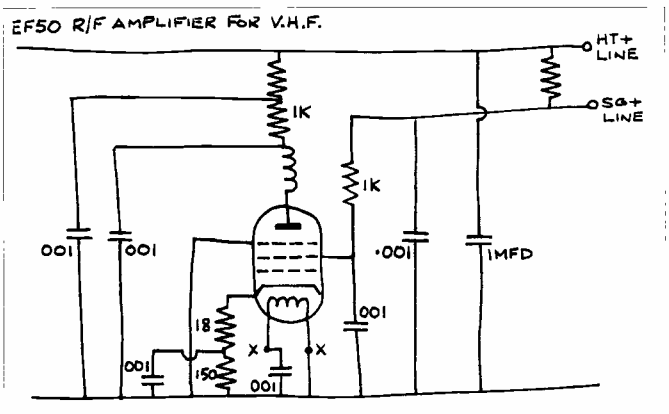
It is an interesting observation on the era to recall that, unlike today, much metrewave operation was by c.w. telegraphy. The All EF50 box would resolve it very well with the regeneration just at the point of oscillation. Below that point, as has been explained, the sensitivity fell off so abruptly that only strong local a.m. stations using their carbon granule microphones on two' or 'five' could be heard.

Relegated to the Roof-space

In the late forties and early fifties, amateur applications of the EF50 were many, professional ones few. By now, smaller valves of even higher performance had been developed in readiness for the extension of nation-wide television and its taking over of the then most popular v.h.f. band, 56 to 60MHz. This sad event was commemorated by a grand 'Last Night on Five'. Hundreds of v.h.f. enthusiasts throughout the land met on the band to make their last farewells to it before the final switch-off on 31 March 1949 at midnight.

And so into the fifties and the 'success decade' of the British television manufacturing industry. Valves needed no persuading to function efficiently both on the BBC frequency spectrum and later, when the ITA, as it was then, started broadcasting in the 200MHz area. All the receiver designs of the day were full of valves and quite literally hot devices. The valve for TV was swept aside by the inexorable onward march of semi-conductivity, and it moved into the 'replacement types' columns of the valve lists. The EF50 came a sadder fate, it was relgated to the 'obsolete types' section, its ultimate indignity.

Yet today, there must be thousands of radio amateurs who remember and love it but cannot bring themselves to discard the boxes-full languishing in their lofts. Why not? The true radio experimenter will tell you: "After all, you never know, they might 'come in'". ■



'Commit it to the technical notebook before you forget it'. A typical G5UM design doodle, scribbled down during his early experiments with the EF50 r.f. pentode.

Continuing Along The Right Lines - 5

With this part George Dobbs G3RJV gets on with the actual construction of the SWM t.r.f. receiver.

The main components of the SWM t.r.f. receiver are all mounted on a group board. A 'group board' (sometimes called a 'tag board') is a flat board made of Paxolin with two rows of solder tags along both sides. The prototype used the 18-way (two rows of nine holes) group board sold by Electrovalue as stock number GB18. Maplin sell a 36-way tag board (FL11M) which could, no doubt, be cut down to do the job.

The components are laid out on the board as shown in **Fig. 5.1**. Compare this drawing with the circuit diagram, (Fig. 1,Part 4) The board contains all the components except the controls, coil and connectors. Several link wires are shown on the board and it is vital to include all of these link wires. One wire is shown as a dotted line. This is connected between the two tags as shown but runs under the group board. Inserting the components into the board requires careful soldering and I would advise the scraping clean and tinning of all the tags before any components are added.

The tags on the group board have holes which can be used for securing the component leads prior to soldering. Place the component leads through the holes and turn back the ends of the leads to hold the component firmly in place. Heat the tag with the soldering iron and quickly melt some solder on the junction between the lead and the tag. If possible do not apply too much solder and fill the hole because in many cases another component lead may have to go to the same tag.

Begin with T1, which is the largest of the components. This LT700 transformer must be fitted the correct way around. The primary winding (from TR2) is readily identified as it has a tapped winding, so there are three wires from that side of the transformer. The centre wire, which is not required, can be soldered to the unused tag between the outer two wires. The secondary has only two wires, both of which are used.

It is a good idea to insert all the link wires before adding the rest of the parts, as these are easy to miss from the board. Next add the resistors and capacitors. These are simple to mount, although some resistor leads will have to be bent back on themselves to fit the spaces. C4 is an electrolytic capacitor and must be fitted with the correct polarity. The + and - (positive and negative) leads must go to the correct tags, as shown in **Fig. 5.1**.

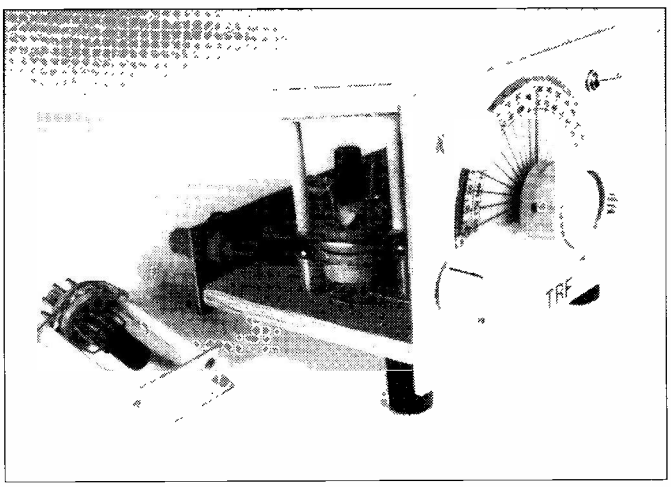
Naturally, the two transistors must be fitted with their leads on the correct tags. **Fig. 5.1.** shows the correct way to mount TR1 and TR2. In the early days of transistors there was much talk about damaging them with the heat of a soldering iron. If heat is applied for an excessive amount of time, damage may occur. I have never in many years of soldering transistors lost one by soldering it in place - but I have through putting them into a circuit the wrong way around. The leads which go to the other components not mounted on the board are better added when the board is in place.

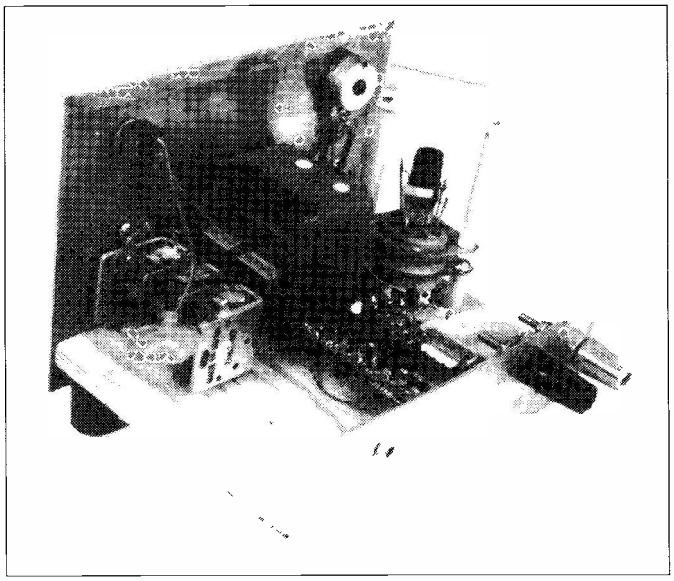
The Baseboard

The *SWM* t.r.f. receiver is built on a wooden baseboard with a front panel made from double-sided, copper-clad board. The base is a piece of 9mm plywood measuring 120mm deep by 150mm wide. The front panel is 110mm high and 150mm wide. The copper-clad board used for the front panel is the material used for making double-sided printed circuit boards. It was chosen because it is easy to work with hand tools and soldered connections can be made directly to the back of the front panel. A suitable piece of double-sided board can be obtained from Electrovalue as stock item FG2. This measures 300 by 150mm and provides more than enough material for the front panel. A small back panel could also be cut from the board to carry the input and output connections as shown in the photograph.

The group board is mounted at the back and to the centre of the base board. Small wood screws hold the board through the fixing holes provided. The board needs to be raised up a little from the base and this can be done with stand-off pillars or the use of two nuts of a size that allows the wood screws easy passage. The Octal base is mounted, as shown, to the right of the group board. It requires mounting with the pin numbers aligned as shown to make the lead routes as short as possible. The Octal base needs to be mounted high enough above the board to clear the pins and the central locator lug of the plug. This requires the base to stand at least 20mm off the base board. It is not easy to obtain 20mm stand-off pillars, but they can be made from thin tubing or wooden dowelling.

The front panel holds the control components : main tuning capacitor (C7) bandspread capacitor (C8) RF GAIN control (R1) REACTION control (R2) and the ON/OFF switch (SW1). The two tuning capacitors are surplus items obtainable from J. Birkett of Lincoln. C7 is a 2-gang 200 +





Two views of prototype SWM t.r.f. receiver built by George Dobbs G3RJV, showing the simple construction and plug-in coil.

350pF capacitor and C8 is a 3-gang 10 + 10 + 20pF capacitor. In both cases, only the front gang (or portion) of the capacitor is used. C7 has built-in, slow-motion drive - gearing within the control shaft reduces the rate at which the vanes move in relation to the rotation of the shaft.

The two variable capacitors are mounted onto the wooden base by means of small wood screws through existing holes in the capacitor casing. When mounting these capacitors place them on the base board with just the shaft protruding beyond the front of the board. By bringing the front panel towards the shafts it is then possible to mark with a pencil where the holes have to be drilled in the front panel to accept the shafts. Two single holes are drilled to the side of C7 to accept R1 and R2. Another single hole is drilled above C8 for the ON/OFF switch. The front panel is attached to the base with two wood screws.

A small back panel, about 20mm high, is screwed to the back of the base board. This panel takes the input and output connectors. A 3mm jack socket is mounted for the headphones and a pair of insulated screw terminals added for the antenna and earth connections. When all the controls, the group board and the Octal base are in place the interwiring can be attemped.

The interwiring is shown in **Fig. 5.1**. Screened wire is required for some of the connections. These screened wires go between the antenna and the RF GAIN control, The RF GAIN control and pin 8 of the Octal base and also between the secondary of the transformer and the headphone socket. This screened wire can be cheap microphone cable or the rather more expensive RG174 miniature coaxial cable. The rest of the wiring may be cheap *pvc* covered 'hook-up' wire.

There are four earth connections to be made directly to the front panel. These are important not only to ensure an earth (or ground) path throughout the circuit, but also to ensure that the front panel is earthed, as t.r.f. receivers can suffer from hand capacitance effects. That is, the proximity of the hand to the tuning controls can alter the tuning of the receiver. If the front panel is earthed such effects should not occur. Capacitors C8 and C7 are directly connected to the front panel as are the 'earthy' sides

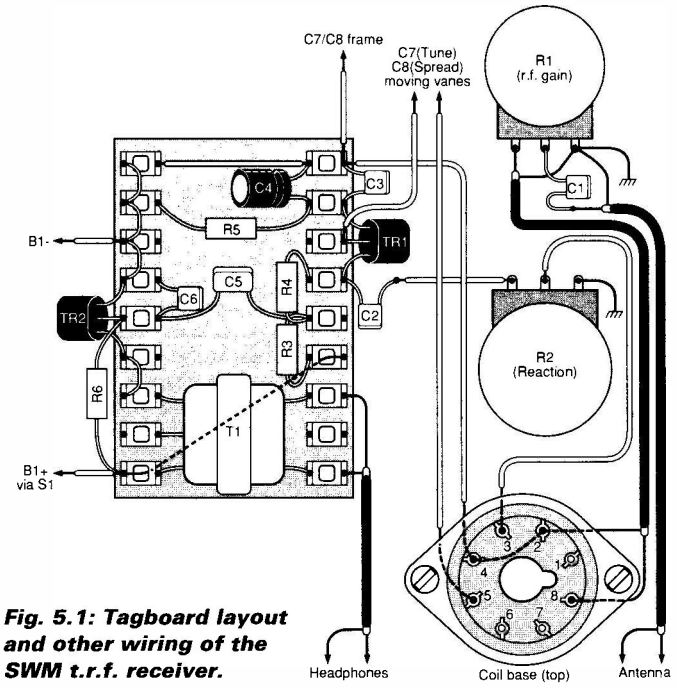


Fig. 5.1: Tagboard layout and other wiring of the SWM t.r.f. receiver.

of R1 and R2.

Follow the routes of the wires carefully, not only on **Fig. 5.1**. but also checking on the circuit diagram exactly what each wire is doing. Check the routes of the wires around the Octal base as these can be easily misplaced - check the numbering sequence of the octal pins. The PP3 battery that powers the receiver has a snap-on connector. The battery may be held in a Terry Clip or one of the purpose made battery clips or even just held to the base with a blob of BluTak.

Using the Receiver

The *SWM* t.r.f. receiver is a 'real' radio and does require some operating skill to achieve the best results. Using this receiver takes you back to the early days of short wave radio and recaptures the excitement of those early short wave listeners with their simple receivers. With careful operating this little receiver is capable of quite amazing results but without a little care, the results can be next to useless. This is not a 'tap in the frequency and there it is' radio - you built it yourself, you know how it works and it is capable of good reception on the short wave bands.

Controls

Let us begin with a few words about the functions of the front panel controls. The ON/OFF switch is simple enough. I mention it only to say that this receiver draws very little power from the battery but it is still a good idea to switch it off after use. The main tuning control (C7) is the coarse tuning control and covers a large part of the short wave spectrum. It is, therefore difficult to tune in individual stations with this control on the more crowded bands. Hence the need for C8, which is the fine tuning, or bandspread control. This allows finer tuning so that individual stations can be resolved with greater ease. It is possible to calibrate (mark the frequencies) on the main tuning control and a simple method will be described later.

The potentiometer, R1, is a basic form of r.f. gain control. It is, in fact, a simple r.f. attenuator. It is used to reduce the signal strength of the stronger stations. This not only allows a comfortable listening level but also prevents strong signals swamping the regeneration action within the receiver. R2 is the Regeneration Control, altering the amount of signal fedback from the output to the input of the detector TR1 and is the key to successful use of the receiver. The regeneration increases the overall gain of the receiver - makes it more sensitive. It also makes the receiver more selective - better able to 'sort out' one station from another.

What makes a regenerative receiver fun - or more difficult to use, depending upon how you look at it - is that these controls can all interact. That is, the regeneration control may need adjustment as the receiver is tuned. It will certainly need adjustment between weak stations and strong stations. At this point the RF Gain control can be brought into play to reduce or increase the strength of a station, which in its turn will require a minor re-adjustment of the regeneration control. I told you it was fun !

The explanations, as is often the case, are more difficult than the real 'hands-on' experience. Some time spent playing with the receiver over a range a frequencies and types of station will soon teach the operator the best way to tune in stations. With a little patient practice, this little receiver will soon more than justify the effort to built it.

The receiver does require an antenna. Its sensitivity is such that a large antenna will not be needed. In fact there are advantages in using a simple small antenna so that strong signals do not cause problems with the operation. I heard an amazing number of stations on the prototype using about 6m of wire simply strung between an upstairs window and a table just inside a downstairs window. I also tried using about 3m of wire along a curtian rail and heard many stations. The need for an earth (or ground) will depend upon the frequency in use and the type of antenna. Generally an earth will help on the lower frequency bands. Using my little pieces of wire as antennas, I found adding an earth only marginally useful on the lower bands and a disdvantage on the higher frequency bands. Try it and see.

Begin by connecting an antenna to the receiver, using the low frequency range coil, and switching on. Set C8 at about half mesh and also have C7 roughly central. Turn the RF GAIN (R1) almost full up. Careful rotation of the regeneration control should find a point at which the receiver goes into oscillation - a rushing sound, or a loud howl - if a signal is present. Back off the rgeneration control to the point at which this effect just begins. The secret is to operate the receiver on the edge of oscillation. The point at which oscillation is just about to occur is ideal for a.m. broadcast stations and the point at which oscillation has just begun is correct for Morse and signal sideband stations. Operating the receiver either side of the critical point at which oscillation occurs produces the optimum results. This will depend upon the strength of the station which can in its turn be altered by

use of R1. If the signal reaching TR1 is too strong it will not be possible to obtain a smooth regneration control.

Try tuning in stations using C7, with R2 set at the oscillation point. At first just find stations and then make adjusments of the other controls to make them readable. After a station, or stations have been found, attempt fine tuning with C8. Then try the effect of altering the regeneration and RF GAIN controls. It should soon be possible with a little fiddling to receive stations. Once it is know how the controls 'feel' and how the stations can be resolved, the operation of the receiver becomes obvious and easier.

Calibration

Although it is not not possible to put an accurate tuning scale on such a simple receiver, an indication of the frequency can be added. I used a protractor as a front panel tuning scale and made a chart showing degrees against frequency. It would be possible to make a scale of card and mark it with actual frequencies. All that is needed for a simple calibration is another receiver covering the same frequency range as the *SWM* t.r.f. When the receiver breaks into oscillation it produces an r.f. signal, acting like a very low powered transmitter. For this reason the receiver should be operated carefully and not over the oscillation point because it can radiate a signal, albeit small.

This signal can be picked up on an adjacent receiver. To calibrate the receiver attach a small antenna and operate it close to a receiver which also has a small antenna. The listening receiver should be operated in the s.s.b. or c.w. mode. If the *SWM* TRF is operated at just over the point of oscillation it will be heard on the listening receiver when they are tuned to the same frequency. The frequency can be read off the calibration (scale or readout) of the listening receiver. Hence we know at what frequency the *SWM* t.r.f. is tuned. Naturally C8, the fine tuning control also alters the freqency of the *SWM* t.r.f., so this must be set at the same point during the calibration. I would advise setting C8 at half mesh for the calibration. We now know that the calibration only applies accurately when C8 is at half mesh. This means that C8 can be used to tune either side of the marked frequency when the *SWM* t.r.f. is in use.

In several weeks of use, I was surprised at how much I was able to hear on the *SWM* t.r.f. Broadcast stations were very simple to tune and copy. I also used it to listen to amateur band signals. As these are mainly s.s.b. and c.w. (Morse) signals the oscillation point was required to resolve the signals. It does take a little skill to tune and hold s.s.b. signals, but this receiver is capable of copying a wide range of amateur band stations. ■

YOU WILL NEED

Resistors
Carbon film 5% 0.25W

2.2kΩ	2	R3,4
3.3kΩ	1	R5
1MΩ	1	R6

Potentiometers

1kΩ *lin*	2	R1,2

Capacitors
Min. Electrolytic p.c.b. type

10µF 16V	1	C4

Min. Plate Ceramic

100pF	1	C1
1nF	1	C6
10nF	2	C2,3

Disc ceramic

0.1µF	1	C5

Variable air-spaced

10pF	1	C8
500pF	1	C7

Semiconductors
Transistors

BC183	1	TR2
2N3819	1	TR1

Miscellaneous
18-way tag board; Octal base Maplin HL00A; Knobs; Plywood; Double-sided copper-clad board; Switch; 3.5mm jack socket; Terminals (2); Wire, screws, etc.

Bandspreading

Selectivity (being able to resolve individual stations) is important in a short wave receiver. The short wave bands are crowded with stations that are often difficult to separate. Careful tuning of the stations is required: a large knob and a careful hand are both helpful. The swing of frequencies given by a single turn of a variable tuning capacitor can be very large and some means of reducing the frequency tuning rate is often required. This is called **band spreading**.

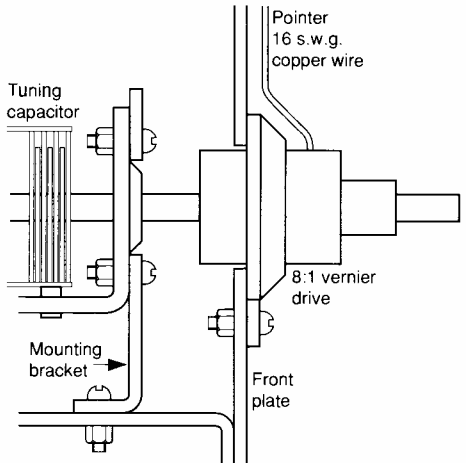
You can see one method of achieving band spreading in a short wave receiver in **(a)**. This shows mechanical band spreading. This is a method by which the tuning rate of the variable capacitor is physically slowed down. You will have noticed tuning scales on some radio receivers that involve pulleys, wheels and a sliding cursor. Although such methods are common in domestic receivers, they rarely provide the smoothness of control required for tuning the short wave bands.

A better way is to use a mechanically sound method of reducing the rate of rotation of the vanes of the variable capacitor. Good quality, geared reduction drives are rare and very expensive. Many amateur constructors use vernier drives, sometimes called 'in-line epicyclic drives'. You can see the use of such a drive in **(a)**. The in-line drive provides a 6:1 reduction. That is, for every one turn of the control knob, the shaft carrying the capacitor vanes only moves a sixth of a turn. These drive are easy to mount and provide a useful improvement in the tuning rate.

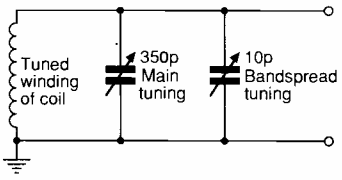
An alternative method of providing band spread is to add it electrically as shown in **(b)**. You may recall that when capacitors are placed in parallel, the nett value of capacitance is the sum of their capacitance. In **(b)** you can see a large value, variable capacitor (250pF) with another, smaller value, variable capacitor (10pF) connected in parallel. One complete swing of the smaller value capacitor can only change the total capacitance by 10pF.

Hence the large value capacitor can be used for coarse tuning and the smaller value capacitor is then used for fine tuning. This arrangement of two variable capacitors to provide a coarse and fine tuning control was common on early short wave receivers. They were often called the BANDSET and BANDSPREAD controls. The smaller the value of the band spread capacitor in relation to the bandset capacitor, the finer is the tuning it can offer.

The only problems with this is accurate re-setting of the bandset capacitor on to a particular frequency. If a calibrated dial is used to indicate the frequency tuned by the bandset capacitor, it will only be accurate when the bandspread capacitor is at a particular setting. It is usual to calibrate the bandset capacitor with the bandspread capacitor set at half mesh. The bandspread capacitor can the provide off-set tuning either side of the frequency selected.



(a): Mechanical bandspreading using a slow-motion drive on the main tuning capacitor.



(b): Adding bandspreading by electrical means.

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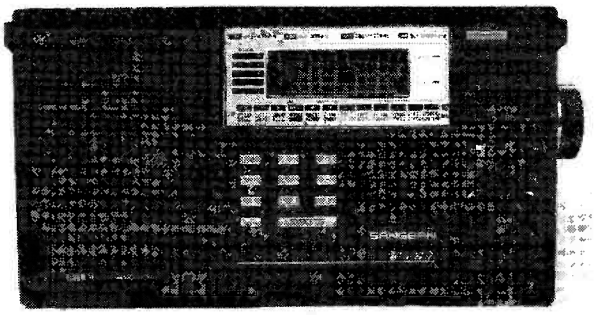

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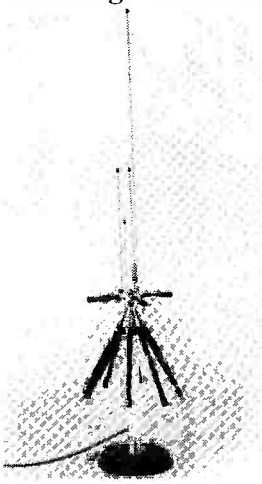

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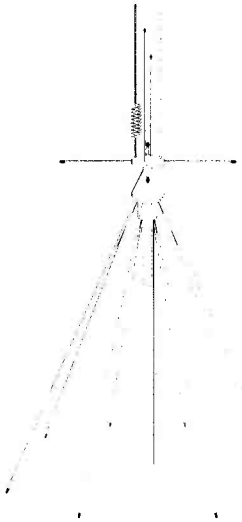

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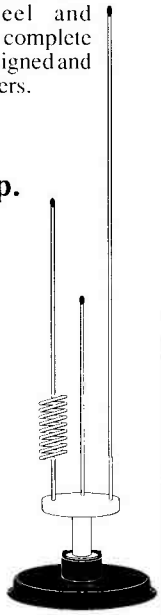

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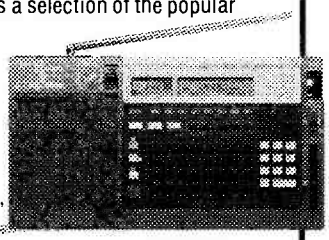
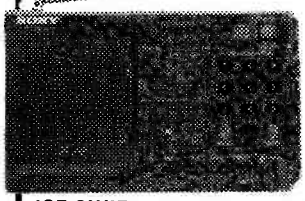


IFC 2001D Full coverage shortwave, VHF and airband radio. (150 kHz-136 MHz) Receives AM, FM, SSB. **£299**



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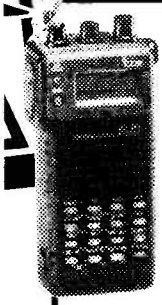

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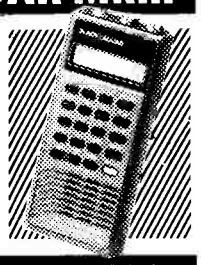

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Sony TCM-38V Cassette Recorder

One of the most rapidly growing areas of the radio hobby is scanning the utility bands. Unfortunately, there are two problems that quickly become apparent to the enthusiast. First, most transmissions are fairly intermittent and despite claims of spectrum shortage, most frequencies are silent for the majority of the time. This means that to catch everything on a channel, many hours may need to be spent listening to background noise or a radio silenced by its squelch. Secondly, even scanner enthusiasts probably have daytime jobs that take them away from their radios. It is not surprising that most utility transmissions are busiest during this daytime period and, therefore, much of interest will be missed.

The solution to both these problems comes in the form of a voice activated cassette recorder attached to the audio output of the receiver. Short burst of received audio will trigger the tape recorder and tape will not be wasted recording silence between transmissions. Currently, several firms offer products that will provide voice operated switching (VOX) of ordinary domestic cassette recorders, but these are outboard units priced around the £30 mark. They do work, but in use they expose one further problem.

Suppose you have left your scanner to record an interesting frequency all day whilst you have been away at work. Returning home you find an hour of continuous taped messages with absolutely no indication of when the recording was made. Since the VOX system has eliminated all the silent gaps, the start and end of each group of messages becomes obscured and confusing. Ideally, the system should record the time at which the recording was made, so that on play back, the listener can determine when the tape was made. Until recently, such a system was only affordable by the emergency services and firms of stockbrokers, for example, who record all their telephone calls on special time-stamping recorders manufactured by firms like Racal. Now, for the first time, such a system is available to the radio enthusiast at a very reasonable price.

The Sony TCM-38V is just the tool to overcome the problems described. It is a portable Walkman-style cassette recorder/player which operates just like its conventional counterparts. In addition to basics, it has a built-in microphone and loudspeaker and mechanical tape counter all within conventional space limits. However, the most significant difference between the TCM-38V and all other portable cassette recorders is discretely placed on the front panel, which doubles as the cassette lid. Here you will see a real time clock and calender displayed on an l.c.d. instead of the radio frequency readout that appears on some combined radio cassette recorders on the market.

This is the key to what Sony call 'time index recording' (t.i.r.). Whenever a recording is made with the TCM-38V, the time and date information is actually transferred onto the magnetic tape of the cassette along with the audio. When you play back such a coded tape at a later date, the l.c.d. clock display shows the time details as they are played back from the tape instead of the current time. This feature will allow coded tapes to be swapped interchangably between compatible recorders/players. In operation, there is only one drawback with this facility - for the time stamping process to work each recording must last for at least ten seconds. This could mean that very short bursts of audio might be recorded without being time stamped.

Naturally to make the most of the time index recording, the TCM-38V offers a 'voice operated recording' (v.o.r.) system that switches on the tape immediately audio is detected. The system conveniently leaves a short 'tail' after the audio ceases before stopping the motor. On the top edge of the unit there is a switch that allows the user to either use or disable the v.o.r. facility. In use, there is also an adjustable trigger threshold which is a control labelled VOR SENSITIVITY; it looks and operates rather like a input level control on a hi-fi cassette recorder. Strictly speaking, however, it determines how loud the audio needs to be before the cassette recorder is triggered into action.

In Use

In practice, both the time index recording and the voice operated recording work very well indeed, just as Sony specify. It is interesting, however, to look a bit more closely at the details that Sony do not specify. Sony make no pretence that this is a hi-fi recorder; it records and plays

back in mono rather than the stereo that most people would expect from a Walkman. The specifications indicate a frequency response of 200-8000Hz but fail to state if this is record or playback. Although laboratory tests have not confirmed this, I feel that this must refer to playback. Certainly the recorded response seems to be even more restricted - especially using the built in microphone. I recorded tapes on the TCM-38V using both the internal mic and external inputs (for which there is a 3.5mm jack socket) and played them back on a conventional hi-fi cassette player. The restricted audio quality and significant wow and flutter were immediately noticeable; clearly this is not hi-fi but perfectly adequate for speech recording.

Interestingly, Sony make little reference in their literature as to the way the t.i.r. system works. My initial (incorrect) assumption was that one audio channel was used to store the coded time information whilst audio was recorded on the other. Clearly this was not the case since playback on a conventional cassette unit produces mono output from both the right and left channel outputs. The t.i.r. system produces no audible output, so I suspect that a form of sub-audible carrier technique is being used to carry the time code.

There is no doubt that to use this clever machine properly you need to connect the audio output from your radio to the external microphone input socket. Here a word of caution is necessary since the TCM-38V input is incredibly sensitive and overloads (distorts) with high level audio sources. It only needs 200µV of audio input across a 3kΩ load. Also for long term monitoring it will become expensive to use the two internal AA style batteries so the external a.c. power adapter (AC-D2M) is highly recommended.

Conclusions

If you use the TCM-38V with a scanner that has a squelch function, operation will be simplicity itself. On the other hand, if the v.o.r. system has to discriminate between continuous background noise and speech (as in a non-squelched radio) some experimentation with the exact setting of the v.o.r. sensitivity will be necessary. In practice, both the t.i.r. and v.o.r. functions are easy to use and the cassette recorder mechanism offers all the normal features of a Walkman-style unit, apart from stereo hi-fi audio.

Finally, although I wouldn't recommend it, since you may be unpopular with friends and could be considered to be invading privacy, the TCM-38V would make a very good room bug if it were left switched on in a hidden location.

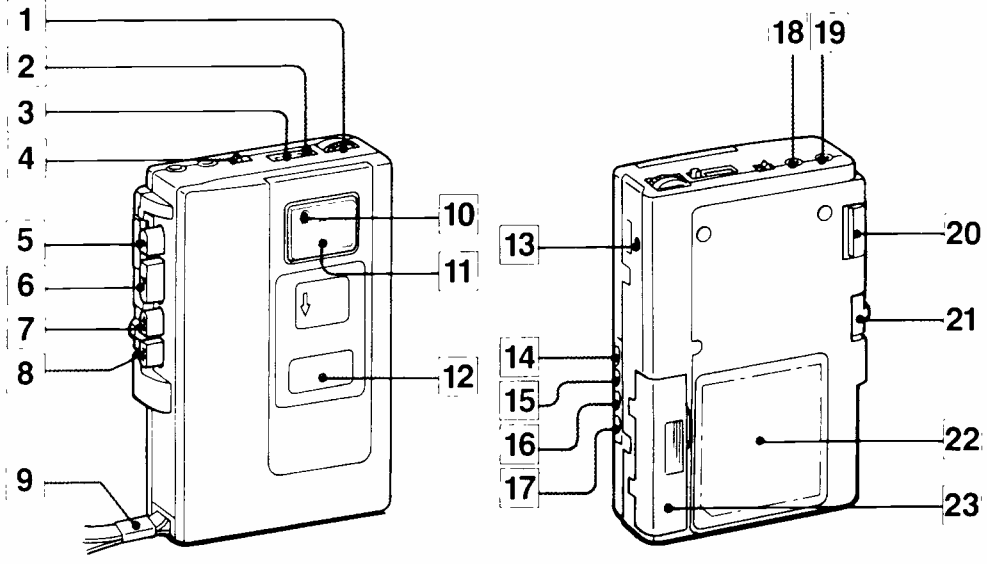
The TCM-38V is an excellent, compact and feature-packed unit that would make a ideal accessory for every scanner enthusiast. What is more, it is available for around £65 from Sony dealers and that makes it very good value. It certainly should make sure that you do not miss any of the action on the radio waves. The unit in the photographs was kindly loaned by **Raycom Communications Systems Ltd**.

Specifications

Recording System:	Twin-track mono
Frequency Response:	200-8000Hz (type I cassette tape)
Input Sensitivity:	200µV for 3kΩ or lower impedance microphone
Output:	180mW 10% distortion Internal speaker. Minijack for 8-300Ω earphone
Power Requirements:	3V d.c., two R6 (AA) batteries or external mains adaptor AC-D2M
Battery Life:	2 hours carbon zinc batteries 7 hours alkaline batteries

Abbreviations

d.c.	direct current
Hz	hertz
kΩ	kilohms
l.c.d.	liquid crystal display
mm	millimetres
mW	milliwatts
t.i.r.	time index recording
V	volts
v.o.r.	voice operated recording
VOX	voice operated switching
µV	microvolts
Ω	ohms



Key to Diagram

1 Volume/VOR Sensitivity
2 Counter reset button
3 Mechanical tape counter
4 VOR on/off switch
5 Record button
6 Playback button
7 Rewind/Review button
8 Fast forward/Cue button
9 Handstrap
10 Record/Battery Indicator
11 Flat microphone
12 Liquid Crystal Display Window
13 External DC Power Input Jack
14 Date/Time Set Button
15 + button
16 - button
17 Reset button
18 Earphone jack socket
19 External microphone jack socket
20 Stop/Eject button
21 Pause switch
22 Loudspeaker
23 Battery compartment

Educational Software for Basic Electronics - Part 8

This month J.T. Beaumont explains why engineers use exponent format for numbers. Power gain and decibel-watts are also covered and a start made on the subjects of Sound, Light, Radio Waves and Antennas.

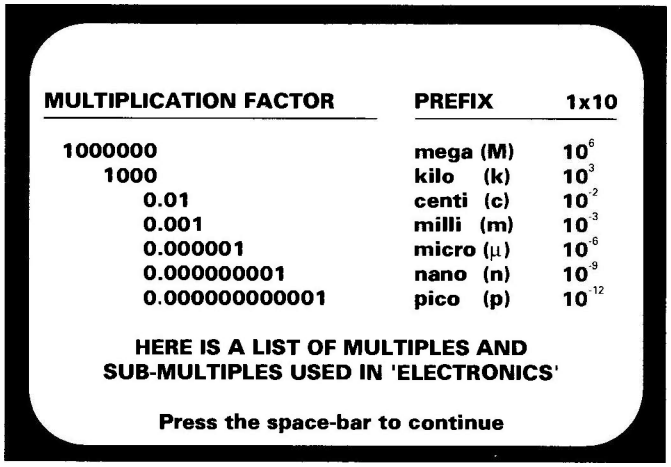
The first program this month explains why engineers use 'Exponent Format'. A list of some of the SI Units used in electronics is displayed, with multiples and submultiples. Finally a scrolling screen of exponent notation is displayed, which can be paused by holding down the CTRL and SHIFT keys simultaneously.

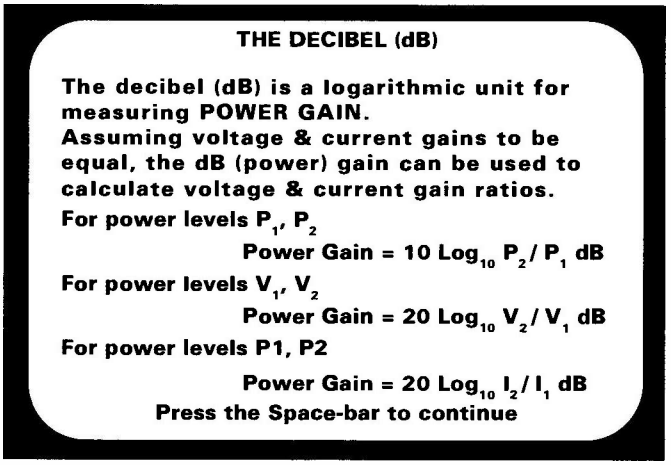
Power Gain and Decibel-watts

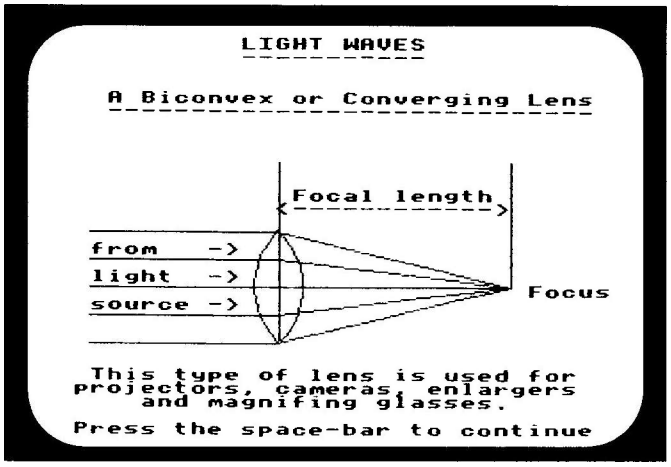
When this program is RUN a set of options are listed on the screen:

1. Introduction. This option contains a short lesson on power gain; a list of the formulæ needed to perform calculations; a graph showing the frequency response of an audio amplifier (with reference to the 'half-power' points'); an explanation of the 'decibel-watt' (dBW). (The DTI require radio amateurs to use this unit when measuring TX power).
2. To Calculate Power Gain.
3. To Calculate Voltage Gain
4. To Calculate Current Gain
5. To Convert Watts to Decibel-watts.
6. To Convert Decibel-watts to Watts.

In options 2 to 6, students can use the computer to check their answers.







Sound, Light, Radio Waves and Antennas

When this program is RUN the following options are shown on the screen:

1. Introduction to Sound.
2. Introduction to Light.
3. Introduction to Radio Waves.
4. Introduction to Antennas.
5. Sound Calculations.
6. Radio Calculations.
7. EXIT the Program.

The 'Introduction' options are good for revision purposes, whilst the 'Calculation' options provide accurate answers to questions which can be written at random by both students and teachers.

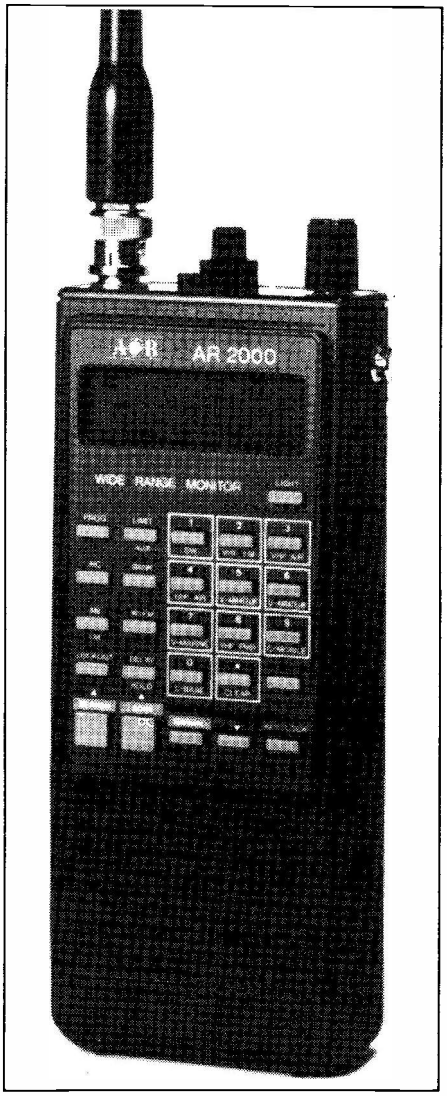
In the Radio Calculation section three further options are provided to enable the student to learn and carry out frequency to wavelength conversions:

1. Frequency (MHz) to wavelength (m).
2. Frequency (kHz) to wavelength (m).
3. Wavelength (m) to frequency (MHz & kHz).

At the same time, a half-wavelength dipole antenna is drawn at the top of the screen, with the physical length of the antenna (including correction factor) calculated and displayed. ■

Listen to AOR

The **AR3000** now extends your listening horizons. Frequency coverage is from 100 kHz to 2036 MHz without any gaps in the range. All mode: USB, LSB, CW, AM, FM (narrow) FM (wide). 400 memory channels are arranged in 4 banks x 100 channels. 15 band pass filters before the GaAsFet RF amplifiers ensure high sensitivity throughout the entire range with outstanding dynamic range and freedom from intermodulation effects. An **RS232** port is provided to enable remote operation by plugging directly into most personal computers.
ACEPAC3 is an exclusively developed multi-function IBM-PC based program to further increase the versatility of the AR3000. A sweep facility provides a spectrum analysis graph. The very latest version displays frequencies in X axis and squelch opening percentage on each frequency in the programmed frequency search range. This indicates 'how active' the frequencies are in the programmed search range. In addition to the graphic display, ACEPAC3 can produce a detailed numerical list from the graphic information. One memory file has 400 channels divided into 4 banks of 100 channels. More than one memory file can be created to increase the memory storage capability. If you make just one extra memory file you can store 800 memory channels!
DA3000 Wide band 16 element discone aerial for external mounting. Frequency range 25 MHz to 2000 MHz (2 GHz). The aerial is supplied with approx 15m of coax terminated in a BNC connector ready to plug in and use with any AOR receiver. 'V' bolts and clamps are provided, however an additional supporting pole will be required for installation.

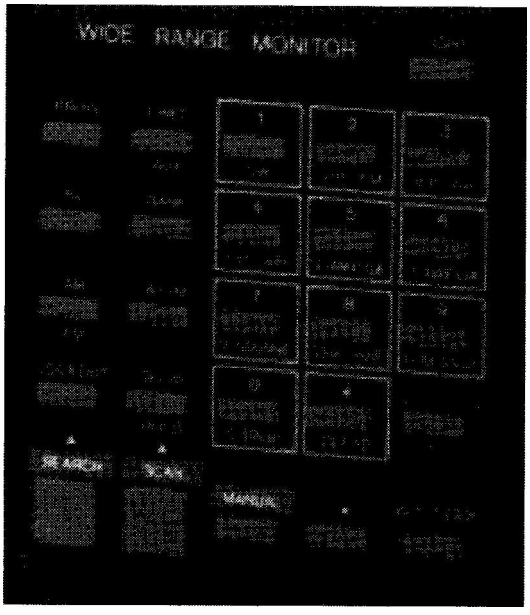


AR2000 ***ultimate portable monitor receiver...***
AOR have followed on from the successful AR1000 and have made the specification of the AR2000 even better. (One major change is the replacement of the 154.825 MHz crystal with a highly-stable 12.8 MHz reference and multiplyer chain). Whether out in a field running hand-portable, in the car or at home the AR2000 enables you to listen to both VHF and UHF airbands. Of course if you get tired of listening to airband, you can push a button or two and the world is yours! 'If it moves you can monitor it' - *well almost.* The choice of listening is endless, marine, Amateur band, airbands even BBC radio 2 on VHF FM. There are 1000 memory channels and 10 search banks, even a rotary tuning control is fitted to further enhance operation.

Search banks:

Bank 1	Shortwave	2 - 30 MHz	5 kHz step	AM
Bank 2	VHF FM	88 - 108 MHz	50 kHz step	WFM
Bank 3	VHF Air	108 - 138 MHz	25 khz step	AM
Bank 4	UHF Air	225 - 400 MHz	50 kHz step	AM
Bank 5	VHF Amateur	144 - 146 MHz	12.5 kHz step	NFM
Bank 6	UHF Amateur	433 - 435 MHz	25 kHz step	NFM
Bank 7	VHF Marine	156 - 163 MHz	25 kHz step	NFM
Bank 8	VHF PMR	165 - 174 MHz	12.5 kHz step	NFM
Bank 9	C-Mobile	890 - 905 MHz	12.5 kHz step	NFM
Bank 0	C-Base	935 - 950 MHz	12.5 kHz step	NFM

UK Specific:
For ease of operation in the UK, the search banks have been pre-programmed at the factory. They may be easily re-programmed by the user.
Each of the ten numeric keys is labelled with the corresponding search band, simply press one button and the receiver starts looking for interesting frequencies.



Frequency coverage:
The receiver has an exceptionally wide frequency coverage from 500 kHz to1300 MHz (1.3 GHz) with no gaps. The modes available are AM, FM (narrow) and FM (wide). Any available mode may be selected at any frequency within the receiver's coverage. There is no frustration in mode selection encountered here, you are *not forced* to listen to a specific mode at a specific frequency or band.

Accessories supplied:
DA900 single wide band whip aerial for VHF and UHF
AC charger
4 x AA High capacity rechargeable NiCad batteries
12V DC lead fitted with a cigar lighter plug for mobile operation
Soft case with carry strap
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E&OE

50 Countries on the 144MHz Band Part 3

There have been many excellent articles written on the subject of Sporadic-E propagation (Es). Many theories have been expounded as to its cause, many far more qualified persons than I, have tried to give a reason for its presence, but to date the answer is still a mystery. I can do no more than quote Fredrick E Terman in his book *Electronic and Radio Engineering*, first published in 1932. "The cause of Sporadic-E ionisation is still uncertain". Sixty years later we know much more about short wave propagation, but the problem is still with us. It will be answered some day, and it would be nice to hope that a short wave enthusiast could provide the solution.

Despite this lack of complete understanding, the mode of Sporadic-E propagation is eagerly listened for and used on the v.h.f. bands, and on 144MHz produces startling loud signals from long distances by stations who may be using low power and inefficient antennas.

Sporadic-E propagation is peculiar in that is may last for only a few seconds, or may be present for many hours. What you can hear at enormous signal strength may be completely inaudible by someone 30km away - which makes this mode of propagation extremely frustrating if it is you who cannot hear the choice DX being logged by your friend!

What is known about Sporadic-E is that at certain times a cloud of ionised gas forms at the E layer height, i.e. about 80km above the surface of the earth and reflects radio waves from 28MHz to frequencies above 146MHz. These openings take place at any time of the year, but in the Northern Hemisphere are most likely to be obvious on 144MHz during the period of late May to August, in the Southern Hemisphere the opening corresponds with their summer months.

Ionised Molecules

For some unexplained reason, a cloud of ionised molecules suddenly forms and reflects v.h.f. radio signals without apparently absorbing much of the wave energy. Dependent on the geographical position of the cloud, very closely confined point-to-point contacts can be made. For instance, there may be contact taking place between Italians in the Rome area and amateurs in North Wales, whilst at the same time communication is taking place between Southern Ireland and Austria and from the Amsterdam area to Portugal. In circumstances such as these the participants on each of the legs will be totally unaware of the other paths open and will not hear any other signals except those on their own path, see **Fig. 3.1.**

Lines drawn on a map connecting these three paths will converge at a point, presumably the location of the Sporadic-E cloud, and from a simple plot it can be deduced

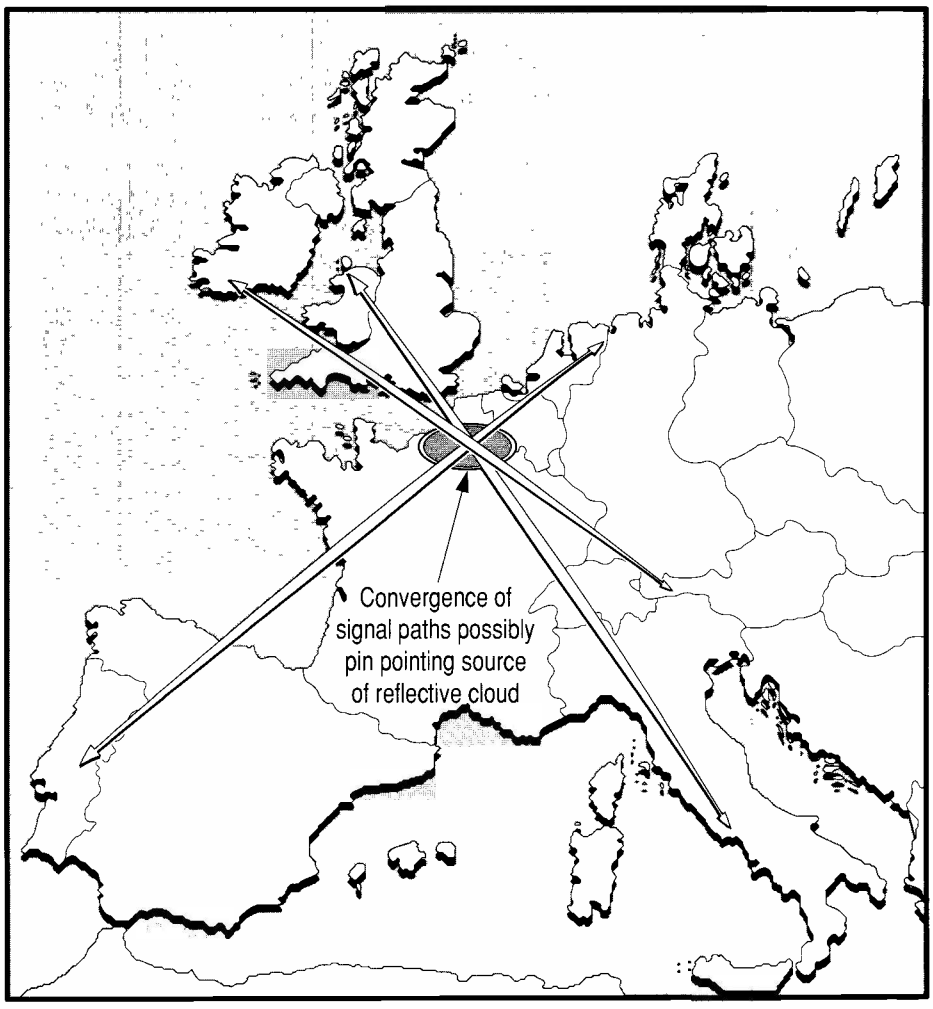


Fig. 3.1: Lines drawn on the map connecting three Es paths converge at what is, presumably, the location of the Sporadic-E cloud.

Sporadic-E is still largely an unexplained mystery. P.E.W. Allely GW3KJW looks at this intriguing mode of propagation.

that something very mysterious causes such selective reflection to take place. The benefit of Sporadic-E propagation is that there is almost no attenuation of the signal and listeners with low gain antennas have every chance of hearing signals from distances in excess of 2000km.

The term 'sporadic' is wisely given, not only is the time of the opening variable, but the cloud may suddenly shift some hundreds of kilometres, to reform seconds later, opening up a totally new path of communication. I well remember being in contact with a string of Italian and Yugoslavian amateurs when, without warning, the path collapsed, only to re-open to Southern Spain almost immediately.

I have experienced Sporadic-E openings on 144MHz as early as 0700UTC and as late as 2200UTC, although I feel that the most likely time is around 1600UTC during the months of June and July. The weather conditions at my end of the path do not seem to influence this mode of propagation. I have experienced these openings in fine high pressure conditions and also in low pressure wild and windy days when instinct says, 'don't switch on, it won't be worth listening'. I did that once and missed a fine opening to the Soviet Union. I have my own theory considering the formation of these ionised clouds, I feel somehow that they are connected with ionisation induced by high thunderstorms. I will be the first to admit that this idea is not based on any hard scientific evidence. What is certain is that the sun again plays some large part in the mystery. Sporadic -E openings seem to occur proportionally to a peak in the solar cycle and occur during the months when the sun is closest to the earth, i.e. our summer months.

Forecasting Sporadic-E

There is one sure method of predicting a Sporadic-E opening on 144MHz. It is in fact that every year, between May and September, there will be a Sporadic-E opening. Unless you intend to spend every waking minute of five months monitoring the 144MHz band, this indicator should be used just as a guide. A more precise indicator is to monitor the 28MHz (10m) band. Find out if there are unexpected short-skip openings taking place. Sporadic-E propagation is more frequently heard the lower the frequency in use. Should 28MHz be subject to this mode, I monitor Band I TV to see if any continental TV signals should appear. Listening to the 50MHz (6m) amateur band also serves the same purpose. There are a surprisingly large number of days when Band I pictures can be received from many parts of Europe. Supposing that strong signals are present around 50MHz the next frequency to monitor is around 100MHz. I should imagine that virtually every household in the UK contains a domestic receiver capable of tuning the v.h.f. f.m. broadcast band - Band II (2.88 to 108MHz). It is very likely that you may find broadcast signals coming in from Spain or Italy, in amongst our domestic transmissions, with signal strengths comparable with local radio. Now things are becoming very interesting, the Sporadic-E cloud is intense enough to reflect signals at 100MHz - could it be that 144MHz is now possible?

A tune around the bottom end of 144MHz may reveal locals calling 'CQ E'. You may hear very loud Morse signals from long distance stations. A tune up the band should, if the propagation is dropping down on your location, disclose a mass of highly excited amateur both local and distant, all at strong signal strengths, exchanging reports and locations as quickly as possible. Unfortunately, a number will tend to squash together on or around 144.300MHz so causing mutual interference but others will operate well away from the 'calling frequency'. In such conditions, a person establishing a contact on 144.300MHz will not move to another spot, but will remain there hoping for further contacts. A search on the more obscure frequencies should the band be open, can be rewarding, for example ZB0T in Gibraltar has been known to call CQ on 144.350MHz and invariably attracts a pile-up.

Moving up to the 145MHz portion of the band can be equally rewarding, f.m. signals via Sporadic-E are well worth listening to. Hungarians sitting in Budapest, or Yugoslavians on holiday with their hand-held rigs come in as strongly as old Fred on the other side of town. Not long ago, a friend of mine was walking along the promenade, carrying his FT-290 running 2W to its rubber duck antenna, worked a dozen Hungarian amateurs and another friend told me that whilst driving through the concrete canyons of Central London, he worked three Maltese station with 5W of power to a 5λ/8 gutter mounted whip antenna.

Brief Contacts

Sporadic-E is a form of propagation that has a lot going for it, but not as a mode for long conversations. Contacts will be brief almost to the point of rudeness, everyone is trying to work as many different stations as possible before the cloud disperses - which could be in the next second, or it might be in three hours time!

As far as the beacons are concerned, I must admit that whenever I have come across a Sporadic-E opening I have not tuned the beacon allocation. Presumably I would hear those beacons close to the distant stations I could hear, but I have always been far too engrossed listening and attempting to work new squares and countries. ■

Abbreviations

CQ	general call
Es	sporadic-E
km	kilometres
λ	wavelength (Greek letter lambda)
m	metres
MHz	megahertz
UTC	Universal Co-ordinated Time (=GMT)
v.h.f.	very high frequency
W	watts

The Proof of the Pudding

The last two years have seen dramatic changes in the world in which we live. Short wave radio has played its own part in not only helping these changes but in keeping the world informed of what is going on. Gary David Rawnsley examines the importance of short wave radio in the light of world events - in particular the Chinese crisis of June 1989.

In 1989, Radio Moscow World Service celebrated its sixtieth anniversary. During the same year, the Berlin Wall crumbled, Eastern Europe was torn open by the people themselves, and a new world order was established. The short wave stations of Eastern Europe became more open and free in the age of Glasnost.

In China, pro-democracy movements were ruthlessly supressed, and the authorities have now begun jamming broadcasts to China by the BBC World Service. The irony of this becomes extreme when one reads a publication by the World Service entitled *Voice for the World*, which states quite categorically that, "Unlike the Soviet Union, China has never jammed BBC broadcasts. 'China is a country looking outwards for the first time in many years, where the government itself wishes the population to know what is going on in the worlds,' says Mark Dodd, the Controller of Overseas Services. 'China is a short wave listening culture with very close ties to Britain. These are circumstances in which the BBC will thrive.'" This was obviously written before the Tiananamen Square Massacre.

It is ironic when one also reads that in 1987, the Soviet Union stopped jamming the BBC in Russian for the first time in 6½ years and ordinary Rusian people are encouraged to telephone the World Service and put questions to famous British people, including Paul MaCartney and Margaret Thatcher.

Short wave radio has, increasingly over the years, assumed an important and at times, influential role in world political events, particularly when those events have degenerated into acute crises. It has also, of course, assisted in shaping peoples' perceptions of what is actually going on anywhere in the world at any one moment in time. This is achieved via propaganda, the dissemination of ideas and opinions, and just plain, hard, factual news.

Time and again we tend to dismiss such notions as having been buried along with the Cold War, but time and again we are proved wrong. Another widely-held belief is that programmes are broadcast purely as entertainment, or information on home affairs exclusively for the ex-patriot, the tourist or the travelling businessman. While a great part of the station's output is pure entertainment, China, and subsequency events, have shown that we must now radically re-think out beliefs on the true importance of short wave broadcasting.

Paradoxical

Much of what is broadcast over the short waves to a specific target area concerns major, world news stories. In crises of the degree that China experienced during those turbulent days in June 1989, it becomes critical that the crisis itself is covered in depth for the benefit of the area in question. This may seem paradoxical. After all, it requires much more effort and expense for a Chinese man to listen to the BBC World Service or The Voice of America, than it does to listen to local stations.

However, foreign broadcasts are often the only source of truth available to the people themselves and so it is very much worth the extra effort. This is neither as altruistic nor moralistic as it may at first sound. A few examples may serve to demonstrate the truth of the statement.

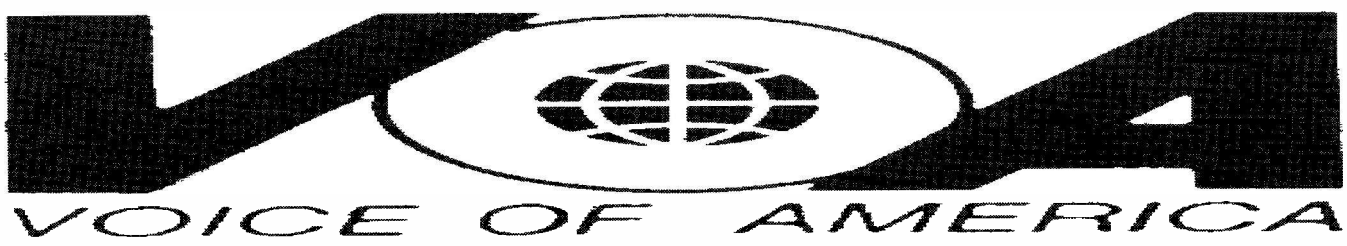
In China, the people get their **real** news, not from state-run television and radio, but from publically displayed, illegal posters. Their content is obtained from the Voice of America and what has been described by one reporter as the "Infinitely more respected BBC World Service". The Chinese depended on the BBC and the VoA for truth at a time when the truth was being distorted at high levels of the state apparatus. There are other examples of this.

During the Solidarity uprisings in the early 1980s, most Poles learnt about events from the BBC World Service, the Voice of America and Radio Free Europe. In 1986, the Soviet Government made no announcement to its people concerning the Chernobyl nuclear accident, but as soon as American satellites confirmed it, news of the disaster was broadcast to the USSR.

In themselves, these three separate events prove the worth and value of international broadcasting; we owe it to the people of the world to provide them with a service they can trust at a time when the truth is hard to determine.

Practical Value

The events in China proved the practical value of short wave radio in another slightly different way. Following the news at 1700UTC on 11 June 1989, the Voice of America broadcasted a message from the State Department informing all American, British, Canadian and Australian citizens of a free flight out of China. They were



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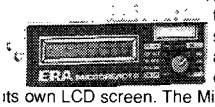

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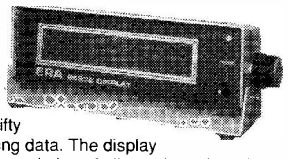

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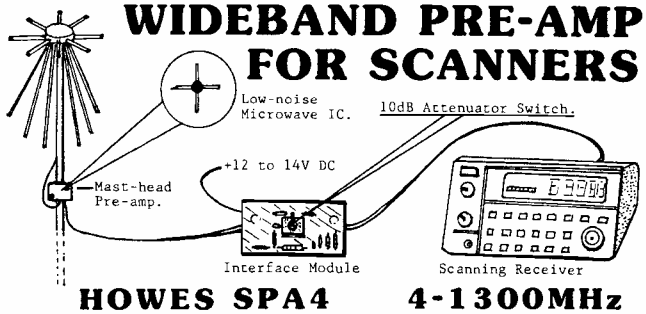

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PLEASE ADD £1.20 P&P to your total order value

HOWES KITS are produced by a professional RF design and manufacturing company. They contain a good quality printed circuit board with screen printed parts locations, full clear instructions and all board mounted components. Sales and technical advice are available by phone during office hours. Please send an SAE for our free catalogue or specific product data

73 from Dave G4KQH, Technical Manager

told where to meet and at what time and were given a Beijing telephone number to ring (probably an embassy number) if further information was required. It is highly probable that the individual diplomatic missions in China could have organised the relay of this message without the assistance of VoA, but it is doubtful whether the effect would have been quite the same, and the resonse as desired. It proved vital to get information to those people considered to be in danger, and radio is the perfect medium for such an enterprise, particularly when the voice is identifiable as one from home - a friendly voice.

We can not be sure, of course, without the data received from extensive market research, that messages, news and information are heard by the people to whom they are targeted. For a whole variety of reasons, cultural, economic, geographical as well as political, many are unable to hear programmes from the BBC World Services, or VoA. Yet it can be just as important that reporters are seen to be working in a country experiencing the crisis, so the people know that news of the event is getting out, even if their own media is suppressed. This was definitely the case in China. It is unknown whether the broadcasts by the West were heard in China during the crisis days in June 1989, but the students and the intellectuals knew that the world's media was there to witness the events and would get the facts back to the newsrooms, often at great cost. Some had the harrowing experience of body searches and intense questioning by authorities, while, at the other end of the scale, a few suffered severe beatings in the course of their work. But the Chinese felt safe knowing that the truth would permeate the globe before the authorities managed to give their own, often distorted, account of events.

Ideas and Opinions

Perhaps a final point to note in this argument for the importance of short wave radio, is that ideas and opinions, which really serve as warnings, are able to be sent from government to government. These may manifest themselves in the guise of items of news, or under programme titles such a 'Opinion' or 'Commentary', a feature usually to ne heard after the main news on the hour on many international broadcasting stations. It is open to speculation how far these 'warnings' are heeded by the target regime. The Voice of America spent many hours broadcasting the speeches of President Bush, the Secretary of State and a number of Congressmen that focussed on the China crisis; it was much the same story as regards the BBC World Service, providing a medium for Mrs Thatcher (then Prime Minister), Sir Geoffrey Howe (then Secretary of State for Foreign Affairs) and a whole host of politicians. It must be remembered, however, that the BBC is independent from both the government and the Foreign Office. It is after all, the BBC World Service. Other stations' obligations to government is indicated by their very names - The Voice of America, Radio Moscow World Service and Radio South Africa, the Voice of South Africa - all of which are state owned and largely state run.

All messages of this nature tended to sympathise with the Chinese students and condemn the way the government in Beijing chose to handle the situation, with talk of such measures as embargoes and sanctions.

Recently, events have unfolded in Eastern Europe that have commanded the use of the short wave radio by one regime to broadcast to another in the region. Radio Berlin International, the international broadcasting station of East Germany, talked on September 11, of how the Hungarians had engaged in 'trade in human beings' when they helped the refugees move from the GDR to the West.

Radio Moscow World Service, usually so vociferous on matters of world affairs, particularly when they occur in their own back-yard, opted to remain silent on the refugee problem, and so avoided becoming entangles in what appeared to be the evolution of an inter-alliance feud. After all, the USSR had, at the time, too much at stake to side with either East Germany or Hungary in opposition to the other.

Reaction

Underhand, unofficial diplomacy, carried out via the media, can prove to be very effective, although, even now, we are still waiting to see the Chinese reaction to Western-broadcast opinion. However, it must be assumed that subsequent jamming of the BBC undertaken by the Chinese was either a reaction to these broadcasts, or evidence that the broadcasts were not heard in the first place.

As humans, we take great pleasure in viewing ourselves as Aristotleian political animals. If this is so, it follows that we are not devoid of emotion, but are able to determine the truth from fiction, and can ascertain our moral and value systems, both as a national and as individuals. With this in mind, it is important that we all understand the formidable significance of short wave radio broadcasting, and this includes those of us who, until now, didn't even realise the short wave bands existed. It is for this reason, and China was the icing on the cake, that much more should be done to ensure the quality of output remains high, (although the BBC and VoA are already of very high standards, and so enjoy a well deserved world-wide reputation), in order that they might continue to be listened to **and trusted** by people across the globe. It is a shame that when governments decide that cuts in the expenditure of the media must be made, it is the international broadcasting station that suffers first and foremost. This should not be allowed to happen.

Since 1989, many events in the international arena have compounded to re-assert the power of short wave broadcasting. Eastern Europe effectively no longer exists as a monolithic, closed bloc and this is reflected in the style and content of their overseas broadcasts. The two Germanies have united and it will be interesting to see how this affects the output, as well as organisiation, of their short wave stations.

Over-shadowing all of this good news, however, has been the Gulf Crisis and its continuing repercussions. If our government was ever in doubt as to the importance of this sector of the media, it should look to the Middle East for inspiration.

It is often said that the proof of the pudding is in the eating; what I am suggesting is, that China and others have allowed us to sample that pudding, and experience short wave radio in all its glory. ■

Permit to Receive

Had you wished to become a 'listener' to any form of wireless transmission during the early 1920s, you would have required a 'permit' to do so from the Post Master General. At that time there was no Wireless Receiving Licence as such - that came later, as Fred Judd G2BCX explains.

First you acquired the requisite 'Form of Authority' that stated the tems appliable to both the installation and use of your proposed wireless receiving apparatus. The PMG also required your birth certificate plus a few other personal details that had to be verified by two references, exactly as stated on the Form of Authority, a copy of which, originally dated June 1920, is reproduced here.

The initial comment is worthy of note - *Formal licences to conduct experiments in wireless telegraphy cannot at present be granted.....the Post Master General is prepared to authorise the use of wireless apparatus for the reception of signals.*

Among other things, the PMG required a circuit of the receiver you intended to use. If valves were to be employed in the receiver, special permission was needed. It was stipulated that the antenna must not be higher than 100 feet above ground! Was there was no local planning authority in those days?

However, if all the information requested was supplied and proved satisfactory, you, or your guardian if you were under 21 years old, were given a 'permit' to receive wireless telegraphy. No mention was made of telephony.

There is an interesting clause in the 'permit' about the *release of any wireless apparatus in Post Office custody.* This applied to wireless apparatus you may have had confiscated by the Post Office at the outbreak of World War I and held in storage until the end of hostilities. ■

In any reply please quote
the registered number.....

A.

Experiments in Wireless Telegraphy.

N.B. Under the Wireless Telegraphy Act,1904, the Postmaster General's authority is necessary before any apparatus for Wireless Telegraphy is installed or worked.

Authority for the use of receiving apparatus.

Conditions of issue, etc.

Formal licences to conduct experiments in wireless telegraphy cannot at present be granted; but pending the settlement of certain outstanding questions, the Postmaster General is prepared to authorise the use of wireless apparatus for the reception of signals on the following conditions:-

(1) The applicant shall produce evidence of his British nationality and two written references. (A certificate of birth should be furnished if possible; but this will not be insisted upon if the two referees testify of their own knowledge that the applicant is of British nationality. The references should be given by persons of standing, who are British subjects and not related to the applicant).

(2) There shall be no divulgence to any person (other than properly authorised officials of His Majesty's Govenment or a compentent legal tribunal) or any use whatever made of any message received by means of the apparatus;

(3) The installation shall be subject to the approval of the Postmaster General;

(4) The aerial shall not exceed the undermentioned maximum height and dimensions:-

Extreme height of aerial above ground) 100 feet.

Total length of wire including lead-in wires) 100 feet for a single wire aerial.) 140 feet of wire where two or more) wires are used (e.g. total length) of 70 feet of double wire.

(5) Valves shall not be used without the special authority of the Postmaster General.

(see over)

(6) The apparatus shall be open to inspection at all reasonable times by properly authorised officers of the Post Office.

(7) A fee of 10/- shall be paid. (It is contemplated that an ananual charge of 10/- shall be made in respect of each experimental receiving licence to cover the expenses of the issue of the licence and the inspection of the station).

Procedure to be followed * see below as regards minors. *

The applicant should furnish (by letter addressed to the Secretary. G.P.O. E.C.1)

(a) a formal acceptance of the foregoing conditions:-
(b) evidence and references as described in (1).
(c) his full Christian names and particulars of his occupation.
(d) a remittance of 10/-
(e) a description of the apparatus which it proposed to install, and, if authority is desired for the use of valves, a diagram of the circuits in which they would be used.
(f) a sketch showing the form, height and dimensions of the proposed aerial (including lead-in wires);
(g) the address at which the apparatus would be installed.

Any wireless apparatus belonging to the applicant which is in Post Office custody will be released as soon as authority is granted for the use of such apparatus. The production of a permit from the Post Office for the use of wireless receiving apparatus will be sufficient authority for the purchase by the person or firm to whom the permit has been granted of such apparatus as comes within the terms of the permit. The sales in these cases need not be be reported to the Post Office by the vendors. If necessary, this form as well as the permit for the use of the apparatus, should be produced for the vendors inspection.

N.B. Authority to use wireless apparatus cannot be issued to a minor (i.e. a person under 21 years of age). Application should accordingly be made on his behalf by his parent or guardian who should proceed as indicated above and should, in addition, state his (or her) relationship to the minor. In such cases the evidence and references specified in condition (1) should be furnished BOTH REGARDS THE MINOR AND HIS PARENT OR GUARDIAN. There would be no objection to a minor working the authorised apparatus as the agent of his parent or guardian.

Exact copy of 'Authority for the use of Receiving Apparatus. Conditions of Issue, etc.' The registered number of the original was 175856/20 and was issued to Fred Judd.

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"With many years of amateur radio business behind me, I am keenly aware of the value placed on customer care and service by those that visit me here at this centre.

"See you soon, I hope! 73, Tom"

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Tuneable Sound for Satellite TV Receivers

In this article, Gareth Jones GW4KJW describes a simple way of adding greater sound versatility to cheap ASTRA satellite receivers for use with other satellites.

There are a number of 'first generation' ASTRA satellite television receivers now appearing on the second-hand market at prices well under £100. Whilst it is true that some of these can be quite restrictive when you attempt to use them for receiving other satellites, the knowledgeable enthusiast can, with a little bit of time and effort, use one as the basis of a very useful multi-satellite receive system.

Many readers will be aware that the ASTRA satellites - the ones carrying SKY and MTV - are fairly high-powered devices, and as such can be received on fairly small dishes and with pretty basic equipment. Over two years ago, when the first ASTRA came on-air, just about the only satellite receivers you could find in the shops were the excellent value Amstrad SRX100/200 - pretty much identical apart from the SRX200 having infra red remote control. For those readers who are unfamiliar with these receivers, they are a fairly straightforward, dedicated ASTRA design, providing tuning over the frequency range of 10.991GHz to 11.678GHz with sixteen user-programmable, memory stored channels within this range, they were usually sold with a 600mm (800mm in Scotland) plastics covered, steel dish, intended for fixed position mounting. The band of frequencies covered has a limiting effect on what other satellites you can use this receiver on. The part of Ku-band used for this type of satellite broadcasting, is 10.950 to 11.750GHz - slightly greater than that provided on the basic Amstrad. Obviously any satellites transmitting on channels outside this range will not be receivable. A more important limitation, however, is the small number of audio sub-carriers that can be selected.

As with many other ASTRA receivers, the Amstrad only allows operation on a few fixed audio sub-carriers. The original ASTRA specification suggested that all broadcasters using the satellite would use 6.5MHz as the main mono audio sub-carriers. Additional pairs of sub-carriers could be used, either for reception of stereo audio of those channels transmitted in this mode, or be individually selected, 'two-mono' channels for additional languages or radio stations use, etc. They could also just be usd to duplicate the main 6.5MHz audio, as the majority of existing broadcasters, in fact, do.

This is the specification for these satellites only. Others have various primary and

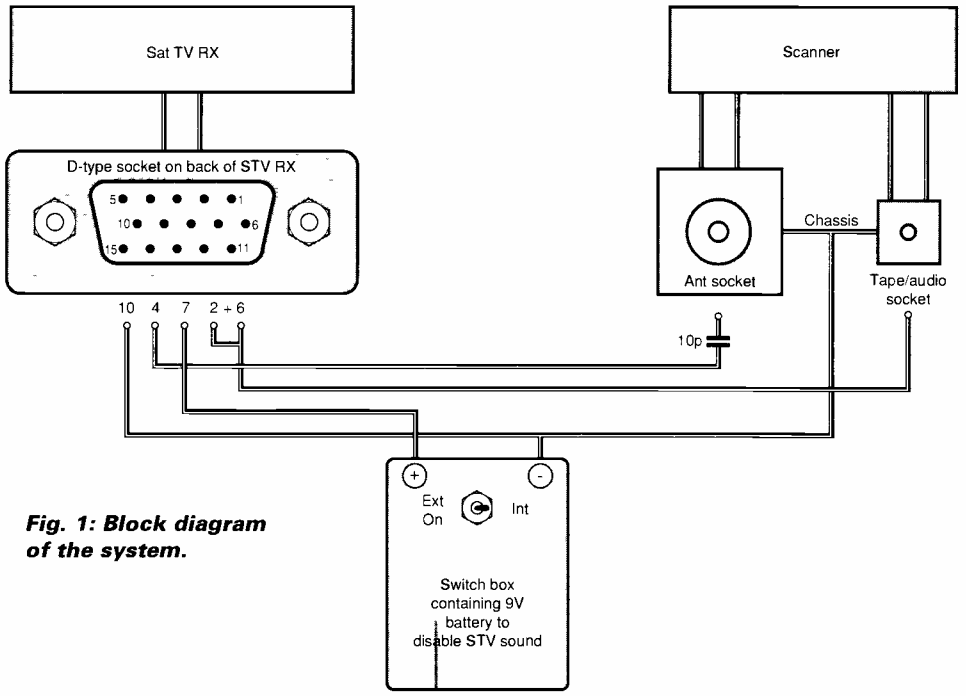

Fig. 1: Block diagram of the system.

Table 1: Pin-out of the D-type connector used on many ASTRA satellite receivers.

Pin	Function	Signal Levels
1	audio return (left)	500-700mV (10kΩ)
2	video return	1Vp-p into 75Ω
3	video control voltage	0 or +12V
4	baseband output	25Hz-10.5MHz -3dB
5	video output	1V p-p into 75Ω
6	audio return (right)	500-700mV (10kΩ)
7	audio control voltage	0 or +12V
8	ground	
8	unused	
10	unused	
11	ground	
12	audio output (left)	500-700mV (10kΩ)
13	audio output (right)	500-700mV (10kΩ)
14	unused	
15	unused	

ADVERTISERS

Please note the copy date for the November issue of ***Short Wave Magazine*** is the 20th September 1991, this is our Leicester Show issue.

secondary audio sub-carriers in use on frequencies in the range 5-8.5MHz. So the Amstrad and, for that matter, many other types of ASTRA receiver, having fixed coverage of two pairs of sub-carriers at 7.02-7.2MHz and 7.38-7.56MHz, can prove a bit of a let down if, for example, you attempt to watch a channel on a satellite providing audio on 6.65MHz - this can be a sure-fire way to make you wish you had taken up lip-reading, you'll receive the picture OK but not the sound. Worse still, you may well find that some of these other satellites television channels may be broadcasting entirely unrelated audio on some or all of the higher audio sub-carriers capable of being received on the Amstrad.

Try pointing your dish at Intelsat VA-F11 at 27.5°W. This channel provides mainly science, technology and nature programmes and is one of the best channels of its type. However, if you are using the Amstrad receiver and select audio mode AU2 or AU6 you'll get horse racing commentaries!

Solving the Problem

So how do you get around this problem? Well, if you are handy with a soldering iron you could build an outboard tuneable audio strip - it's not very difficult and any one of a number of published audio demodulator designs could be adapted. But if you happen to own one of the many types of scanning receivers providing full-frequency coverage and a.m./f.m. selection throughout its range, it's even easier. If your scanner can be tuned, by fair means or foul (i.e. 'tricked'), down to the required frequency - preferably whilst in wide f.m. mode - then all you need to do is find a way of getting the baseband range of frequencies out of the satellite receiver and into your scanner, thus permitting it to provide the function of a tuneable audio stage at these baseband frequencies.

Table 2: The main audio frequencies found on some of the other satellites.

Satellite	Position	Frequency (MHz)
Intelsat VB F15	60°E	6.800
DFS Kopernikus *	23.5°E	6.650
Eutelsat II F1 *	13°E	6.650
Eutelsat II F1	13°E	6.600
Eutelsat II F2*	10°E	6.600
Eutelsat I F4	7°E	6.600
Telecom 1C	5°W	5.800
Intelsat V1 F4	27.5°W	6.650
Intelsat V1 F4	27.5°W	6.600

** Received in South Wales on a standard 600mm dish.*

This may sound complicated but its actually very easy, particularly if your satellite receiver (Amstrad or whatever) has a 15-pin 'D-type' Sky Movies decoder socket. The pin-out on this socket, should conform to a laid-down standard, see Table 1. They provide an easy way to 'get at' the baseband signal and perhaps more importantly obviate the need to remove the case from the satellite receiver or on any way 'fiddle' with its guts.

A tap to the baseband frequency range of 25Hz-10.5MHz (-3dB) is needed and you can take a connection from Pin 4 of this socket and feed it to your scanner antenna input socket, via something like a 10pF capacitor - make sure you use 75Ω screened coaxial cable. You may need to apply additional attenuation to reduce the level of the signal (depending on the type of receiver used). Pins 1 and 6 on this socket provide audio return lines, so you may, if you wish, feed the recovered audio, as tuned by your scanner, back in via these lines. You will have to connect them together if course, since unless you happen to have some sort of stereo scanner - I don't think they make them, but I've probably just put the idea into the minds of half-a-dozen Japanese manufacturers - you will only be able to receive in mono mode anyway. This will result in the received audio being modulated back onto the combined audio/visual signal and fed out to your television set on Channel 35, or whatever.

If you do this you will need to:

(1) ensure the audio fed back from your scanner is at an acceptable level (approximately 500-700mV into 10kΩ) and

(2) switch off the satellite receiver's internal sound receiver circuitry and feed those audio signals applied to pins 1 and 6 to the modulator stage instead.

The first requirement is easily achieved. Simply take the output from your scanner that is intended for connection to a tape recorder and which should be something around this level. **But do check!**

The second is also easy. Once again the D-type socket comes to the rescue, with Pin 7 providing a control voltage application point. With no voltage on this pin the satellite receiver's internal audio strip is selected, whilst the application of +12V will switch the internal circuit off and feed anything applied to pins 1 and 6 straight through instead.

The maximum bias voltage that should be used is +12V, so for convenience you could use a 9V PP3 type battery to switch this line. Pins 8 and 11 on this socket are at ground potential. A block diagram showing how it all fits together for neatness is shown in **Fig. 1**. You can put a small box in-line between the satellite receiver and the scanner to hold the battery and a small switch to apply the bias voltage to pin 7. The required 15-pin, high density, D-type plug is available, together with suitable hoods, from any electronic or computer component supplier.

Table 2 is a list of the usual main audio frequencies you will find on some of the other satellites. You should bear in mind, however, that the strength and quality of the signal you receive using the standard 600mm ASTRA dish may not be sufficient for reception of all of these satellites, those marked * have all been received in South Wales on the standard 600mm dish, with a larger 900mm dish bringing results from most of the others. For a full list of all available frequencies and TV channels, together with details of the very many radio stations and their sub-carrier frequencies, consult one or other of the many specialist books and magazines available. ■

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SPECIAL OFFER

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SWM SEPTEMBER 1991
EDUCATIONAL SOFTWARE

DXing in Ecuador

Part 2

Dick Ganderton continues with the story behind the recent SWM/HCJB DXpedition to Ecuador. This month, he describes a spectacular outing to one of Ecuador's volcanos for a barbecue and the chance to listen on some very long wire antennas.

When Andrew Steele of HCJB UK and I were producing the initial outline of what we thought readers might like to do in Ecuador, I suggested that it would be interesting to try listening for DX up a volcano. John Beck and his team at HCJB came up with the ideal spot - the Cotapaxi National Park situated on the slopes of Cotapaxi itself. The afternoon and evening of one day would be devoted to listening up Cotapaxi - with, of course, a barbecue to keep us alive.

Ken MacHarg and Rich MacVicar were very enthusiastic about this trip. They had done a lot of preparatory work, including arranging with the National Park wardens that, although the gates were locked at 6pm, we would be able to stay inside as long as we wanted and still be able to get out. Ken and Rich had organised a system of portable plywood poles to enable them to erect a couple of Beverage antennas. With the space available they really went overboard and the shortest one was paced out around 240m! I was eager to see just how the Lowe HF-225 coped with such a mighty antenna. At an altitude of around 3350m - 11000ft in understandable units - and more to the point, miles from anywhere so no QRM, a Beverage of this length ought to provide an enormous signal. Five lengths of flex were attached to one end of each antenna so that up to five receivers could be hung on to them. The Lowe was hooked up and I tuned around the dial until I found a really good signal. This turned out to be BBC World Service from the Ascension Island Relay on 15.070MHz and elicited the comment from Ken MacHarg that the audio quality of the Lowe was superb. Neither Ken nor Rich had come across the Lowe before and it really interested them. I always find giving a SINPO report to be the most difficult part of filling in the logbook, but the signal from World Service proved to be easy - 55555 - of course! As a comparison I also used the Lowe's built-in active antenna and 50Ω telescopic whip and found no difference in the signal whatever. Up on Cotapaxi it gets very cold at night, even in June. Ken had told us to wear warm clothing, but failed to mention woolly hats and gloves! The Lowe has an optional leather carrying case and it can be operated when still inside the case, a very useful feature. The case makes it easy to transport the receiver around, slung over shoulder and ready for almost instant use. Unfortunately, there is no provision for the 50Ω telescopic whip in the case and I ended up by tucking it under the front of the set. It really needs a tailored pocket in which it can be stored to prevent it scratching the set.

As an aside, John Wilson of Lowe Electronics, who kindly loaned us the set, was approached by John Fogg, PRO at the Scouts Association HQ. John is going out to Korea in August with a party of Scouts from the UK to attend the World Scouting Jamboree. He needed a short wave receiver for the radio station he hopes to set up. John Wilson had the bright idea that, like us, they really ought to take a British designed and manufactured set. What better than a Lowe HF-225 that had already been taken halfway round the world, up a volcano and down into the Amazon Jungle! As a result the HF-225 is now performing in the Orient - coals to Newcastle?

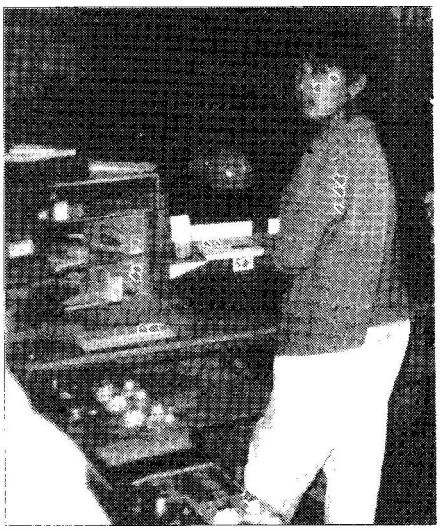
Breathtaking Sights

John Beck's barbecue was superb. While it was being prepared, several of us sneaked out in the HCJB minibus to look for the herds of wild horses that Polly MacHarg said roamed around the mountain. Polly drove us round the base of the volcano and for just a few minutes the curtain of cloud parted and most of Cotapaxi was 'out', leaving just a small cap of cloud over the very summit - a breathtaking sight. Later on, we persuaded Umberto to drive the bus around the same route - in the dark - and we were treated to some fantastic star-gazing. The Southern Cross and The Plough, both visible together, made it somewhat special and I can only recall seeing more stars when on an RFA tanker in mid-Atlantic some twenty-nine years earlier!

Ken and Rich had arranged it so that we could stay on the mountain for as long as we wanted to, but by 8pm we had all had enough - we blamed it on the altitude - and the cold was getting at the fingers and other extremities. So the bus set off for Quito leaving Ken and Rich huddled in their car listening to the radio and hunting the DX - they really are dedicated to the cause! However, they only stayed a few minutes longer than us. It turned out that there was a lot of static around and they felt that discretion was the better part of valour - so they packed the antennas away before the lightning did it for them.

Local Radio

Mention local radio here in the UK and thoughts turn immediately to stations such as 2CR. Out in Ecuador there are, seemingly, dozens of small, privately owned radio stations serving a



One of Radio Interoceanica's two stud

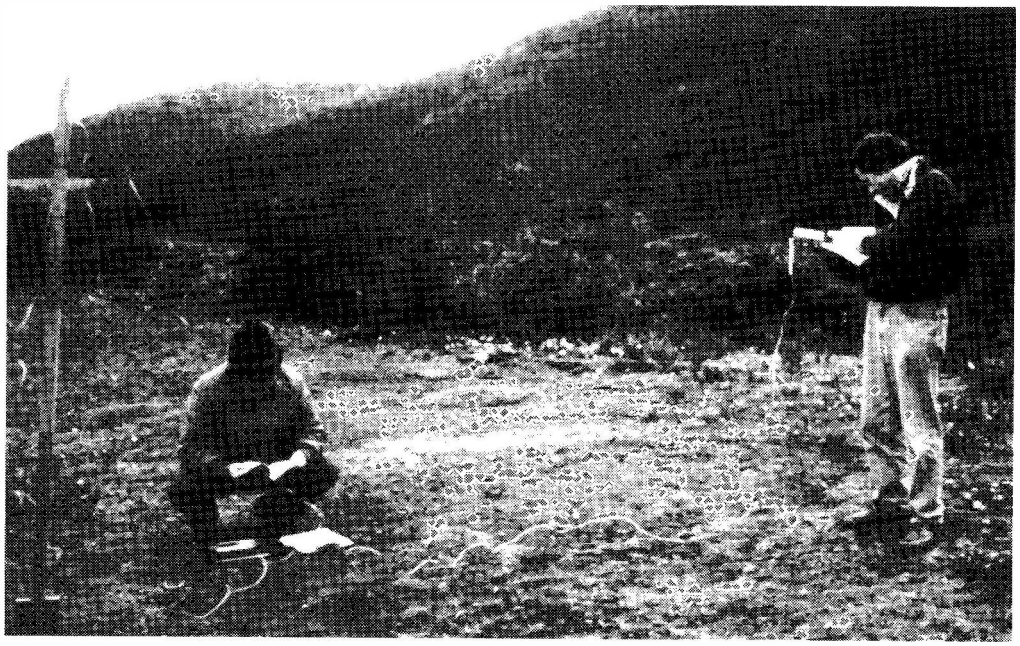
limited population. We were taken by HCJB to visit a couple of these small, but nevertheless important broadcasters.

In Quito itself, there are radio stations for just about every taste in broadcasting. We went to the old colonial part of Quito to visit a typical station, Emisoras Gran Colombia, HCMJ1. This is a privately owned station which is financed by advertising and provides music and sport based programming aimed at the population of Quito. They broadcast on 610kHz medium wave with 25kW of power between 1100 and 0545UTC (local time in Quito is UTC minus 5 hours) and on v.h.f. f.m. They also have a short wave allocation of 4.910MHz, but at present this is not used. The studios are located in an old, colonial style, building in Quito with conventional studio facilities.

The transmitters and antennas are, as seemed to be common, remotely sited with a microwave link between studios and transmitter. Latin America is football mad and Ecuador would seem to be no exception, so Emisoras Gran Colombia covers football matches, as well as other sports.

The name Emisoras Gran Colombia intrigued me. Ecuador was once part of Simon Bolivar's Gran Colombia republic, so perhaps it is connected with that phase of history.

lios at Santa Rosa. *Peggy Ganderton.*



Ken MacHarg, presenter of* Saludos Amigos *on HCJB, and Mike Burden, hook their portable sets onto the end of one of the Beverage antennas on Cotapaxi. *Dick Ganderton.*

Radio Interoceanica - that's their studio building on the front cover - serves the small community of Santa Rosa de Quijos, a couple of hours east on the bus from Quito over the Continental Divide and along the route of the Transequatorial Pipeline. On the way, we passed HCJB's antenna farm and transmitter site at Pifo and the hydro-electric plant at Papallacta.

Back to Radio Interoceanica, callsign HCIR7, who broadcast on 4.840MHz short wave and 96.3MHz f.m. in the v.h.f. broadcast band. The station is equipped with two studios and can cater for the local interests with music and local language programmes. While we were visiting a couple of local people were recording a discussion programme using one of the studios while the other one was being used to broadcast a programme of popular music from records. Funding, like so many of these smaller stations comes from church fund raising activities, mainly in the States. Interoceanica seems a strange name for a radio station situated thousands of kilometres from the Atlantic Ocean and with the Andes blocking the view to the Pacific. As the target area for the station is small the transmitter power is also low - 1.5kW in the case of the short wave station. This makes it a very rare catch here in the UK - has any reader logged it?

Hydro-electric Power

After leaving Radio Interoceanica and eating our HCJB 'sack lunch' by a river, we set off back along the dirt road towards Papallacta for a quick visit to HCJB's hydro-electric plant. This is another piece of typical HCJB thinking - the first water turbine and generator is a veritable working museum piece - I seem to recall 1903 somewhere on the generator - acquired from somewhere in the States and shipped to Ecuador. The entire installation was designed and built by HCJB missionaries and supplies the transmitters at Pifo via a high voltage overhead transmission line, again installed by HCJB. This three-phase line was interesting, as each line was fitted with large r.f. chokes where it left the generating building, as a precaution against any r.f. from the transmitters at the Pifo end of the line getting back into the system. Similar chokes are fitted at the Pifo end as well.

A second, modern generating set was installed later and when we were there this was the only one that was operating, the vintage set being shut down as the water level in the reservoir was too low to run both sets. HCJB also sells any surplus Papallacta produced electricity to Quito.

Running the hydro-electric plant guarantees HCJB low-cost electricity for its transmitters and it is this that has enabled them to develop and add extra transmitters at Pifo - something that would have been prohibitively expensive if they were having to use diesel generators or buy power from the local electricity company.

The day was rounded off with an hour soaking in the hot volcanic springs at Papallacta - very relaxing and therapeutic, before setting off in the bus back over the Continental Divide to Quito and another evening of DXing at the guest house. ■

propagation

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

June 1991 must have pride of place this time because of the high level of solar activity and the resultant effects it had on the earth's atmosphere. But first, thanks to all of you, astronomers and radio enthusiasts alike, who kindly sent me such information that made this special report possible.

Solar

"Large 'D'-shaped penumbra, with 5 umbrae included + linear feature", wrote **Ted Waring** (Bristol) about one of the sunspot groups he saw early in the month. He also counted 43 spots on the 1st, 52 on the 10th, 53 on the 12th and 38 on the 28th. **Patrick Moore** (Selsey) followed the progress of the giant spot group that was present during the first half of the month and the drawings of his observations made at 0950 on the 9th and 1130 on the 12th can be seen in **Figs. 1 & 2**. **Ron Livesey** (Edinburgh), using a 4in projection screen coupled to a refractor telescope, identified 5 active areas on the sun's disc on June 22, 28, 29 and 30; 6 on days 1, 3, 7, 8, 17 and 20; 7 on the 25th and 26th and 8 on the 9th.

In his June report, **Fred Pallant** (Storrington) said, "A very patchy period with a lot of disturbance from the sun". For 28MHz at 1900 on the 19th he wrote, "no beacons but very high level of solar noise". **Ern Warwick** (Plymouth) found the 28MHz band 'dead' at various times on days 4, 5, 7, 9-14, 16, 24 and 25 and heard solar noise on days 10, 11, 19, 20, 22 and 27.

Auroral

Gordon Foote (Abingdon) and Ern Warwick report that the German beacon DK0WCY on 10.144MHz was giving weak auroral warnings at times on days 8, 11-13 and 17 and strong on the 12th and 13th. **Doug Smillie GM4DJS** (Wishaw) detected tone-A signals on 144MHz between 1405 and 1820 and during a second auroral-phase from 2245 to 2300 on the 5th. Within those periods Doug made 35 auroral reflected c.w. contacts, (which would have sounded like a low pitched 'rasp' at both ends) with stations in 10 countries, Belgium, Denmark, England, Faroes, France, Germany, Holland, Poland, Scotland and Wales. He also heard the 50MHz beacons in Anglesey (GB3SIX), Buxton (GB3BUX), Garvagh (GB3NGI), Inverness (GB3RMK) and Potters Bar (GB3NHQ) and the 144MHz beacons in St. Austell (GB3CTC), Faroes (OY6VHF), Garding (DL0PR), Holbaek (OZ7IGY), Lerwick (GB3LER) and Wrotham (GB3VHF), by the same mode.

Doug's 12-element 'ZL' Yagi varied from north to north-east to east throughout his activity on the 5th and north-east to east during the aurorae which manifested, at various times, each day from the 9th to the 13th inclusive. He added Czechoslovakia, Norway and Eire to his countries list on the 10th and Holland, plus the Delft 144MHz beacon (PI7CIS) on the 13th.

Ron Livesey, the auroral co-ordinator for the British Astronomical Association, received reports of visual aurora from observers in Scotland for the overnight period on days 4/5; Detroit on 5/6; Canada, London, Scotland and Wales on 10/11, Sussex on 12/13, London and Wales on 13/14 and Canada on 17/18. 'Rayed-aurora' was seen all over Scotland on 4/5 and 'coronal' displays were visible reported from Nova Scotia on 10/11. "The Geomagnetism unit at Edinburgh put out a magnetic storm warning in the TV networks on June 13 and 14. The 5th, 10th and 13th, were the most magnetically active nights. Those days also coincided with the strongest radio-aurora events," wrote Ron in his report to the BAA.

Magnetic

The magnetometers used by **Tony Hopwood** (Worcester), **Karl Lewis** (Saltash), Ron Livesey, **David Pettitt** (Carlisle) and Doug Smillie between them recorded storm conditions on June 2, 5, 6, 10, 13, 17 and 23. **Richard Noble** (Abergavenny) has developed and built a fluxgate magnetometer which, briefly, comprises four transistors, four integrated circuits and a toroid coils sensor. The latter is mounted in his attic and the instrument produced an impressive recording of the magnetic disturbance which lasted from 2000 on the 12th to 2100 on the 13th.

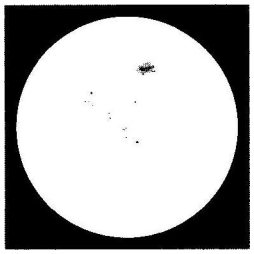


Fig. 1.

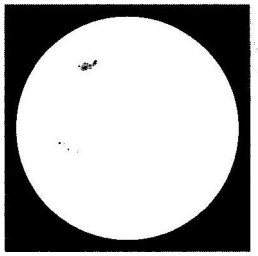


Fig. 2.

Propagation Beacons

First, I must thank **Chris van den Berg** (The Hague), Gordon Foote, **Cmdr. Henry Hatfield** (Sevenoaks), **Ted Owen** (Maldon), Fred Pallant, Ted Waring and Ern Warwick for their 28MHz beacon logs from which I prepared our regular monthly chart, Fig. 3.

"Where have all the American beacons gone?" asks Gordon Foote who says that his worst reception days for the period were May 29, 30, June 3, 6, 9, 10, 12, 14 and 19 while his best were May 31, June 1, 8, 16 and 22. That's a good question Gordon, I suggest readers that you compare the current beacon chart, **Fig. 3**, with those in recent issues of *SWM*. Both Gordon and Ern frequently logged signals during this period from the Sao Paulo beacon (PY2AMI) on 18.100 and 24.915MHz and Ern copied signals daily from ZS6DN/B and 4X6TU/B on 14.100.

Henry Hatfield noted that the German beacon DL0IGI was 'very loud and clear' on June 2 and 20. Ted Owen received a card from W8UR confirming that his beacon is 0.5W from Mackinaw City, Michigan on 28.218MHz. My thanks to **John Allaway**, the Secretary of IARU Region 1, for the July issue of their journal, *Region 1 News*, in which I see that 5Z4ERR is the callsign of the beacon on 28.2075MHz maintained and operated by the Radio Society of Kenya. The beacon is located at Kiambu some 15km NE of Nairobi City at the QTH of Hermann 5Z4RT. Readers reports of its signals will be welcome and acknowledged by The Radio Society of Kenya, PO Box 45681, Nairobi. The call sign 5Z4ERR is in memory of the late Robie Robson, ex-VQ4ERR, a leading amateur radio operator in East Africa.

Sporadic-E

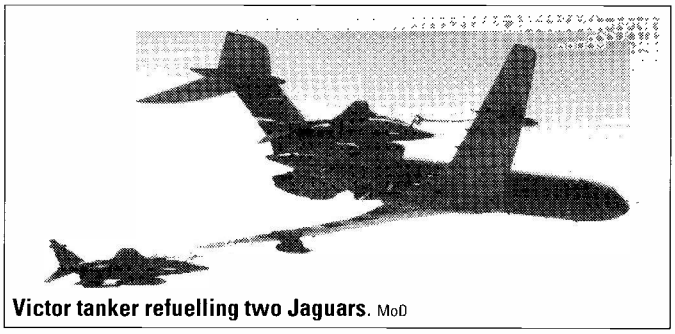
I found a multitude of Italian and/or Spanish broadcast stations spread through Band II between 1950 and 2015 on June 15 and over 40 strong f.m. signals from eastern European broadcast stations scattered between 66 and 73MHz during the morning of the 16th. Both events were due to the seasonal Sporadic-E openings. While a similar disturbance was in progress around 0730 on the 20th, **Simon Hamer** (New Radnor) heard RAS1 and 2 from Iceland and a Swedish station in Band II and, "even local radio Bryglan from Iceland!," said Simon.

	May					June																					
Beacon	26	7	8	9	30	1	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	20	1	2	3	4	5
DF0AAB		x	x	x	x	x	x	x			x	x	x	x		x		x			x	x	x	x		x	x	x		x	x
DF0THD							x															x	x		x		x		x		
DL0IGI		x		x		x	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	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	
EA6RCM												x	x	x	x	x	x		x		x	x	x	x	x	x	x	x	x	x	x
HG5GEW	x						x	x	x				x			x					x	x	x	x		x	x			x	
IY4M		x	x		x	x	x	x	x	x			x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x		x	
KC4DPC	x																														
KD4EC																						x									
LA5TEN		x	x			x	x		x		x	x			x					x	x	x	x	x	x	x	x		x		
NX20	x						x			x																					x
OK0EG		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	x
PI7BQC												x																			
PT7BCN								x						x															x		
PY2AMI			x		x			x		x	x		x	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x
SK5TEN		x	x		x		x	x	x	x			x						x		x	x	x	x	x	x		x			x
VE2HOT								x																							
VK5WI														x																	
VK6RWA																x						x									
WA4DJS	x									x																					x
W3VD																															x
ZD8HF					x	x		x		x			x	x	x	x		x		x		x	x		x	x		x	x	x		x
ZS1LA			x		x	x		x		x	x	x	x	x		x			x	x		x	x		x	x		x	x	x		x
ZS5VHF			x		x	x	x	x	x	x	x	x	x	x	x	x			x	x	x	x	x		x	x		x	x	x	x	x
ZS6PW	x	x	x	x	x		x	x	x		x	x	x	x	x	x	x		x		x	x	x	x	x	x	x	x	x	x	x	x
Z21ANB	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
4N3ZHK		x		x		x	x	x	x		x	x			x	x	x	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	
5Z4ERR								x														x							x		

Fig. 3.

ssb utility listening

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



Victor tanker refuelling two Jaguars. MoD

This month I start with a few notes from my own log. Major alterations at Chateau Rouse meant listening was curtailed for a while but everything is straight again now. Perhaps the most amusing entry was Cyprus RAF weather on 4.730MHz. The operator was clearly in a desperate hurry or taking part in a competition to see who could talk the fastest. I defy anyone to have copied his details of the various airfield weather states. Still with weather, Brazzaville popped up on 10.057MHz and RCAF Trenton in Canada on 15.035MHz. The Iceland-Shannon-Gander link on 10.878MHz seems to have been abandoned. This unpublished frequency was used by the controllers to chat between themselves, but I have not heard anything on it for some time now. I wonder if any readers also monitor this one.

Message handling was noted on 14.890MHz with 'Phoenix Ops' and I discovered that not only is this is a fairly new frequency for Portishead in the UK but they seem to have shifted some of their other channels as well. Portishead establishes telephone patches with radio stations. These are usually for aircraft and marine operators, although technically they will also carry traffic from land mobile stations and others. During the Gulf War, the service was used fairly extensively by the Royal Navy. The current frequencies are: 5.6100, 8.1700, 8.9600, 12.1330, 11.3060, 14.8900, 15.9640, 17.4050 and 20.065MHz.

Although the Gulf War is now well behind us, many of the USAF channels are still very active and, of course, there is still a fair sized US military presence in northern Iraq and Turkey and back-up is not far away at several European bases. For the record, 2430 allied aircraft were used in the Gulf war according to a special edition of the *RAF Year Book*. The RAF themselves used 135 aircraft which consisted of the following: 46 Tornado GR1s and GR1As (the reconnaissance version) 18 Tornado F3s, 17 tankers, 31 helicopters (Chinooks and Pumas), 7 Hercules transports, 12 Jaguars, 3 Nimrods and 1 BAe 125. One of our overseas readers has sent a tape of some very interesting military traffic from the Gulf War. The tape is still being examined and information gleaned from it may be published in the near future.

Meanwhile, you may care to note that the expression 'hot cookies' used by the USAF means armed bombs. The tape also contains references to 'hot dogs' and 'hot pastrami' and I believe these refer to certain types of missiles. The 'hot' part may mean they are armed. Anyone know better?

Numbers Again

I promised to return to the subject of so called 'spy number stations' and have received several letters urging me to get on with it. It seems you either love them or hate them but as I have to try and please everyone, here goes. **Simon Mason** of Hull sent in a long list and I have extracted some which readers may care to try. Papa November is probably the easiest to find. It transmits on 2.707, 5.015, 7.404 and 11.108MHz. Transmissions start at midnight (UTC) and continue every six hours and half past those hours throughout the day. The on-the-hour transmissions use a.m. and the ones at half past use u.s.b.

At night, on 7.887, 8.464 and 9.251MHz, you can hear on the hour a woman sending five digit groups. Someone is trying to jam this station with a warbler (because a warbler varies in pitch it is almost impossible to filter it out with a notch filter). The warbler and the the first few bars of a tune called the *Lincolnshire Poacher* make this station easy to identify. Simon says a station that appears on 4.665 and 7.605MHz at 45 minutes past the hour is allegedly the Israeli Mossad secret service. A station that only transmits on Saturdays appears on 5.340, 4.778 and 6.707MHz at 2000 and 2100 hours. The transmissions start with the tune *Swedish Rhapsody* on a music box.

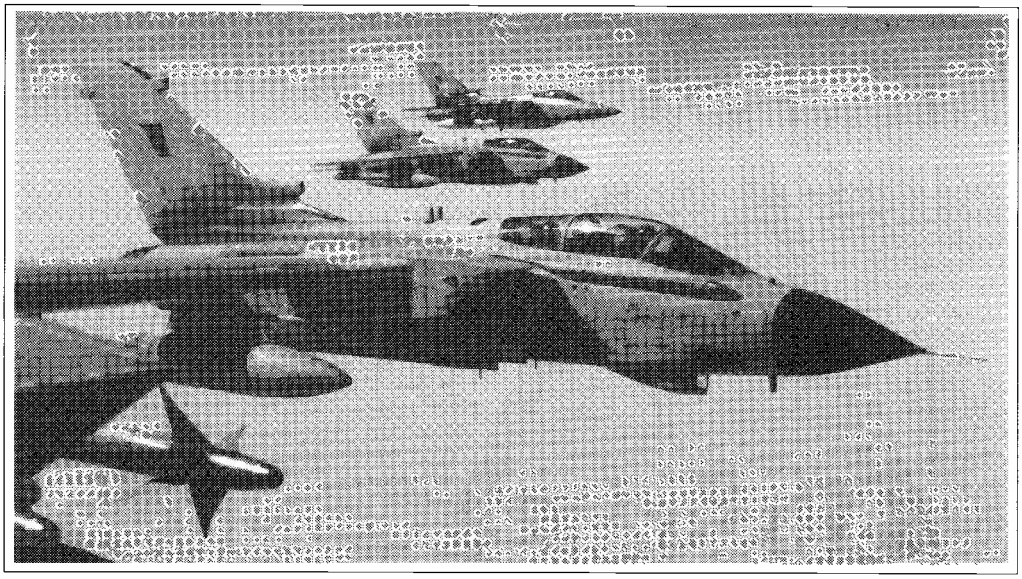
One reader from London has also written in with another station that transmits on Saturday on 6.510MHz at 2100 hours. He also says that numbers experts in the USA believe that the station on 7.887, 8.464 and 9.251MHz is British. He has also asked if any reader has information about a Romanian station where the five digit number groups are followed by the words 'Termina, Termina, Termina'. The transmissions are also accompanied by violin music.

You Write

Peter F. of Milford Haven picked-up some interesting USAF traffic on June 6 at 1037 hours on 6.750MHz. Two F.111's with the callsigns 'Raider 23' and 'Raider 24' had been using the practice bombing range at Macrihanish in Scotland when 'Raider 24' suffered a serious bird strike (ironically there is a published RAF warning about the danger of bird strikes on this range) which knocked out one of the two engines. Using Croughton for phone patches to the Lakenheath Command Post, the decision was taken to make an emergency landing at Leuchars. The latter was not able to communicated directly on h.f. and so all messages were relayed through Croughton. The damaged aircraft eventually landed safely.

Paul H. of Newbury monitored the same emergency and has again sent in detailed logs but I must also apologise to him. In the July edition I said he had logged 28.465MHz as being used by Upper Heyford. I misread his log which, in fact, said 284.650MHz. Paul has been doing some early morning listening and discovered a lot of stations which are masked by other traffic during the day and evening. British and American voices have been heard carrying out radio checks on 4.457, 4.458 and 4.471MHz and Lima Radio in Peru was heard on the Portishead frequency of 11.306MHz working a phone patch between an American Airlines flight and 'Tulsa ops'. On 4.426MHz, the US Coastguard station NMN at Portsmouth in Virginia was heard at 5am giving weather for the Miami, Caribbean, Gulf of Mexico and New Orleans areas. Paul queries the frequency but, in fact, this is the correct new frequency for marine Channel 424 which came into effect on July 1.

Incidentally, Paul's logs are a good example of how they should be done and I mention this for those people who have written to me wondering where they go wrong because they miss most of the communications mentioned by several of our regular readers. To my mind the log book is the most essential tool apart from the radio and antenna. None of us have perfect installations and so our log book is the guide to what we can hear. The chance discovery of a particular station and a check back through our logs can remind us of which other stations and areas might be coming through given similar propagation. Remember, despite the unpredictable nature of h.f., events regularly repeat themselves and so your log for each station should not only cover frequency, time and date but also notes about which other stations were coming through and which countries and areas were also being being heard at the time. My other guide to radio traffic is the newspaper and television news. Quite often dramatic events and incidents mean that the radio signals from that area will increase considerably. The Gulf War was a classic example and so is advanced warning of Shuttle launches, hurricanes and so forth.



The nearest two aircraft are Tornado GR1s, the furthest, a Tornado F3, taken from a Tornado F3. MoD.

bandscan

AUSTRALIA
Greg Baker

SPECIAL BROADCASTING SERVICE

A rather mild winter is giving way to spring here on the New South Wales Southern Tablelands and preparations to fight bushfires are stepping up ready for summer. Included in those preparations comes, of course, radio communication planning. In my shire we have about 50 mobiles operating to a base operating on 168.55MHz f.m. and though we test the radio network each Sunday, all year the spring and summer periods give greater impetus to our efforts.

Though I am one of the five volunteer base radio station operators, I have responsibility also within my own local brigade. Currently we operate one water tanker with a Motorola multichannel transceiver. While this does allow communications with shire base and with brigade bases in other shires, it does not give us direct communication with the private vehicles of volunteers in the brigade area or with the tankers of other brigades. This is because the bushfire network is a controlled network and flank communication can only take place with permission from base. To overcome the problem this year we are installing u.h.f. CB radios in the tanker and in the vehicles of the brigade captain and other key personnel. Hopefully we won't need to use them but if a wild fire does come our way we'll be ready.

New VHF Bandplan

The band our bushfire brigade operates in, the v.h.f. High Band (148-174MHz), is about to undergo an Australia-wide reorganisation. The current structure of the band was set in the late forties and early fifties when it was decided to use the band for land mobile services. At that time the operating mode was single frequency. This progressively evolved with technology and the need for greater band productivity from 240kHz channelling to 120kHz, to 60kHz and finally to 30kHz channelling in 1962. Half channel offsetting (1kHz) was introduced a few years later.

The new band plan largely allows for dual frequency systems to facilitate more efficient use of radio communications sites and the introduction of compandored s.s.b. services. In addition, it reduces channelling to 12.5kHz. Conversion will begin after comments on the draft plan and gazetting of the new plan and will fully take effect depending on area between 1996 and 2001.

A similar change is intended for the v.h.f. Mid Band (70 - 87.5MHz).

High Frequencies

Last time I promised a few h.f. ideas to try. Though Radio Australia only transmits to Asia and the Pacific, they suggest the following times and frequencies for listeners in the United Kingdom and Europe for English language services. Times are in UTC.

Frequency	Time (UTC)
21.775MHz	0700-0900
17.630MHz	1330-1800
15.240MHz	0730-0930
13.745MHz	1430-2000
9.770MHz	1230-1330
9.770MHz	1430-1530

Reception reports to Radio Australia, Frequency Management Unit, PO Box 755, Glen Waverley, Victoria 3150, Australia. Write to Radio Australia also at that address for latest schedules which are published in March, May, September and November of each year.

Electromagnetic Interference

I reported last time that the Department of Transport and Communications (DoTC) was due to issue a draft set of proposed mandatory standards on electromagnetic interference and electromagnetic compatibility. As is often the case with complex undertakings, the drafting process was not complete at this column's deadline in mid-July. Nonetheless, I am told that the date for introduction remains at 1 January 1992 to coincide with the equivalent EEC date.

BBC World Service

As has already been mentioned in *SWM*, the BBC World Service is now being transmitted on domestic transmitters in New Zealand. The BBC World Service is carried on local transmitters here in Australia too though not on a full time basis. The Australian Broadcasting Corporation (ABC) has a contract to use World Service material. They do so on a regular basis throughout Australia using appropriate 'grabs' packaged for Australian conditions and suitably edited to remove announcements specific to BBC World Service.

However, ABC radio and television here are currently going through a period of restructuring and staff reductions and there is some consequent industrial disruption to normal services. An all-day strike of public sector union members on June 27 meant that the Radio Australia international service was broadcast overnight on all domestic networks.

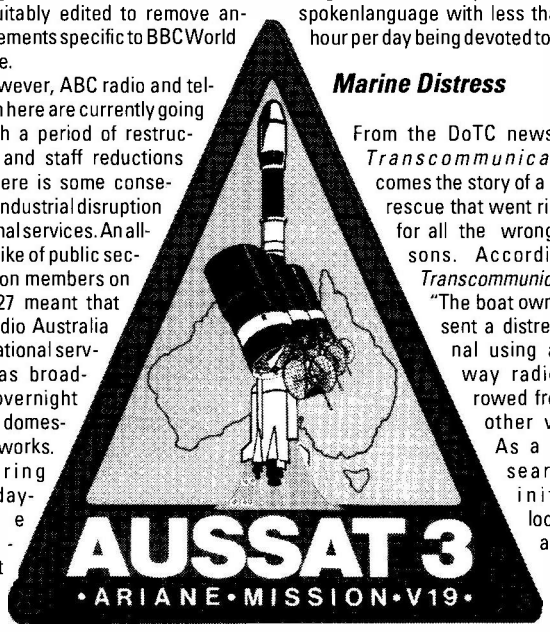
During the daytime however, it was the BBC World Service that was relayed on all networks through approximately 400 ABC a.m. and f.m. radio transmitters Australia wide. Programmes relayed included *News* and *The World Today* and *BBC Newsdesk*.

Some of these were recorded and replayed later within Australian news and current affairs time slots; some went live to air causing a few headaches with BBC inter-programme comments on items following. Though World Service programmes come in on satellite and use Australian OTC telecommunications facilities, ABC management are a bit cagey about revealing technical details of their strike thwarting efforts.

Print Handicapped Radio

The BBC World Service is also relayed here overnight on the Melbourne, Brisbane and Sydney print handicapped a.m. radio stations. Like similar countries world-wide, Australia's larger cities support radio stations for the print handicapped. In addition to the stations in Melbourne, Sydney and Brisbane, there is one each in Adelaide, Perth, Hobart and Canberra. While not strictly speaking a network, these stations belong to the Australian Council for Radio for the Print Handicapped. This ensures that less topical recorded material is circulated around the stations and duplication of effort avoided.

In Canberra, the Australian capital, radio 1PPP transmits at 500W on 1620kHz a.m.. At any one time 1PPP has an active volunteer register of about one hundred people who put in around 300 hours of effort per week. The only paid staffer is the administration manager who works 25 hours a week organising rosters and producing and reading when the call arises. Programmes are predominantly spoken language with less than one hour per day being devoted to music.



Marine Distress

From the DoTC newsletter, *Transcommunications*, comes the story of a marine rescue that went right but for all the wrong reasons. According to *Transcommunications*, "The boat owner had sent a distress signal using a two-way radio borrowed from another vessel. As a result, searchers initially looked for a 15-foot glass-fibre half cabin cruiser when in fact the boat in distress was a 30-foot steel cruiser. To compound the situation, the radio was unlicensed, the distress signal was not transmitted properly and the boat owner did not hold an operating certificate. Despite these fundamental and potentially tragic errors, the boating party was saved." *Transcommunications* does not say whether DoTC laid any charges against the boat owners.

SWL Clubs

I promised last time to provide details for DX Australia (DXA). DXA can be contacted at PO Box 285, Mount Waverley, Victoria 3149, Australia. Annual membership is $A20 surface mail, $A30 airmail. Remittances should be in Australian currency by international bank draft or money order and made payable to DX Australia. The DXA monthly magazine *DXers Calling* runs to 28 closely typed A5 pages photo-reduced from A4 size. Among a host of other material, it contains regular columns Radio Activity (a general band round-up), Out of the Box (QSLs from members), Onda Corta (short wave log) and a copy of the *WRTH* Latin America Newsletter from Sweden. DXA will send a sample bulletin for 4 IRCs.

In addition to DXers Calling, DXA publishes *AM Pacific Log* and *Pacific FM Log*. DXA along with the Southern Cross DX Club (SDC) that I mentioned last time are affiliated with the South Pacific Association of Radio Clubs (SPARC) who can be contacted at PO Box 1313, Invercargill, New Zealand. Other affiliates are the New Zealand DX Radio Association (NZDXRA) and the New Zealand Radio DX League (NZRDXL). NZRDXL publishes a monthly magazine called *New Zealand DX Times* which runs to around 36 pages a month.

And for those who are interested, you may remember that I reported last time that my Kenwood R-2000 is suffering tuning problems. Unfortunately, I have been too busy to start delving into its innards. That makes chasing around the dial a bit awkward, but as my wife and sometime friend says, that also means the radio still produces usable audio output!

Oh well, perhaps I'll suffer a bit longer and study the workshop manual at great depth before I launch myself in.

I welcome any news and comments. In particular I am interested in any s.w.l. information on Australian stations heard by *SWM* readers so I can chase up more details and interesting snippets from this end.

My address is **PO Box 208, Braidwood, NSW 2622, Australia.** For personal replies please send 2 IRCs.

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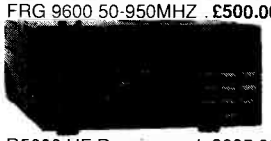

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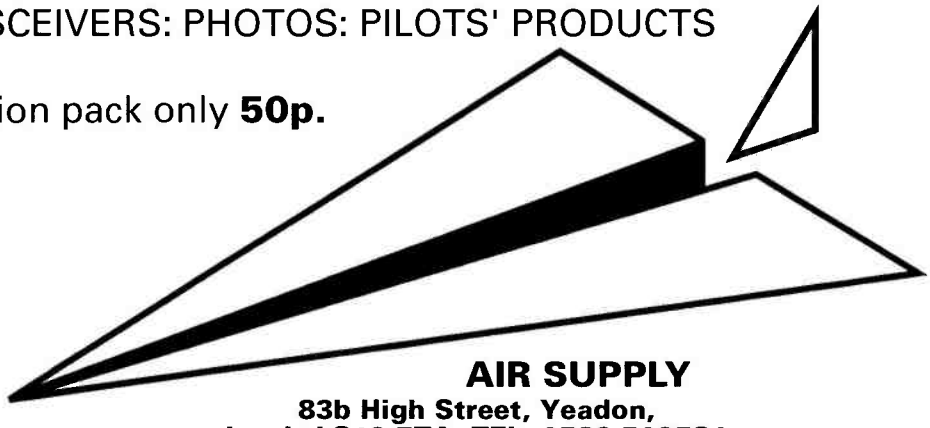

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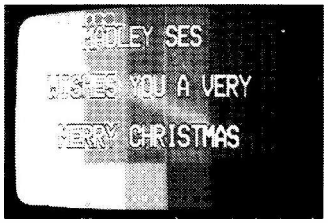
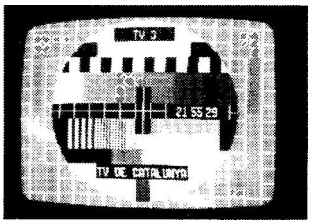
satellite tv news

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

Festive greetings, seen in the Ku-Band from Goonhilly.



More festive fun from the BTI Madley Earth Station.



The TV3 Spanish card seen over Eutelsat I F47°E.

Revolution in Yugoslavia has produced much activity in the SNG (Satellite News Gathering) field, with various uplinks being monitored mainly from the border areas. Earlier in the conflict, on June 30, ORF Austria were running border checkpoint video including interviews with Austrian armed guards. Italy were also buzzing with their ITA21 TES (Transportable Earth Station) at Taranto with war footage. Both were running uplinks over Eutelsat I F4 7°E horizontal at 11.50 and 11.12GHz respectively. Odd perhaps that the Yugoslav TV programme feed (for pan-European cable systems) that is carried also over 7°E at 11.178GHz horizontal has featured as part of its regular programme line up the latest 'from the front' with details of skirmishes, road blocks (not unlike UK TV running road reports!).

Alex Radulovic (Burton-on-Trent) observes that the Serbo-Croat news is aired 1830 most days with audio 6.60MHz. It's interesting to note that retuning the audio subcarrier to 7.56MHz will give an English translation for the 1830 news ONLY. Radio Belgrade is carried on 7.02MHz subcarrier. Typically the downlink on 7°E opens at 1655 with test card, a Belgrade regional programme at 1700 and programming throughout the evening up to about 2230ish with close down, these times over the 7 days. A corner log with 'P 5' in a circle with horizontal antenna indicates the programme is taken from the TVB1 or 2 service, and a large 'K' in an ellipse indicates programming from the 3rd channel.

Additions to the ITA registration list (see last month's column) are ITA4 - seen with 'Susa' location ident and ITA12 with a swimming OB at 'Congorento'. Another rare sighting was of an OB feed to RTL Plus, Luxembourg with Wimbledon tennis over Eutelsat II F2 10°E horizontal. Other OB feeds seen recently were the European Golf championships from Marbella, Spain (10°E) and a rather unusual open air evening boxing match in an unknown Italian town square - as is usual for Italian OBs, 10°E was downlinking.

A symphony concert over 10°E (it's been an active 10°E this past month) carried conventional audio 6.60MHz and additionally sound in syncs - very odd (13 July @ 1800).

Final observation this month was the July 17, 11.12GHz horizontal at 1000 on 10°E, a caption ex Spain 'COI Madrid' logo, and under 'Centro de Servicios Informativos TVE'. All the previous times are BST.

Rumours suggest that there are problems with Astra 1B, it seems that there may be a solar panel problem resulting in a loss of nearly 25% of required power when fully loaded. Astra 1B lost control on June 4 with a roll error giving a swing of 4° peak-to-peak, resulting in a loss of signal downlinks. Services were interrupted for 1 hour 46 minutes during the morning period.

News Items

There have been modifications to the Town and Country Planning Act and how the legislation relates to satellite receiving dishes within the domestic environment. Though a single dish per household will be permitted, the overall diameter of 900mm has now been reduced to 700mm with no part of that dish protruding above the highest part of the roof.

Certain parts of the UK will, however, be allowed to retain the 900mm size, generally those counties furthest removed from the south-east UK and roughly over a line drawn from Cornwall, West Glamorgan, Manchester, South Yorkshire to Humberside.

Following on from the recent changes at Gibraltar TV (GBC) with the cut-backs mentioned last month, the main programme content will comprise BBC World Service TV taken from the Intelsat 27°W downlink and with local news programming inserted at specific points during the weekdays only (i.e. a 5 day operation for GBC). Programming will be scrambled, though all Gibraltar residents with a fully paid up licence will receive a free decoder. Those fringe viewers along the Costa del Sol who up to now have received English programming free of charge will now - assuming copyright clearance is OK - will have to pay for the privilege of GBC. RTL have been mentioned as a possible co-operator at GBC - this could well happen with weekend TV time up for grabs.

Expansion

Good news for pan-European broadcaster Super Channel (Eutelsat II F1 13°E) with a £21.5 million cash injection to revamp its service, improvements in the news service and 500 new films purchased - the aim being a general expansion throughout the European market over the next few years. RTE, the main Irish broadcaster is now evaluating means of extending coverage of its two TV services into the UK cable systems via satellite, including another service of Irish sports events specifically for the club/pub market.

Expansion, too, in Africa with CNN, the US based news channel, opening additional news bureaux throughout the continent with particular emphasis in Southern/Western Africa. Currently only Kenya radiate any CNN news material in its output (TVDXers be aware since Kenya operates a Ch. E2 transmitter!) and to afford greater coverage several bureau will open 'as soon as possible' - it is hoped that with greater African content so CNN will have a greater take-up across the Continent.

Satellite expansion in Africa with South African progammer 'M Net' offering a PAY-TV service across the Continent, intended for small SMATV or local transmitter schemes taking the Intelsat V F5 (66°E C band) downlink (3.908GHz). M Net is currently viewed in Lesotha, Transkei and Namibia - the aim is to feed hotels and mining groups south of the Sahara and offer an alternative to CNN. BOP-TV (Bophuthatswana) have also been contemplating a pan- African/Middle East service via satellite as an adjunct to its existing TV distribution base via satellite - currently BOP has viewers over much of Africa and into Israel.

Mergers

Two Scandinavian cable services have merged, that of SF Succe (over Intelsat VI F4 27°W) with that of TV1000 (over Astra 1A 19°E) and from September 1 will be known as 'TV1000-Succekamaan'. Amongst the joint owners are Canal Plus, Warner Bros and Kinnevik, rumours 'in the trade' suggest that this group may bid for Filmnet later. The new TV1000 will broadcast to Scandinavia using D2MAC and from September 1 will be into hard scrambling using Eurocrypt. Programming on a 24 hour basis with over 120 feature films per month, existing subscribers will gain more value for money with the 24 hour service - though decoder costs are extra. An off the record comment - Filmnet recently went 100% digital audio over its Astra and Eutelsat downlinks thus depriving UK (pirate) viewers of the full sound and vision programme. Though there are many efficient video decoders on the market - and many readers will undoubtedly have them - beware at rushing for any digital sound upgrade boards. Digital upgrade boards offer a technical challenge to the pirate decoder makers which will undoubtedly provide the upgrade service at a high price. If Filmnet are taken over by the above group then it's likely that the film channel will go D2MAC Eurocrypt.

Launches

Eutelsat have annnounced that their II F2 satellite will fly October 1992, following the January '92 launch of the II F3 bird. Special offers, offering discounts, are available to potential customers if you lease a satellite transponder for set periods, previously these periods had been 1, 3 and 5 years and now these bargains have been extended down to 1, 3 and 6 months - with a special price for a jumbo 10-year lease period. Eutelsat are also offering a 'disaster recovery service' that will offer capacity on a priority basis should there be a transponder feed loss resulting from computer error.

Following problems with the Ariane space launch vehicle during the Astra 1B launch phase, certain forthcoming launches have been delayed including the Intelsat VI-F5, now to fly mid August '91, nearly 7 weeks late. One launch that also may be delayed is the Telecom 2A from Kourou, French Guyana, it had been intended that the craft would carry much of the communications and TV feeds (including HDTV) from the forthcoming Winter Olympics. Intelsat are now offering a new facility for mobile SNG/TES units (SNG = Satellite News Gathering; TES = Transportable Earth Stations). Such portable units uplink (and normally downlink) in Ku band, several Intelsat craft have been switched to provide Ku to C Band cross strapping, thus providing access to the Global occassional-use network.

Middle East Broadcasting (MBC) could well be operational by early August offering an 8 hour daily service (in Arabic) comprising films, culture, news/current affairs and general entertainment. MBC have transmitted an 'MBC' logo over Eutelsat II F1 for some months. The Saudi and Egyptian financially backed channel will carry both advertisments and sponsored programmes and will also be carried over Arabsat for onwards distribution to a wider Arabic audience. MBC have located in the former BSB 'Power Station' facility studio in SW London.

Future Standards

The European Commission have been discussing the adoption of a future standard for satellite transmission and talks continue. It seems that certain guidelines are now emerging. These are that HD-MAC will be the only European TV standard; that D2MAC will be used for wide screen HD-TV; that existing TV transmissions and standards to continue - and to transfer to other satellites retaining that same standard; that future TV transmissions/services to be in D2-MAC; that large screen domestic TVs (over 22in screen) to be suitable for D2-MAC signal processing.

The photographs this month are from Geoff Sarbutts, London.

amateur bands round-up

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

A QSL card received by special event station GB2PW in 1983. The station was operated by the staff of sister magazine *Practical Wireless* at the Breadboard 83 exhibition.

Before setting off around the bands this time, let me remind readers that *Short Wave Magazine* and sister publication *Practical Wireless* are always looking for photographs of readers in their shacks and listening posts to adorn their pages.

This time of year on the bands is most notable for 'summer conditions', about all I can say is that I have seen more rain and high winds than enough; indeed after writing last month's column, I went off to the north of GM for a few days and came back to find the wind had 'seen off' the gears in my rotator, though not, luckily, the actual antenna. Thanks to some help from RSGB Council Member GW4YKL we soon had things taken down, and later the beam was re-erected on a replacement rotator. Meantime the old rotator lies on the bench until I pluck up courage to open it up and survey the repairs needed.

Safety!

During recent weeks there has some summer lightning, and I have been asked what is the best thing to do when there is lightning about. First, nothing can save the gear from the consequences of a direct hit! It is the nearby ones we have to guard against. The strike's electromagnetic field will induce very high voltages into the antenna side on the one hand, and on the other, less obviously, similar voltages into mains and telephone wires. If the antenna is isolated from earth one may also find high static voltages appearing on it. Thus, when threatened by a thunderstorm, I carry out three steps:
1: Disconnect the antenna from the receiver and move it well away from the receiver.
2: Ensure the antenna is provided with a direct-current path to earth where it enters the house.
3: Disconnect the mains by switching off and pulling the plug out, taking care that the plug is well away from the socket. Above all, do it in good time.

I recall a certain s.w.l. who left precise instructions for his XYL to follow when he was at work. She left it a bit late, and when she got hold of the static charged antenna wire to earth it she got a shock. That was bad enough, but just as she dropped the wire it lay on top of the 'fridge, lo! another near crack of lightning and the poor girl was terrified to see a long spark from the antenna wire to its nearest earth! Suffice it to say poor Joe was very nearly stopped from being an s.w.l. that very day. Certainly he had 'earache' for some days afterward! Being serious for a moment, it is quite important that you arrange things so that this can be done safely and quickly; and that you do it whenever you are not at home so that a crack of lightning in your absence doesn't result in disaster! Incidentally, don't think that because you have a valved receiver you are OK - not so!

Letters

Vince Cutajar hails from Malta and sticks to the WARC bands. On 24MHz he logged V51P, IS0PNY, TG9TSS, VK7GK, 9V1WW, HK0HEU (San Andres), UH8EA and 6W1QJ. Turning to 18MHz Vince noted TI2CCC, AP2JZB, D2ACA, A45ZN, 4U1ITU, PJ8AD, VU2RX, GU0ELF, VQ9AP, W6BCQ, KO0D (Missouri), N0JR (Iowa) and LZ1NK.

John Collins is in the Small Heath district of Birmingham, where he has an Eddystone 830/7 receiver with 3m of wire up at 15m, the far end being connected to a CB dipole. John went on 14MHz after midnight UTC to log AA5DX/MM off Portugal, HK0TCN, 3B8AD, 9K2KW, 9K2YH, 9K2SH, Y59YS with an American operating, UZ9LYP, I42MED at the Mediterranean Sports, K0WX in Kansas under a pile-up, OZ1LPH, G4IRS/MM off the Colombian coast, 9H1JP, PJ9EE and PJ8PQ who is QSL via W3HNK. Turning to 7MHz, John used this band from 1000UTC and noted GM3POI up in Orkney, GU0ALD under a pile-up, GX3MDG, GB5OO, GX3WRS/P, GB4SSF, GB2WVW and GX2IL/P.

J. Scott (Glasgow G44) runs a Kenwood R2000 through an a.t.u. and a switch box to either a G5RV antenna or a 30m length of wire. Again, mainly 14MHz this time of the year, with LA1LBG, UZ3XWA, 4J1FS, CU8AH, EA4BB, KA1MM, EA3OT, EA3JE, UZ3DJ, UC2LR, CI2SM, RA3WA, K2PS, 5B4ABR, A92EV, PY2PE, 4X4FR, 9K2YA, VK5MS, 9H3ML and CT1AOZ. GB0CDN and GB4GSS were noted on 7MHz while 21MHz yielded UA6LHB, JE3TXA, YC4FP, RA6AH, RA3JQX, YB2QAR, KD7CL and N7AWM.

Gerald Bramwell (Greater Manchester) says he is plagued by a local idiot who 'sits on' just about every bit of DX he comes across on the low frequency bands. He suggests manufacturers might be persuaded to make their microprocessors transmit the make and serial number each time the transmit button was pressed, so making identification of offenders easier. Gerald splits his list, not just band-by-band, but also into categories: USA/Canada, USSR, Europe and DX, which certainly helps at this end.

Top Band listening resulted in the odd G station, while on 3.5MHz the Europeans were augmented by 9Q5PL, PY2DSC, CT3FF and A92BE. The DX on 7MHz included 4X1EL, PZ1EL, PT7BSH, 7X2BK, CP5NU, 5Z4BI, 5B4ABL, PT7ZOK and PY5MOE. Turning to 14MHz we find all the continents, with LU8HCE, VP8CEM, 4X6UV, PS7ACK, A71BK, 9M8PV, YV5KPD, 8P6BU, PP7GAG, LU5DBJ, LU7HJM, CP2EN, 4X6YH, 7X2DB, LU2HBO, CE2DSA, CP5NU, HP6AYV, YV5AMH/LU, 9K2EC, PY4VB, VP8CFM, OD5PA, PY7HFA, PY7AGC, LU5DL, OX3KM, PY2ETR, 7Z1IS, PP5ZYZ, 9L1US, CN8CH, JR1BLX, CE2CC, V85IR, 4X6WS and YV5DEI. On 28MHz Gerald tried a spot of narrow-band f.m. reception, which accounted for EA4BK, HG5BSV, OK1AJN, G4YFT, G0IHB, IK6OHK, GI4SNA, SV0HV/SV9, EA3FGZ, CT1DVV, OH6MTE, OH0/LA0EW, OH6KD, G0BOR, IK1LAI/4, HA8ZB, LU2DMR, HR2JEB, FY5YJ, Z21HJ, J6LQC, LU4ACJ and PP7GAG.

Brian Lucas is in charge of third-year training at an establishment not so very far from London, where his students are being taught to listen on the bands, make their own antennas and bits in addition to the usual theoretical activity; Brian himself notes that the students were still awaiting their RAE results (June 26), while on July 1 a new intake would start work. During his holiday, Brian says, between Morse practice sessions he wound up his old HRO to come to grips with YC0WWL, VK3AEO, VK3MI, VK2BRM, UT4UXX/P/D2A, TK5BF, VK2GJR, VK2EAF, VK4BRA, VP9YL, OT4ADO, DK0MC/MM, HP1XWU, plus 'specials' in SN7JP (QSL via SP7CVW), II0ONU (QSL via I5KKW), EJ0A (QSL via EI8EM), DJ2QD/M/OZ4, SN8JP (QSL via SP8AJK), SK3IK/P3 (Hogbonden Is, an IOTA expedition) and OH2AP/P/OJ0 on Market Reef.

Paul Hilton writes from Thatcham in Berkshire on the subject of Gogland, or to give it its correct name Ostrov Gogland, queried recently. The spot is Lat 60° 04' Long 27° 00'; a line between Helsinki in Finland and Leningrad goes close by, and the 27° longitude completes the job with a nice 'fix'. Page 66 of the *Philips International* applies. Since maps can appear in different projections - compare a Great Circle and a Mercator! - I checked by looking it up in *Bartholomew's Edinburgh*, where the island is marked but not named, and found that the rules above apply well enough for identification. On a different tack, Paul mentioned the problems with GB1MIR; Helen Sharman was blotted out in Thatcham by twerps calling on her transmit frequency. There is a major problem here; if you think about it, it becomes obvious that the satellite antenna looks out at an enormous area of the earth's surface; thus hundreds of amateur stations can hear her. From the satellite's point of view, it is receiving simultaneous calls from stations over thousands of square kilometres, with an f.m. receiver. The end result is a king-sized pile-up which would need all the skills of Danny Weil or the late Gus Browning to cope with, while the poor lass is still at the bottom of the learning curve where pile-ups are concerned!

Another one plagued by local noise is **Angela Sitton** (Stevenage) who says her problem is a noise which sounds like a roaring furnace, which peaks on 7MHz but is bad also on 3.5 and 14MHz. When it comes up, a nice 579 c.w. signal is reduced to almost unreadable.

Home-brew!

P. Newton recently attended a local club meeting at which Jandek displayed their wares. It provoked him into building a direct-conversion receiver for himself and comparing it with a TS-440S. Not surprisingly, the home-brew receiver has more 'presence' than the TS-440S, while in terms of sensitivity the edge was if anything also in favour of the home-brew. For s.s.b. operation, the direct-conversion receiver made a surprisingly good showing with suitable audio bandwidth restriction: not quite as good as the TS-440S when the latter was using the s.s.b. bandwidth, but as good when the '440 'broad' bandwidth was selected to equate to the normal s.w.l. receiver. As for stability, the home-brew wasn't quite as good as the TS-440S from a cold start, but plenty good enough for day-to-day use on the band. I suspect that anyone who builds from a kit, whether Jandek, Lake, Howes or whoever will find similar performance when the result is put into service on the bands. To home-brew from scratch as s.w.l. Newton did is not quite as predictable, but I can say that receivers having most alarming circuit aberrations have been shown to 'produce the goods' in skilled hands.

Bernard Salt (Harlow) has been an s.w.l. for many years and seems to be mainly interested in listening to c.w. and playing with antennas. The last one was a 51m wire grounded at the far end which has now been replaced by an inverted delta loop cut for 14MHz, which fits nicely into the plot, fed by way of the slotted 300Ω feeder to the a.t.u. It loads nicely on all bands 10-28MHz, but on 7MHz the a.t.u. doesn't answer at all. So - Bernard then took down the 21MHz half-sloper and replaced it by a 7MHz half-sloper which works well for the EU and G stations, but hasn't so far been really tested in terms of 7MHz DX. Reverting to the loop, it works, as is shown by (14MHz) VK3DEG, VK5QJ, PY3AVF and s.s.b. from ZL4AN; (21MHz) VK2HHD, YB2FRR (s.s.b.) W1HNA (s.s.b.), PY4PZ; (28MHz) LU5DON, LU7FJD, KR2I (s.s.b.) and UD6DCG(s.s.b.), all received under poor conditions.

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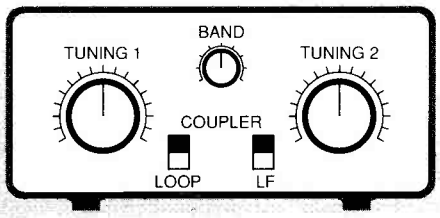

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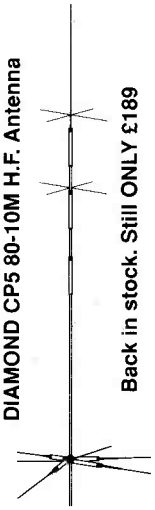

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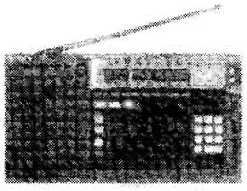

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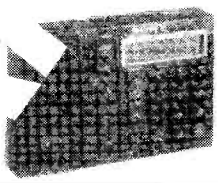

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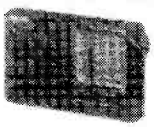

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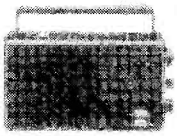

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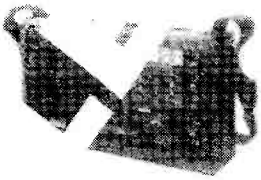

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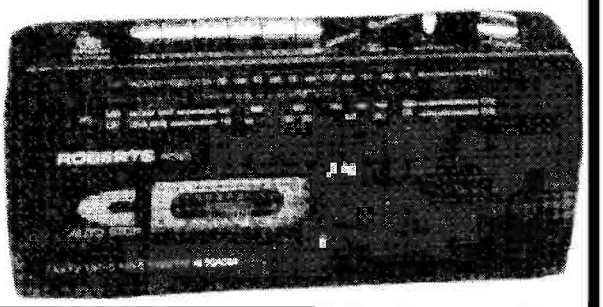

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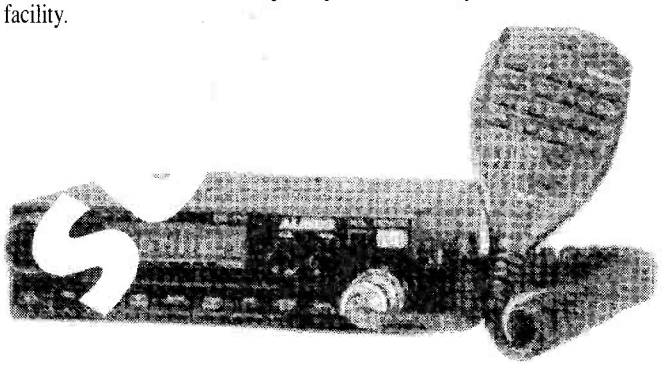

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dxtv round-up

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Peter Walduck (Milton Keynes) recently purchased a copy of a mid-1930s magazine entitled *Short Wave & Television* published by *Short Wave*, 63 Lincoln's Inn Fields, London, WC2. The original price was two 'old' pence and Peter, who has No. 3 of volume 1 in perfect condition, would like to know more about it. Any ideas readers? Seeing by wireless has always been a fascinating subject and well-supported through the years by various technical magazines, especially when the signals are carried beyond their normal range.

Band I

"As for Sporadic-E, we've had the quality if not the quantity," remarked **Simon Hamer** (New Radnor) about conditions for the month prior to July 8. He received programmes, idents and/or test-cards from stations in Albania (RTSH), Czechoslovakia (CST), Denmark (DR), France (TDF), Hungary (MTV1), Iceland (RUV), Italy (RAI-UNO), Jordan (JTV), Morocco (RTM), Norway (NRK), Poland (TVP), Portugal (RTP1), Romania (TVR), Spain (TVE1&2), Sweden (SVT1), USSR (BPEMR) and Yugoslavia (JRT) and a couple of unidentified 525-line signals on Chs. A2 & A3 (55.25 & 61.25MHz) during the ebbing and flowing of Sporadic-E conditions on June 15 and 16. He also logged Iceland, Italy and Norway on the 18th, Finland (YLE), Italy and Sweden on the 20th, Germany (ARD), Iceland, Italy and the USSR on the 20th, Italy and Spain on the 22nd, Italy on the 25th, Spain and Sweden on the 28th and Czechoslovakia, Germany and Italy on July 5.

Although **John Woodcock** (Basingstoke) logged pictures from Spain on June 17, 18 and July 5, signals from Italy were predominant with him on days 16, 20, 22, 28-30 and July 5. "Sporadic-E activity hasn't been bad, while not being spectacularly good either. Lots of the usual stuff especially TVE-1," wrote **David Glenday** (Arbroath) on July 1. Just as the Italian signals favoured John Woodcock, David had the same from Spain's TVE on June 1, 2, 11, 12, 15-17, 27, 28 and 30. In addition to Spain on those days, he logged pictures from Austria (ORF1), Czechoslovakia (CST1 ISR-P), France, Finland, Germany (ARD1 Grunten), Hungary, Italy, Norway, Poland, Portugal, Sweden, USSR (TSS) and Yugoslavia.

Among the idents and programmes seen by **Mike Bennett** (Slough) during the month prior to July 8 were adverts and local news from Spain; ARD SRG from Germany; cartoons, films, news and Teletext from Italy; the regionals Bremanger, Gamlem, Hemnes Kongsberg, Melhus and Steigen from Norway; Bratislava, ODK3 and ISR-P from Czechoslovakia and Slovenija from Yugoslavia. In addition to adding Bagn to Mike's list of Norwegian regionals on July 8, **Andrew Jackson** (Birkenhead) also received test-cards from Czechoslovakia and Romania (TVR Bucaresti) and Sweden on June 21; news and sport from Italy on the 13th; adverts from France; cartoons from Spain and news (BPEMR) from the USSR on the 15th; a clock caption from Iceland on the 16th and a variety of signals daily until the 30th. Andrew's impressive antenna system for Bands I, III (top) and V (bottom) are in **Fig. 1**.

Adverts and a film from Germany; cycle racing from Italy; folk dancing, news with Mr. Gorbachov and a clock caption from the USSR; the caption Gamyz from Spain and a test-card from Norway (Hadsel) were among the June Sporadic-E highlights for **Bob Brooks** in Great Sutton. I found a very strong picture from Spain on Ch. E4 (62.25MHz), with news, sport and weather, during the evening of the 15th. Next day, I received pictures up to Ch. R3 (77.25MHz) on my Yoko TVC8M, Fig. 2 and heard the sound for R3 (83.75MHz) and the vision pulses of Ch. R4 (85.25MHz), mixed up with a variety of RT stations, on my aged ex-military R216 v.h.f. communications receiver. The Yoko and the R216 are fed by a chimney mounted dipole. Although the photograph of the Yoko in action, **Fig. 2**, is not good you will get some idea of the signal strength from Sweden (Kanal1 Sverige) at 0915 on June 20.

DXing Abroad

I am always pleased to hear from overseas readers because it gives us in the UK a chance to learn about the effect of atmospheric disturbances in other parts of the world. **Victor Spiteri** (Gibraltar) began TVDXing back in the 1960s after reading about the subject in the magazine *Practical Television*. It seems that, like us, Victor observed Sporadic-E openings on most days between June 15 and 30 and from his home at sea level he watched cartoons, a nature programme and news from Belgium (RTBF1); news from Czechoslovakia; adverts, news and a panel game from Germany (ARD1 and ZDF); news and test-cards from Holland (PTT NED1); cartoons, history and news from Italy; a documentary about old cars, news, the film *Carry On Camping* and football from Portugal (RTP1); Canary Islands regional news and Television Turistica Almunelar, Tele Motril and Tele Banasias from Spain; adverts, news and Teletext pages, from Switzerland (PTT-SRG1) and military news and colour test-cards from Yugoslavia (TV Sloveniya).

"The 'E' season has been very poor. We have had some Es but nothing like those intense Es we used to have about 4 to 6 years ago [I heartily agree]," wrote **Lt. Col. Rana Roy** (Meerut, India) on June 26. He added that most events have been weak and only lasting between 30 and 90 to 120 minutes. Also he has noticed more activity in the Chs. R2/R3 (59.25/77.25MHz) and E3/E4 (55.25/62.25MHz) regions than at the lower end of Band I on Chs. E2/R1 (48.25/49.75MHz). However, while the band was open Rana received pictures from Dubai TV, **Fig. 3**, on Ch. E2 at 2030 on June 6 [look at that signal-strength readers] and the USSR, on Ch. R1 at 1730 on May 16, **Fig. 4** and 0833 on the 17th, **Fig. 5** and on Ch. R2 at 1902 on June 1, **Fig. 6**. He also enclosed a photograph, **Fig. 7**, of an unidentified 525-line picture which he received from the west, on Ch. A2, at 2030 on April 25.

Weather

"May was the month of the mid-Atlantic high. June has been a month of transatlantic lows, with little more than small ridges of high pressure sweeping over the UK between low pressure systems," wrote David Glenday who only saw about 3 hours tropospheric

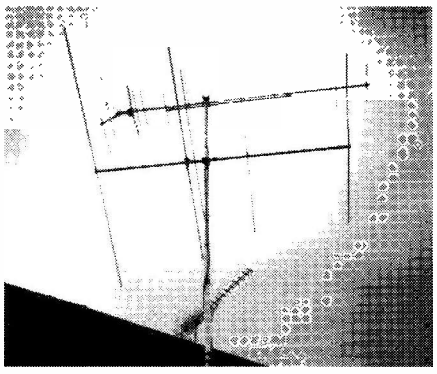


Fig.1.

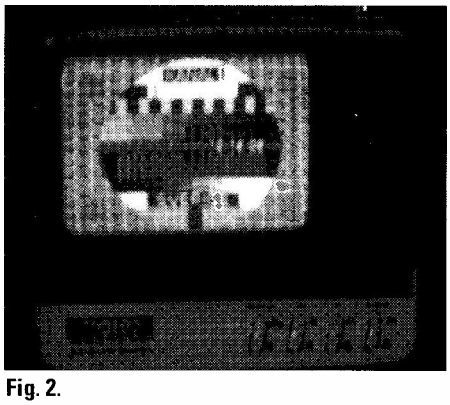


Fig. 2.

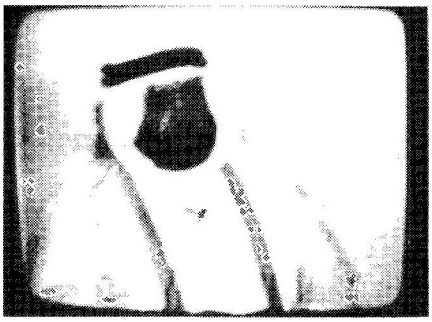


Fig. 3: Dubai TV.

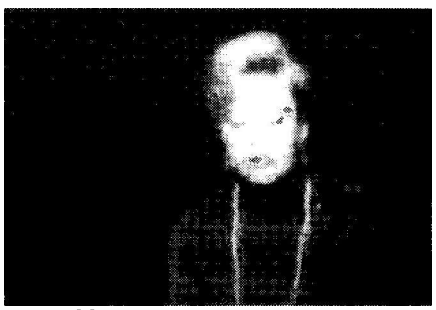


Fig.4: USSR.

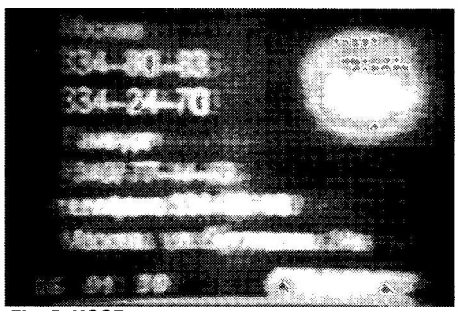


Fig. 5: USSR.

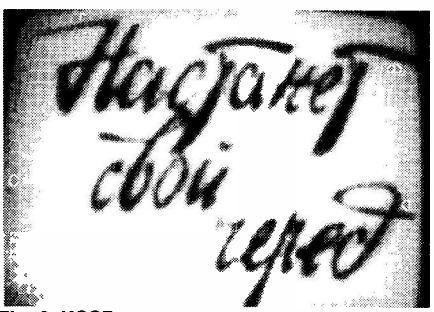
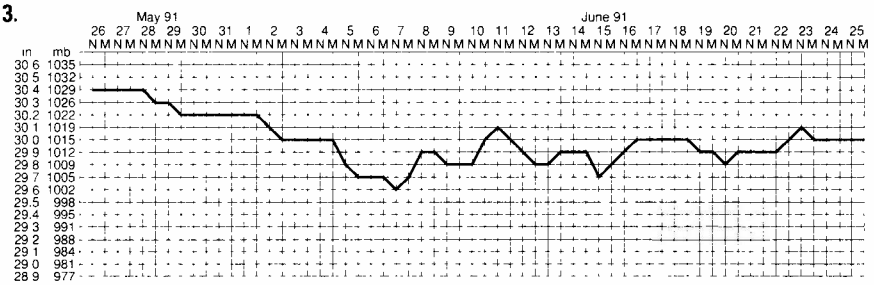


Fig. 6: USSR.

Fig. 13.



activity all month.

"Meerut has not been very hot, maximum temperature was 42°C in May for a day. We have had a few storms with rains and wind speeds up to 100km. Monsoon seems to have arrived early this year. We have had some pre-monsoon showers. The coastal regions of Western India have had extremely heavy rains disrupting traffic and communication lines. Rajasthan has had extremely hot conditions with temperatures going 50°C in some places. The heat wave killed a number of people," said Rana.

The slightly rounded atmospheric pressure readings for the period May 26 to June 25, **Fig. 13**, were taken daily at noon and midnight from the barograph which sits, like a thing of beauty, on the mantelpiece in my office at my Sussex home. I recorded 4.68in of rain in June with the heaviest fall of 1.35in on the 23rd with thunder on the 13th and 16th

Tropospheric Openings

"With the persistent unsettled weather for the most part of June there was not much DXTV activity to report," wrote **George Garden** (Edinburgh) on the 30th. However, while in Lawrencekirk overnight on the 15th and 16th, he received "rather strong totally non-fade signal in black and white, with flashes of colour," from the Black Hill transmitter in central Scotland, a distance of approximately 160km. David Glenday received u.h.f. signals from Holland (NED1, 2 & 3) from 1845 to 2140 on June 5. John Woodcock reports weak pictures from France, in Band III, during the afternoons of June 7, 11 and 13, Andrew Jackson had a strong colour test card from Holland (PTT NED1) on Ch. E39 on July 5. On the same day, Simon Hamer logged pictures from Belgium, Eire, France, Holland and Norway in Band III and all again, except Norway, in Bands IV and V.

Satellite Watch

The Fig. 6 in the July column showed the large letters 'mbc' above some Arabic text received from Eutelsat F1 by **Les Jenkins** (Godalming), who was not sure of its source. But, as always, readers come up with the answer. "The script underneath the logo MBC translates to read Middle East Television Centre," wrote **Mr. I.D. Barrett** (Rugby). "The caption is of a Middle East flavour and a literal conversion of the Arabic script to Roman is Markaz Television Al-Sharq Al-Awsat which means the "mbc" stands most likely for Middle East Broadcast Centre," said **David Peers** from Middlesex. My thanks to you both, such info really does help your fellow readers.

While writing to me on July 8, David Peers was watching an Opera, staring Pavarotti, from Raidue on Eutelsat II F2 at 10°E on 11.097GHz. At present David can pick up more than 40 television stations with his modified domestic equipment. The azimuth of his 650mm 'dish' antenna is adjusted by a rotator, but, if he moves it too far then he has a trip down the garden to alter the elevation. While viewing Eutelsat I F4 at 7°E on 11.178GHz he saw a logo, **Fig. 8**, which is sometimes displayed in the top right of the screen from Yugoslavia's RTB (Radio Television Belgrade). "At other times it displays TBHC (in Yugoslavian) i.e. TVNS (in English) in the top right hand corner," said David.

This logo was also seen by Mike Bennett at 0923 on June 16 on a terrestrial transmission from Yugoslavia, on Ch. E3, via a Sporadic-E opening. David and Mike both sent me a sketch of this logo which, with the Windows Paint program on my Amstrad PC2086DD, I made the drawing in **Fig. 8**. During the last two weeks in May, Les Jenkins received a logo on Intelsat, **Fig. 9**, at 27.5°W and test cards from TVE, **Fig. 10**, on Eutelsat at 10°E and from SAT1, **Fig. 11**, from Eutelsat at 13°E.

SSTV

Toward the end of June, John Scott (Glasgow) received slow-scan television 'CQ' captions, on around 14.29MHz, from DL5FCW and LY2BOK. "I have found this month a drastic drop in SSTV signals in the 14MHz band, the usual received calls that come in at a good signal strength from say EA2JO, DL8AC and other regulars have not been about," wrote John, on July 8. It often happens that way John especially at the time when you wanted those signals to try out that new BMKMULTY-SSTV program, from Grosvenor Software, on your PC. However, we will look forward to a more detailed reception report next time. John tells me that all the electronics for interfacing between the computer's RS232 port and the receiver are built into a 25-way plug. The program can decode 8 and 32 seconds SSTV pictures, has 6 levels of grey-scale and places the brightness and contrast controls, plus a tuning aid at the base of the screen. Earlier in the year John copied a 'CQ' caption from a German station, **Fig. 12**, which included a photograph of the operator.

Microwaves

On June 27, Joan and I spent a pleasant afternoon at Parham House, Sussex, taking archive pictures while Gloria Hunniford and Alan Titchmarsh presented a live programme from the house and garden for BBC Radio 2. My thanks are due to the BBC engineers for showing me their equipment, which included a television microwave links vehicle that carried the programme, via a high spot on the South Downs, back to London.

Fig.7: Unidentified.

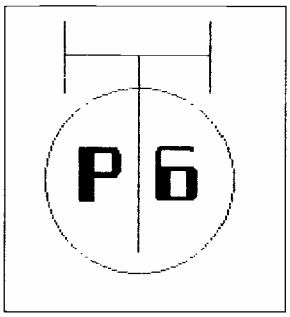


Fig. 8: Yugoslavia.

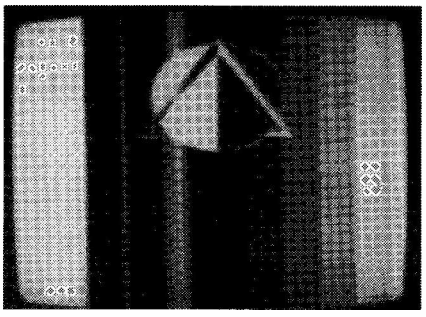


Fig. 9: Intelsat.

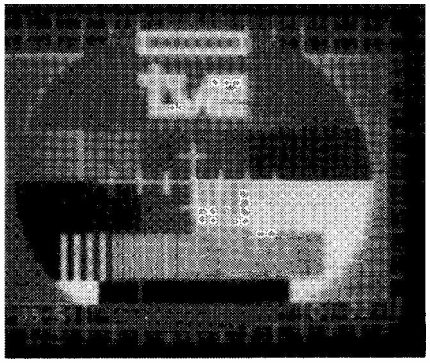


Fig.10: TVE via Eutelsat.

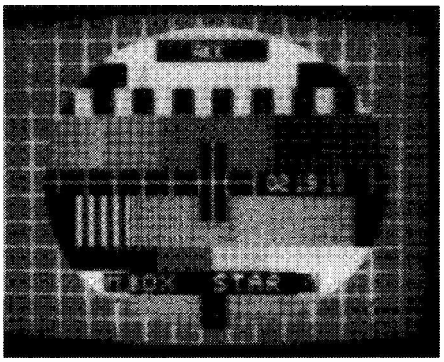


Fig. 11: Eutelsat.

Fig. 12: SSTV, Germany.

airband

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

Help your local aerodrome! A sign of our times seems to be the short-sighted selling of aerodromes as land for building developments. There must be plenty of choice for the site of a new factory or housing estate, but an aerodrome is more restricted. Natural and artificial obstacles, adjacent air traffic structures and prevailing weather patterns all need consideration. Even established aerodromes don't find it easy to survive transplanting to another location.

Airspeed Aviation have applied to build an aerodrome at Egginton, Derbyshire, as a replacement for Burnaston. If you feel strongly enough, there is just time to write to The Inspector, Department of the Environment, Cranbrook House, Cranbrook Street, Nottingham NG1 1EY. If you respond as soon as you read this, you will just be in time to have your letter considered by the Public Enquiry. Quote Ref: EMP/1040/21/54 and South Derbyshire Ref: 9/1290/0907 & 06. I personally feel that the applicant has given proper consideration to the problems of selecting an aerodrome site. The bottom line is that if this Public Enquiry is lost, then Derbyshire will have probably lost an aerodrome - for ever. Please consider your support.

Final Departure

I'm not sure what the aviation equivalent of a 'silent key' is, but Ted Calvert became an 'extinguished light' recently at the age of 89. He invented the Calvert approach lighting that is now standard on all major runways. The centre-line is, of course, illuminated, but there are also perpendicular bars of reducing width (when seen from an approaching cockpit). Such a simple idea - yet such a life-saver, preventing disorientation in poor visibility. The June edition of *The Log* (page 2) pays tribute.

Taking advantage of Calvert lighting was **Bob Ramshaw G3RLD** (Northampton) landing on 27R at Heathrow. The cloud base was low on that day! Bob flies a C.172 from Sywell and would like to generate interest in an amateur radio 'aviation enthusiasts' net', any takers?

Follow-Ups

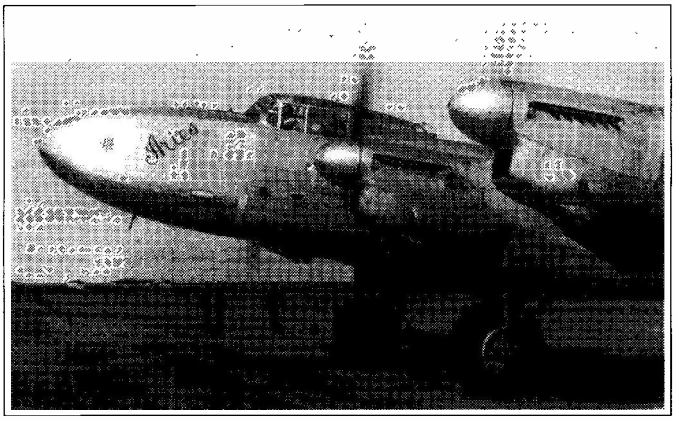
My attempt in August to re-unite Evan Murray (Auckland, New Zealand) and Dallas A. McKenzie (London) was successful. Happy ending!

In July, Paul Hilton (Newbury) gave me a tip-off about listening to GB1MIR (and no complaints from me about interrupting dinner - it was worth it, thanks, Paul!). He also reminds us now of two MIR operational frequencies: 121.75 and 143.625MHz both f.m. As for Dan Air, **Richard Bird** (Bexhill-on-Sea) is informed by Paul that the callsign is 'Dan Air + flight number' when working air traffic control, but 'Dan Air + last two registration letters' when working their own operations (e.g. 131.875MHz).

Eric Franks (Paignton) answers the query from Norman Locke (Peterborough) about N112WA also in July. The construction number is 47820 and *High in the Sky* gives the Selcal as GH-FK and the operator as Garuda. *Airline Fleets 91* (Air-Britain) still says World Airways. Could it be leased out?

Historical Section

Eric goes back to the days of Valletas and Hastings. He asks if I remember the typical directional gyro 'compasses' made by Sperry. Indeed, I have examples in my Museum and visitors are welcome by prior arrangement. 'Phone me on 081-958 5113 during weekday evenings. In a top corner of the instrument is a little window through which an annunciator can be seen. Either a dot is displayed, or a cross, or the annunciator stops in the middle in which case the adjacent edges of both symbols are seen together. This indicates slaving of the gyroscope to magnetic North (as sensed by a flux gate, a suspended coil normally mounted in the wing tips). If the dot or cross were visible on their own, the gyro had drifted to one side or the other of the correct heading and would either self-correct or could be adjusted manually if the flux-gate had failed.



Avro Lancaster *Aries I* at Reykjavik, in May 1945 whilst on polar navigation duties. John Irvine.

Shawbury-based Lancaster *Aries I* flew over the Pole from Reykjavik. Although now an everyday occurrence, in May 1945 this was quite an achievement! **John Irvine, Sqn. Ldr. RAF Ret'd.** (Barnstaple) was stationed at Reykjavik at the time and has supplied the contemporary photo of the aircraft. Sorry its serial isn't visible - but I bet there's a reader out there who'll write and tell us what it was!

Frequency and Operational News

AIC 57/1991 from the CAA suggests that at Chichester (Goodwood) runway 14L/32R has been reinstated.

Charles Holloway G4WIE (London) reports that Shannon Volmet is now 'read' by a synthesised voice using 'vocabulary concatenation' which, rephrased in technical jargon, means 'stringing words together'. The operating authority at Ballygirreen rightly laments that the voice supplied has an English and not, as would be more appropriate, an Irish accent. Steps are in hand to do something about this though. Refreshing when so many other speech synthesis devices seem to adopt 'mid-Atlantic' American accents.

Portishead have started a 'phone patch facility on 131.625MHz. What isn't clear is if ordinary passengers can use this to make urgent 'phone calls in flight. Do they have to go to the cockpit, how are they billed, and do they need to remember to say 'Over' and release the transmit switch? **Michael Davies** (Barry) who reports this also mentions Portishead on marine channel 25 (161.85 shore transmission, 157.25MHz shore reception) which presumably enables a duplex 'phone patch facility.

Another possible new facility is an a.t.i.s. at Leeds & Bradford; **Simon Lucas** (Normanton) believes that this is being tested on 118.025MHz. Simon says he enjoyed the Vulcan's display at Church Fenton and notes its spectacular climb performance. Of course the aircraft displays at light weight; if fully operationally equipped and 'bombed up' it wouldn't be the same. Glad you take my advice to listen to your radio with an earpiece when in public places - that way your noise doesn't disturb others, and background noise doesn't affect reception of whatever you're listening to.

Chris Hasman (Arthingworth) is another Sywell pilot and so perhaps knows Bob Ramshaw (even though the former flies AA5s)? He describes the satellite data link that sends oceanic clearances to suitably equipped aircraft. In fact, the information can be received as far as Singapore, well outside the North Atlantic tracks, but I wonder if the system will be expanded to give other long-range clearances? The majority of aircraft still have to receive and acknowledge clearances in the conventional manner, of course. In the future it is hoped that satellites will replace the less reliable h.f. oceanic communications. Who is Sandra, and what's this flying group of hers that you're in, Chris?

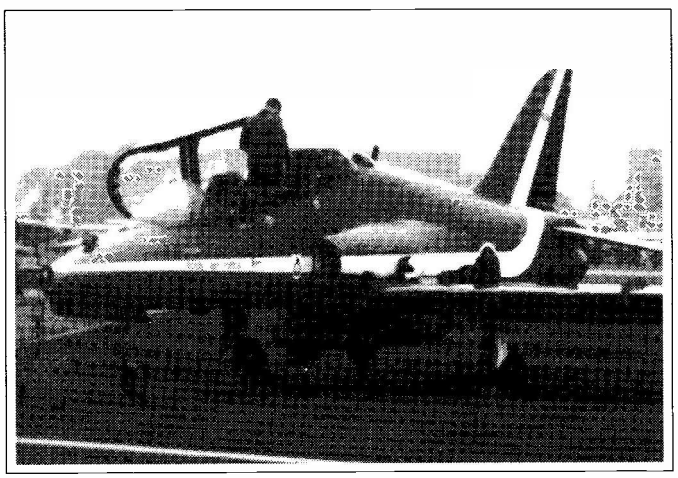
Information Sources

Another Yorkshireman, **David Shaw**, has sent his latest computer-produced callsign listing. If you send him a reply-paid, self-addressed envelope capable of carrying half-a-dozen A4 sheets (which weigh 40g total) you too can have a copy. Thanks for the generous offer, David. Also, if you have information on callsigns from overseas, especially North America and Australia, then David would like to correspond with you. In either case, his address is 93 Quarry Moor Park, Harrogate Road, Ripon, North Yorkshire HG4 3AQ, England.

In Cheltenham, **Anne Reed RS87871/G-20126** has collected a library of "...almost every aviation related book" that must rival nearby CAA's publication department! Latest acquisition is *The Aviation Enthusiast's Handbook* by Kevin M. Fox (Argus Books). This places heavy emphasis on aeronautical radio and also describes the spectator facilities at major airports. Watch out for a full review in the near future.

Please note that I am unable to reply directly to readers, but I always try to answer queries in this column.

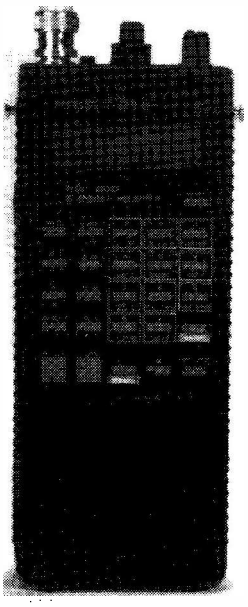
The next three deadlines (for topical information) are September 13, October 18 and November 11. All correspondence to Airband, c/o The Godfrey Manning Aircraft Museum, 63 The Drive, Edgware, Middlesex HA8 8PS.



Ground checks on a Hawk of the Red Arrows. Janice Cox.

scanning

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



Due to the increasing number of cases where scanning receivers have been used in connection with criminal activities, the DTI Radiocommunications Agency has issued a guidance document for use by law enforcement officers. I believe this is the first time the various clauses relating to illegal reception under the Wireless Telegraphy and Telecommunications acts have been clearly defined. It is anticipated that a public information sheet based on this document will be available soon and I hope to include extracts when it is published. In the meantime, the details given here should make it clearer what is, and what isn't, permitted.

I have been hearing rumours about a clarification of the law for some time now and I had hoped that it would make the monitoring of aircraft and marine communications legal. This has not happened, but it is clear from the document that such activities would be considered as being relatively harmless. What it does do is clarify the circumstances under which a prosecution may be considered, for example it is not an offence to use a scanning receiver as it does not require a licence.

If a person uses a receiver to listen to messages that they are not authorised to receive - and that is normally anything other than amateur or authorised broadcast stations, then an offence under section 5(b) (i) of the 1949 Wireless Telegraphy act has been committed. This is true even if the contents of the transmission are not disclosed in any way.

If the contents are passed on to another person then a more serious offence under section 55(b) (i) would have been committed.

A good example of this is given in the document:

If a taxi operator uses a scanner to receive his own radios no offence would have been committed as he is authorised to monitor those transmissions.

If he uses a scanner to monitor his competitors transmissions and poach the fare an offence under section 5(b) (i) would have been committed.

If he monitors his competitors transmissions and then conveys the information to another driver a more serious offence would have been committed under section (55) (b) (i).

It is clear that listening to law enforcement agencies is taken very seriously and if a person is suspected of using a scanning receiver illegally, the Police have the right to confiscate the equipment for further examination in order to determine what frequencies have been stored in the receiver.

The punishment when an offence has been proven is usually determined by the court. Obviously this depends upon the seriousness of the crime and the circumstances under which it was discovered, but for a first offence the person is usually fined and the receiver forfeited.

Reading between the lines it is not very likely that you would be prosecuted for listening to transmissions such as aircraft communications. If you are listening in a public place such as an airport lounge it might be a good idea to ask for permission. By obtaining approval you become authorised to listen and are no longer committing an offence. It is also unlikely that you would be discovered illegally using a scanning receiver in the privacy of your own home. Although the electronic detection of scanning receivers is possible, it does require sophisticated equipment and a trained operator. This only makes it worthwhile if a more serious offence is also suspected.

A good example of this would be the rumours I am beginning to hear of a trend towards people paying for details of conversations monitored by owners of scanning receivers. This is really bad news for the hobby both in terms of the ethics involved and the knock-on effect it may have on the more stringent enforcement of listening laws. If you pass on information you have heard or go chasing fire engines/police vehicles with a scanning receiver you will probably get what you deserve. Please use your scanner responsibly.

Antenna Design

Edward Sinclair writes from Manchester regarding the antenna design I featured in the May column. He is confused about the dimensions given for the design as they don't exactly match the values produced when the figures are calculated using the formula I included in the article. He also notes that a slightly different formula is given in Peter Rouse's book *Scanners* and wonders which of the two is correct.

When an antenna is used for transmission, it is important that the best possible match is obtained in order prevent damage to the transmitter. This is usually measured by connecting a device known as a s.w.r. meter between the antenna and the transmitter. The antenna can then be mounted in its final operating position and the length of the elements adjusted to give the lowest reflected power reading which occurs when the best match is obtained.

However, in the design I described there are several dipole elements connected together. Interaction between individual elements makes it unlikely that the receiver will be presented with an exact match, but as the antenna is only being used for reception purposes no damage will result. The overlap in the operating frequency range of each element means that even if the elements are not quite the right length the antenna will still work. So, in this application you can use either formula providing you stick to the same one for all the dimensions - and don't worry about any small errors in length as they shouldn't make a significant difference to the overall performance.

AOR/Fairmate Reset

Many of the original owners of AOR AR1000s or Fairmate HP100s were disappointed when later models were announced offering a much wider frequency coverage. However the solution is at hand - the frequency range is pre-programmed into the receiver at the factory and can be manually reset if required. Both the AOR and Fairmate do not have an external reset button, very occasionally problems can occur due to the programme, which is retained within the microprocessor control i.c., becoming corrupted. This is a fairly common problem in computer circuitry and may simply be caused by an excessive build up of static electricity. This does not normally result in major problems but you may possibly find controls such as the rotary tuning knob stop working or certain memory channels cannot be scanned. The solution is to reset the microprocessor - when this is done some of the information relating to the operation of the receiver is lost and has to be re-entered via the keyboard. If new frequency limits are used in place of the original ones the frequency range can be extended.

OK, warning over, here are the details:

Remove the batteries, antenna and control knobs. Undo the two screws in the battery compartment and the two screws at the top rear of the case. Carefully separate the case halves and unplug the battery connector. Locate the three cross-head brass screws holding the main p.c.b. in place and remove them. Once again carefully separate the p.c.b. from the case half. You may need to de-solder two earth straps in order to do this - so remember where they came from. You should now be able to see three brass studs holding a second p.c.b. in place remove these and the short wire near the top of the scanner. Lift out the p.c.b. to reveal the square 80-pin microprocessor control i.c. mounted on a third p.c.b. Looking from the bottom edge of the scanner with the top facing away from you pin 1 is at the top left hand edge of the i.c. Counting anti-clockwise down the left hand edge of the i.c. locate and mark pin 13. Now go to the bottom right hand edge of the i.c. and count up from pin 41 until you find pin 51 - and mark it. Just count those pin numbers again to be absolutely sure you got it right.

The next stage is to temporarily solder a small silicon diode between pins 13 and 51. If you can trace the track away from the pins slightly it may be a good idea to connect at these points rather than directly onto the pins. The cathode of the diode (the end with the band) goes to pin 51 and the anode to pin 13. Reconnect the battery pack and switch the scanner on, the display should be blank indicating that the circuits are ready to be reprogrammed.

Carefully enter the information shown here with the keypad.

The command keys are shown in brackets and the down arrow key is shown as [>].

[BANK] 1 [PROG] 0.5 [LIMIT] 49.995 [SEARCH] 561.225 [ENTER]

2 [PROG] 50 [LIMIT] 107.995 [SEARCH] 561.225 [ENTER]

3 [PROG] 108 [LIMIT] 169.995 [SEARCH] 561.225 [ENTER]

4 [PROG] 170 [LIMIT] 296.995 [SEARCH] 561.225 [ENTER]

5 [PROG] 297 [LIMIT] 804.995 [SEARCH] 251.575 [ENTER]

6 [PROG] 805 [LIMIT] 1109995 [>] 251.575 [ENTER]

7 [PROG] 1110 [LIMIT] 1300 [>] 561.225 [ENTER]

Switch off the set and disconnect the battery pack. Disconnect the diode and re-assemble the receiver, taking care not to trap wires in the process.

And that's it - as I said not a job for the faint hearted. My thanks to Richard Hillier of AOR UK for the majority of this information.

RS232 Problems

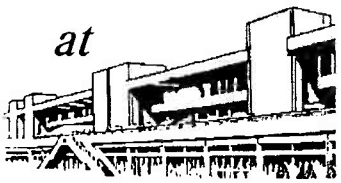
Two readers are trying to use computers to control scanning receivers but are experiencing problems in getting the computer to talk to the relevant serial port. **Stuart Lace** of Cumbria is trying to obtain a simple terminal program to run on his Sinclair Spectrum 128+2 in order to operate a AR2002 Scanmaster. **Julian Long** from Suffolk on the other hand is trying to get to grips with the * FX commands on his BBC model B computer in order to set the serial communications protocol to 4800 Baud, no parity and two stop bits in order to control an AR3000. He is able to set the Baud rate and parity correctly but the BBC only seems to permit 1 stop bit.

If anyone can help with either of these requests why not drop me a line and share the information. Until next month - Good listening.

B.A.R.T.G. RALLY

SUNDAY 15th SEPTEMBER 1991

B A R T G *at* B A R T G



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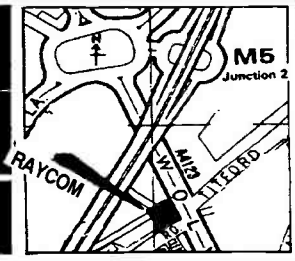

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decode

Mike Richards G4WNC
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I'll start this month with a request from **Chris Vasili** of London. Having origins in Cyprus, she is rather keen to receive press RTTY broadcasts from either Greece or Cyprus. I've checked through all my data, but sadly have drawn a blank. I can find no listing for an h.f. press transmission from either of these countries. The nearest I've got is Greek news being transmitted to ships from Athens Radio. I've included these loggings in the frequency list at the end of the column. The only problem with the ship press transmissions is that they are transmitted on request, so don't fit into any fixed schedule. If any of you know of a source of regular Greek press reports, perhaps you'd be kind to enough to write with the details.

William Playle of Billericay has gained a new lease of life from his utility listening. Unfortunately, due to a war injury, he is nearly deaf and has been having great difficulty resolving any conventional signals. After reading 'Decode' he realised that there was a whole new world that was not dependant on good hearing. William is now equipped with an ERA Microreader and a Sony ICF-2001D receiver. The antenna system comprises a long wire and an active antenna. William reports great success with this set-up and has been receiving c.w. and RTTY signals with ease. The next project is to link the Microreader to his ZX Spectrum computer. If there is anyone in the Billericay area who could help, I'm sure he would be very grateful.

US Navy Guam

Over recent months, many of you have written asking about the role of this station and how it fits into the rest of the US Navy operation. All was revealed when **Day Watson** sent me a copy of the *Guam Manual of Operations*. He had received this in response to a recent QSL.

Let's start with some information about the island itself. Guam forms part of the Mariana Islands that are located about 2400km east of the Philippines on the edge of the Pacific Ocean. The island is a self-governing dependant state of the US. Although only a small island of 541sq km and a population of 134 000, its position makes it a very valuable military location.

From a utility point of view, the main interest centres around the Guam FAX transmissions that are commonly known as GFAX. There are two continuous FAX transmissions that are managed by the Naval Oceanography Command/Joint Typhoon Warning Centre. This is a bit of a mouthful, so has been abbreviated to NAV-OCEANCOM-CEN/JTWC! The GFAX service operates primarily for the 7th Fleet, but also supports other Naval activities in the Western Pacific and Indian Ocean.

The two continuous broadcasts are based on computer generated products that are received from the Fleet Numerical Oceanography Centre, Monterey, California. They also make their own manual inserts based on local information.

The area of coverage is divided between the two transmissions with one covering the Western Pacific, while the other concentrates on the Indian Ocean. The Navy circuit codes used for these transmissions are KFBV for the Pacific and K3SN for the Indian Ocean.

The distribution network for these signals is very comprehensive and worthy of a description. The signals are initially routed over microwave links to the Naval Communications Area Master Station where the main h.f. transmitters are located. The signals are also simultaneously routed to Totsuka, Japan and San Miguel in the Philippines for h.f. transmission.

In order to provide comprehensive coverage of the Indian Ocean, the K3SN transmission is broadcast continuously on the Fleet SATCOM using the Indian Ocean MILSAT satellite. The Indian Ocean transmission is also broadcast on h.f. from Australia, Greece and Spain. The routing for this being via a mixture of land-line, satellite and microwave links.

In addition to a wide range of standard weather and sea condition charts, the Guam transmission includes some satellite images. The Western Pacific signal sends only GMS images, while the Indian Ocean signal includes DMSP (Defense Meteorological Satellite Program) images. These latter images are sent at 0820 and 2020UTC.

For those interested in receiving transmissions from these stations the Guam frequencies are as follows.

West Pacific: 5.258, 10.253, 19.858 and 20.525MHz.

Indian Ocean: 5.262, 10.257, 19.862 and 23.01MHz.

Transmission schedules are in two parts and are sent at 1230 and 1250UTC for West Pacific and 1320 and 1335UTC for Indian Ocean.

To help solve the poor reception conditions in some areas of the Indian Ocean, a compacted set of charts are transmitted during two one-hour sessions. This facility is likely to be of interest to the listener as it gives access to a lot of information in a short space of time. The transmissions are timed at 0735 and 1935UTC and the following charts are sent:

850mb and 200mb NOGAPS analysis

850mb 24 hour prog and 250mb 36 hour prog

Indian Ocean surface 24 and 36 hour prog

Surface analysis and 36 hour prog blend (hand-produced)

Significant wave height analysis (hand-produced)

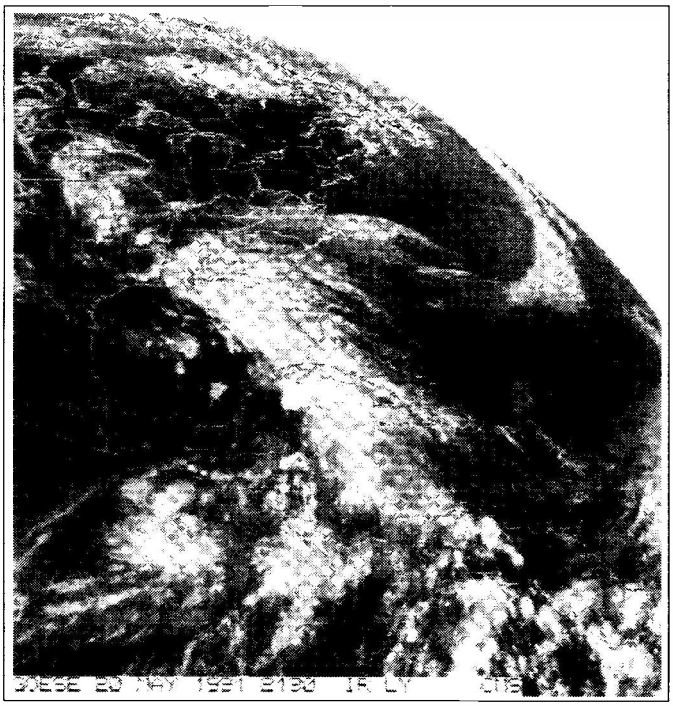

Fig. 1: High quality h.f. satellite image from Roger Barker.

DMSP 6.7nm resolution satellite coverage of the Indian Ocean.

I would be very interested to see samples of the output from this station (particularly satellite images). My thanks to Day Watson of Clevedon for supplying the Guam Operations Manual.

Public Domain Software News

Having just received the latest catalogue from the Public Domain Software Library, I see there are a couple of interesting new updates.

The first relates to a package called GEOCLOCK Ver 4.2. This is a graphic representation of either the whole earth or just the US. The important point about the display is that the areas of daylight and darkness are clearly shown. This is of particular importance from a propagation point of view and can give a good idea on the area to look for DX signals. To help with propagation predictions, the program highlights the 'grey line' area where enhanced transmission exists. Other useful extras include indication of the sun's position and the ability to run the clock in real time or speeded-up. The catalogue number of GEOCLOCK is 2490.

The second package is titled Coded Transmission Database and is aimed at the utility listener. The program is actually a card file index system designed specifically to handle Morse, AMTOR, FAX and RTTY. It sounds as though it should be just right for 'Decode' readers. The catalogue number of this program is 2290. As an added bonus, this disk also contains SCANNER MANAGER Ver 2. This is another database system that has been designed specifically to help keep track of the information in scanner memory banks. This could, of course, easily be adapted to store h.f. receiver frequencies. If you are a DBase 3 user you will find that this program allows file import and export.

For more details on the software library, their address is: Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. If you prefer to phone, the number is (0892) 661149.

Unusual Shifts!

I'm sure regular readers will have noticed a number of unusual shifts creeping into my frequency lists. The reason for this is the new Code 3 decoding package that I reviewed a few months ago. One of the important features of this package is that it can provide an accurate measurement of the frequency shift used by data transmissions. As well as being a helpful reference, it can be very useful when trying to identify a new signal. This is because certain modes tend to use a specific shift. For example, the majority of press RTTY stations use a 400Hz shift, not the 425Hz that many assume. Another example is standard SITOR signals, these almost always use a 170Hz shift. From this you can see that if you resolve a signal with, say, a 400Hz shift the chances are that

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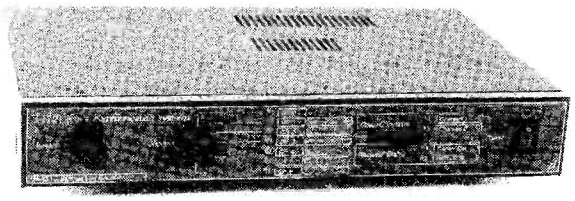

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Icom IC751A	£1535
Icom IC735	£1000
Icom IC725	£779
Icom IC726	£1015

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Kenwood TR751E	£610
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Yaesu FT290R11	£429
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Icom IC229E	£299
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Icom IC2SE	£269
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Yaesu FT712RH	£359
Icom IC4GE	£289
Icom IC4SE	£304
Icom IC449E	£359

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Kenwood TM731E	£675
Kenwood TM531E	£415
Yaesu FT470R + FNB10	£424
Yaesu FT736R	£1359
Icom IC322OE	£510
Icom IC2410E	£659
Icom IC2500E	£689
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AOR AR3000	£765
AOR AR2500	£419
AOR AR2800	£395

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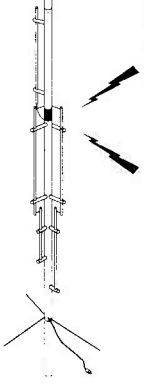

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T40	7MHz Traps 1kW (Pairs)	£41.90	£2.50
T80	3.5MHz Traps 1kW (Pairs)	£41.90	£2.50
16SWG Hard Drawn Copper Wire (50 Mtrs)		£12.95	£3.00
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With regard to the shifts shown in my list, these are either supplied with the report or, occasionally, I will measure them myself.

As many commercial decoders work to fixed 'standard' shifts you may be wondering if you can resolve these other shifts. First of all let me assure you that, in most cases, you can. The common range of shifts used in commercial decoders are 170, 425 and 850Hz. The tolerance on most of these is usually plenty wide enough to accommodate virtually all the popular transmissions. For example the 425Hz position is perfectly OK for the reception of 400Hz press transmissions. If in doubt, the answer is to experiment but start with the decoder set to a shift wider than the desired signal.

If any readers have any useful hints for receiving unusual shifts please drop me a line with the details.

Northwood Frequency Changes

Paul Mately of Blackpool dropped me a note to let me know that RN Northwood has just changed the frequencies of its FAX transmissions. The new frequencies are as follows:

2.374MHz, 1630-0730UTC from September 30 to March 31

17.635MHz, 0730-1630UTC from April 1 to March 30

3.652MHz, 4.307MHz, 6.446MHz, 8.342MHz and 12.8445MHz all year.

I've also managed to receive a schedule off air which I've shown here for your information:

0300UTC Schedule
0315UTC 00Z Surface Analysis
0340UTC 10Z Sig SU Wind and WX Prog
0400 and 0500UTC Specials as requested
0600UTC 00Z Selected Upper Air Ascents
0620UTC NAC TAFS
0630UTC Repeat of 0315UTC
0655UTC Combined 0C and 2C 12Z Prog
0705UTC Repeat of 0340UTC
0800UTC Gale Summary
0840UTC Surface Analysis
1030UTC Gale Summary
1305UTC 06Z Sig SU Wind and WX prog
1330UTC 06Z Sea and Swell Prog
1355UTC Sea Surface Temperature Analysis
1500UTC 12Z Surface Analysis
1525 and 1550UTC Specials
1635UTC Schedule
1645UTC 12Z Selected Upper Air Ascents
1735UTC Gale Summary
1800UTC Repeat of 1500UTC
1825UTC Repeat of 1305UTC
1850UTC Repeat of 1330UTC

If you have any further details of these changes please write and let me know.

Kuwait News Agency Update

You may remember that I recently mentioned receiving a transmission on 18.44MHz that claimed to be from this agency. Since mentioning this I've had several confirmations, including one from **Adolphe Perez** from Nice. In addition to 18.44MHz, transmissions have been logged on 14.67MHz and 15.846MHz. I suppose mentioning this signal in the column was fatal as the transmissions have now disappeared! I've written off to KUNA for details of their proposals for re-commencing transmissions and am awaiting a reply. If you have any further information, please drop me a line.

FAX Schedules

Jan Nieuwenhuis of The Netherlands has written with a couple of interesting FAX schedules that I've reproduced here.

US Navy Pearl Harbour, Hawaii

Frequencies: 4.855, 9.396 and 21.837MHz. Here are a few of the more interesting transmissions.

0000UTC Schedule Part 1 (Wed and Sat)
0000UTC Storm Track (Tue)
0015UTC Schedule Part 2
0015UTC GMS Satellite picture
0030UTC GOES Satellite picture
0245UTC GMS Satellite picture
0600UTC GOES Satellite picture
0900UTC GOES Satellite picture
1045UTC GMS Satellite picture
1215UTC GOES Satellite picture
1445UTC GMS Satellite picture
1800UTC GOES Satellite picture
2100UTC GOES Satellite picture

The QSL address for this station is; Naval Western Oceanography Centre, Box 113, Pearl Harbour, Hawaii HI 96860-550 USA

Tokyo Meteo is another popular station so here are a few of the latest details.

3.6225MHz (JMH), 7.305MHz (JMH2), 9.970MHz (JMH3), 13.597MHz (JMH4), 18.220MHz (JMH5), 23.5229MHz (JMH6), 3.365MHz (JMJ), 5.405MHz (JMJ2), 9.438MHz (JMJ3), 14.692MHz (JMJ4), 18.441MHz (JMJ5)

As with the previous US Navy listing, here the schedule for a few of the more interesting charts.

0103UTC Test Chart
0110UTC GMS Satellite Picture
0209UTC Radio Prediction (20th & 21st only)
0310UTC Typhoon Forecast
0430UTC Typhoon Forecast
0710UTC GMS Satellite Picture
0910UTC Typhoon Forecast
1030UTC Typhoon Forecast
1303UTC Test Chart
1310UTC GMS Satellite Picture
1510UTC Typhoon Forecast
1630UTC Typhoon Forecast
1910UTC GMS Satellite Picture
2110UTC Typhoon Forecast
2230UTC Typhoon Forecast

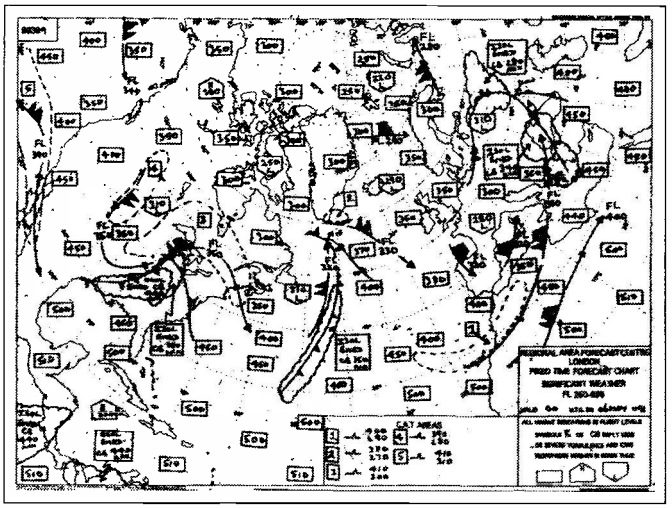

Fig. 2: Typical h.f. weather chart.

My thanks to Jan for supplying this information. Don't forget to send me a copy of any schedules you may receive.

Yugoslav Press

With the current political unrest within Yugoslavia, there is likely to be some interesting reports on the press networks. Probably the best starting point for monitoring events is the Tanjug press agency that operates from Belgrade. The station operates on a number of frequencies using 50 baud RTTY with a 400Hz shift. The frequencies and times of the English language service are as follows:

5.24MHz (40C2) 0000-0400, 1700-2400UTC
7.658MHz (YZD) 24hr
7.806MHz (YZD7) 0000-0400, 1700-2400UTC
7.996MHz (YZD9) 0000-0400, 1700-2400UTC
11.604MHz (YZJ) 0400-1700UTC
12.2125MHz (YZO7) 0400-1700UTC
13.44MHz (YZJ5) 0400-1700UTC

The transmissions start at 0900UTC on Monday with a schedule and the Sunday transmissions are limited to 0900-2200UTC. In practical terms, the 7.658MHz broadcast is the one likely to give best reception in the UK.

Frequency List

As usual here are a selection of some of the more interesting loggings for this month. The format used is frequency, mode, speed, shift, callsign, time and notes.

2.6805MHz, CW, -, -, DJH59, 2147, Wilhelmshaven
2.822MHz, RTTY, 100, 800, DHN37, 2200, Grengel Met
3.595MHz, RTTY, 50, -, 9HA, 2124, Malta Air
4.542MHz, RTTY, 50, 425, FDY, 0949, French Military
7.959MHz, RTTY, 50, 533, 9BC23, 2038, IRNA Tehran English News
8.165MHz, RTTY, 50, 220, 5YD, 2149, Nairobi Air
9.285MHz, ARQ-242, 96, 400, TNL, 0112, Brazzaville - 2 chans!
9.298MHz, RTTY, 50, -, SOJ229, 0600, PAP Warsaw
9.43MHz, RTTY, 50, 500, ZAT, 1726, ATA Tirana English press
10.15MHz, RTTY, 50, -, SUA, 2146, Cairo (MENA)
10.408MHz, RTTY, 50, -, 9VF63, 1824, Singapore ANSA
10.536MHz, RTTY, 75, -, CFH, 0540, Halifax
10.6542MHz, RTTY 85/50, -, VT88, 1840, Bangkok Air
10.72MHz, FAX, 120, 576, LRB72, 2242, Buenos Aires Met
10.856MHz, FAX, 120, 576, NAM, 0545, USN satellite image
11.08MHz, RTTY, 50, 600, YKP28, 1826, Sana Damascus - press
11.1124MHz, RTTY, 50, 850, ETD3, 2109, Addis Abbaba Air
11.476MHz, RTTY, 50, 220, HMF52, 1852, KCNA Pyongyang Press
11.68MHz, RTTY, 75, 425, BZP51, 1523, Beijing English press
16.032MHz, ARQ-342, 96, 390, RBI75, 0720, PTT Moscow
17.2085MHz, SITOR-B, 100, 170, SVT6, 1310, Greek ship press
17.2085MHz, SITOR-B, 100, 170, SVT6, 1300, Greek ship press
17.2075MHz, SITOR-A, 100, 170, WCC, 1823, Chatham Radio.
17.2125MHz, SITOR B, 100, 170, OXZ, 0830, Lyngby - ship press
17.468MHz, RTTY, 50, 400, HGO24, 0615, English press
18.7042MHz, FEC-A, 96, 400, DGS70H5, 0846, PIAB German press
20.56MHz, RTTY, 50, 400, 5AQ88, 1617, JANA Tripoli
23.545MHz, FEC-A, 96, 400, DGX54, 0848, PIAB Bonn German press

If you would like to receive a full list of the frequencies logged recently by readers, send three First or Second Class stamps to me and I will send off my listing.

info in orbit

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

Fig. 1: METEOR 2/20 showing North Atlantic, from Peter de Jong.

Changes continued to the operating Russian METEOR weather satellites during June and July. By early July, METEOR 3-4 was orbiting near the terminator, running from south to north during the early evening and experience shows that the Russians do not usually leave these satellites operating during this time. On July 9, it was switched off and during the night METEOR 3-3 was switched back on. I left a tape recorder on overnight to see whether data would be received and replaying this enabled me to confirm the satellite involved.

The picture format from METEOR 3-4 appears to change occasionally and this may account for the difficulties that people are reporting in getting software to synchronise properly. **Bob Warriner** of Lancing was one of those noticing slippage on some images. The real surprise for me was hearing METEOR 2-18 come on for the 1355UTC pass on June 19. I haven't had pictures from this one for many months, but it was switched off just a few days later.

I mentioned last month about the missing phasing bars and grey scale in the METEOR 2-20 telemetry. Just after last month's press time for *SWM*, the problem vanished and METEOR 2-20 has, as of late July, been transmitting good pictures complete with bars and scales.

New METEOR Due

A further METEOR launch is scheduled for mid-August and will presumably be METEOR 3-5, that is the fifth in the series three satellites. These are distinguished by providing infra-red pictures when the satellite enters darkness, compared with the series two, which normally switch off at that time.

NOAA Satellites

The four NOAA weather satellites are also involved in switching operations. When NOAAs 9 and 11 coincide (as they do every few months), the APT from NOAA 9 is turned off. Similarly, when NOAAs 10 and 12 coincided recently, NOAA 12 was turned off for a few days. On July 10, both NOAAs 10 and 12 were above my horizon and still operating and so I had the unusual experience of seeing the picture from NOAA 12 gradually turn into a picture from NOAA 10!

OKEAN 3

Some correspondents have received a few pictures from OKEAN 3, the new Russian oceanographic satellite, but they seem to be infrequent. For a few days in early July, OKEAN 3 transmitted pictures while passing southbound over Iceland at about 1745UTC. A longer image was received on July 10 consisting of a radar and microwave picture. Some superb OKEAN pictures were published in a recent edition of the magazine of the Remote Imaging Group.

METEOSAT-4

This geostationary weather satellite has continued to transmit pictures although METEOSAT-5 was scheduled to replace it in May. **Peter de Jong** of Leiden in Holland wrote to EUMETSAT to ask about the problems and kindly sent me the details of their reply. It explains that an anomaly in both infra-red and water vapour images was detected and so operations were returned to METEOSAT-4. Further tests are planned until a cure can be found for the image anomaly when they expect to resume operations with METEOSAT-5. Details of progress will be published via the EUMETSAT Electronic Bulletin Board or by the administration messages broadcast at 0218UTC and at three hourly intervals. This information originated from Gordon Bridge the METEOSAT Missions Manager.

METEOSAT-3

By the time that this appears we may be receiving pictures from this satellite, which is now positioned over the Atlantic. While searching for GOES 2 in mid July, I found the METEOSAT-3 signal loud and clear, some way to the left of GOES, but there were no pictures being broadcast at the time.

METEOSAT-2

An ESA press release marked the tenth anniversary of METEOSAT-2 on June 19. It was designed for a three year life but has worked perfectly all this time and took a final 10th birthday image. It was the main satellite until number three took over on 11 August 1988. It will be de-orbited soon from its position near 10°W longitude.

GOES

A few years ago we were able to receive a good signal on 1691MHz from the GOES East satellite, which was positioned several degrees above the western horizon, as seen from here in the UK. When one of the GOES satellites failed, changes had to be made to the positions of the remaining GOES constellation. Then, the slip in the launch of a replacement GOES has meant that GOES 2 is being used to transmit pictures. As mentioned last month GOES 2 appears to move between about 1° and 20° above the western horizon, during the day and so from Britain, can best be seen during the late afternoon until late at night. It is located at about 60° west.

If you have a dish or Yagi to receive METEOSAT then you should be able to hear the signal from GOES and possibly receive some reasonable pictures. Without using a pre-amp, I have seen some identifiable pictures during the evening. As a guide to transmission times, the following may help.

1630UTC A series of six infra-red frames showing each quadrant of the globe plus two of the equatorial regions.

1700UTC A series of three visible frames of the eastern quadrants.

1905UTC A series of six frames similar to the 1630UTC pictures.

1935UTC A series of six visible frames similar to the 1630UTC pictures.

2020UTC A long series of meteorological charts is broadcast until about 2200UTC.

2220UTC A series of visible followed by infra-red frames of each quadrant for one hour.

There are many other sequences transmitted while the satellite is at lower elevations.

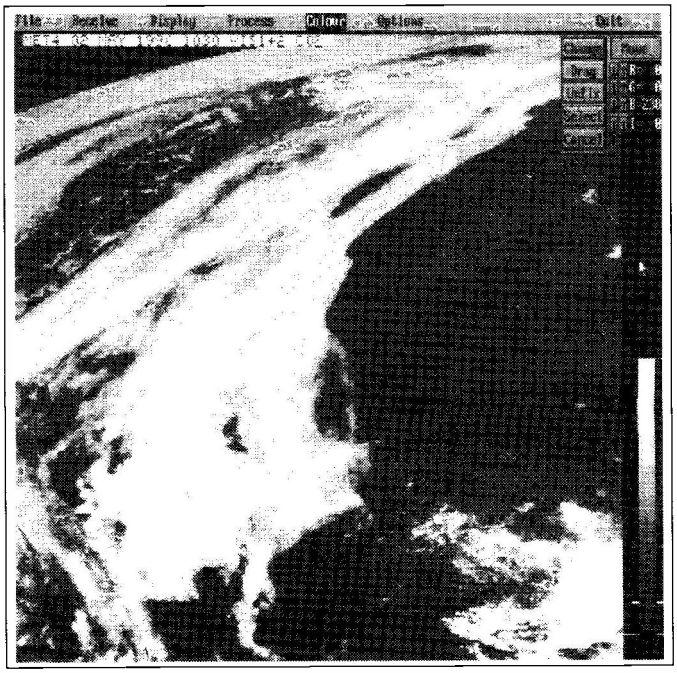

Fig. 2: METEOSAT 4 from Dave Cawley.

GOMS

The Russian Geostationary Meteorological Satellite GOMS 1 is scheduled to be placed in orbit during August and so it will be worth moving the dish occasionally to see whether its signal can be heard. It is due to be placed some 14° to 16° west longitude. I would have expected an easterly position, but there we are!

Signal Polarisation

I received a FAX from **Guy Denier**, forwarded via the *SWM* office from Guy's address in France. He is a dealer in WXSAT equipment and tells me of some of the reports that he receives from his world-wide customers. One lives on a Caribbean Island and was monitoring GOES 2 when he accidentally knocked the feed and got a much

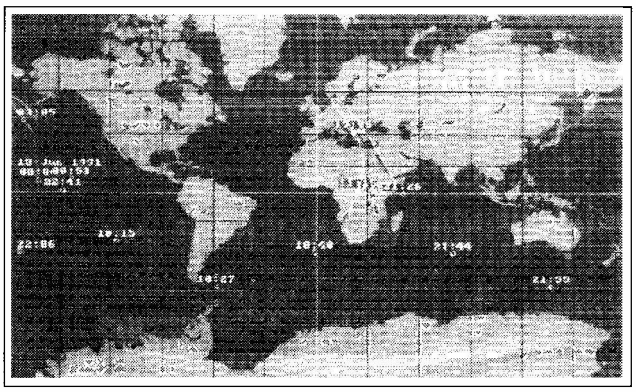

Fig. 3: Screen display of Amiga SatTrack from Nick Grundy.

stronger signal than when everything was correctly set-up. Another customer somewhere in the Indian Ocean was monitoring METEOSAT with a long Yagi and found that re-adjusting the polarisation of the Yagi to vertical gave an improved signal. Guy comments that it is essential to adjust the feed of the dish or Yagi, by rotating it to give the strongest signal. The signal is horizontally polarised as seen from a station on the same longitude as the satellite's sub-satellite point.

Letters

Peter de Jong continues to not only carefully monitor the weather satellite scene but also regularly takes photographs of some of the major weather features. His picture from METEOR 2-20, which was suffering from missing phasing bars at that time can be seen in Fig. 1. The left side shows the picture distortion that resulted.

He has been restoring some equipment and passes on some advice regarding earthing and interference. He explains that even when the chassis is well earthed, the various 'earth' connections of the plugs may not be effective perhaps due to paint, and he recommends separate earthing by soldering copper wire around them and earthing this.

A letter from **Geoffrey Chance** of Redruth told me of his testing of the Technical Software APT-1 module for decoding WXSAT signals. This allows signals to be displayed on a FAX system and Geoffrey is using the J&P FAX equipment, though it appears that he may need to purchase a faster printer. His receiving set-up includes a Cirkit antenna, and he has boxed his Garex receiver ready for testing.

Graham Smith G1JVZ of Chislehurst sent me some fascinating articles on the radio telescope built by the late Frank Hyde. My own unit was not working properly and the fault appeared to be the down converter, which changes the 150MHz signal to 28MHz. I could hear the Russian communication satellites on 150MHz when fed to my scanner but not after conversion. This unit has now been repaired. Fellow Plymothian **A P Hancock** has a working system comprising a turnstile antenna, modified Bearcat 175XL receiver and software decoding with PCGOES 3. He is receiving pictures from both the NOAAs and METEORs, but with paging interference, and promises to forward some photographs for publication.

Space Information

Paul Wilson of Macclesfield recently started reading *SWM* and told me of his deep interest in the various space research programmes. He has written to me with a particularly helpful offer to readers of this column. He collects space-related data from Usenet which is an international computer network originating in the USA. He suggests that if any readers would like to receive some of this information direct, they should write to him enclosing an s.a.e. for details. Paul may be able to supply data at cost on a regular basis. His address is: PO Box 54, Macclesfield SK10 5EH.

Paul provided me with a sample of the data which included the telephone numbers of nine USA Bulletin Board systems that carry space news on a regular basis. Also mentioned was a note about the operations done by the Satellite Meteorological Center of China's State Meteorological Administration, to stabilise the FENGYUN 1B weather satellite. In early May they were able to gain attitude control, but intermittent problems still caused loss of control. Currently the HRPT (high resolution data) is transmitting on 1704.5MHz but not the APT. We must hope that the Chinese have success with their efforts to recover FENGYUN. This information originates from the NOAA Electronic Bulletin Board. My thanks to Paul for providing it.

Pictures from Suppliers

I welcome any pictures that WXSAT equipment developers may send in for publication. The photograph in Fig. 2 was received from **Dave Cawley** of Timestep Weather Satellites. The original is in full colour and would grace any shack. Perhaps other suppliers will contribute?

Predictions

I try to include a small set of predictions occasionally, especially for newcomers who need to know just when the satellites are going over, but may not yet have any method of predicting times. The main problem (apart from space) is that the Russian satellites are changed every few weeks and so, by the date of publication, my list may include non-operating satellites. The table below lists AOS (acquisition of signal) time UTC, the time of LOS (loss of signal), the maximum elevation and whether to the east or west, and finally whether travelling north or south. Predictions for Sunday August 25.

Satellite	AOS	LOS	Maxel	Direc
NOAA 9	0805	0821	49W	SB
NOAA 10	0819	0834	61W	SB
NOAA 12	0833	0848	75W	SB
NOAA 11	1348	1404	69E	NB
NOAA 9	1756	1812	76E	NB
NOAA 10	1806	1821	54E	NB

By late August, both METEORS 2-20 and 3-3 will be near the terminator and so there will probably have been a change over to two of the other METEORS.

Starting to Monitor?

For the complete beginner who wants to investigate the costs and equipment involved in setting up a weather satellite receiving system, it can be a daunting task. Many amateur radio enthusiasts have already got a receiver or two, possibly a computer, and are also able to build some of the hardware. Recalling my own problems I feel sure that a good start is the obtaining of some facility to predict where the various satellites are. Those who already have a computer may be able to buy a suitable program from one of the clubs or societies such as AMSAT, or a commercial supplier, or possibly from a shareware company. I have seen such programs advertised and they are usually within about £30. These programs should allow you to input Kepler elements in an easy manner. You will need a new set every four to six weeks to allow your program to remain accurate to within a couple of minutes or so. These elements are also available quite widely, including from me (see below) but also from Bulletin Boards. Kepler elements can come in two forms - NASA two-line format, which is a summary of the satellite's orbit in a form that some programs use, and the standard listing where each parameter is spelt out.

Amiga Predictions

Some time ago, I mentioned that a few readers, including Nick Grundy G4NKV, have written satellite predictions programs for the Amiga computer. Following requests from *SWM* readers G4NKV has developed his SATTRACK program to include a print facility to provide prediction data and an automatic facility to control a steerable antenna, although he adds that this is not a project for beginners! He has designed it around the AR40 azimuth and KR500 elevation rotators. A screen dump of the track display is shown in Fig. 3. Further details can be obtained by writing to him at Bar Farm, 15 Main Road, Drax, Selby, N Yorks YO8 8PA and enclosing an s.a.e.

Schools

There are a number of schools with WXSAT receiving equipment either in full operation or being assembled. **G Beaumont** is the Information Technology Co-ordinator at Siddal Moor High School in Heywood and he told me that they did originally have a good set-up but some of the equipment is now being used to good effect elsewhere; the satellite feed cable now supplies the Modern Languages department with French TV! However, he has repaired the v.h.f. crossed dipole and obtained a 1.2m dish for METEOSAT reception and has a good location. As with many educational establishments their computer is the BBC Master and the Acorn Archimedes, and their technician is writing some improved software. **Peter Finn** of Milford Haven decided to spend some money on the *Field Studies Council* book written for schools on the topic of weather satellites, but he was surprised to hear of its price - £95. A glance through the literature does show some cheaper alternatives!

Maplin Receiver Mods

I recently mentioned that Maplin Electronics are asking for any users of their WXSAT receiver who have made modifications to minimise the paging interference to let them have details. I received a letter from **Simon Lewis GM4PLM** who is a member of the Remote Imaging Group and he reminded me that some time ago they published a number of articles by various people including Peter Hayes GM3RAO and others who have developed such modifications. I have passed the details on to Maplins.

Frequencies

NOAAS 9 and 11 use 137.62MHz
NOAAS 10 and 12 on 137.50MHz
METEOR 2/20 on 137.85MHz
METEOR 3/3 on 137.30MHz
OKEAN 2 and 3 on 137.40MHz occasionally
FENGYUN 1-2 was on 137.80MHz

Kepler Elements

These are available from me for the cost of an s.a.e. and will include the frequencies of the operating satellites in case you are new to monitoring.

Abbreviations

NASA	National Aeronautics and Space Administration
ESA	European Space Agency
GOES	Geostationary Operational Environmental Satellite
GOMS	Geostationary Operational Meteorological Satellite

long medium & short

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The congestion in the h.f. broadcast bands was considered at the World Administrative Radio Conference (WARC) held in February '87. It was decided that the best solution would be to replace the existing double sideband (d.s.b.) transmissions with single sideband (s.s.b.), since it would enable a 100% increase in the number of available channels to be achieved. Subject to confirmation by a future competent WARC, it was agreed that all d.s.b. emissions would cease by 31 December 2015. Some broadcasters are now using the s.s.b. system and low cost s.s.b. portables may soon be available.

The next WARC will be held in Spain in February '92, when the allocation of frequencies throughout the radio spectrum will be considered. It is expected that some broadcast bands will be expanded.

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 7.

The test transmissions on 225kHz from the new 600kW long wave transmitter located in Van, Turkey may have been received on two occasions by **John Coulter** in Winchester. Listening at 1425 on July 3, he heard an announcement in a language that was just recognisable as Turkish, followed by music. Encouraged by these results, he re-checked the frequency again at 1425 on July 4, the weak signal was there and just about readable. The frequency indicated by his Yaesu FRG-7 was 222kHz.

A holiday in Puerto Pollensa, Majorca enabled **Jim Cash** to explore the band from a new location. Using a Sony ICF-SW1E portable with the supplied reel of antenna wire, he picked up BBC R-4 on 198kHz at 2106UTC. The combined signal from Droitwich (500kW), Burghead (50kW) and Westerglen (50kW) rated 14232. A check on 252kHz revealed that there was no difficulty in receiving the broadcasts from Tipaza, Algeria, which rated 55454 at 1539.

MW Transatlantic DX

While listening in Grimsby, **Jim Willett** heard four broadcasts from C.America. The first became audible on 1505kHz and was R.Anguilla (10kW), rated SIO222 at 0035. At 0210 he heard R.Reloj (CMGI) in Trinidad, which runs just 1kW on 610. By 0220 the Caribbean Beacon, Anguilla 1610 was peaking SIO222. Later, he logged El Oso (WOSO) San Juan, Puerto Rico (10kW) on 1030 as SIO222 at 0615. Despite deep fades, some of which lasted up to ten minutes, Jim obtained definite idents and is now awaiting their QSL.

Jim also picked up several broadcasts from Canada and the USA. The earliest to reach him came from CJYQ in St.John's, NF 930, rated SIO333 at 0020. He logged WOR in New York on 710 at 0100; VOCM in St.John's, NF on 590 at 0130; CHRM Matane, PQ on 1290 at 0235; WCAU (WOGL) in Philadelphia, PA 1210 at 0250; WINS in New York 1010 at 0300; CFFX in Kingston, ON on 960 at 0315, all rated SIO222.

Other MW DX

Some of the signals from N.Africa have reached the UK via sky wave paths after dark. When searching the band in Morden, **Sheila Hughes** logged Ain Beida, Algeria on 531 (600kW) as 33333 at 2300; Sidi Bennour, Morocco on 540 (600kW) as 32332 at 2310 and Algiers, Algeria on 891 (600/300kW) as 43333 at 2320. In Co.Down **Eddie McKeown** rated Algiers on 891 as 23122 at 0142 and Alger on 981 (600/300kW) as 21312 at 0208.

MW Local Radio DX

Many DXers live where high levels of electrical noise prevent the reception of the weaker ground wave signals from distant local radio stations, but a chance to check the band under more favourable conditions may arise during a holiday. A holiday in Old Hunstanton, which is a quiet location on the Norfolk coast, enabled **Ron Galliers** to log many local radio signals, some of which cannot be received at his home in N.London.

Short Wave Reports

High levels of solar activity have resulted in very unsettled propagation conditions in the h.f. bands. Although good reception over long distances has been noted during some days, at other times the effects of solar flares have rendered signals poor or non-existent. Such effects are likely to continue.

Considerable variations in propagation have been noted in the **25MHz (11m)** band. Strong signals reached the UK from R.Australia via Darwin on 25.750 (Eng to Asia, Middle East 0900-1100) during some mornings, but often they were weak or buried in the noise. During good conditions, **Simon Hamer** (New Radnor) rated them as SIO454 at 1034. The broadcasts in Arabic from the Voice of the UAE in Abu Dhabi on 25.690 usually peaked SIO555, as noted at 0740 and 1000 by **Kenneth Buck** in Edinburgh, but some mornings they have been inaudible.

At 1400, **Phil Townsend** (E.London) picked up RFI via Issoudun on 25.820 (Fr to E.Africa 0700-1500) for the first time. Reporting from Largs, **John Stevens** says he found the conditions poor, only Voice of the UAE on 25.690

Medium Wave DX Chart

Freq kHZ	TX Location	Country	Power kW	DXer
531	Ain Beida	Algeria	600	B,E*
531	Leipzig	Germany	100	H*
531	Oviedo	Spain	10	I
531	Beromunster	Switzerland	500	D,N
540	BRT-2 Wavre	Belgium	150/50	A,D,E,H*,I,J,O
540	Sidi Bennour	Morocco	600	E*
549	Les Trembles	Algeria	600	B
549	DLF Bayreuth	Germany	200	D,E*,J,O
549	Nordkirchen	Germany	100	A,H*
558	Valencia	Spain	20	A,H*
567	RTE-1 Tullamore	Ireland (S)	500	A,D,I,J,D
576	Muhlacker	Germany	500	D
576	Stuttgart	Germany	500	H*,I
576	RNE-5 Barcelona	Spain	20	B
585	FIP Paris	France	8	E,I,O
585	RNE-1 Madrid	Spain	200	E,H*,J
594	Frankfurt	Germany	400	D,H*,I
603	Lyon	France	300	H*
603	BBC-R4 Newcastle	UK	2	H*
612	Kiel	Germany	10	D
612	RTE-2 Athlone	Ireland (S)	100	A,H*,I,J
621	RTBF-1 Wavre	Belgium	80	A,D,I,O
630	Vigra	Norway	100	H*,J*
639	La Coruna	Spain	100	H*
648	BBC Drfordness	UK	500	I,J
657	BBC Wrexham	UK	2	D
666	R.Vilnius	USSR	500	H*
675	Marseille	France	600	B,J
675	Hilversum-3 Lopic	Holland	120	A,D,H*,I,O
684	RNE-1 Sevilla	Spain	250	H*
702	Aachen/Flensburg	Germany	5	D
711	Rennes 1	France	300	D,E,I
711	Heidelberg	Germany	5	D
720	Langenberg	Germany	200	I
720	BBC-R4 Lisnagarvey	Ireland (N)	10	A
720	BBC-R4 London	UK	0.5	D,I
729	RTE-1 Cork	Ireland (S)	10	G,H*,I,J
738	Paris	France	4	I
738	RNE-1 Barcelona	Spain	250	H*
747	Hilversum-2 Flevo	Holland	400	A,D,E,H*,I,O
756	Brunswick	Germany	800/200	E,H
756	BBC-R4 Redruth	UK	2	A,I
774	BBC-R4 Enniskillen	Ireland (N)	1	H*
783	Burg	Germany	1000	H*
792	Limoges	France	300	A
810	BBC-Scot.Westerglen	UK	100	A,D,H*,I,J
846	Rome	Italy	540	J
855	Murcia	Spain	125	I,J*
864	Paris	France	300	D,I,O
873	AFN via Frankfurt	Germany	150	H*,J*
882	BBC-Wales Washford	UK	70	A,D,E,H*,I,J
891	Algiers	Algeria	600/300	B,E*,H*
891	Hulsberg	Holland	20	D
927	BRT-1 Wolvertem	Belgium	300	A,D,I,J
936	Bremen	Germany	100	H*
963	Pori	Finland	600	D,H*,J
972	Hamburg	Germany	300	D,H*,J
981	Alger	Algeria	600/300	H*
1008	Hilversum-5 Flevo	Holland	400	A,O,I,J,O
1017	Wolfsheim	Germany	600	H*,I
1044	Dresden	Germany	250	H*
1062	Kalundborg	Denmark	250	D,E
1071	Brest	France	20	H*,I,J*
1071	Lille	France	40	D,E
1098	RNE-5	Spain	10	H*
1107	AFN via Munich	Germany	40	H*,J*
1125	La Louviere	Belgium	20	D,H*,I
1134	Zadar	Yugoslavia	1200	H*,I
1143	AFN via Stuttgart	Germany	10	D,H*
1143	Century R. Dublin	Ireland (S)	?	H*,L*
1143	Kaliningrad	USSR	150	J
1161	Strasbourg (F.Int)	France	200	H*
1179	Solvesborg	Sweden	600	D,H*,J
1188	Kuurne	Belgium	5	I
1188	Szolnok	Hungary	135	D
1197	VOA via Munich	Germany	300	H*,J
1197	BBC-R3 Enniskillen	Ireland (N)	1	H*
1206	Bordeaux	France	100	H*
1233	Liege	Belgium	5	D
1233	Melnik	Czechoslovakia	400	J*
1251	Huisberg	Netherlands	10	H*
1260	VOA via Rhodes	Greece	500	A
1260	Valencia	Spain	20	H*
1269	Neuminster	Germany	600	D,H*,J
1278	RTE-2 Dublin/Cork	Ireland (S)	10	D,E*,G,H*,I
1296	Kardzali	Bulgaria	150	H*
1296	BBC Drfordness	UK	500	E*,H*,O
1314	Kvitsoy	Norway	1200	A,D,H*,I,J
1323	BBC Zyyi	Cyprus	50	F
1323	R.Moscow via Leipzig	Germany	150	H*
1332	Rome	Italy	300	H*
1341	BBC-Ulst.Lisnagarvey	Ireland (N)	100	A,D,I
1350	Nancy/Nice	France	100	H*
1359	Berlin	Germany	250/100	D*,J
1359	Bhadravathi	India	20	F
1368	Manx Radio, Foxdale	IOM.	20	G,H*,K
1377	Lille	France	300	A,I,O
1386	Kaliningrad	USSR	500	J
1395	R.Tirana via Lushnje.	Albania	1000	H*,M*
1404	Brest	France	20	I
1413	RCE Zaragoza	Spain	20	J*
1422	Heusweiler	Germany	1200/600	H*,I
1440	Marnach	Luxembourg	1200	D,H*,I,J
1458	R.Tirana, Lushnje	Albania	500	D*
1467	TWR Monte Carlo	Monaco	1000/400	C,E*,J
1476	Wien-Bisamberg	Austria	600	H*
1503	Stargard	Poland	300	E*,H*,J*,M*
1512	BRT Wolvertem	Belgium	600	D,E*,I,J,M*
1521	Cizatice	Czechoslovakia	?	H*
1530	Vatican Radio, Rome	Italy	150/450	D*,E*
1539	Mainflingen	Germany	700	D*,H*,J
1566	Bandarabbas	Iran	100	F
1575	Burg	Germany	250	H*,J
1593	Langenberg	Germany	400/800	D,H*

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

DXers:
A: Noel Carrington, Sutton in Ashfield.
B: Jim Cash, while in Majorca.
C: Bill Clark, Rotherham.
D: Ron Galliers, Old Hunstanton.
E: Sheila Hughes, Morden.
F: Rhoderick Illman, Thumrait, Oman.
G: Bryan Kimber, Hereford.
H: Eddie McKeown, Co.Down.
I: George Millmore, Wootton IOW.
J: Sid Morris, Rowley Regis.
K: John Parry, Northwich.
L: Roy Patrick, Derby.
M: Chris Shorten, Norwich.
N: John Stevens, Largs.
O: Phil Townsend, E.London.

and RFI on 25.820 were heard. During a visit to N.Wales, **Alan Roberts** took his Panasonic RF-B40 portable to the summit of Tal-y-Fan (610m a.s.l.) and logged the Voice of the UAE, Abu Dhabi 25.690 as 45444 at 1125; RNI Oslo 25.730 (Norw to S.America 1100-1130) as 35333 at 1130; DW via Julich 25.740 (Ger to Far East, Pacific 1100-1200 as 25222 at 1205; RFI 25.820 as 55555 at 1125, but 25222 at 1415; HCJB Quito, Ecuador 25.950 (u.s.b. + p.c. 24 hrs) as 25222 at 1540.

The 21MHz Band

Good reception over long distances has been noted in the **21MHz (13m)** band during some days. Radio Australia's broadcasts to Asia via Carnarvon 21.775 (Eng 0100-1000) were 34433 at 0629 with **Darran Taplin** in Brenchley; to C/SE Asia via Darwin 21.525 (Eng 0100-0800) as 44444 at 0635 by **Chris Shorten** in Norwich; to SE.Asia, M.East via ? 21.720 (Eng 1100-1330) as 34443 at 1305 by **David Edwardson** in Wallsend.

Some broadcasts to Europe come from HCJB Quito 21.455 (u.s.b. + p.c. 0000-2400), rated 35434 at 0716 by **Denis Bosher** in Dolgellau, 33333 at 1500 in Co.Down and 25554 at 1900 by **John Robertson** in Alnwick; Voice of the UAE in Abu Dhabi 21.515 (Ar 0600-1500) SIO454 at 1000 in Edinburgh; UAE R.Dubai 21.605 (Ar, Eng 0615-1640, also to N.Africa) SIO444 at 1345 in E.London; WSHB Cypress Creek 21.780 (Eng 1800-2000) 54444 at 1940 by **Darren Beasley** in Bridgwater; VOFC Taipei, Taiwan 21.720 (Eng 2200-2300) SIO544 at 2215 by **Bryan Kimber** in Hereford.

Those to other areas include the BBC via Tsang Tsui 21.715 (Eng to E.Asia 0300-0900), logged as 32322 at 0708 by **Rhoderick Illman** in Thumrait, Oman; R.Austria Int via Moosbrunn 21.490 (Ger, Fr, Eng to M.East 0500-0800) SIO433 at 0730 by **Cyril Kellam** in Sheffield; R.Prague, Czechoslovakia 21.705 (Eng to Asia, Pacific 0730-0800) 44444 at 0740 in Morden; BRT via Wavre 21.815 (Eng, Fr, Du, Sp to Africa 0900-1155), heard at 0900 by **Don Phillips** in Bridlington; R.Denmark via RNI 21.705 (Da to USA 1230-1255) SIO454 at 1240 in New Radnor; BSKSA Riyadh, Saudi Arabia 21.505 (Ar to N.Africa ?-1700) SIO434 at 1420 by **Cliff Stapleton** in Torquay; BBC via Limassol 21.470 (Eng to M.East, E.Africa 0900-1615) SIO444 at 1615 in Winchester; BBC via Ascension Island 21,660 (Eng to S.Africa 0700-1745) SIO333 at 1715 in Grimsby; WCSN Scotts Corner 21.640 (Eng to S.Africa 1800-2000) SIO343 at 1934 by **Zacharias Liangas** in Thessaloniki, Greece; WYFR Okeechobee 21.525 (Ar, Fr, Port, Eng to W.Africa 1600-2300), heard by **Julian Wood** in Elgin; R.Norway Int. Oslo 21.705 (Norw to S.America 2200-2230) 44333 at 2200 by **Paul Hilton** in Newbury.

The **17MHz (16m)** signals from R. New Zealand Int. are intended for the Pacific areas, but some mornings they have been audible in the UK. Their 100kW signal via Rangataiki, N.Island on 17.770 (Eng 2200-0730) was rated 32222 at 0535 by **Alan Smith** in Northampton and 42333 at 0557 in Majorca. Some of R.Australia's broadcasts were also logged here. Their transmission to Pacific areas via Shepparton 17.715 (Eng 2200-0530) was noted as 24432 at 0415 in Wallsend; to Asia via Darwin 17.750 (Fr, Eng 0600-0800) as 33534 at 0625 in Brenchley; to S.Asia via Carnarvon 17.630 (Eng 1430-1800) as SIO444 at 1740 by **Philip Rambaut** in Macclesfield.

Among the other broadcasts noted in this band were Vatican R, Rome 17.730 (Eng to Africa 0500-0530), rated 32344 at 0515 in Newbury; R.Japan via Yamata 17.890 (Jap, Eng to Oceania 0600-0800) 44444 at 0745 in Norwich; R.Cairo, Egypt 17.595 (Eng to S.Asia 1215-1330) 33332 at 1241 in Oman; Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) SIO433 at 1345 in Hereford; R.Romania Int, Bucharest 17.720 (Eng to Asia, Pacific areas 1500-1530) SIO444 at 1500 in Sheffield; P.Pakistan, Islamabad 17.555 (Eng to M. East 1600-1630) SIO343 at 1610 in Torquay; DW Cologne, Germany 17.875 (Ger to Asia 1600-1800) SIO444 at 1625 in Winchester; RSA Johannesburg, S.Africa 17.790 (Eng to W.Africa 1700-1800), heard at 1700 in Bridlington; R.Surinam via RNB Brasilia 17.755 (Du, Eng to Europe 1700-1745) SIO3333 at 1730 in Grimsby; HCJB Quito 17.790 (Eng to Europe 1900-2000) SIO444 at 1920 in Edinburgh; RHC Havana, Cuba 17.815 (Fr, Eng to Europe 1900-2100) 53434 at 2003 by **Noel Carrington** in Sutton in Ashfield; R.Sofia, Bulgaria 17.825 (Port to Africa 1930-2030) 53443 at 2005 in Bridgwater; Voice of Israel, Jerusalem 17.575 (Eng to Africa, S.America 2130-2200) SIO333 at 2130 by **Alf Gray** in Birmingham; Voice of the UAE in Abu Dhabi 17.855 (Eng to USA 2200-0000) 44444 at 2200 in Morden.

The 15MHz Band

In the **15MHz (19m)** band, potent signals have often reached the UK from R.Australia via Shepparton. Their transmission to Pacific areas on 15.240 (Eng 2200-0930) was rated SIO444 at 0700 in Sheffield; to Asia on 15.320 (Eng 2030-0800) as SIO433 at 0615 by **Francis Hearne** in Bristol.

Many broadcasters use 19m to reach listeners in Europe. Among them are R.Japan via Yamata 15.325 (Eng 0700-0800), rated 43333 at 0707 in Co.Down; HCJB Quito 15.270 (Eng 0700-0830) 54444 at 0815 in Dolgellau; RCI via Sackville 15.315 (Eng 1400-1429) SIO454 at 1400 in New Radnor; R.Algiers via Bouchaoui 15.160 (Fr 0700-1800), heard at 1730 in Bridlington; Voice of Vietnam, Hanoi 15.010 (Eng, Fr, Sp, Ger 1800-2130) 45544 at 1800 in Alnwick; RNB Brasilia, Brazil 15.265 (Eng, Ger,

Local Radio DX Chart

Freq kHz	Station	BBC ILR	Power kW	DXer
558	Spectrum R.	I	7.50	B,D,F*,G,I,J,L
585	R.Solway	B	2.00	D,H*,L
603	Invicta Snd(Coast).	I	0.10	D,F,I,M
603	R.Gloucester	B	0.10	D,E*,G,I,J
630	R.Bedfordshire	B	0.20	A,D,E,F,G,I,J,M
630	R.Cornwall	B	2.00	G,I
657	R.Clwyd	B	2.00	D,F,G,H*,I,J
657	R.Cornwall	B	0.50	I
666	DevonAir R.	I	0.34	E,F,G,I
666	R.York	B	0.80	D,F
729	BBC Essex	B	0.20	D,F,I,J,M
738	Hereford/Worcester.	B	0.037	D,E,G,I,J
756	R.Cumbria	B	1.00	H*
756	R.Shropshire	B	0.63	D,G,I,J
765	BBC Essex	B	0.50	D,F,G,I,J
774	R.Kent	B	0.70	D,I,M
774	R.Leeds	B	0.50	A,D
774	Severn Sound (3CR).	I	0.14	E*,G,I,J
792	Chiltern R.	I	0.27	D,G,I,J,M
801	R.Devon	B	2.00	D,G,H*,I,J
819	Hereford/Worcester.	B	0.037	D,G,I,J
828	Chiltern Radio	I	0.20	D,E,H*,M
828	R.WM	B	0.20	G,J
828	2CR	I	0.27	E,I
837	R.Furness	B	1.00	H*
837	R.Leicester	B	0.45	A,D,F,G,I,J,M
855	R.Devon	B	1.00	G,I
855	R.Lancashire	B	1.50	H*,L
855	R.Norfolk	B	1.50	D,F,M
873	R.Norfolk	B	0.30	A,D,F,H*,I,L
936	GWR (Brunel R.)	I	0.18	D,E,G,I,J
945	R.Trent (GEM-AM)	I	0.20	A,G,I,J
954	DevonAir R.	I	0.32	F,I
954	R.Wyvern	I	0.16	D,E*,G,I,J
990	WABC (Nice & Easy).	I	0.09	G,J
990	R.Aberdeen	B	1.00	H*
990	R.Devon	B	1.00	F,G,I
990	Hallam R.(C.Gold)	I	0.25	D
999	R.Solent	B	1.00	F,G,I
999	R.Trent (GEM-AM)	I	0.25	A,D
1017	WABC Shrewsbury	I	?	A,C,D,G,I,J,K
1026	R.Cambridgeshire	B	0.50	A,D,F,G,M
1026	Downtown R.	I	1.70	K*
1026	R.Jersey	B	1.00	F,G,I
1035	Northsound Radio	I	0.78	D
1035	R.Kent	B	0.50	G,I,M
1035	West Sound	I	0.32	A
1107	R.Northampton	B	0.50	D,G,H*,I,J
1116	R.Derby	B	1.20	A,D,G,J
1116	R.Guernsey	B	0.50	G,I
1152	BRMB (Xtra-AM)	I	3.00	E,G,J
1152	LBC (L.Talkback R).	I	23.50	I
1152	R.Broadland	I	0.83	D,E*
1161	GWR (Brunel R.)	I	0.16	E,G
1161	R.Bedfordshire	B	0.10	A
1161	R.Sussex	B	1.00	F
1161	Viking R.(C.Gold)	I	0.35	D
1170	Ocean Sd.(SCR)	I	0.12	F,I
1170	R.Orwell	I	0.28	D
1170	Signal R.	I	0.20	A,J
1170	Swansea Sound	I	0.58	E,G
1170	TFM Radio (GNR)	I	0.32	H*
1242	Invicta Snd(Coast).	I	0.32	D,F
1242	Isle of Wight R.	I	0.50	G,I
1251	Saxon R.	I	0.76	D
1260	GWR (Brunel R.)	I	1.60	F,G,I
1260	Leicester (GEM-AM).	I	0.29	D,J
1260	Marcher Sound	I	0.64	H*
1278	Pennine R.(C.Gold).	I	0.43	I
1305	R.Hallam (C.Gold)	I	0.15	D
1305	Red Dragon (Touch).	I	0.20	A,E,G,I,J
1323	R.Bristol (Som.Snd)	B	0.63	E,G,J
1323	S'thern Sound(SCR).	I	0.50	I,M
1332	Hereward R.	I	0.60	A,D,M
1332	Wiltshire Sound	B	0.30	G,I
1359	Mercia Snd(Xtra-AM)	I	0.27	A,D,J
1359	Red Dragon (Touch).	I	0.20	E,G
1359	R.Solent	B	0.85	I
1368	R.Lincolnshire	B	2.00	A,D,H*
1368	R.Sussex	B	0.50	F,I
1368	Wiltshire Sound	B	0.10	G,I,J
1413	Sunrise R.	I	?	I,M
1431	Essex R.(Breeze)	I	0.35	D,L*,M
1431	Radio 210	I	0.14	G,I
1449	R.Cambridgeshire	B	0.15	A,D,G
1458	GLR	B	50.00	D,I
1458	Radio WM	B	5.00	A,D,G,J
1476	C'ty Snd(1st Gold).	I	0.50	D,F*,G,I
1485	R.Humberside	B	1.00	A,D
1485	R.Merseyside	B	1.20	G,H*,J
1485	R.Oxford	B	0.50	A,E,G,I
1485	R.Sussex	B	1.00	F,I
1503	R.Stoke-on-Trent	B	1.00	A,D,G,I,J
1521	R.Mercury	I	0.64	I
1521	R.Nottingham	B	0.50	A,D,G,J
1530	Pennine R.(C.Gold).	I	0.74	A,D
1530	R.Essex	B	0.15	F,I
1530	R.Wyvern	I	0.52	G,H*,I,J
1548	Capital R. (Gold)	I	97.50	A,G,I
1548	R.Bristol	B	5.00	G
1548	R.Hallam (C.Gold)	I	0.74	D
1557	Chiltern R.(Gold)	I	0.76	A,D,G,H*
1557	Ocean Sound (SCR)	I	0.50	F
1584	Gatwick	I	?	F,I
1584	Heathrow	I	?	F
1584	R.Nottingham	B	1.00	D,H
1584	R.Shropshire	B	0.50	G,J
1602	R.Kent	B	0.25	D,I,K,M

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

DXers:
A: Noel Carrington, Sutton-in-Ashfield
B: Jim Cash, Swanwick.
C: Bill Clark, Rotherham
D: Ron Galliers, Old Hunstanton
E: Francis Hearne, Bristol.
F: Sheila Hughes, Morden
G: Bryan Kimber, Hereford.
H: Eddie McKeown, Co.Down.
I: George Millmore, Wootton, I.O.W
J: Sid Morris, Rowley Regis.
K: John Parry, Northwich.
L: Roy Patrick, Derby.
M. Phil Townsend, E.London.

long medium & short

1800-?) 33233 at 1800 in Northampton; SLBC Colombo, Sri Lanka 15.120 (Eng 2000-2130, also to Middle East) SIO444 at 2025 in Hereford; R.Korea, Seoul 15.575 (Eng 2030-2130) 44444 at 2053 in Brenchley; Voice of Israel, Jerusalem 15.640 (Eng 2130-2200) SIO434 at 2150 in Torquay; WWCR Nashville 15.690 (Eng, Sp 1200-0000) 24332 at 2250 in Thessaloniki, Greece.

There are many broadcasts to other areas including SLBC Colombo, Sri Lanka 15.425 (Eng to Asia 0030-0430), noted as 42333 at 0415 in Thumrait, Oman; RFI via Allouis 15.300 (Fr to C.Africa 0600-0800) 43333 in Old Hunstanton; RFO Papeete, Tahiti 15.170 (Fr, Tah to SE.Pacific 1600-0930) SIO111 at 0930 in Macclesfield; DW via Julich 15.105 (Ger to Pacific areas, Australia 0800-1000) SIO443 at 0935 in Winchester; Voice of Israel, Jerusalem 15.650 (Eng to Australia, Asia 1000-1030) 44333 at 1000 in Morden; AIR via Aligarh 15.050 (Eng to Asia 1000-1100) 34333 at 1005 in Bridgwater; Voice of Greece via Kavala 15.640 (Gr, Eng to USA 1200-1250) 55545 at 1240 in Norwich; R.Japan via Sri Lanka 15.345 (Eng to ? 1700-1800) 43433 at 1717 in Wallsend; Voice of the UAE, Abu Dhabi 15.305 (Eng to N.Africa? 2200-0000) SIO444 at 2300 by **Neil Wheatley** in Lytham St.Annes.

Quite often the **13MHz (22m)** broadcasts from R. Australia have reached the UK at remarkable strength. Their transmission to S.Asia via Carnarvon 13.745 (Eng 1530-2100) was rated SIO444 at 1950 in Largs. Good reception has also been noted from R.New Zealand Int on 13.785 (Eng to Pacific areas 1800-2200, Sun to Fri). In Rotherham **Bill Clark** rated their signal SIO333 at 1830.

Occupants of this band include

DXers:
A: Kenneth Buck, Edinburgh.
B: Jim Cash, Majorca.
C: John Coulter, Winchester.
D: Francis Hearne, Bristol.
E: Sheila Hughes, Morden.
F: Eddie McKeown, Co.Down.
G: George Millmore, Wootton, IOW.
H: Sid Morris, Rowley Regis.
I: Fred Pallant, Storrington.
J: Phil Townsend, E.London.

Long Wave DX Chart

Freq kHz	TX Location	Country	Power kW	DXer
153	Bechar	Algeria	1000	I*
153	Donebach	Germany	500	A,E,F,G,I,J
153	Brasov	Romania	1200	A
162	Allouis	France	2000	A,B,E,F,G,H,I,J
171	Kaliningrad	USSR	1000	A,E,F*,G,H,I,J
177	Oranienburg	Germany	750	A,E,F*,G,H*,I,J
183	Saarlouis	Germany	2000	A,B,E,F,G,H,I,J
189	Motala	Sweden	300	A
189	Tbilisi	USSR	500	I*
198	BBC Droitwich	UK	500	B*,E,F,G,H,J
198	BBC Westerglen	UK	50	A
207	Munich	Germany	500	A,E*,F*,G,H*,I,J
207	Azilal	Morocco	800	I*
216	Roumoules	Monaco	1400	A,B,E*,F*,G,H,I,J
216	Oslo	Norway	200	A,F*
225	Konstantinow	Poland	2000	A,E*,F*,H,I,J
225	TRT-1 Van	Turkey	600	C
234	Junglinster	Luxembourg	2000	A,F,G,H,I,J
243	Kalundborg	Denmark	300	A,E,G,I,J
252	Tipaza	Algeria	1500	B,E*,I*
252	Atlantic 252	S.Ireland	500	A,D*,E*,F,G,H,I,J
261	Burg	Germany	200	G,J
261	Moscow	USSR	2000	A,E,H,I
270	Topolna	Czechoslovakia	1500	A,E*,F*,G,H,I,J
279	Minsk	USSR	500	A,F*

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

Tropical Bands Chart

Frequency MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2100	F
2.325	ABC Tennant Creek	Australia	2100	F
2.485	ABC Katherine	Australia	2100	F
3.200	TWR	Swaziland	1940	N
3.210	R.Mozambique	Mozambique	0322	C
3.215	R.Orange	S.Africa	2130	C,E,F,R
3.220	R.HCJB Quito	Ecuador	0400	F
3.220	R.Togo, Lome	Togo	2301	C,N,X
3.225	RRI Tanjung Pinang	Indonesia	2200	N
3.240	TWR	Swaziland	2100	N,R
3.255	BBC via Maseru	Lesotho	2100	C,I,R
3.270	SWABC 1, Namibia	S.W.Africa	2100	C,F,N,D,R,X
3.280	R.Beira	Mozambique	0305	C,N
3.295	Reykjavik	Iceland	2230	F,R
3.300	R.Cultural	Guatemala	0330	C
3.315	SLBS Freetown	Sierra Leone	2100	R,X
3.320	R.Orion	S.Africa	2000	C,F,R
3.320	R.Suid Afrika	S.Africa	1900	N
3.325	FRCN Lagos	Nigeria	2218	C,N,R
3.330	R.Kigali	Rwanda	2045	C,L,N,X
3.355	R.Botswana	Gabarone	0255	C,R
3.365	R.Rebelde, La Julia	Cuba	0300	E
3.365	AIR New Delhi	India	1800	N
3.365	GBC Radio 2	Ghana	2030	C,D,E,L,O,P,R,S,V,X
3.370	R.Beira	Mozambique	1800	N
3.380	R.Malawi	Malawi	1815	N
3.385	RFO Cayenne	Fr.Guiana	2036	M
3.390	R.Candip Bunia	Zaire	1800	N
3.472	R.Alfonso Padilla	Bolivia	0015	X
3.915	BBC Kranji	Singapore	2220	I,R,X
3.950	PBS Qinghai Xining	China	2200	N,R
3.955	BBC Daventry	England	2048	D,G,L,W
3.965	RFI Paris	France	2120	D,H,L,R,W
3.970	R.Buca	Cameroon	2100	N
3.980	VOA Munich	W.Germany	2052	D,L,S,W
3.985	R.Beijing, China	via SRI Berne	2120	B,D,G,J,K,R,T
3.985	SRI Berne	Switzerland	1912	R,T,W
3.995	DW Cologne (Julich)	W.Germany	2100	O,H,L,R,T
4.000	Bofoussam	Cameroon	2035	O
4.035	PBS Xizang Lhasa	Tibet	2210	N
4.040	R.Yerevan 1	USSR	2230	R
4.220	PBS Xinjiang	China	2200	C,R
4.470	R.Movima	Bolivia	0000	F,X
4.500	Xinjiang	China	2210	C,N,R
4.735	Xinjiang	China	2200	B,C,H,K,R
4.740	R.Afghanistan	via USSR	1740	K
4.750	R.Bertoura	Cameroon	1954	J,O
4.760	R.Moscow (Dushanbe)	USSR	2342	L
4.765	Brazzaville	Pep.Rep.Congo	2006	B,C,D,J,K,L,O,Q,R,T,X
4.770	FRCN Kaduna	Nigeria	1910	B,D,H,K,O,R,V,X
4.775	Kabul City Service	Afghanistan	2015	N
4.775	RRI Jakarta	Indonesia	1959	C,N
4.785	RTM Bamako	Mali	2033	O
4.790	R.Atlantida	Peru	2310	X
4.790	TWR Manzini	Swaziland	1800	N,O,R
4.795	R.Douala	Cameroon	2030	A,K,O
4.800	AIR Hyderabad	India	1630	N
4.800	LNBS Lesotho	Maseru	1912	I,O,R,X
4.805	R.Nac.Amazonas	Brazil	2330	R
4.810	R.Yerevan 2	USSR	2344	L
4.815	R.diff TV Burkina	Ouagadougou	2000	N,O,R
4.820	R.Moskva 4 (Khanty-M)	USSR	2053	D,O,R
4.825	R.Cancao Nova	Brazil	2240	X
4.825	R.Moscow	USSR	2053	D,H,L,O
4.830	Gaborone	Botswana	1910	N,O
4.830	R.Tachira	Venezuela	0015	C,F
4.832	R.Reloj	Costa Rica	0400	R
4.835	RTM Bamako	Mali	2044	C,D,K,L,O,R
4.840	R.Valera, Trujillo	Venezuela	0018	F
4.485	R.Kek'chi, Fray Bme	Guatemala	0020	F
4.845	ORTM Nouakchott	Mauritania	2044	B,D,O,R
4.850	R.Yaounde	Cameroon	1916	A,D,H,L,O,R,V
4.850	R.Tashkent 2	USSR	2347	L
4.855	R.Aruana	Brazil	0120	X
4.860	AIR New Delhi	India	1755	N
4.865	PBS Lanzhou	China	2055	O
4.865	Caracol	Colombia	0630	R
4.865	V of Cinaruco	Colombia	0220	N
4.870	R.Cotonou	Benin	1900	O,R,X
4.875	R.Tbilisi	USSR	2030	R
4.885	Voice of Kenya	Kenya	1852	O
4.895	R.Moscow (Kalinin)	USSR	2130	R
4.900	V. of the Strait 2	China	2230	N,R
4.900	V de la Rev.Conakry	Guinea	2040	O,X
4.902	Voz de Saquisili	Ecuador	0108	F
4.905	R.Nat.N'djamena	Chad	1913	H,K,O,R
4.910	R.Zambia, Lusaka	Zambia	1800	I,O,R
4.915	R.Anhanguera	Brazil	2330	R
4.915	R.Ghana, Accra	Ghana	2040	K,O,R
4.915	Voice of Kenya	Kenya	1914	O
4.925	R.Nacional, Bata	Eq.Guinea	1930	R
4.930	R.Moscow	USSR	1914	B,O,H,O,R
4.935	Voice of Kenya	Kenya	1914	C,F,I,L,O,R,S,U,V
4.940	R.Abidjan	Ivory Coast	2140	X
4.940	R.Kiev 2	USSR	1914	D,K,L,O
4.950	R.Nac.Luanda	Angola	1914	O
4.950	R.Madre de Dios	Peru	0032	F
4.955	R.Marajoara, Belem	Brazil	0020	C,F
4.958	R.Baku	USSR	2000	R
4.965	R.Alvorada	Brazil	2330	R
4.970	R.Rumbos, Caracas	Venezuela	0230	R,X
4.975	R.Uganda, Kampala	Uganda	1915	I,O,R,V
4.980	Ecos del Torbes	Venezuela	2200	F,R
4.985	R.Brazil Central	Brazil	0030	F
4.990	AIR via Madras	India	2358	V
4.990	FRCN Lagos	Nigeria	1915	D,K,O,R,V
4.990	R.Ancash, Huaraz	Peru	0315	X
4.995	R.Andina, Huancayo	Peru	0000	N
5.005	R.Nacional, Bata	Eq.Guinea	1915	A,C,D,L,O,Q,R
5.005	R.Nepal, Kathmandu	Nepal	1640	N
5.010	R.Garoua	Cameroon	2047	O
5.010	SBC Singapore	Singapore	2250	X
5.015	R.Brazil Tropical	Brazil	0030	F
5.020	La Voix du Sahel	Niger	2220	K
5.025	R.Parakou	Benin	1917	O
5.025	R.Rebelde, Habana	Cuba	0000	R
5.025	R.Uganda, Kampala	Uganda	1830	R
5.030	R.Catolica, Quito	Ecuador	2330	F,N
5.030	R.Los Andes	Peru	0300	X
5.035	R.Aparecida	Brazil	0035	F
5.035	R.Bangui	C.Africa	1915	O,R
5.035	R.Alma Ata	USSR	2200	R
5.035	R.Tashkent	USSR	2230	X
5.040	Vos del Upano, Macas	Ecuador	0020	F,N
5.040	R.Tbilisi 1	USSR	1940	H
5.045	R.Cultura do Para	Brazil	0030	E,F,L,N,R
5.047	R.Togo, Lome	Togo	2047	C,D,L,O,Q,R
5.050	SBC Singapore	Singapore	2255	X
5.055	RFO Cayenne(Matoury)	French Guiana	0503	D
5.060	PBS Xinjiang	China	2300	R
5.065	R.Candip, Bunia	Zaire	1918	O
5.075	Caracol Bogata	Colombia	0430	R
5.260	R.Alma Ata 2	USSR	2100	B,R

DXers:
A: Jim Cash, while in Majorca.
B: Bill Clark, Rotherham.
C: David Edwardson, Wallsend.
D: Ron Galliers, N.London.
E: Bill Griffith, W.London.
F: Simon Hamer, New Radnor.
G: Robin Harvey, Bourne.
H: Sheila Hughes, Morden.
I: Rhoderick Illman, Thumrait, Oman.
J: Bryan Kimber, Hereford.
K: Zacharias Liangas, Thessaloniki, Greece.
L: Eddie McKeown, Co.Down.
M: John Nash, Brighton.
N: Sergei Oleynik, Ukraine.
O: Fred Pallant, Storrington.
P: John Parry, Northwich.
Q: Roy Patrick, Derby.
R: Don Phillips, Bridlinmgton.
S: Johm Robertson, Alnwick.
T: Chris Shorten, Norwich.
U: Alan Smith, Northampton.
V: Darran Taplin, Brenchley.
W: Phil Townsend, E.London.
X: Jim Willett, Grimsby.

R.Austria Int, Moosbrunn 13.730 (Ger, Fr, Eng, Sp, Ar to Europe 0400-1655), logged as 44444 at 0646 in Old Hunstanton; RFPI Costa Rica 13.630 (Eng to ?) 15321 at 0855 in Bridgwater; SRI via Sottens 13.685 (It, Eng, Ger, Fr to Pacific areas 0745-1030), heard at 1000 in Bridlington; KHBI Saipan, N.Mariana Islands 13.625 (Eng to S.Asia 1400-1800) 42333 at 1550 in Oman; R.Pakistan, Islamabad 13.665 (Eng to M. East 1600-1630) 54344 at 1620 in Norwich; ISBS Reykjavik, Iceland 13.855 (Ic to Europe 1855-1930) 44444 at 1900 in Morden; KSDA Agat, Guam 13.720 (Eng to NE.Asia 1900-2000) SIO333 at 1910 in Grimsby; WHRI Noblesville 13.760 (Eng to USA, Europe 1600-0000) SIO444 at 1925 in Edinburgh; Voice of Israel, Jerusalem 13.750 (Heb to C.Europe 0400-2310) 45444 at 1930 by **Roy Patrick** in Derby; WSHB Cypress Creek 13.770 (Eng to USA, W.Europe 2000-2200) 43333 at 2000 in Newbury; R.Austria Int, Moosbrunn 13.730 (Ger, Fr, Eng, Sp to Africa 1700-2100) 44554 at 2005 in Wallsend; DW via Julich, Germany 13.780 (Eng to SE.Asia, Australia 2100-2150) 34333 at 2100 in Thessaloniki, Greece; Voice of the UAE, Abu Dhabi 13.605 (Ar, Eng to N.Africa 2200-0000) SIO343 at 2200 in Torquay.

The 11MHz Band

There is plenty to interest the listener in the **11MHz (25m)** band. Among the signals noted in the morning were R.Tirana, Albania 11.825 (Eng to USA 0330-0400), heard at 0330 in Bridlington; RHC Havana, Cuba 11.760 (Eng to USA, C.America 0400-0600), rated 45554 at 0500 by **John Parry** in Northwich; HCJB Quito 11.835 (Cz, Sw, Ger, Fr, Eng to Europe 0500-0630) 43323 at 0633 in Old Hunstanton; KNLS Anchor Point 11.715 (Eng to E/N.Asia 0800-0900) SIO222 at 0805 in Grimsby; R.Korea via Sackville 11.715 (Eng to E.USA 1030-1100) 33333 at 1045 in Norwich; BBC via Kranji 11.750 (Eng to SE.Asia 1030-1615) 43333 at 1110 in Oman.

Later, R.Romania Int, Bucharest 11.940 (Eng to Europe 1300-1400) was rated 54444 in Sutton in Ashfield; the Voice of the Mediterranean, Malta 11.925 (Eng to N.Africa 1400-1600) 44433 at 1455 in Brenchley; KTWR Agana, Guam 11.650 (Eng to S.Asia 1445-1700) 22222 at 1515 in Morden; BBC via Skelton 12.095 (Eng to N/W.Africa 0900-2315) 54544 at 1517 in Majorca; R.Pakistan, Islamabad 11.570 (Eng, Ur to Europe 1700-1900) 55555 at 1700 by **Bill Griffith** in W.London; R.Finland via Pori 11.755 (Fin to Europe 1700-1930) SIO444 at 1710 in Winchester; R.Beijing, China 11.575 (Eng to E/S.Africa 1700-1800) 42432 at 1712 in Bridgwater; R.Zanzibar, Dole 11.734 (Swa to E.Africa 1500-1830) SIO343 at 1800 in New Radnor; AIR via Aligarh 11.620 (Hi, Eng to Europe 1845-2230), noted as 'good' in Elgin; RNE via Aganda 11.790 (Eng to Europe 1900-2000) SIO433 at 1930 in Birmingham; RAI Rome 11.800 (Eng to Africa 1935-1955) SIO434 at 1935 in Sheffield; R.Beijing via Mali 11.500 (Eng to E/S.Africa 2030-2130) 34533 at 2033 in Wallsend; R.Damascus, Syria 12.085 (Eng to Europe, USA 2005-2105) 43333 at 2056 by **Robin Harvey** in Bourne; R.Yugoslavia, Belgrade 11.735 (Eng to Europe 2100-2145) 45444 at 2100 in Derby; R.Nederlands via Flevo 11.660 (Eng to W.Africa 2030-2125) 44444 at 2120 in Thessaloniki, Greece; AIR via Aligarh 11.715 (Eng to Pacific areas 2045-2230) SIO444 at 2215 in Bristol; R.Nac.Amazonas, Brazil 11.780 (Port to E/S.America 0800-2300) SIO433 at 2230 in Hereford.

The 9MHz Band

The **9MHz (31m)** broadcasts to Europe include R.Polonia, Warsaw 9.675 (Eng 0630-0700) rated 55555 at 0645 in Newbury; WCSN Scotts Corner 9.840 (Eng 0600-0800) SIO433 at 0705 in Birmingham; R.Jordan, Amman 9.560 (Ar, Eng 1415-0030, also to USA) SIO433 at 1600 in Hereford; R.Pyongyang, N.Korea 9.325 (Eng 1700-1800, also to M.East, Africa) 24432 at 1702 in Wallsend; REE via Madrid? 9.620 (Sp 1600-?) SIO444 at 1719 in Winchester; VOIRI Tehran, Iran 9.022 (Eng, Fr, Ger, Sp, Ar 1800-2230) SIO444 at 1925 in Rotherham; Voice of Greece, Athens 9.395 (Gr, Eng, Fr, Ger 1900-1950) SIO444 at 1935 in Edinburgh; R.Sweden via Horby 9.655 (Fr, Sp, Eng, Ger, Sw 1900-2130) 33343 at 1930 in Co.Down; Voice of Vietnam, Hanoi 9.840 (Viet, Eng, Fr, Sp 1700-0000) 55545 at 2049 in Bourne; R.Budapest, Hungary 9.835 (Eng 2100-2130) 44444 at 2100 in Morden; R.Yugoslavia, Belgrade 9.620 (Eng 2100-2145) SIO545 at 2105 in Lytham St.Annes; R.Cairo, Egypt 9.900 (It, Ger, Fr, Eng 1800-2245) 44444 at 2205 in Thessaloniki, Greece.

Those noted to other areas were R.Rumbos, Caracus, Venezuela 9.660 (Sp to S.America 0900-0600), rated 22532 at 0015 by **Sergi Oleynik** in Kalush, Ukraine; BBC via Skelton 9.410 (Eng to N/W.Africa 0400-0730) 55555 at 0600 in Majorca; HCJB Quito 9.745 (Eng to Pacific areas 0730-1130) 33343 at 0750 in Dolgellau; R.Mediterranée Int via Nardor, Morocco 9.575 (Ar, Fr 0800-2100) 54444 at 1300 in W.London; Voice of Ethiopia, Addis Ababa 9.560 (Ar, Eng, Am, Fr to E.Africa 1400-1800) 32232 at 1550 in Thumrait, Oman; BBC via Kranji 9.740 (Eng to India 1615-1830), heard at 1830 by **D.Hammonds** (Quebec) while in Tehran, Iran; FEBC via Bocaue 9.845 (Russ, Uk to N.Asia, E.Europe 1600-1900) SIO222 at 1830 in Grimsby; Radio Australia via Carnarvon 9.860 (Eng to S.Asia 1800-2100) 33543 at 2050 by **John Nash** in Brighton; AIR via New Delhi 9.910 (Eng to Pacific areas 2045-2230) 54444 at 2045 in Norwich; R.Nacional, Paraguay 9.735 (Sp to S.America 0800-2300) 43443 at 2205 in Bridgwater; Voice of Israel, Jerusalem 9.435 (Eng to USA 2300-2330) SIO444 at 2315 in Bristol.

Among the broadcasts noted in the **7MHz (41m)** band were RFPI Costa Rica 7.375 (Eng to ?) 34343 at 0450 in Northampton; WYFR Okeechobee 7.355 (Eng to Europe 0600-0800) 33333 at 0640 in Old Hunstanton; Sudwestfunk via Rohrdorf 7.265 (Ger) 55555 at 0900 in W.London; Voice of Ethiopia, Addis Ababa 7.165 (Eng to E.Africa 1500-1600) 44333 at 1550 in Oman; RFE/RL Munich 7.165 (Ro to Europe 1500-2255) SIO444 at 1702 in Winchester; BBC via Masirah Island (Eng to Middle East 1700-1830) SIO323 at 1730 in Macclesfield; RAI Rome 7.275 (Eng 1935-1955) SIO544 at 1940 in Hereford; Voice of Nigeria, Lagos 7.255 (Eng to W.Africa 1900-2030) SIO322 at 2000 in Grimsby; R.Korea, Seoul 7.550 (Kor, Ar, Eng to M.East, Africa 1700-2130) 43343 at 2050 in Norwich; RCI via Daventry 7.235 (relay of CBS domestic programme) 55555 at 2100 in Brighton; R.Tirana, Albania 7.245 (Eng to Europe 2130-2200) 32323 at 2135 in Bourne; AIR via Aligarh 7.412 (Eng to Europe 2045-2230) SIO333 at 2200 in Rotherham; R.Polonia, Warsaw 7.270 (Esp, Fr, Eng to Europe 2130-2355) SIO444 at 2245 in Bristol.

The 6MHz Band

Some of the **6MHz (49m)** broadcasts stem from the BBC via Daventry 5.975 (Eng to Europe, N.Africa 1030-1515), rated SIO222 at 1452 in Elgin; R.Pyongyang, N.Korea 6.540 (Ar to Middle East, Africa 1700-1900) 44434 at 1800 in Greece; R.Budapest, Hungary 6.110 (It, Ro, Russ, Hung, Eng, Ger, Sp to Europe 1600-2230) SIO444 at 2000 in Birmingham; CPBS-1 Beijing, China (Chin 2000-1730) 33453 at 2005 in Northwich; BRT via Wavre 5.910 (Eng to Europe 2100-2125) 53543 at 2100 in Alnwick; BBC via Mayhe 6.005 (Eng to E.Africa 1900-2300) SIO423 at 2115 in Macclesfield; R.Nacional Amazonia, Brazil 6.180 (Port to S.America 0800-2200) 33533 at 2200 in Ukraine; ABC Perth, Australia 6.140 (Eng to W.Australia 0945-0100) SIO222 at 2300 in New Radnor; BBC via Limassol, Cyprus 6.180 (Eng to Europe, W.Asia 1700-2300), heard at 2200 in Tehran, Iran; R.Polonia, Warsaw 6.135 (Eng to Europe 2305-2355) SIO322 at 2315 in Bristol.

Station Addresses

BBC Radio WM, PO Box 206, Pebble Mill Road, Birmingham B5 7SD.
ILR Piccadilly Radio, 127-131 The Plazza, Manchester M1 4AW.
La Voix Du Zaire, Station Nationale, Boite Postale 3171, Kinshasa-Gombe, Zaire.
Qatar Broadcasting Service, PO Box 3939, Doha, Qatar.
Radio WOR, 1440 Broadway, New York, NY 10018, USA.
Radio CHRM, 800 Ouest du Phare, Matane, PQ G4W 1V7, Canada.

Abbreviations

%	per cent
a.t.u.	antenna tuning unit
Am	Amharic
Ar	Arabic
Chin	Chinese
Cz	Czechoslovakian
d.s.b.	double sideband
Da	Danish
Du	Dutch
Eng	English
Esp	Esperanto
Fin	Finnish
Fr	French
Ger	German
Gr	Greek
h.f.	high frequency
Heb	Hebrew
Hi	Hindi
Hung	Hungarian
Ic	Icelandic
It	Italian
Jap	Japanese
kHz	kilohertz
Kor	Korean
kW	kilowatt
l.w.	long wave
m	metre
M.	Middle
m.w.	medium wave
MHz	megahertz
Norw	Norwegian
Port	Portuguese
QSL	verification of contact
R.	Radio
r.w.	random wire
Ro	Romanian
Russ	Russian
s.s.b.	single sideband
s.w.	short wave
Sp	Spanish
Sw	Swedish
Swa	Swahili
Tah	Tahitian
u.s.b	upper sideband
Uk	Ukrainian
Ur	Urdu
UTC	Universal Co-ordinated Time (=GMT)

Equipment Used

Darren Beasley, Bridgwater: Philips D2935 + a t u + 10m wire
Denis Bosher, Dolgellau: Matsui MR-4099 + single loop or r.w
Kenneth Buck, Edinburgh: Lowe HF-225 + r.w. in loft or loop.
Noel Carrington, Sutton in Ashfield: Philips D2999 + built-in whip or r.w.
Jim Cash, Puerto Pollensa, Majorca: Sony ICF SW1E + r.w
Bill Clark, Rotherham: Sony ICF-SW7600 + built-in whip
John Coulter, Winchester: Yaesu FRG-7 + r.w
David Edwardson, Wallsend: Trio R600 + inverted V trap dipole
Ron Galliers, while in Old Hunstanton: Philips D2935 + a.t.u + 20m wire
Alf Gray, Birmingham: Codar CR70 + PR30 + a t u + Ex-Army whip
Bill Griffith, London: Matsui MR-4099 + 25m wire
Simon Hamer, New Radnor: Lafayette HE30 or Grundig S1400 or Sony ICF-2001D + a t u. + r.w. or magnetic loop
D Hammonds, Tehran: Sony IC 7600
Robin Harvey, Bourne: Matsui MR-4099 + s w loop
Francis Hearne, Bristol: Sharp GFA3 cassette radio + r.w
Paul Hilton, Newbury: Yaesu FRG-7700 + Datong AD270
Sheila Hughes, Morden: Sony ICF7600DS; Vega 206 + loop. Panasonic DR48 + 15m wire
Rhoderick Illman, Thumrait, Oman: Sony ICF7600DS + whip or 23m wire
Cyril Kellam, Sheffield: Sony ICF-7600DS + 25m wire
Bryan Kimber, Hereford: Zenith R7000 + inverted L antenna
Zacharias Liangas, Thessaloniki, Greece: Philips D2935 or Sony ICF 7600D + r.w
Eddie McKeown, Co Down: Tatung TMR 7602.
George Millmore, Wootton, IOW: Tatung TMR-7602 + loop or Racal RA17L + v.l.f. converter + r.w.
Sid Morris, Rowley Regis: Kenwood R5000 + r.w
John Nash, Brighton: Kenwood R5000 + Datong AD370
Sergei Oleynik, Kalush, Ukraine: Ishim-003 + 70m wire
Fred Pallant, Storrington: Trio R2000 + r.w. in loft
John Parry, Northwich: Realistic DX-400 + 33m wire.
Roy Patrick, Derby: Lowe HF-125 + 44m wire
Don Phillips, Bridlington: Yaesu FRG-8800 + a.t.u + r.w
Philip Rambaut, Macclesfield: Int.Marine R R 700M + r.w.
Alan Roberts, N.Wales: Panasonic RF-B40 + built-in whip
John Robertson, Alnwick: Lowe HF-225 + r.w
Chris Shorten, Norwich: Matsui MR-4099 + 10m wire
Alan Smith, Northampton: Matsui MR-4099 + a.t.u. + dipole
Cliff Stapleton, Torquay: Trio R1000 + dipole or 25m wire or Philips D2935
John Stevens, Largs: Hammarlund HQ 180 or Icom R-70 + loop or r.w
Darran Taplin, Brenchley: Yaesu FRG-7700 + FRA-7700 or FRT-7700 + Zepp
Phil Townsend, London: Lowe SRX-30 or Codar CR 70A + PR40 + a t u + r.w.
Neil Wheatley, Lytham St Annes: Sangean ATS-803 + built-in whip
Jim Willett, Grimsby: RCA AR77 + 4m loop or Trio 9R-59DS + a t u + X dipole
Julian Wood, Elgin: Kenwood R2000 + Yaesu FRT-7700 a t u. + 5m wire.

Long Wave Maritime Beacon Listening

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

Several listeners have been trying this aspect of our hobby for the first time. Writing from Skipton, **Steve Milner** says, "The recent column on maritime radio beacons has really captured my imagination and has opened up a new window on radio listening for me." A new Icom R72 receiver plus 20m random wire antenna enabled him to receive a number of the beacon signals from around the UK and several other countries too. The *Admiralty List of Radio Signals*, which he purchased from Kelvin Hughes Ltd in London, helped him to identify some of the beacons.

After studying the beacon chart in June *SWM*, **Taff Rees** (Worcester Park) decided to check the band. Using a Philips D2935 portable with just the built-in ferrite rod antenna, he searched the band during daylight and logged three maritime radio beacons, namely Outer Gabbard (GA), North Foreland (NF) and Cap d'Alprech, France (PH). Spurred on by these results, Taff connected a 30m random wire antenna to his portable and searched the band on several occasions. His listening took place during daylight because the high level of electrical noise prevented him from receiving any beacon signals after dark.

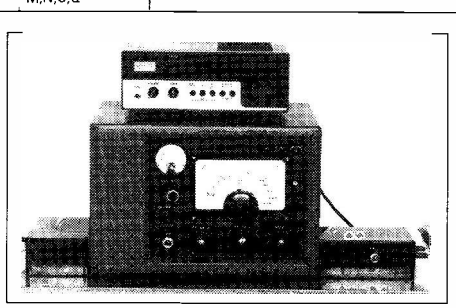
Having compiled his first beacon log in Grimsby, **Jim Willett** took it along to the Coastguard HQ in Grimsby docks so that his reception could be verified. Jim used an indoor X antenna with a home-built a.t.u. and a Trio 9R59DS receiver.

Although Stoney Stanton is a long way from the coast, **Martin Blunn** decided to try beacon DXing. Using a Trio R600 receiver plus an a.t.u. and a 20m random wire in the loft, he logged a surprising number of distant beacons during daylight. Down in Southampton, **Steve Cann** compiled his list over five nights. He says, "It's amazing that there are some very local beacons that I can't seem to get yet, but I'll be listening!" Nearby in Wootton, IOW. **George Millmore** added several beacons to his growing list.

Whilst on holiday in Old Hunstanton on the coast of Norfolk, **Ron Galliers** had a quite field day! He erected a 20m random wire antenna and connected it to his Philips D2935 portable via an a.t.u. Listening mostly in the morning and early afternoon he logged some fifty beacons! He says, "I had been listening to this band at home in N.London, but had not had anything like this success". The main problem he encountered was line time-base interference from nearby TV sets. He found that he could improve reception of the weaker beacons by using the beat frequency oscillator (b.f.o.), which he set to the mid-point between the upper and lower sidebands.

In an attempt to combat interference from local electrical sources, which masks the weaker beacon signals in Edinburgh, **Kenneth Buck** tried screening his large home-built loop. He wrapped three layers of bubble plastic sheet, around the loop. This gave an air gap (plus some plastics) of about 10mm between the loop winding and the outer screening, which was aluminium cooking foil.

Upon testing the loop, Kenneth found that its sensitivity appeared to be unchanged. The distributed capacitance was noticeable but not a problem. Unfortunately, the reduction in interference was not sufficient to justify making the screening a permanent feature. It is worth noting that Kenneth uses a 2N3819 f.e.t. source follower to maintain the high *Q* of the loop and ensure good matching to the low impedance input of either his home-built t.r.f. radio beacon receiver or a Lowe HF-225. In order to prevent the interference from reaching the receivers via the a.c. mains supply, he powers them from NiCad batteries. Despite these precautions reception is still impaired by the interference. Kenneth says, "The only solution that I have found is to listen in the mornings when neighbours are out!"



The r.f. beacon receiver built by Kenneth Buck, with his HF-225 on top.

High levels of QRM were encountered in Torquay by **Cliff Stapleton** during some evenings, but nevertheless he received some of the radio beacons along the south coast of the UK, Channel Islands and N. France.

A problem of a different kind has beset **John Macdonald** in Thurso. He found that the sensitivity of his Sony 2010 had decreased on the long wave band, but it seemed to perform normally on other ranges. Just before this fault occurred he picked up, for the first time, the beacon signals from Uto Main Light, Finland (UO 287.3), Cabo San Sebasitan Light, Spain (SN 291.9) and Cap Frehel Light, France (FE 305.7).

287.3	BY	Bressey LH	Shetland Is	C,L*,T*
287.3	CM	Cromer LH	Norfolk	B,C,E,L*,N,S,T
287.3	CR	Channel LV	??	A*,D*,L*
287.3	CV	Cabo Carvoeiro LH.	Spain	I
287.3	FN	Walney Island	off Lancs	L*,N,O
287.3	GA	Outer Gabbard LV	off Suffolk	B,C,O*,E,F,L*, M,N,O,P,S,T
287.3	GR	Goeree	Holland	E
287.3	LV	Dudgeon LV	off Norfolk	B,C,E,N,O,S,T
287.3	NR	Noordhinder LV	Holland	D*,L*
287.3	PS	Point Lynas	Anglesey	B,C,E,G,L*,N,O
287.3	SK	Smith's Knoll LV	off Norfolk	B,C,D*,E,L*, N,O,P,S
287.3	SL	Sletterhage	Denmark	E
287.3	UD	Uto Main Light	Finland	J
289.6	FD	Fidra LH	F. of Forth	C,T*
289.6	FV	Falsterborev Lt.	Denmark	N*
289.6	LP	Loop Head	S.Ireland	L*
289.6	SL	Slatterou	Norway	L*
289.6	SM	Pte de St.Mathieu	France	D*
289.6	SN	Slyne Head	Ireland	L*,O
289.6	TN	Thyboron LH	Denmark	C,E
291.9	CP	St.Catherines Pt.	IOW	A*,B,D*,E,F, M,P,Q,S
291.9	ER	Pointe de Ver LH	N.France	A*,O*,E,F,L*,S
291.9	FG	Pointe de Barfleur.	N.France	A*,B,D*,E,F,H, L*,M,N,O,Q,S
291.9	KD	Kinnairds Head LH	Aberdeen	B,C,E,N,T*
291.9	KN	Skrova LH	Norway	T*
291.9	MH	Mahon, Minorca	Balearic Is	N
291.9	NR	N.Ronaldsay LH	Orkney Is	C,N
291.9	OM	Stroma Pt LH.	Caithness	C,E,T*
291.9	PB	Portland Bill LH	Dorset	A*,B,D*,M
291.9	SB	Sumburgh Head	Shetland Is	C,N,P
291.9	SN	Cabo San Sebastian.	Spain	J
291.9	TI	Cap d'Antifer	France	A*,B,D*,E,F, M,Q,S
294.2	AH	Altacarry Head LH	Antrim	C,L*,N,O,R
294.2	DA	Pladda LH.	Is of Arran	C,G,L*,O,R
294.2	ER	Eierland LH	Holland	E,N
294.2	FL	Fladen Lt.	?	E
294.2	KI	Kiel LH	Germany	T*
294.2	LG	Eilean-Glas LH	Is of Harris.	C,F
294.2	MW	Mew Island LH	off Co.Down	C,L*,N,O,R
294.2	NO	Cabo de la Nao LH	Spain	D*,N*
294.2	OR	Oigh Sgeir LH	off Is Rum	C
294.2	PA	Cabo de Palos LH	Spain	O*,N*
294.2	RN	Rinns of Islay	Is of Islay	C,L*,N,O,R
296.5	BH	Blaavandshuk LH	Denmark	C,E,N
296.5	BN	Ballycotton	S.Ireland	D*,K,N,O
296.5	HM	Hanstholm	Denmark	C,E,N
296.5	LA	Lista LH	S.Norway	C,I,L*,N,S,T
296.5	LS	Lundy Is. S.LH	off N.Devon	K,O
296.5	MA	Cabo Machicharo LH.	N.Spain	N*
296.5	MY	Cabo Mayor	Spain	E*,N*
296.5	NK	Inchkeith	F. of Forth	C,T
296.5	NP	Nieuwpoort W.Pier	Belgium	E,L*,O
296.5	NP	Nash Point	S.Wales	A*,D*
296.5	OH	Old Head Kinsale	S.Ireland	D*,K,L*,O
296.5	SB	South Bishop LH	Pembroke	A*,D*,K,L*,N,O,P
296.5	TR	Tuskar Rock	S.Ireland	A*,D*,E,G,K, L*,N,O,R
298.8	AD	Ameland	Holland	C,E,L*
298.8	BE	Borkum LH	Germany	C
298.8	BL	Butt of Lewis	Is of Lewis	C,G,I,T*
298.8	CW	Cape Wrath LH	Sutherland	C
298.8	LK	Sule Skerry LH	off Orkney	C
298.8	LZ	Lizard LH	S.Cornwall	A*,D*,K
298.8	MF	Muckle Flugga LH	Shetland Is	C
298.8	PE	Penlee Pt.	UK	A*,D*,K,L*
298.8	QS	Casquets LH	Channel Is	A*,D*,E,I,L*, M,N,O,Q,S
298.8	RD	Roches Douvres LH	Channel Is	A*,D*,E,K,N,Q
298.8	SP	Start Point LH	S.Devon	A*,D*,E,K, M,N,O,Q
301.1	CN	Cregneish	IOM	C,G,L*,N,O
301.1	GE	Skarvoy Egersund	Norway	C,E,N,T
301.1	HO	Hirsholm Main LH	Denmark	C
301.1	NF	North Foreland LH	E.Kent	B,D*,E,F,L*,N,O,P,S,T
301.1	PY	Point of Ayre LH	IOM	L*
301.1	SR	Skerries LH	Anglesey	C,K,N,O
301.1	SU	South Rock LV	Co.Down	C,L*,N,O
301.1	VS	Grosser Vogelsand	Germany	N,T*
301.1	WK	Wicklow Head Light	Co.Wicklow	A*,B,V,D*,K,L*,N,O
303.4	FB	Flamborough Hd LH	E.Yorkshire	B,C,D*,E,N,O,S,T,V
303.4	FP	Fife Ness Point	Fife	C,E,N,O,T*
303.4	LT	Longstone LH	Berwick	C,E,N,T
303.4	NH	Newhaven	E.Sussex	M
303.4	PO	Poole	Dorset	D*
303.4	SJ	Souter Light	Sunderland	B,C,E,N,O,T*,V
305.7	CB	Corbiere	Jersey C.I	A*,B,D*,E,F,K,M,N,S
305.7	CS	Calais Main LH	N.France	B,D*,E,F,N,P,S,U
305.7	FE	Cap Frehel	France	J
305.7	FS	Fall's LV	off Kent	E,M,N,O,P,S
305.7	KY	Oksoy LH	Norway	C,G*,T*
305.7	LS	Hirtshals	Norway	C,E
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308.0	MZ	Mizen Head LH	S.Ireland	O*,E,F,K,L*,N,O
308.0	RC	Cabo Roca LH	Portugal	D*
308.0	RR	Round Island LH	Nr Cornwall	C,D*,E,K,N,O
308.0	TY	Tory Island LH	N.Ireland	C,N,O,R
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310.3	AL	Pointe d'Ailly LH	France	A*,B,D*,E,F,P,S,U
310.3	DU	Dungeness LH	S.Kent	B,D*,E,F,M,N,O,P,S,T
310.3	FS	Kalkgrund	Denmark	E
310.3	GD	Girdle Ness	Aberdeen	C,I,N,T*
310.3	PH	Cap d'Alprech	France	A*,B,D*,E,F,L*, M,N,O,P,Q,S,U
310.3	RY	Royal Sovereign LV.	Eng. Chan	D*,E
310.3	VI	Cabo Villano	Spain	D*,E
310.3	VR	Utvaer	Norway	C
312.6	FN	Feistein	Norway	C
312.6	GU	Geltungane	Norway	C,L*,N,T*
312.6	KH	Kish Bank	E.Ireland	C,N,O
312.6	MA	Marstein	Norway	C,T*
312.6	NB	Nab Tower LH	off Sussex	A*,D*,F,M
312.6	PT	Souter Pt.	Durham	C,N
312.6	RB	Cherbourg	France	D*,F,M
312.6	SR	Stubbenkammer	Germany	U*
312.6	UK	Sunk LV	off Essex	A,E,N,O,P,S,T
312.6	UT	Utsira	Norway	C
312.6	VR	Utvaer	Norway	C,T*
313.5	BN	Cap Bon	Tunisia	D*
313.5	PQ	Ile Porquerolles	France	D*
318.0	BHD	Berry Head LH	Devon	A*,M,Q
318.5	RS	Ristna	USSR	M
319.0	LEC	Stavanger	Norway	A*,B,C,D*,E, L*,O,P,S,T
397.2	DHE	Helgoland Lt.	off N.Germany	C,D*,E,M,T

Note: Entries marked * were logged during darkness. All other entries were logged during daylight.

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B Martin Blunn, Stoney Stanton
C Kenneth Buck, Edinburgh
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F Paul Hilton, Newbury
G Simon Holland, Douglas, IOM
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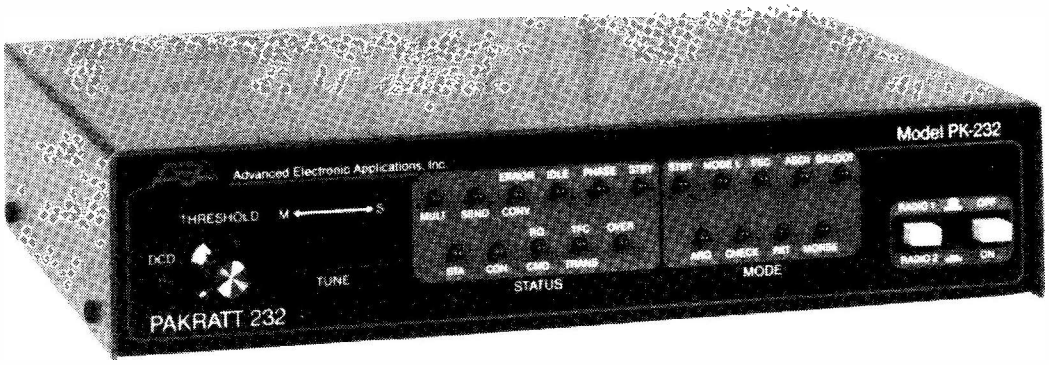

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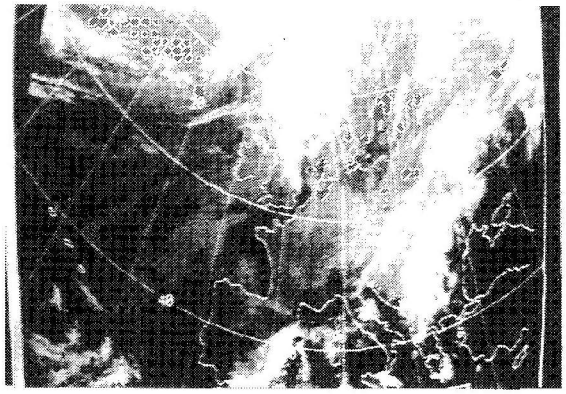

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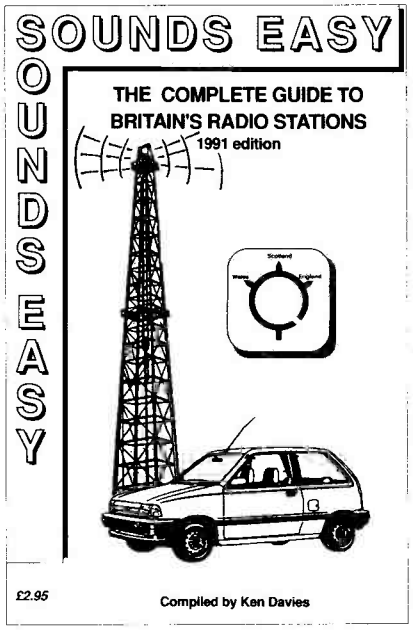

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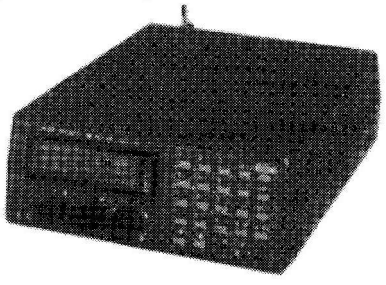

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