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short-wave magazine

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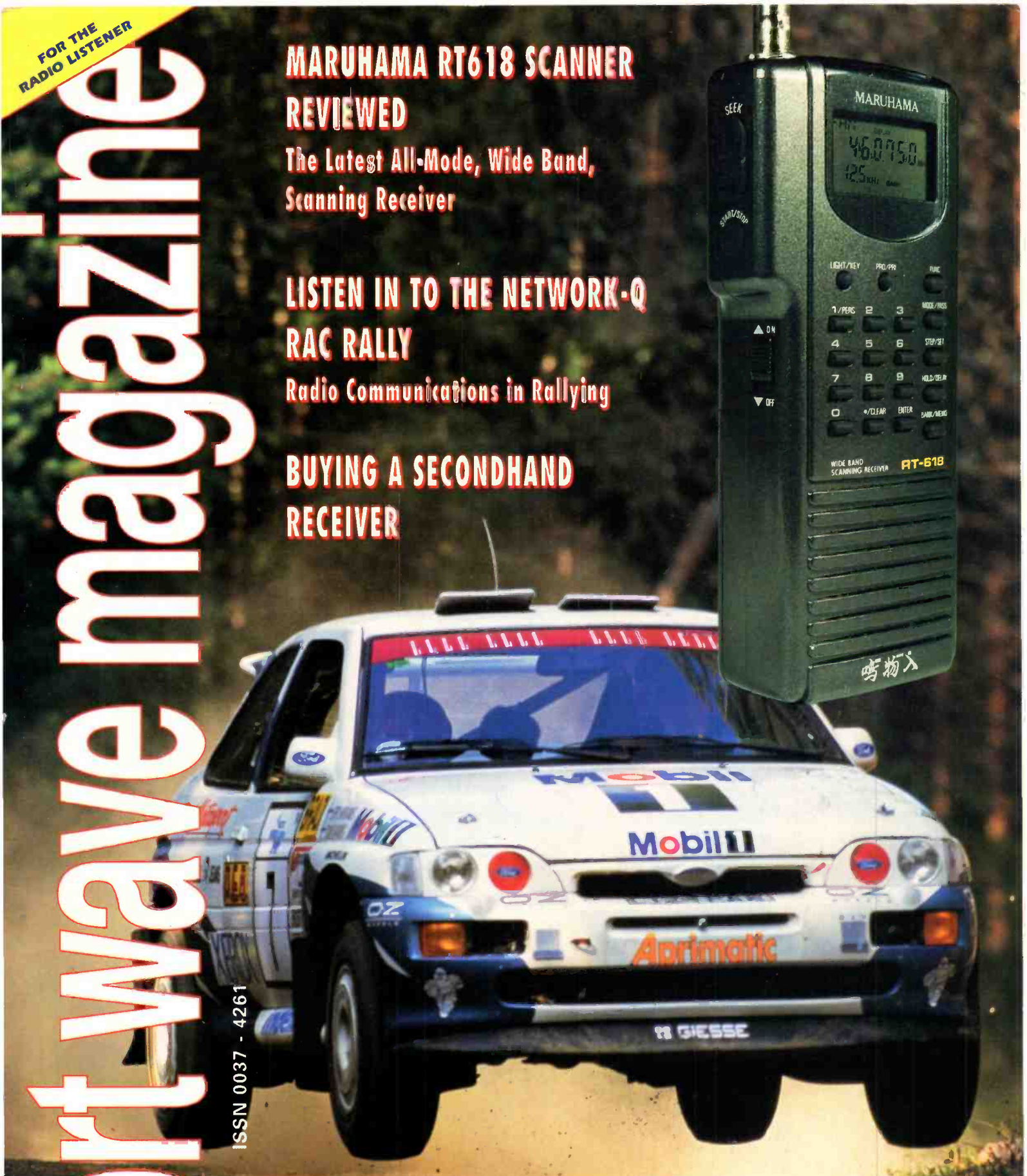

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Cover Subject

November is the month of the Network Q RAC Rally. Read our guide to monitoring the teams as they compete in the forests and on the highways of Britain. What better to listen with than the Maruhama RT618 wide band receiver? See what it can do in our review inside this bumper issue.

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Components for SWM Projects

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

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

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

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editorial

The Science Museum's amateur radio station, GB2SM will close on November 7, as planned. However, it seems that a concerted protest by radio enthusiasts has changed the minds of those in charge. So GB2SM will reopen, *in the same location*, on a date yet to be announced! The station will be refurbished and redesigned to allow 'hands-on' participation by visitors.

Apparently the RSGB has been negotiating hard behind the scenes to retain the station, but I would like to think that readers of *SWM* played a part in reversing the original decision to close GB2SM. So, if you responded to my Editorial plea a couple of issues ago, thank you!

Dick Ganderton G8VFH

letters

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

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

Dear Sir

May I, on behalf on the Poldhu Amateur Radio Club, enlist your aid in tracing the holder - or next-of-kin if a 'Silent Key' - of the callsign G3MPD, which would have been issued in 1958. Apparently, this call has been dormant for many years and SSL has no record of the holder; the RA also say that they are unable to help. The RSGB has no record - apparently he was never a member.

The only avenues remaining are either a very old *Call Book*, say, from the early 60s, or a friend of the holder or his family. Any information would be appreciated.

I can be reached QTHR or on (0736) 710454.

L. D. Davey-Thomas
G3AGA
Penzance
Cornwall

Dear Sir

I was wondering if you could help me. I have been given an AR88 radio and I am writing to ask if you have any information, or a wiring diagram, on this radio. I would be very grateful, and I do hope you can help me.

D.R. Marker
Bracknell
Berks

Dear Sir

The letters from C. M. Lindars and Chris Snipe were very interesting. We have had an overdose of meddlers who change names and symbols, it does nothing to improve our knowledge of electronics. The daftest change must be that of the name of the unit of conductance, Mho was so easy to remember and so descriptive as the reciprocal of Ohm. The term Siemans has no such value. If discrete components trade less current than integrated circuits then let us have more designs and projects for transistors. The other drawback with i.c.s is that when they become obsolete they cannot be substituted, on the other hand, when transistors and diodes are no longer manufactured it is not difficult to modify circuits to take current devices to replace them.

Jack Treeby
Plymouth

More change for changes sake?

If you can help this reader, please reply via the Editorial Offices at Broadstone.

Dear Sir

Does anyone know how the SEM h.f. QRM Eliminator MkIII works with an active antenna as the Sony AN-1 to avoid the terrible noise generated by the PC (IBM PS1) being picked up by my Sony 2001D, even when working with batteries.

Would it be only due to the plastics cover of this receiver? If so would the interference disappear if I use a receiver with a metallic case, such as the JRC NRD535?

Unfortunately, I live on a second floor and therefore have difficulty achieving a good earth installation.

Another problem is my difficulty in getting British stamps and knowing how many to use for a Stamped Addressed Envolope to send to British advertisers to get brochures or information.

Many thanks and congratulations on a serious magazine.

J. F. Giráldez
Spain

A significant amount of noise from computers is radiated from power leads, keyboards and monitors and their interconnections. One way to reduce this is to wind the leads through a ferrite toroidal core. Further suggestions on how to reduce QRM can be found in the book Interference Handbook *by William R. Nelson, available from the* SWM *Book Service. Good luck with reducing your interference.*
Regarding your query about stamps, why not use IRCs (International Reply Coupons)? These are available from Post Offices and act as an international postal currency.

letters

Change for Changes Sake?

Dear Sir
I recently received a pamphlet from 'Deutsche Welle' radio international, giving, among other things, the time and frequency of their programmes. They go to some pains to inform me that UTC has replaced GMT.

Who said so? I most certainly was not asked, or given the opportunity of saying 'Aye or nay' to this decision. Who made this decision and why? What is wrong with GMT? It seems UTC is the same as GMT, so why change? Or is it just another case of change for changes sake, rather than any logical reason?

I am reliably informed that all the other variations mean the same as GMT so what's the big idea?

It is very unfortunate for the dedicated Europeans that the 'Prime Meridian' happens to go through the middle of Greenwich Observatory, and painful as it must be, all navigators, surveying, etc., starts right there in the UK. I, for one, will always insist on GMT as I see no reason whatsoever to change.

If someone can give a logical reason for change, please do so. Another very stupid and annoying practice is becoming common and that is logging the month before the day, then the year. When checking the log to see if the QSL is correct, one has the laborious job of having to check two log books to see if you have, in fact, made contact on the 1st of the 7th or the 7th of the 1st? Who was the idiot who thought this one up? Month follows day in every logical way of thinking and this sort of thing makes for tedium and confusion. I have often threatened to return cards filled in this way as incorrect to see if a bit of common sense can be brought to bear.

SOS is another example of change for no other reason except cussedness. Every schoolchild knew the Morse code for SOS. It was taught in the Scouts, Guides, Cubs and Brownies and almost everyone knew it off by heart. Not so anymore. We are told that SOS is now obsolete, now we have 'Pan pan' 'May day', etc.

No wonder it took so long to find the poor soldiers that got lost in Borneo a few months ago, the poor chaps had written SOS in white stones on the ground. Nobody had told them that SOS was obsolete and it's quite possible that the helicopter pilot, if recently trained would have no idea was SOS meant.

What they should have done was write 'May day' or 'Pan pan' or whatever, presuming they had enough energy to find enough white stones for the job. Confusion, it seems, rules supreme.

As a matter of casual interest, just what is the correct procedure at the present time? I take it that if one picks up an SOS signal on the radio, one ignores it, as it is now obsolete. What if its genuine? How can one tell? What if the poor so and so on the other end doesn't know that SOS is obsolete?

I wonder how many poor souls have gone to the 'Happy hunting ground' because they didn't know the correct procedure, whatever it is.

Perhaps some enlightened person will explain to all and sundry why SOS is obsolete, and what exactly replaced it, also just what does one have to look and listen for?

In the meantime, go very carefully, because if you find yourself in a jam, you've 'had it'.
Bill Mitchell EI5GQ

Change for changes sake - what do you think? Perhaps we should have got the French to move Paris 45 miles west in return for letting them call it UTC instead of UCT! As for month, day, year, what can you expect from a country that cannot even spell colour correctly! I did notice that the last time I filled in an imigration card to enter the USA that they had corrected the order - so there is a ray of hope! Seriously, though, I fear that we are stuck with UTC, although the BBC seems to be resolutely sticking to GMT, but I will never spell colour without the u! Ed.

Bouquets...

Dear Sir
May I congratulate and thank you for 'Receiver Specifications Explained' by Peter Buchan in the August issue of *Short Wave Magazine*.

I do hope that Peter Buchan will continue to write for you for evermore. Quite the best paper on signal to noise I've seen.
Peter A. Galsworthy

I am pleased that you enjoyed the 'Receiver Specification' Series. We have had lots of letters complimenting us on this feature. We are always pleased to receive constructive feedback and suggestions from readers regarding articles published in SWM.

Dear Sir
It appears that the best radio magazine in the UK attracts the best advertisers and in saying this, I am linking *Short Wave Magazine* and Pervisell Ltd., of High Wycombe.

Having read the excellent articles by Mike Richards, I rang Pervisell Ltd. at 1445 to order a demodulator using a credit card. A friendly voice apologised that they were not organised for credit transactions but could they put the item in the post with my cheque to follow.

They also went out of their way to organise FAX programs on two disks to suit my needs. The following morning the demodulator arrived by first post and appears to be of first class construction and I am looking forward to using it.

I feel that excellent service of this nature deserves a mention and there is no better place than the pages of *Short Wave Magazine*.
V. S. Crabb
Torquay

Dear Sir
At 1700 hours on Friday, I posted a parcel containing a part exchange deal, rig and cheque to pay the balance needed, to Lowe Electronics at Matlock.

At 1000 hours on the Tuesday following, my new HF150 receiver arrived. Take away the weekend in between and it leaves very little in the way of working days.

The Post Office of course must have some credit, but Lowe Electronics certainly ensured that I received my new receiver with the least possible delay. I honestly don't know how they did it in such a short space of time.

Oh yes, although I haven't dealt with Lowe Electroncs directly before, there was no waiting for my cheque to clear.
K. Anderson
Isle of Wight

...Brickbats

Dear Sir
Paul Clark (Rochford, Essex, 'Letters' *SWM* 10/94 page 3) may take comfort in knowing that it is not his youthful age (17) or appearance or indeed any other factor that caused his poor treatment at the hands of retailers.

I'm pushing 40 (my thinning hair turning grey) and usually look presentable in a conventional 40-year-old way. I'm not treated any better by companies, organisations, shops or retailers.

Our self-inflicted recession is a vicious circle. Vendors of all kinds enjoy making it difficult for us to spend our precious money, being unhelpful, ignorant and arrogant. We British seem to be proud of our ability to create and then sustain a recession. Perhaps we're all now so competitive towards each other that we are no longer able to help each other? We don't even seem able to help customers to buy our wares and part with the money that they offer!

I hope that Paul is not put off from following his interest, but manages to find a helpful retailer (there are many, but be selective) and also continues to enjoy and learn - just as I did at his age, and just as I continue to do so now!
Dr. G. L. Manning G4GLM
Edgware
Middlesex

AOR Spectrum Display Unit

The **SDU-5000** Spectrum Display Unit adds a variety of features to extend a receiver's capabilities, such as visually identifying new active frequencies and taking measurements. The SDU-5000 may be used with a number of receivers which have a 10.7MHz I.F. output and produces a bandwidth up to 5MHz in 1kHz increments with a resolution of 5kHz or 30kHz. The SDU-5000 remains compact due to the use of an internal 3.1" HQM simple matrix 16 colour LCD 192 dot x 210 dot. An external home colour television with video input may also been connected (PAL or NTSC).

In particular the AR3000A has been designed to provide best compatibility by communicating directly via the receiver's RS232 port / SDU-5000 COM1 ensuring the full potential of the SDU may be exploited. Operation is extremely simple as the SDU-5000 utilises an on screen menu system. The AR3000A frequency, mode & attenuator may be controlled from the SDU so that a displayed frequency may be easily monitored. When using the AR3000A, the cursor frequency is equal to the receiving frequency of the AR3000A, by using the cursor in the SDU, frequency and signal level can be read directly. This enables the SDU-5000 to be used as a wide coverage spectrum monitor between 100kHz to 2036MHz with DDS providing an accuracy of 100ppm. Dynamic range is 50dB with an acceptable input level between -10dBm to -90dBm with selectable gain control. The SDU-5000 has a multiple processing function which displays Average Level, Peak Detection and Maximum Value Hold. These professional features are usually only available from expensive professional class spectrum analysers. The SDU may also be connected to a PC where all controls are accessible and display data can be downloaded for record and later analysis.

Note: The SDU-5000 is designed with the AR3000A and future generation of receiver in mind. A small modification of the AR3000A is required in order to provide a suitable 10.7MHz I.F. output. Other receivers (including the AR3000 not "A") with suitable 10.7MHz I.F. outputs may be used but the full range of SDU facilities will not be available.

SDU-5000: £699 inc VAT

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junior listener

Prefix Lists

Desmond Sharpe writes from Co. Meath asking about up-to-date prefix lists. With all the changes in geography there have been in the world of late it's not surprising that it is difficult to find a definitive list. But I have got a copy of *The Official ISWL/DXCC Country and Prefix Lists* booklet that could fit the bill.

It lists the countries alphabetically along with the prefix, continent, CQ Zone and ITU Zone. The bit that most people will find useful is the country and prefix bit and to help out, the list has also been printed out in alphanumeric order on prefix too. So if you want to know the call prefix for Bouvet Island - you look it up and discover that it's 3Y. Alternatively, you can look up a T32 prefix to discover that it's East Kiribati.

Onto other details such as price and availability. As always the ISWL do a good line in bargains and the booklet isn't going to break the bank - even if you're on 'junior' pocket money. You need to send £2.50, 4 IRCs or postage stamps to the value of £2.50 to: The International Short Wave League, 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA.

75th Anniversary

Many years ago I was at college studying to be a radio operator and one of the other reprobates on the course was Larry Bennett, who is now the Customer Services Radio Officer at Portishead Radio GKA. I'm sure that the coast station GKA is one of the signals that most listeners have heard when listening around the marine bands.

In 1995, Portishead Radio is celebrating its 75th Anniversary and Larry is trying to put together a booklet of stories involving GKA over the years. Do you know anyone who can come up with any stories that may interest him, if so drop him a line:

Larry Bennett (Radio Officer), BT Portishead Radio, Worston Road, Highbridge, Somerset TA9 3JY.

JOTA

JOTA or Jamboree on the Air took place on October 15&16 and I'd be interested in hearing from you if you took part in a station. Many radio amateurs set up these stations and the local Scout troops take the opportunity to contact other Scout groups all over the world. Obviously they don't only talk to Scout troops, but that must be one of the best bits about running a station.

If you did take part or if you logged lots of the stations then drop me a line and I'll feature it in a future column.

Did any of you log GB2BS back around July or August time.

Well that was a station manned by six Scouts who also have their Novice licences. They were at the 1994 National Scout Band Festival in Walsall showing their radio hobby to the 2000 other Scouts gathered at the event.

Passport to World Band Radio

Christmas is just around the corner (groan!) and I'm sure there are some of you who are being asked the evergreen question, "What do you want for Christmas". Well, how about adding the 1995 edition of *Passport to World Band Radio* to the list. My copy arrived last week and I've been busy reading through the pages - the white pages that is - to see what new information I could glean. There's an interesting feature on the Top Ten shows you could tune into, such as Music & Musicians from Radio Moscow International - try listening at 0811 and 1311 on Sundays or 1711 and 2211 on Saturdays on 15.210, 15.345, 15.380, 15.440 or 15.540MHz.

My favourite feature was the Complete Idiot's Guide to Getting Started. It contains such information as - Set Clock for World Time, Get a Radio That Works Properly and Ten Easy Catches. Each piece of advice is carefully explained and the Ten Easy Catches provided so much information on the stations I'm sure even a real beginner would have a lot of success. The book also contains the usual reviews of the latest radios and antenna advice that regular readers have come to expect.

One of the main reasons that people buy this guide is for its Blue Pages - yes they really are printed on blue paper. It shows in almost graph form who is on the air transmitting in which language, to whom and when. This can help to increase your chances of actually hearing a specific station as it's not much use if they're not transmitting or it's in Chinese and you want French.

If you can persuade your Mum or Dad to buy this for you, then they can obtain a copy from the *Short Wave Magazine Book Service* priced £14.50 plus £1.00 post and packing (UK).

SINPO CODE

Many of you have written to me recently about signal reporting, there would appear to be a little confusion beween the RST and SINPO format of reporting reception of stations heard. Well, the convention is that the SINPO code is used for broadcast station reports whilst the RS(T) system is almost exclusively used by licensed Radio Amateurs. I covered the RS(T) scheme in July's Junior Listener. So here is an explanation of the SINPO code.

Signal Strength
5 excellent
4 good
3 fair
2 poor
1 barely audible

Interference
5 nil
4 slight
3 moderate
2 severe
1 extreme

Noise
5 nil
4 slight
3 moderate
2 severe
1 extreme

Propagation
5 nil
4 slight
3 moderate
2 severe
1 extreme

Overall merit
5 excellent
4 good
3 fair
2 poor
1 unusable

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- ★ AM mode reception
- ★ Signal meter
- ★ Supplied with NiCads, Charger, Earphone, Belt Clip
- ★ Optional Leatherette Case available
- ★ Price: £189

MVT-7100 WIDEBAND WITH SSB

The ultimate in Scanning Receivers - with true SSB reception using carrier insertion for effortless reception of both USB, LSB or CW. A rotary tune knob allows normal receiver tuning across the entire wideband frequency range. It's exceptional sensitivity and ease of use has made this the UK's number one scanning receiver.

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- ★ AM/FM/WFM/USB/LSB/CW
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- ★ Optional Leatherette Case available
- ★ Price: £389

MVT-7000 WIDEBAND

The exceptional receiver performance of this handheld has to be heard to be believed. It's ease of use and instant results with only minimum programming make it one of the best in it's class.

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- ★ 200 memory channels
- ★ AM/FM/WFM modes
- ★ Rotary or keypad frequency control
- ★ Signal bar graph meter
- ★ Supplied with all accessories
- ★ Price: £289

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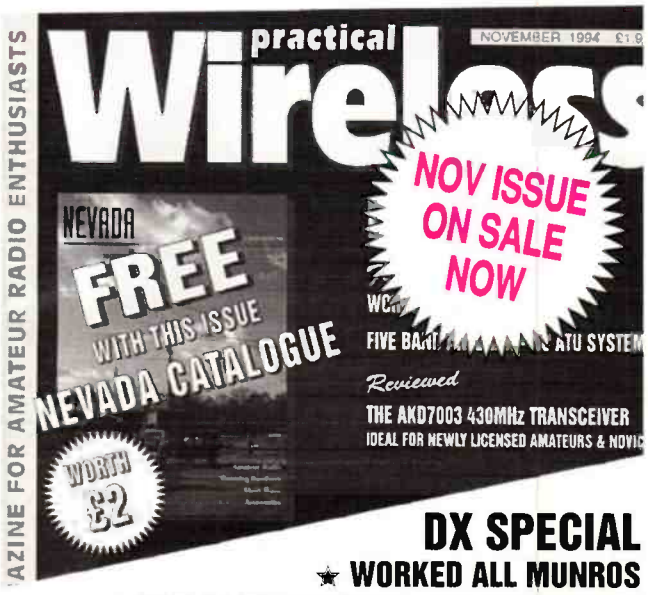

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courtesy of Martin Lynch.
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news

Winner of SWM survey receives prize

Ian Shields of York was presented with his Dressler AR2000 active antenna by *SWM* Editor Dick Ganderton G8VFH. Ian was drawn from the respondents to our survey earlier in the year.
The presentation took place at the Scarborough Radio Rally, held at The Spa, Scarborough in August.

ISWL announce new booklet

The latest publication from the International Short Wave League is a combined 30 page A4 ISWL/DXCC country and Prefix list. This invaluable shack guide is available to both members and non-members alike from: **The International Short Wave League, 10 Clyde Crescent, Wharton, Winsford, Cheshire CW7 3LA. United Kingdom.** Price £2.50 or 4 IRCs post paid. Postage stamps to the value of £2.50 are acceptable.

New Distributors for AEA products.

We have received news that as from October 1 ICS Electronics are no longer the distributors for AEA Products. **Martin Lynch** and **Siskin Electronics** have been appointed as distributors for the complete AEA range. For more information contact either **Martin Lynch** on **081-566 1120** or **Siskin Electronics** on **(0703) 207155.**

BARTG 1994 AGM

The British Amateur Radio Teledata Group 1994 Annual General Meeting will be held on 5 November at 1400. The venue is London House, Mecklenburgh Square, London, which is conveniently sited for the Kings Cross and Russell Square Underground stations.

ICS Win Two 1994 SMART Awards

In this year's competition for research and development grants to small companies organised by the UK department of Trade and Industry, ICS Electronics Ltd - suppliers of *FAX III, SYNOP III* and *WeatherPlot*, have been successful in winning two new awards for 1994 - in addition to that won last year.

The research and development funding awarded to ICS under the UK government's SMART (Small Firms Award for Research and Technology) Award programme now totals £150 000. These new awards will be used to fund continued development of ICS's marine and land based radio communications products.

Formed in 1982, ICS have expanded their turnover by 50% in each of the last two years and now export over 60% of their products. Further information from **Alan Clemmetsen, ICS Electronics Ltd., Unit V, Rudford Industrial Estate, Ford, Arundel, West Sussex BN18 0BD. Tel: (0903) 731101, Fax: (0903) 731105.**

Catalogue for Airband Enthusiast

Air Supply announce the release of their latest catalogue catering for the Aviation enthusiast. Featured are a wide range of scanning and h.f. receivers and accessories as well as other aviation essentials. For a copy send £1.50 inc. P&P (refundable with first order) to: **Air Supply, 83b High Street, Yeadon, Leeds LS19 7TA. Tel: (0532) 509581, Fax: (0532) 500199.**

Grundig Review Compendium

Grundig have just launched a collection of reviews reprinted from various publications including *SWM*. The guide provides a cross section of the company's product range and is available from Grundig dealers.

White Rose Amateur Radio Society 14th Listening Competition

Rules are as follows:
1. From 1200UTC 14 January 1995 to 1200UTC 15 January 1995. The contest is over 24 hours but only 18 hours may be operational during the 24. A continuous 6 hour rest period must be clearly shown in the log.
2. The contest is open to all s.w.l.s in the world. There will be two sections - phone and c.w. Transmitting Amateurs holding v.h.f. licences and Novice licences are very welcome to participate. Multi-op and mixed mode entries are not allowed.
3. The 1.8, 3.5 and 7.0MHz bands are to be used.
4. The object of the contest is to log a maximum of five station on each band in as many countries as possible. Scores shall be compiled as follows:-
5. The call areas of Canada, Japan, Australia and New Zealand will all count as separate countries, i.e. VO1, VO2, VY, VE1-VE8, JA1-JA0, VK1-VK8, ZL1-ZL4. All other countries will be determined by the ARRL countries list.
6. No CQ, QRZ or similar calls will be allowed to count for points. Aeronautical and Maritime mobile stations are not to be included in the entries.
7. Log sheets to show the following columns:- Date, Time (GMT), Station heard, Station being worked, RS(T) at s.w.l. QTH. If both sides of a QSO are heard they may be claimed as separate countries, and the call signs are to appear once in the station heard column. Each station heard can only appear once in the 'station heard' column on each band. Logs should be submitted with each band on separate sheets. A separate sheet listing all multipliers for each band should be also be included.
8. Entries should be sent to the Contest Manager, Mr David A. Whitaker, c/o The White Rose Amateur Radio Society, 57 Green Lane, Harrogate, North Yorkshire HG2 9LP. Entrants should ensure their entries are postmarked no later than 14 February 1995.
9. A plaque suitably engraved with the winner's name, will be presented to the overall contest winner. Certificates of Merit will be awarded to the leading s.w.l. station from each country.

Book Service £50 Draw

We are pleased to announce the first winner of our £50 draw. If you hadn't already realised, buying a book from the *SWM* Book Service qualifies you for entry to a monthly £50 prize draw. Congratulations this month go to Mr J.P. Deal of Somerset. Here we see Johnathan being presented with his winnings by *SWM's* Assistant Editor, Kevin Nice.

National Transmitter News

New BBC FM Transmitters

August 18 Blunsdon, Wiltshire. This new station now brings good f.m. radio reception including stereo to about 50000 people in the Swindon area. Located just north of the town of Swindon, service commenced after a period of test transmissions. Frequencies are, Radio 1 98.6MHz, Radio 2 89.0MHz, Radio 3 91.2MHz and Radio 4 93.4MHz. Antenna polarisation is **vertical**.

September 20 Woolmoor, North Yorkshire, located 10km southeast of Northallerton. The station brings good f.m. radio reception including stereo to around 25000 people in the area of Richmond, Ripon, Harrogate, Northallerton, Thirsk, Darlington and the surrounding area. Frequencies are as follows, Radio 1 99.6MHz, Radio 2 90.2MHz, Radio 3 92.2MHz and Radio 4 94.4MHz. The station has a **vertically** polarised antenna.

Television Relay Stations

July 18 Canford Heath, Poole, Dorset. The relay is provided jointly by the BBC and the ITC and is located on a water tower 4km north of Poole. Providing good television and teletext reception to 2500 people in Sherborn Crescent, Verity Crescent and Kellaway Road area of Canford Heath. Use of the relay outside of these areas is not recommended.

Station Details

Channels:	BBC1	39
	BBC2	45
	ITV (Meridian)	68
	Channel 4	42
Antenna Group:	E or W	
Polarisation:	Vertical	
Effective Radiated Power:	6W	

August 11 Felling, Gateshead. The relay is provided jointly by the BBC and the ITC and is located on top of Croxhall towers an existing block of flats to the south of Felling. It brings good television and teletext reception to 1000 people in the Fella Park Road, parts of Sunderland Road, Pensher Street, Friary Gardens and Acaccia Road areas of Felling.

Station Details

Channels:	BBC1	52
	BBC2	68
	ITV (Tyne Tees)	46
	Channel 4	66
Antenna Group:	E or W	
Polarisation:	Vertical	
Effective Radiated Power:	6W (to the N & W only)	

August 26 Caernarfon. The relay is provided jointly by the BBC and NTL on behalf of the ITC and is located at the Police Station in Maesincla. It brings the possibility of improved television and teletext reception to about 290 people in William Street, Margaret Street and Penllyn, Caernarfon. Good quality antennas will be needed and should be mounted above the roof and **vertically** polarised. Set-top antennas are **not** recommended.

Station Details

Channels:	BBC Wales on 1	21
	BBC Wales on 2	27
	HTV Wales	24
	S4C	31
Antenna Group:	A	
Polarisation:	Vertical	
Effective Radiated Power:	2W	

Listen With Grandad *by Leon Balen & David Leverett*

Blasted horse! My insurers will never believe this story!

Radio and TV News

A curious item extracted from the *Gulf News Tabloid*, published in Bahrain, details the local TV programmes both via satellite, local microwave distribution (MMDS) and terrestrial. Another five channels have been added to the MMDS system which are ART-1, 2, 3, 4 downlinked from Arabsat 1D and the Indian 'Z' TV ex AsiaSat 1. In looking through the terrestrial TV channel guide, ch.E2 from Dubai is shown (August 29 opening @ 1711-0052 local), what however is more interesting relates to the Bahrain section that clearly shows a ch.2 transmitter providing the 'Ptv2' service, a main Arabic offering opening 1200-2320 close down local time. Dubai has been well received in Europe via Sporadic E and F2, more information is being sought to establish what the ch.2 transmissions are - if this is ch.E2 in Band 1 it may well answer certain of the unidentified ch.E2 receptions of the past....

From Holland the DX catch ZHTV ch.E49 transmitters still off the air with no test transmissions or programmes. Keep a DX eye open for the Irnsum transmitter ch.E28 horizontal at 10kw e.r.p. omni - it's for 'Regionnale Omroep Friesland'. There is a feeder STL (studio transmitter link) transmitter operating ch.E22 at 500 watts.

Mid-September saw only the TF-1 Paris Eiffel Tower transmitter equipped for 5.8MHz NICAM stereo but by January, Toulouse, Lille, Lyon, Rouen, Nantes and Clermont Ferrand will be up and running. Progressively through 1995 the following main transmitters will be NICAM operational - Bourges, Rennes, Tours, Marseille, St. Raphael, Niort, Chartres, Le Mans, Dijon-Macon, Bordeaux, Montpellier, Brest and Caen. Converters will be on sale for current receiver conversion, Nokia is the only manufacturer offering a NICAM-L reception standard. The France 3 TV network is now using CEEFAX for their teletext service, having dropped the Antiope French standard, both TF-1 and France 2 will be into CEEFAX by January next.

The old Telecine TV channel that operated from La Dole on ch.E69 which bankrupted earlier this year had intended to reopen as Cinevision. This has now been dropped, the operation was never out of the red since it first aired in 1984! The Swiss 4th channel 'S+' will be called S4 from January 1 1995. It has not been a popular channel being a mix of German and French - S4 will now operate in dedicated languages - German, French or Italian depending on the area of transmission.

Reconstruction of the Moscow Ostankino TV tower continues and when completed late 1995 should allow six private TV channels along with the main national five channels, a further 20 satellite channels and several cable channel packages (likely via MMDS) - licences have already been issued to private broadcasters.

Full programmes have now started from the radio and TV studios of the Palestinian Broadcasting Corporation. The typical menu will consist of films, cartoons, light entertainment and extracts from the Koran - all in Arabic. With the easing of relations between Jordan and Israel, a new proposal suggests the opening of an 'arts' station to offer cultural insights into the two countries. Programming will be locally movies, documentaries and cultural fare in both the Arabic and Hebrew languages.

Canal Plus and media company Austral will have their TV service on air by March 1995 in Chile's largest cities - Conception, Santiago and Valparasio. Start up costs are £40 million, 2/3rd of which are born by Canal +. The new service will be on a subscription basis and encrypted. Canal Plus Polska has been given regional licences to open transmitters in 13 more Polish cities, most will be on air by next January.

AIR is improving coverage in Andhra Pradesh with the installation of a 50kW short wave sender at Hyderabad. More Band 2 f.m. stations are on the way with nearly 50 transmitters planned, increasing the v.h.f. radio network to 125 transmitters.

grassroots

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

* Short Wave Magazine & Practical Wireless in attendance

rallies

***November 5 & 6:** The Eighth North Wales Radio & Electronics Show is being held at The Aberconwy Conference & The Bew Theatre, Llandudno. The show opens at 10am both days, entrance is £1.50 for adults, children under 14 free. **B. Mee GW7EXH** on **Tel/FAX: (0745) 591704.**

November 12: The All Micro Show 8, Radio Rally & Electronics Fair is being held at the Bingley Hall, Staffordshire Showground, Weston Road, Stafford (A518 Stafford-Uttoxeter Road), AA signposted from Junction 14 on the M6. Doors open at 10am to 4pm. Entrance fee is £2 for adults and children under 14 free. As usual, there will be the local charity stalls, a licensed bar from 11am, refreshments, and free parking. **(0473) 272002.**

November 13: The Donegal/Tie Conaill Radio Club will be holding their annual mobile rally and junk sale in Jacksons Hotel, Ballybofey, Co. Donegal. Doors open at 12 noon and admission is £1. There is ample parking available. Also a bar, refreshments and food available all day. **Raymond EI9DM** on **(073) 37152.**

November 13: The Barnsley & District Amateur Radio Club will be holding its fourth Amateur Radio Rally at the Metrodome Complex in Barnsley Town Centre, less then two miles from Junction 37 M1. This is a new venue, all on one level with excellent disabled facilities, a licensed bar/restaurant and a separate cafeteria. The Rally will have all the usual amateur radio and computer dealers with radio clubs, specialists groups and a Bring & Buy. **Ernie G4LUE, QTHR. Tel: (0226) 716339** between 6-8pm and 6-7pm on Monday evenings.

November 13: The Midland Amateur Radio Society are holding their Radio/Computer Rally at Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Doors open 10am, usual traders, local clubs, special interest stands, bring and sell tables, refreshments available and free car parking. Admission is £1. For further details contact **Norman G8BHE** on **021-422 9787** or **Peter G6DRN** on **021-443 1189 evenings.**

November 20: The Bishop Auckland Radio & Computer Rally will be held at the Newton Aycliffe Leisure Centre, Beveridge Arcade, Newton Aycliffe, Co. Durham DL5 4EM. Doors open 11am (10.30am for disabled visitors). **Mike Shield G0PRQ** on **(0388) 766264.**

November 27: West Manchester Radio Clubs 'Winter Rally' will be held at the usual venue of the Bolton Sports & Exhibition Centre, Silverwell St., Bolton (town centre). All the usual trade stands (over 75) societies, Bring & Buy etc., all at pavement level, with facilities for the disabled. Bar and refreshments available all day. Doors open 11.00am, 10.30am for disabled visitors. Admission £1, children free. **Dave G1IOD** on **(0204) 24104 evenings only.**

***November 27:** The Bridgend District Amateur Radio Club are holding their radio rally at the Bridgend Recreation Centre, Bridgend. Doors open at 11am (10.30am for disabled visitors). Food and refreshments are available all day. There is also a large Bring & Buy and talk-in on S22. Morse tests are available all day (photo ID req.). Further details from **Mike GW7NIS** on **(0656) 722199. Please note corrected date.**

December 4: Leeds & District ARS Christmas Radio, Electronic & Computer Rally will be held at Allerton High School, [illegible] open at 11am, 10.30am for disabled. **Phil Robinson** on **(0532) 680006.**

CANCELLED

***December 11:** The Verulam Amateur Radio Club will be holding its Verulam Christmas Rally at the Watford Leisure Centre, which is located less than five minutes drive from the Junction of the M1 and M25 motorways. Trading will be from 10am to 4pm. **(0923) 222284.**

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

Editor

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

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc., Bridge Farm House, East Dundry Rd, Whitchurch. November 2 - Top Band activity evening/committee meeting, 9th - Your opinions on club matters please, 16th - AGM, 23rd - Xmas raffle. For more information ring (0275) 834282 on a Wednesday evening.

CORNWALL
Saltash & DARC: 1st and 3rd Fridays at 7.30pm. The Burraton Toc H Hall, Saltash. November 6 - Buffet and reception at the Rodney Inn to celebrate the 30th anniversary of its formation. A warm invitation is extended to all present and past members. Brian G7SSH on (0752) 844321 evenings.

DERBYSHIRE
Derby & DARS. Wednesdays, 7.30pm. 119 Green Lane, Derby. November 2 - Junk sale, 7th - Amateur TV group meeting, 9th - Video show, 23rd - An American Odyssey by Brian Meaden G3BHT. Mrs Hayley Winfield, 2 Hilts Cottages, Crich, Matlock, Derbyshire DE4 5DD. (01773) 856904.

DEVON
Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. November 18 - DXpedition to ZD9 by Roger G3SXW. Peter G4UTO. (0803) 864528.

DORSET
Dorset Police ARS: 1st and 3rd Thursday at Force HQ at 7.30pm. November 3 - Club project update, 17th - Club project update. (0202) 229351.

DYFED
Aberystwyth & DARS: 2nd Thursdays, 8pm. Scout Hut, Plascrug Avenue, Aberystwyth. October 27 - GW0ARA on the air, listen on S17. Katy GW0SFO. (0545) 580675.

EAST SUSSEX
Hastings Electronics & RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. November 16 - Main meeting. G3YYF on (0424) 830454.

ESSEX
Vange ARS: Thursdays 8pm, Barnstable Community Centre, Long Riding, Basildon, Essex. October 27 - First transmitting station by Mike G4BQF. Doris. (0268) 552606.

FIFE
Dundee ARC: Tuesdays, 7pm. College of Further Education, Graham Street, Dundee. November 1 - Beginners thoughts on antennas by Leslie McKenzie GM0TGG, 8th - Construction night, 15th - Surround sound, talk and demo. by Gordon Deans, 22nd - Construction night. GM4FSB, 30 Albert Crescent, Newport-on-Tay, Fife DD6 8DT.

GRAMPIAN REGION
Aberdeen ARS: Fridays, 8pm. Queen Mother House, Aberdeen. October 28 - The repair of the Sea Cadets radio equipment, November 4 - Junk sale, 11th - The all-band Delta Loop, 18th - DXpedition video. Gordon Stuart GM7PXW. (0224) 780591.

GREATER LONDON
Crystal Palace & DRC: 3rd Saturdays, 7.30pm. All Saints Church Parish Rooms, Beulah Hill, London SE19. November 19 - Surplus equipment sale. Wilf G3DSC on 081-699 5732 or Bob on (0737) 552170.

Edgware & DRS: Thursdays, 8pm. Watling Community Centre, 145 Orange Hill Road, Burnt Oak. October 27 - Morse training evening, November 10 - Video evening, 24th - Morse training evening. Rod Bishop. 081-204 1868.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road SW19. October 8 - AGM. 081-540 2180.

HAMPSHIRE
Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross, Horndean. November 3 - Amateur radio - an old man needing the kiss of life by Stephen Harding G4JGS, Sony Broadcast. S. Swain (0705) 472846.

HEREFORD & WORCESTER
Bromsgrove ARS: 2nd & 4th Tuesdays. Lickey End Social Club, Alcester Road, Burcot, Bromsgrove. November 8 - Test equipment evening, 22nd - BARS Christmas dinner. Barry Taylor. (0527) 542266.

HERTFORDSHIRE
Hoddesdon RC: Alternate Thursdays, 8pm. Conservative Club, Rye Road, Hoddesdon. October 27 - Talk on the SS Titanic by T. M. White G0BXL, November 10 - Aerials by Dennis French G3TIK, 24th - AGM. John G7OCI. (0920) 466639.

KENT
Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. November 15 - Radar by Alastair Dunlop. A Messenger. 081-777 0420

Medway AR & TS: Fridays, 7.30pm. Community Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham, Kent. November 11 - Fish and chips supper. George Packham. (0634) 685585 or Alan Stanley. (0634) 201462.

West Kent ARS: 1st and 3rd Fridays. The School Annex, Camden Road, Tunbridge Wells. November 18 - British callsigns by G3GWD. John Taylor G3OHV. (0892) 664960.

MERSEYSIDE
Wirral ARS: 1st & 3rd Wednesdays at Ivy Farm, Arrowe Park, Birkenhead, Wirral. Informal natter nights on each Tuesday. A. Seed G3FOO on 051-644 6094.

NORFOLK
Norfolk ARC: Wednesdays, 7.30pm. Formal and informal meetings at The Norman Centre, Bignold Road, Off Drayton Road between 'Asda' and Three Mile Cross Roundabout, Norwich. November 2 - Night on the air/construction QRP/Morse practice, 9th - Science for all by Arnold Tomalin G3PTB, 16th - Night on the air/construction QRP/Morse practice, 23rd - Xmas surprise by Mike Lemin G4UUB. Mike G4EOL. (0603) 789792.

NOTTINGHAMSHIRE
Mansfield ARS: 2nd Mondays, 7.30pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. November 14 - Workshop hints and test gear. Howard G1JGY. (0623) 423697.

OXFORD
Oxford & DARS: 2nd and 4th Wednesdays, 7.45pm. The North Oxford Grove House Club. Terry Hastings G0CFN. (0865) 863526.

SOMERSET
Yeovil ARC: Thursdays, 7.30pm. The Red Cross Centre, 72 Grove Avenue, Yeovil. October 27 - Club station on the air and committee meeting, November 3 - Club project 'The Coker' receiver testing, 10th - Satellite TV receiving, 17th - WX safellite receiving, 24th - Club station on the air and committee meeting. Cedric White, QTHR. (0258) 473845.

SUFFOLK
Haverhill & DRC: 2nd Mondays, 7.30pm. Samuel Ward Upper School, Chalkstone Way, Haverhill. November 14 - EMC & RFI by Gordon G0SOF. Rob Proctor G4PZW. (0440) 704637.

Sudbury & DRA: 1st & 3rd Tuesdays, Wells Hall, Old School, Great Cornard, Five Bells Public House, Bures Road, Great Cornard. November 1 - Talk and demonstration on first aid by St. Johns Ambulance, 15th - Natter & noggin night. Tony Harman G8LTY. (0787) 313212

WARWICKSHIRE
Mid Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St. Johns HQ, Warwick Div., 61 Emscote Road, Warwick. November 8 - Programme discussion, 22nd - Morse code evening. Don on (0926) 424465.

Stratford-upon-Avon & DRS: 2nd & 4th Mondays, 7.30pm. Home Guard Club, Main Street, Tiddington, Stratford-upon-Avon. November 14 - Operation Rayleigh by John Leyton G4AAL. Mr A Beasley G0CXJ. (0608) 682495.

WEST MIDLANDS
Sandwell ARC: The Broadway, Warley. RAE class on Monday nights, Morse class on Wednesday nights and RAE Novice class on Thursday nights. Three operating shacks, h.f./v.h.f./u.h.f., Phone, c.w., RTTY, AMTOR, Packet, all bands. Talks, outings, contest and demonstrations. For further information please ring 021-552 4619/021-552 4902.

South Birmingham RS: West Heath Community Association, Hamstead House, Fairfax Road, West Heath, Birmingham. November 2 - AGM. Don Keeling. 021-458 1603.

WILTSHIRE
Salisbury Radio & Electronic Society: Tuesdays, 7.30pm. 3rd Salisbury Sea Scout Hut, St Marks Avenue, Salisbury. November 1 - Talk by two engineers from Lascar Electronics, 8th - Open Forum, 15th - Fast scan TV by Neil G4LDR, 22nd - Construction evening using Greenweld 10 in 1 kit. J David Kennedy. (0722) 330971.

Trowbridge & DARC: 3rd Wednesday, 8pm. The Southwick Village Hall, Southwick, Trowbridge. November 2 - Judging of construction projects, 16th - Natter night. Ian G0GRI. (0225) 864698.

new products

HF Converter for Scanners

A new product prom AKD the HFC1 Converter, enables FRG9600/965 scanner owners to receive the frequency range 0.1-60MHz. The unit is designed to operate with most scanners, with a continuous range from 100.1-160MHz. It is self-contained and is small enough to fit in the palm of the hand. Power supply requirements are 11-14V with a phono terminated flying lead designed to plug into the rear of the scanner. The converter uses a double balanced mixer with a low pass filter on the input. No r.f. amplification is employed to maximise the Dynamic Range. Price is £49.95 plus 75p P&P. **AKD** can be contacted at **Unit 5, Parsons Green Estate, Boulton Road, Stevenage, Herts SG1 4QG. Tel: (0438) 351710, Fax: (0438) 357591.**

Spectrum Display Unit for Receivers with 10.7MHz i.f.

The SDU-5000 from AOR extends the capability of your receiver. You can now see as well as hear the signals in the receiver's pass band and beyond.

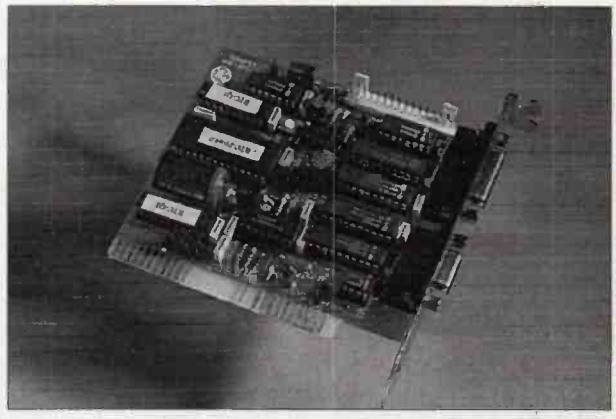
The SDU-5000 is designed to be used in conjunction with the AR3000A, and it's future replacement. Use with the AR3000A enables the use of the full range of SDU facilities, via the receiver's RS232 port. The SDU is a menu driven device with user display comprising of an internal 7.8cm HQM simple matrix 16 colour l.c.d. 192x210 pixels. An external composite video output is also provided (PAL or NTSC).

The AR3000A frequency, mode and attenuation may be controlled from the SDU. When using the unit in conjunction with the AR3000A, the SDU cursor value defines the receiving frequency. This enables the user to directly read the frequency and signal amplitude. The features are utilised in what is in effect a wide coverage spectrum monitor with an input range of 100kHz to 2036MHz. The SDU-5000 has a multiple processing function which displays, Average level, Peak Detection and Maximum Value Hold. The features are usually only available from expensive professional class spectrum analysers. The SDU-5000 may also be connected to a PC, which allows remote control and downloading of display data for archive of later analysis. The SDU costs £699.00 inc. VAT. For further details contact **AOR (UK) Ltd., Adam Bede High Tech Centre, Derby Road, Wirksworth, Derbys DE4 4BG. Tel: (0629) 825926, Fax: (0629) 825927.**

Leather Cases for Realistic Scanners

Javiation are now able to supply custom made robust leather carring cases that are suitable for some of the Realistic range of scanners. The case was originally designed for the PRO-43 but since the PRO-39 and PRO-44 utilise the same case mouldings these receivers also fit. The leather case originates from the US and costs £20.00. A useful feature is the two 'scan bank' labels which allow notes of memory contents to be made. These fit in the bottom of the case. Javiation can be contacted as follows: **Javiation, Carlton Works, Carlton Street, Bradford, West Yorkshire DB7 1DA. Tel: (0274) 732146, Fax: (0274) 722627 or by E-Mail, Compuserve: 100117,535, Intenet: Info@Javiaton.demo.co.uk**

MSF Rugby on your PC



Sonifex announce their new Mentor MSF radio clock system, designed to ensure that your PC is synchonised to UK time automatically by utilising the broadcasts from the 60kHz l.w. Rugby MSF station. The signal from Rugby can be received in most UK locations.

The Mentor MSF is a simple to install half length card and software connected to a small high gain electronic antenna. The unit is supplied with simple instructions and 5m of antenna connection cable complete and ready to run.

Sonifex, a name that you may not be familiar with, is a long established manufacturer of radio and TV studio broadcast equipment. For further information contact: **Sonifex Ltd., 61 Station Road, Irthlingborough, Northamptonshire NN9 5QE. Tel: (0933) 650700, Fax: (0933) 650726.**

Seven Additions to Kit Range

Ben Spencer Consultants have just added the following kits to their range.

- 13.8V 5A protected p.s.u. board
- One-shot Gell-Cell battery charger board
- Deluxe Curtis 8044abm lambic keyer
- High stability crystal oven kit
- u.h.f. prescaler
- m.w./l.w. t.r.f. a.m. receiver
- Thermal d.c. fan controller with p.t.t. input.

All these are available in both kit or ready assembled and tested form. A full catalogue detailing all the products on offer from **Ben Spencer Consultants** is available from: **Enterprise House, 33 New King Street, Bath BA1 2BL. Tel: (0225) 482604.**

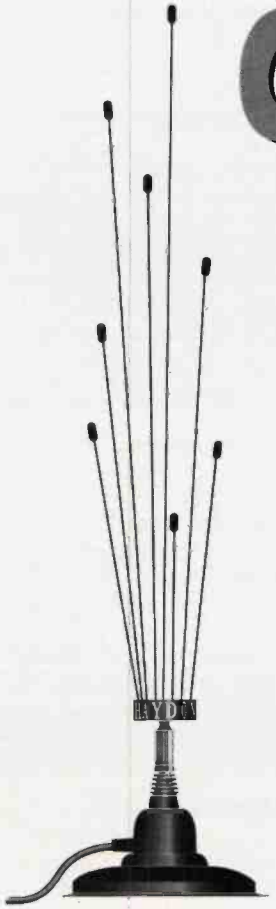
6 to 1 Favourite from Jackson Brothers

A new range of vernier dial drives has been launched by the variable capacitor and precision engineering specialist, Jackson Brothers. Offered in a choice of anodised aluminium or black finish, the new drives are an ideal choice for all those precise repeatable adjustment requirements.

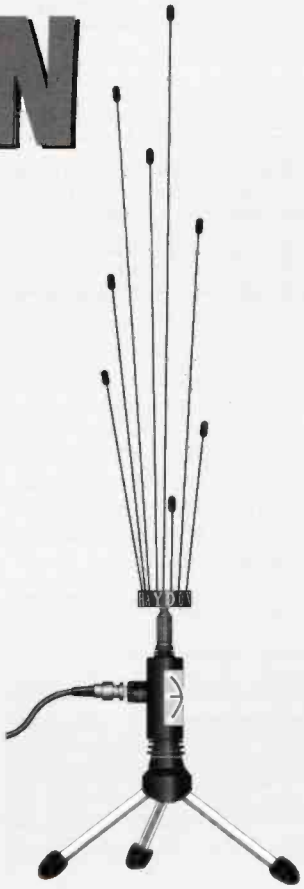
The dives are available in three sizes with overall diameters of 43, 50 and 70mm the corresponding front-of-panel depths are 18, 20 and 22mm standard units are supplied with shaft couplings for 0.25in or 6mm dia. spindles, and with a 100-division scale covering 180°. Alternative coupling sizes and custom printed scales are available to order.

The Jackson units use a close-tolerance ball-drive system in place of the friction drives often found in competitive products. This guarantees durability, even under conditions of intense usage. The ball-drive system also allows an exceptionally high drive torque of 185mNm to be achieved. Further information from: **Jackson Brothers Ltd., Kingsway, Waddon, Croydon CR9 4DG. Tel: 081-681 2754, Fax: 081-681 3728.**

SWM WORDSEARCH COMPETITION



Thanks to the kind generosity of **Haydon Communications**, this month we are giving away five wide band scanning antennas. Two versions are available. The lucky winners can choose either the MSS1300 or the DSS1300 as their prize. Just tick the appropriate box.



PRIZES

MSS1300
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This is the desk version of the MSS1300. Supplied with a low profile mount and 3m of coaxial cable terminated with a BNC plug. Intended for either desk or loft mounting. Height 460mm. Normal price is **£44.95**

Wordsearch rules:
Twelve different words have been hidden in the letter grid. They have been printed across (forwards and backwards), up and down, diagonally, but they are always in a straight line with out odd letters between. You can use the letters in the grid more than once for different words. Once you have found all 12 words, mark them on the grid and send it, along with your name and address (photocopies accepted but must be accompanied by the corner flash) to our Editorial address, marked Antenna Wordsearch. Don't forget to indicate the antenna of your choice.

U	B	B	H	J	R	T	E	G	I	M	Z	C	V	J
W	A	Y	Q	E	R	D	X	Y	U	V	B	A	M	H
F	E	B	N	V	Z	F	E	U	S	V	Y	N	A	S
M	L	N	T	J	V	P	L	Q	T	I	S	N	G	G
Y	I	C	R	E	N	E	T	S	I	L	K	E	M	S
W	Q	F	R	O	N	T	E	N	D	H	Y	T	O	C
B	A	S	E	S	T	A	T	I	O	N	U	N	U	A
D	S	E	Z	I	R	P	H	K	J	I	U	A	N	N
D	L	E	H	D	N	A	H	L	C	W	G	E	T	N
H	F	K	R	O	T	J	P	R	Q	J	D	H	U	I
S	N	O	I	T	A	C	I	N	U	M	M	O	C	N
I	D	Y	S	P	R	F	K	U	D	W	K	I	L	G
Y	P	N	O	D	Y	A	H	M	D	C	V	S	P	F
T	X	V	V	C	L	J	O	A	S	S	W	P	T	V
D	N	A	B	E	D	I	W	A	R	T	L	U	L	A

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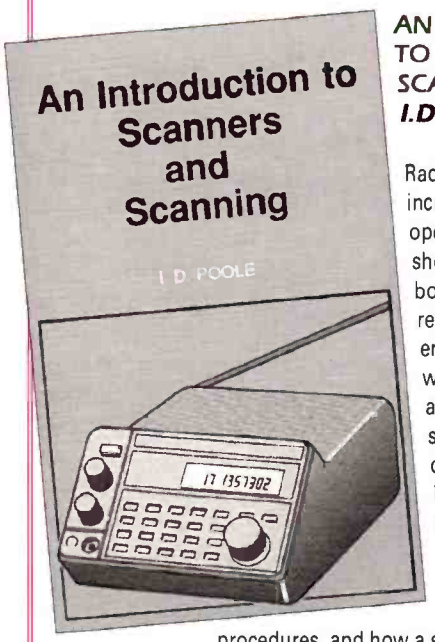
BOOK BONANZA UPDATE



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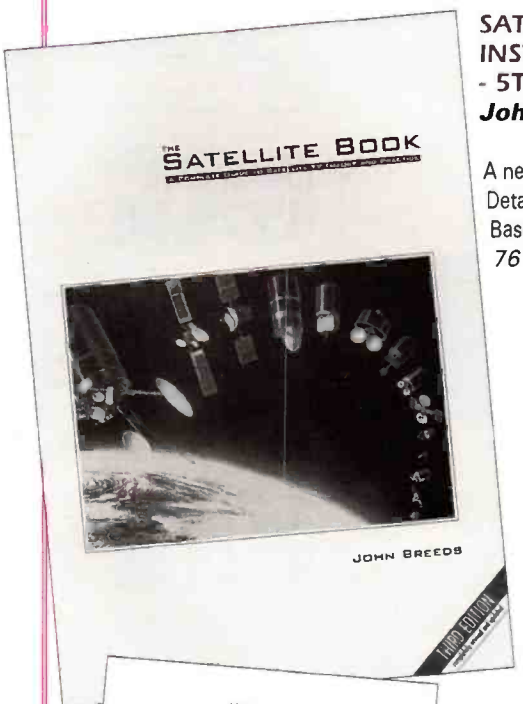

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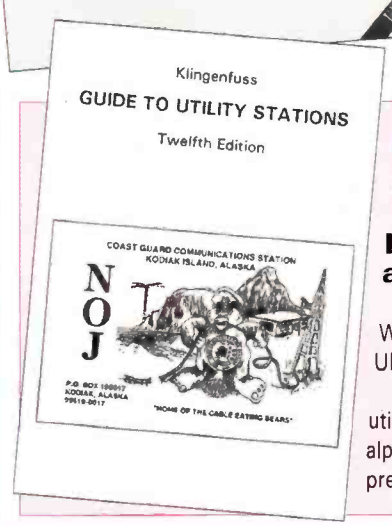

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Computer Control for the HF225 Receiver

Part 1

Do you use a Lowe HF225 with a K225 keypad? If so, Mike Bradbury shows you how to set the receiver frequency, or scan the first ten internal memories, under computer control.

This project was first conceived whilst thinking about programs to meet the needs of the many Amstrad PCW 8256/8512 users, who suffer from a dearth of radio/electronic software. These machines are Z80 microprocessor based and use CP/M as the normal operating system. Although marketed as a word processor, the machine is quite acceptable for use as a general purpose computer in the radio and electronics workshop and can now be found at low cost on the second user market. If you can't afford to replace your HF225 for a receiver with serial interface and wish to have frequency setting and scanning under control of your computer, read on!

Universal Hardware

The hardware for the HF225 interface should, in fact, work with any computer which has either a 8-bit parallel port or Centronics printer port and has been used with the obsolete ZX81 with a Maplin programmable I/O board. o now's the time to dust down those BBCs, Spectrums, etc. Latter in the project you will find described the skeleton programs in Mallard BASIC, supplied with the PCW computers, but which can be easily modified for other versions of BASIC. For readers with no programming skills, it is intended to offer a limitless database program, for the PCW, using 500 records at a time loaded from disc files. One record field will contain the station frequency and the receiver frequency will be set according to which record is selected. The database is arranged in 20 banks, each bank having 25 entries, all of which can be viewed on one screen. The banks can be named to suit individual requirements and allow grouping of frequencies of interest.

Unfortunately, due to the design of the HF225, it is not feasible to include mode switching etc., without major internal modifications, which would render the receiver valueless. But being able to set the frequency under computer control, from a database will enhance your enjoyment of the receiver. Dependent upon your own programming skills, it would be possible to incorporate frequency switching at predetermined times and tape recorder control - a boon to the broadcast enthusiast - as the PCW has an internal clock which can be set and read from BASIC.

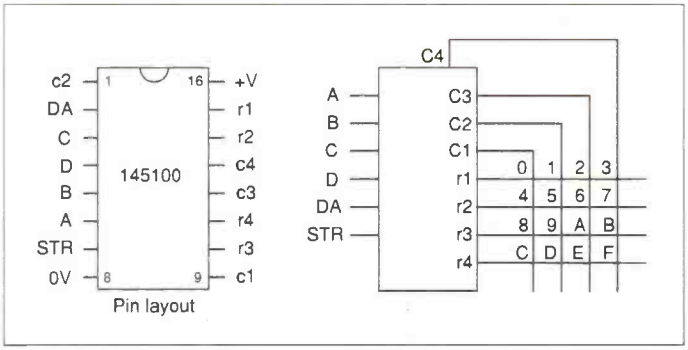


Fig. 1: The pin-out of the MC145100, showing how the 4x4 switch matrix appears.

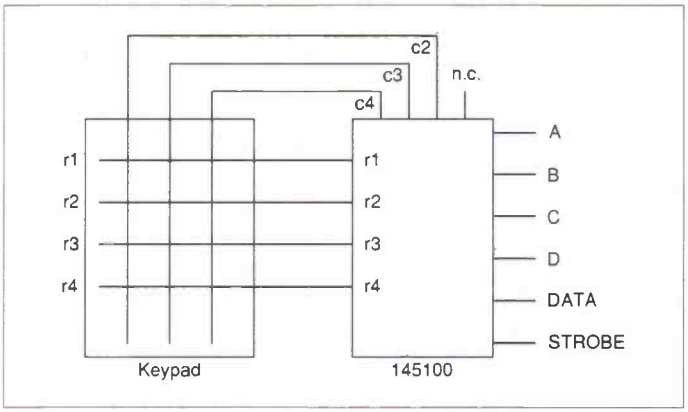


Fig. 2: Connecting the MC145100 in parallel with the keypad matrix.

Keypad Required

To make use of this project, you will need to have a K225 keypad attached to your receiver and PCW users will need a CPS8256 serial/ Centronics printer interface fitted to the expansion slot at the rear of the machine. Also you need to be prepared to make a simple modification to the keypad, which is reversible in the unlikely event of a wish to sell the receiver at a later date! Nevertheless, please bear in mind possible keypad warranty invalidation.

The interface is designed around a MC145100 electronic crosspoint switch which has a 4x4 switch matrix, (16 switches) but in this application only 12 switches are used to mimic the mechanical switches on the keypad. It was first intended that the interface should be designed to be independant of the keypad, using its own remote control i.c., but by connecting to the existing keypad which remains functional, control from the computer can be overidden. Isolation between the computer and receiver is achieved by the use of opto-isolators in each of the data wires from the parallel port. This also takes care of the different logic levels used by the TTL circuits in the output port and the CMOS crosspoint switch supply. Please note that there is no connection on

the HF225 interface board between either the 0V and Ground lines from the computer.

The pin-out diagram for the MC145100 **Fig. 1** also shows how the 4x4 switch matrix appears together with the switch numbering (0 to 15) shown here in HEX for convenience. Any chosen switch can be set to ON by setting the switch address in binary code on the inputs A-D. The DATA and STROBE pins are then taken high and the switch latches on. To set the same switch off, the binary switch address is set on inputs A-D and with the DATA pin held low and the STROBE pin set high, the switch is set to OFF. As mentioned earlier, only 12 switches are used, matrix column 1 being left unconnected. The software you will be using takes care of the discrepancy between the keypad and MC145100 switch numbering. **Fig. 2** in conjunction with **Fig. 1** should clarify how the MC145100 is connected in parallel with the keypad matrix. Power for the interface is derived from the keypad supply, about 10V d.c. fed from the receiver *via* the keypad cable.

The opto-isolators used in the prototype are of the type ILQ74, which contain four isolators per chip. The quad type were to hand but only six isolators are used here, the two remaining ones being connected to the computer port, bits D6 and D7 and the phototransistor outputs left unconnected. These two devices could then be used later for tape recorder control or whatever other ingenious uses may come to mind.

Detail for one data bit (D0) is shown in **Fig. 3** and is the same for D1 to D5 with the emitters of the opto-isolators connected respectively to inputs B to D, STROBE and DATA of IC3. **Fig. 4** is the complete circuit diagram and **Fig. 5** shows the pin numbering of the ILQ74. Diode D1 provides protection against supply polarity reversal and can be omitted if preferred. Resistors R15 to R21 limit the maximum current through the crosspoint switches under fault conditions, to a safe value.

It is suggested that the circuit be assembled on a piece of Veroboard about 100 x 50mm, with 9-way ribbon cable connected at the keypad end and 9-way ribbon cable at the parallel port end. The method I use to overcome the problem of Veroboard tracks not aligning with the required ribbon cable terminations is to cut the tracks at the third hole from each end and insert Veropins each side of the cut. The ribbon cable can then be connected 'straight' and the appropriate pins connected

LISTING 1

```
10 REM Test program for HF225 interface (PCW version)
20 on%=48:off%=16:wait%=150:star%=13
30 port%=&HE9:REM PCW Centronics port address E9 hex/233 dec
40 cls$=CHR$(27)+"E":PRINT cls$
50 REM Ensure all switches are off at start
60 FOR n%=0 to 15:OUT port%,n%+off%:GOSUB 240:NEXT n%
70 while 1
80 FOR n%=0 TO 9
90 digit%=n%
100 IF n%>=4 AND n%<=6 THEN digit%=digit%+1
110 IF n%>=7 AND n%<=9 THEN digit%=digit%+2
120 IF n%=0 then digit%=14
130 OUT port%,digit%+on%:GOSUB 240
140 OUT port%,digit%+off%:GOSUB 240
150 PRINT "HF225 display should show digit: "n%:PRINT
160 PRINT "Press any key for next digit.";
170 k$=INPUT$(1):PRINT cls$
180 OUT port%,star%+on%:GOSUB 240
190 OUT port%,star%+off%:GOSUB 240
200 NEXT n%
210 WEND
220 REM For other computer types, wait% (line 20) may need to be changed
230 REM to allow time for digit to be sent to receiver. Set at lowest value giving reliable switching.
240 FOR d%=1 to wait%
250 NEXT d%
260 OUT port%,0
270 RETURN
```

Fig. 3: Details for one data bit showing the opto-isolator connections.

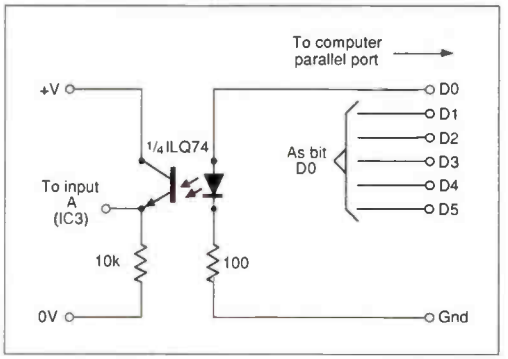
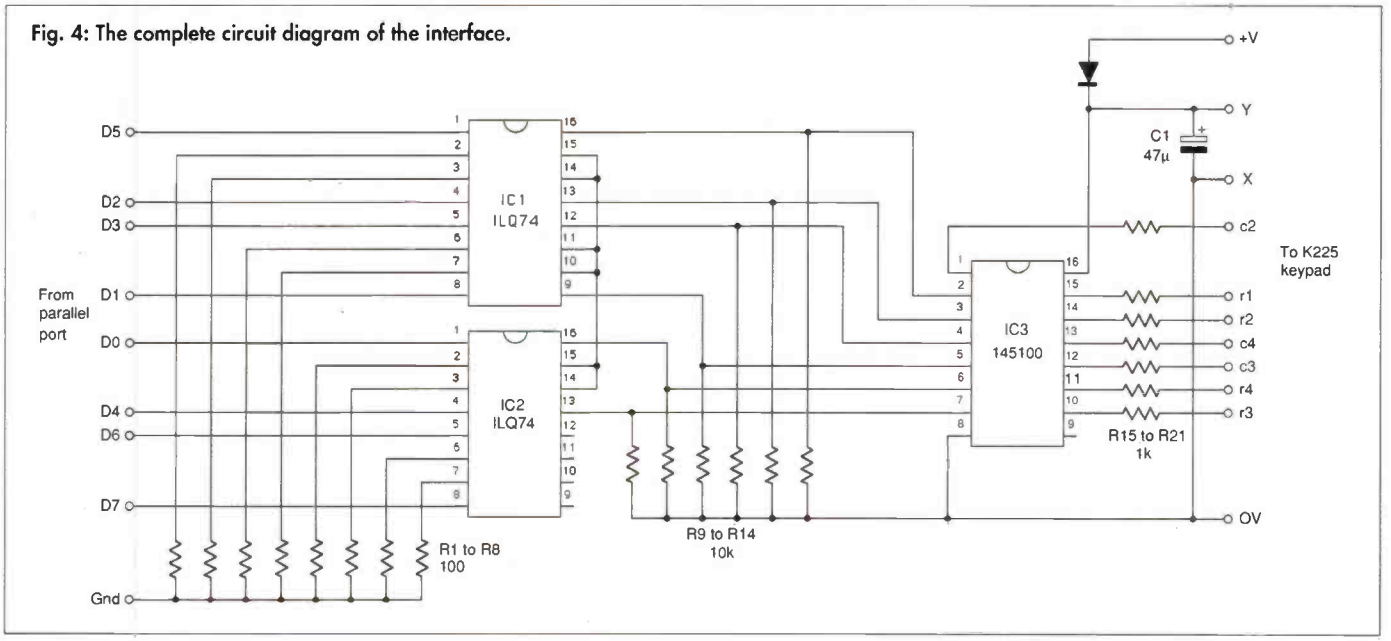


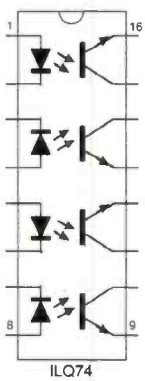
Fig. 4: The complete circuit diagram of the interface.



LISTING 2

```
10 REM Skeleton program for PCW8256/8512 to set HF225 frequency
20 cls$=CHR$(27)+"E":BEEP$=CHR$(7):REM define clearscreen and BEEP
30 PRINT cls$:on%=48:off%=16:REM  bit  D5=16  and  bit D6=32 for STROBE and DATA to MC145100 IC.
40 wait%=100:hash%=15:port%=&HE9:REM port address for PCW
50 REM ensure all switches are off at start.
60 FOR n%=0 TO 15
70 OUT port%,n%+off%:GOSUB 340
80 NEXT n%
90 while 1
100 INPUT "Enter frequency in kHz: ",FREQ!:PRINT cls$
110 GOSUB 140
120 WEND
130 '
140 FREQ!=ROUND(FREQ!):REM HF225 can only be set to nearest kHz from keypad.
150 IF FREQ!<30 OR FREQ!>29999 THEN PRINT:PRINT BEEP$ "Frequency ";FREQ!;"kHz out of range for HF225 receiver.":PRINT:RETURN
160 '
170 REM Send digits to Xpoint switch via parallel port.
180 fr$=STR$(FREQ!)
190 FOR n%=2 TO LEN(fr$)
200 digit$=MID$(fr$,n%,1)
210 digit%=VAL(digit$)
220 xpt%=digit%
230 IF digit%>=4 AND digit%<=6 THEN xpt%=xpt%+1
240 IF digit%>=7 AND digit%<=9 THEN xpt%=xpt%+2
250 IF digit%=0 THEN xpt%=14
260 OUT port%,xpt%+on%:GOSUB 340
270 OUT port%,xpt%+off%:GOSUB 340
280 NEXT n%
290 IF FREQ!<3000 THEN GOSUB 390
300 PRINT:PRINT "Receiver frequency set to: ";FREQ!;"kHz":PRINT
310 RETURN
320 '
330 REM Delay counter
340 FOR d%=1 TO wait%
350 NEXT d%
360 OUT port%,0
370 RETURN
380 '
390 REM keypad # required below 3000 kHz
400 OUT port%,hash%+on%:GOSUB 340
410 OUT port%,hash%+off%:GOSUB 340
420 RETURN
```

Fig. 5: Pin-out of the ILQ74 quad opto-isolator integrated circuit.



LISTING 3

```
10 REM skeleton program to scan first ten HF225 internal memories.
20 cls$=CHR$(27)+"E":PRINT cls$
30 on%=48:off%=16:wait%=100:port%=&HE9
40 REM ensure all switches are off at start.
50 FOR n%=0 TO 15
60 OUT port%,n%+off%:GOSUB 310
70 NEXT n%
80 PRINT "Press MEMORY SELECT button on HF225, then press spacebar when ready....."
90 GOSUB 350:PRINT cls$
100 OUT port%,on%+14:GOSUB 310:OUT port%,off%+14:GOSUB 310:REM set channel mode.
110 PRINT " 1) Short press on SPACEBAR holds channel or restarts scan."
120 PRINT:PRINT " 2) When holding channel, press RECALL on HF225 to allow fine tuning."
130 PRINT:PRINT " 3) Press MEMORY SELECT & CHANNEL before restarting scan."
140 PRINT:PRINT " 4) Press 'Q' whilst channel is held, to exit program."
150 PRINT
160 WHILE 1
170 FOR n%=1 TO 10
180 PRINT " Selected channel: "n%;
190 chan%=n%
200 IF n%>=4 AND n%<=6 THEN chan%=chan%+1
210 IF n%>=7 AND n%<=9 THEN chan%=chan%+2
220 IF n%=10 THEN chan%=chan%+3
230 OUT port%,chan%+on%:wait%=100:GOSUB 310
240 OUT port%,chan%+off%:GOSUB 310
250 wait%=1500:GOSUB 310
260 k$=INKEY$:IF k$=CHR$(32) THEN GOSUB 350
270 PRINT chr$(13)SPC(22)CHR$(13);
280 NEXT n%
290 WEND
300 '
310 FOR d%=1 TO wait%
320 NEXT d%
330 OUT port%,0
340 RETURN
350 k$="":WHILE k$<>CHR$(32)
360 k$=UPPER$(INPUT$(1))
370 IF k$="Q" THEN GOSUB 400:END
380 WEND
390 RETURN
400 PRINT cls$:wait%=100
410 PRINT:PRINT " Program end.":PRINT:PRINT
420 OUT port%,on%+14:GOSUB 310:OUT port%,off%+14:GOSUB 310:REM set receiver to preview mode
430 PRINT " Press MEMORY SELECT to restore HF225 receiver to manual tuning.":PRINT:PRINT
440 RETURN
```

You Will Need

Resistors

Metal Film, 0.25W, 5%

100Ω	8	R1 - 8
1kΩ	6	R15 - 21
10kΩ	5	R9 - 14

Capacitors

Electrolytic 25V

47µF	1	C1

Semiconductors

Diodes

1N4001	1	D1

Integrated Circuits

ILQ74	2	IC1,2
MC145100	1	IC3

Miscellaneous

Veroboard; Ribbon cable, 10-way; D type IDC connectors, 9-pin male, 9-pin female, 25-pin female; DIL i.c. sockets 16-pin (3); Plastics box.

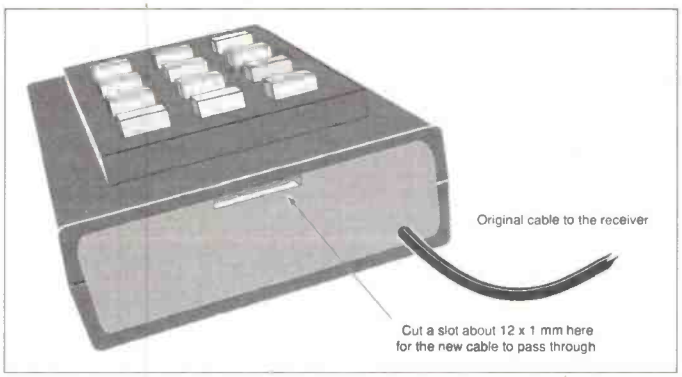


Fig. 6: The end of the kepyad showing where to file the small notch needed to allow the ribbon cable to exit the box.

Table 1.
Printer cable from PCW Centronics port. 25-way D type.

Pin	2	3	4	5	6	7	8	9	24
Use	D0	D1	D2	D3	D4	D5	D6	D7	Gnd

together by insulated wire straps. If you are using this project with a PCW computer, the ribbon cable to the parallel port needs to have a 25-way female 'D' connector fitted, to mate with the 25-way male connector found on the end of most Centronics printer cables. See **Table 1** for pin allocations. Alternatively, if you are confident in connecting up Centronics type connectors a longer ribbon cable could be taken direct to the computer Centronics port.

The 9-way ribbon cable to the keypad should also be connected via a plug and socket, the 9-pin 'D' type being suitable. For the prototype, the ribbon cable soldered to the keypad was cut to 150mm. in length with a 'D' plug fitted. This means that the keypad has the ribbon cable hanging out when the interface is not connected, but this method involves the minimum modification to the keypad.

Readers will, no doubt, have their own preferences on how to assemble and interconnect.

Having built the interface, double checking your assembly and wiring, the keypad now has to be opened up and the case bottom removed, revealing the pcb and the loose end panel through which the cable to the receiver passes. The end panel requires a notch to be filed centrally in the top edge, using a small flat needle file, just wide enough to allow the 9-way ribbon cable to pass through - **Fig. 6**. Take great care not to file below the rebate which exists on all four edges of the panel and the the modification will not show if the cable is removed at any time. Looking at the keypad p.c.b. **Fig. 7** observe the row of seven solder pads next to the i.c. and the two pads where the receiver cable is connected. The 9-way ribbon should be connected as **Fig. 7** taking care to use a fine tipped, low wattage soldering iron and ensuring no solder bridges occur. Keep the 0V and +V connections to the opposite sides of the ribbon to avoid possible contact between the two within the 'D' plug fitted at the interface end of the ribbon. When finished, reassemble the keypad case, leading the ribbon cable out through the slot previously made in the end panel. At this point connect the keypad to the receiver and check that the keypad functions normally. If not, examine the keypad p.c.b. for soldering errors.

Assuming all is ok, plug the keypad ribbon cable into the interface board, and with the keypad connected to the receiver check that about 10V d.c. appears across points X and Y (**Fig. 4**). Now recheck that the keypad still functions.

PCW users will, if not already fitted, need to obtain a Centronics printer cable with a 25-way 'D' type male plug at the printer end. **Table 1** shows which pins are used for data wires D0 to D7 and Ground, to be connected to the HF225 interface. Users of other computer types will need to study the manuals to identify the appropriate connections.

Testing

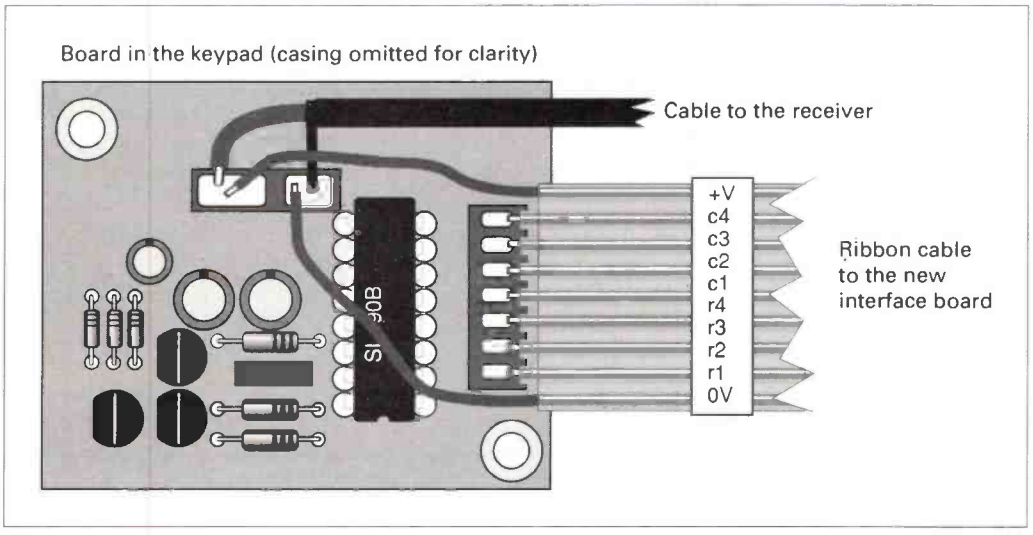
Part 2 will cover programming methods to control the interface and give more details of, and screen dumps from, the database program for the PCW 8256/8512. But if you can't wait till then to test your interface, **Listing 1** is a short program (PCW version) that checks that the computer can send all digits 0 - 9 and * to the HF225. PCW users should start up BASIC, which is to be found on the CP/M Plus disc supplied with the machine. Type in the program and when satisfied that all program lines are error free, save to floppy disc as "PROG1.BAS". Connect the interface to the computer Centronics port and then RUN the program. Each digit 0 - 9 should appear on the receiver display, following a prompt to press any key on the computer keyboard. The REM statements make most of the program self explanatory but lines 100 to 120 may need further clarification; the crosspoint switch numbers for digits 4 to 9 and 0 do not correspond with the keypad and these lines account for that.

Mallard BASIC requires the % symbol to be added to variable names, to define the variable as integer type. Other versions of BASIC may not have this requirement so omit the % symbol where necessary. The port address in line 30 will of course need to be changed to correspond to the address specified for the particular machine you use and the OUT command may need changing to POKE. The remainder of the program should match almost any other version of BASIC.

If the test program and interface works correctly, you are 'home and dry'; Listing 2&3 are included in this part, but will be explained in Part 2.

■

Fig. 7: Connecting the 9-way ribbon cable to the keypad p.c.b.



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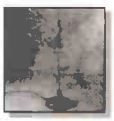

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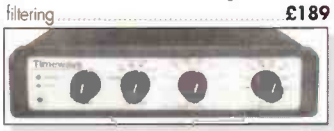

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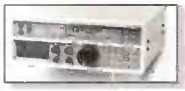

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Maruhama RT-618 Wide Band Scanning Receiver

Many sanning enthusiasts have asked for 'less tech spec, more hands on' reviews of scanners. John Griffiths approached his review of the new Maruhama RT-618 with this in mind

Initial impressions count for a great deal when it comes to scanners. Appearance is, therefore, quite important when it comes to choosing a set. The RT-618 does have some features over and above what is now the norm in the saturated scanner market. While my own palate may be quite jaded in that once you've seen one, you've seen them all, this set has certain qualities that will give it wide appeal.

Open The Box!

After waiting patiently for the scanner to arrive, my first big - and lasting - impression was that they could have at least charged the battery pack up! With no charger available in the review sample, I had to use my own to power up. *(Oops that's what happens when I forget to send the charger! - Ass. Ed.)* This took 12 long hours, which, while it gave me time to look through the instruction book. Previous sets have been taken from the box, had charged NiCads slapped in and off I went. Not, alas, this one! The set does, however, come with a charger - the set I reviewed was almost straight from the airport.

It did give me time to look over the set externally, however. With its 'shiny' finish and metal telescopic whip antenna, the RT-618 looks like a scanner. It doesn't masquerade as a mobile 'phone or hand-held TX/RX. I liked that. It showed you exactly what it was and made no inroads into being anything else. I did, however, feel that the recessed b.f.o. and Squelch thumbwheels could have been made a bit bigger. I've got small hands and fingers - someone with bigger digits will have a problem getting these to operate accurately, needing, as you do, the dancing digits of a safebreaker to tune s.s.b. with any degree of success.

The front panel buttons looked pretty small, but man enough for the job, while the layout itself was very logical. It wouldn't take too long to understand the front panel which is a plus point when it comes to ease of operation. With a front mounted speaker, pleasant green backlit l.c.d. display and thumb operated scan function buttons it became obvious a lot of thought had gone into the design. Many scanner manufacturers should take note of this. Far too many sets require a Degree in Electronics to master and have sloppy, unergonomic front panels. The RT-618 doesn't and that puts it well up on my scale of 'user friendly' sets.

Acid Test

Apart from scanning my other interests lie in h.f. This enabled me to set up a good spread of spots in which to push the RT-618 through its paces. HF - with its multi-mode signals - is a tough area in which to test out a set and I decided that Marine s.s.b., some Amateur and some numbers stations would show me what was what. I ranged the RT-618 against my Sony ICF PRO-80 which, although quirky design wise, is a passable competitor. Both sets were used on their own antenna as my exterior ones are still down while the builders continue to do strange things to the house shell.

To initialise the set you have to have it fully charged and then press 'reset' - situated in the battery compartment. Once that was done I decided it was time to have a bash at seeing what it could do. The first test was to be held on 2.182MHz, the m.f. International Marine Distress and Calling Channel.

Against the PRO-80 the RT-618 performed well, matching the signal audio of its older consort. The lack of an S-meter here doesn't matter and I feel that having one would be of no real use anyway. Signals received from Stonehaven Radio were audible, with the best signal coming in from Portpatrick Radio and audible in a crisp and clear tone. That done, we went searching on channels.

It was here that previous experience of s.s.b. resolution will, I feel, count hard. Points would be lost by a novice owner who may fumble the thumbwheel to produce garbled audio. It is only a small point but one worth mentioning. I listened to inter-ship conversations between two rig stand-by ships and despite the almost unintelligable Scots brogue used I was able to follow the conversation reasonably well. Some loss of signal was noticed on both sets but this is atmospheric and not due to anything on the sets part.

I spent a good couple of hours up on 40 metres, with its cluttered conditions and the RT-618 did as well as the PRO 80 if not better on signals outside the ±5kHz offset of the Sony. Again, I felt that an outside antenna would have proved to be better for the set, together with an a.t.u., but did not have the facility while my house is being slowly destroyed by the contractors!

On number stations I went to a well known location for the 'Lincolnshire Poacher' and, again, the set coped as well as the Sony.

This is quite a good test area as front-end overload can cause more than just a headache due to adjacent signals and, of course, jamming of the 'Lincolnshire Poacher' signal. While nowhere near as good as a dedicated short wave reciever, the RT-618 coped with what I'd asked of it, bearing in mind its limitations and lack of outside antenna and a.t.u.

Operations

The beauty of this set is that you do not have to fiddle with complicated programming to enter such things as step increments and mode. Shuttle the appropriate button and you

are in! On h.f., the 1kHz step is handy and 'as standard' on h.f. amatuer bands. For broadcast short wave stations a 5kHz step size is available. These are selected automatically when you go into the relevant bank although provision exists to alter them around if you wish. Step size can be selected from 1 to 100kHz - very thoughtful!

The mode is auto-selected if you run through the programmed banks. however, this can be altered simply from the front panel if you wish.

As I thought - and mentioned earlier -resolution of s.s.b. signals can be fiddly due to the recessed thumbwheel. Maruhama may like to alter this to either a button or enlarge the wheel to make it stand proud of the recess but, with a little practise, it soon gets to be second nature. Nothing really, but in practice it may well frustrate owners of large hands and thick fingers!

Higher Purchase

On v.h.f. and u.h.f. the set was run 'bare' - that is, with no competitor. I used Marine v.h.f. as the test area living as I do on the coast and here was complaint number two! Although the factory banked frequencies are good, there wasn't any set in for Marine v.h.f.! Airband, amateur, broadcast - all there. What's wrong with putting in a banked cover for Marine? This was my first shot at inputting my 'own' area of interest and the time to see how easy it was, or wasn't....

One of the hardest sets I have ever programmed was an Alinco DJX-1. It put me off right away! The next was an Yupiteru VT-225, but I was impressed by its sensitivity. The RT-618, up to now at least, had proved easy to operate following the instructions for choice of memory bank scans. Everything is done for you if you choose this route - mode, steps and delay. A bonus, meaning that you can quite happily have what it has in its pre-programmed banks. Apart from lack of marine v.h.f., the set should keep scanner enthusiasts happy.

In actual practise, frequency entry is on a par with my AOR AR2000 - very user friendly indeed. A look at the book, know what you want to input, and follow the instructions. Easy! This is, again, a plus point for new or would-be owners as it means you can live with the set while getting to know it and, on that basis alone, I found it pretty simple to use. Then again, the 12 hour charging period means you have time to read the book!

I began the v.h.f. start on 156.000MHz - v.h.f. Channel 0 - and then worked through the band slowly. The set performed very well, giving crisp and clear audio and the scan delay was long enough in practice. Search speed was good - faster than my AOR, slightly slower than my VT-225 - but more than ample to hold signals without rudely chopping them off as so many do during a lull in transmission.

I decided here to pace the RT-618 against the Yupiteru VT-225. Obviously a wideband radio cannot out- perform a dedicated one. Its circuitry just doesn't allow for it. Versus the VT-225 it was a bit unfair and yet the RT-618 coped very well indeed. I listened to Civair and also to Milair out of Valley and, in both cases, the set was able to handle conditions with good results indeed. Impressed? We-e-ll....as an airband monitor I wasn't that keen on the speed but, as previously noted, it doesn't pretend to be a dedicated monitor. It did the job however - and far better than some I've heard.

The audio is suprisingly clear and sounds punchy, reminding me very much of the JVC Marine v.h.f. we have at the lifeboat station. The set sounded good, giving excellent reproduction - and seemed to be better on Marine than my VT-225.

It also locked on faster than the AOR, which missed a few channels when both sets were set to scan between 156.000 and 160.000MHz. I put this down to technological advances!

General Comments

The Maruhama RT-618 retails around at £299.00. In competition it has some fast stable mates to contend with. Alinco's DJ-X1; Yupiteru's MVT-7000; Trident TR-1200; Trident TR-980. All of these are, however, *sans* s.s.b. and it is my own personal view that s.s.b. should be the option you need, at reasonable cost, to explore below 30MHz. The RT-618 has that option and is, overall, a damned good little set for your money. Against this, though, is the mass second-user market in sets with s.s.b. fitted as standard - and for nearly £300 notes you'll get a top name in good condition.

Unfortunately, Maruhama isn't a name on everyone's lips. Yet!

However, with its 'classy' finish, easy to read display and general good construction, the set should prove to be well placed in the ranks of scanners. Add to that the s.s.b. facility and Maruhama have got a definite winner. s.s.b. would benefit from an a.t.u. before an external antenna and the MFJ MF-1 SW Scanner antenna system would be something to give consideration to if you decide you want to do more below 30MHz. You should note, however, that no scanner can give the same results as a dedicated h.f. receiver. It can only give a fair impression. The RT-618 did, however, whet my appetite.

I suppose, in summing up, I'd go as far as to say that I'd consider buying the set for the shack. Why? I like its looks, its ease of operation and its overall style. It feels right in my hand, has thumb press operation to scan and start/stop and weighs very little. If I could change anything I would certainly go for a flexi-whip if operating /P. That's all, however. If you're thinking of buying a set and are put off by the complexities of many then give serious thought to this one. It may look daunting but, in practice, it is a most user-friendly radio with good performance.

It has the usual scanner fitments: Delay, Priority channel and a massive 800 channel memory bank! Also, a 500 channel 'skip' or 'pass' memory - more than enough to keep even the most hardened scannerist happy!

I would add that I was impressed by it, by the quality of finish and the ease in which you can enter important details. Equally impressive was the almost ridiculous learning curve needed to master the set - an experienced user could have it up and running within the hour while a complete novice would find a day to be more than adequate. It is factors like these which will give the RT-618 the edge against its more complicated stable mates and may well be the selling point that has it up amongst the front runners extremely quickly indeed.

Finals

In conclusion I can say, in all honesty, that the charging period was maybe a good thing on reflection. Getting to know the set was something I really did enjoy and, quite obviously, reading the handbook helped tremendously.

If you are a beginner in scanning, an amateur who is on the look-out for a broad spectrum set or an established owner, looking for a general purpose radio to enhance a current set up, then my advice would be to look seriously at this set. Sure, there is so much on the market today that looks the same and a lot with pretty mediocre performance - certainly not value for money - but this set isn't one of them. I'd even go so far as to say it stands above the rest. With s.s.b. fitted as it is this is certainly true.

Placing the set in a personal chart would give it a very respectful fifth place! Having handled an AOR 1500 with s.s.b. fit I found the Maruhama was twice as easy to program and far more friendly. My own views on scanners are that there is far too much techno attached to them, which frightens people off. The simplicity of the RT-618 should be applauded and afforded respective status. This set is easy to work with!

Maruhama may be a name we are not familiar with now. My guess is that it will be sooner rather than later.

My thank's to **Lowe Electronics, Chesterfeild Road , Matlock, Derbyshire DE4 5LE. Tel: (0629) 580800**, for the loan of the review set and to the Editor for allowing me to play with it. For **£299.00** you, too, can play to your heart's content.

Oh and no I didn't want to send it back! ■

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REVIEW

Sky Scan DX V1300 Discone

The V1300 is unlike any other discone I have seen. Above the cone are four vertical whips, giving the V1300 both vertical and horizontal active elements, pre-cut to set frequency bands.

The V1300 is made of good quality, stainless steel and aluminum and on unpacking the parts I was vary pleased with the high overall standard of the engineering. The only change I would suggest is to the design of the cone. I would like to see the base of the cone threaded to take the top of a screwed support tube and make an already good bit of engineering outstanding. Although it would probably raise the overall cost a little, but would be well worth it for the overall improvement to the waterproofing of the coaxial mounting point.

The coaxial cable and the PL259 are fitted inside the cone after passing through the support tube, giving good weatherproofing. This needs to be done before any of the radiators and active elements are screwed into place. Once this is done, the discone is ready to mount out in the open, as high as possible and away from all power lines. One golden rule when putting up any discone is use UR67, or similar, coaxial cable, to cut down feeder losses at the higher frequencies.

Results

Test results taken against two other discone antennas, one without a vertically polarised section and one with such an element, showed that from 50 to 107MHz there was no difference between the three antennas. On the 108 to 136MHz a gain of 4dB over the two reference discones was measured. Between 137 and 175MHz this rose to 7dB falling to 2dB between 176 and 525MHz and steadying at 4dB between 526 and 1300MHz.

Using the Sky Scan V1300, I carried out listening test at my QTH in Bristol. On both the v.h.f. and u.h.f. Air Bands I was able to monitor air to ground and air to air, both ways, at distances of over 300 miles under far from ideal conditions during the first half of October 1990.

During the test it was pleasing to record, after darkness on several days, a number of military in-flight transmissions on frequencies never before monitored by myself between 176-525MHz.

The receivers used to carry out the tests were Kenwood R5000VHF, Signal R535 air band receiver, Kenwood RZ-1, Icom IC-R100 and a Realistic PRO2022 scanner. Not much difference between the receivers was noted during the tests.

Conclusions

It all adds up to the fact that your receiving station is really only as good as your antenna makes it. From my tests, I think that you should get very good results with the V1300 and any good scanner on the market today. The Sky Scan V1300 can be used for transmitting on the 144, 430 and 1296MHz amateur bands, unlike many other wide-band discones, if one of the long elements is replaced by an element about 280mm long. This length would depend on the locality of the QTH and should only be done by a person with some knowledge of working with antennas.

From Alf Brimming's Review in Short Wave Magazine – January 1991

Radio Communications in Motor Rallying

Head for the forests with a scanner in your hand and you can be sure of some exciting listening as well as viewing. With the Network-Q RAC Rally about to hit the road, Peter Dowling explains how to use your scanner to listen in to the action.

Rallying is a highly competitive sport, with entrants from clubmen to multi-million pound teams, with venues ranging from a single airfield to stages all across the country. Due to the very nature of the sport, radio communications are an essential part of a rally - no matter what the venue. With a scanner in your hand, there can be some very interesting listening.

The biggest rally of the British calendar is due to start from Chester on the 20 November. The Network-Q RAC Rally is the biggest single spectator event in this country, with many thousands of people tramping around forests for four days. Trying to find frequencies during these four days can be hard work. The large numbers of people following the Network-Q RAC Rally create traffic chaos wherever the event goes. There are a lot of other radio users wherever the rally is, the Police, Forestry Commission, motoring services plus many others.

Stages

Each rally is made up of stages, which can be in forests, on closed roads, on old airfields, or a mixture of all. During the Network-Q RAC Rally, cars will cover about 1200 miles, of which roughly 350 are competitive stage miles driven at full speed, averaging 65m.p.h. each stage. The rally has an overall commander, and each stage has its own Stage Commander. There are marshals on every junction of every stage, all in radio contact with the radio controller of the area, eg. Yorkshire Forest Area. The controller will organise recovery, first-aid, etc. for each stage in his area. He is answerable to his Area Commander with reference to crowd safety, weather conditions, etc. Before each stage can 'go-live', the organisers send a course-car through the stage to warn spectators that rally cars are imminent. It is also their job to make sure that spectators are not standing in dangerous places - it has been known for a stage to be cancelled because of too many people in the forest! A stage cannot go ahead until the start marshals get the all-clear from the course-car.

Rally organising is a big job

Key To Route Map Table:
TC = Time Control
SS = Special Stage
™ = No service allowed
A = asphalt surface
G = gravel
M = mixed

Route Map

Leg 1: Sunday 20 November

Control	Liaison	Miles	SS miles	Surface	Time
TC10	Chester				08.00
TC1		13.64			08.28
SS1	Carden Park		2.61	M	08.31
TC2		35.88			09.48
SS2	Tatton Park		4.27	M	09.51
TC3		46.89			11.40
SS3	Chatsworth		6.53	M	11.43
TC3A	Clumber Re-Group In	38.47			13.11
TC4		0.13			13.17
SS4	Clumber Park		5.70	M	13.20
TC5		51.89			15.01
SS5 ™	Donington 1		4.00	M	15.04
TC6		0.19			15.13
SS6	Donington 2		4.00	M	15.16
TC6A	Donington	0.22			15.25
TC6B	Eccup	92.63			17.34
TC7		4.12			17.34
SS7	Harewood Hill		1.86	M	17.46
TC9A	Harrogate (Holding)	12.78			18.41
TC9B	Harrogate (Car Wash)	1.65			18.50
TC9C	Harrogate (Parc Ferme)	2.29			19.00

Leg 2: Monday 21 November

Control	Liaison	Miles	SS miles	Surface	Time
TC7D	Harrogate				05.00
TC8		64.06			07.01

Previous RAC Rally frequencies

1992 Lombard RAC Rally:	Ford	163.45
	Lancia	163.4874, 158.9875
	Nissan	163.4125, 159.9125
	Subaru	163.5, 159.0
	Toyota	163.4
1993 Network-Q RAC Rally:	Ford	82.9
	Mitsubishi	82.9
	Subaru	82.925, 69.425
	Toyota	82.9875, 69.4875 (airlink)

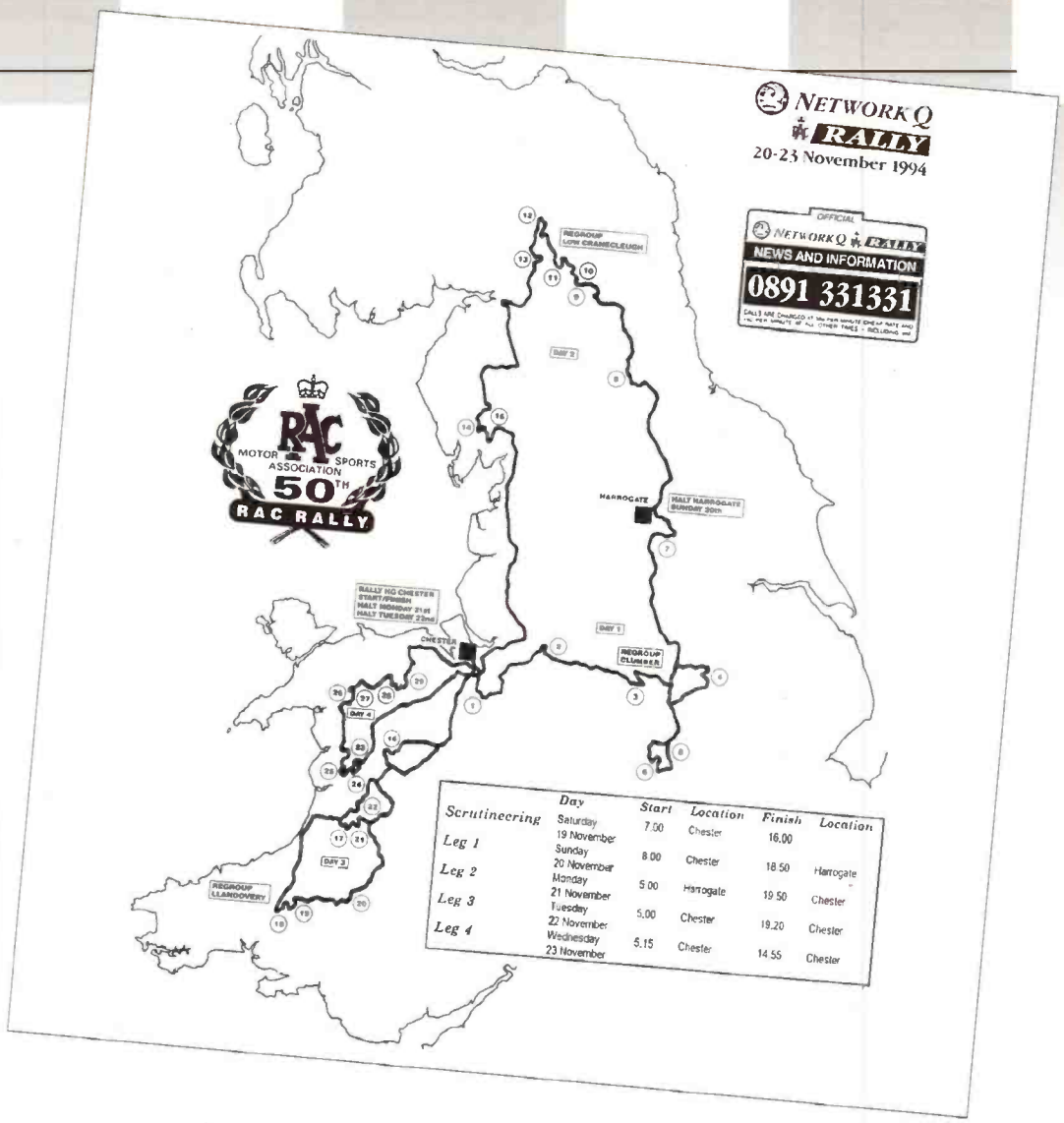
Other rally search frequencies:	a.m.	n.f.m.
	69 - 70	69 - 70
	82.5 - 83	159 - 160
	86 - 87	163 - 165
		168 - 170

UHF spot frequencies: n.b.f.m.

414.4875	455.2350	459.5000	462.4250
415.9875	456.6150	460.3250	465.2350
450.2250	457.3125	460.5000	466.6150

All frequencies in MHz.

and they use numerous frequencies. With a big event like the Network-Q RAC Rally, organisers use various short-term-hire frequencies, as well as the published frequency of 86.4375MHz a.m. In forest stages, where line of sight doesn't work, they have manned repeater stations passing details back to the controller. There is usually a marshall sat in his car passing on details from one station to another. Each junction of a stage is manned to help identify problems. The biggest problem is cars crashing off the stage and blocking it for other competitors. As soon as this happens, the marshals must assess if the stage is safe to continue and radio back to the stage start with a status report. As there is a marshall on each junction, which are numbered, the location of the problem can



Scrutineering	Day	Start	Location	Finish	Location
Leg 1	Saturday 19 November	7.00	Chester	16.00	
Leg 2	Sunday 20 November	8.00	Chester	18.50	Harrogate
Leg 3	Monday 21 November	5.00	Harrogate	19.50	Chester
Leg 4	Tuesday 22 November	5.00	Chester	19.20	Chester
	Wednesday 23 November	5.15	Chester	14.55	Chester

SS8	Hamsterley		16.86	G	07.04
TC9		44.50			09.07
SS9 TM	Shepherdshield		7.67	G	09.10
TC10		2.75			09.31
SS10	Pundershaw		28.18	G	09.34
TC10A	Low Cranecleugh Re-Group In	5.10			10.47
TC10B	Low Cranecleugh Re-Group Out				11.05
TC11		1.24			11.10
SS11	Chirdonhead		10.58	G	11.13
TC12		20.46			12.16
SS12	Wauchope		8.80	G	12.19
TC13		10.68			12.58
SS13	Kershope		19.55	G	13.01
TC13A	Kershope	0.75			13.36
TC14		83.22			16.01
SS14 TM	Grizedale West		17.33	G	16.04
TC15		0.37			16.40
SS15	Grizedale East		4.85	G	16.43
TC15A	Grizedale	0.27			16.52
TC15B	Chester (Holding)	122.79			19.50
TC15C	Chester (Parc Ferme)	2.59			20.00

Leg 3: Tuesday 22 November

Control	Liaison	Miles	SS miles	Surface	Time
TC15D	Chester				05.00
TC16		52.62			06.46
SS16	Dyfnant 1		13.46	G	06.49
TC17		31.15			08.19
SS17	Hafren 1		18.00	G	08.21
TC17A	Hafren	0.99			08.53
TC18		55.14			10.44
SS18	Brechfa		20.29	G	10.47
TC19		5.42			11.39
SS19	Trawscoed		22.76	G	11.42
TC19A	Llandovery Re-Group In	15.13			12.58
TC19B	Llandovery Re-Group Out				13.15
TC20		7.45			13.30
SS20	Crychan		3.88	G	13.33
TC21		43.10			15.07
SS21			20.53	G	15.10
TC22		29.58			16.51
SS22	Dyfnant 2		13.46	G	16.54
TC22A	Dyfnant	0.69			17.15
TC22B	Chester (Holding)	50.38			19.20
TC22C	Chester (Parc Ferne)	2.59			19.30

Leg 4: Wednesday 23 November

Control	Liaison	Miles	SS miles	Surface	Time
TC22D	Chester				5.05
TC23		71.17			07.38
SS23	Pantperthog		9.41	G	07.41
TC24		3.52			08.07
SS24 TM	Dyfi Main		14.57	G	08.10
TC25		3.32			08.50
SS25	Dyfi Gartheiniog		14.04	G	08.53
TC26		43.68			10.49
SS26 TM	Penmachno South		8.31	G	10.52
TC27		0.21			11.10
SS27	Penmachno North		6.25	G	11.13
TC28		23.05			12.17
SS28 TM	Clocaenog West		3.75	G	12.20
TC29		0.34			12.29
SS29	Clocaenog East		12.04	G	12.32
TC29A	Chester (Holding)	45.06			14.47
TC29B	Chester (Racecourse)	1.13			14.55

be easily identified. If drivers are injured, the stage must be stopped and first-aid and rally rescue services called to help the casualty. If necessary, the stage will be cancelled, non-started cars sent round to the next stage, and they're given a default time. Each of the marshalls are in radio contact using either car mounted sets or hand-held units.

Rallying is against the clock, with cars being timed around each stage. The car is given a start time, and as they finish the stage, a finish time is recorded. The start time is deducted from this, to give the total time for that stage. The time for each car is radioed back to the area time-keepers who compile a list of leaders for that stage. This list is then radioed back to the rally headquarters. So, with a scanner you can monitor these times being passed and work out who is leading.

Big Money

The big rally teams spend hundreds of thousands of pounds on rally development and support. Basically, if their car wins the Championship their sales will be boosted - Peugeot's 205 World Championship in 1988 increased their sales by 55%!

So, there is big money in supporting the big teams. This support includes: chase cars, which follow the rally car round for the whole event carrying essential spares for on-the-spot repairs, ice and mud-note cars that drive around the forest stages about two hours before the competitors to make notes of any bad patches that drivers will need to be careful of when they drive around at full speed. These findings are then radioed back to the rally car. Ice note drivers are usually junior team drivers gaining experience. There is a whole armada of service vehicles for each car, usually doubled, so that they can leap-frog each other around the country, being ready for the car as it arrives at a service area.

The Team Manager then follows the whole team in his Range Rover type vehicle. Additional vehicles include catering and motor homes providing driver comforts between stages.

Airborne Repeater

On the Network-Q RAC Rally the whole team stays in constant radio contact by various means. The big teams have an airborne repeater, either fixed wing or helicopter, providing contact between the different vehicles and back to the rally headquarters, at whatever major town that may be. A lot of rallying is done in remote areas and so line-of-sight communications become a problem. The repeater gives them the flexibility. This does mean that with a scanner, you can tune in from just about any area within 150 miles. This is similar to major cycling events. The allocated frequencies change each year, with a new DTI allocation. A guide to previous year's allocation and possible search ranges are given in the accompanying table. Rally team managers have been known to stand near another team, with frequency counter in hand ready to get the frequencies of their competitors!

Enough of the big teams, the Network-Q RAC Rally would be impossible without the private teams which make up the numbers. They're not on big budgets, and rely on more down-to-earth radio communications - such as short-term-hire (STH), p.m.r., CB radio and even mobile 'phones. These are not used whilst driving, but for calling a service car in case of trouble. These frequencies can obviously by anywhere on the spectrum and therefore even harder to find.

Communications Car

The Network-Q RAC Rally organisers have their own 'communications car' - which one year I managed to get a look at. It was a Sierra estate packed with scanners, CBs, mobile 'phones and other bits and pieces. Talking to the cars' operators, their main purpose is to unofficially listen to the main rally teams - and report back to rally headquarters any breaking news during the event.

Service areas are a good place for tracking down frequencies. There are two or three of these services during the day, and always one at the end of the day. The Network-Q RAC Rally route and service area details are published in specialist motor sport press. Servicing is usually in a big open space, for example a big car park, so you can get a good look at what work is being done on the car. They are also very hectic and the service team can often be heard guiding their car to the correct service point.

Competitive

Motor sport is a big user of radio communications. As technology progresses, the teams with big money will use telemetry and satellite communications. But the core of the rallies will still remain the club-man, competing for himself and using his radio communications to keep in contact. Rallying is an interesting and competitive sport using radio communications - hopefully this article has encouraged you to get your scanner out on the 1994 Network-Q RAC Rally and have a go at finding these hard-to-find frequencies. If you do, I'm sure you won't be disappointed. Details of locations of stages and times for this year's event are shown on the route map. ■

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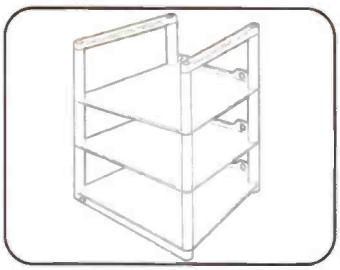

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Be a RadioScience Observer Part 1

Using your radio receiver to make scientific observations can be very satisfying as well as useful. This short series by Joseph J. Carr BSc. MSEE should help to get you started.

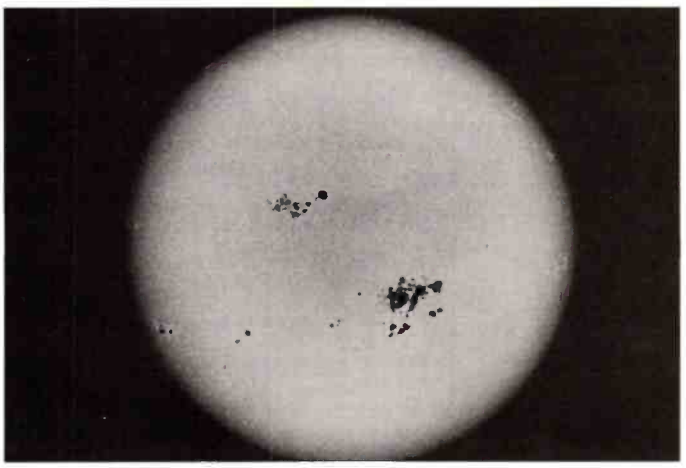
Short wave listeners, licensed amateur radio operators, general electronic hobbyists, and even most casual users of radio receivers know that some interesting scientific observations can be made on the airwaves. Many of these observations are in the form of radio signal propagation effects, although some - such as 'spherics' and 'whistlers' - are due to other natural phenomena as well as radio signal propagation effects.

Radio propagation effects can be seen easily, even on the medium wave a.m. broadcast band (540 to 1705kHz). During daylight hours, the medium wave a.m. broadcast band is limited to ground wave reception. Only local stations, out to a few dozen kilometres, are audible at most locations. But starting at sundown, a strange thing happens: local stations begin to be interrupted by long distance signals. Indeed, some 'local' signals that are on the fringe of reception during daylight hours fade into the background chatter altogether at night. At my home in Virginia, normal daytime reception is limited to around 40 miles during normal conditions. At night however, long distance reception begins to roll in. With any decent radio receiver, stations in Canada, the Caribbean, Latin America, as well as from US sites as far away as Denver, Colorado, become audible. I've even heard a.m. broadcast band stations in Europe during odd reception periods. At sun-up the next morning, however, the long distance stations fade rapidly and the situation returns to daylight status.

Profound changes are also seen on the high frequency bands - 3 to 30MHz. Starting at sun-up, the long distance 'skip' reception arises. The amateur radio bands from 14MHz through 28-29.7MHz begin to open up for DX. The band openings follow the sunrise across the planet. As an east coast USA amateur radio operator, I find it easier to work European stations early in the morning, when the planetary terminator (grey zone between day and night) hasn't reached the large mass of American amateurs to the west of me. With my low power transmitter, I find it easier to be heard when the rest of the amateurs in the USA and Canada are 'in the dark.'

Fig. 2. Solar prominence (photo courtesy Jean Dragesco).

Fig. 3. Sunspots (photo courtesy Jean Dragesco).



The Radio Mirror

The variation in radio propagation is caused by action of the Earth's atmosphere, principally in the ionospheric region (**Fig. 1.**). This region is affected by solar radiation, cosmic radiation, meteors and other sources of energy that causes the gas molecules to become ionised into positive and negative ions. Radio signals entering the ionised regions are bent back towards the Earth's surface. Although the effect appears from the Earth's surface to be a 'reflection' from an invisible radio mirror, the actual effect is what is called 'refraction with total internal reflection' in the physics textbooks.

The ionosphere is divided into three major regions labelled: D-layer (closest to the Earth), E-layer (middle region) and F-layer (furthest from the Earth). The D-layer is found 50km or so above the Earth's surface, and is responsible for long-wave reflections. The air is dense in this region, so positive and negative ions rapidly recombine to form electroneutral gas molecules. Ionisation levels cannot be easily maintained in the D-layer without the Sun being present above the horizon.

The E-layer is above the D-layer. Some textbooks further divide the E-layer into E1 and E2 sublayers. The E1 layer is closer to the Earth's surface than the E2, and is responsible for medium wave a.m. broadcast band skip propagation. The E2 layer is believed to be responsible for some daytime short-wave skip propagation.

The upper part of the ionosphere is the F-layer. The F-layer is usually subdivided

in F1 and F2 sublayers. The F1 sublayer shares with the upper regions of the E2 layer responsibility for daytime short wave skip propagation. Night time short wave propagation is carried out through the action of the F2 layer. The ionisation of the F-layers begins to decay after dark, but stays around much longer than D-layer or E-layer ionisation.

Certain disturbances in the ionosphere cause changes in radio propagation patterns, and it is these that are the basis for making several different types of radio science observations.

Most of these disturbances are created by events on the Sun, solar prominences (**Fig. 2.**), sunspots (**Fig. 3.**) and solar flares (**Fig. 4.**) all cause radio propagation effects.

Sunspots vary on a 28 day cycle, as the Sun rotates. This variation is the reason why *Short Wave Magazine* publishes propagation charts on a monthly basis that show considerable monthly variation in the maximum usable frequency (MUF) for propagation to various parts of the world.

Sunspot counts also vary on an approximate eleven year cycle. When the number of sunspots is high (peak of the cycle), then the MUF goes up to the lower end of the v.h.f. region. During these periods, communications world-wide is easy, even for stations using very low power levels. During the low count periods, the MUF depresses and the upper shortwave bands seem dead Sudden Ionospheric Disturbances (SIDs) are traced to solar flares (**Fig. 4.**), and severely impede short wave skip communications. I've observed SID events, which last from hours to days, in which short wave skip was all but impossible. In the years before transatlantic telephone cables (1955 - telegraph cables were laid a century earlier), or in recent years geosynchronous communications satellites, a SID event could cut-off telephone service between Europe and North America for days at a time.

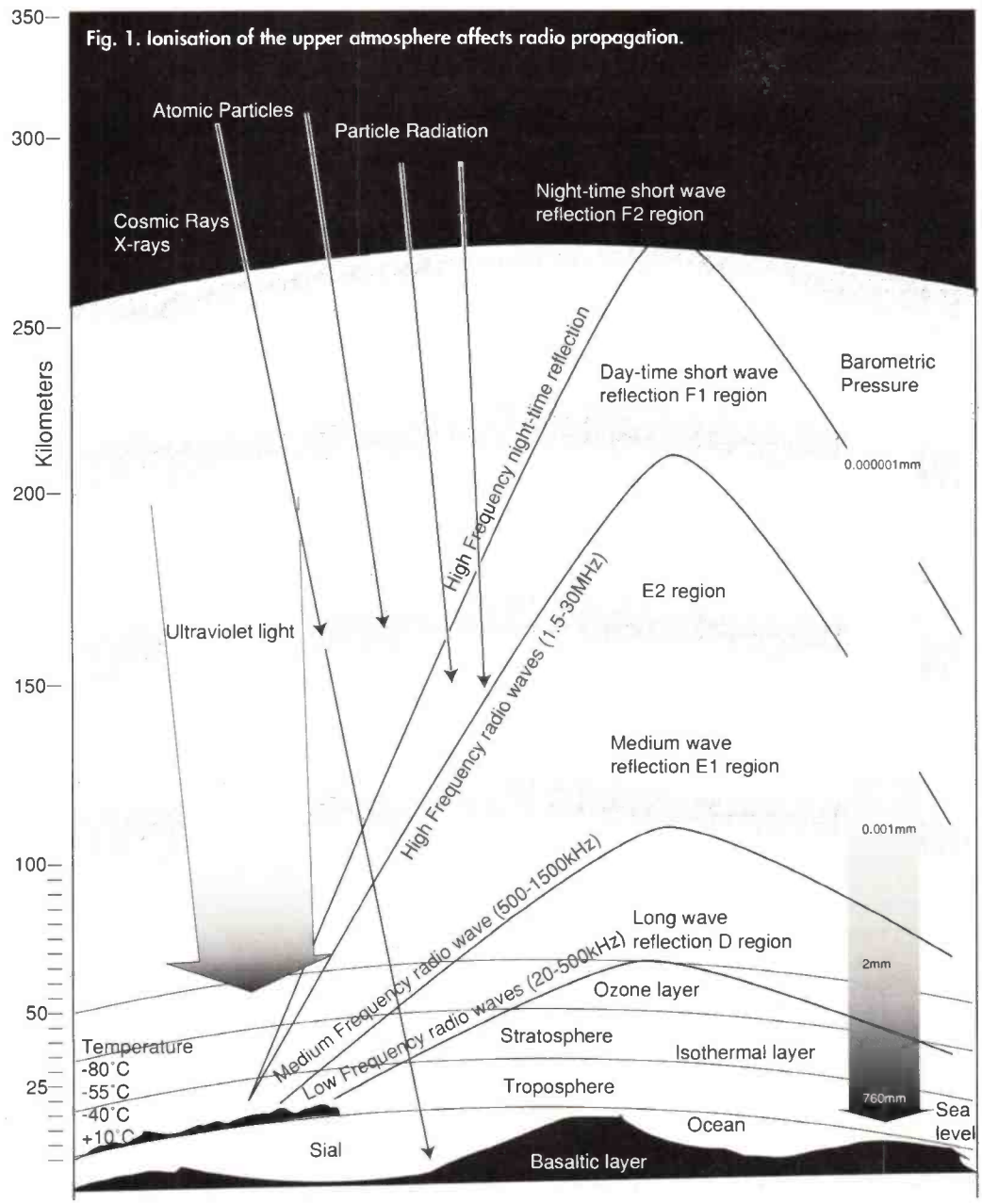


Fig. 1. Ionisation of the upper atmosphere affects radio propagation.

HF Band SID Detection

SID events can often be detected using an ordinary short wave receiver and a rectifier/integrator circuit (**Fig. 5.**). The key is to monitor a known, standard radio signal that is continuously present at least during daylight hours. In the USA, we find it convenient to monitor the National Institutes of Standards and Technology (NIST) standard time and frequency station, WWV, at Fort Collins, Colorado or WWVH in Hawaii (5, 10, 15 and 20MHz). The receiver is left tuned to the standard station. The audio output from the earphones jack is rectified by a voltage doubler made from germanium signal diodes (D1 and D2), and then is integrated by a 220µF capacitor.

The output of the rectifier/integrator is read from a d.c. microammeter (100µA to 1mA full-scale). Unfortunately, this read-out, while useful for tuning the system, must be read and logged constantly to see any effects. Some observers record the output on a strip-chart recorder to overcome this problem. Popular models include the Rustak Model 288 0-1mA d.c. current recorder and various recording volt-ohm-milliammeters (e.g. Simpson Model 604). Other observers are now using a small personal computer and an A/D converter, which today seems like a better and more cost-effective choice. I use a Pico Technology Ltd. Broadway House, 149-151 St Neots Rd, Hardwick, Cambridge CB3 7QJ, UK; Tel: (0954) 211716 or Fax: (0954) 211880 Model ADC-16, a 16-bit A/D with a conversion time that is fast enough for this purpose (ADC-8, ADC-10 and ADC-12 are also suitable). Being able to make an 8-bit conversion once per second is sufficient for this application.

Various results are seen when the rectified and integrated output is continuously monitored and recorded. Most days, the output of the integrator, which indicates signal

strength, rises shortly after sun-up as propagation effects come alive, and then varies somewhat throughout the day. On a day with high solar activity, the variations will be unusually many, looking somewhat like a graph of stock market prices over a year or so. At sundown, the integrated signal level drops to near zero, where it remains until sun-up the next morning. If a SID occurs during the day, the signal level will drop dramatically, and the effect is easily seen. If the receiver is designed such that the automatic gain control (a.g.c.) voltage, or the d.c. level that drives the S-meter, is available through a connection to the outside, then that signal can be recorded instead of the rectified and integrated audio output signal.

Unfortunately, the solar flare induced SID is not the only event that can make h.f. propagation fade in and out, so these frequencies are considered second best for SID observations. The principal attraction of the h.f. band for solar monitoring is that it is easily accessible to large numbers of people because it uses an ordinary short wave receiver, and does not require modification of the receiver.

A more reliable band to monitor is the very low frequencies (v.h.f. from 10 to 100kHz, with principal effects being seen in the 20 to 40kHz region. We will discuss v.h.f. monitoring in Part 2.

HF Standard Stations

Even if you don't want to be a SID-hunter, there are a number of interesting observations that can be made on the short wave bands. If you have a receiver that is equipped with an S-meter, and are willing to do manual data recording, then it is probably not necessary to build the rectifier/integrator circuit. The idea is to record the strength and nature of the reception of a standard station that is normally in the clear. Some people use international broadcasting

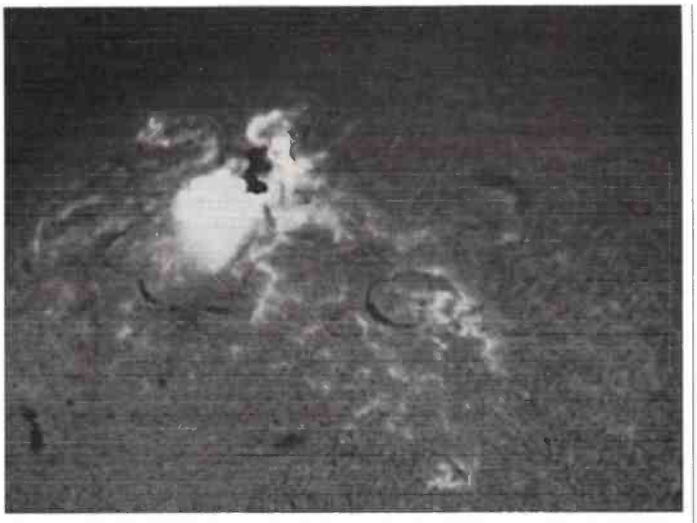


Fig. 4. Solar flare (photo courtesy Jean Dragesco).

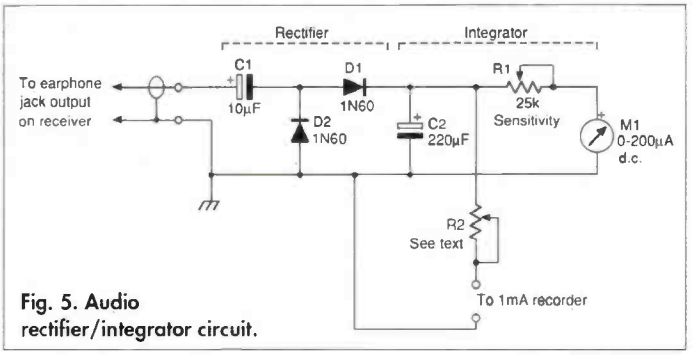


Fig. 5. Audio rectifier/integrator circuit.

stations, while others use standard time and frequency stations. Some scientifically inclined s.w.l.s have been known to keep detailed records of signal strength on the same station, at the same time, every day for long periods of time. One fellow I encountered had recorded the signal strength of Radio New Zealand as received in the USA, at the same time of day, for about five years.

With modern computer software spreadsheet packages, such as Excel, huge amounts of data can be stored and portrayed graphically. Later versions of most of the popular packages will even do simple statistical calculations such as mean and standard deviation.

The NIST radio stations WWV (Colorado) and WWVH (Hawaii) broadcast certain information of interest to radio enthusiasts or those doing radiosolar observations. At 18 minutes after the hour on WWV, and 45 minutes after the hour on WWVH, information about current propagation conditions and a forecast for the next 24 hours are broadcast. The information includes the 1700 UTC solar flux data from Ottawa, Canada, and the Boulder 'A' and 'K' indexes. The 'A' index is a number between 0 and 400, and is based on data taken over the previous 24 hours. The K index is a number, generally less than 10, and is based on the current three hours data (Helms 1993). Quiet geomagnetic conditions are indicated by an 'A' index of 10 or less. Higher values of the 'A' index indicates high ionospheric absorption, and the effect is especially severe in high latitude paths - such as the infamous North Atlantic path between Europe and North America. When the 'A' index reaches the vicinity of 100, there is severe disruption of short wave communications, and the visible aurora borealis appears in high northern latitudes (Helms 1993).

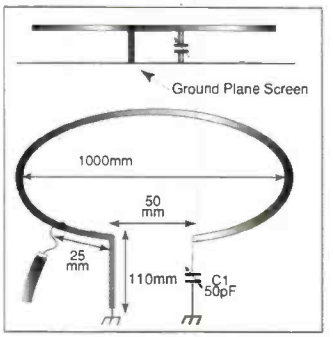
The 'K' index is based on a smaller range scale. When the geomagnetic field is quiet and normal, the value of K = 0. When K is about 1 or 2, the geomagnetic field conditions are unsettled, while values of K ≥ 3 indicates possible auroral conditions. The 'K' index is variable with geography. The value given is for Boulder, CO, USA; locations to the south of Boulder have lower K values, and locations north of Boulder have higher K values (Helms 1993).

The NIST stations WWV/WWVH also broadcast somewhat subjective observations of solar activity and geomagnetic conditions using terms like 'very low', 'low', 'moderate', 'high' or 'very high' to describe solar activity, and 'quiet', 'unsettled', and 'active' to describe the geomagnetic conditions. At one time WWV/WWVH used a radio conditions scale that featured a letter and number combination. The letters 'W', 'U' and 'N' were used for 'warning', 'unsettled' and 'no-warning', while conditions were broadcast on a 1 to 9 scale (with better propagation conditions being indicated by higher numbers). An N9 reading meant very good, solid DX listening, while W2 meant go have a beer because DX will be non-existent. The information was broadcast in modulated CW at 19 and 49 minutes after the hour. These scales are sometimes found in older texts and papers on propagation, so should be understood by anyone who researches prior amateur radio and professional scientific literature on the subject.

General Advice

When looking for short wave fadeouts from SIDs, take advantage of the fact that

Fig. 6. Directional Discontinuity Ring Radiator (DDRR) antenna.



absorption varies with the square of the frequency (F^2), so observations should take place on a frequency as close as practical to the MUF for that day. Estimations of the MUF can be gleaned from the propagation prediction column in *SWM*, or from the *MiniMUF* software packages on the market.

For eclipse monitoring (of which, more in Part 3), use frequencies that are most affected by the D or E-layers of the ionosphere. Lewis recommends using frequencies that are most affected by D-layer, so he prefers frequencies in the 3.5MHz amateur radio band, or other (non-amateur) bands near 5MHz . He claims that the greatest signal enhancement will occur just before totality reaches the receiver observation site.

Monitoring Jupiter

One of the strongest radio sources in the sky, second only to the Sun, is also the second most accessible: the planet Jupiter. The largest planet in the solar system has a complex, stormy atmosphere. It is believed that an interaction of the atmosphere, the moons of the planet and the planet's magnetic field are responsible for generating strong radio signals in the spectrum 5 to 40MHz, with the strongest signals appearing in the 18 to 24MHz band. These frequencies are within the range covered by most high frequency short wave receivers.

The Jovian radio signals are characterised in various ways. Some sources say the signals sound like a handful of fine pebbles thrown against a metal roof. Others characterise the signals are a 'swooshing' sound, or a rising and falling variable hiss - which represent the signals that I have heard. Any white, pink or 'shot' noise heard within the 18-24MHz band is a candidate for identification as a Jovian source. However, to be identified for certain, it is necessary to monitor the time the signals are heard and correlate the existence of the signal with the time that Jupiter is above the horizon. Observers with beam antennas that are limited in the elevation extent often identify Jovian sources by correlating the noise signal strength with the passage of Jupiter through the antenna's elevation pattern.

Because of the strength of Jovian signals simple antennas can be used for reception, even an ordinary half wavelength dipole works well. A half wavelength dipole, cut for about 21MHz, is suitable, although some people like to cut three dipoles (18, 21 and 24MHz) and feed them from the same 52Ω transmission line. This tactic tends to broaden the performance over the entire 18-24MHz band, rather than optimising it in the centre. The dipole should be erected so that the wire runs east-west in order to have the dipole's aperture face in a southerly direction. The antenna should be not more than a half wavelength above the ground in order to ensure a high angle of radiation. The actual angle of radiation desired depends on the elevation of Jupiter above the horizon at any given location.

Jovian signals tend to be wide band, so the best receiver is one that has a wide a.m. filter position (or even wider). Even though the signals are wide band, they do not extend the entire 18-24MHz spectrum, so some tuning is necessary when Jupiter hunting.

There is about a 1 in 6 chance of hearing a Jovian at any given time when Jupiter is above the horizon, but if you don't tune or use too narrow a passband on the receiver, the odds drop considerably. Another popular Jupiter hunting antenna is the directional discontinuity ring radiator (DDRR) shown in **Fig. 6.** Complete details for the DDRR are given in *David* (1991, p.100), but for Jovian reception, and not transmitting, the version in **Fig. 6.** will suffice. This design is a 1 metre 'hula hoop' ring that is open at one point (i.e. 'discontinuous'). The ring is made of aluminium or soft-drawn copper pipe (10-50mm o.d.). The soft-drawn copper material is especially suitable because it is flexible, and already comes coiled at do-it-yourself hardware stores. I was able to purchase ½ inch (15mm) soft-drawn plumbing pipe that was already coiled in about a 1m diameter circle.

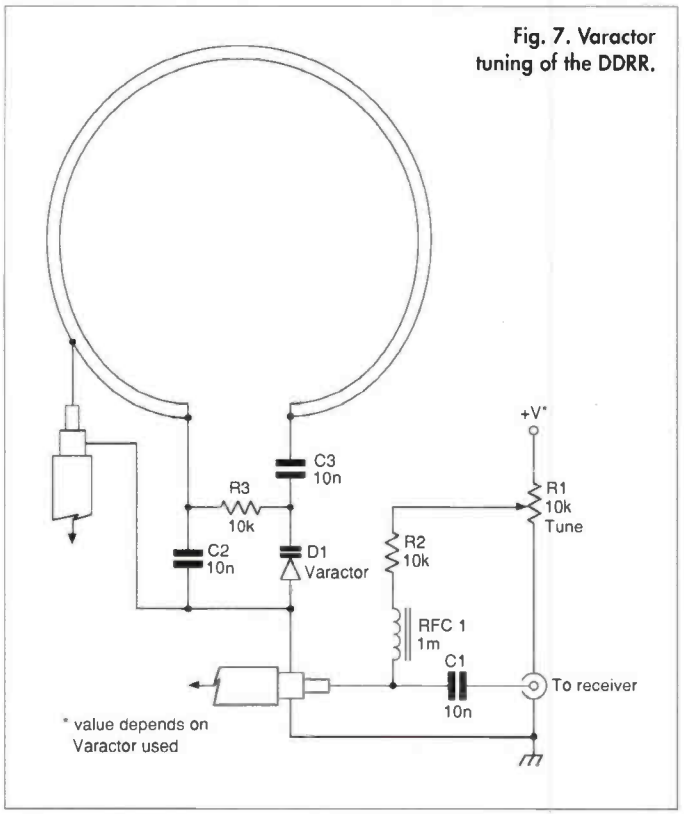


Fig. 7. Varactor tuning of the DDRR.

The neat trick was to get the sales person to gently cut a one turn loop off the supply for me without distorting the roundness of the circle or kinking it in any way.

One end of the open ring is grounded, while the other is terminated in a 50pF variable capacitor that tunes the loop. I recommend tuning the capacitor to the middle of the 18-24MHz band, or about 21MHz. Otherwise, a small low voltage d.c. motor could be used to remotely tune the loop. Alternatively, a voltage tuned Varactor diode could be used.

Direct current for setting the diode capacitance could be sent up the coaxial cable from the receiver, provided that a suitable circuit was provided (see **Fig. 7**).

The open ring of the DDRR antenna is installed over an artificial metallic ground plane. Suitable materials include copper sheet (roofing material), copper foil, metallic wire window screening, or 'chicken coop' wire. The ground plane is laid out in a square format that extends at least 250mm beyond the rim of the ring radiator all around.

The DDRR antenna will work well when laying flat on the ground, although a couple sources show a frame holding both the ground plane and the ring radiator elevated about 45°, and facing south.

The ring radiator produces a relatively low signal level, so may require a preamplifier. A suitable design will be offered later in the series.

Part 2

In Part 2 of this three-part series we will take a look at monitoring solar events that cause Sudden Ionospheric Disturbances (SIDs) on the very low frequency (v.l.f.) bands between 10 and 60kHz. A couple of designs for your own home-brew SID-hunting v.l.f. radio receivers will be presented.

A bibliography of sources consulted will be presented at the end of Part 3. ■

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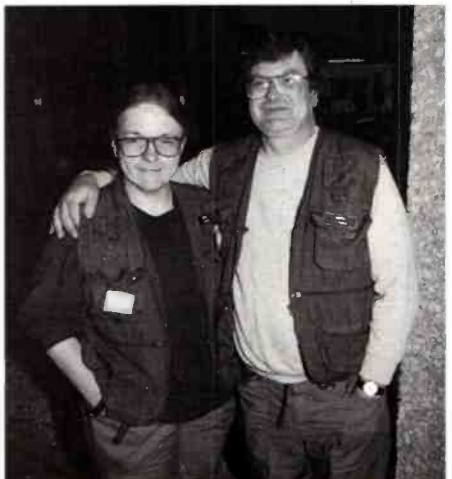

Lucky couple Arthur G0NDI and Anne Izzard G0NDJ from Birmingham, won two prizes in the huge draw at the 1993 Dayton HamVention

The annual *PW* trip to the Dayton HamVention has established itself as the highlight of the year for me. I look forward to flying to the USA every year, meeting all our old friends and making new ones every time. So, why don't you join us on the 1995 HamVention holiday.....it's a marvellous experience and I'll enjoy your company.

As this is our 'Leicester Show' issue of *PW* I thought it would be a good idea to invite readers to come and chat to me about the Dayton HamVention Holiday during the show on Stand 3 in the Exhibition Hall. So, if you're attending the show I'd be delighted to talk to you about the trip. Alternatively, if you prefer, I would be pleased to talk to you on the telephone between **1 and 2pm** on **(0202) 659910.**

The 1995 HamVention Holiday departs from Gatwick on Tuesday April 25 and we'll fly direct to Cincinnati in the USA for £650 per person (based on two people sharing a room). We'll be staying at the Holiday Inn in Englewood, Dayton for six nights and return home from Cincinnati on Monday 1st, arriving home on Tuesday 2 May. The price includes entrance tickets to the three day HamVention and an excursion to the world famous Air Force Museum (other optional excursions available).

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And, don't forget...if you're travelling alone on the *PW* trip 'singles can save'. We'll be pleased to arrange for you to share accommodation.

Although I'm leading the *PW* party again and look forward to chatting to you, as with the successful 1994 holiday, the 1995 trip is being organised by the professional tour operators Gulliver's Groups & Incentives. Andy Garside is looking after our arrangements and he's looking forward to your enquiry for the full itinerary and booking form.

Rob Mannion G3XFD

So, for full details on the 1995 *PW* Dayton HamVention trip don't delay...send the coupon today to: **Andy Garside, Gullivers Groups & Incentives, Fiddington Manor, Tewksbury, Gloucestershire GL20 7BJ, Tel: (0684) 293175, FAX: (0684) 290093**.

LOWE COMPETITION Part 2

as reviewed in the September 94 issue of SWM.

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

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

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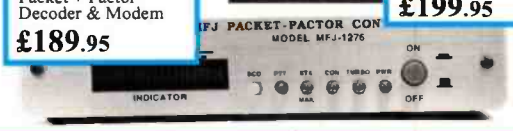

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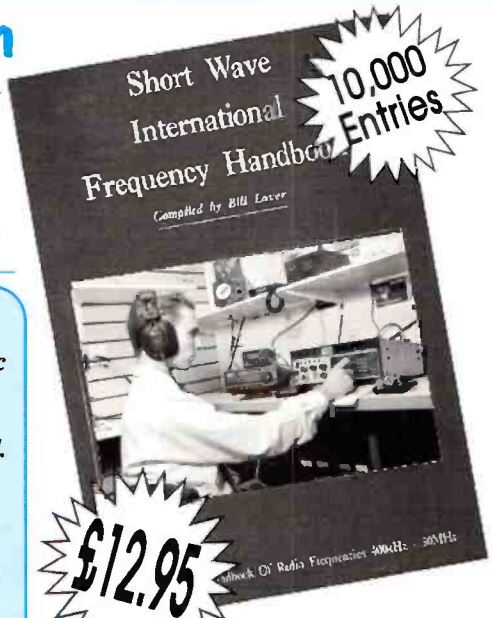

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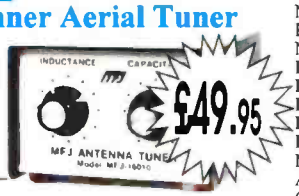

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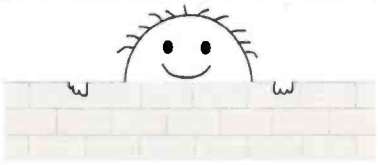

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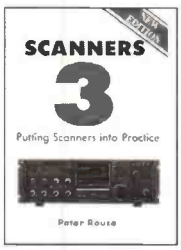

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Buying a Second Hand Receiver

The numerous receivers, both old and new, available on the market present a bewildering choice that is difficult to put into comparative terms. In this article, Ben Nock G4BXD points the newcomer in the right direction.

Various aspects of a receiver always present problems - should it be transistorised or valved?, short wave or amateur bands?, big or small?, expensive or cheap? - the latter being my prime consideration. Whatever we are looking for there will be several receivers that will fit the bill and do the job. To the newcomer or junior in our midst, I would like to suggest that, with a few exceptions, you might like to consider an older valved set as a good starting point, the older participants in the hobby already know the magic of valved sets.

Abbreviations

a.c.	alternating current
a.f.	audio frequency
a.m.	amplitude modulation
a.t.u.	antenna tuning unit
a.v.c.	automatic volume control
Æ	antenna (aerial)
b.f.o.	beat frequency oscillator
c.w.	continuous wave (Morse)
d.c.	direct current
dB	decibels
f.m.	frequency modulation
h.f.	high frequency
i.f.	intermediate frequency
kHz	kilohertz
l.s.b.	lower sideband
m	metres
mA	milliamps
MHz	megahertz
mW	milliwatts
Q	a measure of the 'goodness' of a tuned circuit
r.f.	radio frequency
s.s.b.	single sideband
s/n	signal to noise ratio
u.s.b.	upper sideband
V	volts
v.f.o.	variable frequency oscillator
W	watts
µV	microvolts
Ω	ohms

What's It For?

This is the usual question raised when thinking of a purchase. What will the receiver be used for?, if exclusively for amateur band listening, then a general coverage set might not be needed - but having said that, what will you listen to when the amateur bands close?

Out of the hundreds, if not thousands, of sets around I offer the following few as examples of what can be obtained at rallies or club junk sales. I'll point out their coverage and what each lacks or has in its favour.

I'll start with the Eagle Products short wave receiver, a 4-valve set, covering 550kHz to 30MHz in four bands plus a bandspread control, a.c. mains powered, transformer driven, with a fitted loudspeaker, a fitted ferrite rod antenna, external antenna/earth connections, noise limiter switch, high/low tone switch, standby switch, a b.f.o., and a large S meter. The fact that it is transformer fed is better than using an a.c./d.c. set with the potential hazards involved.

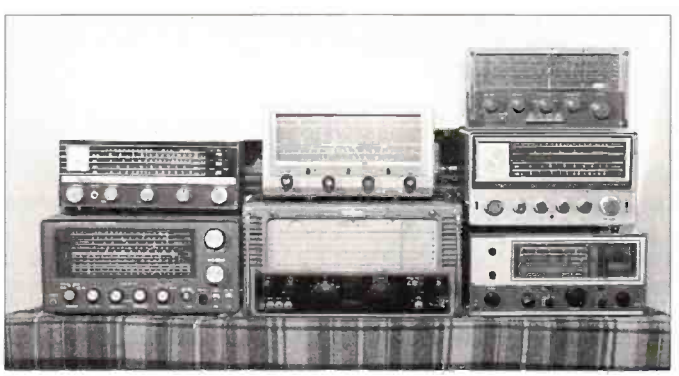
The valves used are 12BE6, 12BA6, 12AV6, 50C5. This compact set is probably suited to the youngster, it is cheap and takes little room. The b.f.o. does work but there is no means of attenuating the incoming signal thus making the reception of strong s.s.b. signals difficult. This can be overcome by using an a.t.u. and slightly detuning it when trying to listen to a strong s.s.b. station.

Hallicrafters S-38E

Next is The Hallicrafters S-38E, a development of the S-38 offered in 1946, and produced between 1957 and 1961 (originally offered at $54.95). For that money you got a 4-band, short wave receiver that would not have looked out of place on a bookshelf in the living room or shack.

The S-38E uses five valves, a 12BE6 as oscillator come frequency changer, a 12BA6 as i.f. amplifier come b.f.o., a 12AU6 (a 12AV6 in the S-38EB) as detector and a.f. pre-amp, a 50C5 as audio output and a

The Lafayette HE-30 general coverage set.



A collection of short wave receivers of varying cost and sophistication offering basic facilities up to high quality reception.

Continued Over

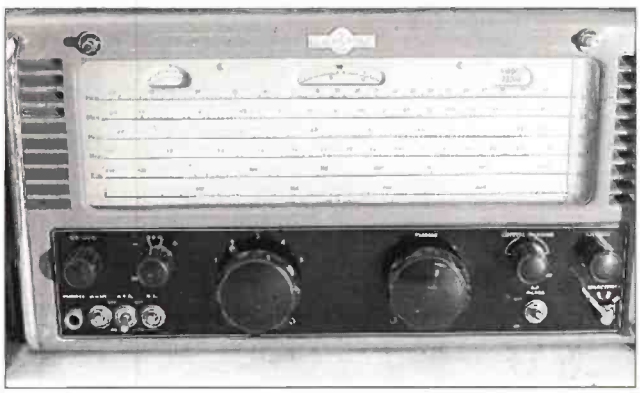
35W4 as power supply rectifier. Notice the similarity here to the Eagle receiver.

The frequency coverage is from 540kHz to 32MHz, single conversion, with an i.f. of 455kHz. A b.f.o. allows reception of c.w. and of course today's s.s.b., but again, no method of reducing the signal strength. In conjunction with the main tuning dial there is a bandspread dial and the case has a small loudspeaker fitted.

The set is a.c./d.c. powered, but at 115V, so that a transformer is required for use on British 240V mains, thus preserving the safety aspect. On the rear are connections for antenna, the b.f.o. frequency adjust control and the headphone sockets. Front panel controls include On/Off plus volume, main tuning, bandspread tuning, band switch, a.m./c.w. switch, loudspeaker/phones switch, and, oddly, a Receive/Standby switch that mutes the set.

The tuning range of each band is

Band 1:	540 to 1600kHz
Band 2:	1.6 to 5.0MHz
Band 3:	4.8 to 14.5MHz
Band 4:	12.5 to 32.0MHz



The Eddystone 730/4 general coverage receiver, note the superb tuning scale.

This set is, perhaps, a collector's item. I have seen a few at various rallies, but there are many sets of this nature which, whilst being simple, can provide that first foray into the world of short wave.

The Lafayette HA-63A short-wave 'communications' receiver is starting to look the part. Covering 550kHz to 31MHz in four bands with bandspread, a.c. mains, transformer driven, seven valve set, 6BE6, 6BE6, 6BA6, 6BA6, 6AV6, 6AV6, 6AR5, noise limiter fitted, b.f.o., S meter and antenna trim. Again a very nice simple set, should be acquired quite cheaply, small desk space needed, would look nice in a young persons bedroom shack.

This set does boast an antenna trim control, so the incoming signal can be reduced by detuning to help in resolving strong s.s.b. signals. This problem of resolving strong s.s.b. signals is due to the fact that most simple sets use a straight forward diode detector with the b.f.o. simply fed to the last i.f. transformer at the same time.

As the b.f.o. injection voltage is quite low, any strong s.s.b. signal simply swamps the b.f.o. making resolving difficult. Dearer sets with a product detector do not suffer to this extent. A product detector can, don't forget, always be added to any set.

Lafayette HE-30

The Lafayette HE-30, is a single conversion, 4-band receiver covering 550kHz to 30MHz. A bandspread facility offers seven portions covering the 80 to 10m amateur bands.

It's a 9-valve receiver, 6BA6, 6BE6, 6BE6, 6AV6, 6AV6, 6AV6, 6AQ5, 5Y3/5CG4. The actual coverage is as follows:

Band 1:	550 - 1600kHz
Band 2:	1.6 - 4.8MHz
Band 3:	4.8 - 14.5MHz
Band 4:	10.5 - 30.0MHz

The bandspread function gives a further seven slices on the dial which cover the 80 to 10m amateur bands. A main function switch selects either off, a.m., standby, or c.w./s.s.b.

Using the Heathkit RA-1 with a KW Vespa as an amateur station.

In the s.s.b. position a *Q* multiplier is used that also doubles as the b.f.o. The *Q* multiplier was a particular favourite of US set manufacturers in the 50s & 60s.

An a.f. gain, an i.f. gain and an antenna trim are provided along with a.v.c. On/Off and an audio noise limiter. A band switch completes the control compliment for this set. On the rear wall are terminals for antenna, earth, speaker and a pot to set the S meter zero level.

This is quite a nice receiver, plenty of room on the scale, easy tuning, with a bandspread for the amateur band marked on the dial. A separate i.f. gain allows easy adjustment for strong signals. The set is a little larger and heavier than the HA-63A but it is better than it when it comes to reception.

Heathkit RA-1

Often seen at rallies, the Heathkit RA-1, amateur bands only receiver is a very pleasing set, produced both as a kit of parts and an assembled receiver, in the 60s by the Daystrom Company in Gloucester. Its 6-band coverage of the 160, 80, 40, 20, 15 and 10m amateur bands allows a.m., c.w. and s.s.b. reception. A half-lattice crystal filter is fitted to the i.f. circuits, and provision of an internal crystal calibrator ensured a high degree of accuracy and a fairly good selectivity factor.

The 8-valve set, EF183, ECH81, EF183, ECF82, EB91, ECL86, EZ81, OA2, had a quoted sensitivity of 2µV for 10dB s/n ratio or better, 40dB or better image rejection, 75Ω antenna feed, 3Ω speaker with 600Ω headphones and 2W of audio output. As a kit of parts there were 65 capacitors, 48 resistors, the valves, the coils, nuts bolts, case, wire, string - in fact all that was need to produce the finished item.

Controls provided include a.f. and r.f. gain controls, main tuning control, the band switch, noise limiter control, b.f.o. on/off switch, u.s.b./O/l.s.b. switch, a.v.c. on/off switch, a push to calibrate switch, a calibrate adjustment and finally an antenna trimmer. The headphones socket is mounted on the front panel for easy access and the S Meter adjust, along with the antenna and speaker terminals, are mounted on the rear wall of the set.

Two OA81 semiconductor diodes are used as the audio detector and a.v.c. rectifier.

Frequency Coverage

160 Mtrs:	1.7 - 2.0MHz
80 Mtrs:	3.5 - 4.0 MHz
40 Mtrs:	7.0 - 7.3 MHz
20 Mtrs:	14.0 - 14.45 MHz
15 Mtrs:	21.0 - 21.5 MHz
10 Mtrs:	28.0 - 30.0 MHz

The set does not, of course, cover the 'new' bands, but a simple converter could be built to fill the gap. A similar receiver, the RG-1, uses virtually the same components and is identically styled, the RG-1 though being a general coverage set, Medium Wave to 30MHz. The RA1 and RG1 are very good sets, I had one of each for a number of years and have recently acquired this RA1 to play with again. Once aligned it is a very good set, the b.f.o. is switched between u.s.b. and l.s.b., which makes tuning and resolving s.s.b. stations easy. One of these sets, for those solely interested

6BA6	V1,2,5,6,12	RF amp 1, r.f. amp 2, i.f. amp 1, i.f. amp 2, b.f.o.
6BE6	V3	Mixer
12AU7	V8	Audio pre-amp 1 & 2
6AM6	V4, 10	LMO, crystal calibrator
6AM5	V15	Audio Output
6AL5	V7, 9	AF detector, a.g.c., S Meter, noise limiter
6AU6	V11	IF amplifier (output feed)
5Z4G	V13	Dual-diode rectifier
VR150	V14	Voltage regulator

in the amateur bands, could provide many hours of enjoyment.

Eddystone 730/4

A far more serious set is the Eddystone 730/4 general coverage receiver, made by Stratton & Co. Ltd. This set has 15 valves, two r.f. stages of amplification, two i.f. stages of amplification, stabilised h.t. for v.f.o. and b.f.o., audio filter, crystal i.f. filter, crystal calibrator and a noise limiter. The set tunes from 480kHz to 30MHz in five bands. It is still only a single conversion superhetrodyne though, with an i.f. of 450kHz. The frequency coverage for each band is:-

Band 1:	12.3 - 30.00MHz
Band 2:	5.3 - 12.5MHz
Band 3:	2.5 - 5.7 MHz
Band 4:	1.11 - 2.5 MHz
Band 5:	480 - 1100kHz

The complete valve line up is shown in the tabe at the top of this page.

The general appearance of the set is traditional Eddystone - die-cast case, fluted sides, large chromed grab handles the full height of the set at each end of the front panel, with large, easy to use, black knobs. The slate grey case is contrasted by a black scuff panel behind the knobs and controls, each control identified with silver lettering. The Eddystone badge takes pride of place in the upper centre of the front panel.

This sort of set offers the listener many features, such as variable selectivities, needed to pull out that real weak station from the crowded 49m band.

Widest setting:	10kHz at -3dB
First reduction:	4kHz at -3dB
Second reduction;	2kHz at -3dB
Max reduction	1.3kHz at -3dB

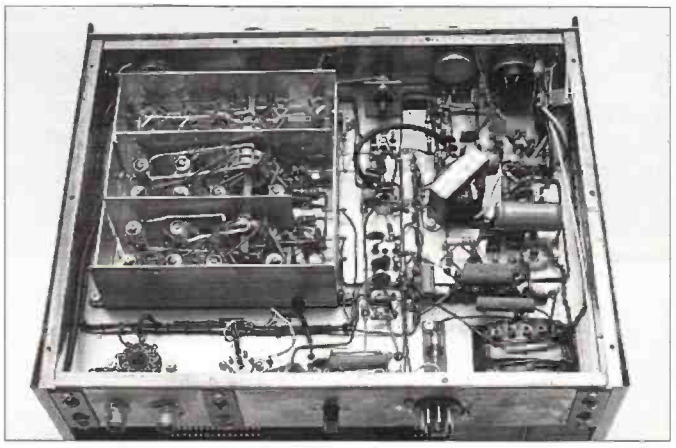
Max reduction + crystal filter 0.5kHz at -3dB

These figures are estimated from the i.f. response curves in the manual.

The voltage is permanently connected to the b.f.o., the tuning capacitor effectively being shorted out when turned anti-clockwise past a pre-set point, thus ensuring the warm up starts as soon as the set is switched on. A 500kHz crystal calibrator is fitted to ensure real accuracy.

Using the receiver is a joy, but it does take practice to get the full benefit from all the controls. The large scale and smooth tuning control allows easy progression through the bands. The variable selectivity, whilst taking some mastering, does allow the weakest of stations to be extracted from a pile up. The considerable reduction on the tuning knob, 60 complete turns to cover the entire scale, means that even on the most cramped of the ranges, range 1 12.3 to 31MHz, there is sufficient movement of the knob to make station separation easy.

The set is, by modern standards, large and heavy, but against this must be considered the fact that it is a piece of engineering of the sort that will not be seen again! Lots of design hours went into this and the other sets in the Eddystone range, easy of operation, reliability with a 'feel' that is not apparent in modern plastics cased replacements. This set is simply one of the better short wave receivers.



Internal view of the Heathkit RA-1, 6-band coil pack on left.

The Hallicrafters S-38EB receiver with civil defence spots on the broadcast band.

Eddystone EC-10

As a slight deviation from the valved theme I offer the very well-known Eddystone EC-10 transistorised communication receiver. This single conversion design, with an i.f. of 465kHz, employs six OC171 devices, an OC71, three OC83 and three diodes.

Produced by the Eddystone company from the early 60s onwards, it is a 10-transistor, 5-band receiver covering 550kHz to 30MHz and capable of a.m., c.w. and s.s.b. reception.

The 5-band coverage is broken into the following ranges:

Band 1:	18.0 To 30.0MHz
Band 2:	8.5 To 18.0MHz
Band 3:	3.5 To 8.5MHz
Band 4:	1.5 To 3.5MHz
Band 5:	550 To 1500MHz

A similar looking set, the EB-35, was also produced which covered 150kHz to 30MHz along with the 88-108MHz f.m. band. All the versions of that set I have seen over the years have been of a brownish orange colour. Again, the EC-10 has no antenna peak, no S meter and no bandspread, but there is an r.f. gain pot and audio filter built-in.

Sockets are provided on the rear apron, marked A1 A2 Æ and EARTH, for either balanced or unbalanced antennas. Short or long wires can be used along with a balanced fed antenna. If using a singe long wire end fed antenna then this is connected to A1 with a shorting link between Æ and EARTH. A coaxial feed also uses this combination, the braid going to EARTH with the inner core going to A1. If a balanced line is used then it is connected to A1 and Æ, the shorting link being removed.

For those more technically minded the specifications for the set are shown over the page:

Continued Over

Sensitivity:	5µV for 15dB s/n Ranges 1 - 4 15µV for 15dB s/n Range 5
Selectivity:	6dB at 5kHz, 40dB at 25kHz
Image rejection:	20dB at 18MHz, 50dB at 2MHz
Stability:	1 part in 10^4 per °C
Consumption:	36mA (Q), 77mA at 50mW, 180mA at 500mW

The EC-10 does have slight drawbacks for the amateur bands listener, cramped bandspread on the highest range, no antenna peaking and fixed selectivity but, considering its size and weight, it proves a very useful receiver for those with either a limited budget or limited space in which to pursue the hobby.

In Conclusion

So these are just a few of the sets around, many sets are of a similar nature to the above, most are single conversion which can suffer a little from image reception, some have no means of peaking the antenna circuits, here an a.t.u. can help greatly.

Always look for a.c. sets, a.c./d.c. sets can be dangerous, especially for those new to the hobby. Any a.c./d.c. set should be fed from an isolating transformer for added safety.

Tuning can be cramped on the simpler sets, remember that they were produced in times when the bands were not so crowded. A set with a bandspread facility is always a better option.

Other sets around include the Codar series, there were several made and all are basic, simple sets to operate, I have had several CR-70A examples. There are other transistorised sets around as well as the EC-10, there is for example the old Heathkit *Mohican*, a general coverage set with bandspread for the amateur bands. In all my years playing I must admit I have never had any of the Realistic range, these sets have never appealed to me, but I expect they would fill the role for the newcomer.

The later FRG series by Yaesu, whilst being very good, do tend to hold their value better, prices over the £100 mark being common. Many of the valved sets can be acquired for a lot less than the £100 figure and still provide interest and fun on today's bands. ■

Happy hunting and short wave listening to you all.

Hunting The Sheep

One of the more satisfying occupations is to make a collection of something and of course one of the most popular among listeners is the QSL card.

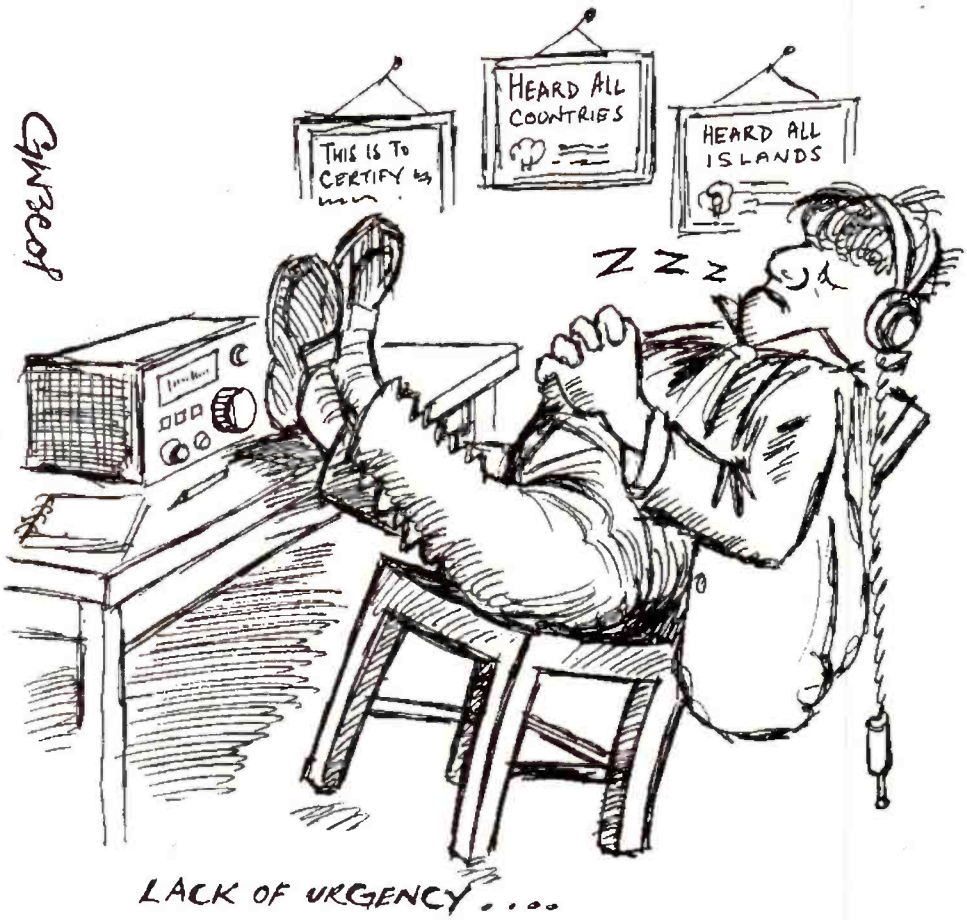
Some keen folk will go to extraordinary lengths to obtain the ones they want but if in the course of their life they are sent, say, routine cards from local amateurs they do not scorn such as later they may come in handy for a particular 'sheepskin'; as our US friends call certificates, for hanging on your shack wall.

One of the best points about this side of the radio hobby is its lack of urgency - it took me twenty five years to get the QSLs for my *Worked All States* sheepskin! The last card that caused me lots of searching the bands was for any station in Nevada - I shall always visualise that State to be a vast desert with a population of 0.2 persons per 100 square miles. As for the Certificates themselves, the really busy collector soon finds he has no room left in which to hang them and has to resort to keeping some in album form. This is a poor method as it gets overlooked by visitors who are often best kept on the move and not allowed to browse through log books, etc.

Talking about dynamic card collecting, I've always had difficulty raising stations along the Côte D'Azure, perhaps because the climate there by the Mediterranean is so good that radio interest cannot flourish (as it does in the gales of Wales).

But eventually, I did work a guy down there and I rejoiced for quite a while. I made plans to journey down to the actual QTH for my annual holiday. I had the address as given in the *Callbook* and with rising adrenaline I knocked confidently on the front door. It was opened by a rather severe Madam who met my fluid French with a stern command to remove myself forthwith, very closely followed by slamming the door. Would you believe, I still need a card from down there. But of course, one never values anything that is easy to get and I am afraid some awards are so easy, even a non-radio fan can get them. However, there are new ones to aim for nearly every month and as a matter of fact, I am awarding one myself right now! Surprise, surprise, eh!

The beauty of this one is that instead of a certificate, you get a personal design for your own card or whatever. The rules of 'WORKED OR HEARD TEN GW3COI DESIGNED QSLS AWARD' are simple - you just have to obtain, by ANY MEANS, ten of the QSLs I have designed, have a photocopy made showing the callsigns only and send this to me with an s.a.e. together with any ideas of the sort of design you want me to produce for you. This is a perfectly genuine award and what is more, apart from the s.a.e., it costs nothing and you get my drawing free. What is the snag? There aren't any and I am even giving you a list of some present holders of my designed QSLs, this will give you something to aim at - but remember, there are others entering 'circulation' all the time. ■



Some stations with GW3COI QSLs.

G3JFC	G3LWM
G3MCK	G3UFY
GW3CZC	
G4TJB	G4CQK
G4ENZ	G4IRS
G4EDD	G4NCS
G4XMX	GW4KVJ
GM4TOE	GM4GZW
GJ4TAW	
G7DII	
G0BXC	G0CVI
G0ICE	G0GRM
G0DBX	G0LMX
G0HUZ	G0NTQ
G0NTP	G0OES
G0TVI	G0KHB
GM0GNT	
W4MPY	W6DDB

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Bearcat 220

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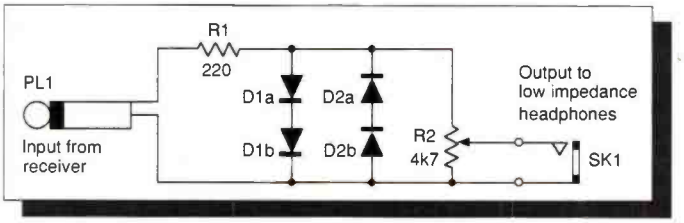
An Audio Frequency Output Limiter

Fig. 1: Circuit of the audio frequency amplitude limiter.



When using headphones there is a very real danger of exposure to noise levels sufficient to seriously damage your hearing. The most common effects of excessive noise are a loss of high frequency response, which makes normal speech sound muffled, and an increase in the hearing threshold so that faint sounds can no longer be heard. In addition to deafness, exposure to very loud noise may cause severe tinnitus - incessant buzzing or ringing in the ears.

The effect of noise is cumulative, so that frequent exposure to quite moderate levels of noise is just as damaging in the long term as short exposure to very loud noise. Of importance to younger readers is that partial hearing loss acquired, but probably not noticed, in one's youth may cause very serious hearing disability in later life when the inevitable age-related loss is added on.

Our hearing mechanism is very delicate and easily damaged, so in view of the possible consequences it is wise to take precautions against being deafened by loud signals when using headphones. This applies to all listening, but it is particularly important when monitoring the short wave bands where there are a multitude of strange noises and interference to contend with as well as signals of widely different strengths. Keeping the volume control backed off can help, but sooner or later you will forget to do this and so the only really safe solution is to fit an amplitude limiter to the receiver output.

The Amplitude Limiter

An amplitude limiter is a device used to limit the maximum amplitude of a waveform to a predetermined level and one of the simplest circuits for this is shown in **Fig 1**. This is generally referred to as a peak clipper because the limiting action clips the peaks of the input signals. It is an effective circuit and may be built as an outboard unit - and it doesn't need power.

How it works

Operation of this circuit depends on the fact that the voltage drop across a forward biassed semiconductor diode is almost constant irrespective of the applied signal level. This voltage, known as the junction barrier voltage, is about 0.7V for silicon or 0.3V for germanium. It is also the lowest voltage that will make the diode conduct fully.

Consider first silicon diodes D1a and D1b in **Fig 1**. As the input signal increases positively from zero the output across R2 rises in step until it reaches about +1.4V - the barrier voltage for two silicon diodes in series. At this point D1a & b conduct heavily and shunt the signal to ground. Further increases in the input signal level makes the diodes conduct harder, with no significant increase in output level. Diodes D2a and D2b work in exactly the same way when the input goes negative, limiting the output to 1.4V peak.

The circuit as shown is for low impedance (4 - 16Ω) headphones. With the values given there should be a good limiting action and the 1.4V peak signal should provide plenty of volume. Older headphones may be less sensitive and require more voltage. If so, it is a simple matter to raise the limiting level by adding extra diodes to the circuit.

For high impedance headphones the resistor values must be increased - R1 to optimise the limiting action and R2 to reduce damping and insertion losses. The new values are best found by trial-and-error, starting with R1 equal to, and R2 at least 10 times the load impedance.

Construction

Apart from making sure that the diodes are connected the right way round there is not much else that need be said about the construction. The components can be built into a small box, PL1 being on the end of a flying lead to plug into the receiver's headphone socket.

Setting-up and Operation.

Tune in a very strong signal with the receiver gain controls turned well up - to make sure that the limiter diodes are conducting fully - and set R2 for a comfortable listening level - ideally with R2 about mid position. If it doesn't, just connect extra diodes in series with D1a,b and D2a,b to achieve this. For normal operation R2 is used as the headphone volume control and apart from minor adjustments should be left alone once set up. The receiver gain controls themselves are used in the normal way to prevent receiver overload and also to keep the signal being monitored just above the clipping threshold. This is easy to recognise as the point at which distortion starts.

Set up in this way, no matter how strong the incoming signal, your hearing will be protected. You will be able to tune over the noisiest bands without fear of getting your head blown off by unexpectedly loud stations.

Final Comments

Because of the large variations in human response it is impossible to predict the effect of loud noise on any individual as one person may be quite unaffected by exposure to noise that leaves another with substantial problems.

However, the one thing that is certain is that excessive noise eventually causes the permanent destruction of hearing nerve cells. There is no clear warning that this is happening and there is no respite either. Damaged hearing cells do not regenerate when the abuse is removed. By the time that you find out the damage has been done. So, if you value your hearing, take great care when using headphones. ■

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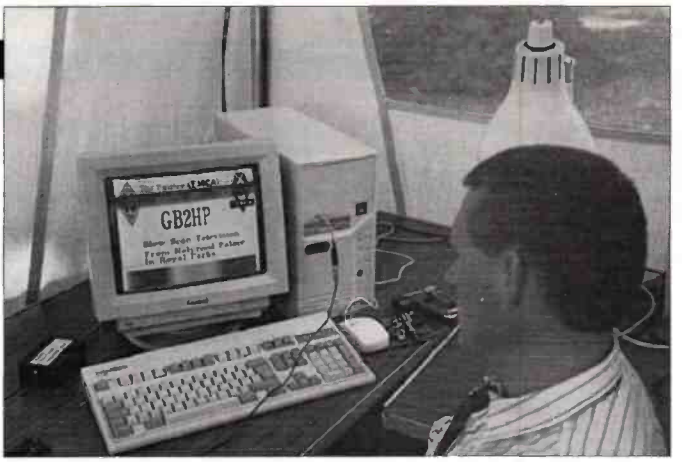


Fig.1: John Scott at his SSTV receiving station.

Fig.2: Lee Smallbone checks out the AR88D.

The pride of place this month goes to the Paisley Amateur Radio Club who established a special event station, using the callsign GB2HP, at Edinburgh's Holyrood Palace Park for the 150th anniversary celebrations of the YMCA.

The station functioned from August 19 to 21 and its operators made many contacts on the key and by packet, single side band and slow scan television. The Paisley members put in a maximum effort to make sure that the visitors could see amateur radio at its technical best. They erected a 3-element rotatable beam and a full size G5RV for the h.f. bands and collinear arrays for the 144 and 432MHz bands. "It was a fine station", said **John Scott** who is seen in **Fig. 1** checking the station's slow-scan signal being received at his home in Glasgow.

John used his computer, **Fig. 1**, during the event to demonstrate previously recorded and live SSTV pictures to visitors who were interested to see all this technology at work. John made up the special event screen, using a graphic program called Improces, which was transmitted in reply to slow-scan contacts with such stations as OH2LU (Finland), on 14.230MHz and GM3AEY (Kirkcaldy) and GM3OBC (Glenrothes) on 144.5MHz.

Special Events

Throughout any year there are many such stations and special radio exhibitions that deserve our praise. Believe me readers, the antenna work alone for these occasions consumes a great deal of time to pack and unpack the gear and rig and de-rig the installation. In addition, the forward planning by those concerned includes safety, the transporting of beams, masts and associated equipment, insurance and making sure that the temporary antennas, look good and will remain aloft throughout the event.

A special Vintage Wireless day was held at the Amberley (Chalk Pits) Museum - Sussex on September 11, where, to save leg work between the museum's own wireless exhibition building and the exhibitors marquee, an early field telephone set was installed at both ends. One of these can be seen on top of a 52 year old ex-military, AR88D communications receiver, **Fig. 2.** This was demonstrated in action by **Lee Smallbone** (Bognor Regis) who also dealt with phone messages to the marquee. Several *SWM* readers attended the gathering and were delighted to meet **Chris Mlynek** and **Godfrey Manning**, **Fig. 3**, from Edgware and **Dave Rudram** and **Ron Weller** (Worthing) who organised the displays. Godfrey's popular 'Airband' column will be found on page 62 in this issue.

Computers

On the subject of computers, I was recently shown a CD program entitled *The New Grolier Multimedia Encyclopaedia* that I understand is included in a number of computing packages. Briefly, it has an easy to understand and well illustrated User's Guide that points out that 'all 21 volumes of *Grolier's Academic American Encyclopaedia*' are on a single CD-ROM. In addition there are pictures, maps, animation, videos, Multimedia maps and sound. All of these I found very informative and simple to call-up. I asked the word-search section to find 'radio' and I was quickly presented with an index of related subjects to choose from. I selected 'ham radio' and the opening lines from a well-written piece said, "Amateur, or 'ham' radio, a non-commercial system of communication, is as old as the medium of radio itself."

Although the mechanism of his 10-year old printer was OK, **David Glenday** (Argyll) found that the tiny pins in the print-head were 'sticking in place and tearing the ribbons'. After disconnecting the printer from the computer and the mains electricity supply, he removed and dismantled the head, took out the pins and springs and soaked it all in meths. 'Re-assembly was a tricky tweezers job', said Dave and, judging by his letter to me, after the repair, it looks to be to be working fine and it saved him the cost of a new head. Well done, David.

Weather

In August, I recorded 2.09in of rain compared with 1.0in for the same period in 1993. The heaviest fall of 0.65in came on the 25th and the rest, in much smaller amounts, was spread over days 2, 3, 4, 10, 11, 17, 19, 24, 27 & 31. **Arthur Grainger** (Carstairs Junction) reported thunder storms in his area on July 31 and very heavy rain at 2100 on August 1. The variations in atmospheric pressure shown on the chart, **Fig. 4**, for the period July 26 to August 25, were taken at noon and midnight by Arthur (Solid trace) in Scotland and by me (broken trace) in Southern England.

From Edinburgh, **George Garden** reports that while the pressure was falling on September 2/3 he logged good quality pictures from the Bilsdale transmitter of Tyne-Tees TV on Ch. 29. Also, during the evening of the 2nd, he checked Band II and received signals from the Tyne and Wear transmitter of Metro FM and stronger signals from Radio Borders and Radio Forth and the new station, Century FM, serving Tyneside around 103MHz.

Arthur Grainger also heard Century Radio's tests and broadcasts from Gateshead on 100.7MHz. Soon after George Garden, right **Fig. 5**, arrived at Amberley he was telling an interviewer from Coastway Hospital Radio about his particular interest in DXing and of his contributions to this column. The Coastway outside broadcast team were active at the museum throughout Vintage Wireless day, playing a wide variety of music and talking to as many people as possible. They have their own magazine and do a grand job broadcasting to the hospitals of Brighton, Hove and Worthing.

Good Location

Band II enthusiast, **John Court**, using a Grundig World Band receiver with its own rod antenna, hears Belgian, Dutch and French stations around 1300 on most days of the week. In addition, at his home in East Birmingham, he gets 'excellent reception' from BBC Radios Derby, Hereford, Leicester, Shropshire and Worcester and good results from Radio Oxford. You certainly have a good choice of programmes John without looking for DX, hi.

Fig.3: Chris Mlynek with Godfrey Manning.

Sporadic-E

As I write this, we are approaching the end of the 1994 Sporadic-E season, mid-April to mid September, when many radio enthusiasts have been looking for signals being reflected over long distances by sporadic clouds of ionised gas that suddenly form in the E region of the ionosphere.

During the peak of the season, David Glenday noted Band I openings, mainly at midday and in

the early evening, on July 11, 17-19, 21 & 28. Spread among those days he received pictures from Austria (ORF-1) on Ch. E2A (49.75MHz), Czech Republic (NOVA) on Ch. R1 (49.75MHz), Germany (ARD-1) on Chs. E2 (48.25MHz), E3 (55.25MHz) and E4 (62.25MHz), Iceland (RUV Island) on Chs. E3 and 4, Italy (RAI Uno) on Ch. Ia (53.75MHz), Norway (NRK) on Ch. E2, Slovakia (STV-1 Bratislava) on Ch. R2 (59.25MHz), Spain (TVE-1) on Chs. E2 and 3 and Sweden (KANAL1 Sverige) on Chs. E2, 3 and 4. Amid these he saw adverts and the caption 'REKLAMA', a game show, tennis, a soap opera, weather and an unidentified caption from the former Yugoslavia.

John Woodcock (Basingstoke) logged pictures from Italy and Spain for short periods at 1012 on August 14 and 0800 on the 19th respectively. Also strong pictures of unknown origin on Ch. R1 at 0830 on the 24th.

"There certainly was a lot less Sporadic-E activity in August compared to July," wrote **Richard Wood** (Redditch) at the end of the month. He found openings, mainly toward Spain (TVE1&2), on August 1, 5, 13, 19, 20 & 24. However, he added a CIS station on Ch. R2 on the 13th and Portugal (RTP), on Ch. E3, on the 24th. **Richard Gosnell** (Swindon) found August 'barren' when he looked for DX in Band I, although he did hear and see some activity on Chs. R1 and R3 (77.25MHz) at 1424 on the 13th. Arthur Grainger detected RDS signals from France Culture on 100.7MHz and another station called Bouno? on the 11th.

Over the next two days **Tim Bucknall** (Congleton) saw his first multi-directional opening in Band I when he received programmes and test-cards from stations in Eire, Italy (RAI), Norway (NRK), Portugal (RTP1), Spain and Russia. At times their signals were very strong and often in colour.

Solar

In July, **Ron Livesey** (Edinburgh), using a 2.5in refractor telescope with a 4in projection screen, located one active area on the sun's disc on days 1, 7, 8, 17-20, 22, 23 and 25-27 and two active areas on the 5th and 6th. In August he found two such areas on days 17, 18 and 20 and three on the 12th, 13th and 15th.

From his observatory in Bristol, **Ted Waring** counted 4 sunspots on his projection screen on the 8th, 16 on the 13th, 7 on the 17th and 3 on the 24th. Ted also reports seeing active areas on each of these days and, on the 16th, there was a string of 14 spots around the sun's central meridian.

Patrick Moore reports seeing a clear solar disc on his screen from July 27 to August 2, after which he followed the daily progress of a small group of spots between the 3rd and 10th. He also located a group of 3 spots at 0945 on the 18th.

Fig.5: George Garden being interviewed for Coastway Hospital Radio.

Magnetic

The various magnetometers operated by **John Fletcher** (Tuffley), **Andy Hollis** (Winsford), **Tony Hopwood** (Upton-On-Severn), **Karl Lewis** (Saltash), Ron Livesey, **Ted Owen** (Malden), **David Pettitt** (Carlisle) and **Tom Rackham** (Goostrey) recorded, between them, strong disturbances to the earth's magnetic field on July 5, 15, 16, 18 and 25 and minor events on several other days. The main disturbances in August were recorded between the 10th and 15th.

SSTV

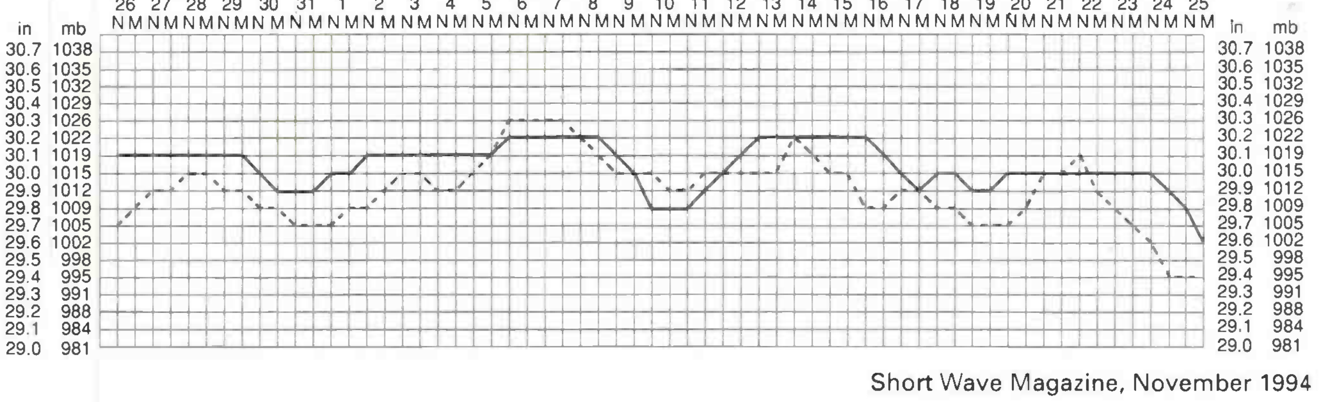
While 14MHz conditions were good one evening during early August, **Ian Macartney** (Ballymena) received slow-scan television pictures, in colour, **Fig. 6**, from a station in Maracaibo on the north coast of Venezuela. Also on this band he copied signals from stations in England, France and the USA, **Fig. 7.** Ian sent me a 3.5in floppy disc with a dozen pictures to choose from. As usual, the captions were of good quality and colour and the subjects very amusing.

Late one night in August, John Scott, tuning around 14.230MHz, heard a German station calling into America and Canada by voice followed by slow-scan pulses. John monitored the frequency for a reply and was rewarded with a good picture, of a desert island, being transmitted by YV1AQE in Venezuela.

Fig.5: SSTV from Maracaibo, Venezuela.

Fig.7. SSTV from Maracaibo, Venezuela.

Fig.4



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Satellite TV News

The Latest from the Clarke Belt

TVS facility company's newsfeed into London via Eutelsat II F3 @ 16°E.

Intelsat 601 via Atlantic Express transponder.

There was an outside broadcast football match during the evening of September 13 - a hot match between Woking and Yeovil - carried on Intelsat 601 @ 27°W. TV company Televideo provided technical facilities and **John Locker** snapped an ident detailing their audio subcarriers, audio 1 carries the programmed mix of commentary and match effects, audio 2 carries clean effects only i.e. no commentary. The latter track allows a broadcaster to use the picture and effects with local commentary added later - for example the next evening's sports round up package. The destination for this local football match is unknown, possibly an insert into the ITV regional sports offerings or for cable channel Wire TV.

Several readers have reported the mystery of the Telecom 2B (8°W) test card with 'Sainte Assise' identification and a scrolling message - 'FRANCE FTRS 1/TSP CTS - seen over a couple of weeks end August and mid September ceased!

Exciting loggings from **John Locker** (Wirral) armed with his new Echosphere 8700 receiver and the MIR Russian space station. The TV downlink is relayed by the ZSSRD-2 satellite at 15°E at the out of band frequency of 10.820GHz circular. The data downlink had been seen by many at 11.385GHz though varying in strength due to inclined orbit operation. Detective work by John suggests that the ZSSRD-2 is in fact Cosmos 2054!

With extensive media publicity of the early September MIR activities including a docking, John could make visual contact with the space craft assembly as it passed over the Wirral in the early evenings - the bright star of the main MIR station with a dimmer dot from the 'Progress' craft some 160km ahead. Early morning of September 13 as John tuned through the 15°W position, signal activity could be seen at 10.820GHz, switching in threshold extension produced weak pictures from MIR, views of the earth and of MIR's solar panels were seen. If the media reports MIR activity then its well worth checking out - 10.820GHz - video confirmed; 10.930GHz - video reported; 11.385GHz data downlink confirmed. Tune to the data downlink and peak antenna bearing, then re-tune to the video frequency downlink. I received signals previously from MIR, this time shots of the crew inside the cabin, again signals were hardly S9+ but could be clearly seen, not bad for an out of band channel.

Alan Smith out in Thailand comments that a recent Star TV trade show in Bangkok suggested that all folk seeking Star TV reception now that they are encrypting using Videocrypt 2 will need to purchase new IRDs (integrated receiver decoders) rather than using outboard (add-on) decoders that will not be available. This has caused a degree of emotion in the Far East since millions of receivers are now in use and equipped for C Band reception, none have integrated decoders and will need outboard Videocrypt 2 decoders. Star Movies on the Southern beam of Asiasat 1 opened mid September going into Videocrypt 2 early October. There are differences between the UK Videocrypt and Videocrypt 2 so don't start sending out your old Videocrypt 1 decoders to pal Fred in Burma, it will not work!

Bud Bennett, ex TVDXer and now sat-zapper in Bahrain hopes to subscribe to Star Movies now that the service is being advertised in the Middle East. Bud is using a 2m dish and a Chaparral 'Sidekick' C Band LNB at 20K that gives him 90% sparklie free programming.

Aidan Murphy (Co. Meath, Eire) comments that with the recent IRA cease-fire in operation so Eutelsat I F4 @ 25°E has been very busy, at one stage 4 transponders carrying cease-fire material out of N.I. were active, one transmission included Jerry Adams being wired for sound, one of the first transmissions with the 'real voice' rather than the dubbed over actor's voice that had been used in recent years.

Fred Hartley (Hayes) logged at 12.570GHz from Intelsat 513 at 53°W a sales presentation for the Newsforce digital SNG unit, uplinking out of Amsterdam's IBC in digital compression mode in C Band to a mid-Atlantic bird that downlinked into BT Madeley, a further up and down link at Ku band via a 2nd satellite back to Amsterdam IBC - thus to demonstrate that a small 1.9m dish will work for SNG operations in C Band and give high quality results.

Finally **Ian Waller** (Lincoln) has lost his planning application to retain a C Band satellite receiving dish, exposed when the fence blew over in gales last year. Ian is going to appeal and I wish him the best of luck. He comments that the screen identifications 'SU10007G' and 'G00031G' both originate out of the Rwanda/Zaire region.

Clarke Belt News

Interesting comment from Eutelsat concerning digital satellite radio, tests have shown that noise levels in many domestic LNBs are unsuitable for use in digital audio transmissions and for the time being analogue subcarrier or SCPC transmission will be retained.

Intelsat 702 at 1°W is now transmitting on all transponders with a heavy loading of Scandinavian fare. Together with Thor 0.8°W and Sirius 5°E there's a lot to look for, see below.

Intelsat 702 @ 1°W			
TV Norge	11.016 GHz horizontal		PAL in the clear
TV3 Norge	11.096GHz horizontal		D2-MAC Eurocrypt M
NRK	11.176GHz horizontal		D2-MAC Eurocrypt S
TV2 Norway	11.555GHz horizontal		D2-MAC Eurocrypt M
TV1000	11.054GHz vertical		D2-MAC Eurocrypt M
TV3 Sweden	to be advised		D2-MAC Eurocrypt M
TV3 Denmark	to be advised		D2-MAC Eurocrypt M
Thor 0.8°W			
CNNI	11.785GHz	RHC	D2-MAC Eurocrypt S
Eurosport Nordic	11.096GHz	RHC	Eurocrypt S
TCC	11.983GHz	RHC	Eurocrypt S
Discovery	11.938GHz	RHC	Eurocrypt S
Filmnet	12.015GHz	RHC	Eurocrypt S
MTV Europe	12.092GHz	RHC	Eurocrypt S
Sirius 5°E			
TV3 Sweden	11.785GHz	RHC	PAL in the clear
TV6 Sweden	11.862GHz	RHC	PAL in the clear
TV4 Sweden	11.983GHz	RHC	PAL in the clear
Filmax	12.015GHz	RHC	D2-MAC Eurocrypt M
ZTV	12.092GHz	RHC	PAL in the clear (music channel)
and not forgetting the aged **TELE-X at 5°E**			
Femman	12.476GHz	LHC	PAL in the clear

Selective Nordic subtitling will be introduced by CNNI on their Scandinavian services from Thor

Correspondent **Bindu Padaki** (Bangalore, India) advises that one of the UHF-TV services from Ekran - Asianet - has ceased and is now transferred to RIMSAT @ 130°E. Also on Rimsat are Sun-TV (Tamil) and Udayan (Kannada) channel, all these are C Band. The Russian STAT-3 @ 85°E has just opened a Hindi language channel 'Aurovision' at 3.875GHz, audio 7.5MHz. - and EL Channel opens October '94 from AsiaSat 105.5°E - with all these + offerings on AsiaSat, India has certainly entered the satellite age!

News cuttings from our Thailand reader **Alan Smith**.... Shinawatra is planning two more satellites after the launch of Thaicom 2, bookings have been excellent and most capacity has already gone. The Japanese are still upset over the launch of Apstar 1 into orbit at 131°E, next to the Russian Rimsat at 130°E and Japan's Sakura 3a at 132°E. The main concern is of mutual interference in C Band, normally a spacing of at least 3° is expected between adjacent orbiting C Band birds.

Expansion by CMT - Country Music Television - with programming reaching across Asia by Autumn 1994 on PAS-2 and across Latin America in the spring of 1995. Negotiations are also underway to extend CMT coverage into Australasia.

Eutelsat provide a complete listing of their satellite radio and TV downlinks, if you'd like information on the downlinks or the satellites themselves then write to - Public Relations Dept., Eutelsat, Tour Maine-Montparnasse, 33, Avenue de Maine, 75755 Paris Cedex 15, France.

Irish sports service Sentanta Sports, uplinked by Armstrong in Dublin, mainly for pubs and clubs.

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Amateur Bands Round-up

Listening to the Amateurs

Since we are well into the falling side of the sunspot cycle, we need to modify our listening habits to some extent. For example, at the peak, most of the excitement tended to be on 21/24/28MHz during the day, dropping to 14MHz in the late evening. The low bands were largely neglected in the search for 'new ones.'

Now, the picture is different, and it will remain so through the bottom of the cycle, and for several months after that. The frequencies from 7MHz on down are the places to trawl through, especially late at night.

Since being at the present home my l.f. antennas have been, at best, pathetic, and I frankly never had hope of them being useful for much beyond the local club natter-net.

Bear in mind, however, that most amateurs go to work! Hence the local natters die out as the clock gets round to eleven, and it will be found that the l.f. bands are in fact open to signals from much further afield. One bit of advice, though: don't be afraid to try either the r.f. attenuator or the r.f. gain controls. It sounds daft, I know, to add attenuation into the antenna circuit, but there are good sound technical reasons why it can often help, and even bring up a signal previously inaudible under noise. Try it regularly!

Conditions

I can't comment personally, not having been able to be on for most of the period.

Expeditions and Oddballs

That P5RS7 over the December '92-January '93 period has been turned down by the DX Advisory Committee at ARRL. They stated that the paperwork contained no proof that operating permission had been granted by the appropriate authorities, or that the operation in fact took place from N. Korean territory. A little earlier, at Huntsville Hamfest NC1L of the DXCC Desk stated that no paperwork had been received for 5A0RR. Since Romeo Stepanenko who was involved with both these exercises was present and said nothing, the conclusion is fairly obvious.

A proposal that bit the dust was the one for country status for the so-called 'Turkish Republic of Northern Cyprus.'

Another oddball that you may have tripped over is the Principality of Seborga, 1S1A, OS1A, and now 1S1A/1P. I'll believe it when I see it accepted by the DXAC. I1RBJ is involved with this, which at least offers a glimmer of hope.

Letters

From September until the end of the year the Oostendradio club station OR0OST will be active with a special prefix OS0. Reports on the station, when using the special prefix, will be confirmed via the Bureau system, or direct c/o ON4APU, Clubstation OR0OST, Vriendenkring van Telegrafie Telefonie en Radio, Perronstraat 6, B-8400, Oostende, Belgium. This information, for which our thanks, came from club member **ON6CQ**.

A nice long letter from **Frank Lennon** in Hyde, Cheshire, says that he has dug out and added to the station an old reel-to-reel tape recorder dating back to 1972 (modern, huh?), that is now permanently connected to the receiver via the Datong filter. Frank can now silently record while listening, or blast it round the house on two big speakers. One handy use is to cater for visitors who want to know what it's all about when the bands are dead, and of course a second and even more useful one is to enable repeated playback of a signal for example to confirm and identify in a pile-up. As for the tapes, Frank notes he got a 7in reel made in USA by Radio Shack, for £3.99 from his local Tandy shop.

Turning now to Frank's list, he stayed on 14MHz for most of the time, finding such as 5X1P, 9Y4VV, 9M2SH, WA6ALQ, SU2MT, V51OM, OD5JY, BV5CM, OZ8ABE on an island called Sealand, 9Y4BA, AP2AGJ, S21ZG, ZD7WRG, 9M2KUC, TF5BF, KS8Y, VK6WOG,TU4EI, KP4DBR, KJ5KQ and 5AARG. The latter may or may not be in Libya, but he has openly said he has no licence and cannot QSL. Turning down to 7MHz Frank found GB2FW from Orkney, at lunch-time on August 28.

One who spent time looking at the low bands was **John Collins** in Birmingham, who stuck totally to 7MHz; his listening started at 2300UTC, and on occasion he was around at 0730. For example, HB0/DK8GP, LX75LGS for a 'special', CU2DX, TA2AJ, CP6PL, PZ1EL, KP2/AA1BU (St Johns Is), OY/OZ1KG, HC1NDT, 5B4YY, and for a couple of 'locals' GW4VEQ/P in IOTA EU-106 and GW5LP/P for EU124. John uses an Eddystone 870A and a dipole at 12 metres, running north-south.

Now **Tony Capon** in Lindfield who has an Eddystone 730/4 to compare against his modern Icom R-70. The only problem with the older set he says is that of setting the b.f.o. That's easy! Warm the receiver thoroughly. Take a signal on the lower bands (160/80/40), with b.f.o. switched OFF. Now, tune the incoming signal carefully for maximum volume or S-meter deflection; it will of course be quite unintelligible. Leave the main tuning at this setting. Switch the beat oscillator on, tune it slowly through the signal until the audio cleans up; with a big signal you may find you have to back the r.f. gain down a bit as well. Mark the position of the beat oscillator knob 'LSB' and repeat the exercise on a higher-frequency band where people are on upper sideband. Mark the position so found as 'USB'.

It is worth while having a peep inside to make sure the knob is at vertical when the capacitor of the b.f.o. is at half-mesh, 'cos then your two marks will be nicely separated either side of the vertical - makes it look prettier! To tune sideband, all you have to do now, is set the b.f.o. to the correct position as marked, and tune in the normal way. The other thing to recall about such an older receiver is that the automatic gain control system is derived from the second detector stage, so the beat oscillator voltage and the a.g.c. can't be used together. So, switch the a.g.c. off and control the receiver on the r.f. and i.f. gains, with the a.f. gain set to suit you.

If you insist on having a.g.c. then you can use one of the well-tried audio systems as a modification; this will give the chance then to make a second modification, namely to increase the amount of beat oscillator injection. I recall doing this years ago to an HRO; I just took a covered wire from the anode of the beat oscillator across to the last i.f. stage grid and wrapped a turn or so around the grid lead, so there was a capacitive feed to the grid.

Turning to the list, Tony listened to 4X/OK1FGC and JA5AQL on 7MHz as early as around 2000. On 14MHz, VP8CQG, around the same time, took 25 minutes to 'pin down' followed by VE3MB, 9G1UW, CU2DX, ZS6AOO, JI1UJG, 9K2DT, YC0ENI followed eight hours later by YV0ENI, JA5AQC again, VY9CC, PY1HE, YV5EUX, VO1TX, ST0ST, C53HG and PY1AQT. On 18MHz PJ8AD, VO1AA, 7X5JF who said he was mobile on a camel and VP8GAV. On the 21MHz band - the highest on which distant stations were noted, Tony mentions ZP5ZL, ZD8EB, D2EGM and ZP6XR.

From Aberdeen, **Geoff Crowley** sent in a hasty list without a covering letter, doubtless on his way to work. On 3.5MHz Geoff noted a CQ2, VO1FG, 9V1XQ, DL3LAB/TF, 9J2SZ and CP6DA. A turn to 7MHz yielded c.w. from DK2OY/TF, V51BLX, VK7GK, ZL4BO, ZL4WA, ZL2OH, VE3YJ and 9V1XQ. 10MHz now, and here we see the Europeans on c.w. On again, up to 14MHz for WA1HMW, 7X5JF, battery-powered at 50W, JA6MWW, W1ZGP, 9G1SD, W4TXP, ZB2JO, TF3KM, TF3BJ and LA2AB in Icelandic, TF6EZ and KC2FM. At 18MHz Geoff found 9H1FN, PY5CC, YV5CMI, PJ8AD, 4U1ITU, JR4WWT, PR7SM, while 21MHz sorted out ZP6KP, PY5AAK, LU1FKP, ZP5MAL, DH2JD/LU, CP3BX and another ZP not fully identified. That left 24 and 28MHz where many signals were noted, but all were Europeans. On all bands, I've taken out the smaller fry from everyone's logs by the way.

Earl Shilton is the next stop, to where **Dennis Sheppard** lives. Dennis is back on the radio again, at least on 3.5MHz, though he has problems with the dial drive on his JR500S. Whatever the problems Dennis booked in HJ6SQQ, JX7DFA, K4ISV, CE8EIO, LU2DKT, C53HG, VE1ZZ, VE3YJ, VK3EPF, VK6ACN, VK6LK, VO1FG, V85PB, S5/KC1YR, ZL4BO, ZL4KF, ZS6AUL, ZS6IR, Z22JE, Z31FK, 5Z4FM, 9G1MR, 9M8DB, 9V1XQ and 9X2GA.

Finally, a nice letter from **Finbarr O'Driscoll**, in Skibbereen, who enjoys the Canadian 'Sandbox' net around 7.063MHz plus/minus the QRM. They start around 2300UTC with a natter and go on from there on into what for us is the wee sma' hours. On a different tack, Finbarr wonders about the Canadian call areas. VE1 covers Nova Scotia, New Brunswick and Prince Edward Island, VE2 Quebec. VE3 Ontario, VE4 Manitoba, VE5 Saskatchewan, VE6 Alberta, VE7 British Columbia, VE8 North-West Territory and VY for Yukon.

Closing

That's it again. All your news, questions, lists and comments, please, to the usual Box 4, Newtown, Powys SY16 1ZZ, to reach me at the start of the month. 'Bye now!

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73 from Dave G4KQH, Technical Manager.

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- ARQ6-90/98 – 200 Baud Simplex ARQ
- SI-ARQ/ARQ-S – ARQ1000 simplex
- SWED-ARQ/ARQ-SWE – CCIR 518 variant
- ARQ-E/ARQ1000 Duplex
- ARQ-N – ARQ1000 Duplex variant
- ARQ-E3 – CCIR 519 variant
- POL-ARQ – 100 baud Duplex ARQ
- TDM242/ARQ-M2/4-242 CCIR 242 with 1/2/4 channels
- TDM342/ARQ-M2/4 CCIR 342-2 with 1/2/4 channels
- FEC-A – FEC100A/FEC101
- FEC-S – FEC1000 Simplex
- Sports Info. 300 Baud ASCII F7BC
- Hellschreiber – Synch./Asynch.
- Sitor RAW – (Normal Sitor but without synchronisation)
- ARQ6-70
- Baudot F7BBN
- Piccolo Mk6 12 tone/ASCII mode – coming soon!
- GMDSS 100 Baud system – coming soon!

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HF Sideband

I hope that by now everybody who wrote to me recently has received their list of 'hurricane frequencies'. I was quite surprised at the number of letters I received, and I think that the postman was a bit surprised also. I look forward to hearing from you with copies of your logs of any hurricane related traffic. I have personally heard some 'GULL' and 'NOAA' callsigns already, so the signals are there for you to listen to.

A number of you took the opportunity to send along a copy of your own logs with your s.a.e.s, so I thought that I'd take this opportunity to say thank you. They make very interesting reading, and a number of the most interesting and unusual items are listed in this month's Traffic Log. In fact, they will be appearing bit-by-bit over the next few months.

The starboard wing of a British Airway Boeing 747 'Jumbo Jet', somewhere over the north Atlantic. Note the horizontal 'rod' at the wing tip - this is the h.f. antenna. Photo: Graham Tanner.

Antennas

Stuart McMurtie writes from south London asking for information about the different kinds of h.f. antennas used by aircraft. I have personally seen two different types 'in action', but I know of several others.

The first of these is the faithful 'long-wire' that usually runs from somewhere on the forward fuselage to the top of the vertical tail. In most cases, these are end-fed, but some are centre-fed. Typical users of this type of antenna are most C-130 Hercules and other slower moving aircraft. In some aircraft, the whole antenna is centre-fed at the top of the tail, but each leg of the long-wire travels outward and downwards from the tail towards the outer edges of the tailplanes where it then travels to the forward fuselage. This allows the whole antenna to be nearly twice the length of the aircraft.

Another sort is a form of 'trailing rod' that can be found at the wing-tip of many airliners. I'm not sure of the correct description for this arrangement of antenna. This month's photograph shows an example of this kind of antenna; it shows the h.f. antenna of a Boeing 747 'Jumbo Jet'. Many modern airliners use this kind of antenna; if you get the opportunity to visit the flight-deck of an airliner, remember to ask the crew about their h.f. equipment and antennas. The more recent models of Boeing 747, the -400 series, do not use this type of antenna, as they all have a small upturned winglet at the end of each wing. On these types, the antenna is either built into the surface of the tail, or is a form of 'sticky-tape' attached to the body of the aircraft. In the latter case, there tends to be dead-spots in the coverage of the antenna, so there may be more than one antenna, usually one on each side of the fuselage.

Where the antenna is within the tail, there is usually a large dead-spot directly behind the aircraft, sometimes as much as 15° either side of the flight-path. This only becomes a problem when you wish to talk with somebody who is behind you, or the ground station is in that direction. This type is available on some of the more recent models of C-130 Hercules, and it is this type that is used in the RAF Tornado F.3 interceptor aircraft.

Some aircraft are specially designed to communicate with submarines using very low frequencies (v.l.f.). These tend to have a very long trailing wire antenna, either in an underwing pod or built into the fuselage. Before the antenna is used, it is unwound fully, sometimes as much as a mile in length. The US Navy used to operate a fleet of special C-130 Hercules for this specialised task, but they have now been replaced by a fleet of E-6 TACAMO aircraft.

Helicopters are a different case entirely. If they are equipped with h.f. equipment, they almost always have a long-wire antenna that runs the length of the helicopter. They are kept away from the body of the helicopter by insulated stand-offs.

Finally, one aircraft deserves a special mention. The US Air Force operates a small fleet of aircraft that are used to transmit TV and radio signals for information and propaganda purposes. Yet another variant of the C-130 Hercules has been adapted with a powerful short wave transmitter (amongst several other transmitters) that feeds a signal into a vertical long-wire. This amazing antenna is dangled beneath the aircraft through a hole in the floor, weighed down by a large weight at the bottom end. The length of antenna used depends upon the transmitting frequency, but generally speaking they are not usually concerned with operating on an inefficient antenna!

Airwaves

During the summer I came across a new frequency book that will be of interest to many readers of this column. *Airwaves 94* is a complete h.f./v.h.f./u.h.f. directory for just about anything to do with aviation. The book is divided into six sections; the first three cover v.h.f. and u.h.f. airband, the fourth section covers the Major World Air Routes (by area), and the fifth section covers Airline/Company frequencies, VOLMETS, and the many military high frequencies. The h.f. sections are very well laid-out, and are also very accurate.

Airwaves 94 costs £7.95, and is available from PhotAvia Press at 21 Downlands, Pulborough, West Sussex RH20 2DQ. The book has been advertised in *SWM* over recent months, and their advert gives more details of the other sections in the book.

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

1.856 *Dee Mariner* working Stonehaven Radio with crew phone patch.
1.925 *Stena Aurelia* working Humber Radio with a phone patch to the Stena office.
2.182 *Toisa Widgeon* calling *The Lady Jill*. No reply.
2.624 Venice and Ancona Radios giving weather forecasts for the Mediterranean, Aegean and Adriatic seas.
3.643 Station 661G working station JRE5, requesting that they QSY to channel 'H7' (4.629 MHz).
4.484 Royal Navy warship 8ZS reporting that it had 'splashed two fakers with Seadart missiles, and two others were being engaged by combat air patrol aircraft'. Probably the RN engaged in war games or training, the CAP aircraft would have been Sea Harriers.
4.629 Station 661G working station JRE5. They came here from 3.643, and eventually QSYed to 4.634MHz
5.245 Air Training Corps net with several callsigns in the MRH/MRC/MRU/MRW and MRR ranges. Station MRH19 appeared to be controlling the net.
5.697 RN Culdrose working Navy 322 (a RN Lynx helicopter from RNAS Portland) arranging a rendezvous with RN warship 4WE. Also worked warship 3TZ to pass details of the arrival of Harriers from Boscombe Down using callsigns 'Civic 1' to '3'.
5.718 St Johns Military (Canada) repeatedly calling Rescue 305, requesting that they QSY to 4.439MHz.
6.513 Coast Guard 2114, operating with the US Drug Enforcement Agency, reporting to COMMSTA Boston that the suspect yacht had been located in a Marina.
6.746 Cosmos 4 working Cosmos Control on voice and RTTY.
6.779 German Navy ship DRAO calling German Navy Radio DHJ59 for a radio check.
8.180 UN 33 calling Portishead Radio for a radio check. No reply.
8.238 RN Destroyer *HMS Norfolk* working Portishead Radio, making phone patches for numerous crew-members.
8.976 Aussie 744 calling Air Force Sydney for a radio-check.
11.176 Reach 2301 working Lajes with a phone-patch to HILDA. They reported that they had 'various pallets of cargo and 21 prisoners'. Does anyone know who these prisoners may have been?

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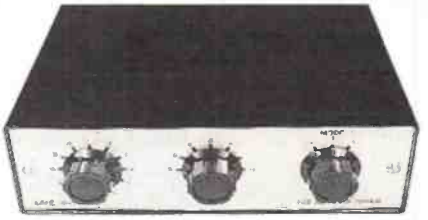

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Bandscan

America

4VEH was the last of Haiti's short wave broadcasters, but it has not been active for several years.

It's time once again for our quarterly look at short wave broadcasting activity in North, Central and South America, as well as the Pacific. Here comes the tour.

ARGENTINA - A reminder that if you listen for English from RAE on Saturday or Sunday you won't hear it. English to Europe is scheduled Monday to Friday at 1900-2000 on 15345. On weekends RAE simply relays the Radio Nacional domestic service.

BOLIVIA - A new station here is Radio Carlos Antonio, operating on variable 4.632MHz and broadcasting from the town of Guayamerin. Other reports say the station's name is Frequencia Modular. Radio Loyola has been reactivated on its old 5.994MHz frequency, running to 0200 sign-off, mostly in the Quechua language.

COSTA RICA - Long time short wave broadcaster Radio Reloj, San Jose, has reactivated its old 4.832MHz frequency. It had been gone from that spot for a number of years, although the station's 49 metre band channel, 6.066MHz, has continued to be more or less active during that time.

Radio For Peace International has reactivated 7.385MHz on an experimental basis. It's also on nearby 7.375MHz.

COLUMBIA - La Voz del Cinaruco (4.865MHz) has been heard with an English language ID, including a slogan for the Caracol network. This was aired at 0859, but it may also be used during other station ID breaks. La Voz del Yopal on 5.040MHz has been widely reported in recent months, putting out a good signal and running to sign off at 0500. Ondas del Meta, that used to operate on 4.885MHz is inactive. But this station has a history of being on again, off again, so it may well return sometime in the future.

CUBA - As this is written, the decades old US-Cuba disagreement had made one of its periodic returns to the front page. It might be interesting to keep a watch on the area between 7000 and 7100 for the possible appearance of new or reactivated anti-Castro broadcasters, although I don't know of any being reported so far. Usually these are low powered stations using converted amateur radio transmitters. Try around 0000 or 0100.

Incidentally, Cuba has been operating heterodyne-type jammers against such anti-Castro stations as La Voz del CID and Radio Caiman, although they have had little effect. The US government's Radio Marti broadcasts to Cuba have added frequencies to increase coverage.

Radio Havana Cuba's latest English schedule shows operations at 2100-2200 on 17.760MHz for Europe. For North America it's 2200-2300 on 9.550MHz and 13.715MHz (upper sideband), 0000-0500 on 6.010MHz, 0000-0300 on 13.700MHz and 0200-0655 on 9.820MHz. Be aware that RHC suffers from occasional technical difficulties.

FRENCH GUYANA - Swiss Radio International is now being relayed by RFI's Montsinery site. The schedule is reported to be 0030-0315 on 13.635MHz (to Central and Eastern North America), 0330-0530 to Western North America on 11.620MHz, 0830-1045 to Australasia on 11.640MHz and 2000-2100 to South America on 11.650MHz. Incidentally, SRI's Brasilia relay is now using the odd frequency of 5.888MHz (ex-5.905) between 0030-0315. It may have moved to 5.885MHz by now though.

HAITI - There's been no short wave activity from Haiti in some years (the last was religious broadcaster 4VEH). The US government is broadcasting to Haiti from a US Air Force C-140. Radio Democracy is using 1.035MHz - a frequency once used by 4VEH (and also 91.9MHz f.m.).

HONDURAS - There's another new short wave station in this country - Radio HRET on 4.960MHz, broadcasting from Puerto Lempira. Best chance to hear this one is between 0000-0200. The address is Mission La Mosquita, Puerto Lempira, Gracias Adios 3301, Honduras. Programmes are both in Spanish and the Miskito Indian language. Another station in Puerto Lempira, La Voz de la Mosquitia is active again on 4.9105MHz. It's been heard airing an English program at 0245.

Radio International, the other 'newish' Honduran continues to be active on 4.930MHz, running Spanish language programming with lots of music until signing off shortly after 0430.

Radio Copan International (15.675MHz) now has a DX programme, produced by the Global DX Association. It airs at 2125 on the second and fourth Saturdays of the month. Global DX maybe reached at PO Box 1176, Pinson, Alabama, 35126, USA.

NEW CALEDONIA - News of short wave activity from the Pacific Islands has been more bad than good over the last several years and here's more from the bad category. Radio Noumea has been off short wave for sometime now and we have reports that the station won't return to short wave. Apparently the transmitter, that operated on 7.170MHz is in poor repair and there are no funds available to obtain a new one.

NEW ZEALAND - The Radio Reading Service has been on short wave for sometime using very low power and a frequency in the middle of the 80m amateur band. Now the service is expanding. The power will be increased to one kilowatt and a new frequency 5.960MHz (full carrier u.s.b.) has been added to 7.290MHz (that was added a year or so ago). The schedule: Sunday-Thursday at 2030-0600 on 5.960 and 7.290MHz, Monday to Friday 0600-1000 on 3.935MHz. Fridays-Saturdays 2030-0500 on 5.960 and 7.290MHz and Sundays 0600-0900 on 3.935MHz. The address is Bryan Stokoe, QSL Manager, Radio Reading Service, PO Box 360, Levin 5500, New Zealand.

PALAU - If you hear KHBN on 9.965MHz instead of or in addition to the usual 9.830MHz frequency you are hearing the station's new (second) 100kW transmitter. The new transmitter will eventually be used to broadcast to India in one or more of the languages of that nation. KHBN is one of the short wave stations operated by High Adventure Ministries, based in California.

PERU - It's nearly impossible to keep up with the never-ending short wave changes in this country. New stations are always coming on the air and old ones leaving, not to mention all the frequency changes. One new station is Radio Luz y Sonido in Huanuco, which operates on 6.472MHz and a fraction. It signs off at 0130.

UNITED STATES - As this is written the Voice of America is facing what is probably the most severe threat in its history. Certain elements in the bureaucracy are attempting to put through some very serious cuts in the VOAs technical facilities. The plan includes disconnecting some transmitters at the VOAs giant Greenville, North Carolina complex. The planned reduction would amount to about 50%. The VOAs transmitter site at Bethany, Ohio will almost certainly close down entirely and, indeed, may have done so already. The full plan isn't yet known so we are not yet sure just how badly the cutbacks will affect the VOAs ability to serve its world-wide audience.

One of the oldest short wave stations in the United States, KGEI in California, has gone silent. The Far East Broadcasting Company closed the station in mid-summer. Officials said it was a difficult decision but that the KGEI transmitters were very old and, apparently, the organisation did not want to spend the money to refurbish the facility. KGEI aired programmes in Spanish for Latin America. Coupled with the closure was the discontinuance of the FEBC mission effort in South America. The organisation will focus its efforts elsewhere. KGEI went on the air in the 1930s and was originally owned by the General Electric Company. At one point following the end of WWII it was one of only two active, non-government short wave stations in the US. Some reports say a new organisation is trying to raise money to buy (and perhaps move) the facility.

Radio Miami International is, at last, now broadcasting on a regular basis. The initial schedule runs only from 0100-0400 on 9.955MHz. An RMI-produced programme *Viva Miami!* takes the first hour (one half hour in English, the second in Spanish). The 0200-0400 period is used by the Cuban-America National Foundation for its anti-Castro La Voz de Fundacion broadcast.

By now, the call letters of Monitor Radio's former WCSN (Maine) should have been changed to WVHA to reflect the new owners, Prophecy Adventism. The programming currently runs from 2230-0200 and 1200-1700. The frequencies used (at various times) are 9.885 and 15.665MHz.

KCBI, the Texas station reactivated a year or so ago and carrying Gene Scott's University Network religious programming, has had a call letter change, too. It's now KAJI.

Word is that the Federal Communications Commission has applications on file for four more US short wave stations, in Georgia, New York, Arizona and North Carolina.

VENEZUELA - Long time Venezuelan broadcaster Radio Barquisimeto is reported to have been sold and the new owners are said to be thinking about returning to short wave. Radio Barquisimeto occupied 4.990MHz for many years.

That will do it for this time. Hope you'll join me in three months for another look at what's happening on the short wave broadcast scene in the Americas and the Pacific.

Until then, good listening!

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

Airband

Super Aero 45 at the PFA Rally, Wroughton.

Christine Mlynek.

I'm grateful to Chris for continuing to supply lovely photos of aircraft to embellish the look of this column. Don't they just make you want to go flying? **Wilfred Guerrero ZB2IB** (Gibraltar) makes the suggestion that, as this is a technical column, I ought to include close-ups of aircraft equipment that you wouldn't usually get to see. Now I thought readers preferred the exterior views, but Wilfred's idea sounds sensible to me. I'd like your opinion. Next time you write in, remember to tell me which sort of photo you'd prefer (or why not write specially anyway?). If there's a general demand for technical pictures, I'll give Chris the run of my Museum and she'll produce some!

Information Sources

As I'm constantly asked where charts and frequency lists can be obtained, I've put all the main sources in my *Airband Factsheet*. This single A4 sheet can be obtained from the Broadstone Editorial Office if you send them an addressed, pre-paid envelope. Now, I always mention that the Editorial Office (see masthead, page 1 of any issue) is the place to send off to. That's because it's no good writing to me, as I don't possess a photocopier! Would **M.A. Smith** (Bicester) and **R.A. George** (Paignton) therefore please try again as described here.

Since the UK sources (as mentioned on the *Factsheet*) are so easy to buy from, I haven't listed the US Department of Defense charts. Some while ago I did refer to them in this column though, so thanks to a reader in West Glamorgan for sending me some examples.

Mayday!

Even the press get muddled about accident investigations, so I'll explain the main agencies involved in safety control. The regulations are agreed internationally by all states through the International Civil Aviation Organisation (based in Canada). Each member state then drafts its own law to encompass the regulations and in the UK the Civil Aviation Authority does this with Parliament's help. Our air law includes the Air Navigation Order, and where this differs from international requirements those differences are notified to ICAO.

The CAA is not in an easy position. It polices the Order but also enforces it in a way that wouldn't make running an airline a commercial disaster. Hence commercial and safety pressures can pull the same organisation in opposite directions. The CAA also has a vested interest because, together with the Ministry of Defence, it runs the National Air Traffic Services (air traffic control) and some small aerodromes (mainly in Scotland).

In the event of an accident the investigation needs to be independent of the CAA in case any of the conflicting interests have contributed to the event. The Department of Transport have this duty, executed by their Air Accidents Investigation Branch based at Farnborough.

Station Calling, Say Again Your Callsign

A cause for alarm, as covered recently in the media, is 'hoax' transmissions to aircraft approaching certain terminals. This isn't the first time this has happened but, despite sensational and alarmist newspaper coverage, no pilots have yet been fooled. In answer to **Jim Wright's** (Bedford) question about the law, transmissions clearly require a licence to operate the equipment and a qualification to demonstrate that the operator is competent. Unfortunately there is a grey area since there are many hand-portable v.h.f. airband transceivers in use by balloon pick-up ground crews and similar operators. If you're driving round after a balloon, you're not exactly a ground station in the same way that an aerodrome is - hence the complication that has so far been tolerated by the authorities.

Also troubled by unidentifiable transmissions is **T.J. Binder** (East Grinstead). Whilst driving home from Gatwick Airport his enjoyment of a Band II broadcast was interrupted by breakthrough from people discussing traffic conditions - without callsigns. I doubt if any aeronautical service is the culprit. What you're describing sounds like the effect of cellular radios fitted to other nearby cars (marketed as car 'phones, would you credit it!). You're not the only one to be troubled by the burgeoning use of these radios for trivial purposes, especially anywhere near the M25 area.

How can TJB obtain up-to-date frequency changes? I publish ones that I get to know about, but there's at least a six week lead time. One of my sources is the *GASIL* from the CAA (see Airband Factsheet). Buying the updated *En-Route Supplement* (from one of the sources listed in the *Factsheet*) is again slow and expensive. The remaining option is fast and expensive - subscribe to NOTAMs from the CAA. If you're lucky, though, your local flying club might let you pop in and read theirs but you **must** clear it with their Chief Flying Instructor first, as visitors aren't always welcome.

Frequency and Operational News

Graham Tanner's (Harlington) list of LATCC frequency changes continues with those scheduled for November. Original 123.9 now becomes 129.075; 128.05 becomes 135.575; 131.05 becomes 136.2; and 134.75 becomes 135.425MHz. The new Irish Sea sector will be served by 134.425MHz. Answering **David Wilkinson's** (Ventnor) question in 'Scanning' (September issue page 65) 134.45 has been re-allocated. Its original function (including airway R1 in south England) transferred to either 128.625 or 120.025, and its new purpose is to replace 132.45MHz. The Flight Information Service on 124.75MHz is unchanged.

The CAA have recently promulgated some useful information. *AIC* 31/1994 explains how flights routing between Birmingham and controlled airspace via Brecon have to transit outside regulated airspace (often called the 'Open Flight Information Region'). A Radar Advisory Service from London Military or Brize Radar (134.3MHz) assists such flights. Another case of special flights coming into conflict with aircraft in the 'Open FIR' is test-flying from Boscombe Down. To alert other aircraft to the presence of low-manoeuverability test flights, Boscombe will advise their activity to the usual neighbouring Air Traffic Service Units who will then pass on the information as needed (AIC 99/1994).

Royal Flight callsigns have changed (*AIC* 52/1994). 'Kitty' denotes a Queen's Flight aircraft. Exceptions are actual royal flights, in which case 'Kittyhawk' is the callsign followed by a number specific to the pilot; if the pilot is the Duke of Edinburgh, the callsign is instead 'Rainbow'.

Radar

When surveyed as part of the last Christmas Quiz, you asked for the locations of NATS radar heads. They are at: Burrington (Devon), Claxby (Lincolnshire), Clee Hill (Shropshire), Debden (south-east England), Gatwick Airport (West Sussex), Great Dun Fell (Cumbria), Heathrow Airport (London), Mount Gabriel (southern Ireland), Pease Pottage (south of Gatwick), St. Annes (Blackpool) and Tiree (west Scotland). I'm not sure if the heads at Ash (Canterbury) or Ventnor (Isle of Wight) are still operational.

Museum Piece

Having noticed that Chris and I spent a holiday in Eire last year, **Drew Patton** (Belfast) kindly invites us to see the Ulster Aviation Society's collection. Unfortunately, we don't have a trip to Newtownards planned at the moment. The Society meets on the fourth Tuesday each month (often for a lecture), organises outings and keeps various airframes including a Buccaneer. I have a contact listed as R. Burrows, 20 Carrowreagh Gardens, Dundonald, Belfast BT16 0TW, and remember to enclose a reply envelope when enquiring about a visit.

Drew also asks about

The SAAB 2000 is a stretched 340. Taken at Farnborough, 1992. *Christine Mlynek.*

transatlantic operations. He's having difficulty tracing a particular flight. All such flights stick to the routinely published frequencies, there are no special cases. Are you sure it's still scheduled? Has its callsign been changed due to a code-sharing agreement or sub-charter? Concorde doesn't come far enough north to pass you, either. At its high cruising level and speed there's no need to change route to allow for wind and so its flightpath is fixed.

Down in Kent, **John Wells** (East Grinstead) found the Brenzett Aeronautical Museum at Ivychurch Road, Brenzett, Romney Marsh, Kent TN29 0EE, on the A2070 north-west of New Romney, half-way between that town and Appledore (there's a roundabout here). The site is a re-developed wartime airfield and as well as airframes there is an exhibition of exhumed pieces of crashed wartime aircraft. One Merlin engine was substantially damaged, its cylinder-heads torn off and crankshaft bent. This sounds like the effect of shock-loading which is what happens when the propeller is forcibly stopped whilst running at high power - usually as a result of ground impact.

How would you like to help restore a Victor? The Victor Association (191 Yarmouth Road, Thorpe St. Andrew, Norwich, Norfolk NR7 0SQ) have acquired the nose of XL160 (amongst other things) and it needs lots of work doing. New members welcome; a newsletter is one of the benefits of joining.

Is Gatwick a suitable area in which to keep aircraft? Apparently not - or so the Vallance collection (250 metres from the airport boundary at Charlwood) has been told. Now this important collection - including two Shackletons with running engines - might have to be scrapped. If you disagree with this decision you need to write to two authorities as follows. First, the Planning Office, Mole Valley District Council, Pippbrook, Dorking, Surrey RH4 1SJ. Also write to Rt. Hon. Stephen Dorrell, Dept. of National Heritage, 2-4 Cockspur Street, London SW1Y 5DH. Do it now! Time's running out. While you're thinking about it, ask yourself how much effort the Dept. of National Heritage is putting in to preserving historic aircraft and anything else aviation-related such as old aerodromes.

The next three deadlines (for topical information) are November 4, December 9 and January 13. Replies always appear in this column and it is regretted that no direct correspondence is possible. Genuinely urgent information/enquiries: 081-958 5113 (before 21:30 local please).

Abbreviations

AIC	Aeronautical Information Circular
CAA	Civil Aviation Authority
FIR	Flight Information Region
GASIL	General Aviation Safety Information Leaflet
ICAO	International Civil Aviation Organisation
LATCC	London Area & Terminal Control Centre
MHz	megahertz
NATS	National Air Traffic Services
NOTAM	NOTice to AirMen (includes AirWomen)
v.h.f.	very high frequency

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

Scanning

I'm opening the column this month with what could turn into a debate. I most certainly believe it will bring in mail and further the suggestion by **Tim Anderson G0GTF** of St. Leonards in E. Sussex, which is that more frequencies should be shown within the column. Tim goes on to say that it is a bit strange to have a column within the magazine dealing with scanners - but with no frequencies!

I agree with Tim but - BUT! - the use of frequencies is governed by statute and infringement of same carries heavy penalties. However, I feel that we can get around it in the following manner: That we:

a) show frequencies but do not list users or

b) use general headings and list band areas.

I think that as long as I do not name a particular user I cannot be called to task over the allocation. Or can I? If there are any legal or para-legals out there would you drop me a line with your suggestions on the issue. In the meantime, I'll stay my hand until the actual position becomes known.

Computer control seems to feature a great deal in the letters I get and I'm pleased to report that Tim is quite *au fait* in this area. He sent me a very comprehensive frequency list that I can only describe as being on a par, if not better, than many published by others. Believe me when I say the list is most excellently done. As it is far too long to photocopy without eating into my meagre pocket money allowance I am afraid it will only be available to owners of Amiga and IBM PCs and compatibles. The disk, entitled AMISCAN is a complete database of frequencies between 25 - 1000MHz. including TV/TVDX offsets and UK and foreign low band signals. You can add new data to it, sort it and use it very much like your own data base. As I have said, I'd seen the print out and it is excellent.

Tim also offers another disk - same machines - entitled TX Watch and DX Watch. Two for the price of one. It is a data base of all DXTV Stations listing IDs, Logos and News Programmes and is claimed to be essential for any TV DXer. Written in collaboration with Dave Shirley G4NVQ can be obtained from:

Tim Anderson G0GTF, 2 Burry Road, St. Leonards, E. Sussex TN37 6QX.

Prices are as follows: AMISCAN on 3.5in disks is £7.50 inc P&P and TX WATCH is £8.00 for IBM & Amiga versions. Both represent good value for money.

With Low Band mentioned, any reader interested in this area is advised to write for a book by Ricky Stein called *Monitor The World* priced at $24.95 plus $10.00 P&P, it is available from SMB Publishing, PO Box 428, Newton Highlands, MA 02161, USA.

The book contains excellent data on stations, including UK ones, and such small things as world mains power, allocations and callsigns and an article on propagation. It would suit travellers going abroad.

Help Time!

Can anyone ID the following frequencies?

36.830MHz - Constant carrier with occasional low level audio. Has tropo flutter. 41.250 - w.b.f.m. mode. Heard via F2 with an STL for a BC station in Israeli although Arabic music heard also.

46.575MHZ - Heard on Sporadic-E with English voices and callsigns X-Ray 40 and X-Ray 30.

87.4375MHz - Warbling tones in series. Similar signal heard at end of UK BC band on v.h.f.

Any help on these would be appreciated.

Staying with computers this time. I get a few disks through that are extremely useful to me although I cannot decode them on my machine! For future reference I have an Amstrad PCW 8256 word processor that uses CPM/+ on 3in disks, so sending me IBM/Amiga disks, etc., means I have to recruit the assistance of friends to get them working!

A letter from Canada next, proving that the magazine is read in places other than the UK. **Ken Lidgett** of St. Catherines in Ontario kindly sent on some computer control information written by Hugh Duff, also of Ontario. This is a PRO-2005 Interface and can be obtained from:

Mr. Hugh Duff, 136 Baronwood Court, Brampton, Ontario, Canada C6U-3H.

On that note, that's about it on the subject of computer control! What with last month's and now this there shouldn't be any trouble in getting what you want!

Follow-ups

September's issue carried frequencies for HM Coastguard and I've since discovered that the answers I gave were only partially right. Channel 99 - 160.600MHz - is fitted to mobiles and hand-helds, MRSC and MRCCs and is primarily a training channel. There are no plans to fit it to other SAR units - lifeboats, ILB's and so on - and, though it could be used to supplement Channel 0, it would be a 'Coastguard Only' usage. Having said that, one correspondent reports it being fitted to MRSC/MRCC's while another says it isn't yet....maybe some areas have done, some haven't! It used to be called 'Double Zero' but was changed to 99 as entering double zero into the Op's desks cancelled selections! 160.600MHz is actually a paired frequency with 156.000MHz.

Cliff Teams may also use the 'Maxon' type of headset/boom mic equipment on climbs. The frequencies of these are very low powered and fall in the range 49.670 through 49.970MHz. One correspondent is saying they are so low powered that maybe only the casualty, if scanner equipped, would pick them up! They are, however ideal for climbing and close searches involving teams.

P.E. Hall of Chichester writes in with more SAR allocations and antenna upkeep advice. SAR can be heard on 157.975 and 162.575MHz. Frequency lists refer to these as being in the Private Marine Message portion and also used within the German 'B2' Mobile Phone range. However, it is used around the area as an 'As & When' Channel. The allocation on u.h.f. at 456.825MHz I asked about in September has everyone baffled. I have found it has been used by the NCB....and, unless they're running ILBs, find that maybe the report of it being used as being a mistake somewhere along the line!

On antenna upkeep, Pete informs me he uses Holts' Damp Start on his antenna and also fills sections with Waxoyl. He states that this method has allowed him to keep his antenna for many years! Speaking of antennas, I'd like to mention **Iolo Roberts**, who is a member of the lifeboat crew at Trearddur Bay and who was s.w.r.ing his new vertical when we took a 'shout' in August - proving, once again, lifeboatmen are often caught short when the pagers go! Iolo's callsign is GW0IJY and he is often active on h.f. using all modes including packet.

Oops!

Gremlins got in during September, ensuring some frequencies were omitted in error. I cite them again:

SAR Training between the civvy manned ex-RAF ASR boats and helios can be caught on: 252.800MHz a.m.

SAR Training. 282.800MHz a.m. NATO Scene of Search. 244.600MHz a.m.

Scene of Search Control. 245.100MHz a.m.

Personal Locator Beacon Training - just noise, no speech. I hope this clears up the issue!

Thanks are due to UnID of South Wales and **M.C. Clouston** for their expertise in these matters.

Keeping it Quiet

One item that does spring to mind is how some people tend to go overboard when it comes to advertising the hobby - something no recommended given the 're-sale' value of radio equipment to certain members of the light-fingered brigade. In this case, a young local chap drives around with his gear quite openly on view and with a Sky Scan Magmount atop the vehicle, given that he often razzes around like a berserker anyway, I would have thought that such a thing was dangerous. Not from velocity, from the eagle eyes of the local constabulary who may be interested in the quality of his set, not to mention its capabilities in interception of certain sensitive areas! I did mention a case in last month's piece on this. Again I raise it as a warning. **YOU** may not think scanning is doing any harm, some authoritarian figures may think otherwise. The penalties, once more, are pretty stiff! Be careful and be sensible. The damage you can do will affect those of us who monitor purely for the pleasure of it.

Whilst it may be 'OK' to scan openly at an air display where there are probably more radio sets on open display to anyone with a pair of eyes than you thought were in the UK, the same thing would be definitely frowned upon if you chose to sit outside the perimeter fence of an air force base. I reckon your chances then would be 100 to 1 for a close encounter with someone in a military police-persons uniform! Rightly so, too. Certain times are sensitive and are a part of the national defence, albeit training. Air displays are known to attract enthusiasts and a blind eye is turned to the use of a scanner.

In my own experience, as part of an RNLI display at RAF Valley last year, two of us took our scanners with us. One was used as a 'dummy' radio in the 'dummy' lifeboat, tuned to marine band it sent forth a stream of messages that attracted great interest in the lifeboat and so in the work of the RNLI, and the other was used to listen into the control tower and aircraft. Part of being one of the display teams was the opportunity to eat 'freebies' at SARTU, The Search & Rescue Training Unit, and quaff as much tea as possible. Here, the hand-held attracted much interest including the comment from an officer, that ;'gen would be quicker via that set than our internal comms system!'. A compliment, though we were, and probably still are, viewed as 'anoraks' because of our hobby! I wonder, however, what his comment would have been had it not have been an Open Day.

People visiting our lifeboat station often have a scanner tucked on their person, always discreetly. This attitude shows a concern for the hobby and is always well met. On the other hand, those who sit outside and monitor from their cars, squelch wide open, volume high, get the sort of look that is best described as 'withering!' Even our Land Rover's set isn't that loud, and we are allowed to use it legally!

The top and tail of it is as it was last month: Be aware of the legalities of having a scanner on your person or in the car. Be aware of the area of your scanning, whilst v.h.f. marine is hardly likely to attract much attention, u.h.f. police is! Use common sense and behave like a responsible user. After all, if we are to halt the derogatory view held by many concerning scanning, it is down to use to self-police the issue adequately. You may argue that hacking never did any real harm to the computer scene, but it did tighten up many areas that were pretty loose!

Myself, I can see scanning going pretty low-key in a year or two, attracting only those with a real interest in radio and in the developments within radio. The 'casual user' who buys a top of the range set, keeps it for a while and then either leaves it switched off or even sells it will taper off and leave a 'hard core' of enthusiasts involved. To do what? The future is already here, we just need eyes to see it with. On that note, I'll leave the issue. Always quit when you're ahead, I say!

Other Matters

On the subject of motorsports comms. It appears that most of the frequency guides have this right, re allocations. However, many teams - like the Formula One chaps - are now scrambling their links to halt journalists listening in! Obviously, this will include others, like rival teams, as well. Telemetry is also rumoured to be used. I have no other information to pass on regarding that area. I have heard CB is used but cannot confirm this.

Gordon Gustar of Weston-super-Mare does list the following frequencies, . 168.4, 169.13, 169.225, 414.4875, 415.9875, 450.225, 455.235, 456.615, 457.3125, 459.5, 460.5, 460.325, 462.425, 465.235, 466.615 (all MHz). Mode is n.f.m. channels are a mixture of ambulances and RAC Rally use. For quite obvious reasons I cannot name individual teams and match them with frequency!

September's column asked for anyone with info on callsign 'WATCHDOG' as used by the military to get in touch. I can now report that the call is used by the Army to call Military Police. Judging by the info I reported on, **Tony Williams** of Middlesex states that it sounds pretty certain to be this. That's one mystery cleared up!

On the Sony ICF-5500M I asked about when I started, a letter from **D. Forrest** of Liverpool informs me he has a handbook available. Thanks but I did get one though. **P.W. Ewers** of Bucks also writes, having bought his for £4.00 at a boot sale! Bargains are available! He does require some parts - a tune/batt./v.u. switch and a pop-up antenna knob. If anyone knows where these can be had, then write to me and I'll forward the information on to him. Thanks for the QSL card as well, Pete!

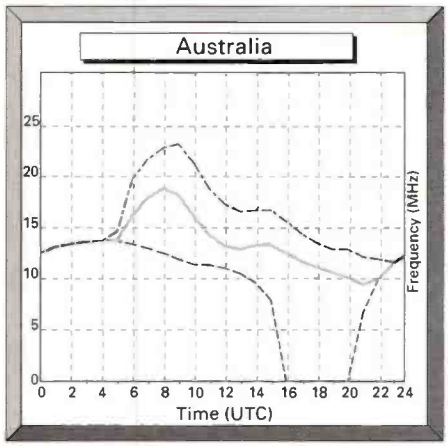
That's about it for another month. In the run up to Christmas many will be thinking of buying new and, if this is you, then look at the review on page 24 this issue for the Maruhama RT-618. Plug!

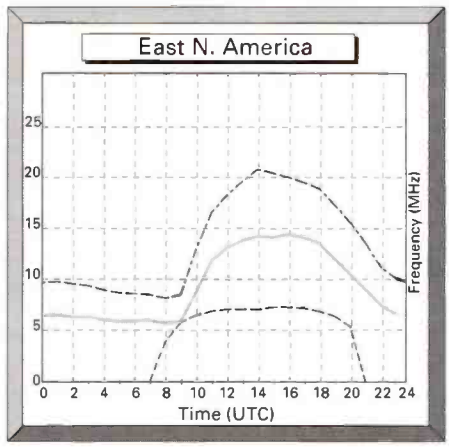
Until next month, good listening.

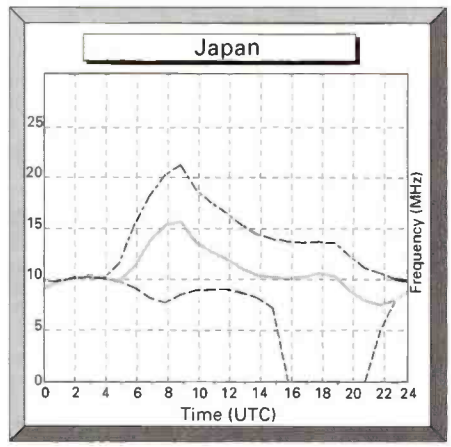
Jacques d'Avignon VE3VIA

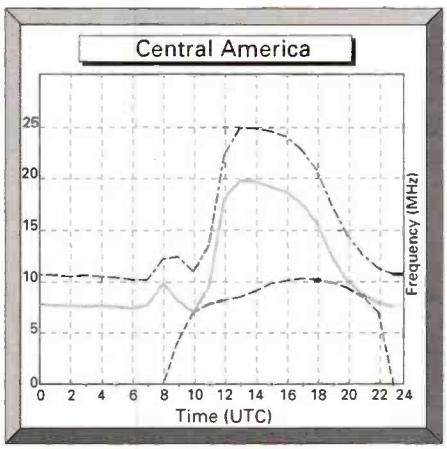
World Propagation Forecasts November

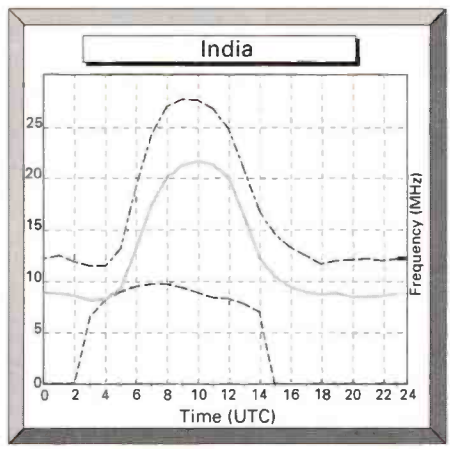
Circuits to London

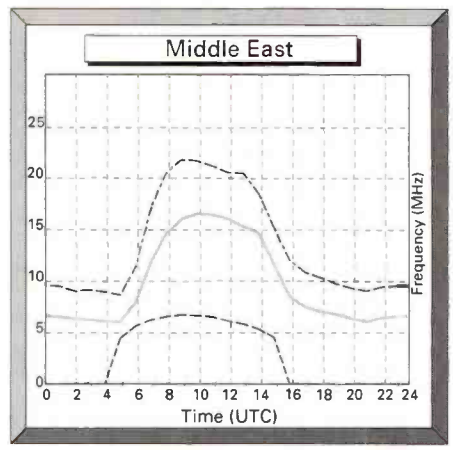


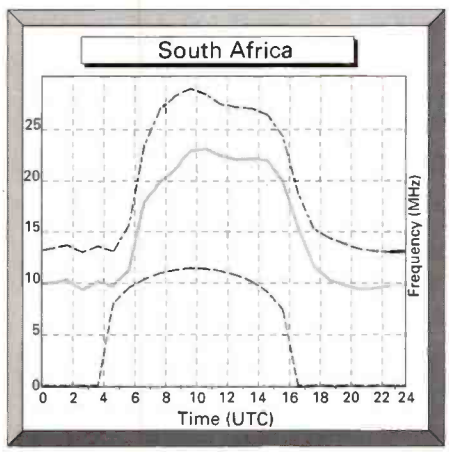


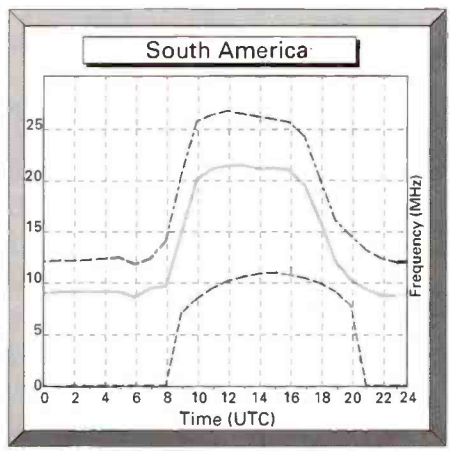


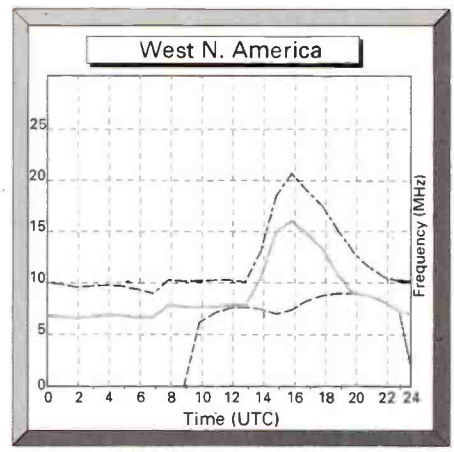












How to use the Propagation Charts.

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

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

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

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

Good luck and happy listening.

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

Info In Orbit

The more satellites that you 'listen' to - and it is easy to tune into them using various receivers - the more your ear learns to interpret. Within a short time of taking up WXSAT monitoring, you learn to recognise the sounds of NOAAs and METEORs. You may even notice particular characteristics in the signal. Watching the resulting picture form on a screen (assuming you have the means to decode the signal) adds to the learning process. So, when I switched on the receiver to monitor the afternoon pass of NOAA 11 on September 16 at about 1655UTC, I knew something was different.

Listening carefully, it became evident that the pictures were not right. Detail in the images (that is, the variation in brightness levels) is heard as a high frequency component within the overall signal. As an example, shower clouds are white spots on a dark background of land or sea. Their presence in the telemetry adds this corresponding burst of high frequency (rapidly changing data) to the a.p.t. (automatic picture transmission) signal. Honest!

Decoding this NOAA 11 picture confirmed the presence of two blank side-by-side images. If this was a planned exercise - and I had not seen any advance information from NOAA (the National Oceanographic and Atmospheric Administration) - then it could have been expected to be implemented about a week later, when its sister WXSAT NOAA 9 would be suitably placed for alternative operations. I therefore expected NOAA 11 to be switched off and NOAA 9 re-instated. This happened the next day.

Current WXSATs

A few days prior to the previous events, METEOR 2-21 ceased transmissions, at least those of its a.p.t. operations. It has continued to provide a variable signal strength for several weeks, transmitting on 137.40MHz until September 11 (or possibly a day or two earlier). Noting that METEOR 2-21 was in full sunlight, it surprised me to find it switched off. METEOR 3-5 remains transmitting despite having gone through the terminator yet again - see later illustrations. I do wonder about the state of the other CIS WXSATs. There are several METEORs that should be capable of routine operations. All have been suitably positioned in full sunlight at one time or another.

Meanwhile, as at late September, NOAA 11 came back into operations but with no detail available in either a.p.t. channel.

Orbit Illustrations

A picture may be worth a thousand words - so I have produced some graphics to illustrate certain points about WXSAT orbits, particularly for beginners. I hope to make this a regular feature if the response is favourable.

To produce these graphics I used my PC and, most unusually for me, ran Windows. The satellite tracking program was started via Program Manager - selecting 'file' then 'run'. In the Windows environment, pressing 'Alt/PrtSc' (normally) transfers an image of the current screen into the 'clipboard'. Only one image can be transferred at a time using this method, so we return to program manager ('Ctrl/Escape'), then select Paintbrush. Some non-Windows software may use this key combination for another purpose, in which case this process obviously won't work.

The image now stored in the clipboard is 'pasted-in' using the 'edit' option, then finally the resulting file is 'saved-as' a named file e.g. METEORs. This produces a .BMP format graphic file. Using any of several file-conversion programs, a more widely-used format, e.g., .PCX or .GIF can be produced containing the original image in compressed format. Finally, the image had its grey scale reversed for clarity in reproduction - otherwise large areas of sea would be dark.

NOAA VHF Clashes

For several weeks at a time, NOAA 9 does not transmit a.p.t., and for a few days at a time, NOAA 10 is similarly removed from active operations. The picture in **Fig. 1** illustrates why this happens. During mid-August - the time slot shows August 13 - neither NOAAs 9 or 10 were transmitting a.p.t. The orbital period of NOAA 10 is slightly shorter than that of NOAA 12, so it periodically 'catches up', then overtakes NOAA 12. The illustration shows how on that date, the footprints of NOAAs 10 and 12 overlapped. Within about a week, this 'clash' ends and normal operations are resumed - NOAA 10 is switched on again.

A similar situation occurs with NOAAs 9 and 11, but because their periods are closer, the period of overlap is longer. Occasionally both sets of NOAA clashes occur, resulting in only NOAAs 11 and 12 operating. With suitable software, one can predict these periods in advance.

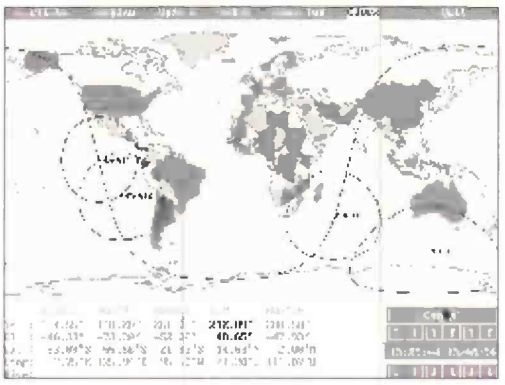


Fig.1: The footprints of NOAAs 10 & 12 overlap.

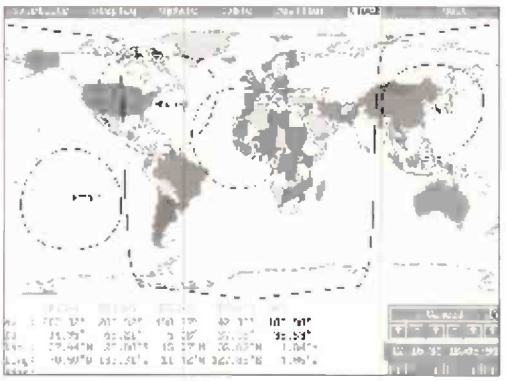


Fig.2: The positions of METEOR WXSATs relative to the day/night terminator.

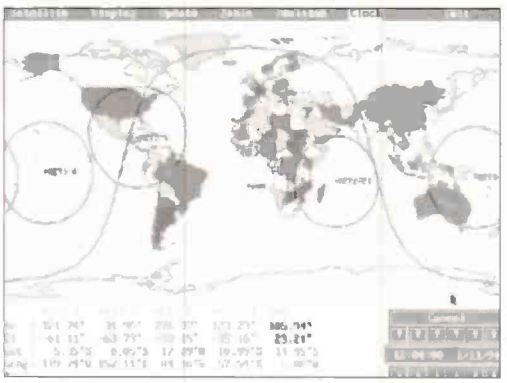


Fig.3: The positions of the METEOR WXSATs several weeks later than in Fig.2.

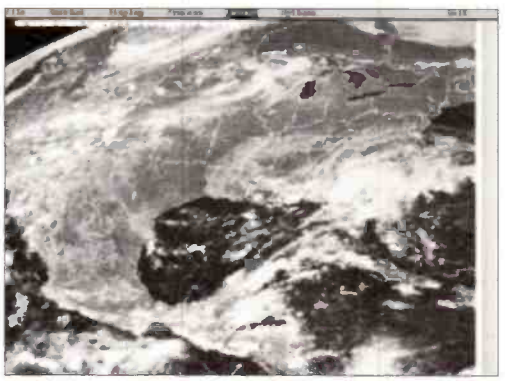


Fig.4: North America, Meteosat 3, 20 September 94.

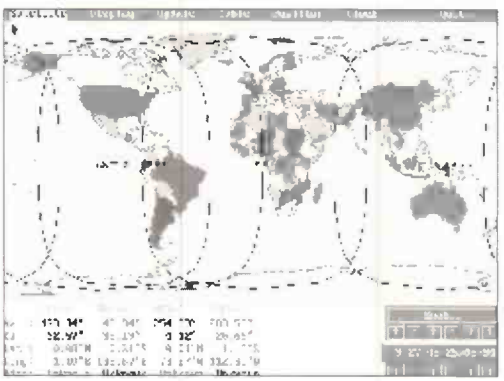


Fig. 5: Footprints of the main geostationary WXSATs.

METEOR Operations

By displaying those METEOR WXSATs that were most recently launched - see **Fig. 2** - we can observe how each is positioned relative to the day/night terminator. The picture shows both terminators near noon, (1210UTC on 18 September 1994), as may be readable on the time slot shown at the bottom right of the graphic. METEORs 3-4, 3-5, 3-6 and 2-21 are displayed. The circles represent areas on the ground where direct reception of the a.p.t. signal should be possible - the 'footprint' - if the WXSAT is switched on.

The left side of the terminator is the advancing daylight edge, and shows that METEOR 3-5 is currently well into the night-time part of its orbit, travelling northbound. Half an orbit later (about 50 minutes) it will be in full sunlight, travelling southbound and transmitting imagery.

METEOR 3-4 is seen to be travelling northbound, rather close to this terminator, so will see the sun at a low angle of illumination. Half an orbit later it will do a similar slide near the other terminator - but in darkness. Satellites in this position (near the terminator) are often running at reduced power levels because of the low sun angle, so might be expected to be rested. METEOR 3-6 is travelling southbound in full sunlight - yet we have not heard it for a very long time.

To the west, near the approaching night terminator, METEOR 2-21 is seen to be running southbound in eclipse. This WXSAT was recently switched off and the reason can be appreciated.

The orbit of each CIS WXSAT is precessing - slowly moving westwards relative to the sun - and therefore towards the next terminator. This happens over a period of several weeks and **Fig. 3** shows the scene a few weeks later, at midday on November 1. The WXSATs are still travelling in the same direction, as in **Fig. 2**, but their positions relative to the terminator have advanced westwards. METEOR 3-6, previously orbiting in full sunlight, is now close to the terminator, and the others have also moved correspondingly.

WXSAT Details

Some readers have expressed an interest in having further details of the CIS WXSATs provided. At one time, such information was difficult to obtain. Then, during the late 80s, this information started to be released, and has provided some illuminating reading. As an example, the design lifetime of CIS WXSATs is described as 'not specified' in most publications!

METEOR Series 2

There are two currently active series of these WXSATs. METEOR-2 WXSATs have a mass of some 1500kg, a cylindrical construction some 2m diameter and 5m length, with solar arrays of 10m length. Their main equipment comprises a scanning telephotometer for direct imaging in the 0.5 to 7.0 micron band (visible), with resolutions of 2km (global) and 1km (local) coverage; a scanning infra-red radiometer using the 8-12 micron band having 8km resolution, and a scanning IR spectrometer using 11, 10-18, and 70 micron bands with 30km resolution. Orbits are nearly polar, at a height averaging 950km and therefore orbital period around 104 minutes.

METEOR Series 3

METEOR-3 WXSATs look virtually identical, have similar mass and payload, but with the addition of TOMS, the Total Ozone Mapping Spectrometer, provided by the USA. Their height of 1200km gives an orbital period around 109 minutes. At this height the scanning IR radiometer (spectral range 10.5-12.5 micrometres) produces a swath width (the width of the strip of earth scanned below the WXSAT) of 3100km. The on-board processing system corrects geometrical image distortion and splits the data into two data streams: a.p.t. for transmission to receiving stations in the 137MHz band, and video information for global cloud cover images. There is a proposal that image transmissions should be transferred to the 1.7 GHz band at some time in the future.

METEOSAT New Schedules

Just after last month's deadline for copy, I received two new schedules for METEOSAT transmissions - one starting from September 20, the other from October 18. These schedules resume the virtually live transmissions of METEOSAT PD (primary data) and WEFAX image transmissions. The short delay in the dissemination of METEOSAT imagery experienced for some time now, resulted from a need to correct what was called 'the rotating lens anomaly'.

The September schedule temporarily dropped GMS (Australia region) formats, but these were due to resume in October. This coincided with a volcanic eruption in that region! Apart from the slightly earlier transmissions of these METEOSAT-5 formats, some schedule changes have been made. Extra, high resolution (PD) images have been added.

The picture in **Fig. 4**, - the WEFAX M1C - format, was taken on September 20 at the start of the new schedule and shows North America in visible light. The Great Lakes of Canada are clearly seen, in fact the detail seems considerably better than before.

The picture in **Fig. 5** shows the footprints of the main geostationary WXSATs; GOES-7, METEOSAT-3, METEOSAT-5 (MOP-2), and finally GMS-4. There are many others in this series, some classed as stand-by or under test - e.g., GOES-8.

Letters

A correspondent from Milton Keynes was studying satellite photographs of

Fig. 6: The West coast of Greenland. METEOR 3-5.

From Lawrence Patton.

earth, apparently published by an organisation called the Earth Satellite Corporation, and asks for a contact number or address. I have not heard of this group before, and it is not listed in the UK Directory of Space Organisations. Perhaps someone else knows of it?

Earlier this year **Laurence Patton** of Luncarty in Perth sent me some pictures taken using his equipment receiving METEOR 3-5 over the far west. His picture - see **Fig. 6** - shows pack ice beyond the west coast of Greenland, as it was near the beginning of the year. The coast of Baffin Island is clearly identified.

Live Pictures from MIR

Sue and John Locker of Newton, Wirral wrote to tell me that they picked up a live video transmission from MIR, relayed via COSMOS 2054. My records show that COSMOS 2054 was launched on 27 December 1989 into geostationary orbit. They add that the satellite is positioned at 15° west, and found transmissions on 10820MHz that were fairly weak. Sue and John give 10835 and 11385MHz as other frequencies, the latter carrying data. According to Sue and John, the best viewing times are currently 0500 to 0600UTC and 1700 to 1800UTC. They also enclosed a printout received by packet radio, containing official confirmation of the e.v.a. (extra-vehicular activity) they had watched - a most worthwhile monitoring coup!

Software

There has been a steady demand for the various software offers appearing in this column in recent months. I am currently looking at another tracking program but getting mixed results. On two computers the software runs acceptably well - but on my 386 it is a disaster! In due course I will see whether I can rectify the problems so that the program can be issued with certainty of success.

Printer Compatibility

Occasionally readers report problems using the printer option usually provided with predictions software. One query related to the use of an IBM Proprinter, when used with Birddog, the satellite tracking and predictions program that I mentioned and issued to dozens of 'Info' readers some months back. Software writers have the problem of trying to have their programs print graphics or text on a variety of printers, these often using incompatible character codes. The normal solution is to check the 'emulation' alternatives of your printer. In the case of Birddog, the documentation states that the program assumes an Epson FX printer is attached.

I use a Panasonic printer, and this permits emulation of both Epson and IBM, by simple programming of the front panel - I normally use it in 'Epson' mode. I presume that the IBM Proprinter can emulate an Epson FX - this should cure the problem.

WXSAT Signal Interface

I was very pleased to see Tom Woolner's article on his WXSAT interface published in the last edition of *SWM*. Tom originally submitted this feature to me for possible inclusion in the column. It seemed to merit a separate feature so I was glad to hear that it was to be published. Several months ago I mentioned that it was possible to set up a very low cost WXSAT decoding system; the advent of the JVFAX program, together with Tom's interface, makes this a reality. Well done Tom.

Kepler Elements

1: A print-out of the latest WXSAT elements is available. Please send a stamped, addressed envelope and separate, extra stamp (towards the cost of data collection). All WXSATs plus MIR are included, together with transmission frequencies if operating. Requests from outside the UK should include an IRC (international reply coupon) - I will forgo the request for a UK stamp! This data originates from NASA.

2: I already send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (plus four s.a.e.s) for four editions. For those living abroad, please supply one IRC and envelope per printout.

3: I can provide files on disk containing recent elements for the WXSATs, and a large ASCII file holding elements for many satellites. This option includes a print-out identifying NASA catalogue numbers (for the WXSATs, Amateur Radio satellites, and others of general interest), in various formats ideal for computer data retrieval. Please enclose cash, a cheque, or PO for £2 with your PC-formatted disk and s.a.e.

Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz; NOAAs 10, 12 on 137.50MHz: NOAA beacons on 136.77 & 137.77MHz and METEORs use 137.30, 137.40 & 137.85MHz.

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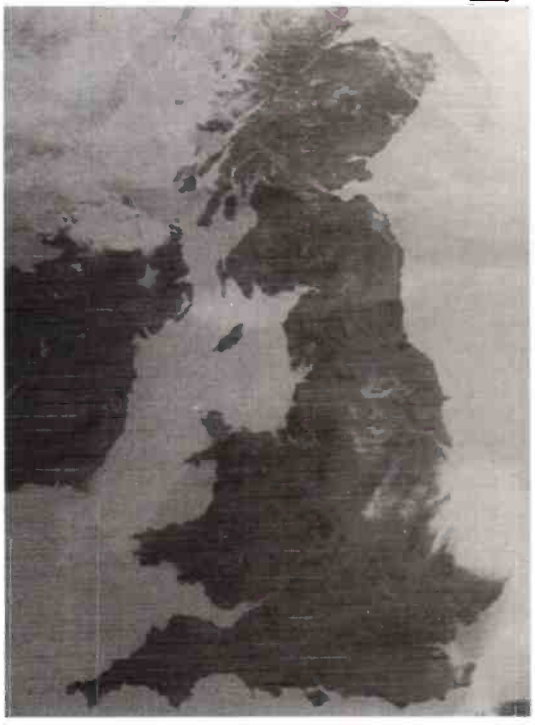

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Decode

All the Data Modes

A. E. Grant of Crowmarsh Gifford reports great success using the JVF1 interface from Martelec. This interface features internal processors with tailored filters for each mode. One of the great advantages of this system over the simple comparator interface is the reduced processor demand.

When using JVFAX with the simple interface, the processor has to deal with every signal transition. Whilst this is fine with fast 386 and 486 based machines, the slower 286 and earlier machines tend to run out of processor time. This can cause all sorts of problems and often leads to a program crash. With an interface such as the JVF1, the really labour intensive part of the processing is handled within the interface so taking the burden away from the computer. In A. E. Grant's case he is able to receive highly detailed FAX images using his 12MHz 286 based computer.

Another interesting snippet was sent to me by **Allan Horsfield** of Peterborough. Whilst on holiday in France he came across a magazine showing a complex interface for JVFAX. The project was clearly for home construction and was featured in the September '94 edition of *Nouvelle Electronique*. My French isn't up to to a full translation but someone out there might rise to the challenge.

Geoclock

Barry Harding of Romford writes this month with some interesting radio shareware.

Geoclock has been around for some time and the version sent in by Barry was version 5.0. This fascinating program is a fully animated world clock with excellent graphics and a wide range of uses. The program is designed for IBM PCs and compatibles and can operate with a wide range of graphic adapters from EGA through to 600 x 800 SVGA systems. Windows users will be pleased to hear that it runs OK under Windows and comes complete with a PIF file and icon.

Installation of the program is very simple following creation of an appropriate sub-directory, you just copy over the main file and un-zip it using the supplied PKUNZIP program. Instead of using an on-disk manual like many systems, GeoClock relies on a comprehensive help system to guide you through the operation. This help even included help for a number of common problems.

Once the program is running you are presented with a colour map of the world with shading to show the areas in darkness. The display is updated in real time and takes into account the time of year, so providing a true representation of the current situation. One of the uses for the program is for what's called grey line DXing. This is where you take advantage of the enhanced propagation that can occur across areas that are going through a period of dusk. The Maps in Geoclock make this very clear indeed.

In addition to running in real time, you can also use Geoclock to predict future events by adjusting the times and dates. You can take this another step further by adjusting the speed setting to produce a rapidly moving display. This gives the opportunity to plan your listening for the best DX.

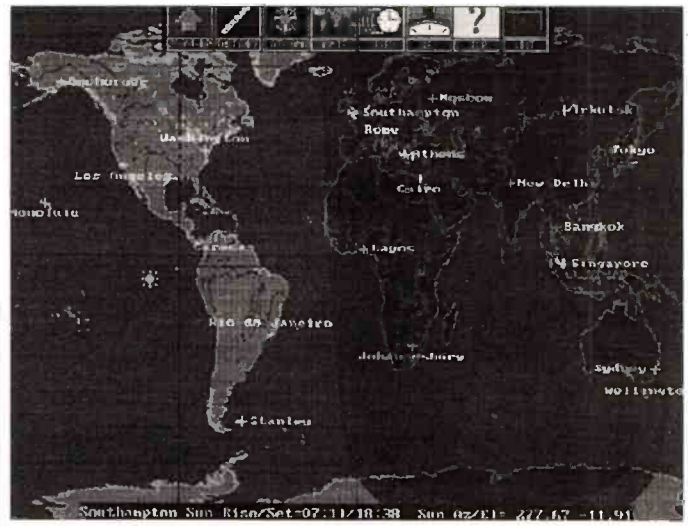
Another interesting feature of Geoclock is the distance measurement system. If you're using a mouse based system you just click on the two points to be measured and the system tells you the lat/long plus distance in miles and km!

Geoclock is packed with features and just about everything is adjustable. The main restriction of the shareware version of the program is the limited selection of maps. However, if you register for the full version you get around forty maps to select from.

Geoclock is available from many shareware sources and the Public Domain Shareware Library (PDSL) have version 5.1. available. The contact number for PDSL is (0892) 663298, or if you prefer to write Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL.

Old Receivers

David Banks of Egremont, Cumbria is a keen utility listener and writes asking about receivers. He currently uses a Sangean 803 receiver which, although fairly basic, produces good results. He would like to upgrade to a more conventional type of communications receiver, but is not sure what to go for when it comes to the second-hand market. To try to help him, and many others that write, I will attempt to run through some of the receivers that you may find being advertised at good prices.



Geoclock Display

For utility listening a receiver needs to have some features that are perhaps not required for many other aspects of the hobby. The first requirement is that of a single sideband (s.s.b.) receive mode. In most cases this will be selectable between upper and lower side band. If you are considering one of the older receivers such as an RA-17 you will find that s.s.b. reception is achieved using a b.f.o. and side band selection depends on the b.f.o. frequency. You will also find that with this type of receiver you get better results if you turn the volume to maximum and use the r.f. gain control to set the sound level.

One of the next most important aspects of a utility receiver is that of frequency stability. Whilst RTTY reception is just about bearable on drifting receiver, FAX is just about impossible. This is because a typical FAX chart can take around fifteen minutes to send. Stability is also very important when receiving some of the more advanced modes. In these cases you may well have to leave station on monitor for considerable periods to receive any interesting messages. This is normally done by leaving the receiver tuned to the chosen frequency and letting your computer store any received text to a disk file. At the end of the monitoring session you can then just quickly review the text file to see what's been going on. This operation is completely impractical if you have to chase signals up and down the band as your receiver drifts!

If you already have an older receiver that suffers drift problems you can take a few steps to minimise the problems. The first point to note is that frequency drift is almost always temperature dependant, so give your receiver plenty of time to warm-up before you start listening. You can also help by ensuring the receiver is kept in dry environment with as constant a temperature as possible and well clear of any draughts.

Another important point for utility receivers is the minimum tuning steps. A step size of around 10 or 20Hz is ideal, but you can get away with much coarser steps depending on your decoding system. If you're using a modern decoding package with an auto tune feature, the program can overcome quite coarse tuning steps at the expense of slightly slower set-up time. If your decoder cannot alter its centre frequency then you really need to stick with 10 or 20Hz frequency steps.

Just to illustrate the point, if you're trying to receive maritime SITOR stations, you will find that the signal has a shift of just 170Hz. If your receiver can only tune in 100Hz steps you can see that you will never achieve accurate tuning as your receiver will always be off-set one way or another. The problem is magnified when you come to receiving those weak DX signals.

Now let's continue with a run down of some of the models you may well find on the second-hand market (in no particular order).

Sony ICF-2001D: This amazing little receiver caused something of a stir when it was first launched as it's performance rivalled that of some so called communication receivers. The frequency coverage extends from 150kHz through to 30MHz plus air band and the v.h.f. broadcast band. The tuning steps are selectable at 100Hz or 1kHz so you will need to be able to adjust the centre frequency of your decoder. Although the ICF-2001D was originally designed to use the built-in whip for short wave reception, it also works well with an external antenna through the built-in jack.

If you're buying second-hand, the one common failing is poor sensitivity. This is usually caused by static build-up from an external antenna blowing the front-end field effect transistor. The failure is well known, so you shouldn't have a problem with repair.

Racal RA17: This receiver was designed over 35 years ago and was truly state of the art at the time. Although it's still much sought after, there are many pit falls. The first point to note is that it's huge and

weighs about as much as one man can lift! When a receiver gets to the age of the youngest RA17 you are bound to start getting problems as components reach the end of their working life. Owning an RA17 is rather like owning a vintage car - its fine while its going, but constant maintenance is required.

Having got all the bad points out of the way, if you really want one, the performance of a good model can still give many modern receivers a run for their money. Frequency steps are no problem as the coverage is continuous in 1MHz bands from 0 to 30MHz. The RA17 also features excellent i.f. bandwidth filters with six choices available. One useful extra to look our for is the s.s.b. module that includes a product detector for this mode.

Yaesu FRG-7700: This was not a particularly good model from Yaesu with coverage from 40kHz to 30MHz and frequency steps of 100Hz. This model suffered with poor s.s.b. selectivity and an unusual front panel layout. If you're also interested in broadcast reception you will find the FRG-7700 is very weak. It's still usable for utilities but make sure the price is right and you're happy with the layout.

Yaesu FRG-8800: This later model is a vast improvement over its predecessor and well worth the extra money. The frequency coverage is 150kHz to 30MHz and there is an optional v.h.f. adapter that adds air band coverage.

The FRG8800 also features keypad frequency entry and 12 memory channels for your favourite frequencies. If you're into computers you will find that there are a number of shareware programs around to let you control the receiver from the computer. The tuning steps of the FRG-8800 are selectable at 25 or 500Hz that gives 6.25 or 125kHz per tuning knob turn.

Trio R-2000: This receiver features continuous coverage from 100kHz through to 30MHz with tuning steps of 50, 500Hz or 5kHz. The 50Hz minimum steps is an unusual compromise but, for utilities, you will still need an auto-tune option on your decoder. This was a very popular receiver with a good layout and very easy to operate.

It's main failing was poor dynamic range which meant it was very prone to overload from strong local stations. You may be able to minimise this with a good preselector, but the money is probably better spent on a better receiver.

Icom IC-R71E: This is one of the classic receivers for utility listening with its excellent sensitivity and top quality selectivity. Frequency coverage extends from 100kHz to 30MHz with 10Hz/1kHz tuning steps. Rapid manual tuning is aided by a two speed system that increases the tuning steps to 50Hz when tuning rapidly. As well as excellent i.f. selectivity the IC-R71E includes pass band tuning and a very effective notch filter. The only weak points with the IC-R71E are the small controls and poor a.m. performance.

AR-88: Rather like the RA17, the AR88 was a great receiver in its day but is not a serious contender for utility listeners. At fifty years old you are unlikely to find one in very good condition and even then they were liable to drift rather more than is required for utility reception.

Lowe HF-125: This was the predecessor of the current Lowe HF range and caused quite a stir when it first appeared as a brand new all British receiver. Despite being first introduced in 1987 the HF-125 makes a fine utility receiver. It has s.s.b. tuning steps of 15.6Hz and exceptionally good frequency stability. The frequency coverage extends from 30kHz through to 30MHz, though the performance below 100kHz suffers quite badly from synthesiser noise.

I hope this short run through a few of the more common receivers proves useful and I will be including this and other help for newcomers in my *Starting-Out FactPack* to be released soon.

Lap-Top Listening

M. Cumberbeach of Lytham St. Annes noted that I was using a lap-top computer during the Decode Clinic at the Stafford rally. He wonders if they are to be preferred for decoding. The reality was that I didn't want to transport my home system and needed something small and portable. In the end I borrowed the lap-top in question from the *SWM* office.

Although it proved OK for the demo station, there were a few problems that anyone considering a lap-top should be aware of. In this particular case I had a lot of problems with noise from the external power unit. This was a small switched mode unit that put out high levels of r.f. noise throughout the h.f spectrum. With a bit of effort I may have been able to tame this - at worst I could have changed it to a bulkier more conventional power unit.

Perhaps more serious was the slow response of the monochrome liquid crystal display unit. Whilst this was fine for text reception such as RTTY its was not so good for FAX reception. The main problem was the lack of contrast that meant FAX charts tended to look rather washed out.

The slow response of the l.c.d. also caused problems with some of the analysis tools such as the spectrum analyser and scope provided with Hamcomm. Having said all this, you may find that some of the later colour display systems have improved sufficiently to make them more usable. However, I would suggest you try your decoding software on any prospective machine before you part with your cash.

Wavecom 4100 press pic from George Newport

Special Offers

The following special offers are available to Decode readers. Although I try to turn the orders round in a day or two, you should allow up to two weeks for delivery.

JVFAX 7.0 - FAX and SSTV transmission and reception for IBM compatible computers.

HAMCOMM 3.0 - RTTY and c.w. transceive facilities for IBM compatibles.

Day Watson Beginner's List - Chronological frequency listing of reliable signals for new listeners.

Decode List - Straightforward frequency list from Decode readers.

Complex Modes List - Advanced frequency listing for experienced listeners.

FactPack 1 Interference - Help for solving interference problems.

FactPack 2 Decoding Accessories - How to use and choose your decoding accessories.

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

Frequency List

Once again its time for a round-up of frequencies logged by Decode readers over recent weeks.

Freq (MHz)	Mode	Speed	Shift	Call	Time	Notes
2.374	FAX	120	576	GYA	446	NORTHWOOD
3.745	FAX	90	576	RIS70	2336	TBILISI MET
4.601	SITOR	100	170	-	1219	?
5.755	FAX	120	576	AXI32	2137	DARWIN MET
7.395	FAX	120	576	HSW64	1705	BANGKOK MET
9.087	ARQ-E	288/186	-		1620	Encrypted
9.282	ARQ-E	96	157	-	1617	Belgrade Serbia
10.151	SWED-ARQ	100	400	SAM	1555	Stockholm to Colombo Embassy
10.605	ARQ-E	72	398	RFGXXK	1555	French Mil
11.112	FEC-A	96	400	9VF39	1604	PIAB Press
11.537	ARQ-E	96	200	-	1147	German MFA to Tel Aviv
12.228	RTTY	75	400	BZR62	1453	XINHUA PRESS
13.437	RTTY	75	800	RPFN	1508	PORTUGUESE NAVY
14.785	RTTY	50	400	ATP65	1430	NEW DELHI PRESS REPORTS
18.173	RTTY	50	400	STK	1300	KHARTOUM AIR
20.348	ARQ-M2	96	355	9RE203	1430	ZAIRE TELEX
20.463	ARQ-M2	96	400	-	1221	ZAIRE TELEX

Andy Emmerson G8PTH, 71 Falcutt Way, Northampton NN2 8PH

Watching Brief

Our Quarterly Look at Amateur Television

Once again we're talking about that evergreen topic, computers in video, specifically about Amigas to be precise.

Letters

First of all **Robert Wyeth** writes from 112 Main Road, Crockenhill, Kent, BR8 8JL.

"Although I use a PC for all my audio s.w.l. work, I would never think of using it for video titling, for my trusty Amiga 600 (no hard drive) is the answer. The beauty of the 600 is that it is smaller than other Amigas (or other makes of computer), mainly because it doesn't have a numeric keypad. I know it isn't manufactured any more but there are still thousands about at ridiculously low prices. The only expensive thing required, if you want your titles to overlay the moving image, is a genlock.

I use the GPV G-Lock, at just under £300 from Silica Systems, also the *Scala 500* software. This software was given away 'free' with one of the Amiga magazines earlier this year. By applying for the manual (low cost) and registering my copy I also received two disks of clip art. The results are as good as any BBC titles. The *Scala HVT* (Home Video Titles) program is easy to use and contains lots of wipes, fades and best of all, it scrolls and you can fade to black or white. Also the titles can be in 3-D, shadow, outline or normal, whilst fonts can be changed from medium to large or very small.

I should add that you don't need to go to the expense of a genlock because Scala performs just as well without it, generating a blue background for all titles. Please don't knock the Amiga, you do not have to buy another card to access a video recorder; unlike the PC, it is built in. I should have added that if you haven't an Amiga with a hard drive, it is a lot easier all the same if you have another floppy disk drive. Two disks is all that is needed, one for the genlock program, the other for titles. If anybody has problem with this program, they may write to me."

Thanks for that offer, Robert.

SSTV Again

After my recent discussion of computer programs for slow-scan television I received an interesting letter from the town of Jaworzno in Poland. Rather than paraphrase it, I thought it more interesting to leave the text just as it is...

"Here Milosz SP9UNB. Last time I got from my friend Les G0JEI a copy of your article in *Short Wave Magazine* from February 1994. You described there Pasokon TV SSTV system and at the end you encouraged others suppliers to feature theirs product for SSTV.

Well, I am just the author of such an SSTV system. Its name is "Micro-Fax 4.3" and it is dedicated for Amiga computers family. I don't want to describe it here too wide, because all basic informations are save in document file on the enclosed disk, so I give you here only the features not present there.

The system consists of two parts : software and small hardware. Since program can work with different interfaces that comes from other SSTV products being in the market, basically program is sold without hardware. For those people who want (and who are able) to built hardware themself, there are three schematic diagrams of simple interfaces saved on the program disk. And if one want to get full system ready to use, I manufacture also special multimode interface that works not only with Micro-Fax but also on packet-radio (with program Amicom 2.0). The program itself has few version: one working on all Amigas (from cheapest A500 to the best A4000) and the second, with improved parameters, for new machines with the AGA-chipset (A1200, A4000).

Full Multitasking

The most important feature (in compare to other such programs) is full multitasking operation. Even during transmission/reception it is possible to work in another parallelly running programs and also to perform all functions in Micro-Fax itself. So it is very easy for example to start painting program together with Micro-Fax and when it transmit or receive ,we can enjoy preparing next picture . Hardware blitter allows us to flash grab the pictures from other programs onto Micro-Fax screen (also in opposite direction) so using that I can immediately move prepared picture from painting program to Micro-Fax and transmit it, or for example start frame grabber with its software, get photo from camera or VCR and just transmit it on the air by one mouse click ...

Of course all basic functions known in such programs are present here: load/save picture from hard-disk, text writing, font and colour selection, quick switch from one mode to another and so on... Most often-used SSTV and fax modes are included now and I intend to add new in future.

The price for full working, commercial version is $30 (inc. P&P), upgrades are $10. This version has callsign of its owner written into it and transmitted with each picture. But there is also freeware version, with some functions disabled as well freeware SWL version (all modes and saving but only on RX side). This freeware is available for anyone and free to copy (To get from me please send blank disk and one IRC). The dedicated multimode interface costs $60 post-paid) now. Its schematic diagram and the board layout are both on paper and saved on disk.

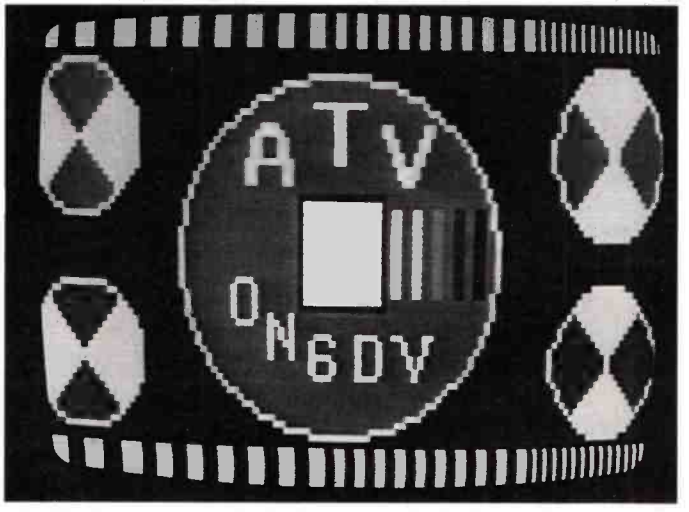
You may publish this materials anywhere but manufacturing for profit is forbidden without my permission. I have until now over 100 registered users in whole Europe. If you want to get some opinions about the system I have a list of all users from UK with callsigns, address and versions of program.

The Micro-Fax (commercial version) is available exclusively from :

Computer Service Studio, Milosz Klosowicz, ul. Matejki 20/30, 32-510 Jaworzno, POLAND. Tel/Fax: 00 48 35 64082 (after 4.00 PM). For any questions and problems I am also available via packet-radio network : SP9UNB@SP9ZDN.KA.POL.EU. It is advised to send the price as the money order or at least as the letter with VALUE DECLARED (insured) . NEVER normal or registered letters. Registered users will can get the next versions only for 1/3 of this price."

Until Next Time

Well that's it for this Quarter, I look forward to your letters so keep them coming in address as always at the top of the column.



Computer graphics of the simpler kind here. Belgian amateur television station ON6DV was photographed operating through GB3LO, the Lowestoft ATV repeater. Picture by Paul Godfrey G8JBO on 11 May this year.

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

LM&S

Long, Medium and Short Waves

The information in LM&S is based on actual reception by listeners in the UK and abroad during a four week period prior to preparing the data. Although international SINPO code ratings are included they refer only to reception at the time.

Some of the international broadcasters mentioned here may alter the times and/or frequencies of their s.w. transmissions to allow for seasonal changes in propagation before this issue arrives on the bookstalls.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless stated, all logs compiled in the four week period ending August 28.

A marked contrast between day and night-time conditions was observed during August by **Eddie McKeown** in Newry. Except for about four stations he found the band nearly dead in daylight. At night though, propagation was really superb. Very potent signals were heard around 0230 from Kaliningrad on 171kHz, Saarlouis 183, Munich 207 and Beidweiler 234.

Good reception was also noted at night by **George Millmore** in Wootton, IoW. After dark, he logged for the first time this year Brasov on 153 and for the first time since April Minsk on 279. The sky waves from Tipaza, Algeria on 252 completely swamped co-channel Atlantic 252 in Clarkestown.

Whilst on holiday in the Algarve, S.Portugal **Bill Griffith** (W.London) checked reception of BBC R-4 on 198. At 2200 the combined signal from Droitwich, Burghead and Westerglen was SINPO 22222.

Medium Wave Reports

The reception of m.w. transatlantic signals at night was reported by two listeners in the UK. At 0016 on August 21 **Roy Merrall** (Dunstable) received a broadcast from WSSH in Boston, MA on 1510. Their signal was very weak - at best it peaked SIO232.

On September 4 **Harry Richards** (Barton-on-Humber) heard 'good time oldies' on 930 at 0246. The signal rated 22222. No ident could be obtained, but Newfoundland was mentioned so it seemed likely it came from CJYQ in St.John's. Later, he logged WSSH on 1510 as 22222 at 0325; WEVD in New York, NY on 1050 as 22222 at 0355; also WBBR in New York, NY on 1130 as 33233 at 0434. Encouraged by these results he listened on September 6 and obtained an ident from CJYQ at 0051. Again their signal was 22222.

In the reverse direction **Alan Roberts** (Quebec, Canada) picked up broadcasts from stations in Scandinavia, S.Europe and N.Africa! At 0240 on August 4 he heard two men talking in Norwegian on 1314. A slow song accompanied by guitars then followed. It came from Kvitsoy, Norway and rated SIO222. On August 10 he heard a religious talk in Albanian? from Vatican Radio, Italy on 1611. It peaked SIO333 at 0355. A broadcast in Arabic from Sebbaa-Aioun, Morocco on 1044 was heard on September 8. A woman was singing with a N.African style backing. Their 300kW transmission rated SIO222.

The broadcasts from Sebaa-Aioun on 1044 were also received after dark by George Millmore. He rated them SIO323. For the first time he heard the 10kW ERTT outlet at Sousse, Tunisia on 603, but it was barely SIO212. The sky waves from some other stations in N.Africa and the M.East also reached the UK at night. Those from Al Karanah, Jordan on 1494 were received by Roy Merrall at 2351 on August 20. He used a parallel to N.America on 11.940MHz to confirm identity.

Soon after WDR closed their outlet on 1593 the channel was adopted by Radio Free Europe to reach listeners in Slovenia, Bosnia, Serbia, etc. At first they broadcast in Serb/Croat between 1600-1700 and 2000-2100, but a slightly variable schedule from 1600-2100 with Czech/Slovac programming has now been noted. Their transmissions should not be confused with the weak signals that George Millmore reported (see LM&S, August '94 *SWM*) - they were heard at 2205.

Riviera Radio, Monaco have advised **Roy Patrick** (Derby) that their m.w. outlet on 702 (40kW) has now been closed, but their broadcasts continue on v.h.f.

Roy informs me that a new transmitter has been installed at Bromborough, Wirral by ILR R.City Gold to improve reception of their broadcasts on 1548 in Liverpool, Wirral and Chester. During daylight their signal in Derby is a potent 45444, but after dark there is co-channel interference. No doubt they would welcome reports from other areas.

Short Wave Reports

Many listeners were disappointed by the poor propagation conditions in the higher frequency bands during much of August.

Propagation in the **25MHz (11m)** band is now so unreliable that it has been vacated by all International Broadcasters.

Daily variations in propagation were evident in the **21MHz (13m)** band. When favourable, R.Australia's Darwin broadcast to Asia on 21.725 (Eng 0900-1100) could be heard here. It was 35333 at 0900 by **Gerry Haynes** in Bushey Heath, 34333 at 0945 in Barton-on-Humber and SIO343 at 1025 by **Leslie Biss** in Knaresborough.

Also logged here before noon were R.Pakistan, Islamabad 21.520 (Eng to Eu 0800-0845) 44444 at 0840 by **Ron Damp** in E.Worthing; R.Japan via Moyabi 21.640 (Jap to Eu, M.East 0800-0900) 43433 at 0849 by **Rhoderick Illman** in Oxted; Slovak R.Int via Rimavska Sobota 21.705 (Eng to Australia 0830-0857) 44322 at 0851 by **Leo Barr** in Sunderland; UAER, Dubai 21.605 (Eng to Eu 1030-1055) 25333 at 1040 by **Simon Hockenhull** in E.Bristol; R.Pakistan, Islamabad 21.520 (Eng to Eu 1100-1120) SIO433 at 1035 [cricket] by **John O'Halloran** in Harrogate; BSKSA Saudi Arabia 21.495 (Ar [Holy Quran] to SE.Asia 0900-1200) 24232 at 1155 by **Darren Beasley** in Bridgwater.

In the afternoon UAER, Abu Dhabi 21.735 (Ar to Eu 0900-1358) was 45433 at 1218 by **Geoff Crowley** in Aberdeen, 21.605 (Eng to Eu 1330-1355) SIO444 at 1330 by **Kenneth Buck** in Edinburgh & (Eng to Eu 1600-1640) 55555 at 1620 by **Chris Shorten** in Norwich; RCI via Sines 21.455 (Eng to Eu, M.East, Africa 1330-1400) 54544 at 1340 by **Michael Griffin** in Ross-on-Wye; BBC via Ascension Is 21.660 (Eng to Africa 0730-1745) 33323 at 1455 by **Martin Dale** in Stockport; R.Japan via Moyabi 21.700 (Jap to Eu, M.East, Africa 1600-1700) 35433 at 1615 by **John Eaton** in Woking; WYFR, Okeechobee 21.615 (Eng to Eu, Africa 1600-1700) 54544 at 1650 in S.Portugal.

During the evening R.Nederlands via Bonaire 21.590 (Eng to Africa 1730-1925) was noted as 44333 at 1846 in Newry; HCJB Quito, 21.455 (Eng, u.s.b. + p.c.) SIO333 at 1905 by **Bill Clark** in Rotherham; WYFR via Okeechobee 21.615 (Eng to Eu, Africa 1900-2130?) 15341 at 1930 by **Eric Shaw** in Chester; VOA via Greenville 21.485 (Eng to Africa 2000-2200) SIO222 at 2122 by **Julian Wood** in Elgin; VOFC Taiwan via Okeechobee 21.720 (Eng to Europe, Africa 2200-2300) 22222 at 2245 by **Robert Connolly** in Kilkeel.

The propagation conditions in the **17MHz (16m)** band were also unreliable. Sometimes R.Australia reached the UK on 17.715 from Carnarvon (Eng to N.Asia 0200-0400, 0500-0900) and on 17.880 from Darwin (Eng to S.Asia 0200-0900). They were logged respectively as 24442 at 0701 by **David Edwardson** in Wallsend and 24332 at 0849 in E.Worthing.

Also received here in the morning were R.Pakistan, Islamabad 17.900 (Eng to Eu 0800-0845) noted as 32323 at 0848 in Stockport & (Eng to Eu 1100-1120) SIO434 at 1104 by **Tony King** in Swindon; BBC via Kranji 17.830 (Eng to S.Asia, Australia, NZ 0500-1030) SIO333 at 0915 in Rotherham; Voice of Greece, Athens 17.525 (Gr, Eng to Aust 0850-0950) 44444 at 0940 by **Sheila Hughes** in Morden; Channel Africa, Johannesburg 17.810 (Eng to E.Africa 1000-1100) SIO333 at 1040 in Harrogate; R.Tunisia Int via Sfax 17.500 (Ar, Fr to ? 0700-1800) 33343 at 1137 in Newry.

During the afternoon RFI via Montsinery, Fr.Guiana 17.575 (Fr, Eng to USA 1030-1300) was 33323 at 1224 in Bridgwater; Africa No.1, Gabon 17.630 (Fr, Eng to W.Africa 0700-1600) 33333 at 1237 by **Andrew Stokes** in Leicester; RTVM via Tanger 17.595 (Eng to M.East, N.Africa 1400-1500) 55544 at 1405 by **Ross Lockley** in Stirling; R.Bulgaria, Sofia 17.705 (Eng to Asia 1400-1500) 53343 at 1425 in Norwich; WEWN, Birmingham 17.510 (Eng to Eu? 1500-1600) 44343 at 1506

Long Wave Chart

Freq kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	F*,L*
153	Donebach	Germany	500	A*,B,E*,F*,G,H*,J,K,L,N,O
153	Brasov	Romania	1200	F*,H*,J*
162	Allouis	France	2000	A*,B,F*,H*,J,K,L,M,N,O
171	Nador Medi-1	Morocco	2000	H*,L*
171	Kaliningrad	Russia	1000	A*,B,F*,H*,L,J,O*
177	Oranienburg	Germany	750	A*,B,E*,H*,J,K,L,M,O
183	Saarlouis	Germany	2000	A*,B,F,H*,J,K,L,M,N,O
198	Burghead BBC	UK	50	A*
198	Droitwich BBC	UK	500	B,D*,F,H,J,K,M,N,O
198	St.Petersburg	Russia	150	H*
198	Moscow	Russia	100	H*
207	Munich	Germany	500	A*,B,E*,G,J,L,O
216	Roumoules RMC	S.France	1400	A*,B,F,H*,J,K,L,M,N,O*
216	Oslo	Norway	200	A,C*,H*,L*
225	Raszyn Resv	Poland	?	A*,B*,E*,H*,J,L,O*
234	Beidweiler	Luxembourg	2000	A*,B,F,H*,J,K,L,M,N,O
234	St.Petersburg	Russia	1000	H*
243	Kalundborg	Denmark	300	A*,B,F,G,H*,J,L,M,O
243	Alma-Ata	Kazakhstan	500	I*
252	Tipaza	Algeria	1500	B*,F*,J*,O*
252	Atlantic 252	S.Ireland	500	A*,B,F*,H,J,K,L,M,N,O
261	Burg	Germany	200	A*,B*,F,J*,L*,M,O
261	Taldom Moscow	Russia	2000	H*,O*
270	Topolna	Slovak Rep	1500	A*,B*,F*,H*,J*,O*
279	Minsk	Belarus	500	B*,F*,H*,J*,L*

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

Listeners:
A: Geoff Crowley, Aberdeen.
B: Martin Dale, Stockport.
C: John Eaton, Woking.
D: Bill Griffith, S.Portugal.
E: Simon Hockenhull, E.Bristol.
F: Sheila Hughes, Morden.
G: Rhoderick Illman, Oxted.
H: Eddie McKeown, Newry.
I: Roy Merrall, Dunstable.
J: George Millmore, Wootton, IoW.
K: Denis Mulkeen, Kiltimagh, Eire.
L: Fred Pallant, Storrington.
M: Bill Rowley, Colchester.
N: Tom Smyth, Co.Fermanagh.
O: Andrew Stokes, Leicester.

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
520	Hof-Saale (BR)	Germany	0.2	A*
531	Ain Beida	Algeria	600	C*,E*,G*,K*
531	Torshavn	Faroe Is.	100	A,E*
531	Leipzig	Germany	100	A*,B*,C,K*,Q*,R*
531	RNE5 via ?	Spain	?	A*,E*,K*
540	Wavre	Belgium	150/50	A*,K,P,Q,R*
540	Solt	Hungary	2000	E*,I*
540	Conamara	Ireland (S)	2	E
540	Sidi Bennour	Morocco	600	C*,E*,G*,K*
549	Les Trembles	Algeria	600	B*,C*,E*,G*,K*
549	Thurmau (DLF)	Germany	200	A*,B*,I*,K*,R*
558	Espoo	Finland	100	A*,I*,K*
558	Tirgu Jiu	Romania	200	K*
558	RNE5 via ?	Spain	?	A*,E,K*
567	Berlin	Germany	100	I*
567	Tullamore (RTE1)	Ireland (S)	500	A*,B,F,K,P,Q,R*
576	Muhlacker (SDR)	Germany	500	A*,B*,H,R*
576	Riga	Latvia	500	E,K*
576	Barcelona (RNE5)	Spain	50	E,K*
585	Orf Wien	Austria	600	K*
585	Paris (FIP)	France	8	C,H,K
585	Madrid (RNE1)	Spain	200	A*,B*,E,K*,Q*,R*
594	Frankfurt (HR)	Germany	1000/400	A*,B*,K*,R*
594	Oujda-1	Morocco	100	E*,G*,K*
594	Muge	Portugal	100	A*
603	Lyon	France	300	I*
603	Sevilla (RNE5)	Spain	50	A*,B*,E*,K*
603	Sousse	Tunisia	10	K*
603	Newcastle (BBC)	UK	2	A*,B
612	Athlone (RTE2)	Ireland (S)	100	A*,B,G,K*,Q,R
612	RNE1 via ?	Spain	10	B*,E*,K*,R*
621	Wavre	Belgium	80	A*,B,K,R
621	Barcelona (OCR)	Spain	50	E*,K*
630	Vigra	Norway	100	A*,K*,Q*
630	Tunis-Djedeida	Tunisia	600	E*,K*
639	Praha (Liblice)	Czech	1500	E*,I*,K*
639	RNE1 via ?	Spain	?	A*,K*
639	La Coruna (RNE1)	Spain	100	B*
648	RNE1 via ?	Spain	10	A*,E*,I*
648	Orfordness (BBC)	UK	500	A*,K*,P,R
657	Neubrandenburg (NDR)	Germany	250	K*,Q
657	Madrid (RNE5)	Spain	20	A*,E*,K*
657	Wrexham (BBCWales)	UK	2	B,R
666	Bodensees'dr (SWF)	Germany	300/180	A,R*
666	Lisboa	Portugal	135	K*
666	Barcelona (COPE)	Spain	10	E*
675	Marseille	France	600	K*,Q*
675	Lopic (R10 Gold)	Holland	120	A*,B,F,K,Q,P,R
684	Sevilla (RNE1)	Spain	500	A*,B*,E*,K*,R
684	Avala (Beograd+1)	Yugoslavia	2000	A*,I*,K*,Q*
693	Burghead (BBC5)	UK	50	A*
693	Droitwich (BBC5)	UK	150	B,D*,K,P,Q,R
702	Flensburg (NDR)	Germany	5	K*
702	Zamora (RNE1)	Spain	10	A*
711	Rennes 1	France	300	F,K,R*
711	Heidelberg	Germany	5	K*
711	Laayoune	Morocco	600	K*
711	Murcia (COPE)	Spain	5	A*
720	Lisnagarvey (BBC4)	Ireland (N)	10	E,K*,Q
720	Norte	Portugal	100	I*,K*
720	Lots Rd,Ldn (BBC4)	UK	0.5	A*,K,P,R
729	Cork (RTE1)	Ireland (S)	10	A*,K*,Q
729	RNE1 via ?	Spain	?	A*,B*,K*
738	Paris	France	4	K
738	Poznan	Poland	300	A*,I*
738	Barcelona (RNE1)	Spain	500	A*,B*,K*,R*
747	Flevo (Hilv2)	Holland	400	A*,B,F,K,P,R
756	Braunschweig (DLF)	Germany	800/200	B*,K*,R*
756	Redruth (BBC)	UK	2	A*,E,K
765	Sottens	Switzerland	500	A*,B*,I*,K*
774	Abis	Egypt	500	K*
774	Enniskillen (BBC)	Ireland (N)	1	A*,Q
774	RNE1 via ?	Spain	?	A*,B*,K*,R*
774	Plymouth (BBC)	UK	1	E
783	Burg	Germany	1000	A*,B*,K*,R*
783	Dammam	S. Arabia	100	G*,K*
783	Tartus	Syria	600	G*
792	Limoges	France	300	A*,K*
792	Lingen (NDR)	Germany	5	I*
792	Sevilla (SER)	Spain	20	K*
801	Munchen-Ismaning	Germany	300	K*,R*
801	St.Petersburg	Russia	1000	A*
801	RNE1 via ?	Spain	?	B*,K*
810	Madrid (SER)	Spain	20	E*,K*
810	Westerglen (BBCScot)	UK	100	A*,B,K*,P,Q
819	Batra	Egypt	450	G*,K*
819	Toulouse	France	50	A*,E*,R*
819	Warsaw	Poland	300	E*,I*
819	S.Sebastian (EI)	Spain	5	E*
828	Hannover (NDR)	Germany	100/5	A*,E
828	Barcelona (SER)	Spain	50	B*
837	COPE via ?	Spain	?	K*
846	Rome	Italy	540	A*,I*,K*
855	Berlin	Germany	100	A*,K
855	RNE1 via ?	Spain	?	B*,K*,Q*,R*
864	Paris	France	300	A*,E,H,K,Q,R
873	Frankfurt (AFN)	Germany	150	A*,B*,F*,G*,K*,R*
873	Zaragoza (SER)	Spain	20	B*,K*
873	Enniskillen (R.UI)	UK	1	E
882	COPE via ?	Spain	?	I*,K*
882	Washford (BBCWales)	UK	100	A*,B,K,P,R
891	Algiers	Algeria	600/300	A*,B*,G*,I*,K*,R*
900	Milan	Italy	600	A*,B*,E,F*,K*
900	COPE via ?	Spain	?	K*
909	Lisnagarvey (BBC5)	N.Ireland	10	E
909	Bournemouth (BBC5)	UK	0.025	K
	B'mans Pk (BBC5)	UK	140	D*,P,Q,R
909	M'side Edge (BBC5)	UK	200	B
909	Westerglen (BBC5)	UK	50	A*
918	Plesivec (Sloven'nR)	Yugoslavia	600/100	A*,K*
918	Madrid (R.Int)	Spain	20	A*,E*,I*,K*
927	Wolvertem	Belgium	300	A*,B,K,R
936	Bremen	Germany	100	A*,K*,Q*
936	Venezia	Italy	20	K*
936	RNE5 via ?	Spain	?	E*
945	Toulouse	France	300	I*,K*
954	Brno (Dobrochov)	Czech Rep.	200	K*
954	Madrid (CI)	Spain	20	A,B*,E*,K*,R*
963	Pori	Finland	600	A*,B*,K*,Q
963	Paris	France	8	I*
963	Tir Chonaill	Ireland (S)	10	K*
972	Hamburg (NDR)	Germany	300	A*,B*,K*,R*
972	RNE1 via ?	Spain	?	E*
981	Alger	Algeria	600/300	A*,B*,G*,K*,R*
981	Megara	Greece	200	E*
990	Berlin	Germany	300	K*
990	R.Bilbao (SER)	Spain	10	E*,I*,K*
990	Tywyn (BBC)	UK	1	E
999	Schwerin (RIAS)	Germany	20	I*
999	Grigoriopol	Moldova	1000	K*
999	Madrid (COPE)	Spain	50	B*,E*,Q*
1008	Las Palmas (SER)	G.Canaria	?	E*,I*
1008	Flevo (Hilv-5)	Holland	400	B,K,R
1017	Rheinsender (SWF)	Germany	600	A*,B,K*,Q*,R*
1017	RNE5 via ?	Spain	?	E*,K*
1026	Graz-Dobl	Austria	100	K*
1026	SER via ?	Spain	?	E*,K*
1035	Tallinn	Estonia	500	K*
1035	Milan	Italy	50	E*
1035	Lisbon (Prog3)	Portugal	120	K*
1044	Dresden	Germany	250	E,K*
1044	Sebaa-Aioun	Morocco	300	K*
1044	S.Sebastian (SER)	Spain	10	E,I*,K*
1053	Tanger	Morocco	600	E*
1053	Iasi	Romania	1000	F*
1053	Zarogoza (COPE)	Spain	10	A*,B*,E
1062	Kalundborg	Denmark	250	A*,B,F*,K*,R*
1062	Norte	Portugal	100	E,I*
1071	France-Inter	France	?	B
1071	Lille	France	40	F,I*,K
1071	Riga	Latvia	50	E*
1071	Bilbao (EI)	Spain	5	A*
1080	Katowice	Poland	1500	A*,B*,F*,K*,Q*
1080	SER via ?	Spain	?	E,K*,R*
1089	Durres	Albania	150	F*
1089	Weimar	Germany	20	E*
1089	Krasnodar	Russia	300	A*,E*,F*,M*
1098	Nitra (Jarok)	Slovakia	1500	A*,B,I*,K*,R*
1098	RNE5 via ?	Spain	?	B*,E*,K*
1107	AFN via ?	Germany	10	A*,B*,I*,R*
1107	RNE5 via ?	Spain	?	B*,E*,K
1116	Bari	Italy	150	E
1116	Pontevedra (SER)	Spain	5	A*,E*
1125	La Louviere	Belgium	20	B*
1125	Deanovec	Croatia	100	K*
1125	RNE5 via ?	Spain	?	A*,E*,K*
1125	Llandrindod Wells	UK	1	E
1134	Zadar (Croatian R)	Yugoslavia	600/1200	A*,B*,I*,K*
1134	COPE via ?	Spain	2	E*,R*
1143	AFN via ?	Germany	1	A*
1143	Stuttgart (AFN)	Germany	10	R*
1143	COPE via ?	Spain	2	E*,I*,K*
1152	RNE5 via ?	Spain	10	E
1161	Strasbourg (Flnt)	France	200	A*,R*
1161	S.Sebastian (EI)	Spain	50	E*
1179	SER via ?	Spain	?	E*
1179	Solvesborg	Sweden	600	A*,B,F*,K*,O*,P,Q*,R*
1188	Kuurne	Belgium	5	B*,K,R*
1188	Szolnok	Hungary	135	A*,E*,I*
1197	Minsk	Belarus	50	A*
1197	Munich (VOA)	Germany	300	I*,S*
1197	Virgin via ?	UK	?	K,P,Q,R
1206	Bordeaux	France	100	I*,R*
1206	Wroclaw	Poland	200	K*
1215	COPE via ?	Spain	?	I*
1215	Virgin via ?	UK	?	A*,B,K,O,P,Q,R
1224	Vidin	Bulgaria	500	K*
1224	COPE via ?	Spain	?	E*
1233	Liege	Belgium	5	A*,E*,I
1233	Virgin via ?	UK	?	K*,P,R
1242	Marseille	France	150	A*
1242	Virgin via ?	UK	?	A,E,R
1251	Marcali	Hungary	500	E*,I*
1251	Huisberg	Netherlands	10	A*,K*
1251	Porto	Portugal	10	E*
1251	Dubai	UAE	600	E
1260	SER via ?	Spain	?	E*
1260	Guildford (V)	UK	?	K,P
1269	Neumunster (DLF)	Germany	600	A*,B,K*,Q,R
1269	COPE via ?	Spain	?	E*,K*
1278	Dublin/Cork (RTE2)	Ireland (S)	10	A*,B*,E,H*,K*,Q,R*
1287	RFE via ?	Czech Rep.	400	A*,E*,I*,K*
1287	Lerida (SER)	Spain	10	E*,R*
1296	Kardzali	Bulgaria	150	A*
1296	Valencia (COPE)	Spain	10	E*,Q,R*
1296	Orfordness (BBC)	UK	500	A*
1305	Rzeszow	Poland	100	G*
1305	RNE5 via ?	Spain	?	A*,E*
1314	Kvitsoy	Norway	1200	A*,B,K*,Q*,R*
1314	RNE5 via ?	Spain	?	E*
1323	Zyyi (BBC)	Cyprus	200	A*
1323	Wachenbrunn (RMWS)	Germany	1000/150	B*,R*
1332	Rome	Italy	300	A*
1341	Lisnagarvey (BBC)	Ireland (N)	100	A*,B,E,K*,Q,R*
1341	Tarrasa (SER)	Spain	2	E*
1350	Nancy/Nice	France	100	A,B,I,K*,R*
1350	Cesvaine/Kuldiga	Latvia	50	E*
1359	Berlin (DLF)	Germany	250/100	S*
1359	Arganda (RNE-FS)	Spain	600	A,E*,K*,R*
1368	Foxdale (Manx R)	I.O.M.	20	A*,B*,K*,L,Q
1377	Lille	France	300	A*,K
1386	Bolshakovo	Russia	2500	A*,F*,G*,Q*,R*
1395	Lushnje (Tirana)	Albania	1000	A*,B*,G*,I*,Q,R*
1395	Ufa	Russia	?	J*
1395	RNE5 via ?	Spain	2	E*
1404	Brest	France	20	A*,B*,I*,K
1404	Dnepropetrovsk	Ukraine	30	E*
1413	RNE5 via ?	Spain	?	A*,E*,K*
1413	Pristina	Yugoslavia	1000	Q*
1422	Alger	Algeria	50/25	E*
1422	Heusweiler (SR)	Germany	1200/600	A*,K*,O*,R*
1440	Kyzylorda	Kazakhstan	?	J*
1440	Marnach (RTL)	Lux'bourg	1200	A*,B,K,Q,P,Q,R*
1440	Damman	S.i Arabia	1600	E*,G*,O*
1440	Jagodina	Yugoslavia	20/10	E*
1449	Squinzano	Italy	50	E*
1449	Redmoss (BBC)	UK	2	A,E
1458	Lushnje (Tirana)	Albania	500	A*,E,R*
1467	Monte Carlo (TWR)	Monaco	1000/400	A*,B,D*,K*,Q
1476	Wien-Bisamberg	Austria	600	A*,B*,I*,K*,R*
1485	SER via ?	Spain	?	E*,K*
1485	Bournem'th (BBC)	UK	2	K*
1494	Al Karanah	Jordan	1000	J*
1494	St.Petersburg	Russia	1000	A*,F*,I*
1503	Stargard	Poland	300	A*,K*
1503	RNE5 via ?	Spain	?	A*,E*
1512	Wolvertem	Belgium	600	A*,B,K*,N*,Q,R*
1521	Kosice (Cizatice)	Slovakia	600	A*,I*,K*,R*
1521	Duba	S. Arabia	2000	E*
1521	R.Manresa (SER)	Spain	2	E*,K*
1530	Vatican R	Italy	150/450	A,I*,K*,Q*
1539	Mainflingen (DLF)	Germany	700	A*,B,G*,K*,Q,R*
1539	Valladolid (SER)	Spain	5	E*
1566	Tartu	Estonia	2.5	E
1566	Sarnen	Switzerland	300	A*
1566	Sfax	Tunisia	1200	E*,G*
1575	Genova	Italy	50	A*,E*,R*
1575	SER via ?	Spain	5	E,K*,Q*
1584	SER via ?	Spain	2	B*,E,R*
1593	R.Free Europe	?	100?	E*,I*,J*,M*
1593	Dnipropetrovsk	Ukraine	5	A*,I*
1602	SER via ?	Spain	?	K*
1602	Vitoria (EI)	Spain	10	K*
1611	Vatican R	Italy	15	I*

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

Listeners:
A: Geoff Crowley, Aberdeen.
B: Martin Dale, Stockport.
C: John Eaton, Woking.
D: Bill Griffith, S.Portugal.
E: Gerry Haynes, Talgarth, Powys.
F: Simon Hockenhull, E.Bristol.
G: Sheila Hughes, Morden.
H: Rhoderick Illman, Dxted.
I: Eddie McKeown, Newry.
J: Roy Merrall, Dunstable.
K: George Millmore, Wootton IoW.
L: Denis Mulkeen, Kiltimagh, Eire.
M: Roy Patrick, Derby.
N: Clare Pinder, Appleby.
O: Harry Richards, Barton-on-Humber.
P: Bill Rowley, Colchester.
Q: Tom Smyth, Co.Fermanagh
R: Andrew Stokes, Leicester.
S: Julian Wood, Elgin.

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum R	I	7.50	A,F*,G,L,N,P,T
585	R.Solway	B	2.00	B,G,K*,O
603	Cheltenham (CD603)	I	?	C,E,G,L,O,S,T
603	Invicta SG (Coast)	I	0.10	E,F*,G*,I*,L,P,T
630	R.Bedfordshire (3CR)	B	0.20	C,G,H,L,O,P,S,T
630	R.Cornwall	B	2.00	G,L,R,T
657	R.Clwyd	B	2.00	G,H,K*,L,O,T
657	R.Cornwall	B	0.50	E,G,L
666	DevonAir R	I	0.34	G,L,T
666	R.York	B	0.80	B,C,G,I,O,S,T
729	BBC Essex	B	0.20	G,L,O,P,R,S,T
738	Hereford/Worcester	B	0.037	C,E,G,H,L,O,S,T
756	R.Cumbria	B	1.00	F,G,,K,O
756	R.Maldwyn	I	0.63	C,E,G,H,L,O,S,T
765	BBC Essex	B	0.50	C,E,G,K*,L,O,P,S,T
774	R.Kent	B	0.70	E,G*,L,O,P,T
774	R.Leeds	B	0.50	C,G,O
774	Gloucester (3CSG)	I	0.14	G,L,O,S
792	Chiltern (S.Gold)	I	0.27	C,G,O,P,S,T
792	R.Foyle	B	1.00	G,R
801	R.Devon & Dorset	B	2.00	C,E,G,H,L,T
828	Chiltern (S.Gold)	I	0.20	G,O,S,T
828	R.Aire (Magic828)	I	0.12	C,G
828	R.WM	B	0.20	C,G,H,K*,O,S
828	2CR (Cl.Gold)	I	0.27	G,H,I*,K*,L
837	R.Cumbria/Furness	B	1.50	B*,G
837	R.Leicester	B	0.45	C,G,I,L,O,P,S,T
855	R.Devon & Dorset	B	1.00	,G,L
855	R.Lancashire	B	1.50	C,F,G,K,O
855	R.Norfolk	B	1.50	B,G,O,P,T
855	Sunshine R	I	0.15	G,H,O,T
873	R.Norfolk	B	0.30	B,C,G,K*,L,O,P,S,T
936	Brunel R (Cl.Gold)	I	0.18	G,L,O,S,T
945	R.Trent (Gem AM)	I	0.20	C,F*,G,I,K*,O,P,S,T
954	DevonAir (Cl.Gld)	I	0.32	B*,G,I,L,R,T
954	R.Wyvern (WYVN)	I	0.16	G,I,O,S,T
990	WABC (Nice & Easy)	I	0.09	C,G,O,T
990	R.Aberdeen	B	1.00	B*,G*,K*
990	R.Devon & Dorset	B	1.00	G,H,K*,L,R,T
990	Hallam R (Gt.Yks)	I	0.25	C,G,P,T
999	R.Solent	B	1.00	B*,F*G,H,L,T
999	R.Trent (Gem AM)	I	0.25	C,G,O,P,S,T
999	Red Rose (Gold)	I	0.80	C,F,G,M,R
1017	Beacon R (WABC)	I	0.70	C,G,I,L,O,S,T
1026	Downtown R	I	1.70	G,R
1026	R.Cambridgeshire	B	0.50	C,G,J,O,P,S,T
1026	R.Jersey	B	1.00	G,H,L,T
1035	Country 1035	I	?	E,F*,G,I,P,Q,T
1035	NorthSound R	I	0.78	B*,G,M,S*
1035	R.Sheffield	B	1.00	C,G,O
1035	West Sound R	I	0.32	F,GG
1107	Moray Firth R	I	1.50	B,F,G,M
1116	R.Derby	B	1.20	B*,C,G,I,K*,O,P,S,T
1116	R.Guernsey	B	0.50	E,F*,G,H,I,L,T
1152	BRMB (Xtra-AM)	I	3.00	G,H,O,S
1152	Great North R(GNR)	I	1.80	G,K*
1152	LBC (L.Talkback R)	I	23.50	B*,G*,L,T
1152	Piccadilly R(Gold)	I	1.50	C,G
1152	Plymouth Snd (Cl.G)	I	0.32	G
1152	R.Broadland	I	0.83	C*,G,K*,M,P,T
1152	R.Clyde (Clyde 2)	I	3.06	B*,F,G
1161	Brunel R (Cl.Gold)	I	0.16	G,K*,L,M,T
1161	R.Bedfordshire (3CR)	B	0.10	G*,O,P,T
1161	Southern Counties R	B	1.00	G*,L,T
1161	R.Tay	I	1.40	B,F,G,K*
1161	Humberside (Gt.Yks)	I	0.35	C,G
1170	GNR Teeside	I	0.32	B*,F*,G*
1170	Hi Wycombe 1170AM	I	?	G*,I,T
1170	Portsmouth (SCR)	I	0.12	G*,L,T
1170	R.Orwell (SGR)	I	0.28	F*,G,P
1170	Signal R (S.Gold)	I	0.20	C,G,O
1170	Swansea Sound	I	0.58	G
1242	Invicta Snd (Coast)	I	0.32	G,I*,T
1242	Isle of Wight R	I	0.50	G,H,L
1251	Saxon R (SGR)	I	0.76	G,D,P,T
1260	Brunel R(Cl.Gold)	I	1.60	B*,F*,G,L
1260	Marcher Snd (Gold)	I	0.64	C,F*,G,O
1260	Sunrise R	I	0.29	G,O,S,T
1260	R.York	B	0.50	F*,G*
1278	Bradford (Gt.Yks)	I	0.43	C,F*,G,K*
1305	Barnsley (Gt.Yks)	I	0.15	C,F*,G,I,D
1305	Red Dragon (Touch)	I	0.20	G,I,K*,L,T
1323	R.Bristol (Som.Snd)	B	0.63	G,K*,T
1323	Brighton(SCR)	I	0.50	F*,G,L,P,T
1332	Hereward R(WGMS)	I	0.60	F*,G,J,K*,O,P,S,T
1332	Wiltshire Sound	B	0.30	G,K*,L,T
1359	Essex R (BreezeAM)	I	0.28	B*,G,P,T
1359	Mercia Snd (Xtra-AM)	I	0.27	G,O,S
1359	Red Dragon (Touch)	I	0.20	G
1359	R.Solent	B	0.85	G,K*,L
1368	R.Lincolnshire	B	2.00	G,O,P,S,T
1368	Southern Counties R	B	0.50	G,L,T
1368	Wiltshire Sound	B	0.10	G,K*,L
1413	Sunrise R	I	0.125	G*,T
1431	Essex R (BreezeAM)	I	0.35	B*,C*,F*,G,O,P,T
1431	R 210 (Cl.Gold)	I	0.14	C*,F*,G,I*,L,T
1449	R.Peterboro/Cambs	B	0.15	G,L,O,P,S,T
1458	Fortune	I	5.00	F,G,K*
1458	R.Cumbria	B	0.50	G,K*
1458	R.Devon & Dorset	B	2.00	G,L,R,T
1458	R.Newcastle	B	2.00	G*
1458	Radio WM	B	5.00	G,O,S
1458	Sunrise R	I	50.00	C*,D,F*,G,H*,K*,L,O,P,S*,T,U*
1476	Guildford (M.Xtra)	I	0.50	F*,G,K*,L,M,N*,P,T
1485	R.Humberside	B	1.00	B,F*,G,K*,M,O,P,S
1485	R.Merseyside	B	1.20	C,F*,G,K*,O
1485	Southern Counties R	B	1.00	G,L,T
1503	R.Stoke-on-Trent	B	1.00	B*,C,F*,G,J,K*,L,O,P,R,S,T
1521	Reigate (M.Xtra)	I	0.64	F*,G,K*,L,M,N*,P,T
1530	Huddersfld (Gt.Yks)	I	0.74	B*,C,F*,G,K*,O
1530	R.Essex	B	0.15	D,F*,G,J,L,P,T
1530	R.Wyvern (WYVN)	I	0.52	D,F*,G,K*,L
1548	Capital R (Cap G)	I	97.50	B*,G,L,P,R,T
1548	R.Bristol	B	5.00	G,K*,L,M
1548	Liverpool (City G)	I	4.40	C,G*,N,O
1548	R.Forth (Max AM)	I	2.20	F,G*,M
1548	Sheffield (Gt.Yks)	I	0.74	F*,G*
1557	Chiltern R (Gold)	I	0.76	B*,F*,G,K*,M,O,S
1557	Southampton (SCR)	I	0.50	C*,D,G,L,T
1557	R.Lancashire	B	0.25	B*,C,F*,G,K*
1557	Tendring (Mellow)	I	?	C*,G,J,P,T
1584	Kettering (KCBC)	I	0.04	F*,G,O,S,T
1584	R.Nottingham	B	1.00	C,E,F*,G*,J,L,O,S,T
1584	R.Shropshire	B	0.50	G,L,P
1584	R.Tay	I	0.21	B*,F,G*,M
1602	R.Kent	B	0.25	B*,F*,G,K*,L,P,T

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

Listeners:
A: Leo Barr, Sunderland.
B: Geoff Crowley, Aberdeen.
C: Martin Dale, Stockport.
D: Ron Damp, Worthing.
E: John Eaton, Woking.
F: Arthur Grainger, Carstairs Junction.
G: Gerry Haynes, Talgarth, Powys.
H: Simon Hockenhull, E.Bristol.
I: Sheila Hughes, Morden.
J: Rhoderick Illman, Oxted.
K: Eddie McKeown, Newry.
L: George Millmore, Wootton, IoW.
M: Denis Mulkeen, Kiltimagh, Eire.
N: Roy Patrick, Derby.
O: Alex Radulovic, Burton-upon Trent.
P: Bill Rowley, Colchester.
Q: John Sadler, Bishops Stortford.
R: Tom Smyth, Co.Fermanagh.
S: Andrew Stokes, Leicester.
T: John Wells, East Grinstead.
U: Julian Wood, Elgin.

in Woking; BBC via Antigua 17.840 (Eng to S.Am 1400-1615) 35322 at 1611 in Bushey Heath.

Later, Monitor R.Int via WCSN 17.510 (Eng to Africa 1800-2000) was 44344 at 1945 in Oxted; HCJB Quito 17.490 (Eng, u.s.b + p.c.) 24433 at 2010 by **Fred Pallant** in Storrington; R.Nederlands via Bonaire 17.655 (Eng to W.Africa 1730-2025) was 45433 at 2015 in Aberdeen; also via Bonaire 17.605 (Eng to W.Africa 1930-2025) 45545 at 2020 in Ross-on-Wye; RCI via Sackville 17.820 (Eng to Africa 2030-2130) 32222 at 2045 by **Bernard Curtis** in Stalbridge; R.Havana Cuba 17.760 (Eng to Eu 2100-2200) 35444 at 2100 in Chester; VOFC Taiwan via WYFR 17.750 (Eng to Eu, Africa 2200-2300) 44444 at 2250 in Kilkeel.

More reliable propagation conditions were evident in the **15MHz (19m)** band and broadcasts from many areas were received here. R.Australia reached the UK on 15.425 from Darwin (Eng to Asia [u.s.b.+ p.c.] 0200-0730, Sat only) was 24552 at 0635 in Wallsend; 15.510 (Eng to S.Asia 0030-0400, 0600-0700) 41433 at 0655 in Bushey Heath;15.530 (Eng to S.Asia 1100-1300) 53343 at 1205 in Norwich and 15.170 from Carnarvon (Eng, Chin, Cant to China, Korea 0900-1400) 23332 at 0911 in Oxted.

Also noted in the morning were VOA via Selbi Phikwe, Botswana 15.600 (Eng to Africa 0500-0630, Sat/Sun 0630-0700) SIO333 at 0620 in Rotherham; BBC via Limassol 15.575 (Eng to M.East 0400-1500) SIO222 at 0700 by **Tom Smyth** in Co.Fermanagh; R.Austria Int via Moosbrunn 15.450 (Ger, Eng to Aust 0800-1100) 54444 at 0830 by **Clare Pinder** in Appleby; UAER, Dubai 15.395 (Eng to Eu 1030-1100) 33333 at 1030 in Morden.

After mid-day, UAER, Dubai 15.395 (Eng to Eu 1330-1400) was 33333 at 1330 in Stockport; R.Veritas Asia, Philippines 15.140 (Pil, Eng 1500-1530, also 1530-1600 Sat/Sun/Mon) 45534 at 1507 in Ross-on-Wye; R.Japan via Moyabi 15.355 (Eng to S.Africa 1500-1600) SIO433 at 1514 by **Philip Rambaut** in Macclesfield; R.Pakistan, Islamabad 15.675 (Eng to M.East 1600-1630) 34333 at 1603 by **Vera Brindley** in Woodhall Spa; BBC via Masirah Is 15.310 (Eng to S.Asia 0900-1830) 32232 at 1609 in Leicester; World Voice of Adventism via WCSN 15.665 (Eng to Eu 1500-1700) 45344 at 1634 in Woking.

In the evening, VOA via Selebi-Phikwe 15.445 (Eng, Am to Africa 1600-1900) 42333 at 1758 in Barton-on-Humber; WEWN, Birmingham 15.695 (Eng, Fr, It, Serb to Eu 1800-2200) 35444 at 1800 in Chester; R.Vlaanderen Int, Belgium 15.550 (Eng to Africa 1800-1830) 45233 at 1805 in Newry; Voice of Vietnam, Hanoi 15.010 (Eng, Fr, Sp to Eu 1800-2130) 33333 at 1815 by **George Tebbitts** in Penmaenmawr; RNB Brazil 15.265 (Eng, Ger to Eu 1800-2020) SIO333 at 1830 in Swindon; Africa No.1, Gabon 15.475 (Fr to W.Africa 1600-1900) 44444 at 1855 in Storrington; VOA via Morocco 15.205 (Eng to Eu, M.East, N.Africa 1500-2200) SIO333 at 1915 in Knaresbrough; Monitor R.Int via WSHB 15.665 (Eng to Eu 1900-2200) SIO444 at 1920 in Edinburgh; WWCR, Nashville 15.685 (Eng to Eu 1000-2100?) 33322 at 1930 in Stalbridge; WYFR via Okeechobee 15.355 (Eng to Eu, Africa 1900-2100) SIO222 at 2000 by **John Sadler** in Bishops Stortford; R.Dniester Int, Moldova 15.290 (Eng 2030-2100, Wed/Sat) 54544 at 2030 in Stirling; BBC via Ascension Is 15.400 (Eng to Africa 1500-2300) 55555 at 2045 in S.Portugal.

Later, WYFR via Okeechobee 15.566 (Eng to Eu, Africa 2100-2200) was 44444 at 2110 in Aberdeen; HCJB Quito 15.270 (Eng to Eu 2130-2200) 44444 at 2140 by **Peter Pollard** in Rugby; R.Korea, Seoul 15.575 (Eng to Eu 2100-2200) SIO333 at 2150 in Harrogate; RAE, Buenos Aires 15.345 (Eng, It, Fr, Ger, Sp to Eu, Africa 1800-0000?) 44433 at 2231 in Bridgwater; BBC via Ascension Is 15.260 (Eng to S.America 2000-0330) 35434 at 2310 in E.Bristol; RTV Marocaine via Tanger 15.335 (Ar to Eu, W.Africa 1000-0100) 44444 at 2330 in Kilkeel.

Good reception from many areas was noted in the **13MHz (22m)** band. In the daytime, R.Austria Int via Moosbrunn 13.730 (Ger, Eng, Fr, Sp to Eu 0400-1800) was SIO444 at 0730 by **Francis Hearne** in N.Bristol; SRI via Sottens? 13.685 (It, Eng, Fr, Ger, Port to Aust, S.Pacific 0830-1100) 55555 at 0900 in Appleby & 13.635 (Eng, Fr, It, Ger to SE/S.Asia 1300-1700) 54555 at 1305 in Stockport; UAER, Dubai 13.675 (Eng to Eu 1030-1100) 35543 at 1035 in Wallsend; R.Australia via Darwin 13.605 (Eng, Chin to Asia 0900-1355) SIO344 at 1110 in Edinburgh; R.Nederlands via Flevo 13.700 (Eng to S.Asia, M.East 1330-1625) 34243 at 1448 in Newry; AWR via Slovakia 13.595 (Eng to S.Asia 1400-1500) 44334 at 1450 in Woking; R.Pakistan, Islamabad 13.590 (Eng to M.East 1600-1630) 43333 at 1629 in Aberdeen; R.Pyongyang, Korea 13.785 (Eng to Eu, M.East, Africa 1700-1750) 35443 at 1709 in Macclesfield.

During the evening, Monitor R.Int via KHBI Saipan 13.770 (Eng to Eu, M.East 1800-2000) was 35343 at 1810 in Chester & via WCSN 13.770 (Eng to Eu 2100-2157) 44344 at 2126 in Woodhall Spa; WHRI, South Bend 13.760 (Eng to E.USA, Eu 1700-0000) SIO323 at 1835 in Knaresbrough; Croatian R, Zargreb 13.830 (Cr, Eng to Eu 24hrs) 34343 at 1907 in Leicester; UAER, Dubai 13.675 (Ar to Eu 0615-2100) SIO444 at 1930 in Harrogate; VOA via Selebi-Phikwe 13.710 (Eng to Africa 1600-2200) 44434 at 1936 in E.Worthing; DW via Julich? 13.790 (Eng to W.Africa 1900-1950) 34232 at 1949 in Oxted; RCI via Sackville 13.650 (Eng to Eu 2030-2130) 54444 at 2045 in Norwich.

Later, WEWN Birmingham 13.615 (Eng to Eu 2200-2300) was 44324 at 2206 in Rugby; UAER, Abu Dhabi 13.605 (Eng to USA 2200-0000) 25322 at 2300 in E.Bristol; Monitor R.Int via WSHB 13.770 (Eng to Africa 2200-0000) 54434 at 2305 in Penmaenmawr; R.Vlaanderan, Belgium 13.655 (Eng to S.Am 2330-0000) SIO434 at 2335 in Swindon; RCI via Sackville 13.670 (Eng to Caribbean, S.Am 2200-0000) 44444 at 2345 in Kilkeel; WWCR Nashville

13.845 (Eng to USA 1200-0200) 35333 at 0102 in Barton-on-Humber.

Quite a few of the **11MHz (25m)** broadcasts are intended for European listeners. Those noted came from HCJB Quito 11.835 (Eng 0700-0830), 32322 at 0749 in Sunderland; R.Prague, Czech Rep 11.990 (Eng 1030-1057) 45534 at 1030 in Ross-on-Wye; ERA Thessaloniki, Greece 11.595 (Gr 0900?-2255) SIO455 at 1135 in Edinburgh; BBC via Skelton 12.095 (Eng 0400-2215, also to N/W.Africa) 33433 at 1215 in Stockport and 55555 at 1815 in S.Portugal; R.Pakistan, Islamabad 11.570 (Eng, Ur 1700-1855) 35443 at 1840 in Woking; AIR via Bangalore 11.620 (Eng, Hi 1745-2230) 33322 at 1940 in E.Worthing; R.Romania Int, Bucharest 11.940 (Eng 1900-1957) 34444 at 1946 in Oxted; R.Kuwait via Kabd 11.990 (Eng 1800-2100) SIO444 at 2007 in Knaresbrough; R.Ukraine Int, Kiev 11.705 (Eng 2100-2200) 33333 at 2100 in Morden; R.Damascus via Adra 12.085 (Eng 2005-2105) 54444 at 2102 in Norwich; R.Japan via Moyabi 11.925 (Eng 2100-2155) SIO444 at 2115 in Bishops Stortford; Israel R, Jerusalem 11.603 (Eng 2130-2200, also to USA) SIO443 at 2145 in N.Bristol; R.Yerevan, Armenia 11.920 (Eng 2245-2300) 35553 at 2244 in Wallsend.

Whilst beaming to other areas, Slovak R.Int, via Velke Kostolany 11.990 (Eng to Aust 0830-0857) was 53444 at 0841 in Newry; VOIRI Tehran 11.790 (Eng to Asia 1130-1230) 32432 at 1200 in Bridgwater; Voice of the Mediterranean, Malta 11.925 (Eng, Ar to N.Africa 1400-1600) 44444 at 1400 in Woodhall Spa; FEBC Bocaue, Philippines 11.995 (Eng to SE.Asia 1300-1600) 44343 at 1450 in Bushey Heath; R.Australia via Carnarvon 11.660 (Eng, Chin to S.Asia 1430-1800) 43443 at 1624 in Leicester; REE via Noblejas 11.775 (Eng to Africa 1900-2000) SIO322 at 1900 in Co.Fermanagh; RCI via Sackville 11.845 (Eng to Caribbean, S.Am 2200-2230) 44444 at 2220 in Rugby & 11.940 (Eng [CBC progs] to Caribbean, S.Am 2300-0000, Sat/Sun only) 34343 at 2325 in E.Bristol; ISBS Reykjavik 11.402 (Ic [u.s.b.+ p.c] to N.Am 2300-2335) 44444 at 2325 in Aberdeen; RAI Rome 11.800 (It, Eng to USA 2230-0120) 44444 at 2350 in Kilkeel.

Good reception over long distances was noted in the **9MHz (31m)** band. R.Australia via Shepparton on 9.860 (Eng to Pacific areas 0630-1200, 1630-2100) was reported as 'loud and clear' at 0720 by **J.Duckworth** in Barnet. Also logged were KNLS Anchor Point, Alaska 9.615 (Eng 0800-0900), SIO252 at 0834 in Dunstable; HCJB Quito 9.745 (Eng to S.Pacific 0715-1125) 33323 at 0859 in E.Worthing; R.Nederlands via Bonaire 9.720 (Eng to Pacific 0730-1025) 54444 at 0930 in Bushey Heath; AIR via Delhi? 9.950 (Eng, Hi to N.Africa, W.Eu 1745-2045) 43344 at 1950 in Stalbridge; R.Pyongyang, N.Korea 9.345 (Eng to Eu 2000-2050) 32232 at 2024 in Newry; AIR via Delhi? 9.910 (Eng to Pacific 2045-2230) SIO333 at 2226 in Knaresborough; R.Nac del Paraguay 9.735 (Sp 0800-0400) 33433 at 2330 in Bridgwater.

In the **7MHz (41m)** band the Voice of Nigeria, Ikorodu 7.255 (Eng to W.Africa 0455-0700) was SIO322 at 0650 in Rotherham; WEWN Birmingham 7.425 (Eng to N.Am 0600-0800) 43333 at 0650 in Stalbridge; Monitor R.Int via WSHB 7.465 (Eng to N.Am 1100-1400?) SIO333 at 1059 in Macclesfield; Tajik R, Tajikistan 7.245 (Eng to Asia 1645-1700) 33443 at 1645 in Stirling; R.Australia via Carnarvon 7.260 (Eng to S.Asia 1430-2100) was clearly received at 1730 in Barnet; R.Nederlands via Talata Volon 7.120 (Eng to S/E/W.Africa 1730-1925) SIO323 at 1745 in Harrogate; AIR via Aligarh? 7.412 (Hi, Eng to Eu 1745-2230) 44444 at 1750 in Rugby; Singapore BC 7.170 (Tam 2100-1800) 35553 at 2306 in Wallsend; WJCR Upton 7.490 (Eng to E.USA 2100-1000) 43343 at 2356 in Leicester; WRNO New Orleans 7.355 (Eng to E.USA 2300-0300) 34323 at 0021 in Woodhall Spa; WHRI South Bend 7.315 (Eng to E.USA 2300-1300) 22332 at 0130 in Sunderland.

Programmes for European listeners were noted in the **6MHz (49m)** band from SRI via Lenk 6.165 (Eng 0600-0630) SIO444 at 0630 in Bishops Stortford; R.Japan via Skelton 5.975 (Jap, Eng 0500-0800) 33433 at 0723 in Sunderland; R.Vlaanderen Int, Belgium 6.035 (Eng 0900-0930) 43333 at 0900 in Morden & 5.910 (Eng 2100-2130) SIO433 at 2100 in Co.Fermanagh; R.Austria Int via Moosbrunn 6.155 (Ger, Eng, Fr, Sp 0400-2300) SIO333 at 1130 in Swindon; R.Nederlands via Flevo 5.995 (Eng 1530-1625) 55555 at 1545 in Penmaenmawr; R.Riga Int, Latvia 5.935 (Eng 1900-1930 Sat/Sun only) 43443 at 1915 in Chester; R.Pyongyang, Korea 6.576 (Eng 2000-2050) 44444 at 2030 in Norwich; RCI via Skelton 5.995 (Eng 2030-2130) 55555 at 2100 in Appleby; R.Sweden via Karlsborg? 6.065 (Eng 2130-2200) SIO444 at 2145 in N.Bristol.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	1943	J,K,M,Q
2.325	ABC Tennant Creek	Australia	1944	J,K,M,Q
2.410	R.Transamazonica	Brazil	0030	D
2.485	ABC Katherine	Australia	2006	J,K,M,Q,T
2.850	KCBS Pyongyang	N.Korea	2046	J,M
3.200	TWR Ndebele	Swaziland	1842	M
3.210	Em.Nacional, Maputo	Moz'bique	1923	C,M,R
3.215	R.Orange	S.Africa	0321	E
3.220	R.HCJB Quito	Ecuador	0316	D,P
3.220	Channel Africa	S.Africa	0252	A,Q,R,X
3.220	R.Togo, Lome	Togo	2103	D,J,K,M,T
3.225	RRI Tanjung Pinang	Indonesia	0105	D
3.230	R.Sol de Los Andes	Peru	0020	D
3.230	SABC Oranje Meyerton	S.Africa	1941	K,M,P
3.240	TWR Shona	Swaziland	1832	M
3.245	AIR Lucknow	India	1720	D,K
3.255	BBC via Maseru	Lesotho	2102	E,K,M,P,R,T
3.270	SWABC 1, Namibia	SW.Africa	2102	D,K,M,P,R,T
3.276	R.S.Highlands, Mendi Pap.	N.Guinea	2041	M
3.277	AIR Srinagar	India	1701	K
3.290	SWABC 2, Namibia	SW.Africa	0445	D
3.300	R.Cultural	Guatemala	0105	D,P,R
3.310	Channel Africa	S.Africa	1904	K,Q
3.315	AIR Bhopal	India	1718	D,K
3.316	SLBS Goderich	S. Leone	2100	B,D
3.325	FRCN Lagos	Nigeria	2130	B
3.335	CBS Taipei	Taiwan	2056	E,J,K,R,T
3.355	AIR Kurseong	India	1641	K
3.356	R.Botswana	Gabarone	2100	B,E,M,R,T
3.365	GBC R-2	Ghana	2033	B,D,E,H,L,N,P,R,S,T,U,V
3.365	AIR Delhi	India	1816	K,M
3.375	R.Nacional S.Gabriel	Brazil	0202	P
3.375	RRI Medan	Indonesia	2105	E
3.377	R.Nacional, Mulenvos	Angola	2044	D,K,Q,R
3.380	RRI Malang	Indonesia	2115	E
3.380	R.Malawi	Malawi	2101	K,T
3.395	RRI Tanjungkarang	Indonesia	2313	Q
3.395	BBC via Meyerton	S.Africa	1728	Q
3.870	Voz de la Esparanza	Peru	0115	D
3.905	AIR Kingsway (Feeder)	India	1725	K
3.915	BBC via Kranji	Singapore	1728	E,I,K,N,P,T
3.930	Hohhot (Mongolian)	China	2113	E
3.930	R.Capital	Transkei	2051	M
3.945	Vatican Radio	Italy	1859	E,O,P,R
3.955	BBC via Skelton	England	0405	P
3.955	R.Budapest	Hungary	2100	B,E,F,M,N,Q,P,R,U,V,W,X
3.955	Novo'birsk rly A.Ata	Kazakhstan	?	R
3.960	RFE/RL Munich	Germany	0406	P
3.965	RFI Paris	France	2125	D,E,F,G,P,R,Y
3.975	BBC via Skelton	England	0333	E
3.980	VOA Munich	Germany	2004	D,E,G,O,P,R,Y
3.985	China R via SRI	Switzerland	2115	E,F,V
3.985	SRI Beromunster	Switzerland	1908	D,G,D,Y
3.995	DW via Julich	Germany	2210	D,E,P,Y
3.995	Channel Africa	S.Africa	1840	Q
4.200	China R, Beijing	China	2053	M
4.500	Xinjiang BS, Urumqi	China	2300	J,R
4.735	Xinjiang, Urumqi	China	2302	B,D,J,R
4.755	R.Educ CP Grande	Brazil	2335	B,D,M
4.760	Yunnan PBS, Kunming	China	2205	D,R
4.760	AIR Port Blair	India	1707	K
4.760	ELWA Monrovia	Liberia	2119	E,K,L,P,R
4.765	R.Integracao	Brazil	0110	D
4.765	R.Rural, Santarem	Brazil	0342	R
4.765	Brazzaville	PR.Congo	1910	B,D,E,L,M,P,R,T
4.770	Centinela del Sur	Ecuador	0207	M,P
4.770	FRCN Kaduna	Nigeria	2037	B,D,E,M,P,R,S,T
4.777	R.Gabon, Libreville	Gabon	2210	D,E,R
4.783	RTM Bamako	Mali	2055	B,D,M,P,R
4.785	Ecos del Combeima	Colombia	0105	O
4.785	R.Tanzania	Tanzania	2127	E
4.790	Azad Kashmir R.	Pakistan	1711	K
4.790	TWR Manzini	Swaziland	1821	K,M,Q
4.800	AIR Hyderabad	India	1731	K
4.800	LNBS Lesotho	Maseru	1909	B,K,M,R,T
4.805	R.Nac.Amazonas	Brazil	0040	D,R
4.810	R.San Martin Tara	Peru	0115	D,P
4.810	SABC Meyerton	S.Africa	1733	B,E,R,T
4.815	R.diff TV Burkina	Ouagadougou	2133	B,D,E,P,R,T
4.820	La Voz Evangelica	Honduras	0035	D
4.830	R.Botswana, Gaborone	Botswana	1953	B,E,M,P,R,T
4.830	Africa No.1	Gabon	1915	R,T
4.830	R.Tachira	Venezuela	0105	D,P
4.832	R.Reloj	Costa Rica	0545	I,J,M
4.835	R.Tezulutlan, Coban	Guatemala	2214	D,I
4.835	RTM Bamako	Mali	2056	B,D,E,J,N,P,R,T
4.840	AIR Bombay	India	1716	K
4.840	R.Valera, Trujillo	Venezuela	0115	D
4.845	R.Fides, La Paz	Bolivia	0125	D
4.845	ORTM Nouakchott	Mauritania	2056	B,D,E,M,P,R,T
4.850	R.Yaounde	Cameroon	2046	E,P
4.860	AIR Kingsway (Feeder)	India	1745	K,M,O,T
4.865	PBS Lanzhou	China	2220	E,J,U
4.865	L.V. del Cinaruco	Colombia	0459	B,D,M,R
4.870	R.Cotonou	Benin	2301	B,D,J,M,N,P,R,Y

Freq (MHz)	Station	Country	UTC	DXer
4.875	R.Roraima, Boa Vista	Brazil	0130	D
4.879	R.Bangladesh	Bangladesh	0005	Q
4.880	R.Nac.Espejo, Quito	Ecuador	0135	D
4.885	R.Clube do Para	Brazil	0025	B,D,R
4.885	R.Difusora Acreana	Brazil	0020	D
4.885	KBC East Sce Nairobi	Kenya	1902	E,M,P,R,T
4.890	RFI Paris	via Gabon	0500	P,R,S
4.890	ORTS Dakar	Senegal	0030	D
4.895	R.IPB AM C'po Grande	Brazil	2359	B
4.895	Voz del Rio Arauca	Colombia	2230	D
4.895	Pakistan BC	Pakistan	1801	K,M
4.900	SLBC Colombo	Sri Lanka	1656	K
4.905	R.Relogio, Rio	Brazil	0130	D
4.905	R.Nat.N'djamena	Chad	2036	B,D,E,M,O,P,R,S,T
4.910	AIR Jaipur	India	1648	K
4.910	R.Zambia, Lusaka	Zambia	2036	B,E,K,P,R,T
4.915	R.Difusora, Macapa	Brazil	0130	D
4.915	GBC-1, Accra	Ghana	2037	B,D,E,G,J,L,M,N,P,R,T,U
4.915	KBC Cent Sce Niarobi	Kenya	1919	I,T
4.920	AIR Madras	India	1716	K
4.925	R.S.Miguel,Riberalta	Bolivia	0005	B
4.935	KBC Gen Sce Nairobi	Kenya	1919	B,R,T
4.940	R.Abidjan	Ivory Coast	2245	D
4.945	Channel Africa	S.Africa	1733	Q,T
4.950	R.Nacional, Mulenvos	Angola	2038	E,K,T
4.950	RTM Kuching, Sarawak	Malayasia	2125	E
4.950	R.Madre de Dios	Peru	0035	D,R
4.955	R.Cultura, Campos	Brazil	0130	D
4.960	Mulenvos	Angola	2032	T
4.960	R.Federacion, Sucua	Ecuador	0015	B
4.960	AIR Delhi	India	0140	D
4.960	R. La Merced	Peru	0125	D
4.970	R.Rumbos, Caracas	Venezuela	0130	D,J
4.975	R.Uganda, Kampala	Uganda	2027	M,P,R,T
4.980	PBS Xinjiang, Urumqi	China	2330	B
4.980	Ecos del Torbes	Venezuela	2315	B,D,E,J,L,P,R,U
4.985	R.Brazil Central	Brazil	0135	D
4.990	Hunan 1, Changsha	China	0025	D
4.990	AIR Ext.Service	India	0013	D,P
4.990	FRCN Lagos	Nigeria	2038	B,D,R,T
4.990	R.Ancash, Huaraz	Peru	0400	R
5.005	R.Nacional, Bata	Eq.Guinea	2030	B
5.005	RTM Sibu, Sarawak	Malaysia	2020	Q
5.005	R.Nepal, Kathmandu	Nepal	1701	K
5.010	R.Garoua	Cameroon	2027	D,E,R,T
5.010	AIR Thiru'puram	India	0120	D
5.020	La Voix du Sahel	Niger	0500	R
5.020	ORTN Niamey	Niger	2040	K,T
5.025	R.Parakou	Benin	2033	E,G,R,T
5.025	R.d'Transamazonica	Brazil	0030	D
5.025	R.Rebelde, Habana	Cuba	2155	I
5.025	R.Uganda, Kampala	Uganda	2023	M,P,T
5.030	AWR Latin America	Costa Rica	0018	B,Q,R
5.030	R.Catolica, Quito	Ecuador	0525	D,E
5.030	R.Continente Caracas	Venezuela	0450	S
5.035	R.Bangui	C.Africa	2142	B,D,E,G,M,P,R
5.040	Voz del Upano, Macas	Ecuador	0546	D,E,M,P
5.040	R.Maturin	Venezuela	0445	S
5.045	R.Cultura do Para	Brazil	0037	D,P,R
5.047	R.Togo, Lome	Togo	2034	B,D,E,I,M,N,P,T,Y
5.050	Em Jesus Gran Poder	Ecuador	0220	P,Q
5.050	R.Tanzania	Tanzania	2034	E,M,P,R,T
5.055	R.Difusora, Caceres	Brazil	0430	D,E,S
5.055	Faro del Caribe	Costa Rica	0545	M
5.055	RFO Cayenne (Matoury)	F. Guiana	0406	D,P,R
5.060	PBS Xinjiang, Urumqi	China	0024	P
5.060	Sist d'Em Progreso	Ecuador	0219	R
5.075	Caracol Bogata	Colombia	0534	B,D,E,J,L,M,P,R,S
5.083	R.Mundo, Cusco	Peru	0035	D

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A: Leo Barr, Sunderland.
B: Darren Beasley, Bridgwater.
C: Leslie Biss, Knaresborough.
D: Robert Connolly, Kilkeel.
E: Geoff Crowley, Aberdeen.
F: Bernard Curtis, Stalbridge.
G: Martin Dale, Stockport.
H: Ron Damp, Worthing.
I: John Eaton, Woking.
J: David Edwardson, Wallsend.
K: P. Gordon Smith, Kingston, Moray.
L: Bill Griffith, W.London.
M: Gerry Haynes, Bushey Heath.
N: Simon Hockenhull, E.Bristol.
O: Rhoderick Illman, Oxted.
P: Eddie McKeown, Newry.
Q: Roy Merrall, Dunstable.
R: Denis Mulkeen, Kiltimagh, Eire.
S: John O'Halloran, Harrogate.
T: Fred Pallant, Storrington.
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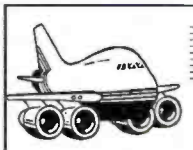

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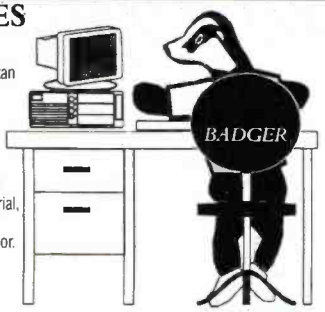

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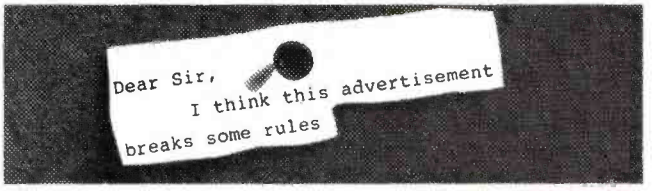

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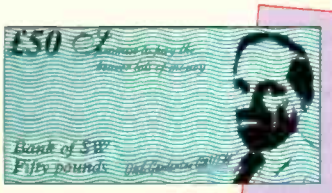

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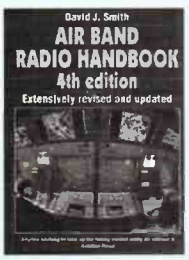

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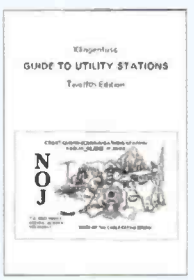
Joerg Klingenfuss



This book covers the complete short wave range from 3 to 30MHz together with the adjacent frequency bands from 0 to 150kHz and from 1.6 to 3MHz. It includes details on all types of utility stations including FAX and RTTY. There are 19549 entries in the frequency list and 3590 in the alphabetical callsign list plus press services and meteorological stations. Included are RTTY & FAX press and meteor schedules. There are 11800 changes since the 10th edition. *534 pages.* **£24.00**

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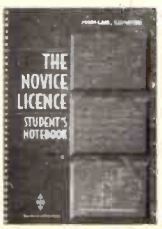

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Aubrey Pilgrim
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RADIO

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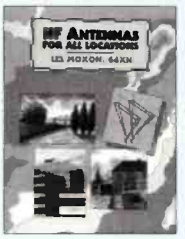

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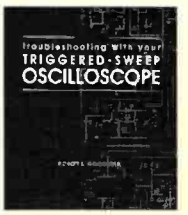

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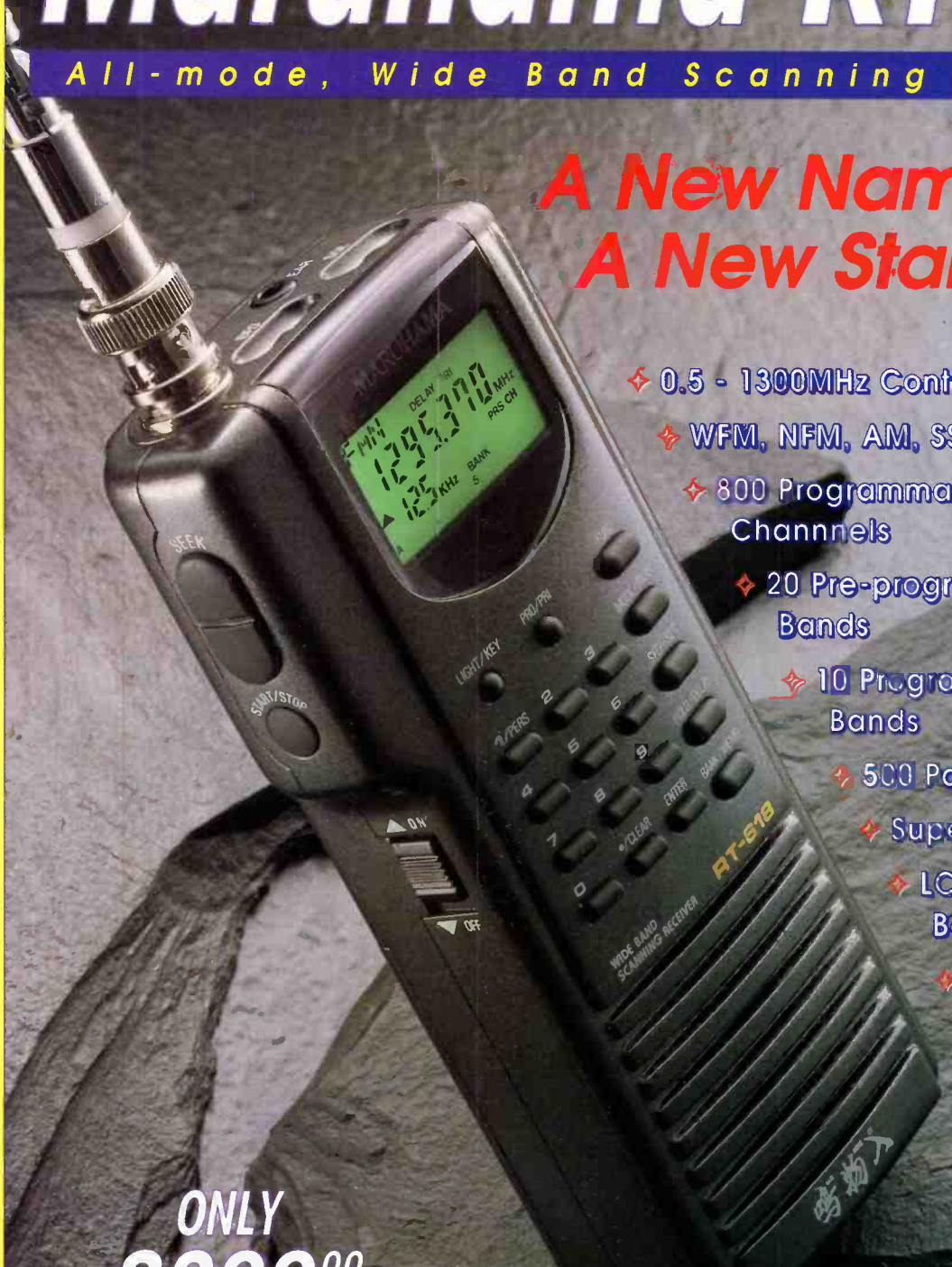

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