CIRCUIGRAPH EASIWIRE
Build our Weather Satellite Antenna
What Receiver?

For The Radio Listener
IC-R7000, 25-2000 MHz, Commercial quality scanning receiver

ICOM introduces the IC-R7000, advanced technology, continuous coverage communications receiver. With 99 programmable memories the IC-R7000 covers aircraft, Marine, FM Broadcast, Amateur Radio, television and weather satellite bands. For simplified operation and quick tuning the IC-R7000 features direct keyboard entry. Precise frequencies can be selected by pushing the digit keys in sequence of the frequency or by turning the main tuning knob. FM wide/FM narrow/AM upper and lower SSB modes with six tuning speeds: 0.1, 1.0, 5, 10, 12.5, 25KHz.

The IC-R7000 has 99 memories available to store your favourite frequencies including the operating mode. Memory channels can be called up by pressing the memory switch then rotating the memory channel knob, or by direct keyboard entry. A sophisticated scanning system provides instant access to the most used frequencies. By depressing the Auto-M switch, the IC-R7000 automatically memorises frequencies that are in use whilst it is in the scan mode, this allows you to recall frequencies that were in use. The scanning speed is adjustable and the scanning system includes the memory selected frequency ranges or priority channels. All functions including the memory channel readout are clearly shown on a dual-color; fluorescent display. Other features include dial-lock, noise blanker, attenuator, display dimmer and S-meter and optional RC-12 infra-red remote controller, voice synthesizer and HP 1 headphones.

IC-R71E, General coverage receiver.

The ICOM IC-R71E 100KHz to 30MHz general coverage receiver features keyboard frequency entry and infra-red remote controller (optional) with 32 programmable memory channels, SSB, AM, RTTY, CW and optional VFO's scanning, selectable AGC, noise blanker, pass band tuning and a deep notch filter. With a direct entry keyboard frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency is altered without changing the main tuning control. Options include FM, voice synthesizer, RC-11 infra-red controller, CK70 DC adaptor for 12 volt operation, mobile mounting bracket, CW filters and a high stability crystal filter.
Cover If you are put off trying your hand at building radio and electronic projects by the thought of soldering then the new Easiwire system is well worth looking at.
Sir
I have been reading, with great interest, the letters regarding the Eureka/Rebecca radar system and I must fall in on the side of W. Blanchard (February '88 SWM) and back everything he said in his letter.

I do not write this as an "armchair expert" with a pile of technical books in front of me, but as an ex RAF Radar Mechanic (National Service) who worked on this equipment in 1950-51.

I would be very surprised if the equipment as W. Blanchard and I knew it ever staggered into the 1960s, let alone the '70s and '80s as some would have us believe.

Is the answer a modern state-of-the-art system but retaining the old code name Eureka etc? After all that seems to have happened with LORAN.

Finally comes the question of Band III TV also raised by LORAN. Of technical books in front of me, but as an ex RAF Radar Mechanic (National Service) who worked on this equipment in 1950-51.

Sir
Oh dear! I suppose that I asked for it. I merely assumed that, because when I last used Rebecca/Eureka in 1958 I was told that it was obsolete and would shortly be withdrawn, 30 years later it might just have been. No chance of its companion BABS being found somewhere, I suppose? Or better still, somebody lurking in a corner with an operative GEE set? This must make it easily the longest-lived of the wartime radio nav aids.

Which brings me to the main point of this letter. The Royal Institute of Navigation was rather surprised recently to discover that nobody seems to have written a proper history of aerial navigation. There are plenty of books about the marine version, and even some on land navigation, but of aerial navigation there is nothing apart from an occasional memoir. Accordingly it has been decided to form a study group with the objective of collecting sufficient information to allow the compilation of an authoritative history.

Much of the aerial navigation is closely concerned with radio navigation, and many of your readers must have worked with, operated, serviced or even designed radio navigational devices in the last 60 years or so. We would be very pleased to hear from anyone who feels that they might be able to contribute to this project by way of personal reminiscence, original material, papers or documents. In particular, material from the years up to 1939 is very scarce.

If anyone wishes to help, please write to me c/o The Royal Institute of Navigation, at The Royal Geographical Society, 1 Kensington Gore, London SW7 2AT W. BLANCHARD DORKING

However, the batteries that I used were brand new and higher than normal cost but don't seem to be suitable for use in the 4099, nor, I imagine, in other variants of the Sangean 803 such as the Realistic DX440.

The radio itself seems to be well made and at £100 offers quite a lot for the money.

K. GARDINER

This poses a problem which, perhaps, some of our readers might be able to unravel. Are Ever Ready Silver Seal batteries over size or are the cheaper, own brand ones made undersize in case they swell? Has anyone else come across this problem? From the frequency with which the 4099 crops up in Brian Oddy's LMS column there are a lot being used by readers.

I do want accurate reports from s.w.l.s in connection with a running design programme of compacted TX antennas and their associated circuitry — or what are sometimes called "his funny aerials"! Most of these antennas are quite unconventional and break many of the accepted textbook rules established for a long time. The object of this research is to make smaller and smaller h.f. antennas for both transmitting and receiving but with a good performance. Many have worked very well but some have been disasters.

Presently on the stocks is a 20mm (8 inch) long 3.5MHz (80m) transmitting antenna! The experimental lash-up works — so Mark 1 is now in the course of construction. I am also working on the MicroLoop 80 which is just 460 x 460mm, and more. You can usually find me between 3.535 and 3.580MHz c.w. 0430 to 0600 prevailing time (GMT or BST). Transmitter power is usually 10 to 15W.

Why c.w.? Because I like it! Why low power? Because it is the only sure way to test a new antenna design. If it doesn't work then it is no good, whereas 100W, say, will get someplace, somewhere, even with a lousy antenna. And c.w. fans — the standard of c.w. operating at that early hour is invariably good and polite!

Detailed written reports, good or bad, will be much appreciated and will be acknowledged. My address is in the current Call Book. Thank you.

RICHARD Q MARRIS G2BZQ

I notice that on the Contents page of the April 88 SWM you have incorrectly credited me with writing "Report from the Polder". Unfortunately you obviously paid the real author!

PETER LAUGHTON

Word processors are marvellous things — but I can still make mistakes! My apologies to both Peter and the real author Jonathan Marks.

ED

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

The Editor reserves the right to shorten any letters for publication but will try not to alter their sense. Letters must be original and not have been submitted to other magazines.
Volvo Launch RDS Car Radio
Way back in the December 87 issue of SWM Peter Shore explained how the new Radio Data System (RDS) works and hinted that Volvo were about to introduce a new car radio equipped for RDS.

Volvo have always been very safety-minded in the design of their cars and safety features heavily in the reasoning behind the introduction of their SR-701 radio.

The driver of a car fitted with the SR-701 can just switch on, select his favourite v.h.f. f.m. station with the touch of one button and stay tuned anywhere in the country without having to retune. This removes the hazardous process of trying to find the same programme on a stronger station whilst driving the car.

Should the driver want to hear traffic information which might affect his journey then the RDS radio will give him that option. It can even be set to break into the programme tape, that he is listening to with urgent, pre-coded traffic messages.

The radio will also display the exact time, controlled by the RDS signal. The time displayed is never wrong and does not need resetting when the clocks change.

Both the BBC and IBA are well advanced with coding their f.m. transmissions. Ultimately the RDS codes, which are standardised throughout a large part of the European Broadcasting Union, will identify not only the transmitter but the different types of programme material so that an RDS radio will be able to select programmes by subject.

There is no doubt that RDS is an exciting step forward, particularly for the motorist. However, there are obstacles to be overcome if you fancy equipping your car with the Volvo SR-701 radio. While the radio itself will fit into the standard car radio cut-out, Volvo in their wisdom have opted to have a separate cassette player. This is fine — just as long as you own a Volvo with twin radio apertures in the dash! Otherwise you will be restricted to just the radio — with RDS benefits of course. Volvo put forward their technical arguments for splitting the system in this way — when you want to change the cassette player for a Compact Disc job you don’t have to throw away the radio. What happens if you want both cassette and Compact Disc was not clear perhaps you like to know more about the group, then contact them at:
The 934MHz Club UK PO Box 424 Althorne Chelmsford Essex CM3 6UP
Free Software
We have heard from Peter Fawcett GOFBK and he would like us to pass on that free software is available in the form of a cassette to enable the EG2000 Colour Genie computer to run packet. The Colour Genie has been used for quite some time now as a dedicated RTTY terminal. It has been used successfully with the TNC220, but it is thought that it should be possible to use it with other TNCs.

If you send one pound, to cover the cost of the cassette and postage, you will receive a cassette and four pages of useful data.

It’s not known just how many Colour Genie EG2000s were sold, but they were retailed by Lowe Electronics for RTTY use.

Now it is hoped that RTTY enthusiasts can get going on packet too — without too much extra expense.

For more details of where to obtain your software from, write to:
Peter L Fawcett GOFBK 7 Albert Hill Bishop Auckland Co. Durham DL14 6EH

The 934MHz Club UK
The 934MHz Club UK is a nationwide organisation that brings together users of 934MHz and represents their interests. The magazine they produce comes out four times a year and gives round-ups of what’s happening in all the different areas around the UK.

For your year’s subscription, you get 4 magazines, updated membership lists, organised contests and rallies. So if you are a 934 MHz user, or potential user, and would like to know more about the group, then contact them at:
The 934MHz Club UK PO Box 424 Althorne Chelmsford Essex CM3 6UP

RadioGram
The RadioGram magazine is published bimonthly for all valve radio enthusiasts. It costs £6.50 in the UK and Ireland for six issues, that’s not always a calendar year. Issue No. 14, which recently arrived on my desk, contains features about the Zetavox ST, The EMI Story, Hail Columbia! as well as general features on vintage music and a beginner’s guide.

If you would like to know more about The Radio Gram, then contact:
The RadioGram Larkhill Newport Road Woodseaves Stafford ST20 0NP

Bearcat BC580XLT Scanning Receiver
Nevada in Portsmouth are introducing the new Uniden Bearcat BC580XLT base/mobility scanning receiver. The main features of the set are that it has 100 memory channels, the frequency coverage is 29-54 MHz, 118-174 MHz and 406-512 MHz. The other main feature is that the price will be £225.

Other things about the set are that it has a folding stand for table top use, can be run from either 13.8V d.c., two AA batteries or an a.c. adaptor and has a rugged construction designed for mobile use.

Nevada Communications 189 London Road North End Portsmouth Hants PO2 9AE

WHAT'S NEW
Amateur Madness

Everyone knows that radio amateurs are mad and a story that reached the news desk recently proves it!
Roy Andreang, using the callsign GB4CMT, jumped out of an aeroplane at 14,200 feet on Easter Saturday. He had hoped to be able to send Morse on the way down, but unfortunately the Morse key didn’t work properly.
Still, he did manage to put out a call using the FT-290 Mk II loaned by SMC (Northern) Ltd. Four days after the jump, Roy celebrated his 64th birthday, but he has promised his family that this was the last time.

Diplome du Calvados

The REF regional club of the Department du Calvados in Normandy, has an award available to all radio amateurs and s.w.l.s. Applicants must have worked (or heard) 10 stations located in the Calvados district (No. 14) on any band and/or mode. There are special endorsements available for h.f., v.h.f., s.h.f., c.w., RTTY, etc., on request.
Contact with the club station, FF9KCZ on h.f. or FF9K1CZ on v.h.f. counts as two contacts.
No QSLs are necessary, send your log details, certified by two licensed amateurs and 10 IRCs to:
The Award Manager
Pierre Roger FC1CNJ
8 Rue des Petites Haies
F. 14440 Douvres La Delivrande
France

QRP Contest

The date of the Practical Wireless 144MHz QRP Contest has now been fixed. The date to put in your diary is:
Sunday June 12
0900 - 1700UTC
Further details and a full set of the rules are published in the June issue of Practical Wireless now on sale at your newsagents.

Attention Cybernet Users

Nevada have recently written to us saying that the Kyocera Corporation of Japan will be ceasing production of 27MHz CB radios. Kyocera were responsible for producing the famous Cybernet and Ham International brand names.
Nevada have managed to purchase a large quantity of spare parts for all the Cybernet models, including the Cybernet Beta 3000, Beta 2000 and Beta 1000. They also have a limited quantity of Ham International spares.
For details of availability and cost of various spares, contact:
Nevada Communications
189 London Road
North End
Portsmouth
Hants PO2 9AE

Improved Discone

Garex Electronics have announced an improvement to the popular Revco Revcone wide-band discone antenna.
There is often an advantage in fitting a vertical whip section above the “disc” elements to improve the i.f. performance of the discone. Another application is to provide a reliable transmitting capability on one particular band.
So now, with the Revcone, the vertical section is optional. Only the mounting stud is provided initially, the vertical section may then be chosen from any mobile type whip in the Revco range from 27MHz to 950MHz.
For more details on this antenna, contact:
Garex Electronics
7 Norvic Road
Marsworth
Tring
Herts. HP23 5LS

Audio/Video Cassette Care

When you have spent many hours waiting for that elusive TV or radio signal, you don’t want to find that the tape or video recorder you have been using to preserve the moment is dirty and the results ruined.
We have been given details of a range of six audio/video care systems launched by Bib. Each care system is packaged in a strong, handy, “luggage” type case with a clear, hinged lid, snap lock closure and tape cutter complete with splicing tape and tape splicer.
The Audio Care System CS1 includes a push button VHS cleaner, anti-static screen cleaner fluid, VHS title labels and re-usable record safety tabs.
The Audio Care System CS3 includes a carbon fibre anti-static record brush, a stylus brush with inspection mirror, cleaning fluid, cassette head cleaner, head cleaning fluid, tape splicer complete with splicing tape and tape cutter.
The Audio Cassette Care System CS5 includes an electronic tape head demagnetiser, audio cassette tape head cleaner and fluid, audio tape head cleaning tools, a pocket sized inspection light and 10 audio cassette title cards.
The price you can expect to pay for these kits is £12.99 each. So does anyone have a birthday in the near future?...
More and more SWLs and TVDXers are investing in rotators these days. South Midlands Communications have sent us details of some of their Yaesu antenna rotators.

There are three which might interest the SWL, as they are for light and medium duty work. Obviously there are some very "beefy" rotators also available including ones that can provide azimuth elevation too.

The first one is the G-250, it is for small and medium v.h.f., u.h.f. radio and television antennas. The power consumption is 37VA, the 360° rotation time is 43 seconds, the maximum vertical load is 50kg and the mast diameter is 25-38mm.

The G-400 and G-400RC have the same specification but have different control units. They are designed for small h.f. and medium to large u.h.f., v.h.f. radio and television antenna arrays. Power consumption is 40VA, 360° rotation time is 50 seconds, the maximum vertical load is 200kg and the mast diameter is 36-63mm.

For details of these and all the other Yaesu rotators, contact:
South Midlands Communications Ltd
School Close
Chandlers Ford Ind. Est
Eastleigh
Hants. SO5 3BY

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**Engineering Information from the BBC**

**Birchover:** A new TV relay station is being built on the south side of Birchover, some 8km north-west of Matlock. Channels are:
- Channel 39: BBC 1 Midlands
- Channel 42: Channel 4
- Channel 45: BBC 2
- Channel 49: ITV Central

Antennas should be horizontal Group B, mounted outside.

**Millbum Muir:** The BBC's f.m. station at Millbum Muir, near Dumbarton, should have changed its frequencies overnight on April 6/7. The new frequencies will be:
- Radio 2/1: 88.3MHz
- Radio 3: 90.5MHz
- Radio Scotland: 92.7MHz

The Millbum Muir relay is 5km north of Dumbarton. As the frequencies are only 500kHz lower than the previous ones, listeners should have no trouble retuning their receivers.

**Perth:** The BBC's f.m. radio services in the Perth area -- Radio 2/1, 3 and Scotland -- should have moved to a new site at Kirkton Mair, about 3km south of the town centre. The transfer should have taken place overnight on March 9/10.

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**RALLIES**

**SWM in attendance**

May 29: The East Suffolk Wireless Revival will take place at the Civil Service Sportground, The Hollies, Straight Road, Ipswich. Doors open at 10am.

Colin Ranson
Tel: Ipswich 688204

June 12: The Royal Naval Amateur Radio Society Annual Mobile Rally will again be held in the sports field, HMS Mercury, Nr. Petersfield, Hants. Gates are open between 1000 and 1700. As usual there will be plenty of attractions for all the family at this very friendly rally. More details from:
Cliff Harper G4UJR
Tel: 0703 557469.

June 12: The open day for the Mid Lanark Society will be held at the Community Centre, Newarthill by Motherwell. This new venue is about half a mile from the old one. There will be the usual traders, a bring & buy stand, demonstrations of packet radio and RTTY, lectures and the annual awards of the EHI Trophy. Talk-in will be on S22.

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**SWM in attendance**

June 18: The Royal Air Force Halton Air Show and Amateur Radio Rally will take place at RAF Halton, near Aylesbury, Bucks. The RAFARS Golden Rally will be held inside a hanger. More details from:
Terry F. Owen G4PSH
Tel: 0296 85760

June 19: Denby Dale Mobile Rally will be held at Shelley High School, about five miles south-east of Huddersfield, West Yorkshire. Rally opens at 11am (10.30am for the disabled). There will be the usual traders there, food and sideshows for all the family. Talk-in on $22, SU22 and 28MHz f.m.

G3SDY
Tel: 0484 602905

June 26: The 31st Longleat Mobile Rally will be held, as always, at Longleat Park, Longleat, Nr Warminster, Wilt. The rally starts at 10am. More details from:
Brian Goddard G4FRG
Tel: 0272 848140

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**SWM in attendance**

July 2/3: The Popular Flying Association Annual Rally is again being held at Cranfield Aerodrome, Bedfordshire.

July 10: The Sussex Mobile Rally will take place at the Brighton Racecourse. More details from:
Bob Henaire G1IOS
Tel: 0798 43841

July 15 - 17: The RSGB 75th Anniversary National Convention will take place at the National Exhibition Centre, Birmingham. RSGB HQ can give you more details.

July 24: The Cornish Amateur Radio Club have had to change the venue of their rally. The new venue is the Village Hall, Perranwell, about 8km SW of Truro.

July 28 - 31: The AMSAT UK Colloquium will again be held in the University of Surrey, Guildford. More details from:
G3AAJ
Tel: 01 - 989 6741
On June 21, Acton, Brentford & Chiswick ARC discuss Mobile & Portable Operation. They meet 3rd Tuesdays, 7.30pm in Chiswick Town Hall, W. G. Dyer G3OEH on Acton 3778.

Derby & District ARS meet Wednesdays, 7.30am at 119 Green Lane, Derby. June 1 is a Junk Sale and the 8th a 144MHz DF Hunt, R. E. Bridson G3VEB on Measham 1348. June 26th is B. Helps Bandwidth and NPL Planning meeting..sidc are on the 22nd. Dave Westby G4UIH on Lanchashire 854745.

Southgate ARC meet 2nd & 4th Tuesdays in Holy Trinity Church Hall (Upper), Green Lanes, Winchmore Hill. June 9 is the Finer Points of Packet Radio by G3XDV and a Packet Radio demo on the 23rd. G60JX on Winchmore Hill 2435. June 2 is Independent TV by G3QOP for Hornsey ARC. Thursdays, 8pm in the Guide Hall, Denmark Road, Finsbury Park G4UI on Stening 814516.

Poniconductor & District ARS meet Thursdays, 7pm in the Carleton Community Centre, Carleton Road, Beeston. June 14 is Technical Description of Your Radiator by G4ISU/G4KMK, June 2 is RAYNET County Controller by G3P3M, the 16th CW Keys and Keying by GH0SO and an Open day on the 23rd. G6QJO on Knottingley 837922.

Blackwood & District ARS have a talk 7pm at Oakdale Community Centre (in school term), May 27 is the Use of Computers in Amateur Radio by Paul Chandler, June 10 is FT-101D2 a technical description by GW0GZD and the 17th is Planning Permission by Robert Morgan of Islington Borough Council's Planning Department. Brian Mathews GW6YYU on Newgates & Dist. ARS.

On June 4/5, Stevenage & District ARS have a Talk & Demo on the "Sheaffer" 144MHz transceiver by the Shefford Club and the 2nd Night follows on the 23rd. Meeting Days are 1st & 3rd Saturdays, 8pm at SITEC Ltd, Ridgemond Park, Telford Avenue. Peter G09TE on Stevenage 724491. Vale of Evesham ARC now meets at the MEB Club, Evesham, 84049 (on the left entering town). This will be their 1st Thursday venue, 7.30pm. 3rd Thursdays will have a caravaneer ready for contests, etc. June 2 is a 144MHz Foxhunt, (7.30pm at HQ) the 16th is Work on Club Caravans by G4UGC on Evesham 831508.

Rugby ATS meet Tuesdays 7.30pm in the Cricket Pavilion, outside Rugby Radio Station. May 31 is a 144MHz DF Hunt, June 7 a Test Gear Night, the 14th a 144MHz DF Hunt and the 21st is a talk by C. M. Howes on QRP Kits, Kevin G8TVH Rugby 779867.

Stourbridge ARS meet twice monthly in the Robin Woods Centre, Beauty Bank. June 6 is Natter/On-Air Night and the 20th is a Summer Surplus Sale. C. Brunn G1WAL on Hagley 885602. On June 1, Wirral ARS have a Surplus Sale, the 15th is a DF Hunt, R. E. Bridson G3VEB on Measham 1348.

Wyre ARS meet 2nd & 4th Wednesdays, 8pm in the Breck Sports and Social Club. May 28 or 29th is NDF reccie, June 8 a Morse Class in the 1811th. 1st and 3rd Mondays and NPL Planning are on the 22nd. Dave Westby G4UIH on Lanchashire 854745.

Todmorden & District ARS have a Quiz Night on Thursdays, G3LEQ on June 6. They meet 1srd and 3rd Mondays, 8pm, Queen Hotel. G1GZB on Todmorden 5752. It's a Treasure Hunt on June 21 for members. The meeting is Unit 16, 60 Regent Place, Birmingham, 7.30pm with classes from 7pm. Tom Brady GB1G on Wednesdays in the 2nd. G3YBK on Birmingham 6044.


The Tyneside ARS is moving to St. Teresa's Club, 200b Heaton Lane, Heaton, Newcastle -Upon -Tyne. Further info and how to get there from Gary G4KOT on Tyneside 2341148.

Wirral & District ARS have Breakfast, 8.30am, the 10th Anniversary Celebration of the Club (special event stations) and the 22nd a Barbecue at Hesswall Shore. They meet 2nd Monday, Wednesdays in Wirral Cricket Club, Wirral Mill Road, Wirral. Alan Griffiths G1XYP on Moreton 7517.

Sutton & Cheam RS meet 3rd Fridays, 7.30pm in the Downsway Tennis Club, Holland Avenue, Sutton. Sutton ARS meet May 29 is 432MHz Trophy Night, June 14, 1st Monday, Downsway Park Fete (Special Event Station GB75SAC), June 16 a Natter Night at 20 West Farm Avenue, Ashhead and the Inter-City 11, 21st Thursday Night follows on the 17th. John Puttcock at 53 Alexander Avenue, Sutton. A Film Show on June 6 is for the Filmhounds & District ARS. They meet at 7.30pm in the 2nd Rhyl Scout Hall (Dyserth Road), and the 22nd is a Treasure Hunt. They meet Wednesdays with Morse or RAE Coaching on Monday & Tuesdays. John Dobson on Dover 211638.


East Ardsley. May 26 is a monthly Rally Club Briefing G4WUB, the 2nd Night on the 23rd. Steve G4RCH on East Ardsley 752558.


6th is a Packet Activity Evening G4XCB, the 11th a Club Open Day GB2WFW, the 15th a Computer Evening G4ZRC and the 22nd a Evening for the Licences Rally. Len Baker G4ZRY on Whitchurch 834282.
A lot of modestly priced scanners have appeared on the market in recent years but the great failing has been the inability of most of these machines to allow the user to select the mode regardless of the band. The reason for this of course is quite simple. Most of the world, and in particular the USA, decided many years ago that f.m. was the best means of getting a v.h.f. or u.h.f. signal from point A to point B whilst mobile. Airband is the exception where because of the traditional use of a.m. it has as yet been impossible to get a change to f.m.

Scanner manufacturers tend to design their equipment for the American market where sales outstrip British figures many times over. The American market provides a simple set of rules for the manufacturer to work with. It goes something like this: You programme the scanner to switch to f.m. except when it is tuned to Airband and then it automatically switches to a.m. That means you can forget front panel switches, elaborate programming techniques to store mode as well as frequency and that means you can keep costs down.

That's all very well until you look at the quirky British market where not only is a.m. still in use on some bands but is getting a new lease of life as certain services you should not be listening to move from Band II to places i am not allowed and start to use f.m. (the fact that British manufacturers are the only ones left churning out equipment for this complete "clunker" of a mode is I am sure purely coincidental).

For owners of top of the range scanners such as the Icom, AORs and Tandy 2004 this presents no problem but for someone with a limited budget it did. I say did because the Revco RS-3000 is the first budget priced scanner to appear on the market with programmable modes.

Banded Coverage

As a budget priced scanner you would neither expect, nor get, the kind of no-gaps coverage offered on the up-market machines so what you get is banded coverage with four bands in all. This starts off at 26MHz and goes on to 30MHz so giving coverage of the CB channels and the amateur 28MHz band. Coverage then picks up again at 66MHz and goes on to 88MHz so covering the "Low Band" v.h.f. channels used by a variety of services. The next band covers 118 to 176MHz offering coverage of Air Band, Marine, 144MHz amateur service, etc. Finally u.h.f. coverage is provided between 380 to 512MHz.

For a great many users those bands will provide all the necessary coverage they will ever want and you can enter 50 of your favourite frequencies into memory. That is: not a bad number of channels (far more than the AOR 2002 for example). The memory is arranged in 5 banks of 10 channels and it is possible to lock-out banks as well as individual channels. Delay (12 seconds) is individually programmed onto each channel which is a bonus because some costlier scanners only allow delay to apply to all channels or none, not individual ones.

The scanner offers full search facilities with stepping rates of 5, 12.5 and 25kHz but it does not recall previously programmed upper and lower limits so these have to be re-entered each time search is used. Priority is provided on memory channel 1 and when this feature is selected it is scanned once every 2 seconds. Memory back-up is provided by a capacitor and the manufacturers say memory is retained for up to 2 weeks with power off.

The Box, the Bells and the Whistles

The RS-3000 is quite compact considering it's features and for anyone looking for a mobile unit it should fit quite easily in most cars. Indeed I suspect it was designed as a mobile unit because it comes with a vehicle mounting bracket but does not come with a mains power supply. The only other accessory is a small telescopic whip which plugs into the Motorola-type antenna socket on the rear apron which you will also find the d.c. input socket and jack socket for external speaker.

The front panel features squelch and volume controls and the keyboard pad together with i.c.d. display. The latter not only shows the frequency and channel number but also mode, manual or scan status, delay, lockout, priority, search limit and stepping rate. The keypad is easy to use, only one button serves a double purpose (decimal point/priority) and there are up/down buttons for manual stepping.

Overall Impressions

The sensitivity of the test sample tallied pretty much with the quoted figures and these are roughly what I would expect on a middle-of-the-road scanner. Spurious rejection figures are not quoted and I suspect this is because they are not very good. Although impressions were purely subjective, it was apparent that strong local signals could pop up on all sorts of frequencies and an acquaintance who had already bought a RS-3000 complains that transmissions from an antenna 200 metres from where he lives, appear on just about any frequency he enters into the scanner. However, I must put this complaint into context by saying that this problem only occurs with nearby transmissions and I know of a lot of other scanners in this price range that fare no better. My only other gripe is about the antenna socket which is the same car radio type as found on quite a few different makes of scanner — it is near useless at v.h.f. and even worse at u.h.f. If I bought a RS-3000 I would remove it and replace it with a BNC connector.

So would I buy one? I think "her indoors" would blow a gasket if I bought another scanner and but for that I would probably buy one to permanently install in the car. The strong point is the programmable mode. Despite the hilarious Pidgin-English manual the beast is easy to drive and frequency coverage is adequate for most needs. It does not come with a mains power pack but then that is something that is quite cheap to buy or simple to build. It has plenty of memory channels and some features that are only found on more expensive machines. It is compact and professional looking and is very good value for money compared with some of the opposition.

I am grateful to Links Communications in Guernsey for the loan of the review sample. The Revco RS-3000 is distributed in the UK by Garex Electronics Ltd and costs £199 inc. VAT.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Coverage</th>
<th>Modes</th>
<th>Sensitivity</th>
<th>IFs</th>
<th>Search Step</th>
<th>Audio Output</th>
<th>Power Source</th>
<th>Inputs/Outputs</th>
<th>Display</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
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<tbody>
<tr>
<td>h.f.</td>
<td>v.h.f. - 28-30MHz</td>
<td>a.m./f.m. programmable on each memory channel</td>
<td>v.h.f. - 118-176MHz</td>
<td>f.m.</td>
<td>5, 12.5 or 25kHz selectable</td>
<td>1.5 W into 8 ohm</td>
<td>13.8V d.c. (mains not supplied)</td>
<td>DC supply, 500hm antenna &amp; external loudspeaker</td>
<td>Backlit Liquid Crystal</td>
<td>152 x 88 x 220mm</td>
<td>0.5kgs</td>
</tr>
<tr>
<td>h.f.</td>
<td>v.h.f. - 118-176MHz</td>
<td>f.m.</td>
<td>0.5µV 110dB S/N</td>
<td>10.7MHz &amp; 45kbk</td>
<td>selectable</td>
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<tr>
<td>h.f.</td>
<td>u.h.f. - 380-512MHz</td>
<td>f.m.</td>
<td>0.5µV (10dB S/N)</td>
<td>10.7MHz &amp; 45kbk</td>
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<td>0.5µV (10dB S/N)</td>
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SCANNING RECEIVERS are our speciality (and that goes with them)

The AR2002 is without doubt the best known and best performing VHF/UHF monitor receiver on the market. Encompassing every frequency of interest, whether it be VHF airband, UHF airband, radio amateur, mobile radio, FM broadcasts, TV sound, the AR2002 also gives the user top performance. Frequency selection can be by direct keyboard entry, but there is a good old tuning knob as well, for whizzing up and down the bands. Properly styled and engineered for use in fixed station, mobile or portable, the AR2002 comes complete with a mains power supply and extending whip aerial. Now available from Aircastle products is a brilliant computer control system which makes the AR2002 into the most amazing monitoring system you ever experienced. Send for details right away.


For the airband enthusiast, the WIN-108 is the answer to a maiden’s prayer. This compact handheld airband receiver is fully synthesised and covers the entire VHF airband from 108 to 136 MHz. With simple keyboard entry you can be on channel faster than a Concorde captain, and the clear frequency readout tells you where you are. 20 memory channels are included, and you can scan these automatically. Not only that, you can tell the WIN-108 to search any given frequency range within the air band so as to find new frequencies of interest. Forget the AIR-7, the WIN-108 does it all and more. The WIN-108 comes complete with a correctly matched helical aerial and is easier to go.


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Send 60p to cover the postage and we will send you, by return of post, your FREE copy of "THE LISTENER’S GUIDE", a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will, I am sure, result in a "good read" but underneath the humour lies a wealth of experience and expertise. You will also receive detailed leaflets on our range of receivers and a copy of our current price list.

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FORTY FIVE YEARS LISTENING

Goff Curtis

Sitting at the receiver, listening out to what is going on in the world, must be one of life’s greatest pleasures, and this pleasant thought was highlighted when clearing out a spare room. Nothing of value was found except for a handwritten notebook of methods and tips found useful when monitoring. Made up at least forty years ago, it could have been written yesterday, as the information, more or less, still holds good today.

On the other hand it took ten days to hear an expedition to an island in the Indian Ocean, but that is a later story.

When first fishing the amateur bands in the 1940s with the battery 1-V-1 the bread and butter countries, apart from a few lucky long distance, were first concentrated on leading up to the better calls. After a time it was realised a more methodical, but not mechanical, system would help during a search for the rarer ones, and as the useful points turned up while listening, they were scribbled down in that 1940s notebook, and this is how it reads. Not very different from todays art of listening.

The following points apply to c.w., because after all, this is amateur radio, and although s.s.b. is rarely used at this QTH (unles there is a "wanted" new country on s.s.b. only). Many of the twenty points to easier hunting must help when listening for speech.

1. Keep the volume down so a weakish one can just be read, but up on its callsign. In fact, keep the gain down naturally.
2. Listen as continually as possible for DX which only operates for a short time.
3. Check other signals for a DX callsign.
4. Check the weakest signals, 2 or 3 layers down, especially in the quiet "cracks", building up to the top, greater strength layer. When looking for the weak ones, ignore the strong. It’s similar, when driving, to not looking at, and being dazzled by, approaching headlights.
5. Don’t listen for too long at a session. Have a rest, keep going back (if you can) every half hour or so. Conditions change.
6. Check all h.f. bands in daytime, especially 14MHz.
7. Watch frequency of stations calling the DX, or "DX only", as the station answering the call could be the DX.
8. Go into a doze on a weak one, they often peak up.
9. Keep the volume down so a weakish one can just be read, but up on its callsign. In fact, keep the gain down as far as possible all the time.
10. Always have pencil, paper, clock, and tape recorder handy.

DXing

1. Grab all information possible on current and future DX activities, via DX broadcasts, and nets, newsheets, "phone ins", and on the air.
2. Listen as continually as possible for DX which only operates for a short time, frequent looks for others.
3. Watch stations not sending their own callsigns, especially snappy RST.

A sketch of Goff at the T1154 and R1155 by an ex-bomb aimer.

Casual Listening

1. Skim over the band once or twice for a possible DX "pile up".
2. Don’t listen for too long at a session. Have a rest, keep going back (if you can) every half hour or so. Conditions change.
3. Check all h.f. bands in daytime, especially 14MHz.
4. Watch frequency of stations calling the DX, or "DX only", as the station answering the call could be the DX.
5. Go into a doze on a weak one, they often peak up.
6. Keep the volume down so a weakish one can just be read, but up on its callsign. In fact, keep the gain down as far as possible all the time.
7. Don’t tune off a likely good station without making a note of its frequency. You may not find it again by going back to its approximate frequency.
8. Always have pencil, paper, clock, and tape recorder handy.

Years ago I flew, and instructed, as a wireless operator in WWII, and on leaving the RAF in 1946 found life somewhat tame without some contact with radio. The l.f. and m.f., broadcast bands soon lost most of their appeal, and on mentioning this to a local G2 he said, "well, you will have to get on the amateur bands, and h.f., if you want to hear long distance stuff".

Although having been a wireless operator, the amateurs and DX were a mystery to me, but on his advice a start was made by "knocking up" a 2-VA battery 1-V-1 with coils for each band.

This was followed by an Edystone 740, a mains receiver built like a battleship. New, it cost £35, and has only just "gone up", and when callers eventually twigged this and went up, her frequency was in the African, sent "I will only answer calls 10 W/W", and instructed, as a wireless operator in WWII, and on leaving the RAF in 1946 found life somewhat tame without some contact with radio. The l.f. and m.f., broadcast bands soon lost most of their appeal, and on mentioning this to a local G2 he said, "well, you will have to get on the amateur bands, and h.f., if you want to hear long distance stuff".

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Part 1

Palmyra Island

Stephen S. Barnes

QSL from KP6AA heard in 1947, received 1961!

The really dedicated listener, like the licenced DXer, seriously studies propagation; is on the right frequencies at the correct times, and consequently hears many more calls than the average listener, who finds this a little too mechanical. It's worthwhile "working it out" if a brand "new one" is reported to be "on". It pays off then! It also pays, of course, to have a pretty good idea of where to look at certain times, but to save over-taxing the brain (although forecasting should be obvious after forty years) a "conditions" (expected) chart is pinned up over the RX, next to that list of wanted callsigns, times, etc. and when conditions are reasonably normal it works out.

It looks like this:

1.7MHz: Day and night: Locals up to about 62km.

3.5MHz: Day: Locals up to about 186km.

10MHz: Dawn: Europe up to 621km. N. Africa? Oceania? Night: Local, Europe and N. America?

21MHz: Dawn: Oceania, N. America (+ West Coast?); S. + C. America, W. Indies.

28MHz: Dawn: N. Africa, M.E., India, F. East; Oceania? S. America?

50MHz: Dawn: N. America, + W. Coast.

144MHz: Similar to 14MHz.

2145UTC and gave their ident at 2215, in exceptionally strong I.F.

search, with the Spanish equivalent for "this is Radio Mexico". An announcer spoke off when the announcer came up at 0001 and equal amounts of coffee, and it paid off when the announcer came up at 0001 with the Spanish equivalent for "this is Radio Mexico".

On checking the details in the World Radio TV Handbook, they were on 15.385MHz (not 11MHz) between 0001 and 0100 in March, only using 10kW. The second "wanted" was found, after a search, due to the Argentine being exceptionally strong I.F. of the 11MHz band, which led one to think that there may be some weaker, usually more difficult to hear stations coming in, and there was. Paraguay was on 11.915, at 2015UTC and gave their ident at 2215, in January. They were on for three nights.

The new bands have not been monitored, and I am unaware of conditions as 80 per cent of my listening done on 14MHz, particularly c.w. 14MHz is an outstanding band, especially at dawn and sunset - when conditions are good. Conditions were good on one night only, and three others, when trying out the broadcast bands for a change. Two S. American countries not heard for 20 years, came through, both on 11MHz, around 2330UTC. A woman announcer speaking in Spanish (I could have been from anywhere) said the word "Mexico", and the station played harp music (only) for about a solid hour. Luckily I stayed awake with help from five pipes of tobacco, and equal amounts of coffee, and it paid off when the announcer came up at 0001 with the Spanish equivalent for "this is Radio Mexico".

The 3rd crew "B" flight (1-r) Flt Jock Mitrat (pilot), Flt Micky Finn (navigator), Sgt Smith (gunner), Sgt Thomas (engineer), W/O Nicholson (bomb aimer) and Goff.

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only with their 40kW, and have not been heard since.

A third exciting time was hearing New Zealand. A pal phoned to say they were reported on 11.60MHz around 0600UTC, and they were. They were tape recorded, as were Mexico and Paraguay, but the tape playback was so grotty it was erased (what a fooll so that another, better recording could be made tomorrow. They were not there the next day, or the next, and were not heard again for another ten years. The station had been licensed to Australia, using only 7kW (I am almost certain) but the recording was OK this time, S7/5, and they kind sent a QSL card and pennant.

Since beginning this "line shoot" I have heard that someone has heard 190 broadcast countries, so I must be satisfied with the 120 on tape here, and keep on the amateurs, as it can't be easy to hear another 70 broadcast countries during the next few years.

The radio "bug" really bit whilst flying, and became almost the sole interest (which is socially wrong) when using that battery receiver between 1946 and 1960. This has been adjusted since by amateur radio being now one of several hobbies, albeit the principal one!

It is impossible to give up listening for too long, for the fear of missing something; the recent August and September 1987 Market Reef and Mount Athos DXpeditions for example. If predictions are broadcast that short future conditions are to be duff, and no "specials" coming up, it is relaxing to have a few days off from wearing the headset. The speaker is only used when keeping an ear open, for something to crops up, from another room, when making the tea! Future details are via Radio Berlin International, currently every second Monday on various "can't-be-missed" frequencies at 1515, 1645 and 2050BST. A premonition reared its head that time.

All those callsigns mentioned by the DX boys were needed for brand new all time "heards", so the RX was kept warmed up and then come out and bring her home. So we made a pact. I would run her to the shops, leave her for an hour, nip back home until 1730, and then come out and bring her home. The speed limit must have been broken as I whistled back home, and switched on to hear from US Samda during the last 29 years, probably due to my bed, at my age, being more attractive than listening at 6am.

The card on the previous page is KP6AA (Palmrya Isl) who crept down the single wire feeder into the battery 1-V-1 on 3 January 1947. A report was sent off that day via the bureau, as his QTH was unexpected, but must have gone astray as nothing was heard until 1960, when his home QTH was seen in a magazine. Another card was sent to this address, and Stephen sent his KP6 QSL, saying "surprised to have a request for my old card after all these years, and happy to say I have a few left". This was in 1961. When mentioning listening is rather like fishing the word "persistence" could have been more applicable to DXing. Probably quite a number of people have passed their c.w. tests, also thanks to VERON.

It is relaxing, at times, to not allow the receiver to become almost the only interest. Secondly, and this impression is rather strange and also welcome going back to the set after not using it for a time almost like the effect of listening for the first time. Very refreshing. Using a new, borrowed, or different spare receiver produces the same feeling — for a time.

The point of having a rest from the R-600 had almost been reached when VERON, and two know DX nets of s.s.b. and c.w. said the following stations should be coming on in August and September (in Mount Athos, and most exciting of all to me anyway) including that country for forty years or so, was 8R1, who was heard with a 339 signal working G3VWM on 21.028MHz around 2000BST. A premonition reared its head that time.

Reports have not been sent out since around 1965, as it's really easier to tape record them, and the recording can be drooled over anytime later, which is more interesting, I think, for a listener, than just looking at a card which, however kindly sent, just says "TKS RPT 73". One of the last "serious" QSL cards sent was to some first class Indian operators who spent ten days (believe) on the Laccadive Island, in the Arabian Sea, (Indian Ocean) in March 1961, and had to convince myself it hadn't all disappeared. Which was not surprising as not one c.w. reports; a few say "tks for the first ever card", and fourteen years to receive a card.

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Part Two continues the story

Three cards were received from this station, one by airmail.

At 1636, W1IJB called them and RAJU, with the callsign UV2NRM, came back with WJBs report, I could hardly believe it, and had to convince myself it hadn't all been a dream, until the daily their QSL card dropped through the letter box by Airmail, and a second card via the bureau. This holds pride of place pinned over the RX, flanked by K6SAG, a YL school teacher, in Pago Pago, Dorothy, heard at 0600hrs in July 1958, working WBWO on the key, and she was kind enough to send her card confirming my report in ten days, by airmail.

Only one American, now KH6, has been heard from US Samda during the last 29 years, probably due to my bed, at my age, being more attractive than listening at 6am.

The card on the previous page is KP6AA (Palmrya Isl) who crept down the single wire feeder into the battery 1-V-1 on 3 January 1947. A report was sent off that day via the bureau, as his QTH was unknown, but must have gone astray as nothing was heard until 1960, when his home QTH was seen in a magazine. Another card was sent to this address, and Stephen sent his KP6 QSL, saying "surprised to have a request for my old card after all these years, and happy to say I have a few left". This was in 1961. When mentioning listening is rather like fishing the word "persistence" could have been included. Ten days to find the Laccadives, and fourteen years to receive a card.

Jack Lamberts VP4WQD QSL took a shorter time to come in from the Tabagios, where he was the first amateur to operate from the hotel Robinson Crusoe, on the island, 90 per cent of the cards here are for c.w. reports; a few say "tks for the first c.w. report", and probably the almost 100 per cent acknowledgments of reports sent out was due to them being in c.w. Many said they were inundated with speech reports from Europe which were mainly useless.
Easiwire is the rather cumbersome name given to a new wiring system which does away with soldering. Using the system a beginner should be able to construct circuits using conventional components and the simple tools supplied in the starter kit.

With Easiwire connections are simply made by winding the connecting wire tightly around the pins or wires of each component in the circuit. The connecting wire is carried on a small spool and fed through the tip of the special pen. Each component is held in place by pushing its pins, or wires, through the holes of the plastics matrix board supplied. The holes in the board are tapered and grip the pins so that the components are firmly held in place. The wire is then wrapped tightly around the first pin to be connected, carried across the board to the next pin in the circuit and tightly wrapped around it. This process is continued until the complete circuit has been connected.

Easiwire has several advantages for the beginner. He, or she, can draw the circuit onto a piece of thick card, pierce the holes for the component leads using the tool provided and simply interconnect the component leads following the circuit diagram. This has the advantage of teaching the beginner something about the relationship between the theoretical circuit diagram and the real, practical circuit while reducing the outlay on matrix board.

The components can be used again and again, after unwrapping the wire, as the wrapping process does not damage the components.

Although it may appear to be a form of wire-wrapping it most definitely is not. Wire-wrapping involves cold-welding the wire to component pins which are specially shaped from hard metal so as to cut into the wire. Easiwire just wraps the wire round the leads without any deformation occurring.

**Starter kit**

The starter kit contains all the tools and basic parts needed to get going with Easiwire. The wiring pen has a built-in wire cutter and carries a reel of wire which feeds through the pen tip to make wrapping easy. A spare reel of wire is provided. A sheet of flexible plastics matrix board is included together with two sheets of double-sided adhesive material which can be used to fix the wire in set positions and hold insulation in place at crossovers. A special double-ended tool is supplied. One end unwraps joints, the other enlarges the holes in the board to allow larger component leads to be inserted. To allow you to connect power to the circuit some spring-loaded terminals and jacks are included in the kit along with instructions on using the system.
Construct your electronic circuits the new, quick and easy-to-learn way, WITHOUT solder: with Circuigraph Easiwire from BICC-VERO

With Easiwire all you do is wind the circuit wire tightly around the component pins. No soldering, no chemicals, no extras, simplicity itself. Circuits can be changed easily, and components re-used.

Easiwire comes in kit form. It contains all you need to construct circuits: a high-quality wiring pen with integral wire cutter, 2 reels of wire, a tool for component positioning and removal, a flexible injection moulded wiring board, double-sided adhesive sheets, spring-loaded terminals and jacks for power connections and an instruction book. Of course, all these components are available separately too.

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INTRODUCTION TO OX-TV

Frequencies Affected
Sporadic-E propagation affects frequencies well into the v.h.f. spectrum. This includes TV channels in Bands I and II which are allocated between 40 and 100MHz. Much of the reception takes place on channels below 70MHz, but during intense openings the m.u.f. (maximum usable frequency) can rise sufficiently to permit the reception of the v.h.f. f.m. radio band and even the 144MHz amateur radio band.

Extreme Distances
Sometimes Band I reception is possible from countries located outside the European area and it is not uncommon to find transmissions from the Middle East mingling with ones from Yugoslavia. In fact, many experienced enthusiasts delight in an opening to the south-east in the hope that something further afield will appear. The same remarks apply to openings to Spain and Portugal.

Double-hop Sporadic-E is usually responsible for the reception of stations situated in the Middle East because there is a tendency for them to appear during the reception of countries located at roughly half the distance. However, one theory suggests that double-hop Sporadic-E is not always responsible and reception could be caused by a combination of single-hop Sporadic-E and tropospheric propagation. This theory is supported by the fact that throughout the Mediterranean area, tropospheric enhancement exists for many months of the year.

A classic example of reception via a combination of propagation modes is thought to have occurred from Zimbabwe. For several years, either side of the solar peak, repeated loggings of the channel E2 transmitter at Gweloi became possible by a process due to transequatorial propagation (t.e.p.) skip and Sporadic-E ionisation. Transequatorial skip is usually limited to a region within 40 degrees above and below the equator but in this particular instance the t.e.p. signal arriving in the Mediterranean area was then propagated by Sporadic-E ionisation, before finally descending in the UK. A photographic example of such reception is shown in Fig. 2.

DX reception isn’t always confined to the lowest channels in Band I either. In 1971, one DXTV enthusiast in the UK received signals on Channel R3 from a Russian transmitter at the coastal city of Baku on the Caspian Sea. More recently, Finnish DX enthusiasts have encountered f.m. radio broadcasts from Iraq during intense Sporadic-E openings.

Sporadic-E reception from countries much further afield has been known and exotic locations such as Dubai, Iran and Saudi Arabia have all featured in DXers’ log-books over the last three years. A few years ago, West Indian signals were logged in the UK, although their exact origin still remains a mystery. On another rare occasion, a Brazilian station operating in Band I was noted in the Netherlands, a distance of approximately 10,000km. Fortunately its location was successfully traced by a studio caption

Fig. 1: Map showing the locations of some of the more distant transmitters received during Sporadic-E openings in the UK.

Fig. 2: The chessboard test card transmitted from the Gwelo transmitter in Zimbabwe. The signal was received in the UK via a combination of transequatorial and Sporadic-E propagation.
being aired at the time. It is worth noting that the two dramatic instances quoted previously were witnessed by experienced enthusiasts, who were diligent enough to spot something unusual during what may have appeared to others as just an ordinary opening.

Transatlantic DXTV Reception

On less frequent occasions, transmissions from North America and Canada have been successfully resolved. Two instances of TV reception from across the Atlantic occurred in 1987, during June and July, when 525-line signals in Band I were observed at several locations throughout the British Isles. On the latter occasion, the signals were extremely weak but one DXer managed to resolve them using a fixed-loft antenna which was facing east! Openings on the 50MHz (16m) band from across the Atlantic were also very much in evidence during both those openings. Similar 50MHz activity was present on other dates too, but there were no reports of 525-line television pictures being received.

One possibility suggests that the m.u.f. was insufficient to propagate signals from the lowest 525-line TV channel (A2), which has a vision frequency of 55.25MHz and a sound carrier 4.5MHz higher at 59.75MHz.

When one considers that reception from distant countries in the Middle East, such as Jordan, Syria and even Iran, has been relatively commonplace during the past few seasons (especially 1987), it is fair to assume that reception from North America or Canada should stand a similar chance of being received. Upon examining the map, the distances involved are very similar and there are a fair number of Band I 525-line stations in operation on the eastern coast of Canada and the USA. Another reason for fewer reports of TV reception from across the Atlantic may be the fact that most DXTVers direct their arrays towards the Continent and are therefore less conscious of signals approaching from the west.

Recognising 525-line Signals

Receiving a 525-line signal seems to be the dream of most DXers (on this side of the Atlantic, at least). Mainly because it signifies a genuinely exotic example of DX reception. Recognising a 525-line signal can be a problem because many enthusiasts are not quite sure what to look for. There used to be widespread belief that the horizontal hold control would require adjustment to compensate for the difference in the number of lines. However, this is not the case. The frequency of the line oscillator needs to be run at roughly the same rate, namely 15.625kHz in the case of a 625-line transmission and 15.750kHz for a 525-line signal. In practice, the flywheel sync circuitry compensates for the slight difference in frequency. So, how do we recognise a 525-line signal?

The chief difference lies not with the number of lines, but with the field frequency. All 625-line signals have a field frequency of 50Hz, a frequency which is governed by the public electricity supply. In the USA, and other areas, where the 525-line is used, the electricity supply is 60Hz — the field frequency of the 525-line system being the same. When a 525-line signal is received, the picture rolls vertically at quite a rapid rate. This is usually the first indication of such a signal. The rolling can be cured by re-setting the vertical hold control, but normally the picture amplitude or height is then insufficient, caused by the field timebase operating at a different frequency. The height can be adjusted to compensate for this, but the gaps at the top and bottom of the picture make the signal more authentic. On strong 525-line DX signals, the frame timebase may be tolerant enough to lock on to the different frame sync pulses without adjustment. Indeed, there are a few receivers designed without provisions for frame timebase adjustment. Note that some of the more modern multi-standard designs will compensate for the difference in amplitude automatically, once the timebase recognises the different sync-pulse rate. For DX work, this can only cause confusion!

In some South American countries, 50 and 60Hz electricity supplies can be found. Venezuela is one example and a combination of 525-line and 625-line TV systems are in operation. The 625-line system used has the same parameters for vision bandwidth and sound spacing as the 525-line system to ensure compatibility with shared channel allocations. The systems are N and M respectively. Unfortunately a System N signal would not be as easily recognised as a System M one would, unless the accompanying sound channel with its 4.5MHz spacing could be monitored, or some visual means of identification was possible — such as captions, etc.

Antennas for Band I

We mentioned in Part 9, that a very simple antenna system, such as a dipole, could be pressed into service for initial experiments with Sporadic-E propagation. The majority of Continental high-power transmitters favour horizontal polarisation in which the receiving antenna has to be mounted "flat" or horizontal. Consequently it is recommended that the dipole should be so positioned.

Occasionally, a polarisation change takes place en route and signals which started out life as horizontally polarised arrive at the receiving site as vertical ones. Surprisingly, many enthusiasts rely solely on an array mounted horizontally, but an additional antenna such as a dipole mounted vertically, could prove advantageous when polarisation changes do occur.

A dipole mounted vertically will respond to vertically polarised signals arriving from all directions (Fig. 3), but with a dipole mounted horizontally, maximum signal pick-up occurs when it faces the transmitter (Fig. 4). With any horizontally mounted antenna, some method of rotating it is essential in order to obtain the best reception. If the dipole is mounted on top of an alloy pole, some method of manual rotation can be devised, although for convenience an electric rotator is best.

Better Antennas

Once addicted to the hobby, most enthusiasts can't resist the temptation of installing a more elaborate means of collecting signals. Band I arrays of
3-elements or more are quite common among enthusiasts as they possess a number of advantages over a dipole. The addition of a reflector behind the dipole and a parasitic elements, known as a director, in front of the dipole increases the gain of the system, in simple terms, its "pulling-in" ability from a more specific direction. The gain of a wideband array will exhibit a lower overall gain than an array cut for single channel operation because of its compromise performance over a wider range of frequencies. Although adding more directors will enhance the gain and directional properties of an array, Band I antennas with elements in excess of five are seldom encountered. Antennas with more than five elements are available, but their sheer size may be a problem and they could attract unfavourable comments from neighbours. The improvement in directivity is perhaps the greatest advantage of using a multi-element Band I antenna because unwanted co-channel signals from other directions can be significantly reduced or eliminated completely. However, an antenna which is too directional could easily become a disadvantage in most DX applications because the operator would probably be unaware of other signals arriving slightly off beam. The same remarks apply equally to its front-to-back ratio. Some of the commercially produced channelised arrays have a multi-element reflector assembly designed to reduce signal pickup from the rear. This is fine if it is used in domestic reception applications where a co-channel transmission to the rear might cause interference. For the DXer, such a design might be a disadvantage in the same way that a highly directional antenna would be. In the UK, for instance, a DX signal picked up from the rear of the antenna would be welcomed with open arms because it means it would have come from an "exotic" source.

Availability

When BBC1 and ITV programmes became duplicated on UHF in November 1969, there was little incentive for manufacturers to continue the production of Band I TV antennas for the UK. Of course, there was an export market, but such antennas were only produced in small quantities. Today you'll be lucky to find a British manufacturer still producing them. Fortunately, specialist manufacturers, such as those engaged in amateur antenna construction, can nowadays be of assistance in supplying suitable antennas for Band I reception. Apart from the traditional multi-element array at least one manufacturer is offering a Band I quad-driven Yagi of enormous dimensions!

DIY Antennas

It is a relatively easy task to construct your own multi-element antennas to cover Band I channels E2 to E4. Suitable half-inch diameter alloy tubing can be obtained from most metal stockists; the necessary hardware such as weatherproof dipole junction boxes and suitable element clips are also available.

The measurements for a semi-wideband array are also shown in Fig. 5. Due to its smaller operating bandwidth, this type of array offers an improvement in gain over a wideband design having a similar number of elements. This particular type of array was designed by Ray Davies and Clive Athorre of Norfolk some years ago in order to improve signals received from Belgium and the Netherlands on a daily basis without restricting its use to any particular Band I channel.

Channelised Arrays

The gain of the system is often considered to be the least important aspect because most signals received via Sporadic-E propagation are anything but weak. However, the increased gain is an important factor if you wish to concentrate on monitoring an extreme fringe Band I transmitter on a regular basis. Such a transmitter could be Lopik in the Netherlands on Channel E4, this is a signal which can be received on virtually a daily basis, albeit extremely weak, over large areas of the UK. For the reception of specific transmitters, a channelised array is recommended since its performance will...
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be optimised for that particular channel. Some Band I channelised arrays can be obtained with as many as eight elements but bear in mind that some of these may constitute part of the reflector assembly.

**Search Antennas**

There are times when some means of monitoring an empty band for initial signs of DX reception is desirable. A four element array beamed east should not effectively respond even to strong signals arriving from other directions (the south, for example) and an opening could easily be missed. Besides, most antenna rotators take a minute or more to turn the arrays through 360 degrees and although this may not seem very long, a small Sporadic-E opening could easily come and go!

What is required is some form of "search" antenna system with an all-round or omni-directional response, thus avoiding the need to continually rotate a multi-element array. Various options are available.

For instance, two or more dipoles could be mounted facing different directions and fed to independent receivers enabling several DX signals to be monitored simultaneously. Alternatively a switching arrangement could be considered allowing the output of either dipole to be selected. Another arrangement consists of two dipoles mounted horizontally at 90 degrees to one another. The output can be phased together to provide a system giving omni-directional coverage.

One type of antenna which has successfully been used by enthusiasts for Band I reception is the discone. This particular antenna covers 50-500MHz and is primarily intended for v.h.f. scanner applications.

Another type of antenna which may have possibilities for search applications is the active antenna. One type is enclosed in a small weatherproof plastic housing, features an integral low-noise wideband amplifier and is omni-directional. This is the UFO manufactured by Triax, at only 325 x 255mm it is primarily intended for yachts, caravans, buses and lorries.

**Need Help?**

The start of the 1988 Sporadic-E season should be with us as this issue of the magazine hits the bookstalls. If there are any newcomers to DXTV who would like queries answered, write to the authors via the Editor enclosing an s.a.e. for a reply.

---

**Fig 8: Triax UFO active antenna.**
Godfrey Manning G4GLM

In the column this issue Godfrey looks at frequency changes and flight plans as well as issuing an invitation to join him on a special charter flight from Gatwick and help a good cause at the same time.

Unfortunately this list is not in callsign order, but is useful information nevertheless. I see that an ordered list does appear in the RAF En-Route Supplement but this is incomplete and I'm not sure as to why. Mr. Coulter's previous experiences were as a naval operator during the war and he also worked with the RAF at Gatow during the Berlin Airlift. Some well-known British airlines had their beginnings at this time; a little-known Frederick Laker was amongst those early operators! Lastly, a comment on the 877R receiver; its tuning scale is, as I suspected, a conventional dial and with 17mm to cover the arband, station identification and selectivity will not be comparable with a scanner.

The usual publications (radio-navigation charts, Aerad Supplements, etc.) give the latitude and longitude of each radio beacon. These can be plotted on Ordnance Survey maps or even located directly on the various topographical aeronautical charts. This was tried by John Parry G4AKX (Northwich, Cheshire) and he was able to find the Whitegate n.d.b. (WHI: di-dah-dah, di-di-dit, di-dit, 306.5kHz) in a wood near Oulton Park Racecourse at N5311.1 W00237.3, also the Manchester runway 06 l.i.s. locator outer marker (MCR; dah-dah, dah-di-dah, di-di-dit, 269kHz) near Knotsford at N5318.4 W00222.2 and 3.89 nautical miles from the threshold. John notes the withdrawal of the Congleton n.d.b. (CON; dah-di-dah-dit, dah-di-dah-dit, 360.5kHz) which should reduce interference to Ronaldsway (RWY: di-dah-dit, di-dah-dah, dah-di-dah-dit, 359kHz).

Eureka has been covered extensively (April "Airband") but continues to attract interest. M. Hames (Chasetown, Staffordshire) quotes the system's range as 50 nautical miles, assuming an airborne interrogator.

The relay sites for the London Air Traffic Control Centre were listed in the March "Airband." Unfortunately, one location was incorrect; for Frintingham read Trimingham. This is 15km from the North Walsham, Norfolk home of T. S. Christian to whom I'm grateful for bringing the error to my attention. The station relays 124.6MHz + 5kHz, 125.275MHz (Anglia Radar), 131.05MHz – 5kHz and 134.25MHz – 5kHz. Note the offset to allow several relay stations, situated at various locations, to work on the same nominal frequency without mutual co-channel interference. Trimingham has within its range Norwich Airport, North Denes helicopter base, RAF Coltishall and several smaller fields. On the Norfolk coast there is much helicopter activity out of Coltishall such as "Rescue 125" and "Rescue 126." Communications are on h.f. when distance requires this; also, marine liaison is done on m.f. and v.h.f. with Yarmouth Maritime Rescue Coordination Centre (m.r.c.c.) and on h.f. with Edingburgh r.c.c. Bad-weather Sundays bring out the helicopters and lifeboats in joint exercises. This is not the sort of flying that would appeal to most people and all users of the coast and sea should be grateful that, if the worst ever happens, help is at hand even in the most undesirable weather conditions.

A reminder that the new North Terminal is now open at London (Gatwick). The Captain's panel. Britannia Boeing 767-204 G-BLVK (23072). Note indicated airspeed 236kts, flight level 410, time 13:15 UTC. Just coming up to Autun (ATN: dah-dah, dah-dah-dit, 114.9MHz) heading 356°. A left turn is required for Abbeville (ABB: dah-dah, dah-di-dit, dah-di-di-dit, 116.6MHz).

(Author's photo)
congestion here was due to apron and not runway capacity, hopefully the extra stands will help. The terminal is accessed from taxiway areas 7 and 8.

Here are the new v.o.r. changes in the 3/88 issue of the Civil Aviation Authority General Aviation Safety Information Leaflet, The Newcastle v.o.r./d.m.e. (NEW: dah-dit, dit, di-da-da) is permanently relocated to the airfield but its frequency has changed from 112.05MHz to 114.25MHz. At Glasgow, the old GOW (dah-dah-dit, dah-dah, 113.4MHz v.o.r./d.m.e. that was 11 nautical miles SSE of the airport has been withdrawn. The temporary v.o.r./d.m.e. on the airport, ABO (dah-dit, dah-di-dit, dah-da-da), 115.40MHz has been made permanent and its identity has been changed to GOW, so be careful! On to BKY: dah-di-di-dit, dah-di-dah, dah-di-dit. At Barkway a d.m.e. is to be permanently located at the airfield but its identity (117.50MHz) has been permanently changed to 114.25MHz. Finally, they’ve re-introduced the London v.o.r./d.m.e. that was introduced the London v.o.r./d.m.e. (dah-dah, 116.25Mhz. Finally, they’ve re-introduced their identity of the changed to GOW, so be careful! On to Prestwick and the PWK (di-da-da-dit, dah-da-da) has been permanently changed to 113.4MHZ v.o.r./d.m.e. identity of the v.o.r./d.m.e./n.d.b. (117.50MHz and 355kHz) has been permanently changed to Turnbury (TRN: dah, di-da-da, dah-di-di). At Heathrow (LON: di-da-da, dah-di-di, dah-di-di) identity of the v.o.r./d.m.e./n.d.b. (117.50MHz and 355kHz) has been permanently changed to Heathrow (LON: di-da-da, dah-di-di, dah-di-di). Finally, they’ve re-introduced the London v.o.r./d.m.e. down here at Heathrow (LON: di-da-da, dah-di-di, dah-di-di, dah-di-di, dah-da-da). At Heathrow (LON: di-da-da, dah-di-di, dah-di-di, dah-di-di, dah-da-da), 116.25Mhz. Finally, they’ve re-introduced the London v.o.r./d.m.e. that was introduced the London v.o.r./d.m.e. (dah-dah, 116.25Mhz. Finally, they’ve re-introduced their identity of the changed to GOW, so be careful!

Pilots shouldn’t take my word for it, all of the above changes are officially covered by class A NOTAMs.

**Flight Plans**

In the April “Airband” Chris Durkin (Omskirk, Lancashire asked for the London/Australia flights plan of BAW9 and BAW11 (note the new 3-letter airline designators that are now coming in to use). The entire plan is far too long to print here, and if you can’t find anything, it varies slightly from one flight to the next. The flight is planned via radio navigation beacons when overland; these are connected up by the airways, making the appropriate chart look like the result of a “join-up-the-dots” puzzle. A typical flight plan is computerised these days; additional information could include true and magnetic tracks; time between waypoints (and elapsed total time); distance between waypoints; forecast wind and temperature; fuel requirements; speed information and likely altitude. To avoid the risk of uncontrolled amendments only one copy of the plan is despatched.

To keep things simple, here is an abbreviated navigation plan for the Speedbird 011 to the first stop en route which this time was at Abu Dhabi. Elapsed time depends on wind.

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**Airway**

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### Antenna Range

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<td>20ft</td>
<td><strong>£164.36</strong></td>
</tr>
</tbody>
</table>

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New Short Wave Service From Morocco

Radio Television Morocaine recently started relaying its international network on short wave. Programmes from Rabat are noted between 1400 and 1700UTC on 17.596MHz. At 1700UTC they switch to 17.710MHz until 1900UTC when they continue until 0100UTC on 11.920MHz. The BBC Monitoring Service reports that English programmes from Morocco also form part of this new international service short wave relay, i.e. between 1630-1800UTC, Monday-Friday. On Saturdays the block is later between 1700-1900, and on Sundays between 1900-2000UTC.

Don't jump to conclusions though because at 1630UTC 17.596MHz in Europe has two stations broadcasting in English on top of each other. BRT Belgium is broadcasting a programme towards Africa, and Morocco is trying to do the same in the opposite direction! Let's hope that one of them makes a move before too long.

Contrás

Despite the recent accord between the Nicaraguan government and the Contrás which started on April 1, the US backed forces have no plans to discontinue their clandestine radio station. Radio Liberación, believed to be coming from the southern part of El Salvador, continues to operate. A spokesman for the United Nicaraguan Opposition in Washington DC told Short Wave Magazine that the opposition was regarded as humanitarian aid, not military.

US Navy Radar To Move

The United States Navy has decided to move its relocatable short wave over-the-horizon radar system to a new site in the Aleutian islands. They are located near the Alaskan mainland. In the course of 1988, the experimental radar system will move from its current site in White House, Virginia to Architskka Island.

Meanwhile the US Airforce has a short wave over-the-horizon radar system up in Maine, in the North-East corner of the USA. Extensive tests of the system were made in January. But judging from monitoring reports, it seems to have done all this testing without causing major interference problems to short wave broadcasters.

Ever since the Russian over-the-horizon radar system caused severe reception problems during its early operations, concern has been expressed that this might also happen. In order to make them compatible with other spectrum users. If any reader has experienced what he or she believes to be the new US h.f. radar system, drop me a line.

Satellite Links Now Working

The Boston based Christian Science Monitor news station has established the satellite link to the rock music station KYOI it has bought on Saipan. Between 2200 and 2300UTC the 'Monitor news programme' is being heard on 15.405MHz before they return to tapes of soft-rock music.

Radio Canada International's new relay of English programmes via the facilities of Radio Japan is being heard on 15.386 and 17.710MHz with fair signals at 1200UTC. But at 2200UTC the programme is blocked by Radio Sweden using the same channel of 11.705MHz to America.

1000 Years Dublin

Back on St. Patrick's Day March 17, a new station began life in Dublin, Ireland. Run by the public service broadcaster RTE it has a rather unusual name: Radio Millenium. As well as f.m., the new station is also being heard on 1.278MHz medium wave between 0700 and 1300UTC Monday to Saturday's between 0900 to 1300UTC. Putting the station in the middle of Dublin's largest shopping arcade is seen as an attempt to improve the national radio's visibility in face of the onslaught from local pirate stations.

New Zealand Out Of Band

Radio New Zealand have announced a move to a new out of band channel back on Sunday May 1. Between 1830 and 2105UTC look for the 7.5kW transmitter on new 12.045MHz. There has been a lot of talk that the BBC External Services have been talking with both Australian and New Zealand broadcasting organisations.

It is said that discussions are underway to establish a new relay station in the Pacific for the BBC. Signals from the BBC Singapore relay station are not reliable all year round in the Pacific area.

But don't hold your breath! The press office at the BBC External Services in Bush House told Short Wave Magazine that plans to build the Pacific relay station in New Zealand are in very early stages. So early in fact that they have not yet approached the British Foreign Office for possible funding.

Moscow's Midweek Muddle

We could have foreseen the muddle that happened on the short wave bands between May 1 and 3. All the new schedules from Radio Moscow and the Soviet Peace and Progress station showed that they would be making their summer frequency changes on Wednesday May 4. Everyone else that planned to make adjustments did so on Sunday May 1. The first Sunday in May is traditionally the time to do this, but this year it coincided with the important May 1 celebration in the USSR. This must have been the reason for delaying frequency moves by three days, thought at the expense of some terrible frequency clashes during that week.

TV5 — Poor Response

The French media report was highly critical of TV5, the consortium of francophone television stations which broadcast to Europe. TV5 isn't as successful as it was hoped suffering from a vague identity, a limited audience, and uncertain funding.

The report estimates TV5's viewership in Europe at just 90000 people.

In other development, it was announced on Tuesday that SEPT, France's cultural channel for Europe, has joined the TV5 consortium. SEPT will officially begin transmitting as an independent station when the TDF1 DBS satellite is launched. However there will be no merger of TV5 and SEPT, and idea put forward in the media report. TV5's management has disclosed that a North American version of the channel will be launched in June.

The Moroccan government has granted a license for a private TV station which will broadcast to Morocco on the country's second network and to Africa and cable systems in Europe via satellite. Broadcasts will start next year in French and Arabic.

One part of the service will be unscrambled, mostly in the morning, with Arabic programmes for general audiences. The scrambled portion will consist of films, music and sport, and will be mostly in French. The station will see the Intelsat satellite network and plans to cover francophone West Africa, Arabic-speaking Africa, and Arabic-speaking communities in Europe via cable.

Financing will come from viewer subscription fees which enable one to unscramble the station's broadcasts. The channel will also have to invest about 38 million dollars to repair and extend Morocco's second TV network which isn't being used at the moment.
RDS On Show
The BBC will be holding a special exhibition in London this year at Earls Court between October 1 and 9. One of the highlights will be the official launch of the Radio Data System — a technical development which makes it possible for f.m. transmitters to carry additional information using a 57kHz subcarrier, and which can be decoded on a suitable receiver as a digital display. You might like to note that SWM will be there too.

French Report
Prime Minister Jacques Chirac recently announced that Canal France (which simply translates as "Channel France") would start broadcasting television programmes to Africa via satellite.

The project is being financed at an initial cost of £600000 by the French Ministry for Co-operation. It is designed to fill the gap in French programming in francophone Africa as well as to offer programmes to Africa's national TV networks which can either be inserted live or taped for later use. Canal France will replace France's current system of sending video cassettes to TV networks. Besides being a rather slow method of distribution, France only sends 5000 hours of cartoons to Africa a year, exclusively in French.

West Germany, on the other hand, supplies 12000 hours in five languages to the same continent, and the US Information Agency's Worldnet has been broadcasting via satellite to six African nations since October of last year.

Mr Chirac said Canal France will carry a variety of programmes, including films, cultural magazines, news and entertain ment programmes, produced essentially by France's public television stations.

The Prime Minister also left open the possibility that programmes produced by African stations might be rebroadcast if they were of interest to other countries in the continent. He added that, in future, financial backing may also come from public and private stations in France, as well as African TV stations.

Initially it will broadcast eight hours a day via the last available channel on the Intelsat V satellite. Reception by home dishes isn't envisaged — it is mainly broadcasting stations that will have the necessary equipment.

The private French television channel, Canal Plus, has also showed an interest in broadcasting via satellite to Africa. It is investigating the prospects of broadcasting its so called Canal Plus Afrique programme via satellite as well as obtaining local partners in Africa to rebroadcast its transmission on local or national TV networks. The French Ministry for Co-operation has not ruled out that Canal Plus could use its satellite channel to transmit to major cities in Africa. However, the ministry hastened to add that this would only be on a temporary basis.

Canal Plus has another plan though. It has applied to use one of the four available channels on the TDFI direct broadcast satellite, scheduled to be launched later this year, to broadcast a scrambled channel in German in conjunction with a West German group. This will try to rekindle the interest in individual home dishes which has been severely hit by the failure of the West German direct broadcast satellite a few months back.

Radio France International Cuts Back English
Meanwhile, a report was recently presented to the French government concerning France's foreign media policy. It congratulates Radio France Internationale France's external radio service, on the progress it has made since 1982. But it also levels criticism at RFI's technical backwardness and its limited audience outside Africa. It says RFI should be heard throughout the world as soon as possible, adding that its development strategy should focus on Asia.

RFI started broadcasting in Arabic to North Africa at the end of March, but has cut back in the number of English bulletins. Some early morning news broadcasts have been cut. You can now hear short news programmes at 0315 on 9.790, 11.700 and 11.670MHz (amongst other channels) and at 1245UTC on 21.645, 15.155 and 11.670MHz (amongst others). At 1600UTC "Paris Calling Africa" has been dropped as a title. The new RFI schedule calls the 60 minute segment on 6.175MHz "Paris Calling the World!", but they don't refer to this on the air.

RFI still get my award for "most confusing programme schedule". All the abbreviations on the charts are only in French. If you haven't got a dictionary, then, it appears, that is too bad!

I recall reading in the monthly journal of the World DX Club that an RFI listener in London received several hundred RFI programme schedules at once last year. All were individually sent through the post thanks to a computer error in Paris. I wonder if they solved the problem?

Sunspots Number Rising Faster Than Expected
Several reports have been circulating that the sunspot cycle is doing some strange things. The source of the news items turns out to be Patrick Macintosh of the US National Oceanographic and Atmospheric Administration. Dr. Macintosh feels that the new solar sunspot cycle is rising surprisingly fast and it might reach its maximum earlier than had been expected. He bases his findings on two primary considerations.

First, the average sunspot number, as well as the solar flux measured at 2800MHz, are rising much faster than most 11 year solar cycles observed this century. Dr. Macintosh has also been analysing the rate at which sunspots are increasing. This also appears to be moving up rather fast.

Second, there is some interesting data surrounding so-called solar filaments. These are masses of gas suspended above the sun's surface by magnetic fields, and from the earth they appear as dark thread-like structures on the solar disk. Solar filaments usually show a tendency to migrate to the poles of the sun as the solar cycle progresses towards the maximum, but this is currently happening more rapidly than would be expected at this point in the cycle.

Overall Macintosh believes that the rise to maximum has been advanced by at least a year. If he is right, then we should see the high sunspot figures appearing in the first quarter of 1990, and even as early as the end of next year.

There is similar thinking in Australia, though here in Europe many observatories are still putting the solar maximum around May of 1991. Short wave broadcast stations are following the developments closely. High solar activity means that the higher frequencies of 17 and 21MHz start to perform much better, and that in turn alleviates the chronic congestion on lower frequencies. There is a trade-off though. Higher sunspots usually leads to an increased chance of sudden ionospheric disturbances, where short wave reception can disappear without warning for several hours at a stretch.
Peter Rouse GU1DKD

On a recent visit to the States, Peter Rouse was fortunate enough to visit the Kennedy Space Center. This report was filed on his return.

There is, as they say, good news and bad news. Luckily the good news is better than the bad. First the good news. The Shuttle programme is still on schedule for resumption in August and the new weather satellite, NOAA-11, is due for lift-off on July 16.

The bad news is that we are unlikely to see another amateur on board the shuttle in the foreseeable future. Although Tony England (WOORE) and Owen Garnott (W5LFL) thrilled the world-wide amateur fraternity with their 144MHz band contacts and slow-scan TV, the sad fact is that as the schedule stands there are no licensed amateurs currently on the roster for the next series of shuttle launches.

That aside, let’s go back to the good news. The NASA staff at Kennedy Space Center, KSC, are “buzzing”. Despite what the newspapers may say, the morale is high and everybody is getting excited about the programme continuing. The three shuttles, Discovery, Atlantis and Columbia are on the site being prepared and, barring hitches, Discovery will be the first to resume operation. At the time of writing, the newly designed O-rings have all been flown before. They are Pilot Richard Covey and Mission specialists John Lounge, George Nelson and David Hilmers. The prime object of STS-26 will be not only to test the modified launcher and shuttle (the improved safety features such as escape hatches that can be detonated), but also to launch a new Tracking and Data Relay Satellite; TDRS-C.

Discovery will lift-off from Pad 39-B at Cape Canaveral and go into a 296km high, circular orbit inclined 28.5 degrees to the equator on a four-day mission. Dick Young at KSC’s Press facility has confirmed that the two UHF frequencies used for communication, 259.700 – 260.000MHz, remain unchanged. NASA is not the least bit concerned that these frequencies are published, nor that enthusiasts listen-in. Indeed, he seemed somewhat puzzled when I (as a Brit used to the attitude of the UK government) asked if they minded. The USA, of course, has a very different attitude to open government and anyone visiting KSC will be bowled over by the openness. Imagine the British Government opening up one of its major scientific establishments to tourists. This is probably the best free show in Florida.

However, you are now faced with an interesting anomaly. NASA say by all means tune-in to the shuttle communications, the British Government via the Wireless Telegraphy Act say “don’t you dare.” It is just another example of how absurd the situation in Britain is and surely one must question whether the government has any legal or indeed moral right to stop anyone from listening to extra-terrestrial communications. For example, when my book, Scanners 2, came out, there were several raised eyebrows about the inclusion of the FLtSatcom (FleetSatCom) frequencies. These are a series of American Geostationary Military Communications satellites and the reason I was happy to publish was quite simply that the American Government themselves make no secret of the frequencies. Indeed NASA issued quite a detailed press release about the satellites on the 4 December 1986.

New Weather Satellite

Anyway, if you follow the advice in my series on getting started on weather satellites you will now be in a position to

NOAA-11, due for launch on July 16, features emergency beacon tracking equipment and scientific equipment some of which is British.
tune in and get ready for the new bird, NOAA-H (she only becomes NOAA-11 once she’s successfully in orbit). NOAA-11 will replace the early morning/afternoon vehicle, NOAA-9 which now has problems showing up on some equipment particularly on the power supply and microwave sounder channels 1 & 2 which have both totally failed.

NOAA-11 will have a big advantage over NOAA-9 in that the overhead time will be earlier (11.40pm and 1.40pm approximate equator crossing)! Naturally, this should mean that better pictures are obtained in the winter because light levels will be better at this time of the day than they are in the middle of the afternoon. NOAA-11 will carry some British equipment and is due to be launched on May 18 using an Atlas-E ballistic missile modified for more peaceful applications from the Vandenberg Air Force Base in California.

In addition to the usual visible image and near-infra-red pictures, she will also carry equipment for SarSat/Cospas, the joint Emergency beacon locator system operated by the USA, France, Canada and Russia. NOAA-11 will join five existing satellites providing reception of signals on 121.5, 243.000 and 406.000MHz. These are the frequencies used by emergency locator beacons on aircraft and ships and include such devices as ELTs, EPIRBs and SAR-BEs. The reception of a signal on any of the frequencies causes an alert signal to be transmitted to a ground station with an approximate location. From there on, search aircraft using more localised d.f. methods can home-in on the beacon.

NOAA-11 also carries a number of scientific measuring instruments and although the data provided by these will not be of interest to most weather satellite enthusiasts, it is interesting to note that there is British participation. This consists of a three-channel sounding unit designed to measure the temperature of the stratosphere.

Communications and Data Handling
NOAA-11 will take up the frequency of 137.62MHz, which is currently used by NOAA-9. Recent NOAA bulletins have hinted that the satellite may simulcast on NOAA-9. Recent NOAA bulletins have hinted that the satellite may simulcast on NOAA-9. Recent NOAA bulletins have hinted that the satellite may simulcast on NOAA-9. Recent NOAA bulletins have hinted that the satellite may simulcast on NOAA-9. Recent NOAA bulletins have hinted that the satellite may simulcast on NOAA-9.

Table 1: Communications & Data Handling

<table>
<thead>
<tr>
<th>Link</th>
<th>Carrier Frequency</th>
<th>Information Signal</th>
<th>Baseband Bit Rate</th>
<th>Modulation</th>
<th>Sub-carrier Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command*</td>
<td>148.55MHz</td>
<td>Digital commands</td>
<td>1kbps</td>
<td>Ternary frequency shift</td>
<td>8, 10 &amp; 12kHz</td>
</tr>
<tr>
<td>Beacon</td>
<td>137.770 &amp; 136.77MHz</td>
<td>HRS, SSU, SBU, SBUV/2, DCS data</td>
<td>832kbps</td>
<td>Split phase shift</td>
<td>p.s.k.</td>
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<tr>
<td></td>
<td></td>
<td>spacecraft attitude data, time code, housekeeping telemetry, memory verification, all from TIP</td>
<td></td>
<td></td>
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<tr>
<td>VHF real time</td>
<td>137.000 &amp; 136.620MHz</td>
<td>Medium-resolution video</td>
<td>2kbps</td>
<td>a.m./f.m.</td>
<td>2.4kHz</td>
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<tr>
<td></td>
<td></td>
<td>data from AVHRR</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>S-band real time</td>
<td>1698 or 1702.5 &amp; 1707MHz</td>
<td>High-resolution AVHRR &amp; TIP data</td>
<td>2.6616Mbps</td>
<td>Randomised non-return-zero</td>
<td>p.s.k.</td>
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<tr>
<td>S-band playback</td>
<td>1698, 1702.5 or 1707MHz</td>
<td>High-resolution AVHRR data from MIRP, medium-resolution AVHRR data from MIRP, all TIP</td>
<td>664kbps</td>
<td>Split phase p.s.k.</td>
<td></td>
</tr>
<tr>
<td>Data collection</td>
<td>401.65MHz</td>
<td>Earth-based platforms &amp; balloons</td>
<td>400kbps</td>
<td>Split phase p.s.k.</td>
<td></td>
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<tr>
<td>(uplink)</td>
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<tr>
<td>S-band playback to</td>
<td>1698, 1702.5 or 1707MHz</td>
<td>TIP data recovered from tape</td>
<td>332.7kbps</td>
<td>Split phase p.s.k.</td>
<td></td>
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<tr>
<td>European ground</td>
<td></td>
<td>recorders</td>
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<tr>
<td>S-band contingency</td>
<td>2247.5MHz</td>
<td>Boost during ascent &amp; real-time TIP in orbit</td>
<td>1024MHz</td>
<td>p.c.m./b.p.s.k.</td>
<td></td>
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<tr>
<td>&amp; launch</td>
<td></td>
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<tr>
<td>SAR L-band</td>
<td>1544.5MHz</td>
<td>Data transmission from SAR &amp; SAR to ground</td>
<td>300kHz (video)</td>
<td>p.m.</td>
<td>2 rad psw</td>
</tr>
<tr>
<td>downlink</td>
<td></td>
<td>spacecraft</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SAR uplinks</td>
<td></td>
<td>From ground ELT/EPIRBs to spacecraft</td>
<td>25kHz</td>
<td>a.m. for</td>
<td>125.5/243MHz</td>
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<td></td>
<td>121.5 &amp; 243MHz</td>
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<td>406MHz</td>
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<td>406.05MHz</td>
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<td></td>
<td>406.025MHz</td>
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* Uplink to the satellite

Behind all the scaffolding and covers, Columbia is readied for her next mission which will be in 1989.
WEATHER SATELLITE RECEPTION

Peter Rouse

This time we look at a crossed dipole with integrated line-powered amplifier which not only provides good reception of the v.h.f. weather satellite signals but, with only slight adjustments, can also be used for UoSAT.

The design presented here integrates the masthead pre-amplifier and in doing so does away with the clumsy matching that is usually employed. It also uses readily available materials and excluding the electronics and cable, all parts for the prototype were bought new for less than £5. Even so, the finished product is a very professional looking antenna.

The reason we need to use a crossed dipole is that signals from the satellites are phased for circular polarisation; right-hand in the case of the weather satellites, left-hand for the UoSATs. This is to overcome the polarisation problem that can occur as the satellite makes a pass, in other words the polarisation of the satellite’s antenna will change in relationship to the polarisation of your own antenna during the course of a pass.

Antenna and Circuit Description

The antenna is a standard crossed dipole, often referred to as a “Turnstile”. It is omni-directional (not evenly distributed gain though, as the response tends more towards a square with rounded corners) and has circular polarisation. To achieve this polarisation, the first set of dipoles are fed with a signal from a second dipole. The signal has to have a phase difference of 90° and this is achieved by using a feeder section that consists of 75Ω cable. The length of this cable is calculated by taking a quarter wavelength and multiplying it by the velocity factor of the cable. A typical velocity factor for solid dielectric cable (v.h.f. f.m. radio type) is 0.68 and by multiplying the true quarter wave by this factor (note that the figure shown for the antenna itself includes what is known as the correction factor we arrive at the length for the phasing section.

Because of the rather cramped confines of the conduit box used in construction you will need to use the thinner v.h.f. type cable rather than the thicker u.h.f. low-loss type.

The resulting feed point impedance is around 35Ω and usually a quarter wave section of 50Ω cable is normally used to provide a 35Ω feed point which is considered near enough a match for a 75Ω feed cable. In this instance, no matching section is required as the necessary match is provided by the input to the pre-amplifier and standard 50Ω cable is used for the feed. The pre-amplifier is a conventional arrangement consisting of a BF981 m.o.s.f.e.t. with input/output matching and direct connection to the first pair of dipoles. The transistor was chosen for its very low noise characteristic at v.h.f. and the two transformers are pre-wound Toko types (MC111 4.25t + 1.25t). The 12 volt d.c. for the pre-amplifier is fed up the coaxial cable and the two chokes L1, L2 provide the d.c. path to the circuit whilst ensuring that the output v.s.w.r. is not unduly affected. These chokes simply consist of 4 turns of pvc covered wire on a small ferrite ring.

In most instances it should be possible to power the pre-amplifier with just a simple modification to the receiver. If the connection between the antenna socket and receiver circuitry is broken into and a capacitor inserted to isolate d.c. from the receiver, then the receiver’s d.c. supply can be fed to the antenna input via the 1µH choke with d.c-coupling capacitor. Alternatively a simple power supply could be used and this can be housed in a small case with input/output sockets.

The p.c.b. is double sided, not only to ensure stability but pads are provided on the top side for connection to the antenna elements. Note that holes are provided for through-connections to connect the pads with the track-side of the circuit board. Where possible the components connected to ground should be soldered both sides of the board.

Antenna Construction

One point that is rarely mentioned in articles dealing with crossed dipoles is that ideally a non-metallic boom should be used to obtain the near-perfect circular polarisation. The easiest way to overcome this is to use a section of standard pvc electrical conduit. It is readily available and is inexpensive. However, it is not very rigid and some form of stiffening is required. The easiest way to overcome this is to reinforce it with a piece of dowelling of the same length. It could be argued that just the dowelling could be used for the boom but the problem with wooden booms is that they need to be heavily varnished and the varnish needs to be recoated at regular intervals to protect the wood and keep it moisture. There is a standard 20mm size in round conduit and its internal bore is a fraction over 16mm. Quite by coincidence, a standard size for wooden dowelling is 16mm and the dowel fits nicely inside the conduit. All that is needed is a liberal coating of impact adhesive on the wood before it is inserted. The ends should be sealed up to keep rainwater out and this can be done with any suitable sealant, even car body filler paste. It is worth noting by the way that this type of boom is also excellent for other antennas needing non-metallic booms, helical types being just one example.

For the actual antenna you will need to obtain a pvc, 4-way, surface, junction box with lid and rubber seal (at least five metres of round conduit and these can be obtained from electrical suppliers or the bigger d.i.y. stores (the conduit is usually sold in 8-metre sections). However, one word of caution, you must use white conduit. Boxes and conduit are made in black, but the graphite used to dye the pvc can affect the characteristic of the antenna. You will need to drill two holes in the base of the box. One should be in the centre and big enough for a No. 8 wood-screw, the remaining one is for the feeder. Cut four pieces of the conduit to a length of 560mm (this is sufficient length for even the airband version), and then glue them with pvc adhesive into the junction box outlets. Smear some liberal amount of impact adhesive onto the top of the boom and screw the junction box into place. The glue, when set, provides a seal to keep water out of the wood and also stops the box from spinning loose.

For ease of manufacture, the p.c.b. is etched in the square shape shown. However, to fit into the conduit box it has to be trimmed and filed to shape with corners cut off and cut-outs for the conduit box screw pillars (see photograph). You will need four lengths of stiff wire (preferably silver coated or tinned copper wire), these must be cut so that when they are soldered to the pads on the p.c.b. they give the required dipole length.
WEATHER SATELLITE RECEPTION

Part 3

The braid from the phasing section must be insulated so that when the cable is soldered to the lower side of the p.c.b., it cannot come into contact with the tracks. With the feeder cable threaded through the junction box and connected, the phasing section is inserted into the conduit carrying element “C”. The element wires are now inserted into each conduit and the ends soldered to the top pads on the p.c.b.

Once the antenna has been tested and the pre-amp tuned up, the ends of the conduit will have to be sealed and this can be done either with corks or rubber bungs. It will also be necessary to use some kind of sealant such as mastic, silicone rubber, glue or even Blu-Tack on the cable entry points, the box lid and the screws that hold it down.

Alignment and Tuning for Other Bands

The input/output matching circuits are simply tuned for best signal-to-noise ratio prior to installing the antenna. Rough tuning can be done with the two trimmer capacitors and the coil slugs can be used for final trimming and both circuits should be re-peaked until no further improvement can be made. In the case of the weather satellites, if a signal source is available then optimise the circuitry for 137.5MHz. For UoSAT reception you will need to swap over connections B and D and peak the circuit for 145.825MHz. Tuning should be done with the antenna well away from any metallic objects and ideally should be done outdoors and not in the shack. It is also best to tune-up with the antenna connected to the full length of feeder that is going to be used.

**YOU WILL NEED**

| Resistors  | Carbon film 1/8W 5%  |
| R3         |
| R1, 2      |

| Capacitors | Disc Ceramic  |
| 1nF        |
| 2.2nF      |
| C2, 4, 5, 7|
| C6         |

| Foil Trimmers | 1, 2 |
| 22pF          |

| Semiconductors | Transistors |
| B7981         |
| Tr1           |

| Sundries    | L1, 2 4 turns pvc coated solid wire on 10mm ferrite ring (Cirkit part number 55-03712); T1, 2 1.25/4.25 transformer (Cirkit part number 35-11158); p.c.b.; Round electrical pvc conduit (must be white); 4-way conduit box with lid and gasket; pvc glue; sealant, etc. (Additional parts may be required for power supply stages.) |

In all instances there should not be any sharp nulls when the antenna is rotated. If this is the case, then the phasing section is not the correct length and you may need to trim-it (do note the earlier comments though that gain is not exactly the same in all directions). If the velocity factor of the cable is not known, then it is probably a good idea to start with a longer than estimated length and cut by a few millimetres at a time until all nulls disappear. It is worth noting by the way that by deliberately mis-phasing it is possible to create a highly accurate d.f. antenna. Careful pruning of the phasing section can produce an antenna with one very sharp null in only one direction (there will be a less pronounced null opposite).

If the circuit shows any signs of instability (oscillation) then two cures are possible. The first is to screen the two tuning coils (old i.f. coil cans will do and can be soldered direct to the top ground plane), the second stage is to include an interstage screen between the transistor and output tuned circuit (a piece of p.c.b. is ideal). In an extreme case, gain can be reduced progressively reducing the value of the resistor R2 between G2 and ground.

Finally

The antenna should be mounted in a good high spot well away from any metal that can upset the polarisation pattern. Normal TV antenna mounting hardware can be used but remember not to put too much pressure on the boom as it is not as strong as aluminium.
THE HAMGEAR PMX PRESELECTOR

The PMX is basically an antenna tuning unit combined with a three-stage pre-amplifier, having full HF coverage and designed expressly for SWL use. Years of short wave work with various poor antennas in small gardens convinced us that what was needed was something just a bit more than the simple ATU. It always seemed that even after tuning the antenna and going to a fair amount of trouble over it there was still something lacking; something we were missing. A preamplifier was eventually tried in conjunction with the ATU and immediately things began to happen; the receiver perked up and felt a whole lot livelier. Overload was no problem with the RX gain backed off, the signal to noise being controlled by the preselector and we did have better reception. In 1964 the first PM1 preselector was produced, subsequent models going all over the world, 2,000 being made before we stopped counting. The PMX is our latest thinking on this original design.

There are four pages of free information available on the PMX, one devoted to 8 unusual antenna experiments using the PMX, non-technical and well illustrated. The PMX can be supplied unpowered (you provide 12v DC) or mains powered.

Unpowered PMX ............................................ £69.00
Mains powered PMX ................................. £78.00
Mains powered PMX with calibrator ................ £97.00

All prices include postage and packing. Despatch normally same day first class.

HAMGEAR ELECTRONICS
125 Wroxham Road, Norwich NR7 8AD.
Tel: Norwich (0603) 405611.

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Spacetech

L. E. Hambly, 21 West Wools, Portland, Dorset DT5 2EA. Tel: 0305 822753

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WXSAT WRITE OR PHONE FOR BROCHURE

This picture is a screen photo of a NOAA image decoded by our popular WX SAT software and receiving station for the BBC computer. Take a look at the evaluation disk before paying over the odds for an inferior system. Our complete NOAA system, built and ready to go only £209.35

The reviewers have said:

"Spacetech have put a lot of effort into making the system easy to use without sacrificing any useful features" - Mike Richards, G4WNC: Radio Et Electonics World February 1988.

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S.W. Magazine June 1988
28
**Mystery Signals**

Reader John Davis of York wrote to me asking if I could help to clear up a problem he has been experiencing whilst scanning across the u.h.f. airband. Every so often the scanner would stop on what John describes as bursts of noise. At first he thought this must just be local electrical interference, but after a while he realised that they occurred at regular intervals across the band and were present 24 hours a day. The mystery deepened when he found that a friend in London could also hear the same signals. Together they tried to trace the direction the signals were coming from but could not seem to make sense of the results they obtained.

Well John, when I tell you where they originate from I think you may be even more intrigued. They are in fact down-links from American Military Satellites. These are parked in geostationary orbits at over 35,200km away from earth and, I think you would agree, are one of the most distant signals you are likely to receive on a scanner.

You may think that I am sticking my neck out by mentioning such things in this column, but as nearly all the traffic being carried by these satellites is digitally encrypted I don’t think that I am giving too much away. In fact I am certain that the US Government has made sure that very few other countries would have the resources available to be able to de-encrypt any of the information.

Some of the American magazines devoted to scanning have at various times included articles on military satellites and from these it is clear that occasionally plain speech is used. One example of this was the 9-day non-stop flight by ‘Voyager’ just over a year ago. During this world record attempt several different communications systems were in use including a Motorola lightweight u.h.f. transceiver which, when combined with a hand-held antenna, provided the satellite link from the aircraft.

The satellites themselves are just like large repeater stations, receiving signals and then converting them for re-transmission at a higher power level on another set of frequencies. This is a linear transposition, which means that the re-transmitted signal is for some part dependent upon the strength of the received signal. So in order to be able to receive the weakest signals large antenna systems are used by the main control stations. Another factor to consider is that the power available to the satellite is limited. So if a lot of channels are in use at once the available power per channel is reduced, resulting in lower signal levels at the ground station.

For details of the main satellite up/down link frequencies I recommend the book *Communications Satellites* by Larry Van Horn. This is an excellent book if you are at all interested in satellites or space communications, and includes a very large table listing giving details of just about every transmission ever connected with space exploration.

The signals themselves are not particularly strong but it is possible to detect some using just a discone and a reasonably sensitive scanner set to n.b.f.m. Obviously the higher the gain of the antenna you use the better the results you will achieve. I have been told that f.m. broadcast band or 144/430MHz amateur Yagis work quite well, but I suspect that they need to be tilted upwards by 30 degrees or so to achieve the best reception. It was also mentioned that the continuous data signals on fleet broadcast channels make a good beacon signal, and are useful when trying out new antennas. Well worth some experimentation I believe — let me know your results.

---

**PRO Problems**

Ron Beaumont of Norwich writes to me with a problem concerning his Realistic PRO 2004. Surprisingly it is causing him problems with TV reception — whenever the receiver is in use it produces patterning on his TV screen, some frequencies producing worse effects than others. He is worried that he may be causing interference to other TV sets in the area and wonders what he can do to either reduce or prevent the effect.

Before we look at ways of solving this problem it may be a good idea to look at what is actually causing it to happen in the first place. Let’s examine the principle on which most modern receivers work, both scanners and short wave general coverage sets.

Back in the mists of time receivers used to use the tuned radio frequency (t.r.f.) principle of operation. In this system the wanted signal was selected by tuned circuits, amplified and demodulated at the original frequency. This had the drawback that if you wanted to change frequency then all of the stages had to be retuned. In

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**Fig. 1:**

(a) Basic tuned radio frequency (t.r.f.) receiver. (b) Basic superheterodyne receiver with wanted signal. (c) Basic superheterodyne receiver with a signal on the image frequency.

---

**Reader Research**

**US Government**

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Before we look at ways of solving this problem it may be a good idea to look at what is actually causing it to happen in the first place. Let’s examine the principle on which most modern receivers work, both scanners and short wave general coverage sets.

Back in the mists of time receivers used to use the tuned radio frequency (t.r.f.) principle of operation. In this system the wanted signal was selected by tuned circuits, amplified and demodulated at the original frequency. This had the drawback that if you wanted to change frequency then all of the stages had to be retuned. In
simple receivers this did not present too great a problem, but as designs got more sophisticated, and the number of stages increased it became clear that some other form of operation would have to be found.

The method adopted was to use circuits tuned to a single fixed frequency to provide the majority of receiver gain. These were called the intermediate stages and so the frequency to which they were tuned was termed the Intermediate Frequency or i.f. Only the circuits responsible for selecting the wanted frequency (the radio frequency or r.f. stages), and converting it to the i.f. (the local oscillator or i.o. and mixer stages) now required tuning. This greatly reduced the complexity of circuit design, particularly where very large tuning ranges were required as in scanning receivers. See Fig. 1.

In most early types of scanning receiver the i.f. was chosen as 10.7MHz. So the r.f. stages were tuned to the wanted frequency, for example 1000MHz, then the i.o. would be tuned 10.7MHz higher in frequency at 110.7MHz.

The i.o. is in fact like a low power transmitter — it produces a signal which is used by the mixer to convert the r.f. signal (the wanted signal) to the i.f. The i.o. must therefore always maintain a difference of 10.7MHz between itself and the r.f. signal for the system to work.

If we now imagine that another signal is present, this time 10.7MHz above the i.o. frequency. Unless tuning of the r.f. stage is very selective the unwanted signal will be passed on to the mixer. As it is 10.7MHz away from the i.o. frequency it will be accepted by the i.f. as a wanted signal.

With scanning receivers this tends to be worse at higher frequencies, with some models giving practically no rejection at uh.f.

If you hear something which you think should not be on the frequency to which you are tuned it is always worthwhile checking if it is on the so called Image Frequency.

To do this find the i.f. of your scanner from the user’s handbook. Now add (or subtract in some cases) twice the i.f. to the frequency to which your scanner is tuned. This gives you the image frequency. Try retuning your scanner to this new frequency, you should hear the interfering signal. The difference in signal strength between being tuned to this new frequency and the desired one will give you an indication of the receiver image rejection.

Designers use two ways around this problem. One is to improve the selectivity of the r.f. stages, in order to reject unwanted signals. This is difficult in scanning receivers as a very large tuning range is required and it is tricky to get all the stages to track each other across the various frequency bands.

The other method is to use a higher i.f. and if this is above the highest frequency to be received it is possible to replace the r.f. tuned circuits with just a low-pass filter, greatly simplifying the design. For this reason modern general coverage receivers use an i.f. of around 45MHz (for reception of 600KHz-30MHz), and the later designs of scanning receiver use around 600-750MHz (for reception of 25MHz-550MHz).

The Realistic PRO 2004 uses a first i.f. of 610MHz. This means that to tune the range 25-520MHz the I.o. has to operate over the range 635-1130MHz. This is in part the reason range used by u.h.f. TV broadcast stations and is the key to Ron’s problem. Although the I.o. is very low in power it can still produce a signal level comparable to that of a TV station if it is in close proximity to a TV receiver or antenna.

To help prevent this from causing problems it is necessary to determinie just how the I.o. signal is escaping from the receiver. Try unplugging the antenna lead from the scanner. Does this stop the problem? If it does, try repositioning your antenna and connecting cable to move it further away from TV antennas and down-leads. If this doesn’t work then the only solution may be a filter in the receiver antenna lead, designed to reject the u.h.f. TV band, and so prevent the I.o. signal from escaping via the antenna. Alternatively a wide band pre-amplifier in the scanner antenna lead may provide an extra degree of isolation.

If the problem is still present with the scanner antenna lead unplugged then the I.o. signal must be leaking out directly from the receiver. Try repositioning the scanner, this may improve the situation. In really bad cases it may be necessary to try screening the case of the receiver. Several aerosols are available for this purpose, but I would strongly recommend contacting the receiver manufacturers before undertaking any major surgery, as they may well have come across the problem before and be able to offer a specific solution.

**AOR Images**

Gordon Foster of Southampton brings to light another interesting problem connected with the image response of receivers, in his case an AOR 2002.

Gordon was trying to listen to his local airport d.m.e. beacon on 1041MHz but found he could also hear cellular telephones as he tuned across the band. This is because AOR had a problem to overcome when they added the 800-1300MHz range to the 2001 to produce the 2002.

If they had used the same i.f. (750MHz) as that for the 25-550MHz range it would have been necessary to make the i.o. tune over the range 1550-2050MHz. This is getting to be a bit tricky with conventional circuit layouts and would have required a major redesign of the I.o. stage. AOR got around this by using one of the other i.f. stages in the receiver (at around 45MHz). This relaxed the design of the I.o. as it now only has to tune over 755-1255MHz, not too far removed from the existing range of 775-1300MHz. The problem in doing this is that the image frequency is now only 90MHz (2x45MHz) away from the wanted frequency. When the receiver is tuned to 1030MHz for example, the image frequency is 940MHz, right in the middle of the cellular telephone band. The only way around this is to place some form of filter in the antenna lead designed to reject signals at the image frequency. This approach has its drawbacks particularly when changing frequencies and is only worthwhile considering when the interfering signals become a real problem. For the most part you just have to live with it. The AOR is no worse than many other receivers in this respect and in some cases is actually better.

Well that’s the end of another column, keep your letters coming in to the usual address, PO Box 1000, Eastleigh, Hants. SO5 5HB. If you require items returning please enclose an s.a.e. Until next month — Good listening.
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IC-R7000 VHF/UHF £957.00

LOWE HF-125 £375.00
Coverage is continuous from 25 to 1300MHz. Modes of operation are AM, USB, LSB, CW, and FM. The receiver has 20 memories, memory scan and a search mode which checks frequencies between user designated limits and a push button keypad for easy frequency entry and operation. A front panel knob allows the listener to quickly step up or down in steps of 5, 12.5 or 25kHz steps from the frequency initially chosen. A socket for the optional RS232 interface (FC 802.5) is provided on the rear panel.

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This is an innovative all-mode SS, CW, AM, FM receiver that covers 150kHz-30MHz. With an optional VC-10 VHF converter unit, coverage of the 1118-174MHz frequency range is possible. New microprocessor controlled operating features and an "UP" conversion PLL circuit assure maximum flexibility and ease of operation.

AR2002 £487.30
The frequency range is from 25 to 800MHz and from 800 to 1200MHz. Modes of operation are wide band FM, narrow band FM and AM. The receiver has 20 memories, memory scan and a search mode which checks frequencies between user designated limits and a push button keypad for easy frequency entry and operation. A front panel knob allows the listener to quickly step up or down in steps of 5, 12.5 or 25kHz steps from the frequency initially chosen. A socket for the optional RS232 interface (FC 802.5) is provided on the rear panel.

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Short Wave Magazine June 1988
What is the best receiver with which to make a start? For most of us, it is the cheapest one, whatever its shortcomings may be. Yet once you make a serious start, in a fairly short time your interests will polarise. Perhaps you start with the broadcast bands and find your way on to the amateur bands — or maybe start on 14MHz and end up chasing TVDX. Whatever the way of it, it seems pointless to spend big money at the start. These thoughts were sparked-off when I extracted an old Heathkit GC1-U from out of the dust and junk in the loft, with intent to use it as part of a talk on servicing at the local club. In the process of satisfying myself that it still worked I had a whale of a time on the bands, and re-learned some long-forgotten lingo and Morse too! So you don’t need to start with an all singing dancing radio.

**Contest**

David A. Whitaker (Harrogate) mentions the White Rose Mid-Summer SWL Contest. Listen on June 19 as follows: on 28MHz between 0900-1100UTC on 21MHz between noon and 1400UTC; on 14MHz between 1500-1700UTC; on 7MHz between 1800-2000UTC and on 2100-2300UTC. Log as many stations and countries as you can in each two-hour period. Stations can only score points if they are in actual contact with your station — e.g. CQ, QRZ and suchlike calls don’t score. Score one point for each station heard on each band. On each band, multiply the points by the number of countries heard on that band. Add the total so obtained for each of the five bands together. That is your final score. Countries as defined in APRRL Countries List. Log to show:

<table>
<thead>
<tr>
<th>Date, Time (UTC), Station Heard, station being worked, report at SWL QTH, points claimed, Logs to arrive at: D. A. Whitaker, 87 Green Lane, Harrogate, N. Yorks HG2 9LN, no later than July 31. Certificates of Merit will be awarded by the White Rose Club at their discretion, and the club’s decision will be final.</th>
</tr>
</thead>
</table>

**The Mail**

Let’s start with the letter from Jim Mowat (Luton) who runs an Icom R71 receiver into dipoles up in the loft — the dipoles seem less prone to pick up noise from nearby TV sets. Jim says that some DX stations are on so regularly that he is beginning to recognise their voices.

Neil Melville (London N18) clicked with his first KL7 since 1981 in KL7GU; March 23 was a 27 minute DX pile-up with JA calls in 27 minutes, four of them the Melville log received 27 JA calls in total. All-Time Post War HPX Ladder

<table>
<thead>
<tr>
<th>Name</th>
<th>Prefixes</th>
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</thead>
<tbody>
<tr>
<td>B. Hughes (Harlington)</td>
<td>3379</td>
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<tr>
<td>E. M. Gauthier (Malta)</td>
<td>3312</td>
</tr>
<tr>
<td>S. K. Graber (Sparks)</td>
<td>2759</td>
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<tr>
<td>R. W. Lingle (Gaspe)</td>
<td>2831</td>
</tr>
<tr>
<td>D. A. Whitaker (Harrogate)</td>
<td>2886</td>
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<tr>
<td>M. Ribton (Gillingham)</td>
<td>1628</td>
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<tr>
<td>R. E. T. Bailey (London)</td>
<td>1716</td>
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<tr>
<td>N. Herne (Northam)</td>
<td>1710</td>
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<tr>
<td>B. Patchett (Sheffield)</td>
<td>1700</td>
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<tr>
<td>B. E. Woodcock (Leeds)</td>
<td>1629</td>
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<td>C. R. Eve (Ley)</td>
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<td>A. Woodcock (Poznan)</td>
<td>1027</td>
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<td>R. C. White (Scranton)</td>
<td>906</td>
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<tr>
<td>J. W. Köhler (Schaumburg)</td>
<td>896</td>
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<tr>
<td>D. B. Glover (Huntsville)</td>
<td>863</td>
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<tr>
<td>S. Burgis (Stockport)</td>
<td>645</td>
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<tr>
<td>D. R. A. Hendry (London)</td>
<td>626</td>
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<tr>
<td>N. K. Yule (Bengal)</td>
<td>569</td>
</tr>
<tr>
<td>P. McAllan (Southampton)</td>
<td>566</td>
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</tbody>
</table>

Starting score, 500 for Phone, 200 for CW or RTTY. Entries in accordance with HPX Rules.
Amateur Round-up

Subsequent to the BARTG Spring h.f. RTTY Contest I have received several interesting reports. The first is from John Barber G4SKA who is a very experienced contest operator. John managed to work some very good DX with the following being a sample of some of the best: TI2PN (Costa Rica), PT2BW (Brazil), 3C1MB (Malako of the best: TI2PI (Costa Rica), following being a sample of some very good DX with the operator. John managed to work who is a very experienced contest first is from John Barber G4SKA several interesting reports. The h.f. RTTY Contest I have received Subsequent to the BARTG Spring satisfactory) takes, say, a couple of hours, the dismantling and reassembly to replace the faulty component an hour, and the actual fault-finding say another hour. That’s at least four hours’ work on top of shipping costs and the cost of the replacement parts. Several of your letters ask for copies of the HPX Rules, they are now available for an s.a.e. to this address.

Finale

Thanks for all the letters. Of course, the more the merrier; and it’s your comments and chuckles that make the column; if everyone just sent in an HPX Listing and no comments the column would soon die.

The next three deadlines are June 21, July 19 and August 16.

Unusual Modes

I received a very interesting letter from Dominique Kremp, Coutances, France. Dominique uses a fully expanded Poly-Electronic Pocom AFR-2010 automatic decoder to receive a variety of data modes. Dominique’s problem is quite simple in that he is having some difficulty finding transmissions using the more advanced modes. My own suggestion is to try some of the following frequencies:

- 8.096MHz TDM2 96 baud 425Hz shift.
- 10.754MHz TDM2 96 baud 425Hz shift.
- 11.434MHz TDM4 192 baud.
- 16.144MHz TDM2 96 baud 850Hz shift.

If you can identify these or perhaps know of some other frequencies and modes then please write and let me know. Dominique would also like to correspond with other listeners who use the Pocom range of equipment. If you would like to contact him his address is: 18 Rue du Moulin de Haut, Lot, Ecusse-Chetete, F-85200 Coutances, France.

Admiralty List of Radio Signals

I have received a plea for help from E. Swan of Eastbourne. After reading my comments about the Admiralty List of Radio Signals in the April issue, he has been having considerable trouble locating a supplier. Well, I obtained my copy from Kelvin Hughes at 19 – 23 Canute Road, Southampton SO1 1FJ. The price for Volume Three was £11 plus £2 handling. I found the company to be very helpful so I can personally recommend them. If you know of any other suppliers then I would be very pleased to hear from you.

Atari 800XL Computer

I have received two letters from computer for RTTY. The listeners involved are Joe Grima (Malta) and N. Ashby (Wembley). Unfortunately there appears to be no ready to run commercial software available to support RTTY. On the bright side though Pete Lewis G3EMF informs me that Maplin Electronics supply a print-out of a RTTY program with their TU1000 terminal unit kit so it may be worth giving them a ring.

I have also noticed that Mike Bowthorpe GOCVZ has written an article in the BARTG magazine Datacom which lists all the published amateur software for the Atari 800XL. The issue concerned is Winter 1987 and I’m sure back issues will be available from BARTG.

BBC B User Groups

Bruce Marshall VK7MB (Australia) has contacted me requesting sources of public domain amateur software for the BBC B computer. Can anyone help? If so then please drop me a line and I will pass the details on to Bruce.

Readers’ Stations

Jack Rosbotham Douglas I.O.M. uses the popular Pocom AFR1000 for the automatic decoding of utility stations. The receivers in use comprise a Sony ICF-2001D and a Yaesu FRG-7700. Jack asks if I publish a frequency list compiled from readers reports. As it happens I am rearranging my database into a form that could be used for publication but time is very much against me at the moment. If you would like to see such a list then
What a Drag!

The now rapidly elevating solar flux has been giving severe attenuation to the weather satellites, with sudden dramatic short periods of "fade outs" during passes. Bill Brennan G3CQE of Crewkeme in Somerset reports that signals from all the satellites, with sudden dramatic attenuation, and partly to noise on northerly parts of a pass. The now rapidly elevating solar flux produces an output which can be directly connected to a standard television set. Unfortunately Mr. Brennan is having only limited success at the moment. My advice is to start with signals of a known format i.e. amateur RTTY on 14.080 – 14.100MHz. The majority of these signals use a speed of 45.45 bauds with a 170Hz shift which should be well within the capabilities of the MM-2001 decoder and can offer some operating tips, please let me know.

DX Tips

"The early bird catches the worm" is an ancient saying but this month's tip! Being a bit of an early bird myself, I have been doing a spot of early morning monitoring. My main aim was to catch some of the long path amateur DX on 14MHz. I've had a fair amount of success with both Australia and New Zealand logged. The signals were not too strong but quite readable. The best time appears to be between 0800 and 0800UTC at the moment but the phenomena is linked to the sun rise so this is the important element.

Although I was looking for amateur transmissions there is plenty of commercial DX to be had between 12MHz and 15MHz in the early hours.

According to a recent report from Chris Kirby the higher frequencies are starting to liven up with good activity between 18MHz and 20MHz. If you have discovered any time or bands that appear to be particularly good, drop me a line and I will pass on the details.

RTTY Frequency List

Regular readers will recall that in the April issue I printed some unidentified signals in the frequency list. So far I have received information on only one of the frequencies. Ian Baxter monitored the station on 3.318MHz for some time, finally receiving the letters EDZG. As the station sends coded weather reports, Ian thinks the station could be Berlin Tempelhof. Referring to the American Meteor Manual Code Manual I found EDZG is the local code for Oldenburg in the Federal Republic of Germany. This seems to be a military meteorological station but it is almost certainly not the transmitter site. Does anyone have any further suggestions?

I have received quite a good selection of RTTY reports this month and a few samples are printed here using the normal format of frequency/mode/speed/callsign:

2.716MHz SITOR A Frigg Oilfield traffic. 5.457MHz RTTY 50/R LZA BTA News Sophia. 5.702MHz RTTY 50/R ESCR Swedish Air Force. 7.972MHz RTTY 50/N XV470 Ho Chi Minh City. 8.050MHz RTTY 50/N IRNA news.

INFO IN ORBIT

Pat Gowen G3IOR

17 Heath Crescent, Hellesdon, Norwich, Norfolk NR6 6XD

Project Nordski Comm

The British polar expedition having its communications handled by Laurence Howell GM4DMA/VE8, has unfortunately had to terminate after 100km due to severe conditions giving

and are already beyond 86 degrees north. They have passed 500km and are all in good spirits.

Fig. 1

The deadlines are June 21, July 19 and August 16.
EXOCR via G3IOR to G0/PA3BHF is now on the Digitalker daily, and is being followed by thousands of students around the world.

Help Line

In last month’s column Howard Barnes of Wivenhoe showed us his satellite station and gave us some good tips. One of his pictures from MET-30 showed Denmark, north-west Germany and Holland exhibiting a characteristic distortion from the raw unprocessed radiometer image. It made it appear that the frame was merged by two observation cameras on the satellite back to back, each looking at opposite horizons.

A further example is given by Fig. 2, a photograph of the English Channel, with the dark patch in East Anglia showing the Brecklands and Thetford Forest, but with a worrying ninety degree “bend” running from north to south across central England. If one believes in the adage that, “the camera cannot lie”, then one might be led to believe that Britain had finally been annexed from across the Atlantic, or that a major geological catastrophe had struck.

The explanation of the strange effect comes from Howard. “The problem with the line display is radio interference from the microprocessor, which leaks from any exposed ribbon cable, and gets into the receiver via the antenna, probably picked up by the braid”, “These semi-synchronised pulses do the damage to the pictures are similar to the problems given by the r.f. generated by ones computer when attempting to run the receiver in close proximity to the computer for generated RTTY and SSTV, etc.

The only answer is to completely screen the computer or microprocessor in a metal box, or to line it out with bonded grounded aluminium foil (alternatively, spray the interior of the housing with one of the available conductive metallic sprays being very careful to avoid the housed components). This will cure the direct radiation, which will be a waste if power supply and interconnection leads are carrying the interfering signals, so these must be filtered and screened also.

If, despite the attenuation provided, any problem still remains, then it is likely that the down lead from the antenna is acting as part of the antenna capture. A good match to the antenna, using good quality coaxial cable is essential. Distancing and separating the antenna system is also important. Interference, external, adjacent channel and home-brewed is a major general problem, particularly on weathersats. I would be interested in hearing from other readers who have experienced problems from whatever source, and their ideas and input on how they deal with it.

Centre Ground Stations

Lawrence Harris writes in from Plymouth to tell us some of his findings on the satellite scene, firstly with the USSR Meteor weathersats. Lawrence says, “the latest talking point among the weather satellite enthusiasts is the new MET 2/17 which was launched on January 30. It is particularly interesting because they have gone back to their ‘old’ frequency of 137.300MHz, which has not been used for a very long time. The new satellite is in a north to south orbit, and the selection of frequency means that it will not interfere with any other Meteor weathersats”. Lawrence was fortunate to pick the new signals up only two days after launch during a routine scan.

He further tells us that Meteor 2/14, on 137.850MHz, is currently in a south to north orbit each morning, whilst Meteor 2/15 is in a southbound orbit during the middle of the day. Meteor 2/16 is a morning southbound satellite. He points out that all the Meteor birds can be heard on the following day some 20 minutes later, e.g. if the pass commenced at 1000 one day, then it will be 1020 on the following day, until the sequence stops when the pass is below our western horizon, and a new one comes in from the east.

“Those using YU3DMV or similar frame stores will know that Meteor 2/14 has aperture troubles,” says Lawrence, “resulting in a sudden opening of the lens aperture and consequent saturation of the white levels. This effect can be compensated for by using the modifications published in specialist magazines”. Meteor 2/17 gave our correspondent some spectacular views of Labrador and Baffin Island, recently, as he is fortunate enough to have a superb western horizon from Plymouth, getting good pictures down to one degree of elevation.

He is finding that Meteor 1/30 on 137.010MHz continues to provide good land detail. For this one, set your receiver to look from 1030UTC and you will get it before 1258 on any day. Each successive day it will appear two minutes later than the previous, until 1258. During the dark winter days it is always travelling north to south, and it can be heard to switch on its carrier for a few seconds before the picture modulation commences as it comes out of eclipse over Norway.

Lawrence continues to observe the NOAA-9 and 10 APT on 137.620 and 137.500MHz respectively, as NOAA-9 passes northbound between 1300 and 1530, southbound 12 hours later, whilst NOAA-10 performs similarly but northbound 1700 to 2100, and southbound 0500 to 0930, and on continuously. He is also looking at the all-British UK-6 satellite on 136.560/137.560MHz, which can be heard for some five consecutive orbits each day due to its inclination. “This satellite brings many happy memories back to me”, says Lawrence, “since I used to command it. I am considering the possibility of decoding the data again, but using my home computer instead of the PDP 8 system that I used some eight years ago!”

"WHAT ARE THE ADVANTAGES OF VHF? There are three main ones, and they are important: (1) almost complete freedom from interference from foreign stations; (2) the reduction and in most cases complete elimination of interference from electrical appliances; and (3) greatly improved quality of reception which adds realism to all programmes and is a real boon when listening to music."

I found this paragraph among my archives in a 4-page pull-out supplement to the Radio Times of 24 January 1956. The centre pages of this supplement are devoted to a map of the UK showing the areas covered by the BBC in those pioneering days of v.h.f. broadcasting. Transmitters for England were sited at Wrotham to serve London and the South-East, Norwich and Sutton Coldfield for East-Anglia and the Midlands, Holme Moss and Pontop Pike for the North, and North Hessary Tor, Rowtridge and Wenvoe for the West. Stations intended mainly for Northern Ireland, Scotland and Wales were installed at Divis, Meldrum and Kirk O’Shotts and Blaen-Plwyf.

In those days Band II extended from 88 to 100MHz and the stations previously mentioned transmitted the Light, Third and Home programmes (now BBC Radios 2, 3 and 4) on frequencies, which varied with area, between 88 and 90MHz, 90 and 92.3MHz and 92.7 to 94.5MHz respectively. Wireless collectors will see this scribed on the dials of Band II receivers and converters manufactured in the late 50s and early 60s.
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This is the ultimate in software for the SWL. Just one program to receive all four modes, switching from one to the other at a single keypress. Extremely user-friendly, RX-4 has the facilities and performance you need to catch all the action on the bands as soon as you hear it.

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SSTV has selectable scan rates and in two modes of picture storage: maximum-use of memory. Text and pictures can be stored, recalled to the screen and dumped to a printer as well as being saved to tape or disk.

Please note that the AMTOR section only receives ARQ mode (mode A) but this is the most common mode and covers a lot of a commercial TOR stations, also.

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AFL-2010 All Mode CW/RTTY Decoder

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- 73 from Dave G4KOH, Technical Manager.
The past 30 years have seen set design change from the use of thermionic valves to a wide variety of semi-conductors, almost 100 percent national coverage by the BBC's transmitter network, the creation of local radio stations by the BBC and the IBA (see current issues of Radio Times and TV Times for your area). This greatly increased the demand for high fidelity broadcast receivers, including car radios and portables, and was another giant step forward and the "improved quality of reception" mentioned in the supplement has been maintained throughout.

This great advance in broadcasting technology is now extensively used around the world and although signals in the v.h.f. bands have a limited range, much careful planning by international bodies was required before stations could share the same frequency without interfering with each other.

However, it soon became known that under certain atmospheric conditions, v.h.f. signals can increase their range considerably and are often heard in neighbouring countries until the cause subsides.

These improved conditions, known as openings, are enjoyed by radio enthusiasts of all ages and the youngest contributor to date is the 15-year-old Neil Oakley from Arbroath who is entering the fascinating world of DXTV.

A piece in the press, a love of football and a bit of television detection helped Neil and David Glenday from Arbroath enter the world of DXTV.

Neil, Greyfriars, Storrington, West Sussex RH20 4HE

The second was on channel 23 and after that evening, prior to News at Ten, the Border Television logo appeared, said David. He realised that this signal was coming from a vertically polarised 2kW relay station at Eyemouth, some 80km away. He also logged signals from the BBC 1 transmitter at Chatton on Ch. 39. He remarked, "It was easy to tell this was not from a local source as the programmes were different and the BBC 1 Globe appeared on Ch. 39 while on BBC 2 Scotland, a different caption was shown."

Conditions were even better up to around 2000 on the 27th, when he received good colour pictures from BBC 1 and 2, CH4 and Tyne Tees TV on March 31 and April 1 respectively. He saw a subtitled film from BBC -1 and 2, CH4 and Tyne Tees TV on March 20, 21 and 23 respectively. He saw a subtitled film from the main Sporadic-E season as Noel Smythe (Caerphilly) found last year when among his catches from Norway were the test cards of Scandinavian stations in full spate.

The deadlines are June 21, July 19 and August 16.

SEEN & HEARD

The antennas mounted on the roof of Ken Lancaster's home.

The same goes for George Garden in Edinburgh who wrote, "With the very high pressure (30.55in), a lot of f.m. signals were received in Band II". In early April, George logged Radio Forth, on his Sharp car-radio while, on low ground, in the village of Fordoun and on the 4th, he drove to Cairn O'Mounth, a local high spot and at midday heard BBC Radio York and reported "very strong" signals from BBC Radios Cumbria and Newcastle.

Reports

In Gloucester, Paul Paintin, using a Philips D999 receiver and a 4-element antenna, logged French stations around 1800 on March 31 and April 1 at the high end of Band II. He tells me that his local station, Severn Sound, now has a transmitter at Stroud on 103MHz in addition to its spot on 102.4MHz.

From my home in Sussex, I heard the news and ads for the Northampton area from Chiltern Radio at 1000 on April 3 and several French stations, at good strength, around 0950 on the 4th. During the Easter holiday at Laurencekirk, George Garden, using a Sony receiver and outside antenna, logged BBC Radio 4 from Sandale and Radio Tay from Dundee.

Band I

"Conditions were useless", remarked Simon Hamer (New Radnor), in his report for the month prior to April 10. However, either by meteor scatter or short bursts of Sporadic-E, he caught glimpses of test cards from Sweden (SVT), Czechoslovakia (RS-KH) and Poland (TVP) on March 20, 21 and 23 respectively. He saw a subtitled film from Norway (NRK) on April 10.

Pictures from Scandinavia are often seen in the UK during the main Sporadic-E season as Noel Smythe (Caerphilly) found last year when among his catches from Norway were the test cards of Scandinavian stations in full spate.

Between March 13 and April 7, Edwina and Tony Mancini (Belper) identified bursts of test cards from Czechoslovakia (CST RS-KH), Denmark (DR), Finland (YLE-TV1), Holland (PTT NED 1), Norway (Norg-NRK) and the regionals Bremeranger and Konsberg, Spain (TVE-1) and Sweden (SVT Kanal 1). It is interesting to note that apart from the signal from Czechoslovakia on Ch. 49 (75.75MHz) on March 28, the rest were at the higher end of the band on Chs. E3, R2 and E4 which, in frequency terms, means 55.25MHz, 59.25MHz and 62.25MHz respectively.

In Bedford, John Raleigh also received pictures at the top end from Belgium and Holland on 6 and 14 days respectively during the month prior to April 13 with best results coming from Holland around 2330 on April 12.

Tropospheric reflections are seen in India, at 0700 on December 11, Lt. Col. Rana Roy (Meerut)
received a very clear test card from the low power transmitter at Bathinda on Ch. 12, followed by breakfast TV at 0730, Rana used his camera to record Fig. 7. During an excellent tropo-opening early on the 22nd, Rana logged breakfast TV from the transmitters in Agra and Jalandhar on Ch. 9, Amritsar on Ch. 7, Bathinda on Ch. 12, and Kesauli on Ch. 6.

With a slight tropo-opening in progress on April 4, Simon Hamer received pictures in Band III from Belgium (BRT-1 and RTBF-1), France (TDF), Holland (PTT NED-11 and Ireland (RTE -1 and 21 and in the UHF band from France and Ireland.

Although sometimes spasmodic, the Mancinis logged Band III signals, from France (Canal +1) on 14 of the 25 days between March 13 and April 7 and, mainly test cards from Ireland’s RTE-1 and 2 on March 14, 16, 17, 18, 23, 28 and RTE-1 on April 2 and 7.

The 24-hour TV from a few ITV regions when the other channels are closed down makes the airways open for us as a DXers paradise with possibilities not available before,” wrote George Garden from Edinburgh. It only needs a hint of a lift for George to take his gear to Cairn O’Mounth and see what extra signals are about on the u.h.f. band. On April 4 he logged strong colour pictures from the BBC at Darvel in Ayrshire. In the small hours of the 5th, at his QTH in Laurencekirk with a 48-element indoor antenna, he received a good Scottish TV signal from Black Hill and, at 0150, logged pictures from the transmitter at Craigkelly. Later, around 0900, he was still receiving pictures from the BBC at Black Hill, Fig. 6.

John Raleigh, kept a regular watch, around 1200, on Band III and logged pictures from France (Canal +1 on Chs. L5 and 9 on 11 days between March 17 and April 13 and RTBF on Ch. E 10 on March 17, 18, 19, 20 and 21 and April 3.

Amateur Television (fast scan)

On March 12 and 13, the newly formed Sevenside Television Group (formerly Bristol FM TV Group) entered the Spring Vision contest using Paul Green’s very distinctive callsign G7ATV/P. This was their first entry as a group chalking up 26 contacts on 432MHz and 10 on 1296MHz from their location some 203m a.s.l. Their best DX was 234km and 85km respectively.

“As a Group we will be pooling our resources to enter TV contests and promote TV activity on all available bands. Our members with camcorders will be out filming, to produce some good quality programming for transmission on the bands,” wrote Group Secretary Shaun O’Sullivan G8VPG. Members of this group are responsible for the 1296MHz f.m. TV repeater (GB3ZZ) which has regular viewers for some distance either side of the River 40 Short Wave Magazine June 1988
WANTED: WW2 Radio AR11, B2, R1155, R1475, etc.

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** 25th Anniversary Year 1963-1988 **

Short Wave Magazine June 1988
Savern. "Our recent increase in power output to the full 1.5kW limit has brought high quality colour f.m. TV signals to an even wider area," said Paul. He reports that the best recorded DX for the repeater, under life conditions, is High Wycombe. If any of you know different, do let Paul know because this is important for their records and future planning.

**SSTV**

With increasing numbers of sunspots there should be more activity and DX on the 14, 21 and 28MHz bands, which is good news for the slow-scan television enthusiasts. Any reader with a graphic tablet, software and a vision monitor, see our advertisers! can receive slow-scan pictures on the dedicated spots within the i.w. amateur bands.

One of the popular areas is around 14.20kHz and between 1800 and 1900 on April 9. Leslie Sargent (Runcorn) received contest pictures, from Czechoslovakia Fig. 9, Hungary, Spain Fig. 10, Sweden and Yugoslavia. Leslie's Yeasu FRG-7700 receiver is fed by an inverted "V" antenna coupled to a FRA-7700 active a.t.r. and his SSTV is decoded by a Sinclair Spectrum computer with GIFTU software and his hard-copy pictures, Figs. 9 and 10, are produced, from the computer by an Alphacam-32 printer. A bit earlier on the same band, Ray Gilchrist, (Millom), using a Sony ICF2001D and long wire antenna, logged SSTV signals from Poland, Fig. 11, Portugal and Sweden. Fig. 12. Ray's station also includes a Panasonic RF4900 receiver, a 3-element beam and he is awaiting SSTV software for his Commodore 64 computer.

**LONG MEDIUM & SHORT**

Brian Oddy G3FEX

Three Corners, Merryfield Way, Storrington, West Sussex RH204NS

Long days and short nights may be ideal for those who enjoy the outdoor life, but dedicated long and medium wave DXers are unlikely to find them conducive to their hobby! The reception of the 28MHz bands, which is good news because this is important for their outdoor life, but dedicated long and medium waves DXers benefit from these.

MW Transatlantic DX

From Tunbridge Wells, Darran Taplin says, "as you can see from my logs, I have at long last managed to pick up some stations on the other side of the Atlantic!" He used an Eddyton communications receiver with a 25m random wire antenna. He heard CQYQ in St. John's, NF 930 three times during the month, once at 2215, but the second and third at 2222 and 2225 were weak. He heard W5OFN for the first time during daylight.

**SEEN & HEARD**

The next three deadlines for your letters are:

June 21, July 19 and August 16
### Table 1: Broadcasters\n
<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency (MHz)</th>
<th>Power (kW)</th>
<th>DXer</th>
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<tbody>
<tr>
<td>WTXR</td>
<td>1560</td>
<td>1.5</td>
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<tr>
<td>WBXY</td>
<td>950</td>
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<tr>
<td>KDKA</td>
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</tbody>
</table>

### Notes: \n
- Entries marked * were logged during daylight hours, and other entries were logged during nighttime.
- DXers:
  - A: Leo Barr, Sunderland
  - B: Alan Carter, Weymouth
  - C: John Evans, Shawforth
  - D: Bill Hare, Stockport
  - E: Jack Hill, Manchester
  - F: G. Millmore, Weymouth
  - G: John Nash, Bantry
  - H: Howard Newell, Great Missenden
  - I: Dale Rout, Colchester
  - J: Tim Shirley, Bristol
  - K: John String, Portsmouth
  - L: Daran Taplin, Tunbridge Wells
  - M: Robert Taylor, Edinburgh
  - N: John Evans, Chichester

### Local radio chart\n
- Notes: Entries marked * were logged during darkness. All other entries were logged during daylight.
- DXers:
  - A: Leo Barr, Sunderland
  - B: Alan Carter, Weymouth
  - C: John Evans, Shawforth
  - D: Bill Hare, Stockport
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  - N: John Evans, Chichester

- *Previously un-noticed weak signals "spring to life!"*
Whayman noted their signal typical. They also beam towards Japanese. jamming has been noted during prevailing on the 21MHz (13m) SINPO 35533 at 1310. Grantham and rated them as monitoring their reception of the broadcasts from Okeechobee, E. Africa) 434 at 1520; RFI via Noblejas, Spain 15.435 (Ar.) noted as 44444 at 1600 by Robert Taylor. Their English news bulletins at 1100 have attracted their broadcasts were logged by Michael Anthony picked up Radio Okeechobee, Florida 21.525 (Eng. to W. Africa) 222 at 1805; VOA via Dixon, California 21.560 (Sp. to S. America) 111 at 1805; also VOA via Bahethy, Ohio 21.580 (Sp. to S. America) 111 at 1808.

Several more were noted by other DXers. Kenneth Buck heard REE via Noblejas, Spain 21.575 (Sp. to Middle East), noting SIO 243 in his log at 1030. Darran Taplin logged Radio Budapest, Hungary 21.525 (Hung., Eng. to Australia) SINPO 25534 at 1034; RFI via Nauen, GDR 21.540 (Hind., Eng. to S.E. Asia) 34443 at 1359; Radio DW Cologne 21.600 (Sw., Eng., Fr. to E. Africa) 44444 at 1506. Howard Newell picked up WCSN in Boston at 1745 on 21.695 (Eng. to S. Africa) and rated their signal as 34433.

Many broadcasts on the 17MHz (16m) band are beamed towards Europe during the day. In order to cater for the wide listening audience the programmes are often repeated in a variety of European languages. In the broadcasts from Pakistan, Islamabad on 17.660 the main language used is Urdu but there are some items in English, especially when the cricket test matches take place in Pakistan! Their English news bulletins at 1100 have attracted Edward Broadsmith's attention in Worcester, they are read at dictation speed. UAE Radio Dubai 17.865 use Arabic as the main language, but there are some segments in English. Kenneth Buck is a regular listener to their news bulletins and weather reports in English, he rated their signal as 33222 at 1010 by Bexleyheath as 45444 at 1525. Many early morning broadcasts on the 17MHz band are intended for listeners in the S. Pacific area and S. E. Asia!

Some of the broadcasters in the USA beam their programmes towards Europe between 1900 and 2000. Among those heard during the daytime were the Voice of Free China, Taiwan via Okeechobee, Florida 17.612 (Sp. to S. America) logged by Darran Taplin; WYFR via Okeechobee, Florida 17.612 (Sp. to S. America) noted as 44444 at 1312 by Darran Taplin; WYFR via Okeechobee, Florida 17.612 (Sp. to S. America) logged by Darran Taplin; WYFR via Okeechobee, Florida 17.612 (Sp. to S. America) rated as 33222 at 0825 by Howard Newell; Radio Pakistan, Islamabad 15.805 (Urd., Eng.) noted as 54545 at 1115 by Kenneth Buck; Radio FEBA in Johannesburg, South Africa 17.660 (Eng.) logged by Sheila Hughes at 1230 as 33222 at 1230; UAE Radio Dubai 15.436 (Ar., Eng.) rated as 44222 at 1345 by Colin Godwin; Radio Dubai, Kuwait 15.505 (Ar.) noted as SIO 433 at 1555 by Robert Taylor. Many more were received during the evening, including RBB Brasilia, Brazil 15.265 (Eng., Ger.) rated as SIO 22222 at 1800; RTM Rabat, Morocco 15.595 (Ar.) logged by Colin Diffell at 1841; Radio Korea Seoul, South Korea 15.575 (Port., Eng., Ger., Sp.) noted by Leslie Hollis as 44533 at 2030; WRNO New Orleans, USA 15.420 (Eng., Fr.) rated by John Parry in Northwich as SIO 343 at 2055; RCI via Sackville, E. Canada 15.325 (Fr., Eng., Russ.) noted as 44533 at 2130; VOPC Taiwan via Okeechobee, Florida 15.440 (Chin., Ger., Fr., Eng.) rated as 34533 at 2200 by Leslie Hollis.

This band is the hub of listening activity for many DXers, consequently their reports detailed many of the broadcasts to several continents. Some of those heard during the daytime were the Voice of Free China 15.640 (Eng., Fr. to Australia) noted by Philip Rambaut as SIO 444 at 1110; WYFR relayed via Taipei, Taiwan 15.085 (Eng., Fr. to S. Asia) noted as 44544 at 1405 by Ken Whayman; Radio Nederlands via Talata Volon, Madagascar 15.570 (Eng. to E. Africa) noted as 44444 at 1630; BBC via Ascension Island.
15,400 (Eng. to Africa) rated as 33333 at 1752 by Ian Curry in Stockton-on-Tees. Many more were logged during the evening including Radio Sophia, Bulgaria 15.310 (Eng., Port., Fr. to Africa) heard by Colin Diffell at 1826; Africa No. 1, Gabon 15.475 (Fr., Eng. to Africa) logged by Martin Andrews at 1855; AIR Bombay, W. India 15.360 (Eng. to E. Africa) heard by John Sadler at 1900; Radio RSA Johannesburg, S. Africa 15.225 (Eng., W. Africa) rated as SIO 444 at 1900 by Bob Isaacs in Peterborough; VOA via Greenville, N. Carolina 15.205 (Eng. to N. Africa as noted at SIO 555 at 1904 by Kenneth Buck; RCJ via Sackville, E. Canada 15.260 (Eng., Fr. to W. Africa) heard at 1920 by John Chown; REE via Noobras, Spain 15.375 (Eng., Fr. to Africa) rated as SIO 333 at 1921 by Julian Wood in Buckley; Radio DW via Antigua, W. Indies 15.105 (Port., Sp. to S. America) logged as SIO 444 at 2130 by John Parry; Radio Corp. de Chile 15.140 (Sp., to S. America) and KGEI San Francisco, California 15.280 (Port., to S. America) both rated as SIO 111 by Philip Rambaut at 2325.

The 13MHz (22m) band has attracted another broadcaster, Radio Liberty. They have recently increased their use to 13,690, which is one of the many frequencies adopted by Russian broadcasts in their 'off season' of 0700 until 1400. Much of the output is in poor quality, but has resulted in jamming being heard for the first time on this band.

There are a number of broadcasts to Europe during the day. These are summarized in the reports stemmed from Radio Moscow. Their broadcasts are carried at 13,790 (Eng.) from USS 13.790 at 1400 by Colin Godwin; WCBC Boston, USA 13.760 (Eng.) rated as SIO 444 at 2130 by John Parry; WHRI South Bend, DEXers (A) Ian Baxter, Blackburn. (B) Amy Curry, Stockton-on-Tees. (C) David Edwardson, Wallerford. (D) Simon Harrow, New Radnor. (E) Dave Rimmer, Freemen, W. Australia. (F) George Milburn, Wootton, IO. (G) John Nash, Brighton. (H) Howard Newell, Great Missenden. (I) Fred Pallatt, Stirling. (J) Christian Pritchard, Cambridge. (K) Roland Poulton, Newcastle-upon-Tyne. (L) Philip Rambaut, Macclesfield.


Fig. 2: QSL from Radio Norway sent to Robert Taylor.

Short Wave Magazine June 1988

45
QSL cards will be available.

W. Australia: Davy Hossack picked up Radio Latitude, Angola 7.245 (Port., Sp., Eng., Fr.) 434 at 2330; also FEBA Radio, Seychelles 7.275 (Tamil), Telugu to S. Asia 444 at 0310. These frequencies are also congested and adjacent channel interference often spoils a wanted broadcast. Noted in the reports were Radio Polonia, Warsaw 6.135 (Eng., Fr., Ger., Pol. to Europe) rated as 222 by Julian Wood at 1722; Radio Bangladesh, Dhaka 6.240 (Eng., Beng. to Europe) logged by Ian Curry as 32333 at 1822; Radio Mediterranean, Malta 6.110 (Fr., Eng. to N. Africa) noted as 322 at 2230 by Martin Andrews; AIR Sinagar, India 6.110 heard by Michael Anthony at 0130.

Using a Philips D 1835 portable with whip antenna in Molepolole, Botswana, P. Gunuprasad logged the Voice of Zimbabwe 6.045 as 45444 at 1015; also AIR Madras, India 6.115 as 44433 at 1540. At 1600 he picked up Radio Australia via Carnarvon 6.275 (Eng., Fr. to Europe) logged by Ian Curry as 31333 at 4313. In contrast, Stewart Russell has found their signal to be generally poor in Forfar, Scotland.

Some of the interesting broadcasts noted on the 5MHz (31m) band include Radio Australia via Shepparton 9.655 (Eng. to Europe) rated as SIO 434 at 0700 by George Hewlett in Torquay; also via Carnarvon 9.770 (Eng. to S.E. Asia) peaking 444 at 1000; TWR Guam, Pacific 9.820 (Jap., Chin. to E. Asia) logged by Philip Ramsay as 322 at 1240; RTI Rome, Italy 9.575 (Eng. to Europe) rated as 33323 at 1935 by Christian Pritchard; Radio Baghdad, Iraq 9.770 noted as 333 at 2000 by Phil Townsend; Radio Cairo, Egypt 9.900 heard at 2115 by Cyril Kellam.

Radio Japan via Maboyi, Gabon 9.570; Radio RSA-Johannesburg, S. Africa 9.580; RHC Havana, Cuba 9.870 and many others were logged by Arthur Bolton in Birmingham using a built two transistor s.w. receiver. Despite the overcrowding, the 7MHz (41m) band attracts many listiners. Their reports included RTBF Belgium 7.140 (Fr., Ger. to Europe) rated as SIO 434 at 1100 by John Evans; RAI via Konigs wusterhausen, GDR 7.185 (Dan., Sw. to Europe) noted as 34 at 1685 by Paul Donovan; Radio Australia via Carnarvon 7.205 (Eng. to S. Asia) heard by Jason Ingram in Ginsborough at 1740; Radio Beijing, China 7.800 (Jap., Chin. to E. Asia) logged by Philip Rambaut as 322; Radio Madras, India 7.820 heard at 2115 by Cyril Konigswusterhausen.

Forfar, Scotland.

Fig. 3: The listening post of John Evans

LISTEN OUT FOR

GB75RPP; Trowbridge & District ARC will be operating this station between June 18-19 from North Townsend Farm, Melksham, Wilts using 144 and 430 MHz. They are being sponsored to raise money for Rotary Polo Plus, a two-year wide worldwide programme to eliminate polo and five other children's diseases. Special QSL cards will be issued.

Ian GOGRI  
Tel: (0380) 830383.

GB75MAL: This call sign will be used by the Scarborough Special Event Group on July 3 and 9 to celebrate the 50th Anniversary of the world record breaking 126mph run by steam locomotive Mallard. On these two days, the famous engine will run from London to Scarborough. Operation will be around 3.725, 7.055 and 144 MHz. Special QSL cards will be available.

Roy Clayton G4SSH QTHR

GB05MC: This call sign will be run from St. Mary's Church Hall, Barham, Ipswich on June 3/4. The station will be sponsored by local people for every call received in aid of church funds. They will be on the air from 9am to 6pm each day, but I'm not sure on which bands.

E.W. Stannard  
17 Ely Road, Barham, Ipswich  
Tel: (0473) 830147.

GB2ACO: Between July 2 and 8, this special event will be established at an International Girl Guide Camp at Alkerness, Evie, Orkney. Operation will be on h.f., s.s.b. using 3.5, 7.14 and hopefully 21 MHz primarily in the evening when the girls will be in the camp. There will be QSL cards available and the WAB is HY32. More details from: Anne GM6WPA or Bill GM3IBU QTHR.

GBOTAC: The Weston-s-Mare Radio Society will be operating special event stations on h.f., 144 and 430 MHz at Brean, Somerset on the occasion of the laying of the new transatlantic fibre-optic cable from Brean to Manusquan, New Jersey, USA with a link to Bermuda. The station will be operating from 1400 GMT on Wednesday 22 June to 1400 GMT on Sunday 26 June. Special QSL cards will be available.

G1D JW QTHR

GB2WAD: The Weston-s-Mare Radio Society will be operating a special event station on July 27 & 28 from the Beach Lawns, Weston-s-Mare for the Great Weston Air Days an annual event in aid of local charities. On h.f., 144 and 430 MHz from 1000 to 1800. Visitors are welcome.

G1D JW QTHR

SEEN & HEARD

USA 13.760 (Eng.) noted as SIO 343 at 2043 by Kenneth Buck; WRNO New Orleans, USA 13.760 (Eng. to Europe) rated as 45444 at 2100 by Ronald Proudfoot in Newcastle-upon-Tyne.

Three of the broadcasts to other areas were noted by Howard Newell, Radio Nederlands, Flevoland 13.770 (Eng. to S. Asia) rated as 23222 at 1430; Radio Prague, Czechoslovakia 13.715 (Eng., Cz. to S. Asia) 43444 at 1445 and Radio DW via Radio Prague, Czechoslovakia (Eng., Hausa to Africa) 24322 at 1445 and Radio DW via Prague, Czechoslovakia (Eng., Hausa to Africa) rated as 23222 at 1430; Radio DW via Prague, Czechoslovakia (Eng., Hausa to Africa) 24322 at 1445.

Several interesting broadcasts on the 9MHz bands include Radio Australia via Shepparton 9.655 (Eng. to Europe) heard by Howard Newell as 32333 at 2300; Radio Baghdad, Iraq 9.770 noted as 333 at 2000 by Phil Townsend; Radio Cairo, Egypt 9.900 heard at 2115 by Cyril Kellam.

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ADVERTISERS INDEX

Aerial Techniques ........................................... 41
AJH Electronics ............................................. 41
Birkett J ....................................................... 31
BICC VERO ................................................... 13
Bredhurst ..................................................... 38
Colomor ....................................................... 47
Component Centre ........................................ 37
Datong ......................................................... 17
Dewsbury Electronics .................................... 37
Dressler Communications ............................... 28
Elliott Electronics ......................................... 31
Flightdeck .................................................... 47
Garex Electronics ......................................... 41
Hamgear ...................................................... 28
Howes C M Communications ....................... 38
ICOM (UK) .................................................... 17

Johnsons Shortwave Radio ............................... 21
Lowe Electronics .......................................... 8
Nevada Communications ................................. 31
Practical Wireless ......................................... 18
Raycom Communications Systems ................ 17
Rylends F. G ............................................... 47
Sandpiper Communications ............................. 32
SEM .......................................................... 41
South Midlands Communications .................. Cover 

Spacecat ...................................................... 28
Stephens James ........................................... 21
Technical Software ........................................ 37
Uppington Tele-Radio (Bristol) ....................... 47

Ward Reg & Co ............................................. 32
Waters & Stanton ......................................... Cover 

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**WHAT RECEIVER**

What Receiver has been split into two sections. This part covers communications and general coverage receivers. The second section will deal with portable sets.

---

### Lowe SRX300 Communications Receiver

- **Coverage**: 500 - 30MHz
- **Modes**: A.M, S.S.B., L.S.B., B.S.B.
- **Sensitivity**: 10dB SIN+NI/N for input of 0.3µV on a.m.
- **Selectivity**: S.S.B.: 6kHz at -6dB, 18kHz at -15dB
- **Image Rejection**: Better than 100dB
- **Spurious Rejection**: Better than 100dB
- **Frequency Stability**: ±300Hz during any 30min period after warm-up
- **Audio Output**: 1.5W at 8Ω
- **Price**: £595

---

### Yaesu FRG-8800 General Coverage Receiver

- **Coverage**: 150kHz to 29,999.999MHz
- **Modes**: A.M, F.M, S.S.B., L.S.B., B.S.B.
- **Sensitivity**: 150kHz to 1.6MHz a.m., 300V/s at 0.5V/75Ω, 1.6 to 29,999.999MHz s.s.b., c.w., 0.4V/50Ω
- **Resolution**: 100kHz
- **Selectivity**: 6kHz at -6dB, 15kHz at -50dB
- **Image Rejection**: Better than 100dB
- **Spurious Rejection**: Better than 100dB
- **Frequency Stability**: ±300Hz during first 30min, <50Hz during any 30min period after warm-up
- **Audio Output**: 1.5W at 8Ω and 10% distortion
- **Stage**: 4.075MHz, 45kHz
- **Features**: 8-bit CPU, keypad for digital freq. entry, 12 internal memories, multi-function scanner, noise blanking, dual 24hr clocks, all-mode squelch, tone and attenuation
- **Reviewed**: Practical Wireless April 1982
- **Price**: £639

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### Icom IC-R700 Communications Receiver

- **Coverage**: 100kHz to 30MHz
- **Modes**: A.M, F.M, S.S.B., L.S.B., B.S.B., R.T.Y.
- **Sensitivity**: Input for 10µV (S/N+NI/N) for input of 0.3µV on a.m.
- **Selectivity**: A.M. (Wide): ±3.5kHz at -6dB, ±7kHz at -15dB; F.M.: ±7kHz at -6dB, ±14kHz at -60dB; S.S.B.: ±12kHz at -6dB, ±24kHz at -60dB
- **Image Rejection**: Better than 70dB
- **Spurious Rejection**: Better than 60dB
- **Frequency Stability**: Better than 1kHz after 5min
- **Audio Output**: More than 2W in 8Ω
- **Price**: £699.95

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### Kenwood R-2000 Communications Receiver

- **Coverage**: 150kHz to 30MHz
- **Modes**: A.M, F.M, C.W., S.S.B., L.S.B., B.S.B.
- **Sensitivity**: 150µV at 2MHz s.s.b./l.s.b./w., 0.25µV at 30MHz a.m., <4µV
- **Resolution**: 50kHz, 500kHz, 5kHz
- **Selectivity**: A.M. wide: 6kHz at -6dB, 18kHz at -50dB; S.S.B.: 2.7kHz at -6dB, 5kHz at -50dB
- **Image Rejection**: >70dB
- **IF Rejection**: >70dB
- **Spurious Rejection**: >60dB
- **Frequency Stability**: ±300Hz for first hour, ±50Hz thereafter
- **Audio Output**: 1.5W at 8Ω and 10% distortion
- **Stage**: Triple conversion: 45.855MHz, 45.5kHz
- **Features**: Optional f.m. modules, independent digital IF stages, 24bit digital display, all-mode squelch, voice blanking, dual 24hr clocks, all-mode squelch, tone and attenuation
- **Reviewed**: Practical Wireless April 1984
- **Price**: Available on second-hand market

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### Trio R-1000 Communications Receiver

- **Coverage**: 200kHz - 30MHz
- **Modes**: A.M, S.S.B., L.S.B., B.S.B.
- **Sensitivity**: Below 2MHz: 5µV s.s.b., 50V a.m. Above 2MHz: 0.5µV, S.S.B., C.W.
- **Selectivity**: A.M. (Wide): 12kHz at -6dB, 25kHz at -50dB; A.M. (Narrow): 6kHz at -6dB, 18kHz at -50dB
- **Image Rejection**: Better than 60dB
- **IF Rejection**: Better than 70dB
- **Spurious Rejection**: ±1kHz
- **Frequency Stability**: ±2kHz max from 1 to 60 minutes after switch-on, ±300Hz max in any subsequent 30 minutes
- **Audio Output**: 1.5W min into 8Ω for 10% distortion
- **Stage**: 48.055MHz & 45.5kHz
- **Features**: Available on second-hand market

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### Panasonic RFB600LBE Communications Receiver

- **Coverage**: 110 - 420kHz
- **Modes**: 300kHz to 1.6MHz a.m., <4V (wide); 1.6MHz to 8.4MHz a.m., <50V (narrow)
- **Resolution**: ±4kHz
- **IF Rejection**: Better than 60dB
- **Image Rejection**: >60dB
- **Spurious Rejection**: >60dB
- **Frequency Stability**: ±300Hz during any 30min period after warm-up
- **Audio Output**: 2.5W at 8Ω and 10% distortion
- **Stage**: 45kHz
- **Features**: Optional f.m. modules, independent digital IF stages, 24bit digital display, all-mode squelch, voice blanking, dual 24hr clocks, all-mode squelch, tone and attenuation
- **Reviewed**: Practical Wireless April 1982
- **Price**: Available on second-hand market

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### Icom IC-R7000 Communications Receiver

- **Coverage**: 150kHz to 29,999.999MHz
- **Modes**: A.M, F.M, S.S.B., L.S.B., B.S.B.
- **Sensitivity**: Below 2MHz: 5µV s.s.b., 50V a.m. Above 2MHz: 0.5µV, S.S.B., C.W.
- **Selectivity**: A.M. (Wide): 12kHz at -6dB, 25kHz at -50dB; A.M. (Narrow): 6kHz at -6dB, 18kHz at -50dB
- **Image Rejection**: Better than 60dB
- **IF Rejection**: Better than 70dB
- **Spurious Rejection**: ±1kHz
- **Frequency Stability**: ±2kHz max from 1 to 60 minutes after switch-on, ±300Hz max in any subsequent 30 minutes
- **Audio Output**: 1.5W min into 8Ω for 10% distortion
- **Stage**: 48.055MHz & 45.5kHz
- **Features**: Available on second-hand market

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### Yaesu FRG-7700 Communications Receiver

- **Coverage**: 150kHz to 30MHz
- **Modes**: A.M, F.M, S.S.B., L.S.B., B.S.B.
- **Sensitivity**: Below 300kHz: 30V a.m., 3µV s.s.b./c.w. Above 300kHz: 30µV a.m., 3V a.m., 300V/s at 0.5V/50Ω, 1µV a.m. for 10dB S+N or better
- **Resolution**: 1kHz
- **Selectivity**: A.M. (Wide): 12kHz at -6dB, 25kHz at -50dB; A.M. (Narrow): 6kHz at -6dB, 18kHz at -50dB
- **Image Rejection**: Better than 60dB
- **IF Rejection**: Better than 70dB
- **Spurious Rejection**: ±1kHz
- **Frequency Stability**: ±300Hz during first 30min, <50Hz during any 30min period after warm-up
- **Audio Output**: 1.5W min into 8Ω for 10% distortion
- **Stage**: 48.055MHz & 45.5kHz
- **Features**: Clock, timer and sleep timer
- **Price**: £350
WHAT RECEIVER

JRC NRD 525
General Coverage Receiver

- COVERAGE: 9KHz to 38MHz optionally to 45MHz in steps of 5Hz
- MODES: AM (s.s.b.), SSB, c.w., f.s.k., I.F.T.TY
- SENSITIVITY: 1.5 to 30MHz: 0.5 µV (at 1KHz)
- IMPEDANCE: 75Ω, 1.5KΩ min.
- IF STAGE: 75KHz
- FREQUENCY STABILITY: ±3 p.p.m.
- AUDIO OUTPUT: 1KΩ, 0dB
- SELECTIVITY: 3.5KHz at >6dB, <60Ω
- RESOLUTION: 10KHz
- PRICE: £1195

Kenwood R-5000
Communications Receiver

- COVERAGE: 100KHz to 300KHz
- MODES: c.w., s.s.b., i.f., f.s.k., f.m.
- SENSITIVITY: <0.3µV for 10dB s/n at 70KHz
- IMPEDANCE: 1KΩ
- IF STAGE: Double conversion: 55MHz and 455KHz
- FREQUENCY STABILITY: ±10p.p.m.
- AUDIO OUTPUT: >2W
- RESOLUTION: 5KHz
- PRICE: £825

Lowe HF-125
General Coverage Receiver

- COVERAGE: 30KHz to 30MHz
- MODES: AM, SSB, C.W., F.M.
- SENSITIVITY: <0.7µV for 10dB s/n
- IMPEDANCE: 1KΩ
- IF STAGE: 75KHz
- FREQUENCY STABILITY: ±55p.p.m.
- AUDIO OUTPUT: 0.8W
- PRICE: £150

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"They said I couldn't work DX with just 100 watts. Especially with a radio that has less than 1000 switches on the front panel.

But the truth is, I'm working lots of DX, more than some of these blockbuster types, thanks to my Yaesu FT-747GX.

You see, my no-nonsense FT-747GX was designed with me in mind, so I can hop around the band fast to nail those DX stations. While the other hams are warming up their amplifiers, I'm working the new country!

My FT-747GX has a super receiver, with a directly-driven mixer for great overload protection. And, Yaesu included the CW filter in the purchase price (I used the money I saved on postage for the QSL cards!).

And my FT-747GX is loaded with other features. The receiver works from 100kHz straight through 30MHz, and it's a fantastic shortwave broadcast receiver. I can use all twenty memories for that alone! Plus it's got dual VFOs. A noise blanker. Split frequency operation for the pile-ups. And scanning up the band helps me check out openings as they happen.

I just put in the optional crystal oven, and next month I'm going to pick up the FM board. And with the money I saved when I bought my FT-747GX, I got a second ten-metre antenna for satellite work on the high end of the band. I use my personal computer to tell me what satellites are going by, and the computer even sets the frequencies on the radio for me.

Now my friends are getting FT-747GX rigs, too. I knew they'd figure out my secret weapon sooner or later. But now I'm setting the pace!

Thanks, Yaesu. You've made a rig that makes sense, at a price I can afford."

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"They laughed when they saw my radio. Then they saw my logbook."