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WORLD BAND RECEIVER

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REVISITED

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★ SATELLITE TELEVISION ★
★ SSB UTILITY LISTENING ★
★ PROPAGATION ★

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CONTENTS

VOL. 49 ISSUE 1 JANUARY 1991
ON SALE DECEMBER 21

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10 Educational Software for Basic Electronics
Part 1
J.T. Beaumont G3NGD

12 Baird Televisor Revisited
R.J. Harry

18 Another Medium Wave DX Loop Antenna
John Tweeker

20 HF Radio Wave Propagation Part 5
F.C. Judd G2BCX

23 Sony CRF-V21 World Band Receiver
Mike Richards G4WNC

29 Sky Scan DX V1300 Discone
Alf Brimming BRS36662

REGULARS

2 Editorial
3 Services
4 Letters
5 Rallies, Grassroots
6 Junior Listener
7 News
30 Propagation
31 SSB Utility Listening
32 Bandscan
33 Satellite TV News
34 Amateur Bands Round-up
37 DXTV Round-up
40 Airband
43 Scanning
44 RadioLine
47 Decode
51 Info in Orbit
55 Long Medium & Short
61 Book Service
64 Trading Post

...GOOD LISTENING
Last month I promised you a brighter and improved SWM - well, here it is! You will obviously have noticed the change to the cover design - the new and bolder logo running up the left hand side of the magazine will help to overcome the main problems with modern newsagents' magazine displays where only a small part, usually the left hand edge, of the front cover is guaranteed to be visible, inside, Steve has completely redesigned the page layouts to give the whole magazine an airier feel by taking advantage of the latest computer technology which we employ to produce the magazine.

On the editorial side, Elaine and myself have been listening to what you have told us about your likes and dislikes at the many rallies which we have attended and I have also taken note of what you have said in your letters and through the surveys which we have conducted either in the magazine or at rallies.

Any magazine is a living thing and must keep up with the times and the whims and needs of its readers if it is to survive. Those that ignore the clamours of their readers do so at their peril. However, the Editor has a very difficult job to do if he is to please the greatest number of readers and attract new ones to the fold.

That's why he has to try to decide which of the letters received are genuinely genuine or which are part of an orchestrated move to try to influence him to change the balance of the magazine in favour of a vociferous minority.

Over the past four years, SWM has evolved, a bit like Topsy, and new regular features have been slotted in where they really belong. Last two have been in - the new 'Junior Listener' page at the front of the issue, followed by feature articles in the middle. 'Junior Listener' is aimed at providing some much needed encouragement for the youngsters - the six to sixteen year olds, for want of a better categorisation. Contrary to some rumours that I have heard, it is not a replacement for 'Starting Out' and I have other plans for series for the beginner.

This issue also marks the change to the cover design - the new and bolder logo running up the left hand side of the magazine will help to overcome the main problems with modern newsagents' magazine displays where only a small part, usually the left hand edge, of the front cover is guaranteed to be visible, inside, Steve has completely redesigned the page layouts to give the whole magazine an airier feel by taking advantage of the latest computer technology which we employ to produce the magazine.

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Over the past four years, SWM has evolved, a bit like Topsy, and new regular features have been slotted in wherever it has been convenient. Now you will find the regular columns all grouped together towards the back of the magazine. This doesn't mean that they are considered unworthy of a place at the front - just that I consider it to be easier for you to find what you are looking for if you know where to look for your favourite items. So you will find your letters, news and new products, together with my leader, when I feel that it is necessary to write one and the new 'Junior Listener' page at the front of the issue, followed by feature articles in the middle. 'Junior Listener' is aimed at providing some much needed encouragement for the youngsters - the six to sixteen year olds, for want of a better categorisation. Contrary to some rumours that I have heard, it is not a replacement for 'Starting Out' and I have other plans for series for the beginner.

Don't forget to make sure that anyone you know with young children, or who are involved with them, such as Brownies, Guides, Cubs, Scouts or at school are aware of the 'Junior Listener' page.

Advertisements, which are necessary if the price of the magazine is to be kept down to a reasonable level, will continue to be spread around the pages.
Dear Sir

I read with interest your Leader Column in the December 1990 issue and look forward to the January issue. Whether it is essential to change the format in view of the fact that, as you point out, SWM is the second largest selling magazine, remains to be seen.

However, time will tell.

Regarding the question of the "Junior Listener", I am of the opinion that to aim a portion of the contents at six-year-olds is a hit-off feat. I am 62 years of age and have been an enthusiast for over 55 years, having been taught about radio by my father, who, with his friends, were exceptions to every rule.

I understand and appreciate radio articles are aimed at the more advanced stages of radio. While I agree that most enthusiasts, at an early stage, SWM is for the adult listener and it is without doubt the right sort of age to start. If you want something for the six-year olds.

In conclusion, I should add that I fully appreciate that there are exceptions to every rule. While I agree that most enthusiasts, at an early stage, SWM is for the adult listener and it is without doubt the right sort of age to start. If you want something for the six-year olds.

J H C WELLS, EAST GRINSTED

Dear Sir

I am 78 years. I could not sleep so I got up and switched on my Russian Selenia short wave set using an indoor antenna on my window sill. I tuned into the 16m band at 0524 - 0930 New Zealand to hear the Pasadena Orchestra playing "I'll see you again". Reception was poor, interference from a Russian station. Sorry I can not give you any more details. Reception report: SINPO 12211. Hope this might be of some interest.

DAVID NICHOLLS, BRACKNELL

Dear Sir

Congratulations to Ron Pearce for reminding us of the excellent results obtainable from a simple one-valve radio (September SWM). As Ron so rightly says, the quiet operation of these is a revelation to those accustomed to today's transistorised designs. The low level of noise should not be taken as a sign of lack of sensitivity, it is due to the absence of cross modulation, intermodulation, harmonics, spurious responses and local oscillator phase noise to which most semiconductor designs (with their totally inadequate input selectivity) are all too prone, and which seriously limits the maximum length of antenna that is usable. With an S-V-O receiver, what you hear is what the antenna provides, with nothing added or taken away.

If these simple receivers do have a problem, it is lack of sensitivity especially at the short highest wave frequencies. As something of an old-timer myself, I well remember the efforts of myself and friends to reach the unattainable ideal reaction circuit which would give ever decreasing bandwidth, combined with stability and lack of backlash as it teetered on the brink of oscillation, and many weird and wonderful circuits resulted, often using ponodies since they gave you more grids to play with!

A basic requirement is for the highest possible Q for the tuned circuit to start with, and for those who like to experiment, the easiest way to get the correct coil connections is to wind the reaction coil in the same direction as the tuned winding, then the two inner ends are the earthy ends. the antenna coil can be wound in either direction, but it is usually best to earth the inner end. Jam jars make good high Q coil formers, wound with the thickest available wire. As only a few turns are required it is easy to adjust the variables for the best results.

Back to the days of true amateur radio?

F.J. ROUSE, LONDON

Dear Sir

I hope that you find the new look to your hobby to be one of the best ways of winding down.

KENNETH W. REECE
PRENTON

I hope that you find the new look to your hobby, Mr. Reece. As you will see the magazine has not degenerated into something for the six-year-olds. However, I firmly believe that to get the interest of children, then six is probably the right sort of age to start. If you want proof of that then you should see my wife's Brownie pack during the weekend of Thinking Day on the Air.

Most of them have already passed the Radio Communicator badge and it is interesting that RTTY seems to be the preferred mode.

Ed.

Dear Sir

Having been on the air for over 26 years and apart from pioneering a much imitated format, Radio Caroline is largely responsible for revolutionising broadcast radio in this country which is now gradually giving more choice to the listener.

Despite all the alleged harassment by the DTI, the 'unauthorised broadcaster' has returned on 819kHz. I hope this will be a prelude to the station being fairly acknowledged and Radio Caroline will, at last, achieve the legal status it greatly deserves.

DAVID NICHOLLS, BRACKNELL

We have received several letters commenting on the subject of pirate stations and what SWM's attitude to them should be. We would be interested in hearing more on this subject before we finally make our decision on whether to report such stations or not.
**rallies**

January 27: The CLARC & ULARS are holding their rally at Lancaster University. Mike Sherlock G4ZYN. Tel: (0257) 452287.

February 3: The South Essex Amateur Radio Society will be holding their 6th mobile rally at Paddockwood, Long Road, Canvey Island. This will be an all-day event featuring trade stands, Bring & Buy, RSGB Bookstall, Boot Sale, home-made refreshments. Doors open at 10am. There will be extensive free car parking and easy access to Paddockwood. Dave Speakley G4 UVJ. Tel: (0268) 697978.

February 24: The East Coast Amateur Radio and Computer Rally will be held at the Clacton Leisure Centre.

February 24: The Bideford Bay ARC are holding their 4th Towr and Torridge Rally at Bideford, Devon in the BAAC Halls starting at 10.30am. Talk-in will be on S22. John Denford GOHQ. Tel: (0237) 476402.

March 9/10: The London Amateur Radio Show will be held in the Pickett Lock Centre, Pickett Lock Lane, Edmonton, London N9 0AS.

March 17: The Norbreck Radio, Electronics & Computing Exhibition will be held at the Norbreck Castle Hotel Exhibition Centre, Queens Promenade, North Shore, Blackpool. Admission is £1, OAPs 50 and under 14s free. Free raffle ticket and exhibition plan. Peter Denton G6CGF. Tel: 051-630 5790.

March 17: The Wythall Radio Club will be holding its 8th annual radio rally at Wythall Park, Silver Street, Walthall, Worcs., which is on the A435 near Junction 3 on the M42 south-west of Birmingham. Doors open 11am. There will be three halls plus a marquee, trade stands, flea market, Bring & Buy, a bar and snacks will be available, talk-in on S22 and admission is 50p. Chris Pettitt G0EYO. Tel: 021-430 7267.

**Short Wave Magazine & Practical Wireless in attendance**

Acton, Brentford & Chiswick ARC 3rd Tuesdays, 7.30pm. Jan 30 - ACM, Paul Trust G5WQO. Tel: 071-938 2561.


Bromsgrove ARC 2nd & 4th Thursdays, 8pm. Aston Fields Working Men's Club, Stoke Road, Astonfields, Bromsgrove Jan 8 - Night on the Air, 22nd - Weather FAX by Barry Penyer G6MRL. J. Yarnall G1JU. Tel: (0297) 503024.


Chelmsford ARC 1st Tuesdays, 7.30pm. Marcon College, Ashburn Lane, Chelmsford. Jan 8 - The Annual Film/Video Show, Roy Marry, Chelmsford 355221 ex 3815.

Cheshunt & DARC Wednesdays, 8pm. Church Room, Church Lane, Womley. Dec 28 - no meeting, Jan 2 - Natter Night, 9th - Flying Tonight by Roy GOMEH, 16th - Natter Night. Roger Frisby, Hoddesdon 464795.

Coventry ARC 3rd Tuesdays, 8pm. Baden Powell House, 121 St Nicholas St, Redford, Coventry. Jan 4 - Computer Night, Bring Your Own if You Can, 11th - Night on the Air & Morse Tuition, 18th - Bring & Buy, RSGB Bookstall, 27th - Annual Dinner. Neil Coventry C329629.


Derby & DARS Wednesdays, 7.30pm. 119 Green Lane, Derby. Nov 28 - Pixilation to W, square paper by Paul G1W8Z, Dec 26 - No meeting, Jan 2 - Junk Sale. 9th - The Year in Retrospect, 23rd - CT2 - The Cordless Revolution by Mike Dorssett. Richard Buckby, Derby 852475.

Horsham & DARC. 1st Thursdays, 7.30pm. Horsham Community School, Barnet Cross (Off Cattern Down Lane). Jan 3 - High Tech Test Equipment by Hewlett Packard. S. W. Swain. Tel: (0705) 472246.

Kidderminster & DARS Alternate Tuesdays, 8pm. The Queens Head, Woverley, near Kidderminster.


Mansfield ARC 1st Thursdays, 8pm The Welsh Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. Jan 3 - India - Overland from Delhi to Ladakh by Mark G8EXH. Mary G0NZA. Tel: (0623) 755288.

Mid-Warwickshire ARC 2nd & 4th Tuesdays, 8pm. St John Ambulance HQ, 61 Emscote Road, Warwick. Jan 8 - HF Night at Warwick School hosted by Ted G0KA0, 22nd - My Year as Young Amateur of 1980, how it went by Ted G0KA0. Mike Newell, Kenilworth 513073.


Premont ARC 2nd Thursdays, 6.00pm. The Lonsdale Sports & Social Club, Southdown ARS: 1st Mondays, 7.30pm. G0YIK, 24th - Discussion Night. David Pottery Hands On by Peter GODRX, 16th - Medical Electronics Evening by John GOMEO, 19th - Photographic Equipment Evening, 9th - Construction Club Night, 15th - Natter Night, 22nd - My Year as Young Amateur of 1980, how it went by Ted G0KA0. Mike Newell, Kenilworth 513073.


Trowbridge 7 District ARC 8pm. TA Club, Trowbridge. Jan 2 - Social, 16th - AGM, G0GRI. (0380) 830383.

West Kent ARS 3rd Fridays, 8pm. The School Annex, Albion Road, Trowbridge Wells, Kent. Dec 3 - Christmas Social at Seven Oaks Radio Club.


Wirral ARS. Wednesdays, 7.45pm. Ivy Farm, Arrowave Park Road, Birkenhead. Wirral.

Yewhol ARS. Thursdays, 7.30pm & Fridays, 7.30pm. The Recreation Centre, Chilton Grove, Yewhol. Dec 27 - Natter Night and Committee Meeting, Jan 10 - RTTY by G8NL. 17th - Simple PSUs by G3HJD. 24th - Discussion Night. David Bailey G0NMW. OTHR.

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

*Grassroots: Send all details of your club's up-and-coming events to: 'Grassroots', Lorna Mower Short Wave Magazine, Enseho House, The Quay, Poole, Dorset BH15 1PP.*
This month, I have a couple of Crystal Sets, supplied by Link Electronics, to give away as prizes. As this is the first time and I'm feeling rather generous, I'll make the competition really easy! All you have to do is write to me with details of your interests and any radio equipment you use along with your name, age and address. All your letters will go into a box and the first one in each age range (up to 12 and 12-16 years old) picked out will win the prizes. You can't get much easier than that now, can you? If you don't win, but would like to add a crystal set kit to your birthday present list, they're available from your local Tandy shop.

**Competition Time**

Hi and welcome to this brand new page. As it's so new, I'll start by telling you how it started and what I'm hoping to cover. The Editor has been aware for a while that something extra is needed for the six to sixteen year olds. The final prompt came from a letter written by Mark Farr of Crewe, printed in the November issue, which contained several good ideas for the basis of a regular column - so here it is!

**Help Desk...**

One of the problems facing those starting out in any hobby is where to get help and advice from. This is a service that I'll attempt to provide through this page. So, if you feel you could do with a hand, why not send me the details and I'll do my best to help out. There are no limits to the range of questions you can ask, just as long as they're in some way related to radio or electronics!

When I first started in radio I used to have all sorts of fun experimenting with antennas. The great thing about building antennas is that they are usually very cheap, so that even I could manage it on my pocket money. So, this month, let's try building our own long wire antenna for listening on the short wave bands. The long wire antenna makes an ideal general purpose antenna for the listener as it is both simple and versatile.

Before I start, I can hear you asking - how long is a long wire? Well, a true long wire antenna is a single wire with a length greater than the longest radio wavelength you want to listen to. Sounds a bit complicated, but there is a simple way to work out the length of wire you need. The length in metres is equal to 300 divided by the frequency in MHz. Put into a simple formula this is: L = 300/f where L is the length in metres and f is in MHz.

If you want to cover medium wave right through the short wave bands, the antenna needs to be longer than 600m. However, if you only want to cover the short wave bands, you can shorten it to 190m.

The next problem, of course, is what do you do if, like me, you haven't got room for a really long antenna. One of the problems facing those starting out in any hobby is where to get help and advice from. This is a service that I'll attempt to provide through this page. So, if you feel you could do with a hand, why not send me the details and I'll do my best to help out. There are no limits to the range of questions you can ask, just as long as they're in some way related to radio or electronics!

First of all, I'd like to give you a chance to have your say about what you'd like to see in the magazine and in particular this page. For this I need your letters but, rather than just sending your views, include details of your station. If you can manage a photo I'll do my best to print it. The address to write to is at the top of this column.

**Pen Pals**

Another interesting subject is pen pals. The magazine has already received many letters asking for this, so I'll include it too. To find a pen pal, all you have to do is write to me and I'll publish as many as I can in the column. So that you stand the best chance of getting the right pen pal, it's important to make sure you include plenty of detail. The important points are: name, address, age and interests. It would also be a good idea to say how long you've been interested in radio and list some of the things you've done.

Let's explain how the system will work. The first step is for you to write to me with the details I've just described. You also need to include a large stamped addressed envelope for the replies. I'll publish the main points in the column, except for your address and ask all those who would like to be pen pals to write to me. Then I'll gather all the replies together and send them on to you in your envelope - that's why it needs to be a large one. All you have to do is decide which ones are most suitable for you - and write to them.

**Antenna Matters**

When I first started in radio I used to have all sorts of fun experimenting with antennas. The great thing about building antennas is that they are usually very cheap, so that even I could manage it on my pocket money. So, this month, let's try building our own long wire antenna for listening on the short wave bands. The long wire antenna makes an ideal general purpose antenna for the listener as it is both simple and versatile.

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The next problem, of course, is what do you do if, like me, you haven't got room for a really long antenna. Fortunately, the long wire antenna can be shortened a lot and still work well. The secret is to keep the antenna as long as possible.

The next question is what type of wire should you use? The type of wire is not too important, as long as it's strong enough to hold up its own weight. The smallest size you should use is about 0.3mm diameter. In fact, there's a special advantage in using thin wire - it becomes almost invisible! This is great when you've got problems with parents and neighbours who don't want to see wires strung across the garden!

When putting up your antenna, the ideal is to have it as high and straight as possible. In real life there are very few listeners who can do this, so all you do is put it up as high and as straight as you can. But, if a bend or two will give you some extra length, it's still well worth doing. To help you out, I've drawn a typical layout for you.

That's about it for this month. Don't forget to write to me with all your news, views and station details.

---

**Jon Jones**
P.O. Box 59
Fishponds
Bristol BS18 4LH

Hi and welcome to this brand new page. As it's so new, I'll start by telling you how it started and what I'm hoping to cover. The Editor has been aware for a while that something extra is needed for the six to sixteen year olds. The final prompt came from a letter written by Mark Farr of Crewe, printed in the November issue, which contained several good ideas for the basis of a regular column - so here it is!
The London (HMS Belfast) Group to blind and disabled claimants. Basildon, Essex SS16 5SG.

In log form, date - time - mode - station aboard HMS Belfast. All claims for upkeep of the amateur radio station are raised will go towards the equivalent to all claimants. Surplus RNARS members - 2 points each. HMS Belfast, the remainder may be with London group members in Europe. Again, four contacts have to be made up of contacts with RNARS members - 2 points each.

G7HMS - 10 points on each band. Four contacts have to be with special GB2 RN, G4HMS, GB2 RN, G4HMS, GB2 RN. Any contact with special GB2 RN, G4HMS, GB2 RN is worth 2 points.

Test transmissions of Radio 1 FM from Whitehawk Hill, Brighton should begin in time for Christmas. Using a frequency of 99.7 MHz, the new service from Whitehawk Hill will extend reception of Radio 1 in f.m. stereo to around 170 000 people in the Brighton and Worthing areas. The test transmissions will continue for two or three weeks before the Radio 1 FM service officially opens. During this period of tests, the transmissions may be subject to interruptions while essential engineering work is carried out.

BBC Radio Solent began broadcasting in stereo on Monday November 12, from new studio premises in Southampton. The stereo programmes are broadcast on f.m. only from the Rowridge transmitting station on the Isle of Wight. The m.w. transmitters at Fareham and Bournemouth will continue to carry BBC Radio Solent's programmes in mono. Operating on a frequency of 96.1 MHz, Rowridge transmits BBC Radio Solent's stereo programmes to around 1 650 000 people in Hampshire, the Isle of Wight, east Dorset, western parts of West Sussex and parts of Wiltshire.

The BBC is building a new relay station for Radio Suffolk, to improve f.m. reception for around 52 000 people in the Lowestoft area. The new relay, sited in north Lowestoft, just off Hollingsworth Road, should be ready for service about now and will transmit on 95.5 MHz.

NIMC digital stereo comes to Central Television and Channel 4 in parts of Warwickshire, Staffordshire and the West Midlands from the end of November 1990. A new relay station called Finchley will shortly bring good TV and Teletext reception to about 1820 people in Finchley, London N3. It is being built jointly by the BBC and the IBA, on the roof of Norman Court, near Finchley railway station, and is expected to open in the next few weeks.

Channel 46 - ITV (Thames/WAT) Channel 47 - BBC 1 (South East)
Channel 48 - BBC (South East)
Channel 49 - Channel 4

The BBC is building new transmitting stations in the following areas. They will shortly bring good f.m. radio reception to people in the areas.

Would-be radio amateurs searching for a way to gain their Radio Amateur Licence, can always try a postal course. The RRC City and Guilds programme covers both Parts 1 and 2 of the course and prepares students for the examinations that are held in May and December of each year.

The RRC programme covers the following subjects: Licensing Conditions, Transmitter Interference, Operating Practices and Procedures, Electrical Theory, Solid State Devices, Radio Receiver, Transmitters, Propagation and Antennas and Measurements. For further details, contact: RRC, Tuition House, 27/37 St George's Road, London SW19 4DS. Tel: 081-947 2211

**Modifications for ICF2001D**

Johnson's Shortwave Radio tells us that all Sony ICF2001D receivers purchased from them after September this year were updated so as to overcome the front-end overload problems, according to the Sony modification sheet. Johnson's have also offered to modify free of charge any ICF2001D purchased from them and still under guarantee. Out of guarantee sets, or sets purchased elsewhere, can be updated by Johnsons by arrangement - call for details.

Johnson's Shortwave Radio, 43 Friar Street, Worcester WR1 2NA. Tel: (0905) 25740.

HARVEY LEXTON OF DRESSELLER HAS TOLD US THAT THEY ARE NOW SUPPLYING THE AOR AR1000 MODIFIED TO COVER 500KHz TO 3.3GHz, WITH NO GAPS. THE COST FOR THE MODIFIED RADIO IS £269. THEY CAN ALSO MODIFY THE FAIRMATE HP100E OR THE NEW HP200E OR YOUR OWN AR1000 TO GIVE THE SAME COVERAGE FOR £49 INCLUDING VAT AND P&P. IF YOU'RE INTERESTED, CONTACT: DRESSLER COMMUNICATIONS LTD., 191 FRANCIS ROAD, LEYTON E10 6NG. TEL: 081-556 0854.
Software for the Astronomers

Ron Ham wants to encourage the astronomers amongst our readers to write to him with their observations as he feels that this could be of relevance to his new 'Propagation' column.

Ron tells us that newcomers to astronomy, students or 'armchair' astronomers, like him, who want to study the night sky from the comfort of their home can obtain a good educational piece of software called Startrack+. For the Amstrad PCW8256, 8512 and 9512 computers. Among the many Startrack+ features is the ability to find and identify the 88 constellations and numerous stars, locate the moon and the planets. Furthermore, you can place yourself anywhere on the earth's surface and learn about the stars you may never see by setting the time to any hour, day, month, or year between 1000 and 2999AD. In Ron's view this is a very important feature of the Startrack+ software, which costs £19.95 from Discovery Software, 291 Cricklewood Lane, Childs Hill, London NW22 2JL.

European Harmonisation

In a highly successful second meeting in Athens, from 15-19 October, the European Radiocommunications Committee (ERC) reached agreement on several significant issues in European radio frequency management. Czechoslovakia and Hungary, two of the five new members of the Conference of European Posts and Telecommunications (CEPT), sat on the ERC for the first time.

The Memorandum of Understanding on the creation of the European Radio Communications Office (ERO) was signed by Austria, the 17th administration to sign. The MOU came into effect on November 16 and guarantees funding from administrations for the ERO.

The ERO is being established to provide greater resources and to meet the demand for wider consultation on radio frequency management activities.

The ERC is being established to provide greater resources and to meet the demand for wider consultation on radio frequency management activities.

The ERC agreed the basic terms and conditions of employment for the six experts and two secretaries who will run the ERO initially. Details of the vacancy notices for the expert posts were agreed for circulation to all CEPT administrations and, through them, to industry. Applications are being invited with a deadline of 31 December 1990.

The New HF-235 Receiver

Derbyshire based Love Electronics has announced the recent introduction of the latest in their range of hf receivers, the HF-235.

The HF-235 is the company's first product dedicated to the demands of professional point-to-point monitoring. The most notable features are its compact size with a '2U' (88mm) x 19in panel, a high 'level of r.f. performance, optional remote control through a RS-232 interface, ease of assembly for multi-receiver installations and bespoke software to drive specially modified monitoring requirements.

This new receiver offers three choices for frequency tuning. Conventional spin-wheel tuning, front panel key pad and remote control. It is equipped for a.m., c.w., u.s.b. and I.s.b., with f.m. and synchronous a.m. also available using an optional detector unit. A full range of bandwidth filters is fitted as standard and specials can be provided for unique applications.

Love Electronics Ltd., Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (0629) 580800.

Two New Scanners

The Fairmate HP200 is a new and improved version of the popular HP100E. This set has extra wideband coverage, 500KHz-600MHz and 805-1300MHz. In conjunction with Fairmate, the importers Nevada have made several improvements to the receiver's sensitivity and stability. In addition, they are now supplying a UK spec charger and short wave telescopic antenna. The set will be available for £269.

The Nevada MS1000 scanning receiver is also new to the market. This is the first in a line of Nevada branded scanning receivers, designed specifically for the UK market. The set has the same specification as the new Fairmate HP200 handheld scanner, but with the following additional features:

- Switchable audio squelch
- Tape recorder output socket
- Automatic signal operated tape recorder switching circuit
- All metal case for improved EMC compatibility

The unit will cost £279.

For more details contact: Nevada, 189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (0705) 662145.

Short Wave Car Radio

Phillips car stereo introduces the combination of a ten-band short wave world receiver, f.m., m.w. l.w. radio and auto reverse cassette with the launch of the DC777.

The DC777 is ideal for the car, boat or caravan, for the motorist travelling abroad wanting to keep up-to-date with the news from home or for drivers who like to listen to their favourite programmes from around the world.

The design features a drop-down panel with keys to store 20 favourite stations from the ten short wave bands. Direct access is also available on the short wave bands to allow fast and accurate tuning to specific broadcasts while a clock/timer allows the automatic broadcast of any programme at a preset time.

A further five presets are available on each of the f.m., m.w. and l.w. bands with auto store for the automatic storage of the five strongest stations on f.m. and m.w.

The DC777 has a 50W power output and is one of the first units to feature the Philips new SCA auto-reverse cassette deck. Security is a Philips strong point these days, with the DC777 featuring security coding. It also has a retractor option for a safe storage away from the car. The cost of the unit is £299.

Radio & Electronics Register

G4NKH is providing a method of buying, selling, exchanging and locating radio and electronic equipment. Daily updates are available, on request, at no charge. There's no waiting two or three months for adverts to appear.

Sellers pay a subscription rate of £8, to advertise as many times as they wish, all year long. Prospective purchasers have to send a 9 x 4in s.a.e. to G4NKH for the list. The purchaser can specify the equipment they are looking for or just the type of equipment they want to buy.

If you think you would be interested, then contact: G4NKH Buyers & Sellers, 42 Arnott Road, Blackpool, Lancs FY4 4ED. Tel: (0253) 62925.
When you are ready to graduate to real listening

Look to Lowe

HF-225  HF general coverage receiver, 30kHz to 30MHz  £425.00 £10.00
(The HF-225 has been voted "Receiver of the Year" by World Radio and TV Handbook, against all other manufacturers' products)

Options
D-225  Synchronous AM and FM detector  £39.50 £1.00
K-225  Keypad for direct frequency entry  £39.50 £1.00
B-225  Internal NiCd battery pack  £49.00 £2.50
W-225  Active whip aerial  £19.50 £2.50
C-225  Delux carrying case for HF-225  £23.86 £3.00
S-225  Wharfedale speaker and lead  £45.90 £3.00

R-5000  Kenwood HF communications receiver, 100kHz to 30MHz  £875.00 £10.00

Options
DCK-2  12volt dc power kit  £9.29 £1.00
VC-20  VHF converter for 108 to 174MHz  £167.21 £3.00
VS-1  Speech synthesiser for R-5000  £32.26 £1.00
YK88A-1  6kHz AM crystal filter  £48.05 £1.00
YK88C  500Hz CW filter  £46.08 £1.00
YK88CN  270Hz CW filter  £54.64 £1.00
YK88SN  1.8kHz SSB filter  £46.74 £1.00
SP-430  External speaker unit  £40.81 £2.50

NRD-525  JRC communications receiver, 90kHz to 34MHz  £975.00 £10.00

Options
CMK165  VHF/UHF converter, 34-60, 114-174, 423-456MHz  £391.35 £10.00
CMH530  RTTY demodulator  £102.19
CMH532  RS232 interface unit  £91.75
CFL231  300Hz CW filter  £126.37 £1.00
CFL232  500Hz CW filter  £126.37 £1.00
CFL233  1kHz RTTY filter  £126.37 £1.00
CFL218A  1.8kHz SSB filter  £117.89 £1.00
NVA88  Matching external loudspeaker  £62.86 £2.50

THE LISTENERS' BOOK OF THE YEAR  £12.95

Never has a title been so well chosen as the "Passport to World Band Radio". This is the one book which seems to contain everything you need to know about listening to the amazingly diverse world of radio broadcasting. Let's just run through what this book contains:

Obviously it has a complete listing of all short wave broadcasters, not simply in order of frequency, but also listing by language and country of origin. AND also the timing of the broadcasts. Almost two hundred pages of such information would make the book worthwhile on its own, but you also have detailed reviews and comment from an acknowledged and respected authority on such matters covering no less than forty radio receivers ranging from the sublime to the gor-blimey. To add to all this, you also get over a hundred pages of general news, views, and information.

The "Passport is an absolutely indispensable companion to the short wave listener and the price is so reasonable for so much information. Get one soon before they are out of print.

The price for this constant companion. Slightly less than that for a pedigree dog. It's £12.95 for callers, or we can send it to you for an extra £1.55 for postage and packing.

Send four first class stamps to cover the postage and we will send you, by return of post, your FREE copy of "THE LISTENERS GUIDE" (2nd edition), 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.

LOWE ELECTRONICS LIMITED
Chesterfield Road, Matlock, Derbyshire DE4 5LE  Telephone 0629 580800 (4 lines)  Fax 580020  Telex 377482
When it comes to scanners
Look to Lowe

The new WIN-108
The finest handheld airband receiver in the world

The new WIN-108 is the latest version of this world beating air band radio, which has been acknowledged all over the world as the best hand held VHF radio available.

Now covering 108 to 143MHz, and with all UK and European channels covered in the now standard 25kHz spacing giving 1400 channels for your use, the WIN-108 will give you total listening satisfaction, at home or out on the airfield.

Everything you need is provided by the WIN-108: 20 memory channels, memory scanning, frequency searching between your chosen limits, a priority channel which you can programme to any frequency in the airband, direct frequency entry from a simple keypad, up/down tuning, and so on and so on.

Best of all, the WIN-108 comes from a respected manufacturer and is backed by the best service in the business from Lowe Electronics.

Airband radios are getting quite complex, and many people are confused by the increasing numbers of apparently similar radios on the market. To help you choose, here is a check list of absolutely essential features you must have in an airband radio. If the radio you are going to buy has any of these features missing, DON'T BUY IT, because you will be disappointed.

THE QUESTIONS
1) Does it have frequency coverage from at least 108MHz to 137MHz? For all new channels? (The WIN-108 covers from 108 to 143MHz.)
2) Does it have channel spacing of 25kHz? This is crucial, because all important frequencies are now using 25kHz channels. The old standard of 50kHz is totally useless. (The WIN-108 has 25kHz channels.)
3) Can you use ordinary pencells if you want to? Having re-chargeable batteries is all very well, but it doesn't help you at an air show when they run flat. You can always get a set of Duracells from somewhere. (The WIN-108 uses easy to obtain batteries.)
4) Can you search for new signals between user-programmed limits? If you have to search the entire Nav and Coms band all the time, it wastes valuable searching time when signals can be lost. (The WIN-108 has programmable search limits.)

So — four simple questions which you MUST ASK. For full details on the WIN-108 and all the other radios from our exciting range, simply ask for our airband information pack, which includes a free copy of our ever popular "Airband Guide".

Happy listening. (It will be with a WIN-108.)

WIN-108 £175 inc. vat.
Available from good dealers everywhere.
Educational Software for Basic Electronics Part 1

The computer programs in this series by J.T. Beaumont G3NGD, can be used as Student Centred Learning material and also to supplement textbooks and notes for students studying for the CGLI Electronics Servicing Course 224 as well as the Radio Amateurs' Course 765.

One disadvantage of self-study is the limitation on the number of calculation questions given in a text book. Occasionally some answers are wrong and this only adds to the frustration. Many of the programs listed in this series have a calculation option. This makes it possible for the student to make questions up at random, and know that the correct answer can be obtained from the computer.

In the early years of study, students experience difficulty when using the oscilloscope. With this in mind, a major program is included later that presents at random, various waveforms on a c.r.o. screen and the student has to calculate voltage, periodic time and frequency.

All the programs are 'user friendly' and make full use of colour and graphics. This helps to maintain interest. The program 'Logic Gates', for example, will allow the student to open and close the gates directly from the keyboard, the answers given in a truth table.

Although the programs are written for the BBC microcomputer they are all written in BASIC. This means that it is possible to convert them to work on other computers.

I am grateful to the students at North Trafford College for their criticism and ideas that have made this series possible.

Additive Mixing of Colour - Program 1

This short program can be used as a visual aid to demonstrate the effect of mixing the three primary colours. This principle is used in colour television, where three electron beams (red, green and blue) are converged to energise colour phosphors on the inside of the cathode ray tube.

When the program is RUN, the three primary colours (red, green and blue) are each drawn appearing in the mixing process. This is followed by a mixing of complementary colours to show that:

Yellow + Magenta = White
Cyan + Yellow = White
Magenta + Cyan = White

10 REM ** PROGRAM ONE **
20 REM * ADDITIVE MIXING OF COLOUR *
30 REM * J.T. Beaumont *
40 REM **
50 REM **
60 REM **
70 REM ***
80 REM ***
90 REM ***
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1100 REM ***
1110 REM ***
1120 REM ***
1130 REM ***
1140 REM ***
1150 REM ***
1160 REM ***
1170 REM ***
1180 REM ***
1190 REM ***
1200 REM ***
1210 REM ***
1220 REM ***
1230 REM ***
1240 REM ***

Fig. 1: Program 1 screen.

Fig. 2: Program 2 screen.
Finally, a summary of the demonstration is given on the screen. At this point, students can copy the information into their books.

Out of interest, the mixing process is achieved on the computer by the instruction: CCOL1,1 at line 720. This allows the programs to perform a logic ‘OR’ with another colour.

Red = decimal 1 = binary 0001
Green = decimal 2 = binary 0010
Yellow = decimal 3 = binary 0011

The use of logic in this way may be of interest later on, when using the ‘Logic-gate Tutor’.

**Decimal to Binary Conversion - Program 2**

This program can be used as a visual aid when teaching students to count in binary arithmetic. The CGLI Course 224 syllabus requires the student to understand the concept of the binary system of numbers, and to be able to convert from decimal to binary and from binary to decimal.

Teachers usually demonstrate this concept by counting on their fingers, but this program goes a great deal further.

When the program is RUN, a Menu is presented on the screen. The Menu allows two options to be selected:

1. Decimal to Binary
   - When a decimal (denary) number is entered, followed by pressing the RETURN key five coloured rectangles appear on the screen to represent the binary digits. This is followed by the binary number itself. If however, a large number is entered, the binary number is printed on the screen, with a message regarding the rectangle display having an overflow.

2. Binary to Decimal
   - This option allows students to check their answers when converting from binary to decimal.

   It is important to remember that only integers (whole numbers) can be used when converting decimal to binary, and also that binary numbers are either '0' or '1'.

---

**Program Notes**

The following notes are included for people wishing to use other computers.

60 *FX11.0 - turns the auto-repeat key off. If a student keeps his/her fingers on a key too long, the computer will not auto-repeat.

70 *FX200, 1 - this enables the ESCAPE key.

60 *KEY10 OLD:MRUN: M - this reprograms the BREAK key to RUN the program again. Students cannot then accidentally stop the program by pressing BREAK.

100 VDU23:820:0;0;0; - removes the flashing cursor, which can be annoying when using the computer as a visual-aid. This may appear more than once in a program, as it is cancelled each time the ‘Screen Mode’ is changed. (Note: For a BBC BASIC 1 Computer, this should be changed to VDU23:1,0;0;0;0.)

220 *FX15.0 - flush the buffer (must wait for key-press).

1000 DEF PROC_Start - this is called a “Procedure”. On computers where this option is not available, the command GOSUB can be used.

Subroutines have a disadvantage that they cannot be called by name, nor can their program lines be isolated clearly from the main program. This is overcome on the BBC microcomputer by using PROCEDURES. By selecting option “F” at the prompt (line 230), the user may exit from the program. Normally, if the programs are stored on floppy disk, “BOOTING” the disk will return to the Menu.

---

**Extra Reading**


The Pre-BASIC Book BP146 by F.A. Wilson. A Bernard Babani (publishing) book. £2.95


A Concise Introduction to the Language of BBC BASIC BP149 by T.J.E. Murphy. A Bernard Babani (publishing) book. £1.95.

My interest in Baird was stirred when I bought a book at a local jumble sale. It was a first edition of Newnes Wireless Constructor's Encyclopaedia published in 1932. I remembered the book well. As a lad it had been my main source of information concerning "wireless" matters, but that copy had been a later edition and had not contained the article on television. In my casual reading, I had come across several descriptions of Baird's Televisor - 30 lines produced by a spinning disc drilled with holes, but this book gave constructional details and reading through the article I thought the whole thing rather ramshackle and hardly worth the effort of construction.

More Confusion

But people did build the "Televisor", as the television receivers were known, and the BBC transmitted the signals. The result of all my efforts at further research was more confusion. One early (1923) helper of Baird said, "...we did succeed in transmitting an image which was moving and recognisable". But another source reported, "...by the beginning of 1924 Baird was able to transmit, electrically, silhouettes of objects...".

At this time in the USA C.F. Jenkins was also transmitting silhouettes, so Baird's efforts at this stage were not a technical advance.

Had all this happened in 1824, it would have been a significant event but it did not, it was between 1924 to 1936. Wireless telegraphy had been in use 75 years, the BBC were starting broadcasting and in the cinema "talkies" were just coming into use. The ordinary citizen of the time was perfectly familiar with moving pictures which, even though they were shot on 16mm, on black and white stock, were still far superior in definition to anything Baird was to produce. So why the interest in Baird? Would you pay 12 Guineas for a Baird Televisor kit, when you earned £2 or so a week? (1930) prices.

It was at this stage that I decided to attempt to construct a Televisor from the details given in the Wireless Constructor's Encyclopaedia. I did not intend to produce a working model, or construct a replica, but I hoped that by going through the process of construction I would gain some insight that would enable me to understand between the work of Baird. What follows is not a constructional article, although some practical details are given; it is an attempt to recreate the environment in which the first television receivers were made.

The principle of the Baird system is well known, and I do not intend to describe it here, sufficient to say that scanning was achieved by a spinning disc and this was the major part of the construction of the receiver. Behind the disc was placed a neon lamp which was connected to the loudspeaker terminals of the wireless. The intensity of the light varied with the transmitted modulation and if synchronised with the disc, a picture would be produced. It was necessary to construct a disc of hardboard or thin aluminium of about 20in diameter and to mark out thirty lines 12" apart radiating from the centre. Baird was limited to the extremely low definition of 30 lines per picture, twelve and a half frames per second, for technical reasons. The greater the picture, the detail the greater is the bandwidth required and because Baird was transmitting on the medium wave he had to restrict the bandwidth of his pictures to that allocated to medium wave sound broadcast stations. Station separation was 9kHz and this must have limited the maximum modulation frequency to something less than 4.5kHz.

Returning to the construction; marking out 30 lines radiating from the centre of my aluminium disc was easy, but the next bit was tricky. The instructions said to mark the first hole 9.5in from the centre, and the next 1/30in closer to the centre and so on. Then drill each mark with a 1/30in (0.0333in) diameter hole. This would give a spiral track of 30 holes - a Nipkow disc.

Problems

Searching through my collection of twist drills, the nearest drill size I could find was 1/32in. The Encyclopaedia, under 'Drills and Drilling', listed nothing smaller than 0.040in (No.60). I reasoned that it was better to under drill then over drill. However, the accurate marking of the holes 1/30in apart presented a problem and Mr Newnes was mute on the subject. However, the consequences of messing up the drilling were spelt out; if the holes were too close then, as the disc was spun, the light from the adjacent holes would overlap and a light streak would result. If the holes were too far apart a dark streak would be produced.

I overcame my problem by using a 300mm length of Styrofoam studding which has 31.31 t.p.i.
LOWE LANDS
AT HEATHROW!

We are very pleased to announce that you now have a choice of Lowe branches in and around London. You will probably know our first outlet at Eastcote run by Fred G4RJS, but to help those coming in by car or plane we have opened our newest branch right beside the M4 near Heathrow. The map shows how close we are to the motorway, indeed it shows how close we are to the entire motorway network.

Initially it will be run by Barrie Kissack G3MTD and a permanent manager will be appointed within the next six months (a job opportunity here for someone). The Lowe Heathrow branch will be different from our other branches in one major respect. In addition to Kenwood equipment, we will be stocking most of the other well known brands from the market leaders, plus a strong representation of scanners and specialist receivers aimed at the aeronautical enthusiast. In addition the range on offer will be complemented by a selection of communication products for the marine, PMR and HF SSB commercial markets, plus the very latest in high performance communications receivers.

The opening of this branch marks the start of a new series of Lowe Global Communications Centres being set up around the country. They will all offer an unequalled combination of long experience, knowledgeable advice, complete product coverage and the best service in the business.

If you want radio at its best, Look to Lowe.

HOW TO FIND US
The new Lowe shop at Heathrow is located just 50 feet from the main A4, 200 yards from the M4 access roundabout at junction 5.

Leave the M4 at junction 5 and take the A4 from the roundabout towards Heathrow Airport and London. After about 200 yards you will see a gap in the brick wall on the left hand side. We are directly through the gap — next door to a fish and chip shop if you are feeling hungry! You can either pull up on the grass verge and walk through the gap, or alternatively carry on another 300 yards and turn first left at the lights into Sutton Lane then first left again into Trent Road. This will bring you out right in front of the shop, where you can park for free without a yellow line in sight.
RECEIVING O.K.?

IF NOT, WHY NOT CONTACT SMC FOR INFORMATION ON OUR COMPLETE RANGE OF RECEIVERS AND SCANNERS.

Yaesu's serious about giving you better ways to tune in the world around you. And whether it's for local action or worldwide DX, you'll find our HF/VHF/UHF receivers are the superior match for all your listening needs. When you want more from your receivers, just look to Yaesu. We take your listening seriously.

SMC are pleased to be able to offer the SONY range of Multiband Receivers. They feature all the latest technology allowing unequaled coverage of both broadcast and shortwave bands, yet remaining both compact and easy to use. All the models illustrated cover VHF broadcast, SW broadcast and some models cover other bands as well. The HF200E Mk II is a 1000 channel programmable handheld receiver that combines power and flexibility with one-touch convenience. Frequent range AM 100-250kHz and FM 76-108kHz. Supplied complete with shoulder strap, carry case & earpiece.

The ICFSW7600 is a premium scanning receiver covering 60-905MHz, SSB, CW, AM & FM modes. 99 memories, 5, 10, 12.5, 25 & 100kHz scanning steps, Keyboard frequency entry. Optional converters to extend range from 0.15-300MHz and 800-1300MHz.

The AK 7 is an all purpose handheld scanner with analogue tuning. AM IFM modes and covers 141-174MHz.

The NRD255 is a high gain, general coverage receiver with expandability looking to the future. Combining traditional technology unique to JRC with the most advanced digital technology gives superb performance whilst remaining extremely easy to use. The NRD255 covers 90kHz-34MHz and with an optional VHF/UHF converter also covers 144-430MHz, 220-450MHz and 430-460MHz. MODES of operation: CW, SSB, AM, FM and RTTY with optional demodulator.

Some Icom receivers are available from most branches.

Lowe receivers are available from Reg Ward.

SOUTHAMPTON

SMC HQ
School Close
Chandler's Ford Ind. Est.
Eastleigh, Hants SO5 3BY
Tel: 0703 255111
Fax: 0703 255307

Leeds

SMC (Northern)
Newhall Lane
Industrial Estate
Leeds LS18 5JE
Tel: 05321 350606
9:30-5:30 Mon.-Sat.
Closed Sat. afternoon

Chesterfield

SMC (Midlands)
102 High Street
New Whittington
Chesterfield
Tel: 0342 453340
9:30-5:30 Mon.-Sat.

Birmingham

SMC (Birmingham)
504 Alum Rock Road
Birmingham B3 3HY
Tel: 021-327-1451/3/13
9:00-5:00 Mon.-Fri.
9:00-4:00 Sat.

Aixminster

Reg Ward & Co Ltd
1 Western Parade
West Street
Aixminster
Tel: 0397 34918
9:00-5:30 Mon.-Sat.

HQ SERVICE DEPARTMENT OPEN MON.-FRI., 9:00-5:00
Using two solder tags that had been cut to a point and soldered to two nuts, I constructed a simple marking machine by fitting them at the ends of the studing and locking one nut to act as the centre pivot. Starting at the outermost hole I scribed a line, rotated one solder tag on its nut one whole turn and marked the next hole, and so on.

**Tedious**

The drilling was straightforward, but until I started the minute size of the hole had not struck me. If I had used hardboard instead of aluminium, the holes would have been less precise, from my experience of drilling hardboard, pieces of fluff tend to stick to the hole. I suppose that in the thirties, hardboard was more readily available than aluminium sheet, so I probably had a good start on contemporary constructors.

Drilling thirty holes with a hand drill is extremely tedious and I paused to wonder how Baird managed to get a picture at all. An early Baird camera used a similar disc to scan the scene and direct the light onto a light sensitive cell. If he had used 1/30in holes at the outermost hole, the image would have fallen on the cell. Photographs of his early equipment show a scanning disc fitted with large lenses (apparently a job-lot from discarded lanterns). The lenses allowed more light to pass through that could be focused onto the light cell.

At this stage, I was beginning to understand the problems Baird faced with the available technology of his day. One of his collaborators (V.R. Mills G5OM) is recorded as saying that [Baird] could not get the disc to operate satisfactorily and called him into help. Mr Mills rearranged the optics to scan the image and not the selenium cell and made it work. Mr Mills parting remarks must have cancelled any elation felt by Baird at seeing his creation work, "...no future for mechanical system...work on cathode ray tube...".

**Further Reading**


For someone seriously interested, British Television the Formative Years by R.W. Burns, published by P. Pergrinus 1986.

The quotations come from correspondence in Electronics & Power 19975-76 (a monthly journal published by the IEE) following an article by Messers Garratt and Mumford in the same journal earlier in 1975.

Newnes was right, if you do not get the holes in exactly the right position you get light and dark streaks, but I like to think that I could have got a picture of sorts. Why did people go to all the bother of making or buying Televisors for such obviously poor pictures? Novelty certainly, but I think also that the fact that the pictures came by radio added to the romance of the occasion. However dim, flickering and unsteady the image, it must have been a thrill to receive a picture using your wireless.

The television system (System I) that eventually came into service and ended in the mid-1960s with the introduction of 625-line colour (System II) was developed by EMI Ltd., a company which did not come into existence until 1931. In 1938 the Scophony Company offered for sale a 405-line projection receiver - using mechanical scanning. Whatever his contribution, Baird must be given credit for being first.
BEARCAT SCANNERS
Recently appointed as the UK distributors for this high quality product range — we offer the complete selection of mobile and base scanners with full service back up.

BEARCAT BC800 XLT
Base Scanner with 900MHz UHF Band
Fantastic Value at ___________________________ £149
* 40 Channels of Memory
* 240V AC Mains
* Covers 29-54, 136-174, 118-136, 406-512, 840-912 MHz

BEARCAT UBC 175 XLT
(16 Ch. Memories) An economical base scanner covering all the popular aircraft, marine and public service bands.
Coverage 66-88, 118-174, 406-512 MHz £169.99

BEARCAT 760XLT
New Model with 900MHz Coverage
With 100 memory channels and coverage of the UHF band, the 760XLT is ideal at home or in the car. Pre-programming of preset bands is possible for fast access. Freq. Coverage 66-88, 136-174. 406-512 MHz £235

UBC 145 XLT (16 CH. Memories)
A low cost base scanner suitable for marine and public service reception
Coverage 66-88, 136-174, 406-512 MHz £115

BEARCAT HANDHELD SCANNERS
UBC 50XL (10 CH MEM.) £99.95
(66-88 MHz, 136-174 MHz, 406-512 MHz)
UBC 55XLT (10 CH MEM.) £99.95
(29-54 MHz, 136-174 MHz, 406-512 MHz)
UBC 100XL (16 CH MEM.) £179
(66-88 MHz, 118-174 MHz, 406-512 MHz)
UBC 100XLT (100 CH MEM.) £199
(66-88, 118-174, 406-512 MHz)
UBC 200XLT (200 CH MEM.) £229
(66-88, 118-174, 406-512, 806-956 MHz)

SONY RADIOS
We are the main short wave stockist
SONY ICF SW1E Short Wave + VHF, world's smallest s/wave radio £149.95
SONY ICF 2001 D (150kHz - 136MHz) £275
SONY SW 7600 Pocket s/wave £275
SONY Air 7 Airband £275
SONY Pro 80 wideband £299
SONY AN1 active antenna £49

COMMUNICATIONS RECEIVERS
Lowef HF229 (30kHz-30MHz) £429
Kenwood R2000 (150kHz-30MHz) £595
Kenwood R5000 (100kHz-30MHz) £875
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ICOM R9000 (100kHz-2GHz) £3995

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### NEW NEVADA MS 1000 BASE/MOBILE SCANNER
Another Medium Wave DX Loop Antenna

There have been many designs for loop antennas in the past, so why another one? This design, by John Tweeker, is simple to make and looks attractive as well.

Well, although the previous designs may have worked well electrically, they have nearly all been very hard to live with. In this design I have tried to produce a loop antenna that will be simple to use, won't look like a 'Heath Robinson' creation, and should be within the scope of most home constructors. The prototype lives permanently in my living room with a minimum amount of objections from 'er indoors! Indeed, it is something of a conversation piece!

A loop antenna has two important characteristics which make it especially useful in the overcrowded broadcast bands. It is both selective and directive. The selectivity will help to overcome overloading in the front end of the receiver by rejecting unwanted signals. The directivity of the loop comes about from the way in which it functions; an r.f. wave which arrives at the loop can either reinforce or tend to cancel itself depending on the direction of arrival. A wavefront which arrives in the plane of the loop will induce currents which add together, while one which arrives at the open face of the loop will induce currents which sum to zero. An easy way to visualise this is to picture a basketball entering the goal hoop. The ball (r.f. wave) which hits the side of the hoop will cause it to shake (i.e. excite the loop), whilst the ball which passes straight through the middle of the hoop has no effect upon it. The more oblique the angle of the ball the more the hoop will shake!

Circuit Description

The circuit diagram of the loop (Fig. 1) is absolutely conventional - a circuit that will resonate at any point in the m.w. band and beyond, by means of a 700pF variable capacitor and a 0.1mH inductance. Energy is coupled into this tuned circuit primarily by inductive coupling between the loop inductance and the magnetic component of passing electromagnetic waves. In other words it picks up signals from all around itself. The loop current at the resonant frequency is magnified by the circuit 'Q factor'. The resultant magnetic

---

**Fig.1:** Loop circuit diagram

**Fig.2(a):** Constructional details of the loop.

**Fig.2(b):** Fixing the Veroboard and curtain track in the box.

**Fig.3:** Veroboard wiring

Incoming r.f. wave

L1 = 100µH Loop

L2 is a ferrite rod antenna inside receiver

C1 = 700pF Airspaced capacitor

C1 tuning

Ribbon cable

Plastics box with cutout to suit curtain track

Curtain track

Self adhesive rubber feet

Wooden block

C1

Glue & Screw curtain track to Veroboard & wooden block

Veroboard

Curtain track

Ribbon cable

Wood block

Fig.1: Loop circuit diagram

Fig.3: Veroboard wiring
**Project**

**YOU WILL NEED**

Capacitors
Variable (Maplin FF40T)
700pF 1 C1

Miscellaneous
1.5 metres 10-way ribbon cable (for L1); 1.5 metres white curtain rail (L1 former) (Texas Homecare Stock No. 738057); Veroboard, 24 holes by 13 strips; Knob for C1; Plastics box 150mm by 80mm by 76mm (Electromail 507-674); Screw Caps (Electromail 549-139); Woodcrews (Electromail 526-259); Hook up wire (2m); Self-adhesive pads (Maplin HB22Y).

Optional Items (see text)

Resistors
Carbon film, 5%, 0.25W
470kΩ 1 R1

Semiconductors
Diodes
OA47 1 D1

Miscellaneous
Rubber Feet (Electromail 543-333); 3.5mm chassis sockets (Electromail 478-497); Hi-Z earpiece (Maplin LB25C).

Component Suppliers
Electromail, PO Box 33, Corby, Northants NN17 9EL. Tel: (0536) 204555.
Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR. Tel: (0702) 525911.

**Construction**

The former for the inductor was made from a 1.3m length of white plastics curtain rail. The type chosen is sold in Texas Homecare stores and has a shallow channel in one side. By coincidence this channel is exactly the right width to accommodate a strip of 10-way ribbon cable. The rail is simply bent into a loop of 380mm diameter, with the channel outermost. This gives an overlap of 50mm. By drilling three 6mm holes through the overlapping ends the loop can be secured to a 45 x 45 x 70mm piece of hardwood by 25mm x No.8 woodscrews. The appearance of this part can be improved by first staining the block of wood and then using plastics screw caps for the screw heads. See Fig. 2.

The inductor itself was made from 10-way ribbon cable. I used the multi-coloured variety as this gives a very attractive appearance. The cable is stuck into the channel of the curtain rail using self-adhesive pads. The free ends of the cable are soldered to a small piece of Veroboard. It is important that the connections are staggered so that you end up with a continuous loop (and not ten parallel loops!). Having accomplished this you should wire the inductor in parallel with the capacitor. The Veroboard was attached to the top of the wooden block using the tree woodscrews.

Next a plastics box to accommodate the capacitor and the wooden block was selected. (If you choose to use a metal case beware of creating a 'shorted turn'). The type I chose has a transparent lid section. This allows the innards of the circuit construction to be seen, so obviously neat wiring is required. The lid was filed to allow the loop to pass through the sides of the box. The wooden block and the capacitor were screwed into the base of the box from below, again plastics screw caps were employed. Some self-adhesive rubber feet were stuck onto the TOP of the box to provide a perch for the receiver.

**Using The Loop**

No connection is needed between the receiver and the loop if a receiver with an internal ferrite rod antenna is employed. The receiver is simply placed inside the loop, sitting on the plastics box, with the internal ferrite rod windings lying in the same direction as the loop windings.

In the case of a receiver which has no internal ferrite rod a direct connection is required between the loop and the receiver. This was achieved in the prototype by using only nine turns of the loop for the antenna and using the remaining turn as a transformer coupling loop for the receiver. The connection was made via a 2.5mm jack socket mounted in one end of the case.

The loop is perfectly conventional in operation; you simply tune both the radio and the loop for maximum signal strength then rotate both the loop and radio together until the interfering signals are minimised. In practice it may be found best to slightly detune the loop to one side of the wanted transmission in order to reject a strong adjacent signal.

This loop can also be used as a 'crystal set'. This is done by adding the circuit of Fig. 3. This could form an interesting project for a newcomer to radio electronics. There can be few other things quite as 'magical' as a radio that doesn't use batteries! Obviously you'll need to be within a few miles of the transmitter to obtain a reasonable signal.
In conclusion, four items are dealt with (1) h.f. radio signals can, and do, travel round the full circumference of the earth. An initial signal and its 'echo' can often be heard when the right conditions prevail, especially on the 28MHz (10m) band. (2) A method for measuring the time taken. (3) A mode of ionospheric propagation known as the 'Chordal Mode'. (4) Data from which the maximum usable frequency (m.u.f.) within the h.f. spectrum can be ascertained.

(1) When suitable 'ionospheric propagation' conditions prevail, h.f. radio signals transmitted from a place, say 'RT', somewhere in the UK (see illustration) could, for example, travel north (direction of arrows and solid line) over the polar region, round the other side of earth (light arrows and dotted line) across the south polar region and back to 'RT'. The 'calculated' time given takes other factors into account, but is only approximate. Meridonal 'surface' circumference is 40 000km. Now see (2).

(2) Measurement of time taken for a continuous signal, e.g. speech or c.w. to travel completely around the earth would be virtually impossible, even though its 'echo' might well be clearly audible. However, with suitable 'ionospheric conditions' and by transmitting short duration 'dot signals' (20ms) approximately one every 200ms, the time taken for these signals to travel an ionospheric/earth path may be 'measured' with reasonable accuracy. The signals are received at the place of transmission, the time taken for the journey round the earth being measured with a calibrated oscilloscope as illustrated. (T) Transmitted Short Dot (R) Received signal. Total ionospheric/earth Meridional path journey 42870.4km. Time taken 143ms.

(3) Although quite feasible, the so-called 'Chordal Mode' of h.f. radio propagation via the ionosphere has yet to be proved. The theory is that as the virtual height of the F region increases at night, a signal transmitted from, say, (*TX) may travel anti-clockwise, be refracted along the region and returned to earth at a distant receiving point, for example, (*Rx1). The signal might then continue along a normal F region/earth propagation path to other points; (*Rx2), for instance. The transmitting signal could, of course, travel via the F Region from (*TX) to (*Rx2) via a short path.

(4) This data will provide a reasonable approximation of the maximum usable frequency (m.u.f.) from the 'critical frequency' as defined by the 'sunspot count number' (SSN). Example: (*) SSN = 140. Critical Frequency, F Region = 11MHz. MUF = 11 x 3.5 = 38MHz. With this condition, the 28MHz band (10m) should be well open. Note: l.u.f. - lowest usable frequency. For critical frequency data see Part 4, (3) and (4).

Thanks are due to The Rutherford Appleton Laboratory, Oxfordshire, The US Department of Oceanic and Atmospheric Administration, Boulder, Colorado, The US Department of Defense, The General Electric Company of America and Dr. Andre Koeclelenburgh (Sunspot Bulletins) Brussels, Belgium, each having supplied scientific data upon which many of the 'graphics' in this series are based.
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must admit, I have always been fascinated by the adverts for the Sony CRF-V21. The fact that the receiver comes complete with RTTY and FAX decoding as well as a built-in printer makes it even more interesting.

The frequency range of the basic unit extends from 9kHz through to 29.99999MHz and 76MHz to 108MHz. The low frequency range is particularly unusual as most receivers stop at around 100kHz. The reception modes are also very extensive covering a.m., f.m., narrow f.m., s.s.b., FAX and RTTY. So, without more ado, let's take a detailed look at the CRF-V21.

**Documentation**

With a receiver as complex and versatile as the CRF-V21, good documentation is essential. As you would expect from Sony, the information supplied was very comprehensive. The main operational manual comprised some 174 A4-pages that were spiral bound for ease of use. This manual was really first rate, with excellent use of diagrams to illustrate all the operations. Every aspect of the operation was covered and the level of detail was just right, there was even a handy help section after each chapter.

Many people, like myself, are too impatient to read the manual before using a new receiver. To help with this there was a good section on general reception that covered the basics functions very concisely. There was also a quick reference manual that served as a handy reminder once the basics had been mastered.

One reception area that perhaps needs a little more technical understanding is FAX. Sony are obviously well aware of this, as they have supplied a 27-page A4 booklet devoted entirely to this subject. This included a clear description of how the FAX system worked and the meaning of terms such as IOC. There was also some very good explanations of common problems with FAX reception. The final section contained a handy frequency list of current FAX stations.

The final book provided was Sony’s Wave Guide. This is a very good guide to general broadcast listening. One extra bonus was that this guide could be stored in a small compartment in the front cover of the CRF-V21, which meant that it was always available as a reference.

**Setting-up**

Despite the comprehensive coverage of the CRF-V21, it was surprisingly simple to get started. The power requirements were well catered for with the option of using either battery or mains. The battery option required the use of a special 6V NP22H NiCad pack, one of which was supplied. Battery life is always an important consideration and the manual suggested a battery life of between three and five hours. The actual period depends very much on the mode being used. Installation of the battery pack was very easy as it simply slid into a compartment on the side of the receiver.

As with most processor-controlled receivers, an auxiliary supply was required to maintain the contents of the memories and clock. The CRF-V21 needed two AA size batteries for this function.

For operation from the mains, a separate power unit was supplied. This was quite a hefty unit measuring 160 x 92 x 232mm. The connection to the receiver was made via a dummy battery that slid into the standard battery compartment. The mains voltage range was 110 to 240V at 50 or 60Hz, so should suit all the common supply types.

Moving onto the antenna, the CRF-V21 is designed to work with external antennas only as there are no built-in systems.
However, the supplied AN-V21 active antenna was extremely versatile. The unit comprised a base that measured 220 x 32mm and into the centre of this was screwed a 520mm telescopic whip. In addition to containing the antenna pre-amplifier, the base unit also housed a ferrite rod antenna for l.w. and m.w. reception.

If you needed to use the CRF-V21 as a portable, the whole active antenna could be stowed away very neatly in a compartment on the rear of the receiver. This was a really useful feature as so many receivers make no provision for the storage of the accessories. To add to the versatility of this antenna it had been weather-proofed so, if required, it could be mounted externally. This is, of course, the arrangement that will provide the best results. The connection to the receiver was made via a standard 50Ω BNC socket that was located on the side of the receiver under a neat protective flap. Adjacent to the BNC socket was a 3.5mm jack that was used for the power feed to the active antenna. Incidentally, although the active antenna required two leads at the receiver end, these were combined into one coaxial lead for the main run to the receiver. More conventional external antennas could be connected directly to the BNC socket, so the CRF-V21 was very versatile.

If you have an interest in the direct reception of weather satellites Sony’s optional AN-P1200 receive dish and converter can be added. With the antenna and power sorted out, the receiver is ready for operation. However, there are a number of additional useful inputs and outputs available.

On the audio side there is a standard external speaker jack and a separate headphone socket for private listening. There is also a useful range of low level audio signals that can be used for connection to a tape recorder or even some secondary decoding equipment.

One notable feature is the provision of variable play-back sensitivity. This means that the CRF-V21 can handle a wide range of input levels.

For use with a tape recorder there is a remote socket. This provides access to a pair of contacts that can be used to remotely start a tape recorder. The great advantage of this is that the contacts could be activated by the receiver’s timer so enabling specific transmissions to be recorded whilst you are away.

Last, but not least, is the provision of an RS-232 serial communications port. The socket used for this port is a miniature DIN type. Thankfully, Sony have provided a lead for this socket that is terminated with a standard 25-way D-plug for connection to the computer.

**Display**

The front panel of the CRF-V21 is dominated by a large I.c.d. panel that is used to convey most of the operational information. This includes information such as the frequency, mode, signal strength and the function associated with the seven push-buttons immediately below the display. For a receiver such as the CRF-V21, with so many modes, this is a very effective and flexible system. To prove the point, it could even be configured to operate as a spectrum analyser, but more of that later.

**Frequency Selection**

Tuning around on the CRF-V21 is extremely easy with a number systems available to the user. Perhaps the most obvious is to use the large, 63mm, rotary knob on the front panel. This knob has a rubberised coating and the weight and feel were excellent. As with all receivers using digital synthesizers, the tuning is not truly continuous. The frequency actually changes in small steps. The size of these steps can be varied between a coarse 1kHz and a very fine 10Hz. This is a useful range and strikes a good compromise between rapid and accurate tuning. To prevent the tuning knob being accidentally knocked off frequency, there is provision to disable it completely.

If you need to tune to a specific frequency, by far the quickest method is to use the direct entry option. In this mode, the frequency is typed in via the front panel keypad. This makes tuning over a wide frequency range very fast. Once a frequency has been set using direct entry, the rotary control can then be used to make any adjustments that may be necessary.

In addition to these manual tuning methods, the CRF-V21 is fitted with an impressive range of memory and scanning options.

**Memories**

The organisation of the memories in the CRF-V21 is very well thought out. They are divided in to 50 pages, each of which can store seven frequencies. As you would expect from a receiver of this specification, all the details of the receive mode are also stored with the frequency. This greatly simplifies the use of the memories and makes for very speedy mode changes.

Another extremely good point about the memories is that you can assign a name to each stored frequency and also to each memory page. The maximum number of characters that can be accommodated is seven, but this should be adequate for most purposes. Once into memory recall mode, the station names are displayed along the bottom of the I.c.d. unit. Recalling a memory is just a case of pressing the appropriate key. Once the memory has been selected, both the memory name and the page name are displayed clearly along the top of the I.c.d. unit.

Another area worthy of note is the way the tuning knob is used whilst in Memory Mode. If the Page Feed button is held depressed whilst the tuning knob is turned, the page number either increases or decreases depending on the direction of
rotation. This is a very quick and convenient way of moving around the memories. The same technique is used to enter the memory and page names, only in that case the Titler had to be enabled. There is also the facility to add a page mark to a favourite memory page so that that page can be recalled at a single button press.

One problem that I find with receivers having large memory capacity is actually keeping track of where everything is. This is where the built-in printer of the CRF-V21 comes into its own. You can easily obtain a full print out of the memories complete with the page name, memory name, frequency and mode. For complete security, you can even store the whole memory range on a standard audio cassette recorder!

**Scanning**

Once you have a receiver with microprocessor control and a number of memories, the next step is to include some scanning functions. Not surprisingly, Sony have taken full advantage of the processor control built into the CRF-V21. The first of these is called Automatic Scan Tuning and is simply a complete scan of the receiver's frequency range. The scan looks for signals that exceed a signal strength that has been set by the operator. When a suitable signal is found there are the usual options to either stop, pause for the duration of the transmission or pause for a pre-set period. The only other parameter that can be set by the operator is the scanning steps that can be 3, 5, 9, 10 or 50kHz.

The second, and perhaps more useful, scanning mode is known as Limited Scan Tuning. This is basically similar to the full scan except that the operator can select the upper and lower limits of the frequency range to be scanned. There is, however, one very powerful extra associated with this mode called Automatic Memory Input. With this facility enabled the frequency of all stations that exceed the threshold are automatically stored in memory. There are 70 memories available for this and they are located in pages 51 to 60, just above the normal memory pages.

The final scanning mode is a conventional memory scan. However, there is an interesting twist in that it only scans pages with a name defined by the operator. This means that say four or five pages could be filled with marine band frequencies and all the pages called 'Marine'. Starting a memory scan on any 'Marine' page will ensure that all the marine band memories were covered.

Whilst on the subject of scanning, I ought to mention that there is also a standard Priority Mode.

**Spectrum Analyser**

This is where the versatility of the CRF-V21's display system really starts to show as the display can be configured to operate as a spectrum analyser, giving a graphic representation of the activity in a specified band. The frequency span of the display can be set to either 200kHz, 1 or 5MHz. Once set-up, there are a number of useful options to increase the flexibility of the mode. In its default condition, the lower end of the displayed spectrum is determined by either direct frequency entry, or by using the tuning knob. Once the correct band has been selected, you can enable and adjust a marker line. This is moved using the same controls as when setting the low end of the spectrum. By using this mode you can easily find out the frequency of any of the stations shown on the display. You can also set the CRF-V21 so that the receiver tracks the marker line. This allows the operator to listen to any signals within the spectrum analyser tuning range.

This is a great system for spotting activity in a band. This feature is further extended in the Activity Search mode. With this mode you can monitor all seven memories in any one memory page. The display takes the form of a graph with seven horizontal traces, one for each memory. The X-axis of the display is calibrated in time and could be set to either 12 minutes or 12 hours. Activity on any one channel is indicated by a thickening of the line in direct proportion to the signal strength. This mode is extremely powerful for plotting the active periods for particular stations. If each memory is set to a different band it can even be used to plot the propagation conditions.

With both of these modes, a printout of the display can be obtained by pressing the Hardcopy button on the front panel.

**Reception Modes**

Probably one of the most attractive features of the CRF-V21 is that it can handle a wide range of modes without any additional equipment.

The broadcast enthusiast is well catered for with wide band and narrow band a.m. filtering. The latter being particularly useful on the short wave bands. A further sophistication in a.m. reception is provided with a synchronous detector. This operates by receiving either the upper or lower sideband of the a.m. transmission and ignoring the other sideband. The great advantage is when suffering interference from an adjacent station, all you have to do is select the opposite sideband in synchronous mode and the interference disappears. So you can see, this is a great boon to the broadcast DXer. For the reception of amateur and commercial voice transmissions, the CRF-V21 is fitted with the standard u.s.b. and l.s.b. modes.

One of the attractive features of the CRF-V21 has to be the built-in FAX decoder. It is this feature that makes the Sony stand out among the many receivers on the market. The actual implementation of the FAX mode is very straightforward, so the operator does not need to be particularly experienced. The mode is selected simply by pressing the FAX button on the front panel. You are then presented with a new display screen that contains all the necessary information. All the standard drum speeds are included, as were IOC's of 576 and 288. To compensate for the rather small print size, you can choose to print one of three chart sections. This is very useful, but it does require the operator to know what part of the chart is needed. With the transmission of FAX charts being a rather slow process, it is good to see that the CRF-V21 can be set to automatic reception. In this mode, the receiver detects a start tone and synchronisation pulses and automatically selects the appropriate settings and starts the printer. Another good point is the auto phase. Using this feature meant that charts can be phased part way through a transmission. This is particularly handy when tuning around searching for interesting charts.

Accurate tuning is always important for good FAX reception and the CRF-V21 handles this with very effective use of the display. Part of the display was configured as a narrow band spectrum analyser, so that the FAX signal can be clearly seen and tuned.

It is, of course, possible to receive weather pictures direct
from the geostationary satellites. The CRF-V21 can receive these, but only when an additional antenna and converter is added. Unfortunately, this was not supplied with the review model.

The final reception mode is radioteletype or RTTY. This is handled in a similar way to the FAX option, with a very good tuning display. There is also the facility to adjust the baud rate, shift and polarity to suit the signal. The operator has the option to either output the decoded text to the display, printer or the serial port. The only odd point about this mode is that the most common speed, 30 baud, is not provided. The actual rates included were 60, 66, 75 and 100 baud. This mode can also be set to receive ASCII transmissions, but there are so few of these on air that it is of little use.

**Computer Control**

Computer control is another area where Sony have taken maximum advantage of the CRF-V21's microprocessor. The RS-232 port provides access to all the main operational features of the receiver. Not only can you send instructions, i.e. to set the received frequency, but you can also extract information. This process extends right down to being able to extract page and memory names. With suitable driver software, the CRF-V21 can be operated remotely very successfully.

**Performance**

The on-air evaluation of the Sony was carried out using both the supplied active antenna and my own external long wire antenna. It quickly became clear that the CRF-V21 was a very capable receiver. The performance I did hit a snag. The question has got to be - is the high price tag of the CRF-V21 really justified? This is a difficult one to answer. The Sony CRF-V21 is certainly a very comprehensive and capable receiver. The technical performance of the main receiver was really excellent. In fact there were only two real problems the display illumination and RTTY baud rates. I can see no reason why both of these shouldn't be quite straightforward to correct. The problem with the display, as it creates a lot of reflections. The only option for the operator is to adjust the display contrast for a.m. reception. This enables the operator to get the best possible from this mode. Provision of synchronous a.m. reception has been a feature of several Sony receivers and has been proven to be very effective. This system really came into its own when receiving broadcast stations on the crowded h.f. bands. It is quite amazing to hear strong adjacent channel interference completely disappear when this mode is selected.

The next area for attention was FAX reception - an area of special interest to me. I started with reception of some weather charts from Bracknell Meteo. The tuning indicator proved to be very effective, making it easy to select the optimum tuning point. The quality of the received charts is really very good, as can be seen from the examples in this review. All the functions worked faultlessly, with the auto phasing being particularly handy. With chart reception complete, I next tried receiving press photos. My favourite station for this is Associated Press in Buenos Aires. Reception of these was again very good with the 16 grey levels ensuring a good image quality. Because FAX images can take up to 15 or 20 minutes to transmit it is important that the receiver has good frequency stability. The CRF-V21 scored extremely well on this and proved to be extremely stable. When looking at the RTTY performance I did hit a snag. The problem was the baud rates provided, or rather not provided. For amateur transmissions 45 baud is standard and for the majority of commercial stations 50 baud is the norm. However the CRF-V21, as supplied, was only able to receive 60, 66, 75 and 100 baud. This was a serious limitation to the RTTY performance. All is not lost, as the provision of microprocessor control should enable this to be corrected with a software update. I have passed the photos. My Sony, so, with luck, this may be changed on later models. On the positive side the CRF-V21 performed extremely well when receiving baud rates within its capabilities.

**Summary**

The Sony CRF-V21 is certainly a very comprehensive and capable receiver. The technical performance of the main receiver was really excellent. In fact there were only two real problems the display illumination and RTTY baud rates. I can see no reason why both of these shouldn't be quite straightforward to correct. The question has got to be - is the high price tag of the CRF-V21 really justified? This is a difficult question as it depends on the buyer's individual requirements. Sony are famous for producing high-quality, executive equipment and the CRF-V21 must fall into this category. It is certainly unique and the technical performance is excellent. So really the choice is yours but at the end of the day you have the quality reputation of Sony to back your decision.

The Sony CRF-V21 costs £2999.95 while the optional NP-P1200 satellite antenna and converter costs just under another £2000.00. The CRF-V21 can be obtained from most Sony outlets, however, the review model was supplied by ASK Electronics, 248-250 Tottenham Court Road, London W1P 8AD. My thanks are due to ASK for the generous loan of the review model.
The **TOKYO HX240** HF Transverter when coupled to an all-mode 2m rig will give you 50 watts on 80 to 10m. RAYCOM have put together this unique unit with the new YAESU FT290R II inc. DC and COAX leads!!!

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Sky Scan DX V1300 Discone

The discone is one of the most popular antennas with scanner users. Alf Brimming BRS 36662 has put the unusual Sky Scan DX Discone through its paces.

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

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

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

Results

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

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

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

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

Conclusions

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

My thanks to SRP Trading, Unit 20, Nash Works, Forge Lane, Belfroughton, nr Stourbridge, Worcs. Tel: (0562) 730672. for the loan of the Sky Scan DX Discone which costs £49.95 plus £3.00 post and packing.

How to fit a PL259 UHF connector to coaxial cable.

Original drawing taken from The 1990 ARRL Handbook, courtesy of ARRL.
The sun is only a minor star in the Milky Way, but to us here on earth it is of major importance. Our planet is singulated in a complex, gaseous atmosphere that protects us from the sun's more deadly rays. Following the advent of radio, it was soon learnt that disturbances in the regions, such as the troposphere and the ionosphere, have a definite influence over the transmission and reception of radio waves. It is the natural disturbances to the normal state of these regions that cause terrestrial signals to suddenly increase their accepted range and provide the communications that the DXers look for. With the help of your letters, I plan to tell you about the state of the sun and compare any atmospheric activity with auroral and/or ionospheric disturbances, meteor trail reflection, sporadic-E and the association between tropospheric openings, atmospheric pressure and the weather.

I would also like to include your work with computers or in the field of radio-astronomy. So, whatever bit of the observation world interests you, well come to this column and don't forget, if you see, hear or work anything unusual, do tell me about it - what we publish today is posterity's scientific record.

Solar

At his observatory in Selsey, Patrick Moore, using his special projection apparatus, observes the sun as often as possible and indicates on a prepared paper chart the position and shape of any visible sunspots. A typical example is the drawing he made at OS50 on September 21, Fig. 1. During September, Ron Livesey (Edinburgh), using a 2.5in refractor telescope and a 4in projection screen, located 5 active areas on the sun's disc on days 5 and 28; 6 on the 8th and 29th; 5 on the 3rd and 10th; and 4 on the 15th. Neil Clarke GCCAS (Ferrybridge) says that the mean sunspot number for the month was 124.7 compared to 199.9 for August and his computer printout, Fig. 2, clearly portrays the climb between the 7th and 19th to 208 out, Fig. 3, showing the daily level of solar flux for the month, clearly portrays the climb between the 7th and 19th to 208 units and the decline to 143 units from the 20th to the 28th.

At his observatory in Bristol, Ted Waring counted 62 sunspots on October 14 which may have had a lot to do with the weak auroral warning that Em Warwick (Plymouth) logged from the German beacon DK0WGY at 0851 on the 18th and the "noisy" 28MHz band and the echo on the signal from the USA beacon W4AGS that he heard on the 18th. Patrick Moore found a good number of spots at 0840 on the 20th, Fig. 2. Cmrdr Henry Hatfield (Sevenoaks), using his spectrophotometer, located 4 sunspot groups, 15 filaments and 11 small quiet prominences at 1028 on the 4th; 2gps, 8fs and 10gps at 1040 on October 25; 2gps, 8fs (one thin and active) and 11 small gps at 1122 on the 13th; 4gps, 9fs and 8gps at 1500 on the 16th and 2gps for a very long chain of 7 spots. 13gps and 11gps at 1400 on the 28th. His observations were hampered by cloud on the 1st. In addition Henry recorded continuous noise from the sun with his 13MHz radio telescope periodically on the 8th and a number of individual solar bursts on the 17th, 18th and 20th.

Auroral

Ron Livesey is the auroral co-ordinator for the British Astronomical Association. As well as his own observations, he received reports of 'glows' from observers in various parts of Scotland during the overnight period from 11th to 12th, September 13, 16, 18, 19, 20, 21, 22, 24, 25 and 28; 'quiet arc or band' on the 20th and 21st; 'ray bundles' on the 20th and "active storm" on the 16th. Also on the 16th, Doug Smillie (Wishaw) received weak auroral reflected signals from GS1LR (Lewick) on 144MHz.

Magnetic

The 'Ap' magnetic index for September, "was mostly unsettled to active with just 5 days when the field was quiet," wrote Neil Clarke and added that the most active days were the 12th and 15th when 'active storm' prevailed gusty," wrote Ron Livesy following the information he received from magnetometer operators Garry Hawksings (Bristol), Tony Hopwood (Worcester), Karl Lewis (Saltash), David Pettitt (Carlisle), Doug Smillie and from his own observations in Edinburgh. In general they found the most active period was between the 11th and 14th.

International Beacons

Thanks to Mark Appleby (Scarborough), Chris van den Berg (The Hague), Henry Hatfield, John Levesley (Transpore), Ted Owen (Maidon), Fred Pallant (Storrington), Ted Waring and Em Warwick for their 28MHz beacon reports covering the period September 26 to October 25.

Tropospheric

The slightly rounded atmospheric pressure readings for the period September 26 to October 25 were recorded at noon and midnight by the Short & Mason barograph installed at my home in Sussex. As expected, tropospheric openings coincided with the falling high pressure between the falling high pressure between October 10 and 13 and 20 and 23. Around 2155 on the 22nd, Leo Barr (Sunderland), using an AO9800 scanner, heard amateurs through the Newcastle repeater on 435MHz saying that the 144 and 24MHz bands were "wide open to Western Europe".

Band II

Tropospheric openings usually provide good DX hunting conditions in the domestic v.h.f. broadcast band (87.5-106MHz) and these two October events were no exception. Leo Barr, using Matsui MR4099 and Philips FD463 receivers, logged BBC Radios 2 and 4, with generally good stereo from Holme Moss and ILR Radio Borders from Eyemouth between the 13th and 14th. "lots of stations from Western Europe, too many to note or identify all of them," on the 22nd. Next morning at 0930 he logged BBC Radio 1, possibly from Scotland and during the following half-hour he heard Dutch stations, at good strength, around 93.5, 97.5, 98.7 and 99.9MHz. While in Larne, McCracken on the 27th, George Garden (Edinburgh) reports a "short spell of very still weather before the onset of deep low pressure and fairly heavy wind and rain."

However, at 2245, using an indoor dipole and amplifier, he tuned through Band II and was delighted to find BBC Radio Newcastle and ILR Radio Clyde 1 and Radio Borders from Eyemouth and Saltirk and Radio Tay from Perth.

Info

At 1003 on October 28, Leo Barr listened to "excellent stereo" transmissions from a new nearby community station, Wear FM, due to begin broadcasting at 0800 on November 5. Francis Hearne (Bristol) told me on November 5 that, "Chilton Radio has now separated. Its medium wave section is known as Chil-

ter Radio Super-Go." During October I recorded 4.28bn of rain and logged thunderstatic on days 15, 18, 27 and 30. The highest humidity reading was 84% at 1600 on the 5th and the lowest of 55% on the 27th. The average noon pressure was 29.88in (1010mb) with a peak of 30.35in (1027mb) on the 8th and a trough of 29.29in (980mb) on the 28th and 29th.

by Ron Ham

Faraday, Greyfriars, Storrington, West Sussex RH20 4HE
Welcome to a new, regular column dedicated to h.f. listening. It will look at such diverse areas of communications as aviation, marine, military, satellite and shuttle launches and more. I shall also be looking at equipment, antennas, books and accessories as well as giving hints on tuning around for those types of transmissions. This month I will look at what is happening in the Gulf and you will find a comprehensive list of frequencies that are being used by the military there.

Naturally a column like this is as good as you the reader make it and I look forward to receiving your comments and details of any interesting loggings.

First though some words of caution. Despite the fact that, if any, sensitive communication is ever passed in the clear (without some form of coding, scrambling or frequency hopping) the British authorities still take a fairly dim view of you tuning into anything except licenced amateur or broadcast transmissions. However, there does seem now to be a bit more unoffcial 'give' in Britain, particularly where some aviation and marine transmissions are concerned (except 'link' telephone calls) and I suspect that the authorities are not particularly worried about you eavesdropping on transmissions from such bodies as NASA who not only publish their frequencies but even seem to encourage listeners. Having said all that, though, you should not take any of the above as an invitation to break the law.

Who am I?

Regular readers of this magazine will probably associate my name more with scanners and weather satellites than h.f. communications but, in fact, I am a fan of all forms of communication including digital modes though I will leave those to Mike Richards. My home station consists of a ZN526 receiver fed by a full-size G5RV antenna connected to the coxial feeder via a 1.1 balun. I do not have permission to use a multi-band, rotatable dipole and find the G5RV is a good compromise for covering a wide range of bands that are not necessarily occupied by others. Other station equipment includes a Packrat PK-222 run under the control of a Macintosh SE computer and an Icom IC-7700 receiver.

The Gulf Crisis

Hopefully, by the time you read this, a peaceful settlement will have been reached in the Gulf. However, at the time of writing the situation was still tense, with troops, munitions and supplies still being ferried in by sea and air. This meant that the many frequencies used by the military were still very active (weekdays during normal working hours, of course).

Gulf area is part of what is known as MID 1. This is an h.f. control zone which runs from Anarka in Turkey, down to Cairo and then Jeddah. It then runs to the southern end of the Gulf and onwards to Bahrain, Kuwait, Basrah and Tehran before cutting west back to Turkey. Other stations within this network include Baghdad, Basrah, Daukus, Ben Guerin and Beirut. The main frequencies in use for MID 1 are 2982, 2567, 8.918 and 13.312MHz. Although MID 1 is defined for civilian air traffic, military aircraft passing through the area may touch in with you.

Military operations have been monitored on a number of frequencies and the list should help you but I cannot guarantee accuracy as it has been drawn from a number of sources. Several frequencies provide some fascinating listening at times such as the AWACS (airborne early warning radar system) operators on 8.867MHz. Broadly speaking, the frequencies between 5MHz and 15MHz will provide the best results - not only with traffic from the Gulf area, but also military units and aircraft crows talking back to the United States.

Next month I hope to look at any of the h.f. frequencies used by NASA during Shuttle launches. Meanwhile, if you have any interesting frequencies then drop me a line.

---

**Welcome to a new, dedicated regular column to**, the southern end of the Gulf, and is as good as you the reader make it and I look forward to receiving your comments and details of any interesting loggings. First though some words of caution. Despite the fact that, if any, sensitive communication is ever passed in the clear (without some form of coding, scrambling or frequency hopping) the British authorities still take a fairly dim view of you tuning into anything except licenced amateur or broadcast transmissions. However, there does seem now to be a bit more unoffcial 'give' in Britain, particularly where some aviation and marine transmissions are concerned (except 'link' telephone calls) and I suspect that the authorities are not particularly worried about you eavesdropping on transmissions from such bodies as NASA who not only publish their frequencies but even seem to encourage listeners. Having said all that, though, you should not take any of the above as an invitation to break the law.

**Who am I?**

Regular readers of this magazine will probably associate my name more with scanners and weather satellites than h.f. communications but, in fact, I am a fan of all forms of communication including digital modes though I will leave those to Mike Richards. My home station consists of a ZN526 receiver fed by a full-size G5RV antenna connected to the coxial feeder via a 1.1 balun. I do not have permission to use a multi-band, rotatable dipole and find the G5RV is a good compromise for covering a wide range of bands that are not necessarily occupied by others. Other station equipment includes a Packrat PK-222 run under the control of a Macintosh SE computer and an Icom IC-7700 receiver.

**The Gulf Crisis**

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**Welcome to a new, dedicated regular column to**
Kashmir Secret

Elsewhere on the radio front, Indian journalists have been reporting what they describe as a secret radio station in Kashmir, which has taken on a revolutionary tone, calling the people to rise up against the Indian army. It turns out the radio isn't secret. Pakistani-backed Azad Kashmir Radio from Muzafarabad has been on the air for years using 792kHz and 3.660MHz. But a programme broadcast in Urdu on Fridays at 0230 and again at 1130UTC called Hamara Kashmir, which means 'Our Kashmir', has started shouting for independence. Both the Pakistani government and Kashmir separatists have denounced the programme as being the wrong approach.

Ivy Bluff

A few months back, there was a curious French television report that claimed the West African coast was to be the site of a new relay station for Vatican Radio. The news item said the move was part of a deal made by Italian President Francesco Cossiga. Vatican officials confirmed the news item said the move was part of a deal made by Italian President Francesco Cossiga. Vatican officials confirmed.

The meeting was supported by a group called Inter-radio, a Dutch organisation. The plan for a third relay station was announced with the support of the West African Broadcasting Union - has been organising regular meetings where its members work out where on the dial each is going to broadcast. Mind you, in Geneva there's a body called the International Frequency Registration Board, a UN body that collects schedules from stations across the globe. However, it seems the IFRB does not collect data on transmissions that fall just outside the current 'official' broadcast bands. But what does the QRT plan to do in the future? Ideally, of course, if there was contact between East and West, at least some of the current frequency clashes could be reduced. However, it now seems the Czech authorities are questions the whole future of the QRT, as many East European broadcasters want to become members of the European Broadcasting Union instead.

QSL card from Radio Moscow.

we were. He says that Vatican Radio has looked into exchanges with other stations, but has no plans to build facilities in Africa. They are more interested in finding relay facilities in Asia. In fact, there are already strong ties between the Vatican and the Catholic religious shortwave station Radio Veritas Asia in the Philippines.

Goddess of Democracy

Remember last year's Goddess of Democracy project? You may recall that this was the ship that set sail from France with the intention of broadcasting pro-democracy messages from international waters just off the coast of mainland China. But the Goddess of Democracy never got on the air, because government in the region refused to assist the Chinese dissidents on board, and the promised medium wave transmitter was never installed. A Taiwanese citizen has now purchased the ship for half a million dollars. He plans to convert the Goddess of Democracy into a museum so that no-one will ever forget the Tiananmen massacre in June 1989.

Bonaire Experiments

It seems that Radio Netherlands is suddenly carrying out a series of tests to improve reception of its Bonaire relay station, and make an evaluation of s.s.b. signals. Tests have been announced with 30 minute transmissions in the standard double sideband (a.m.) mode, and the remainder of the broadcast with a 6dB reduced carrier and only one sideband. The results so far indicate very little difference and so the experiment was only in the last ten years that broadcast transmitters can be capable of working in a reduced power mode. The BBC, Radio Netherlands has added an Optimod system to its signal processing chain. Basically this splits the audio spectrum into six different bands and processes them in such a way that the transmitter is forced to modulate more efficiently. It gives the impression of a fuller sound and punches through the static much better.

USSR Update

A Telex has just arrived from the Soviet Union to announce that the first international gathering of DXers and s.w.l.s in the USSR took place in Leningrad between December 6 and 8. The meeting was arranged by a group called Inter-radio, an independent club for s.w.l.s and radio amateurs. The meeting was supported by the Finnish DX Association who took the train to Leningrad to attend the event. Let's hope that this is the first of many meetings. Perhaps this is the opportunity for the European DX Council to organise a proper 'East-West' conference, probably in Prague or Warsaw. From a western point of view, this would be a cheap way to explore the east, and learn about the stations that have broadcast from behind the 'Iron Curtain'.

Meanwhile Vasily Strelnikov has certainly made a name for himself in international broadcasting circles by his rock request show on both the North American and World Services of Radio Moscow. Now he's persuaded Radio Moscow to install a listener request line. If you fancy giving it a go, then the number to try is 010 7 095 233691.

Paradise Harmonic

The Association of North American Radio Clubs may have folded, but many of the ANARC's activities continue. The ANARC network on the amateur radio bands is still active each Sunday at 1500UTC on 7.240MHz l.s.b. The group recently carried an unusual tip about Radio Paradise, a religious station on St Kitts in the Caribbean. This station normally operates on 825kHz, but because of what must be a transmitter fault, a signal on the third harmonic of 2.475MHz is also being radiated. One to check out for transatlantic propagation at the moment.

The End

I've enjoyed bringing you these notes from the dial, but it's now time for me to pursue other interests. Bandscan is going to be re-organised to bring you more regional reports from around the globe. I hope you'll support the new authors in the same way you've supported me. I'm not disappearing off into the sunset, you'll still hear from me from time to time when I have some interesting items to pass onto you.
This column hopes to provide all kinds of information on the satellite TV world, with the odd juicy bit of gossip about the terrestrial TV industry.

Most TVDXers will be familiar with the scrambled TV service of Canal+, France that uses the Distinct form of encryption. Terrestrial TV transmissions are rarely scrambled, but on 18 May 1990, a new scrambled TV service, Sky Network Television, commenced a three-channel service in New Zealand. Viewers can purchase decoders at their local stores for NZ$359 (or hire at NZ$15.60 monthly) to use with the u.h.f. transmitted offerings though, at this time, only the Auckland, North Island area is covered. They should now have expanded over North Island by the end of this year and cover the more populated parts of South Islands during 1991. The channels cover a 24-hour news service (mainly CNN plus a dusting of BBC news), a sports channel and a noon-to-midnight movie channel.

Problems face Canal+ in France with their terrestrial transmission service, since 'pirate' decoders are now commonly available. The long term aim is to change the encryption standard to a higher level, addressable system coupled with the use of D2-MAC. The problems of programme security are profound with the wealth of single and multi-node pirate decoders now available in the satellite press in Europe and the UK for that matter. One advertisement noted in a German magazine indicated that most scrambled signals could be cleared with the purchase of their various plastic boxes, even the Sky Videocrypt has been hacked successfully. At the 1989 Satellite Shows in Earls Court, D2-MAC decoders were available to the trade with demonstrations of their picture quality - which was surprisingly good. Perhaps FIlminet is the most 'hacked' and pirated satellite channel with decoders offered on the trade market down to £49 + VAT, though with recent buy-outs of programme companies it's likely that both FIlminet and RTL-Wilboth (or at least the mill change their encryption to a more secure standard within the year - so any readers thinking of purchasing black boxes take note, the boxes may not be upgradable.

Canal+ Espagne has delayed its Spanish opening due to office and studio building delays and has stated a September opening, some six months after original plans for the service. It is however thought that Canal+ are seeking a more secure encryption standard since pirate boxes are readily available over the border in France!

Rupert Murdoch of The News Corporation and Sky TV fame is joining forces with the NBC and Cable Systems Corporation to project a Sky Cable service for the North American continent. Based on the Hughes HS601/Ku (11GHz) satellite they reckon to have up to 27 channels beam down from their 101W orbital slot. Programming will be available to either cable systems or the general public, the latter using dish size of 450mm diameter. If all goes well, the DSS service will be operational during mid 1993. Over one billion US$ will be put up for this venture, which if successful could provide upwards of 100 channels by the year 2000.

Intelsat has announced its plans for the next few years which involves three new phases of satellite. The Intelsat VI series will be used for video/telephone and general data transmission. Intelsat VIII will carry 26 Band C and ten Ku band transponders with independent, steerable C and Ku dishes. Upwards of five will be in service. Intelsat K will be a powerhouse of signals with capability of 32 TV channel operation (in a half transponder model) and can provide a 50dBW signal power. Eastern beams will cover most of Western Europe and extending into Eastern Europe, from North Africa to North Scandinavia. Western beams will have the capability to reach into the North American seaboard and Central America.

Romania was accepted into Eutelsat membership on May 4 thus enabling the country to both transmit and receive signals via the present and future European Eutelsat satellites. Another new country in space will be Yugoslavia with their projected service of six hours of local material - which if popular will expand into more of a pan-European programme format. The DTI have allowed cable TV operators to utilise microwave links for programme distribution between cable head end hub units. These link circuits will be broadband and operate within the 17.3-17.7GHz band and be available by the end of March 1991.

It is interesting to note that various European TV satellites services are viewed in Morocco with, perhaps, less than the usual censorship expected in that area. Sky, TF1, La Cinq are transmitted over terrestrial u.h.f. transmitters in both Rabat and Casablanca. One of the most popular programmes is Super Sky (ex-RTL). Though a degree of censorship is at times displayed on certain of the more explicit scenes, if the Rabat transmitter decides to restrain viewers, re-orientation of the antenna to Casablanca will often reveal the missing Rabat material!

**Abbreviations**

- **d.b.s.** direct broadcast satellite
- **dBW** decibel reference one watt
- **DTI** Department of Trade & Industry
- **GHz** gigahertz
- **mm** millimetres
- **NZ$** New Zealand dollars
- **NG** Satellite News Gatherer
- **TV** television
- **TVDXer** "long distance" television signal watcher
- **u.h.f.** ultra high frequency
- **US$** United States dollars
- **VAT** Value Added Tax
- **°** degrees

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**Fig. 1:** A typical satellite television receiving system. Reproduced with permission from *An Introduction to Satellite Television* BP195 by F.A. Wilson, published by Bernard Babani (publishing) Ltd.

- **TVE** International programme carried on Eutelsat 1 F5 at 10° east, Ku band 11.149GHz.

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**This is from a News Gathering Unit in Syria uplinking via Eutelsat at 7° east (525-line).**

**From Gorizont 15 at 14° west showing the Moscow-London circuit with caption.**
F

or many years, it’s been illegal for Soviet sta-
tions to accept foreign currency. Much of that sent
with QSL requests has ended up on the Black Market.
It’s now, however, quite OK. So ‘green stamps’ (dollar
bills), or similar, are now acceptable and the recipient
can go to a bank and redeem his post foreign money with
no questions asked. However, there seems little doubt that letters
containing enclosures are often opened and the contents fail

So, in practice, it is best to either QSL Russians through the
Bureau, or to use a stamped ad-
dressed envelope. Bear in mind
whether QSL Russians through the
questions asked. However, there
acceptable and the recipient can
ever, quite OK. So ‘green stamps’
PO Box 4, Newtown, Powys SY16 1ZZ
Paul Essery GW3KFE

W1BB. When Stew was taken

News

Don’t forget to have a listen to Wireless Line, compiled by
Practical Wireless on 0898 6S4332 which will give you all
the latest news, updated every Friday. This gives you a chance
to check at least a couple of issues per DX season.
All possible support is needed if this one is to succeed. Details
from G3XIT, 105 Shipdale Bot-
tom, Ropark Common, Henley-
on-Thames RG9 5HU.

Beacons

Beacons are a helpful way of assessing band conditions. One
of the most useful of these is the well-known NCDXF chain
on 14.00MHz. Each one operates for one minute and then
gives way to another one, over a ten-
minute cycle, giving world-wide
coverage. Now the beacons are
to be updated by arranging that when a particular beacon fin-
ishes its minute on 14.00MHz, it
immediately moves to 21.150MHz for one minute and
then again to 28.00MHz for one minute.

In due course, all the bea-
ccons in the chain will be arranged
to do this, so that one can assess the characteristics of the three
h.f. bands in ten minutes flat. In effect, this will also give a check
on the three WARC bands too.

On 28MHz, of course, there are already extremely high beacon
levels down and the bands are to be logged. Every beacon is a
callsign followed by the oblique slash / followed again by either
the letter B or possibly BCN.

Letters

Daniel Peake (Burnage) is proposing to take the Novice Test,
both practical and c.w. This summer.
He listens on all bands 8-30,
but his favourites are 21 &
28MHz. The antenna is a 100m
wire up in the loft, fed by way of
a Lake TUI a.t.u., into a Sainso SW5000.

For a first, ZL3GS was heard on
14MHz along with ZR7L, while on
Top Band, ZL781Q, SB9RF, SF2BC,
K63RJ, ZL706Q & ZL795G were
heard.

If you have a QSL to show the world, send it in.
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The AR-1000 is the latest version of the "Fairmate" but with a few extras. 8-1300MHz AM/FM/WFM
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Tel: 0983 200308
Previously in this column, I have confined my chat to those international television signals that increase their normal range for a short period while some form of atmospheric disturbance was in progress. However, from now on, you should read the new 'Propagation' column in conjunction with this column. This will enable you to compare your results on a particular day, with the experiences of others users on nearby bands. For instance, the influence of a good Sporadic-E disturbance is not just restricted to Band I TV, it often stir things up from 20 to 100 MHz. If a healthy tropo really opens the v.h.f. and u.h.f. television bands, then you can be sure that the radio amateurs will be working or hearing DX on 144 and 432 MHz. The success of this cross-referencing idea depends largely upon the details in your reports so, as always, I will be pleased to hear from you.

Band I

Although we only expect a few reasonable Sporadic-E openings throughout the winter months, Simon Hamer (New Radnor) had a good haul on October 31. He logged test-cards from stations in Czechoslovakia (CST), Denmark (DR), Finland (YLE), Germany (ARD), Hungary (MTV), Iceland (RUV Island), Italy (RAI), Japan (NHK), Libya (LBS) and Spain (RTV). He reported receiving NATO communications from Allied Forces in the Middle East, Sigma TV from Paris, and Eutelsat 1 TV from Spain.

He also saw unidentified pictures on Chs. C1 (49.75 MHz), E2 and R1 around 0740 and on Chs. E2 and E3 (55.25 MHz) at noon on the 27th.

Picture Archives

David Glenday, uses a Philips 2605 S5710 UHF receiver with Triax BB grid bowtie antenna and 40055 mast-head amplifier. Back in 1988, he logged Denmark Radio's TV2 clock logo, Fig. 1, at 2214 on May 4 and their TVR' Reklame caption, Fig. 2, at 1750 on the 17th, both on Ch. E30. He also saw a saw a show on the programme Tele 5, Fig. 3, from a West German relay station, "possibly Dusseldorf", on Ch. E36 at 0018 on June 18 "Note the mini-logo" (top left), said David.

Russ Burke (Northampton) checked the bands at 0545 on September 28. He found a test card with the inscription 'Soviet TV' at 2040 on the 21st. In addition, he logged the 'Soviet TV' logo at 1915 on July 28, Fig. 10.

Tropospheric

"Not much DX to report for September, but tropospheric reception during October was very good sometimes," wrote David Glenday. Reference to the barometric pressure chart will show the declining atmospheric pressure which coincided with the tropospheric openings around October 12/13 and 22/23.

While on holiday in Deal on October 12, Les Jenkins received strong pictures from Belgium (BRT), France (ANT2, FR3, LE CINQ, M6 and TF1) and Holland (NED1 and 2). He was using a Salora multi-band portable receiver and a Triax BB GRD' antenna only 3m a.s.l. He reports that the pressure was high at 1022mb (30.5 in) at the time.

John Woodcock received negative pictures from France (Canal+) for most of the day-time on October 14, 15 and 24, the...
morning of the 28th and afternoon of November 1. David Glenday was amazed to receive pictures in the u.h.f. band from Poland (TVP1) on Ch. R30 for several hours and (TVP2) for a short while, on Ch. R35, during the evening of the 22nd. David thinks that these signals came from Jelenia Gora on the Polish-Czechoslovakian border. "Signals were so good that I resolved Teletext - the Polish Teletext header is 'PRiTV'," said David and continued, "I watched in amazement as trailers for American films such as The Amazement and continued, "I watched in amazement as trailers for American films such as The Amazement as trailers for The Hustler and Robocop2 appeared briefing havoc with some signals, Simon Hamer received pictures from Denmark (DR), Norway (NRK) and Sweden (SVT1) in Band I and Denmark (TV2) and Sweden (SVT2) on several spots in the u.h.f. band during the good conditions on the 23rd.

Many of you with h.f. communications receivers may not have realised that the variable 'twittering' signals which periodically appear around 14.230MHz are the pulses from slow scan television transmitters operated by a number of amateurs throughout the world. Briefly, the pictures build up slowly, between 8 and 32 seconds, depending on the system being used and are decoded on to a screen by feeding these audio tones either through dedicated equipment or a suitable home-computer. Readers wishing to know more about SSTV software and its availability for their particular computer should have a word with Grosevenor Software, 2 Beacon Close, Seaforf, East Sussex BN23 2LZ, J&F Electronics Ltd, Unit 45, Meadowmill Estate, Dixon Street, Kidderminster DY11 1HH, or Technical Software, from Upper Llandwrog, Caernarfon LL54 7RF and no doubt there are others whose adverts I have not seen. There is a lot of enjoyment to be had from this mode of communication, especially when the h.f. bands are open and, don't forget, am always pleased to use such reports in this column. Among the slow-scan enthusiasts is Steve Charles (Hustington, Sussex) who follows his Lowe HF-125 communications receiver with a Spectrum computer loaded with the Technical Software RX4 software and an Alphacom 32 printer to produce the hard copy of the pictures he has received. A good example is the 'CQ' Fig. 11 and part of a QSO with a Russian station, Fig. 12, which he copied from EA2J0 and EA1ACT respectively in Spain last August. Such pictures, which include call-signs, messages, photographs and some clever and amusing graphics can be stored on disk or tape. Operators can also look for SSTV contacts around 3.73, 7.04, 21.35, 24.925 and 28.65MHz.

### Teletext

In addition to broadcast programmes, many TV companies now use a few lines of their transmission to send out information in text form, which can be decoded by anyone having a suitable TV set. This is generally known as Teletext, though the advertised name varies from country to country. The information can be accessed by calling up specific page numbers, and usually includes information about the TV company and its programmes, news, sport, business and travel information. Teletext services are normally available throughout the time that regular programmes are on the air, and often at other times when a test card is being transmitted.

**Abbreviations**

- a.s.l. above sea level
- Band I 45.68MHz
- Band III 175-230MHz
- Ch. channel
- DX 'long distance'
- DXTV 'long distance' television
- h.f. high frequency
- in inch
- m metre
- mb millibars
- MHz megahertz
- SSTV slow scan television
- TV television
- u.h.f. ultra high frequency
- v.h.f. very high frequency

---

**Europe**

- **System B 625-lines**
  - Band I
    - E2 48.25/63.75MHz
    - E2A 49.75/65.25MHz
    - E3 55.25/60.75MHz
    - E4 62.25/67.75MHz
  - Band III
    - E5 175.25/180.75MHz
    - E6 182.25/187.75MHz
    - E7 189.25/194.75MHz
    - E8 196.25/201.75MHz
    - E9 203.25/208.75MHz
    - E10 210.25/215.75MHz
    - E11 217.25/222.75MHz
    - E12 224.25/229.75MHz

---

**Figures**

- **Fig. 7:** SE Asia.
- **Fig. 8:** USSR.
- **Fig. 9:** Dubai.
- **Fig. 10:** USSR.
- **Fig. 11:**
- **Fig. 12:**

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Short Wave Magazine, January 1991
**DRESSLER COMMUNICATIONS LTD.**

**MON - FRI 9.0 - 5.30** 
SAT 9.30 - 4.30

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<th>Gain</th>
<th>Bandwidth</th>
<th>Notes</th>
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<tr>
<td>ARA 30</td>
<td>50MHz - 2GHz</td>
<td>1500</td>
<td>50MHz - 100kHz</td>
<td>11.5dB</td>
</tr>
<tr>
<td>Now fully tuneable interface.</td>
<td></td>
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<tr>
<td><strong>£139</strong></td>
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### SPECIAL PRICE

**NRD 525 Receiver £850.00 or £1050.00 inc. ARA 30**

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency</th>
<th>Gain</th>
<th>Bandwidth</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>ICOM R71 General Coverage Receiver</td>
<td>£855.00</td>
<td>£855.00</td>
<td>£855.00</td>
<td>£855.00</td>
</tr>
<tr>
<td><strong>FIRST CLASS SHORT WAVE RECEIVER. Buy this for £855 and receive an ARA 30 FREE. WORTH £139.</strong></td>
<td><strong>ALSO R700 complete with ARA 1500 and delivery… £3995.</strong></td>
<td><strong>FOR CHRISTMAS ONLY! ICOM R70 Receiver inc. FM board, carry handle &amp; Security tunnel inc. U.K.manfactured. £639.00.</strong></td>
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### RECEIVERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Icom IC2GE</td>
<td>8-600MHz</td>
<td>£205.00</td>
</tr>
<tr>
<td>Icom IC228H</td>
<td>8-600MHz</td>
<td>£175.00</td>
</tr>
<tr>
<td>Icom IC225E</td>
<td>8-600MHz</td>
<td>£149.00</td>
</tr>
</tbody>
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### STANDARD

<table>
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<tr>
<th>Model</th>
<th>Price</th>
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<tr>
<td><strong>STANDARD AX700 PANADAPTOR Deluxe £57.00</strong></td>
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</table>
Follow-Ups

The Air-225 didn't display on Farnborough Sunday (November 'Airband') due to a fault with the nose door, according to Paul Hilton (Newbury, Berkshire). The ROOK callsign (requested in the same issue by P.J. Salisse, Highgate) belongs to TRIA's 'spyspans' of the United States. They fly from RAF Alconbury under 95th Reconnaissance Squadron, 17th Reconnaissance Wing and often reac'h in excess of FL600. Thanks for the information go to Paul Hilton, J. Layden (Workshop, Notts), John Locker (West Kirby, Wirral), P.T. Martindale (The Crayke, Marton Fields, Bridlington, E. Yorkshire, Y016 5YP), and S.W. Phillips (39 Bryn Terrace, Brynathel, Abertillery, Gwent, NP3 2HG). S.W. Phillips welcomes direct correspondence about callsigns and I feel sure that Paul in particular would find this an interesting offer to take up. P.T. Martindale also offers direct correspondence if P.J. Salisse would care to write to him.

Now on to navigation and locators if fitted to Shackletons. Personally I still favour the Doppler theory. Thanks for the suggestions, but the case continues and any further information would be welcome.

Frequency & Operational News

Looking at Aeronautical Information Circular 93/90 from the Civil Aviation Authority I see that at Orkney (Goodwood) the parallel 15/33 runways have been re-designated 14/32 and that at Wick 14/32 is now 13/31. As for the information go to Paul Hilton, J. Layden spotted this north-east of Aberdeen on route B2D (see Aerad chart EUR/3). October's request for information on the Elliot Ground Speed & Drift Setting Unit AA 120.8MHz is also used for communication between the aircraft in the flight.

Christmas Quiz

This year's quiz is by popular request: you've often seen my picture in the column but, so far, our photographer, Chris, has remained behind her camera. Now the tables are turned! I took this photo of her, Fig. 3, at a display during the 1990 season. Included is an aircraft, of course. As the previous competitions seem to have been too easy, the clues this time have been kept to a minimum. Identify the aircraft from the close-up! In the event of a tie, I will draw the winner at random from the correct entries.
If there is no correct entry I will allow the nearest "best guess." Deadline to get your entries to the address at the top of the column is the 31 January 1991. The prize is an aircraft instrument. Entries in the name of C. Mlynek will be disallowed. My decision is final.

AIRBAND TITLES FOR YOUR BOOKSHELF

FLIGHT ROUTINGS 1990
by T.T. Williams
published by T.T. Williams
116 pages, 211 x 146mm. £4.95 plus 85p P&P
Available from the SWM Book Service
ISBN 0-9514431-1-9

This popular guide, which is updated on an annual basis, has been produced with the sole aim of assisting airband listeners to quickly find details of a flight, once they have identified the aircraft’s callsign.

Most of the flights to and from British and Irish airports to destinations worldwide and details of many of the overflights to and from Europe and N. America are included. Particulars of scheduled, charter and freight flights are covered. This edition has been completely updated using information received from the airports and airline companies themselves.

Flight number, departure time, departure airport, arrival time, arrival airport, type of aircraft normally used and day of operation are given for each entry together with any relevant notes on the flight.

THE PAPER AEROPLANE PAD
John Adams Trading Ltd., 32 Milton Park, Milton, Abingdon, Oxfordshire, OX14 4RT.

Has your author regressed back to childhood? This book is for ages 8 upwards and I think this includes 34 year old museum curators! Plans are provided to make two examples of each of eight, different, paper gliders - simply cut and fold. I recommend folding over a 30cm plastics ruler for neatness - where folds are made from the reverse of the paper, hold the plan up to the light to see the printed line. You will additionally need to provide scissors, a stapler, adhesive tape and paper clips.

Although it’s sold as a children's toy, I was amazed to find it contains practical lessons based on real aerodynamic principles. Experiment with flawed designs - and then learn from your mistakes. This includes 34 year old museum curators! Plans are provided to make two examples of each of eight, different, paper gliders - simply cut and fold. I recommend folding over a 30cm plastics ruler for neatness - where folds are made from the reverse of the paper, hold the plan up to the light to see the printed line. You will additionally need to provide scissors, a stapler, adhesive tape and paper clips.
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AR-800.
The baby of the family. Covers 75-105, 118-174, 406-495,839-950 MHz in AM and FM. Complete with rechargeable battery pack, charger and flexy aerial. All current channel spacings can be programmed.

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HF-225

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£425.00 £10.00

D-225 synchronous AM and FM detector £39.50 £2.00
K-225 Key for direct frequency entry £39.50 £2.00
B-225 Internal NiCd battery pack £49.00 £3.50
W-225 Active whip aerial £19.50 £3.50
C-225 Deluxe carrying case for HF-225 £23.86 £4.00
S-225 Wharfedale speaker and lead £49.50 £4.00

Short Wave Magazine, January 1991
The Icom IC-R1 hand-held scanner is now being more widely available. As I mentioned in the October column, several owners have been experiencing problems with its strong signal handling performance. This limits operation of the search and scan functions in congested areas. However, a solution has now been found by Ray Withers who, as well as selling modified receivers, will be offering a modification service to existing owners. This involves fitting an additional high-performance crystal filter that improves the selectivity of the receiver in the narrow band modes, but at the same time still permits the w.r.b.f.m. i.f. stages to operate normally. So, all the existing features are retained. This is quite an achievement when you consider the limited amount of space available inside the receiver.

This is just the latest in a long line of innovative scanner modifications offered by Ray. Perhaps the best known being those concerned with the Yaesu FRG-9600, which is transformed into a very creditable performer. The company's showroom is due for expansion soon - so if you find yourself passing Junction 2 on the M5 why not pay them a visit. For further details contact: Raycom Communication Systems, 563 Wiverton Road, Oldbury, West Midlands B9 4RJ. Tel: 021-544 7124.

Long-range Cordless Telephones

Roughing my way through a huge stack of specifications documents released by the DTI Radiocommunications Division, I came across an interesting new allocation for long-range cordless telephones. This is intended to fill the gap between the current selection of domestic cordless phones, which have a range of around 100m, and cellular telephones. The new phones are intended to have an operating range of up to 2km from the base station and should appeal to business users such as farmers who want to keep in touch whilst working.

Several different makes of long-range cordless telephones have been on sale some time now. However, these have not been legal in this country mainly due to the choice of operating frequencies. Units I have seen advertised have operated in the 26, 35, 49, 70 and 138 MHz bands with transmitter powers ranging from 1W to 100W+, in the case of some of the more expensive models. The most popular choice of frequencies being 43-50 MHz base transmit paired with 69-70 MHz for the mobile unit. If, like me, you tend to go antenna spotting, you can quite often see the distinctive H-shaped antennas which have two coaxial cable downleads. The new allocation consists of two, paired frequencies. Channel 1 being 47.41875 MHz base transmit, 77.5125 MHz base receive and Channel 2 47.41875 MHz and 77.500 MHz. As far as I am aware, no equipment has been type approved yet, but expect some soon.

This new allocation is an interesting addition to the range of uses being found for the old v.h.f. Band I TV channels which used to occupy the slot between 47-68 MHz. This range of frequencies is not really suitable for professional communication systems, as its propagation characteristics tend to make reliable communications over more than a few kilometres difficult. However, because of the relatively low frequencies involved, it is ideal for domestic, short-range, radio operated devices.

This is because specialised integrated circuits, capable of operating at these frequencies and combining both r.f. stages and digital circuits, can be produced economically. This opens the way to the development of even more sophisticated radio-linked consumer products that I am sure will appear during the next few years.

Hand-held Battery Charging

Regular reader, A Sheldon of Nottingham, has recently acquired a Fairmaid AA cells hand-held scanner. He is concerned about using dry cells in the receiver when it is connected to an external power supply and wonders if it is safe to do this, or should he remove the batteries first.

Many hand-held scanners make provision for both rechargeable NiCad cells or conventional dry cells. This is usually done by providing a separate charging socket, or by having a switch to select the type of battery in use. However, several of the more recent models only have one power socket. This usually permits the scanner to be powered directly from a 12V source, such as a car battery. An internal voltage regulator circuit converts the 12V supply down to the working voltage of the receiver, which is usually around 6V.

In addition to supplying the receiver circuits, a small part of the supply current is also used to charge the internal batteries. This is generally just a series dropping resistor that has the effect of limiting the charging current to a suitable level. Under normal circumstances, this should present no problems when using rechargeable NiCad cells. These are usually charged at 10% of their normal capacity for a period of around 14 hours - so for popular size AA cells the charging rate should be something like 50mA. Because the cells are being charged inside the receiver, and tend to heat slightly during the process, manufacturers usually reduce this current. A value of around 30mA is often chosen in order to prevent overheating occurring during prolonged periods of operation. Whilst it is perfectly safe to put a charging current of this level through NiCad cells, it is a different story with other types of battery.

Despite various comments that appear from time to time in electronics magazines, dry or 'primary' cells are not designed to be recharged. It is possible to lengthen the life of such cells by using a special 'dirty d.c.' charging technique, but care must be taken to prevent the formation of gas during this process. NiCad cells have a special pressure relief valve is built in to them. The purpose of this is to prevent the build-up of high pressure within the cell during charging. Without this valve the outer casing could explode, resulting in serious damage to the receiver. Dry cells, on the other hand, are generally very well sealed in order to prevent the escape of toxic chemicals, which are produced during the discharge of the battery. In order to be able to 'recharge' such cells, a reversal of the normal chemical process has to take place. This involves the production of heat and gasses, which in a sealed package is asking for trouble, unless special precautions are taken.

Warning

If you use anything other than NiCads in a receiver that does not have a separate charger socket, or 'battery type' selector switch, then beware. It is a good idea to remove the batteries before you connect an external power supply.

If you use a lot of equipment with NiCads in a receiver that does not have a separate charger socket, or 'battery type' selector switch, then beware. It is a good idea to invest in one of the 'Universal' NiCad chargers. These are fairly cheap and have the advantage of charging all cells individually rather than in series. This is important because, under certain circumstances, when NiCads have been used for some time it becomes possible for one or more of series connected cells to become reverse polarised during
the normal charge/discharge process. By charging cells individually, this situation can be prevented from occurring. Some models also offer a faster charging rate, but this should only be used with special types of NiCad.

One final tip is to completely discharge NiCad cells before recharging - put them in a torch which I then leave switched on. This is because NiCads tend to exhibit a 'memory' after a period of use. If they are only partially discharged, the total storage capacity of the cells becomes reduced. By occasionally fully discharging the cells, this condition can be prevented.

Mail Bag

A big thank you to all those people who have responded to my request in the October column for your views on individual scanning receivers. These have already been most informative, but I would still like to hear from more readers before I present the results. All I need to know is, what model of scanner you own, what you tend to use it for and what you most like/dislike about it. Just make a brief note and send it to me at the usual address: PO Box 1000, Eastleigh, Hants S05 5HB.

Until next month... Good listening

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Definition</th>
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<tbody>
<tr>
<td>d.c.</td>
<td>direct current</td>
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<tr>
<td>DTI</td>
<td>Department of Trade &amp; Industry</td>
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<td>i.f.</td>
<td>intermediate frequency</td>
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<tr>
<td>km</td>
<td>kilometre</td>
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<td>m</td>
<td>metre</td>
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<tr>
<td>mA</td>
<td>milliamps</td>
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<tr>
<td>MHz</td>
<td>megahertz</td>
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<tr>
<td>TV</td>
<td>television</td>
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<tr>
<td>V</td>
<td>volts</td>
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<tr>
<td>v.h.f.</td>
<td>very high frequency</td>
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<tr>
<td>W</td>
<td>watts</td>
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<tr>
<td>w.b.f.m.</td>
<td>wide band frequency modulation</td>
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**TITLES FOR YOUR BOOKSHELF**

**AN INTRODUCTION TO AMATEUR COMMUNICATIONS SATELLITES BF290**
by A. Pickard
Bernard Babani (Publishing) Ltd
102 pages, 111 x 178mm. £3.95 plus 85p P&P
Available from the SWM Book Service

Communications and broadcast satellites are normally inaccessible to individuals unless they are actively involved in their technicalities by working for organisations such as BT, the various space agencies or military bodies. Even those who possess a satellite television receiver system to not participate in the technical aspects of these highly technological systems.

There are a large number of amateur communications satellites in orbit around the world, traversing the globe continuously and they can be tracked and their signals received with relatively inexpensive equipment. This equipment can be connected to a home computer such as the BBC Micro or IBM compatible PCs, for the decoding of received signals.

This book describes several currently available systems, their connection to an appropriate computer and how they can be operated with suitable software.

The results of decoding signals containing such information as telemetry data and weather pictures are demonstrated and will hopefully encourage the reader to become actively involved in pursuing this fascinating activity that embraces many aspects of electronics, engineering and science as well as being an encapsulation of information technology.

**DICTIONARY OF ELECTRONICS**
by Ian R. Sinclair
published by Collins Reference
378 pages, 130 x 197mm. Price £3.95
Available from all good bookshops
ISBN 0-00-434345-X

The Collins Dictionary of Electronics is a completely new and up-to-date guide to the science and technology of electronics. Containing over 2000 entries, from aberration to zero error, the Dictionary also includes over 100 diagrams, together with lists of symbols used in electronics.

The Dictionary is directed at students and those who need a source book to the requirements of all who need a source book providing clear, helpful definitions of electronic terms, including advanced school students and those embarking on higher education courses, as well as technicians and hobbyists. The Dictionary guides the reader through the various fields within electronics such as microprocessor technology, digital electronics, telecommunications, hi-fi, radio and television. The emphasis throughout is on the practical application of concepts and devices, although the theoretical background is also well covered.

**MONITORING THE IRAQ/KUWAIT CONFLICT**
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by Langley Pierce
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46 pages, 148 x 210mm. Price £3.95 plus 85p P&P
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The completely revised new edition includes a frequency list with 18233 frequencies, and a call sign list with 3376 call signs. Up-to-date schedules of FAX meteo stations and RTTY press services are listed both alphabetically and chronologically. Abbreviations, addresses, codes, definitions, explanations, frequency band plans, international regulations, modulation types, NAVTEX schedules, Q and Z codes, station classes, telex codes, etc. - this reference book lists everything. Consequently, it is the ideal addition to the World Radio TV Handbook for the "special" stations on SWI!

Further publications available are Guide to Facsimile Stations, Radio-telephone Code Manual (10th editions) and Air and Meteo Code Manual (11th edition). We have published our international radio books for 20 years. They are regular overseas monitoring missions (1990 for months in Guatemala, Malaysia, Singapore and Venezuela) complete this unique book.

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short wave magazine, january 1991
Regular readers will, no doubt, be pleased to hear that, as from this month, my space allocation has increased to two pages. Obviously, I want to make sure that the extra space is used for the items you want. So, please drop me a line with ideas for topics that you would like to see included. I have two ideas of my own. The first is station profiles, where I will give the rundown on some of the stations that we monitor. I’ll include details of equipment, antennas, etc., and operating schedules, where available.

The second area is the more complex data modes, such as the duplex ARQ modes. This is an area that I have tended to avoid, mainly because of the high demand from newcomers for more basic information. However, the additional space will mean that I can detail some of the modes and maybe even include a few tutorials. With these I will attempt to explain the operation of these modes in simple language.

So, there are just two ideas but I’m sure you have ideas of your own. Besides writing with your ideas, I would also appreciate seeing copies of any interesting data you may have received. I know that many stations send a mass of useful material when replying to QSLs. This is a very good source of information. Don’t forget, this is very much your column and its contents are a direct reflection of the mail I receive.

Readers’ Letters

I’ve received a bumper postbag this month, so thanks to all those who’ve written and my apologies to those I couldn’t mention.

Colin Bates from Yeovil runs a Kenwood R-2000 receiver with a 54m long wire antenna. For FAX decoding, he uses an ICS Electronics FAX-1 with a Tranctal printer. He has also just bought an ERA Microreader and the BP-34 filter for RTTY reception. His prime interest, however, is FAX reception and particularly weather maps from the USA and Canada. The only problem he has is with fading and poor signal strengths. Colin asks if it would be worth changing to a G5RV antenna. Rather than just giving a simple no, I’ll give a little background to explain why this is the case.

We really need to start with the origins of the G5RV antenna. The antenna was primarily designed for the amateur radio operator as a simple, all-bands antenna system. Like shortwave listeners, amateurs also suffer space restrictions, so there is a demand for a simple, but small, antenna system. There have been countless designs in the past and the subject is by no means finished. The G5RV scores so well because it combines simplicity and versatility. The simple electrical requirement is that it must provide an acceptable impedance match on all the amateur bands. This is achieved by the careful dimensioning of the antenna including the feeder. It is important to remember that the feeder is very much part of the antenna in designs such as this.

So, how does this relate to the short wave listener? The subtle difference between a listener and an amateur is that the listener requires consistent performance throughout the short wave bands. The amateur, on the other hand, is working on just eleven spot frequencies. Because of the varying requirements it’s not surprising to find that the antenna design is also different. This is why the G5RV is not necessarily the best choice for the listener.

The important point with all receive antennas is the length and height. My recommendation is to stick with a long wire antenna and mount it as long and high as possible.

Returning to Colin’s original problem, one important point to make sure you are using the best frequency. Most FAX stations transmit on several frequencies simultaneously and it’s always worth trying to find the best one.

You may remember that last month I mentioned the problems that readers were having receiving Offenbach Meteor. This was due to interference from a radio-navigational beacon. Ron Higginbotham from London has written with his solution to the problem. Ron uses a Datong FL2 active filter and has managed to almost completely eliminate the interfering signal, so giving a clean FAX copy. The FL2 settings in use are as follows:

- Left hand control set to 0.2kHz
- Centre control set to 1.2kHz
- Right hand control set to 2.2kHz

Mode set to s.s.b.

The rest of Ron’s station comprises a Spectrum ZX+ computer and Alphaacomputer. The receiver is a Panasonic, but he doesn’t state which model.

If anyone else has any examples of cures for this problem, please drop me a line.

Charlie Barker of Northampton has recently returned to listening after an absence of about 15 years. His current station comprises the popular Matsui MR-4099 receiver with a home-made Practical Wireless TAWI converter. The two antennas in use are a long wire and a loop antenna. Utility decoding is achieved using a FAX decoder based on an article in Elektor magazine and the RTTY terminal unit is from Ronsys. Charlie is now looking to upgrade to a more sophisticated receiver and some better software for his Amstrad PC-2086 computer.

Charlie has also developed a very handy way of presenting his frequency list. He uses a commercial program called Portex to produce a personal organizer size printout that makes for a very handy reference in the shack.

Lee Cooper writes from Romsey with a plea for help with software. He currently runs an NRD-525 receiver and would very much like to use his Amstrad 6128 computer to decode RTTY, CW and FAX transmissions. Can anyone out there help? If so, please drop me a line and I will pass on the information.

Peter Threadgold of Clevedon is another who has recently returned to the hobby, only he has had a break of 40 years! His interest was rekindled when he was asked to check out a Matsui 4099 receiver by a friend. Peter’s early experiences started with a crystal set in 1934 and progressed to a single valve receiver using a Mullard FM22X. The power source was a wet Leclanché unit for the I.F. and several grid bias batteries for h.t. Peter remembers listening to Radio Japan on this receiver via his Blue Spot balanced armature loudspeaker with 12in home-made cone. Peter’s current set-up comprises the Matsui MR-4099 with a Microreader decoder for utilities.

The Government surplus R-210 receiver seems to be a popular one with many readers. The latest to write is Peter Hall of Rotherham who uses his to sup-
Maurice Lloyd has kindly written with a few updates that may prove interesting. Regular readers I have put that Maurice was recently approached by a Liverpool family to see if he could help with latest information on the plight of the hostages. Their interest was due to a relative being held hostage. I'm pleased to be able to report that the person concerned, Tony Wilbraham, is now happily reunited with his family. Having spent some time chasing news from the Gulf, Maurice considers that Magnap Arab Press (MAP)/ RABBIT (in Morocco) is the least biased. For those who may be interested, the frequencies and schedule for this station are as follows:

- 12.212MHz, RTTY, 50, 425, -
- 19.1711MHz, RTTY, 50, 425, -
- 18.4%1MHz CNM80, 411 Middle East
- 18.2209MHz
- 15.7527MHz
- 14.76MHz
- 10.213MHz, CNM76/X9
- 9.200MHz, CNM66/X2
- 7.902MHz, ARQ-E3, 100, 425,
- 7.920 MHz, ARQ-E3, 100, 425,
- 7.345MHz, ARQ-E3, 100, 425,
- 6.344 MHz, 8.4465, 8.4455, 8.4755
- 6.344, 8.4465, 8.4455, 8.4755
- 5.172MHz
- 4.345 MHz, ARQ-E3, S. Africa
- 4.255 MHz, ARQ-E3, W. Africa
- 3.555MHz, ARQ-E3, Middle East
- 3.151MHz
- 2.715MHz, ARQ-E3, Europe (1400UTC)

If you have found any interesting Gulf stations, please drop me a line with the details.

### QSL Addresses

There seems to have been a great deal of interest in the few addresses I have put that, I think I would continue the process. This months’s selection comes from Maurice Lloyd and Jan Niewenhuis

1. **US Coast Guard CAMSPAC**: Commander Office, 17000 Sir Francis Drake Blvd., PO Box 565, Point Reyes Station, CA 94956-0560 USA

2. **Agency Telegraphique Albanaisata, Tirana, Albania, Attn: Technical Dept.**

3. **Funkturm Rugen Radio**

Coastal Radio Station, Glowew/ Rugen, German Democratic Repub.

Wilhelmsen Radio, Marinemefenmedeppnp 21, Admiral-Admiral-Zimmermann-Kaserne, 2940 Wilhelmsen 31, Federal German Republic.

Rumpress/Agonce DiPress, Pieta, Preise Liber Nr 1, Bucurest, Romania, Attn: Andrei Vretos.

Rome PT Radio, Stazione Radio Costera PT, Stazione Ricevente, Via Della Cesariana 282, 00139 Rome, Italy

Qatar Radio Coast station, Qatar Public Telecommunications Department, PO Box 217, Doha, Qatar. Attn: Yousef Al Kubaisi, Senior Engineer Transmission.

### Station Profile

This is the first of these features that I hope will help give some useful background information. The station this month is Mobile Radio Inc - WLO Radio which is located in Alabama USA. By the way, don’t be fooled by the word Mobile in the title, it’s actually the name of the town!

WLO Radio is a commercial marine radio station that operates 24 hours a day, 7 days a week. The service offered includes Telex, telegram, phone (h.f and v.h.f.) weather FAX and time slot broadcasts. The time slot broadcasts are particularly interesting and comprise traffic lists and weather forecasts in plain text. The transmission modes used are c.w. and standard FEC broadcast so are easily received. The times and frequencies used for these transmissions are:

- **Normal Season (non-hurricane season)**:
  - Traffic lists on the hour using c.w. and 35 mins past the hour for FAX. (1200UTC, Genova Italy)
  - 8.649MHz, CW, -,-, -,-, 1450UTC 1200 Gulf surface forecast
  - 8.1051MHz, ARQ-E3, 72, 400,
  - 8.1051MHz, ARQ-E3, 72, 400,
  - 8.15MHz, RTTY, 50, 170,-
  - 8.15MHz, RTTY, 50, 170,-
  - 2210UTC, Nairobi Aero
  - 8.48MHz, CW, -,-, -,-, SAG4, 1650UTC, Guetong Radio
  - 9.45MHz, CW, -,-, -,-, 1490UTC, Genua Italy
  - 10.62MHz, CW, -,-, -,-, TAH, 2321UTC, Istanbul Radio
  - 4.345MHz, RTTY, 50, 425,
  - 434kHz, 2.055, 4.2575,
  - 2.055, 4.2575,
  - 1.05MHz, ARQ-E3, 72, 850,
  - 7.920MHz, ARQ-E3, 100, 350,
  - 7.920MHz, ARQ-E3, 100, 350,
  - 1.75MHz, ARQ-E3, Europe (1400UTC)

STOP PRESS… I have just learnt that Ruenge Radio has changed its callsign from V5M to DHO.

0900UTC 0900 Gulf surface analysis
0910UTC 18/36 hour Gulf surface analysis
0920UTC Coastal marine forecast
1100UTC North Gulf aviation forecast
1440UTC Radiofax schedule (Monday only)
1450UTC 1200 Gulf surface analysis
1500UTC 1200 North American surface analysis
1510UTC Off-shore marine forecast
1900UTC North Gulf aviation forecast
2030UTC 1800 Gulf surface analysis
2100UTC Coastal marine forecast

That about concludes the main features of this station, which, I hope you have found interesting.

### Weather Fax

A Service that is always popular with listeners is weather FAX and WLO currently transmits on 6.852MHz and 9.1575MHz. The format used is the standard 120 RPM with a speed of 576. Normal start and stop tones are also used, so full automatic reception is possible. The schedule of transmissions is:

- 0310UTC Off-shore marine forecast
- 0900UTC 0900 Gulf surface analysis
- 0910UTC 18/36 hour Gulf surface analysis
- 0920UTC Coastal marine forecast
- 1100UTC North Gulf aviation forecast
- 1440UTC Radiofax schedule (Monday only)
- 1450UTC 1200 Gulf surface analysis
- 1500UTC 1200 North American surface analysis
- 1510UTC Off-shore marine forecast
- 1900UTC North Gulf aviation forecast
- 2030UTC 1800 Gulf surface analysis
- 2100UTC Coastal marine forecast

Another very good response this month so I would like to thank the following for their contributions: Ted Rickett, Day Watson, Zacharias Liangas, Eric Sillick, Tony Levesey, Cyril Keilamand Chris Durkin.

So, on to this month’s selection of frequencies. The format is the usual; frequency, mode, speed, shift, callsign, time and notes.

- 7.920MHz, ARQ-E3, 100, 350, RTJ7,-,-, Paris
- 8.1051MHz, ARQ-E3, 72, 400, RFFX,-, Versailles
- 8.15MHz, RTTY, 50, 170,-
- 2210UTC, Nairobi Aero
- 8.48MHz, CW, -,-, -,-, SAG4, 1650UTC, Guetong Radio
- 9.45MHz, CW, -,-, -,-, 1490UTC, Genua Italy
- 10.62MHz, CW, -,-, -,-, TAH, 2321UTC, Istanbul Radio
- 4.345MHz, RTTY, 50, 425,
- 434kHz, 2.055, 4.2575,
- 2.055, 4.2575,
- 1.05MHz, ARQ-E3, 72, 850,
- 7.920MHz, ARQ-E3, 100, 350,
- 7.920MHz, ARQ-E3, 100, 350,
- 1.75MHz, ARQ-E3, Europe (1400UTC)

STOP PRESS… I have just learnt that Ruenge Radio has changed its callsign from V5M to DHO.

### Hurricane Season

As with the normal season, traffic lists are released on a channel. The format is the usual; frequency, mode, speed, shift, callsign, time and notes.

- 7.920MHz, ARQ-E3, 100, 350, RTJ7,-,-, Paris
- 8.1051MHz, ARQ-E3, 72, 400, RFFX,-, Versailles
- 8.15MHz, RTTY, 50, 170,-
- 2210UTC, Nairobi Aero
- 8.48MHz, CW, -,-, -,-, SAG4, 1650UTC, Guetong Radio
- 9.45MHz, CW, -,-, -,-, 1490UTC, Genua Italy
- 10.62MHz, CW, -,-, -,-, TAH, 2321UTC, Istanbul Radio
- 4.345MHz, RTTY, 50, 425,
- 434kHz, 2.055, 4.2575,
- 2.055, 4.2575,
- 1.05MHz, ARQ-E3, 72, 850,
- 7.920MHz, ARQ-E3, 100, 350,
- 7.920MHz, ARQ-E3, 100, 350,
- 1.75MHz, ARQ-E3, Europe (1400UTC)
DO YOU ENJOY DXING THE MEDIUM AND LONG WAVE BANDS? THEN MEDIUM WAVE NEWS IS FOR YOU. THE ONLY SPECIALIST MAGAZINE FOR THE MWL/W LISTENER IS AVAILABLE BY SUBSCRIPTION FROM: THE MEDIUM WAVE CIRCLE, 137a HAMPTON ROAD, SOUTHPORT, MERSEYSIDE PR8 5DY.

SEND £20.00 CASH ONLY with clear return address to Nigel Ballard 28 Maxwell Road, Bournemouth, Dorset BI -19 1DL (NO personal callers). State whether 5.25 or 3.5 inch scanning information

1/ Extensive spectrum bandplan. 2/ Exclusive scanning articles. 3/ In-depth frequency hunting information 4/ Shareware frequency logging program. 5/ Latest national Fire Brigade listing. 6/ USAF H.F. Frequency listing. 7/ Plus many scanning hints and tips.

The HOWES AA2 Kit: £7.50

AA2 ACTIVE ANTENNA for 150kHz to 30MHz

The HOWES AA2 Active Antenna gives full coverage from 25 to 1300MHz. It is designed to be the ideal solution for those requiring a compact, broadband antenna for use with scanning receivers. The AA2 features advanced technology with a low noise microwave IC amplifier.

- Fully broad band covering 25 to 1300MHz.
- Low noise microwave IC (NF <3dB). Over 15dB gain. IP3 +15dBm.
- Coax powering 12 to 14V DC at less than 20mA.
- 10dB switched attenuator on the receiver interface board.
- 16 inches long; 1.2 inches wide. Easy to build kit or ready built modules.

If your scanner reception could benefit from the addition of a remotely located antenna, or you would like a much nearer, more compact alternative to the ugly discone types, then the HOWES AA2 could be just the job! You can read the review in the November '90 Short Wave Magazine.

Excellent!

AA2 Kit: £18.80

Assembled PCB modules: £24.90

CV100 - ADD SHORTWAVE TO YOUR SCANNER!

The HOWES CV100 is a frequency converter that adds 100MHz to incoming medium and shortwave signals so that they can be tuned on a VHF scanning receiver. No mods are needed to the receiver. The CV100 simply connects between the HF antenna (AA2 etc.) and the receivers antenna input. It requires a 12 to 14V DC supply. Controls are provided for RF filter selection and three way (0-15-300) attenuator. A Plessey SL6440 double balanced mixer is employed for excellent strong signal handling. If you already own a VHF scanner, then this must be about the most cost effective way of adding medium and shortwave coverage to a decent standard of performance.

CV100 Kit: £25.50

RECEIVERS AND TRANSMITTERS

Our range of amateur radio kits is an integrated, modular range. You can build one of our receivers and use this as an SWL. Later if you get your Novice or full transmitting licence, the relevant transmitting kits can be added to the receiver to form a transmitter. So if you build one of our amateur receivers now, you are already on your way to a fully operational amateur station of your own. Our kits include both simple CW (Morse) and more sophisticated SSB (speech) equipment. Accessory kits to provide extra filters, digital readout, plus ancillaries such as ATUS, SWR indicators, etc. are all available in our range. Why not send an SAE for a copy of our free catalogue?

HAYES KITS are produced by a professional RF design and manufacturing company. They contain a good quality printed circuit board with screen components. Our kits offer the challenge and satisfaction of home construction with the reassurance of help if you need it.

PLEASE MENTION SHORT WAVE MAGAZINE WHEN REPLYING TO ADVERTISEMENTS.

IF YOU ARE INTERESTED IN ADVERTISING IN SWM, PLEASE CALL ROGER HALL, OUR AD. MANAGER ON 071-731 6222 OR MARCIA BROGAN IN OUR PRODUCTION DEPARTMENT IN POOLE ON (0202) 676033
BERNIE’S NEW YEAR MESSAGE

Ealing has for many years been the Amateur Radio Centre of London. Ever since Brenda and I first opened our corner shop 14 years ago, overflowing with second hand junk and fresh coffee, this area has been famous with the amateur radio fraternity.

Other shops have come and gone, but the image that Brenda and I set up on how to run a friendly emporium, that flourished with goodwill and coffee, has never yet been equalled by our competitors.

Our shop at Hanger Lane, Ealing retains the same friendly atmosphere that has been our hallmark. I am still on call most days, but if you phone and I’m out, leave your number and I’ll call you back.

Best wishes for 1991 from B&B and all at A.R.E.

NOW OPEN SATURDAY 9am-3pm
Opening Hours Monday-Friday 9.30-5.30

JAVIATION
VHF/UHF AIRBAND SPECIALISTS
Tel: (0274) 732146

Now available REAL LEATHER Carry Cases for the AR1000/HP100

As specialists in the VHF civilian and UHF military airbands we can offer unbiased professional advice and information on all the various receivers & scanners available suitable for airband listening.

With equipment from Yupiteru, Fairmate, AOR, Icom, Win, Black Jaguar, Revco, Uniden, Tandy/Realistic, Sony, Signal and others, we probably carry one of the widest ranges available.

For a catalogue please send a LARGE SAE or if you would like a chat please give us a call- we will be happy to talk to you.

Our VHF & UHF Frequency Listings are both updated to late November and must be the most comprehensive available. Our VHF list includes ICAO 3-letter designators, callsigns, squawk codes and much more, while the UHF lists includes stud numbers, range and other frequencies. Both lists have LATCC transmitter site/frequency tie ups.

Carlton Works, Carlton Street, BRADFORD, West Yorkshire BD7 1DA
Telephone: (0274) 732146 Facsimilie: (0274) 722627
Current Activities

It seems that no two weeks are the same amongst the Russian METEORS. During early October the transmissions on 137.30MHz were from METEOR 2/18, but by the middle of the month there was a change to METEOR 2/17 on the v.h.f. a.p.t. transmissions that NOA 9 should be back on during December. Interestingly, it is only NOAA 9 that usually lasts about a month, so NOAA 9 should be back on during December. Interestingly, it is only NOAA 9 that usually lasts about a month, so NOAA 9 should be back on during December.

During November, NOAA 9 was switched off while it clashed with NOAA 11. This conflict usually lasts about a month, so NOAA 9 should be back on during December. Interestingly, it is only NOAA 9 that usually lasts about a month, so NOAA 9 should be back on during December.

I had a call from Dave Cawley who is developing an advanced a.p.t. unit. Timesteps Weather Satellite Systems and he told me that he was picking up perfect signals from NOAA 9 in the 160MHz band during this time. This is probably because reception of these signals requires a dish that is pointed at the satellite and wouldn't therefore suffer from interference in the same way that the v.h.f. transmissions do when we use large beamwidth antennas.

Meanwhile, as I was writing this column just before the publication deadline, METEOR 2/17 was switched off and METEOR 2/20 was switched on. METEOR 2/20 is a new satellite on the first hour or two hours later after launch, and, like METEOR 2/18, it remained silent as if resting before starting work!

The final (7) surprise is METEOR 2/16 which came on again on 137.30MHz transmitting slow scan, infra-red pictures.

FENGYUN 1B

On November 3, the Chinese satellite FENGYUN 1B stopped transmitting infra-red images but resumed two days later. The American NOAA satellites and METEOSAT occasionally have a degradation session and their infra-red sensors are switched off, so this was probably what was happening.

Teletext

A letter from Graham Smith G1JVZ reminded me to mention that Oracle (ITV Teletext) carries some satellite and space news during the weekends on page 568.

IBM PC Cards

More and more letters arrive asking about the addition of satellite and space news to personal computers of the IBM PC type, which is an increasing number of people have. These enquiries come at a most interesting time, because the manufacturers of satellite equipment are developing these cards to make use of the standard facilities that these computers have.

A letter from Claude Markham writing from Rabat in Morocco told me that he has an IBM PC/AT 80286 computer fitted with an SVGA monitor and would like to buy a card to input weather satellite data.

Framestores

For the benefit of readers who are new to weather satellite signals and the different ways that they can be processed, it is worth mentioning that until about a year or two ago the usual way to decode the v.h.f. signals was by using a framestore. The most well-known model was the YUV/MV color framestore built by my first framestore some four years ago, but I must admit that it was not a pretty sight. It worked excellently after a friend from the Plymouth Radio Club debugged it for me!

It cost me some £200, which was about a quarter of the price of a commercial unit and I was delighted to convert the "best/best" sound that came out of my v.h.f. receiver into a very good quality image of North African building such units is very satisfying for the enthusiastic hobbyist, but my interest was purely scientific. Having heard that the Russians were using their weather satellites to monitor ice conditions around the world by using radar on board satellites, I just had to get a framestore! The main problem with framestores is their inability to process data after the event. Once you have got your picture you cannot adjust it further to enhance detail that might have been there. This limitation does not stop you being able to monitor the numerous satellites that transmit a.p.t. signals, and I will use my own unit on many occasions.

Claude already has an excellent computer for this purpose and so he needs to choose a suitable card. These are electronic circuits fitted on to a p.c.b. that slot into one of the available connectors usually found inside the computer. The card has an audio connector into which you plug the output from your receiver. It then digitises the signal, and the software processes the resulting numbers, to convert them to a meaningful picture.

Another factor is the screen quality. The original IBM screen was called a CGA and this is probably what most people have, for instance the lower priced Amstrad PC1512 has this type. More advanced models have the better quality CGA and the best quality is the VQA or SVGA. Do be very careful before buying a supposed VGA card for your computer. Some advertisements are a little misleading, even if the advertiser is not doing it intentionally.

There are several satellite cards to choose from, and would love to be able to compare them all. Reviews are not always up-to-date and one published elsewhere of the Timetemp VGASAT software was somewhat inaccurate (I use this myself) and so I would recommend Claude to contact the retailers or manufacturers of the various cards and request the specifications of their latest issues.

Finally Claude is also interested in FAX so perhaps a glance at Mike Richards' 'Decode' column, which looks at these systems, might be of help.

More Letters

C. Archer of Banff in Northern Ireland wrote on behalf of the Grammar School Science Club to ask about the equipment needed to set up a satellite receiving station from scratch. They have a BBC Master computer and a printer. I will be sending some details to him including a summary of antennas, receivers and software. All the frequencies requested are published in this column.

The last question is about foreign language broadcasts from satellites. There are such broadcasts, but they are more easily monitored using a normal radio tuned into one of the many terrestrial radio stations. The satellite broadcasts use non-a.p.t. satellites, usually one of the transponders on a TV satellite.

A reader recently asked about satellite predictions software for the Spectrum computer. I have had a letter from David Martin G1UJO who tells me that he has made considerable modifications to another satellite predictions program to run on a Spectrum, preferably using the PLUS-D interface which runs a 3.5in disk drive. David can be contacted by sending an s.a.e. to 27 St Andrew's Road, Stratton, Bude, Cornwall EX23 9AG to receive details of the program.

Predictions

As well as including a set of predictions here for the weather satellites I am including both SERT 2 and TRANSIT 5BN 5 which have been transmitting (non-a.p.t.) regularly for all to hear. A set of Kepler elements for METEOR 2/20 is also included since this satellite has recently started its operational life using 137.30MHz. Following the pattern of previous tables the satellite identification is given, then its acquisition time o.s.o. (UTC), then logs of signal loss. The maximum elevation of the satellite is given with its direction (east or west), and finally the direction of travel, whether southbound or northbound.

These times shown in Table 1 should be accurate to within about two minutes.

METEOR Predictions

We cannot know which METEOR weather sat's will be operating over the Christmas period and so have run predictions for all the satellites from METEOR 2/16 onwards for December 22 shown in Table 2.

Table 1. Saturday December 22

<table>
<thead>
<tr>
<th>Satellite</th>
<th>AOS</th>
<th>LOS</th>
<th>Maxel</th>
<th>Dir</th>
</tr>
</thead>
<tbody>
<tr>
<td>FENGYUN 1B</td>
<td>0947</td>
<td>1091</td>
<td>28W</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 2/3</td>
<td>1014</td>
<td>1034</td>
<td>5EB</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 3/3</td>
<td>1205</td>
<td>1224</td>
<td>44EB</td>
<td>SB</td>
</tr>
<tr>
<td>OKEAN 1</td>
<td>1226</td>
<td>1256</td>
<td>18 EB</td>
<td>SB</td>
</tr>
<tr>
<td>TRANSIT 5BN 5</td>
<td>1318</td>
<td>1336</td>
<td>24 EB</td>
<td>SB</td>
</tr>
<tr>
<td>NOAA 11</td>
<td>1327</td>
<td>1958</td>
<td>52W</td>
<td>SB</td>
</tr>
<tr>
<td>NOAA 9</td>
<td>1610</td>
<td>1625</td>
<td>52W</td>
<td>SB</td>
</tr>
<tr>
<td>TRANSIT 5BN 8</td>
<td>1645</td>
<td>1703</td>
<td>31W</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 2/3</td>
<td>1724</td>
<td>1741</td>
<td>60 EB</td>
<td>SB</td>
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<td>METEO 3/3</td>
<td>1750</td>
<td>1756</td>
<td>19 EB</td>
<td>SB</td>
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<td>OKEAN 1</td>
<td>1806</td>
<td>1806</td>
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<td>1829</td>
<td>1829</td>
<td>24 EB</td>
<td>SB</td>
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<tr>
<td>METEO 18</td>
<td>1858</td>
<td>1858</td>
<td>19 EB</td>
<td>SB</td>
</tr>
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<td>METEO 10</td>
<td>1909</td>
<td>1909</td>
<td>29 EB</td>
<td>SB</td>
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<tr>
<td>METEO 18</td>
<td>1943</td>
<td>1943</td>
<td>59</td>
<td>SB</td>
</tr>
</tbody>
</table>

Fig. 1: A visible light picture of the Kola Peninsula, which is to the east of Sweden, in early spring when the ice surrounding the area is just starting to melt. The picture shows ice all around the coast line.

Table 2. Saturday December 22

<table>
<thead>
<tr>
<th>Satellite</th>
<th>AOS</th>
<th>LOS</th>
<th>Maxel</th>
<th>Dir</th>
</tr>
</thead>
<tbody>
<tr>
<td>METEO 2/18</td>
<td>0956</td>
<td>0910</td>
<td>18</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 2/20</td>
<td>0915</td>
<td>0931</td>
<td>24</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 2/18</td>
<td>1100</td>
<td>1117</td>
<td>70W</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 2/18</td>
<td>1225</td>
<td>1240</td>
<td>19W</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 2/16</td>
<td>1347</td>
<td>1347</td>
<td>35W</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 2/16</td>
<td>1414</td>
<td>1431</td>
<td>36W</td>
<td>SB</td>
</tr>
<tr>
<td>METEO 2/16</td>
<td>1532</td>
<td>1549</td>
<td>49W</td>
<td>SB</td>
</tr>
</tbody>
</table>

51
new receivers or antennas on satellite transmissions the most reliable satellites are the NOAAs listed above. The Chinese FENGYUN 1B satellite seems to be transmitting reliably now but the METEORS continue to throw unexpected surprises each week. Bear this in mind when you try to tune into an expected METEOR transmission.

**Frequencies**

NOAA 9 and 11 transmit on 137.62MHz.

NOAA 10 transmits on 137.50MHz.

FENGYUN 1B transmits on 137.80MHz.

METEORS may transmit on 137.30, 137.40 or 137.85MHz.

OKEAN 2 transmits on 137.40MHz.

**Non APT Satellites**

I have included the times of TRANSIT 5BN 5 and SERT 2 passes which should be heard on the following frequencies: TRANSIT 5BN 5 transmits on 136.65MHz.

SERT 2 transmits on 136.20MHz.

This should keep everyone busy tuning around the satellite band during the holiday season and perhaps you will let me know whether the list is of use for testing your equipment or simply of general interest.

**The New:**

METEOR 2/20

**Kepler Elements**

EPOCH: 90304.0672294

INCLINATION: 82.5259

MEAN MOTION: 13.83234206

MEAN ANOMALY: 202.7990

ARG OF PERIGEE: 157.3730

EPOCH; 90304.06792294

INCLINATION: 82.5259

EPOCH: 90304.06792294

MEAN MOTION: 13.83234206

MEAN ANOMALY: 202.7990

ARG OF PERIGEE: 157.3730

**The Old:**

SALYUT 7

This satellite has been in orbit for several years and is attached to COSMOS 1868 and so has a total mass of some 30000kg and a total length of about 27m. Its orbit is decaying rapidly and the Russians are not boosting it again and so re-entry is expected to happen within a few years towards the end of December 31. Geoff Saldwell of Penwortham tells me that several sections will survive including the bulkheads and the docking ports and parts of the COSMOS craft.

**The Russian Weathersats**

**Part 4:** Previous articles in this short series have covered the METEOR 1, 2 and 3 series of orbiting weather satellites. The experience gained during the exploitation of these satellites has been complemented by the Cosmos 1500 type of satellite, now referred to as the OKEAN series.

The Russians are developing their meteorological satellites to create a single comprehensive system including geostationary and polar orbiters. These will monitor not only visible and infrared radiation but also ultraviolet water vapour and ozone concentrations. The geostationary satellites will be similar to our METEOSAT and the American GOES in providing near-continuous transmissions with high-resolution pictures.

The OKEAN series of oceanographic satellites started off under the general name of COSMOS, probably due to the early Soviet reluctance to acknowledge problems if such satellites failed to operate properly. Early examples of these satellites include COSMOS 1500, 1689 and 1766 which sent down good images though having problems with other on-board equipment.

**Offers**

In order to help those of you trying to test out new equipment I can supply the latest set of Kepler elements to update your satellite predictions programs if you simply send me an s.a.e. The second offer is for those wanting a tape recording of a.p.t. signals; please let me have a pre-paid package containing a cassette tape and I will record either a NOAA, METEOSAT or METEOR signal, depending on your request.

**Season’s Greetings**

This column will appear just before Christmas and so may I wish all our readers a happy and peaceful New Year. Please continue to send in reports of your satellite work and any suggestions for particular items in the column that you would like to see.

---

**Fig. 2:** A summer picture from METEOSAT showing the G2D visible light image. The mountains of northern Africa can be clearly seen and morning and evening views are very dramatic.

The orbit of SALYUT 7 has an inclination of about 51° which takes it over Britain and so there is a small chance of seeing some debris fall but the oceans or parts of Europe are more likely to see the fireworks.

**Detail**

The computer that I bought in summer for satellite monitoring has the VGA screen mentioned earlier and has revealed far more detail in these METEOR pictures than I knew existed. Each section of this picture contains extra grey scales and also other markers in the bars which might mean something to someone!

**The Russian Weathersats**

**Part 4:** Previous articles in this short series have covered the METEOR 1, 2 and 3 series of orbiting weather satellites. The experience gained during the exploitation of these satellites has been complemented by the Cosmos 1500 type of satellite, now referred to as the OKEAN series.

The Russians are developing their meteorological satellites to create a single comprehensive system including geostationary and polar orbiters. These will monitor not only visible and infrared radiation but also ultraviolet water vapour and ozone concentrations. The geostationary satellites will be similar to our METEOSAT and the American GOES in providing near-continuous transmissions with high-resolution pictures.

The OKEAN series of oceanographic satellites started off under the general name of COSMOS, probably due to the earlier Soviet reluctance to acknowledge problems if such satellites failed to operate properly. Early examples of these satellites include COSMOS 1500, 1689 and 1766 which sent down good images though having problems with other on-board equipment.

These satellites carry radar and microwave sounders and can therefore measure the amounts and thickness of Arctic and Antarctic ice cover, as well as watching reservoir and river ice. The earliest ones were called METEOR-PRIRODA and carried multi-zonal scanners of low (MSL) and medium (MSM) resolution. MSM spectral ranges have in four channels, 0.5 to 0.9μm, 0.6 to 0.7, 0.7 to 0.8 and 0.8 to 1.0; resolution 1000 by 1700m with a swathwidth of 1900km and a scanning angle of 106°. MSM spectral range has two channels, 0.58 to 0.7μm and 0.7 to 1.0; resolution 140 by 240m with a swathwidth of 1380km and a scanning angle of 50°.

Other equipment carried in the early satellites was classed as experimental and included opto-mechanical scanners of both moderate (175 by 24m) and high (45 by 60m) resolution, and a 'Fragment' multi-zonal scanner. COSMOS 1689 was a later development which was launched in 1985 to collect regular data on earth resources as well as meteorology and contained similar equipment but built to a higher specification. These satellites have been used to identify parts of the earth's crust and to prospect for oil.

My thanks once more to the USSR State Committee for Hydrometeorology, State Research Centre for Earth Resources Exploration for providing the information on which this data is based. There will be a further article on the orbits of the METEORS.

**Fig. 3:** A close-up of a typical METEOR visible light image. It shows the set of phasing bars on the right-hand side which give the signal its characteristic sound. The grey scale vertical strip is next and then the rectangular six black-and-white aperture indicator. At the top of the picture the six bars are mostly black indicating that the sensor aperture is almost fully open. The bars represent binary numbers with black equal to 1.
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During 1990, R. HCJB in Quito, Ecuador decided to experiment with the single sideband (S.S.B.) plus pilot carrier system advocated at the last World Administrative Radio Conference (WARC) on: broadcasting. Encouraged by the reception reports, they soon established an 11 m u.s.b. (30kW) broadcast service to Europe.

This mode offers a number of advantages over the original amplitude modulation (a.m.) system, so it is to be hoped that receiver manufacturers will produce some low-cost s.s.b. portables during 1991.

Long Wave Reports

Note: w & m.w. frequencies in kH; s.w. in MHz; Time in UTC (+GMT)

Writing from Edinburgh, Brian Oddy G3FEX says that although he has heard Atlantic 252 as late as midnight, reception is rendered almost impossible at times by the co-channel interference from Lahr, Finland (200kW) and Tipaza, Algeria (150kW). Atlantic 252 has been monitored by John Stevens in Largs since its inception. He has noticed a considerable reduction in the signal strength during the last few months, at one time it was more potent than BBC Radio 4 via Westerglen, but now it is much weaker and reception is very poor after 1800. The ranked reduction in strength of their daily signal was also noted by John Hepburn in Ashington (Northumberland) and by Roy Patrick in Derby.

MW Transatlantic DX

Listening in Grimby, Jim William found conditions to be rather poor compared with last month. The broadcasts from CIJO in St John’s, N.F. on 930 were the first to reach him, they peaked at 003233 at 0315. The signal from WINS in New York 1010 was rated SI0222 at that time. The only broadcast received from S America came from R. Giolo in Rio, Brazil on 1220, rated SI0222 at 0200.

Listeners interested in this aspect of DXing, but unable to search the band at night, might try using a time-switch controlled receiver and tape recorder to monitor a specific frequency. Some receivers have a suitable time-switch built-in, but an alternative is to plug an a.c. time-switch into the mains outlet to power the receiver and tape recorder. The receiver should be set to a suitable frequency, e.g. 930kHz and the recorder left in the record mode.

Other MW DX

While listening in Sunderland, Lee Barr picked up the sky wave component of the 1MW transmission from Qurayyat, Saudi Arabia on 900 at 2255. The signal was only audible for about five minutes and peaked 34344 before fading out.

The sky wave signals from some N Africa stations have reached here after dark. In 4t Yarmouth, Ted Walden Vincent logged Algiers, Algeria 891 (600-330kW) as SI044 at 2045 and Djedeida, Tunisia 630 DXers.

- A: Ted Agombar, Norwich.
- B: Lee Blair, Sunderland.
- C: Andy Conley, Folkestone.
- D: Scott Caldwell, Warrington.
- E: Jim Ormby, Huddersfield.
- F: Ron Danly, Woking.
- H: Steve Hughes, Warrington.
- I: Rodbrock, Ilminster.
- K: David McDermott, Plymouth.
- L: George Milne, Wiston, Kew.
- N: John O’Connor, Harrogate.

P: Chris Shorten, Norwich.
Q: Alan Smith, Northampton.
R: Roy Paris, Harrogate.
S: David Todd, Barntop.
T: Tony, Downham Market.
U: Ted Walden-Vincent, Gt Yarmouth.
The latest ‘pop’ music is carried by and operate 24 hours a day. The Chiltern R. use the name ‘Touch AM’ 1557kHz. At night, they revert to day for broadcasts on 792, 828 & 859kHz.

Faulkner (Leicester) informs me great”.

Having heard great praise for Co.Wexford, Bart O’Brien could be a typical example.

The 13m signals to other areas include R. Moscow, USSR 21.750 (Eng to Australia 2300-0800), 43333 at 0807 by Ted Agomber in Norwich; BFS via Daventry, UK? 21.755 (Eng to Gulf area 0900-1000) 34333 at 0930 by Roderick Illman in Edgbaston, Birmingham; AIR via Madras 21.555 at 1300-1500 was noted by many in the UK. The signal from Alan Smith in New Zealand was 1322 being a typical example.

Long Wave DX

At times, high levels of solar noise have made reception on the h.f. bands poor, or even impossible, in some areas, good reception has been noted at other times. The present high level of solar activity is likely to continue, so more disturbances can be expected.

Most broadcasts in the 25MHz (11m) band are aimed outside Europe, so only a few signals reach the UK via backscatter and reception is generally poor. However, good reception of the signals to Europe from R. HCB Quito 25.950 has been noted in the UK nearly all day. Using a scanning receiver in London, Ron Gallion rated their u.s. and pilot carrier signal as 44333 at 1228. Alan Roberts (Quebec) monitors the signal daily and notes it is insufficient to lock the synchronous detector in his receiver, so a typical rating is 45233 at 1220. The most potent signals come from R. Norway Int., Oslo 25.750 and RFI Paris 25.820, both rated 55555.

In contrast, R. Nederland’s Sunday broadcast on 25.970 (G) on C.W.Africa 1033-1125) rate 22222 at 1120. The 21MHz (13m) broadcast from R. Australia to S.Africa via Caravon 21.755 (Eng 0100-1300) sometimes reach the UK. In the early morning, Kenneth Reice (Perron) noted signal variations ranging from inaudible to 44333. Their signals to C.Africa via Darwin 21.525 (Eng 0100-0900) was logged by Jim Cash in Swanwick as 23721 at 0823.

Good reception of their signal to the Gulf area via Caravon 21.775 (Eng 1300-1500) was noted by many in the UK. The 54344 from Alan Smith in North America was 1322 being a typical example.

Some broadcasts to Europe in this band are from R. Japan via Yama 21.500 (Russ, Sw, It, Ger, Fr, Eng, Jap 0530-0830), rated S4444 at 0740 by Cyril Maggs in Shffield; R. Pakistan, Islam 21.525 (Eng 1102-1147) 34422 at 1130 by John Nash in Brighton; WSCS Counts Corner, MN 21.780 (Eng 1400-1600) 54554 at 1450 by Andy Cater in Falkirk; R. Dubai 21.605 (Ar, Eng 0600-1600) 44444 at 1615 in Morder; also 21.67555545 at 1815 by Darren Beasley in Bridgewater; R. Japan, Caracas 21.695 (Ar, Eng 0600-1600) 54555 at 1300-1500 was noted by many in the UK. The 54344 from Alan Smith in North America was 1322 being a typical example.

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signals were the BBC via Mahe, Seychelles 17.985 (Eng to E Africa 0900-1030), rated 24293 at 0904 in Penzance; R. Washington, USA 17.625 (Eng to N Africa 0400-1000) SI0322 at 0815 in Bristol; R. Romania Int, Bucharest 17.605 (Eng to SE Asia 0545-0715) 3433 at 0533 in Sunderland; R. Jamaica, Kingston 17.830 (Eng to Jap to SE Asia 0600-1000) SI0444 at 0720 in Norwich; BBC via Kranji, Singapore 17.830 (Eng to SE Asia 0000-0105) SI0333 at 0810 by Philip Rambaut in Macclesfield; Voice of Greece, Athens 17.535 (Gr, Eng to Australia 0800-0850) 44444 at 0840 in Morden; R. Finland via Porto 17.800 (Eng, Fin, Sw to E Asia 0830-0957) 4444 at 0812 in London; R. Beijing, China 17.710 (Eng to Australia 0830-1035) 55555 at 0955 in Bridgewater; KHB Saipan, N. Marianas is 17.555 (Eng to Oceania 0800-1000) 23232 at 0955 in Worthing; SRI via Schwarzenburg 17.830 (Eng to E. USA) heard at 1100 in Largs; WHRI via Bonaire, I 17.512 (Ar, Fr, Port, England, Europe 1600-2300) 43343 at 2120 by Cliff Stapleton in Torquay.

Good DX reception was noted in the 15kHz(1530) band. The signals from R. New Zealand Int, Wellington on 15.485, intended for Pacific listeners, reached here at remarkable strength some overnights. In Slough, Thomas Barnett rated their signal (Eng 1645-2105 Mon-Fri, 1745-2105 Sun) as SI0444 at 1700. Some signals from R. Argentina were rated by Cliff Stapleton in Slough, as having been heard here in the early morning. Their transmission to SE Asia 15.465 (Eng to 2100-0730) was rated 43443 at 0705 by Donald Blashill in Cheltenham; to S. Pacific 15.240 (Eng 2200-0830) as SI0444 at 0800 in Sheffield. Broadcasters using the 15m band to reach Europe include R. Luxembourg, 15.260 (Eng 1000-1400, Fr 1400-1800) also to E USA) heard at 1100 in Ashington; WWCR Winterthur, TN 15.680 (Eng 1200-0100) 53343 at 1919 by Robin Clark in Plymouth; R. Korea, Seoul 15.515 (Ar, It, Eng, Sp, Port, Ger 1945- 

2300) 43333 at 1800 in Northwich; R. Pakistan, Islamabad 15.605 (Ur, Eng 1845-1900) 44444 at 1800 by Scott Caldwell in Warrington; R. Bangladesh, Dacca 15.256 (Fr, Eng 1900-2000) SI0343 at 1945 in Edinburgh; R. Romania Int, Bucharest 15.890 (Ger, Fr, 1800-2100)SI05545 at 2010 in Norwich; R. Russia, Leningrad 15.1105 (Ar, Fr, It 1800-2100) 44343 at 1905 in Worthing; WFM via Okeechobee 15.960 (Eng 1900-2245) 43433 at 2100 in Bridgewater; various languages are broadcast to other areas, often with segments in English. Those noted were from R. Japan via Montsiney, Fr Guiana 15.325 (Jap, Eng, Sp; 0200-0240) 43333 at 0310 in Prenton; RCJ Purpose, Tahiti 15.170 (Fr, It) to SE Pacific areas 15.930 (Eng to 2305) at 0435 in New Zealand; BFBS via BBC 15.205 (Eng to Gulf area 0500-1000) 55555 at 0530 in Worthing; WHRI via Bonaire 15.695 (Fr, It to USA 1100-1300) SI0322 at 1200 in London; to E. USA) heard at 1100 in Largs; WHRI via Bonaire, I 17.512 (Ar, Fr, Port, England, Europe 1600-2300) 43343 at 2120 by Cliff Stapleton in Torquay.
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Iraq 13.660 (Eng to Europe: 2000-2230) SI0333 at 2030 by Bill Griffith in London; RCI via Sackville 13.720 (Port, Sp, Eng to South America 0100-0300) 22322 at 0117 in Swannwick.

During the day there are many 11MHz (25m) broadcasts to Europe. Those noted were from KFBS Saipan 11.650 (Russ 0900-1430, also to N.Africa), and to Europe were also noted: R. RSA Johannesburg 7.270 (Eng 0900-1400, also to N.Asia), 34243 at 1531 in Brighton; R. Prague, Czechoslovakia 5.930 (Cz, Fr, Sp, Eng 1900-2215) 44444 at 1920 in Cheltenham; VORI Tehran 9.100 (Eng 1930-2145) 44333 at 1935 in Folkestone; R. Vilnius, Lithuania 9.765 (Eng to USA 1615-1830) 44243 at 1531 in Brighton; R. Sofia, Bulgaria 11.660 (Eng, It, Ger, Fr, Hung to USA 0900-1400, also to N.Asia), 33222 at 1220 in Harrogate; AIR via Delhi 9.950 (Eng to W/ Asia 1930-2030) 510322 at 1805 in Wallingford and on 9.650 (Eng 0800-1200 Sat) SI0333 at 0800 in Sheffield. The broadcasts to Pacific areas from R. Australia via Shortwave are not so dependable here. Ron Damp rated the signal on 9.560 (Eng 0830-2100) as 33343 at 0935.

Many broadcasts to Europe in this band come from R. HCJB Quito 9.610 (Eng 0700-0800) rated 44554 at 0718 in Northwich; TWR Monte Carlo, Monaco 9.480 (Eng 0640-0825) 45343 at 0807 in London; WCN Scotts Corner 9.840 (Eng 0800-1000) SI0444 at 0900 in Macclesfield; R. Nederland via Feve 9.715 (Eng 1130-1225) 33422 at 1133 in Sunderland, R. Pyongyang, 9.325 (Russ 1500-1600) 33433 at 1500 in Brighton; R. Traraz, Albania 9.480 (Fr 1600-1630) 55555 at 1600 in London, RFE/RU Munich, Germany 9.725 (Russ 1800-1835) SI0444 at 1600 in Winchester; R. Norway int, Oslo 9.655 (Eng 1700-1730 Sat/ Sun, also to Al) SI0444 at 1715 in Morden.


John Stevens (Great Ham Radio) or ICI or RCI in Eng.

A few notes on the long wave DXing around 1700 - 1900s.

- Ron Damp (Worthing): Racal RA17 + chimney mounted whip.
- Philip Rankine (Macclesfield): Int. Marine Radio R700M + r.w.
- George Millmore (Wootton): Tatung TMR7602 + loop.
- Sheila Hughes (Morden): Sony ICF7600DS; Vega 206+ loop; Panasonic DR48 + 15m wire.
- Robin Harvey (Bourne): Matsui MR4099 + s.w. loop.
- Simon Hamer (New Radnor): Lafayette HE30 or Grundig S1400+ loop with pre-amp.
- Alf Gray (Birmingham): Codar CR70 + PE130 pre-selector + a.t.u. + Ex-Army rod antenna.

David Edwardson (Vladivostok TEC) + r.w. 20cm long.
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**INDEX TO ADVERTISERS**

Aerial Techniques ........................................... 54
Air Supply .................................................... 60
Alytronics ....................................................... 58
ARE .............................................................. 50
ASK Electronics ............................................... 22 & 28
BBC ............................................................... 54
Ballard, Nigel ................................................... 49
Beckett, P ......................................................... 49
Bradhurst Electronics ......................................... 39
Chevet Books .................................................. 60
Cirkit .............................................................. 46
Colorom Electronics ........................................... 58
Comar ............................................................. 36
Danfast Ind & Leisure Ltd ................................. 49
Datong ............................................................ 53
Dewsbury Electronics .......................................... 36
Dressler Communications .................................... 39
Elliott Electronics .............................................. 58
Euro AM .......................................................... 45
EMP .............................................................. 53
ERA ............................................................... 45
Flightdeck ....................................................... 54
G4NKH Radio & Electronics ............................... 54
Register .......................................................... 54
Garex ............................................................. 63
Holdings Amateur ............................................. 49
Howes. CW Communications ............................. 49
Icom (UK) ........................................................ 42
.....Cover iii
Interbooks ......................................................... 58
J. & P. Electronics ............................................... 60
Javiation .......................................................... 50
Johnson's Shortwave Radio ............................... 45
Klingenfuss Publications .................................... 46
Lake Electronics ............................................... 54
Link Electronics ............................................... 58
Low Electronics ............................................... 8, 9, 13
Mauriton Electronics ....................................... 63
Medium Wave Circle ......................................... 49
Nebraska Communications ................................... 49
.....Cover ii & iv, 16, 17
Photo Acoustics ............................................... 42
RGW Electronics .............................................. 63
Radio School Limited ....................................... 63
Raycom .......................................................... 27
Rylands F G ..................................................... 58
S E M ............................................................. 58
SRP Trading ...................................................... 21
Skilltotal ........................................................ 54
Solid State Electronics ....................................... 46
South Midlands Communications ....................... 14
SpaceTech ....................................................... 45
Stephens James ............................................... 28
Technical Software .......................................... 63
Waters & Stanton .............................................. 35

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