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contents

10

Yupiteru MVT-7000 Hand-held Scanner Reviewed
Mike Richards

12

Continuing Along the Right Lines Part 4
George Dobbs G3RJV

16

50 Countries on the 144MHz Band Part 2
P.E.W. Allely GW3KJW

18

Special Offer Hamdisk PC

22

Yupiteru VT-125 UK Airband Receiver Reviewed
John Waite

29

Discovery of the Ionosphere
F.C. Judd G2BGX

33

Educational Software for Basic Electronics Part 7
J.T. Beaumont G3NGD

34

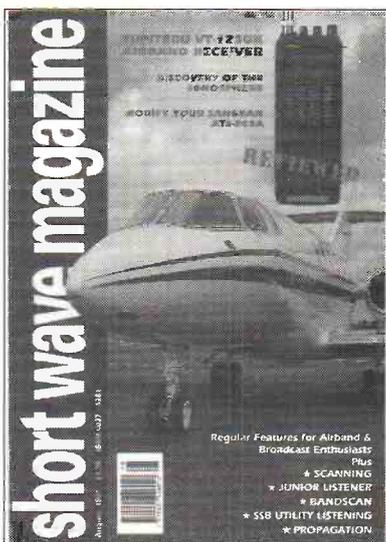
A Sanguine Sangean
Bill Wilson

36

DXing in Ecuador Part 1
Dick Ganderton

REGULARS

Cover: Airband listening is one of the most popular aspects of the radio hobby covered by SWM. Both of the Yupiteru hand-held radios reviewed in this issue cover the v.h.f. airband. Our cover shot was taken by Rob Mackie at Bournemouth International Airport.



51	Airband	63	Long Medium & Short
46	Amateur Bands Round-up	6	News
42	Bandscan - North America	55	PCB Service
68	Book Service	39	Propagation
56	Decode	55	RadioLine
48	DXTV Round-up	7	Rallies
2	Editorial	45	Satellite TV News
41	Errata	54	Scanning
4	Grassroots	2	Services
59	Info in Orbit	47	SSB Utility Listening
70	Index to Advertisers	26	SWM Subscribers' Club
5	Junior Listener	72	Trading Post
2	Letters	67	Watching Brief

...GOOD LISTENING

editorial



SWM SERVICES

Subscriptions

Subscriptions are available at £21 per annum to UK addresses £23 in Europe and £25 overseas. Subscription copies are despatched by Accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both Short Wave Magazine and Practical Wireless are available at £34 (UK) and £39 (overseas).

Components for SWM Projects

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

The printed circuit boards for SWM projects are available from the SWM PCB Service.

Back Numbers and Binders

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

Binders, each taking one volume of the new style SWM, are available price £5.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

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

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

The last few weeks have been really hectic for Peg and myself. First there was the fabulous two weeks spent high in the Andes among the volcanoes of Ecuador with eight SWM readers and HCJB. We managed to pick two weeks when the weather was ideal, making our stay even better. You will be able to read all about the trip in the next few issues of SWM.

At the end of June we loaded the car with several hundred copies of *Short Wave Magazine* and *Practical Wireless* and caught the ferry from Dover to Ostend on our way to the *PW/SWM stand* at the largest amateur radio happening in Europe - Ham Radio 91. This is held at the Exhibition Centre in Friedrichshafen on the shores of Lake Constance and is definitely the event to attend. The Flea Market alone seemed to be larger than the entire RSGB show at the NEC and I could have spent all day just looking round it - although the prices seemed to me to be comparable with UK ones, in some instances higher.

The English contingent of exhibitors grows larger each year and I met several well-known UK traders who were visiting the show with a view to exhibiting next year. The area around Friedrichshafen is very attractive and has a lot of interesting history. For one thing it was the home of the Zeppelin airships and I understand that the museum is well worth a visit. Switzerland is a ferry away on the other side of the lake while Austria manages to get a look in at the southern end, just past the attractive island town of Lindau. We'll keep a look out for you all next year!

letters

Dear Sir

As an old 'learner' s.w. listener, I was having a quick twiddle at 2330 on Friday May 10th around 2.182MHz. I heard the call 'Mayday, Mayday, Mayday' missed the next bit, then I believe something about 'oil pressure', missed the next bit with the message finishing 'Mayday, Mayday, Mayday'. I started to wonder if I had heard the full message, should I pass on the information - and to whom.

I will forever wonder about that message and its outcome.

**C. Jefferson
Saltburn**

Dear Sir

I have just read the letter from Harold Wood in your June issue regarding call signs and QSLing.

I would certainly echo his appeal for a slower and clearer reading of call signs. I have a copy of the RSGB Call Book and it gives a greater sense of satisfaction when I can look up a call sign and put a name and QTH to the voice in my headphones. I also think it is a nice touch when the nets wish goodnight to us s.w.l.s.

Much has been said in the past about QSL cards and I don't really want to get involved in the pros and cons of QSLing. I send off occasionally for the confirmation of stations I have heard and so far have had a 100% success rate.

Like Mr Wood, I include IRCs and also an addressed envelope. I also write a short letter detailing my report, my equipment and giving a few personal details of myself and my QTH. Yes, the thrill of getting a reply through one's own letter box is good and I think it gives a much more personal feel to the reply.

To all s.w.l.s I would say this; remember it costs stations money to confirm signal reports, especially commercial stations who receive many such requests in a year. Let us all have the courtesy to include a couple of IRCs in our requests to pay the return postage. After all, we are the ones who want the reply. I doubt whether it makes much difference to Radio Australia if their Pacific broadcast is heard in London. To misquote an old adage - courtesy cost £1.30 (2 x IRCs)!

Ron Galliers, Islington

Dear Sir

Yes, I had a Fred Eisemann set like Michael Cornell and can confirm it was powerful. The mains dropper was called 'Line Cord' usually 0.3A but I believe this has a different meaning nowadays. As there is an interest in these sets and similar a.c./d.c. or 'Universal' sets as they were called. A word of warning is needed, the chassis is liable to become lethally 'live'.

I started on s.w. on an Aerodyne 285. My first QSL was from Guatemala in 1939.

**Denis Boshier
Dolgellau**

letters

Dear Sir

After reading the letter from Harold Wood in the June SWM, I agree with him as regards to the only way we s.w.l.s can make contact with overseas operators. I find the most likely way to get a reply is to put in a good QSL card, a letter about myself, some information about the area I live and a photo of myself and equipment that I use plus an IRC (not two).

This seems to work very well, I have to date 92 cards. I also have received many letters relating to the writers life-style and home area.

I feel the expense is out-weighed by the thrill of that letter from unknown parts of the world.

The only problem I have come across is the letter being opened and the IRC taken out. The response of Soviet amateurs to our contacts is wonderful, now I have many pen friends all over Russia, which gives another interest to our hobby.

The answer to good DX QSLing is don't expect someone who has never seen or heard of you to pay for the reply and you will win every time.

I also send Short Wave Magazine and Practical Wireless to my friends in the USSR for them to read as they do not have anything like them out there. So keep up the good reading.

By the way, I use a Grundig Satellit 650 with a Telescan antenna.

'Greg' Kenny, Harpenden

Dear Sir

Regarding A. Moulder's letter in the May SWM about the dissipation problem in a.c./d.c. radio sets by line-cord or series dropper there is another, cooler option. Using his example to drop 107V @ 100mA, the impedance at 50Hz of a 3µF capacitor in series would be about 1100Ω and the heaters would not worry about the phase shift.

I am sure that among your readers there must be ex-WWII operators or mechanics from the three Services who have serviced the same RXs or TXs - as your article on the National HRO set reminded me. Do any ex-RAF people

remember the R.1084 ground station h.f. RX, a textbook superhet with separate valves for every function, without ganged tuning so that each set had an r.f. stage and oscillator calibration charts to be consulted, with switchable bandwidths for the i.f.s to assist tuning. Incidentally, the 120V Milnes unit of NIFE cells was used as a rechargeable h.f. battery. I always wondered how the operators managed, especially as we knew that the matching TX 1085 or 1190 were prone to drift in frequency - sometimes deliberately to avoid the QRM.

B.J. Priest, Clevedon

Dear Sir

In reply to the letter from Harold Wood in the May SWM. I also send out QSLs to licensed operators but only within the UK. However, I only send reports on c.w. transmissions and to date I have received 1131 QSL cards of all descriptions including some from special event stations. I am an ex-army sigs operator and can read c.w. but I have never bothered with the RAE staying on the listening side. While I have had a lot of friendly letters as well from those whom I have QSLed I have also had a few very sarcastic replies from those who see the s.w.l.s as being the lowest form of life in the radio hobby.

I admit that these days I do use a c.w./RTTY decoder and a monitor screen as I happen to be totally War-Disabled (Dunkirk 1940) and now at 78 years of age I think I can be excused using these aids to c.w. reception.

I have taken SWM on permanent order from my newsagent for a lot of years and I do agree that the fairly new format which we have now is really good and my special section is of course 'Decode' by Mike Richards. I use the Icom R-9000 and NRD-525 receivers with a Wavecom W-4010 c.w./RTTY decoder plus the CWR-675 teleprinter and 12in monitor. My antennas are a discone and two Datong Active Antennas on a 25ft mast. If Harold Wood or any other reader is interested in corresponding, I always reply to letters.

Harry Scrase, Sandwich

Dear Sir

With reference to your article in the May SWM called 'Make your reports useful'. I find that after having read and re-read it with care to details, I was dismayed by its acidity. Far from helping any short wave listener or encouraging him/her, I found it a turn-off. How Peter of Skegness feels I can only imagine. The writer of this featured article, G.P. Stancey G3MCK, supposes that Peter (whose crime was to send him a QSL card via the bureau) does not receive enough QSL cards and suggest that this is perhaps his own fault.

An unfounded remark, but the forerunner of the Law according to G3MCK. Those of you who have the magazine check it out.

Rules:

- 1: Ignore the Bureau
- 2: Send me a report
- 3: Send me a favourable report
- 4: Send me a stamped addressed envelope
- 5: Send the report from an unusual place - not Skegness
- 6: Give me reports that please me
- 7: I send QSL cards (they're cheaper for me)
- 8: You reports will be more expensive, but I might answer you if I find them of value to me.

These are the rules as Mr Stancey sees them, not as I see them. As an old CBER, I have sent and received QSL cards from many parts of the world. Mine were sent as a friendship gesture and with the hope that a friend was gained in return. Not all of them were responded to, but that too is part of CBing. The exchanging of foreign names and addresses plus postal codes can be difficult, especially when the propagation dies on you. The point is, it's a hobby, and my advice to G3MCK would be to curb his disapproval, thank Peter for his card and accept it, as I'm sure it was meant, as a greeting of friendship.

**R. Thomson
Dumfries**

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

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

grassroots

RAE Courses

Doncaster: Doncaster College will again be running the City & Guilds course leading to the RAE from September. The classes will be on a Tuesday evening from 1800-2000. Anyone interested should contact Mike Parkin G6OSD at the School of Electrical & Electronic Engineering, Tel: (0302) 322122 ext 287 or 282. There will also be a basic practical electronics course on a Wednesday evening 1800-2000, the tutor being Trevor Jones, who can be contacted on the same extension.

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

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

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

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. August 20 - QSL Cards by G0JRY followed by a critique of the Club's performance on Low Power Field Day. Paul Truitt G4WQO. 071-938 2561.

Bedford & District ARC: Tuesdays, 7.30pm. Allen's Club, Hurst Grove, Bedford. August - Social evenings. Glenn G0GBI. (0234) 266443.

Bromley & DARS: 3rd Tuesdays, 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. August 20 - Operating evening & Barbecue. Geoffrey Milne. 081-462 2689.

Bromsgrove ARS: 2nd & 4th Tuesdays, 8pm. Aston Fields Working Men's Club, Stoke Road, Astonfields, Bromsgrove. J. Yarnall G1JLQ. (0527) 503024.

Chelmsford ARS: 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford. August 6 - General Discussion Evening. Roy Martyr. Chelmsford 353221 ext 3815.

Coulsdon ATS: 2nd Mondays, 7.45pm. St Swithun's Church Hall, Grovelands Road, Purley. Aug 12 - RSGB Video Evening with cheese and wine. Andy Briers G0KZT. 081-668 7004.

Coventry ARS: Fridays, 8pm. Baden Powell House, 121 St Nicholas St, Radford, Coventry. July 26 - Outdoor 144MHz d.f. Contest, Aug 2 & 16 - Night on the Air and Morse Tuition, 9th - Social Night. Coventry 523629.

Derby & DARS: Wednesdays, 7.30pm. 119 Green Lane, Derby. July 31 - Satellites & High Definition TV by G3ZDM, Aug 7 - Rally Preparation Evening, 14th - Practical Home-brew Antennas by G4XBY, 21st - Visit to Little Eaton Waterworks, 7pm. Richard Buckby Ambergate 852475.

Edgware & DRS: Watling Community Centre, 145 Orange Hill Road, Burnt Oak. July 25 - Kites by G4UNL, Aug 22 - s.s.b. field day briefing. Hank Kay G0FAB. Tel: (081-205 1023).

Grafton RS: Fridays, 8pm. Holy Trinity Church Hall, Stapleton Hall Road, London N4. Rodney Harrigan. 081-368 8154.

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

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School,

Barton Cross, Horndean. Aug 1 - Antennas...the beginnings. S.W. Swain. (0705) 472846).

Keighley ARS: Thursdays, 8pm. The Cricket Club, Ingrow, Nr Keighley. July 25 - Construction Project with G3TDZ, Aug 1, 15 & 22 - Natter Night, 8th - Quiz. Kathy Bradford. (0274) 496222.

Loughton & DARS: 2nd & 4th Saturdays, 7.45pm. Loughton Hall, Rectory Lane, Loughton, Essex. July 26 - Visit by RLO, Aug 9 & 23 - No Meeting. Mike Pilsbury G4KCK. 081-504 4581.

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. Aug 1 - Junk Sale. Mary G0NZA. (0623) 755288.

Midland ARS: 3rd Tuesdays, 7.30pm. Headquarters Unit 22, 60 Regent Place, Birmingham B1 3NJ. August 20 - Junk Sale. John Crane G0LAI. 021-742 8712 (evenings).

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St John Ambulance HQ, 61 Emscote Road, Warwick. Aug 13 - Spectrum Computer SSTV 7 SCREENS. Mike Newell Kenilworth 513073.

Morecambe Bay ARS: Alternate Tuesdays, 7.30pm. Trimpell Sports & Social Club. J.D. Barrow (0524) 733212.

North Bristol ARC: 3rd Fridays. S.H.E. 7, Braemar Crescent, Northville, Bristol. J. Chris G0LOJ. (0454) 616267.

North Ferriby United ARS: Sundays, 8pm. North Ferriby United Football Club Social Room, Church Road, North Ferriby. July 26 - Night On The Air, Aug 2 - Latest QSLs of Interest, 9th & 23rd - Night on the Air, 16th - Field Night. F.W. Lee G3YCC. (0482) 650410.

Oxford & DARS: 2nd & 4th Thursdays, 7.30pm. The British Legion Club, Marston, Oxford. G8PX Oxford 58785.

Plymouth RC: 1st & 3rd Thursdays. The Royal Naval Community Centre, Raglan Road, Devonport. S. Pimlott G8IDE. Tel: (0752) 363607.

Preston ARS: Alternate Thursdays. The Lonsdale Sports & Social Club, Fulwood Hall Lane, Fulwood. Eric Eastwood G1WCQ. (0772) 686708.

Rhyl & District ARC: Aug 5 - Annual Fox Hunt, 19th - Home-brew Competition. Edward Shipton GW0DSJ. (0745) 336939.

Rugby ATS: Tuesdays, 7.30pm. Cricket Pavilion, outside Rugby Maritime Radio Station. July 28 - 3rd Annual RATS

Club Secretaries:

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

Car Boot Sale, Aug 6 - Visit to comms site, 13th - 144MHz d.f. competition, 4th round. Peter Wells G0JEW. (0455) 552449.

Salisbury R&ES: Tuesdays. Grosvenor House, Churchfield Road, Salisbury. Bert Newman G2FIX, QTHR.

Saltash & DARC: 1st & 3rd Fridays, 7.30pm. TOCH Hall, Burraton, Saltash. Aug 2 - Antennas, 16th 0 h, f, on the air night. A.T. Blackmore, 3 Parkesway, St Stephens-by-Saltash, Cornwall.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. July 31 - Fox Hunt Preparation by G4TSS, Aug 7 - 10m Activity Evening, 14th - DX Broadcast TV Activity by Ron Gardner, 21st - Fox Hunt by G4TSS. Len Baker. Whitchurch 832222.

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

Thornbury & DARC: 1st & 3rd Wednesdays, 7.30pm. United Reform Church, Chapel Street, Thornbury. August - No formal meetings.

Three Counties RC: Alternate Wednesdays, 7.30pm. The Railway Hotel, Liphook, Hants. July 31 - Computer Night, Aug 14 - RSGB video, 28th - Junk Sale. Dave G4VKC.

Trowbridge & DARC: 8pm. TA Club, Trowbridge. Aug 7 - RSGB Video Night *Amateur Radio for Beginners*, 21st - Social and QSL card evening Ian Carter G0GRI. (0380) 830383 evenings.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. July 26 - Camp Briefing. Chris Frost. 081-397 0427.

York ARS: Fridays, 7.30pm. York City Social Club, Bootham Crescent, York. K.R. Cass G3WVO, 4 Heworth Village, York.

junior listener

Electronics Youth Club

George Brooks from Ramsgate recently sent me an interesting advert for an event run by the Thanet Electronics Club for Youth. It was not so much the event that caught my eye as the name of the club. This is the first club that I've come across that's been set up for youngsters interested in electronics. Intrigued by this, I phoned the number in the advert for more information.

The first thing I discovered was that the club is, in fact, run by youngsters and not by adults. The adults are only there to help with technical and other advice. Because of this refreshing policy, the club is thriving. You're probably thinking, ok but what do they do? The answer is they carry out experiments and build projects, exploring all aspects of electronics.

In an attempt to build-up club funds, they've developed a range of simple kits for newcomers to electronics. The kits are called Basikits and comprise a printed circuit board and the associated components. The range includes a short wave radio, multivibrator, v.h.f. radio and many others.

In addition to building projects, they have their own amateur radio station. This is used not only for general use, but specifically to train youngsters for the new Novice Licence.

Another interesting point about the club is that you can't just go along and join, you have to earn your membership. This is done by going along as a visitor for the first few meetings and demonstrating that you have learnt about a chosen topic. If you live in the Thanet area the club meets every Monday evening between 7.30 and 9.00pm. The venue is The Quarter Deck, Zion Place, Margate. If you would like more details on the club or the Basikits write to: Ross Collins, 37 Royal Road, Ramsgate CT11 9LF. Please make sure you include a stamped addressed envelope for your reply.

Do you know of any other clubs like this one? If so, please write to me with the details, so I can print it in the column. If you're a member of a youth club why not see if there's enough interest to start your own electronics club. I'm sure that the people at the Thanet club would be only to pleased to help with details of how they operate.

Novice Morse Test

Many of you'll be aware that the new Novice Amateur radio licence was introduced in April this year. The idea behind this licence is to encourage youngsters to join the ranks of amateur radio enthusiasts. As with the full licences, there are two types of Novice licence - Classes A and B. The difference between two is simply that Class A operators can use the bands below 30MHz. The additional qualification required for the Class A licence is passing the Morse test. Instead the normal amateur test at twelve words per minute, the novice test is at 5 words per minute.

The sending and receiving parts of the test are carried out separately with up to three candidates in the receive test. However, the sending test is taken on your own. To make sure that the receive test is fair, the Morse used is computer generated text that is played via a pre-recorded tape. Another helpful point is that each character is sent at twelve words per minute but with a long gap between letters to give five words per minute overall. The reason for doing this is actually to make

the Morse easier to read. You'll find that if you send a character at a true five words per minute, you lose the rhythm that helps to identify the character.

Another helpful feature is that the text sent will be in the form of a typical exchange between radio amateurs. The danger with this is that you may be tempted to guess what's coming next - that's fatal!

When it comes to making mistakes, you're allowed up to six during the receive test. On the transmit section a maximum of four mistakes are allowed but they must all be corrected.

From what I can see the test appears to be very fair and quite easily attainable.

For those of you who have already started preparation for the Novice licence, the first Morse tests took place on July 1. Also the first Class A and B licences will be specially presented by Mr John Redwood MP, Parliamentary Under Secretary of State of the Department of Trade and Industry.

The presentation will take place on July 25.

Ninja Turtles

What's this got to do with radio I hear you ask? Well I recently received a press release from Wood and Douglas describing their role with these famous characters. For those of you who may not be familiar with Wood and Douglas, they produce a wide range of radio products for industry.

The products used by Jim Henson's Creature Shop were the talkback and telemetry units. Talkback is basically a radio intercom system that was used by the puppeteers to co-ordinate their movements. Telemetry on the other hand is used for remote control rather like the systems used to control model aircraft. These telemetry links helped in achieving the required mobility of the creatures mouths.

The next amazing project from the Jim Henson Creature Shop is well under way and this'll also involve the use of these secret Wood and Douglas ingredients!



Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

Pen Pal

My first candidate for the Pen Pal section is Ivan Cholakov from Bulgaria. Ivan is an economics student in the capital Sofia and picked-up a copy of *Short Wave Magazine* by chance. He, like many other would like to subscribe to the magazine. The only trouble is the average monthly salary in Bulgaria is £30.00, so you can see that a subscription would take about two thirds of this.

Ivan has been a keen short wave listener since he bought a simple receiver for the equivalent of £3.00 five years ago. His prime interest is short and medium wave DX where he has verified seventy countries to date. I'm sure his listening is helped by his multi-lingual talents - he speaks English, Bulgarian, Russian and can get by with most East European languages.

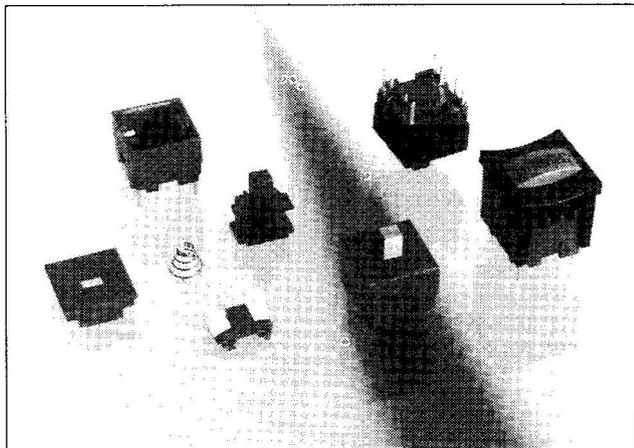
If you would like to write to Ivan just send me a letter giving your name address, age and interests. I'll then gather them together and forward them to Ivan. It will then be up to Ivan to decide just how many Pen Pals he can take on.

Scanners - Contest Result

Back in the May Junior Listener, I ran a competition offering two autographed copies of *Scanners*. This popular book by Peter Rouse has become standard reading for all scanner enthusiasts. I must admit I was very pleased with the response to the competition and the majority of entries were correct. Because of this, selection of the winners had to be done by drawing two names out of a hat! The two winners are: Edward J. Kay (7) from Belper in Derbyshire and Jonathan Stewart (12) from Newquay in Cornwall. Thanks to all who took the trouble to enter. I have managed to beg, borrow and steal some other prizes for the runners-up. All the prizes will be on their way to you soon.

Now for the next competition. This time the prize is a Maplin Starter Tool kit. This contains all you need to start home construction, even a soldering iron. To win the prize, just write and tell me what project you would build first, and why - the best answer or two will win (I'll talk to the Editor and see how many tool kits I can lay my hands on for you!).

news



Multi-function Switch

The Unimec switch makes it possible to have one switch with eight functions. This is achieved by having two separate contacts that can be used simultaneously. Unimec has a contact resistance of typically 100mΩ, a 1.5 million cycle lifetime and a 2N key pressure. With dimensions of 12.5 x 12.5 x 10mm the product offers all kinds of opportunities where mechanical switches are used. The switch is constructed with a polycarbonate housing, tin/bronze terminals and a moving contact spring of beryllium copper. All contact surfaces are protected by a silver or gold coating according to requirement. **MEC A/S, PO Box 26, DK-2750 Ballerup, Denmark.**

The Radio Authority has published its *Pocket Guide to Independent Radio*. The guide, which is literally pocket-size, lists all the names, addresses and frequencies of all the 111 Independent Radio services that operate in the UK. There is also a reference map to help you tune into Independent Radio when you are moving around the country.

As well as giving information on how to get the best reception from your radio, the guide tells you about the role of the Radio Authority, planned services and who to contact when you have an enquiry, comment or complaint to make about Independent Radio.

Not only is the guide pocket-size, it also has punched holes in one cover all allow it to be fitted into a personal pocket file type system for ease of use.

Individual copies of the guide are available free-of-charge from: **Radio Authority Press Office, The Radio Authority, 70 Brompton Road, London SW3 1EY. Tel: 071-581 2888.**

Toroidal Transformers

Toroid Technology Ltd have extended their UK designed and manufactured range of standard toroidal transformers to include another four new power ratings, which are 60, 100, 400 and 630VA. The range now consists of 15 power ratings from 15 to 1000VA, with a broad spectrum of secondary voltages at each power rating. Maximum operating ambient temperature in 55°C.

These products are designed for applications requiring low magnetic field

and temperature rise.

Optional types available include electrostatic copper shielding, resin centred mounting and magnetic shielding. Physical size varies between 60 x 31mm and 168 x 84mm. The high efficiency, low weight and small size means that this range has many uses in the electronic, electrical, telecommunication, computer and engineering fields.

Toroid Technology Ltd., 175a Brigstock Road, Thornton Heath, Surrey CR7 7JP. Tel: 081-689 8002.

Television News

Gibraltar. New proposals for GBC are suggesting that only a 5 weekday local news service be operated on the 'Rock', with remaining programme material coming from the BBC TV World Service feed ex Intelsat 27°W. All programming out of the revamped GBC will be scrambled and viewers will need to obtain a decoder, this should bring in revenue from the many Brits now living along the Costa del Sol that view GBC for free. Other commercial involvement may well be invited and RTL has been mentioned.

UK. The ITC has detailed future plans for the 5th Channel which will use up to 32 transmission sites, though 25 of these will be shared with existing BBC/ITC transmitter locations. It's likely the service will be completed by 1994. Once the Channel 3 franchise allocations have been sorted, advertising for Channel 5 will commence.

East Europe. With relaxations in Polish broadcasting, the authorities have invited applications for new (independent) TV and radio stations, with a projected 7 new TV channels and 22 new radio channels. The new radio stations will operate in the 88-108MHz band rather than the established OIRT 67-73MHz band. The OIRT itself will amalgamate with the EBU by 1993 to form 1 main administrative broadcasting body for Europe. The Czech authorities are also relaxing their broadcasting rules and will allow several new private radio stations 'on approval' within the next 6-9 months.

Germany. The federal states of Brandenburg, Berlin and Mecklenburg are combining into a single broadcasting operation called Nordostdeutscher Rundfunk (NOR). The SFB will therefore combine into NOR which will be based in Berlin, though maintaining studios in each of the other areas. The Israeli government has invited tenders for the establishment of a 2nd national TV network (commercial) to comprise of movies, news, sports and general entertainment. The 7 year franchise with a possible extension to 10 years. Though foreign investment will be allowed, 51% of the share issue must remain in Israeli hands. The PAY-TV service will start with 6 hours daily, extending to 10 within the year. Italy will also soon have its first scrambled TV channel on a PAY basis called Telepui - terrestrially transmitted. Eventually Telepui will have 3 programme channels - Tele 1+ consisting of movies and general entertainment; Tele 2+ being an all sports channel and Tele 3+ based on an educational theme. Initially, the latter will radiate a movie repeated several times each day. Tele 1 is now on the air (June 1), Tele 2 also on-air will scramble June 1992 and Tele 3 will operate its intended format from late 1992.

Roger Bunney

WACRAL Conference

The annual conference of the World Association of Christian Radio Amateurs and Listeners will take place on September 13, 14 and 15 at the Elim Bible College Conference Centre, Nantwich.

This weekend of fellowship combines worship with social events and amateur radio. The WACRAL club station G3NJB will be active, particularly on Sunday morning from 0800, this being the usual WACRAL Sunday morning net held on 3.764MHz.

The inclusive cost of the weekend to members and guests in £44 each. To reserve places, contact: **Geoff Peterson G4EZU, 124 Darnley Road, Gravesend, Kent DA11 0SN. Tel: (0474) 533686.**

Send all your news to Elaine Richards at our editorial office in Poole.

Stolen

Some equipment has been stolen from Aerial Techniques in Poole, Dorset. If any reader is approached with this specialised equipment than they should contact the local police or David Martin at Aerial Techniques.

Missing are: several 7in mono v.h.f./u.h.f. TVs, boxed type YTL575 for system B/G/L/ (i.e. will not produce sound in UK TV stations, only buzz as the units were awaiting modification). Several 10in Nordmende Galaxy PAL/SECAM TVs, multi-standard model G25 covering B/G/L/. One Wolsey field strength meter v.h.f./u.h.f. type TES model MC661-C. One Elmac oscilloscope type 4810 (yellow metal case).

As a result of a break-in on June 10 at Icom's showroom, the following equipment was stolen.

IC-781	731001018
IC-765	773001163
IC-575	598000991
IC-475	585001122
IC-R71	22003635
IC-A20	601002834
IC-A2	42202429
IC-M12	

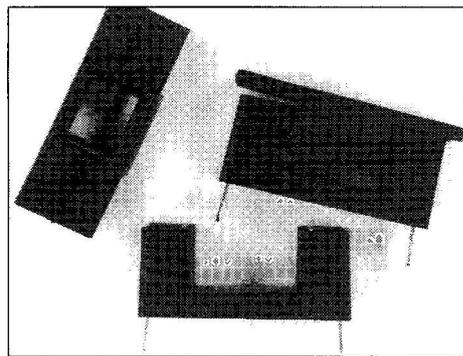
Please contact Icom with any information that may lead to the equipment being recovered.

news

Fuse Holders

Tremiver Ltd is now introducing a p.c.b. mounted budget fuse holder capable of taking standard 20 x 5mm fuses. Manufactured within the EEC, the design is simple and functional. Available as a standard holder or with an optional insulation clip with viewing port that allows visual checking of the fuse. The product is economical, with volume prices from as little as 4p each.

**Tremiver Ltd., Unit 1,
Summerlea Court, Alton Road,
Herriard, Basingstoke, Hants
RG25 2PN. Tel: (0256)
381514.**



rallies

* Short Wave Magazine & Practical Wireless in attendance

July 28: Rugby ATS have their annual Car Boot Sale, venue to be advised nearer the time. The event opens at 10am and talk-in will be provided by GB8CBS on S22. **Kevin G8TWH** on (0203) 441590.

***July 28:** The Scarborough ARS will be holding their annual rally at The Spa, South Foreshore, Scarborough. Doors open at 11am until 4pm. Many trade stands, large Bring & Buy, Tombola, licensed bar and refreshments. Morse tests followed by a demonstration by the North Yorkshire Morse test team. Entrance 50p including a prize draw. **Ian Hunter G4UQP (QTHR)**. Tel: (0723) 376847.

***August 11:** Hamfest 91 will be held at the Flight Refuelling Sports & Social Club Grounds, Merley, Wimborne, Dorset. The event opens at 10am and will feature a Bring & Buy, trade stands, radio and electronics car boot sale, craft fair, field displays and attractions for the whole family. Special disabled parking is available in the grounds and overnight camping can be arranged. **John G0API**. Tel: (0202) 619649. **Rob G6DUN**. Tel: (0202) 479038.

August 11: Derby & District ARS will be holding their 33rd annual rally at Littleover Community School, Rykneld Road, Littleover, Derby. All the usual attractions including the monster junk sale, flea market and refreshments, etc. **Martin Shardlow G3SZJ**. Tel: (0332) 556875.

August 18: The West Manchester Radio Clubs 'Red Rose Rally' will be held at the Bolton Sports & Exhibition Centre, Silverwell Street, Bolton (town centre). All the usual trade stands, societies, Bring & Buy, etc. All at pavement level, with facilities for the disabled. Refreshments available all day and bar. Doors open at 10.30am for disabled and 11am for the general public. Admission £1, children free. **Dave G1100** on (0204) 24104 evenings only.

August 25: The Galashiels Club are to hold their open day at Focus Centre, Livingstone Place, Galashiels. All the usual activities will be there - Bring & Buy, traders, club stands, etc. **John Campbell G0A0MB**. Tel: (0835) 22686.

August 26: The Huntingdon Junk Sale will be held at the Medway Centre, Coneygear Road, Huntingdon. Doors open between 1000 and 1600, refreshments will be available all day. **G1YVS**. Tel: (0733) 241109 evenings.

***September 1:** The Telford Amateur Radio Rally will be held at the Telford Exhibition Centre, Telford. Doors open 11am (10.30 for the disabled).

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

***September 8:** The Lincoln Hamfest will be held at the Exhibition Centre, Lincolnshire Showground. Doors open 10.30am (10am for the disabled) until 5.30pm.

September 8: The Vange ARS will be holding their annual rally at the Laindon Community Centre, Laindon High Road, Laindon. Doors open between 10.30am and 4.30pm. Admission 50p. The rally will include many traders, Bring & Buy, Refreshments and a free raffle. Talk-in on S22. **Mike Musgrave (0268) 543025**.

***September 8:** The Scottish Amateur Radio Convention will be held at The Northern College of Education, Gardyne Road, Dundee. Parking for 1000 cars is available.

September 14: The Wight Wireless Rally will be held at the Wireless Museum, Arretton Manor, Isle of Wight from 1 to 5pm. All will be welcome and there is plenty of free car parking. There is no charge for admission to the museum or the extensive grounds. A collection will be taken for the RAIBC. There will be a Bring & Buy surplus sale in the new covered area next to the cafeteria.

***September 15:** The BARTG Rally will be held at Sandown Park in the Surrey Hall. **Peter Nicol G8VXY**. Tel: 021-453 2676.

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

September 15: The Peterborough Radio & Electronics Society present the East of England radio rally at the ICI Building, The East of England Showground, Oundle Road, Peterborough. Admission is £1, doors open 10.30am, 10am for the disabled. Traders marquee with Bring & Buy, separate outside area with flea market plus radio and electronic car boot sale. **Mike G0CVZ, 2 Chancery Lane, Eye, Peterborough PE6 7YF**. Tel: (0733) 22588.

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

***September 22:** The Centre of England Amateur Radio Rally will be held at the Motorcycle Museum, Bickenhill, near the NEC Birmingham. Doors open 10.30am. Admission £1, OAPs 50p and children free, Concessionary rates to visit the museum, Bring & Buy, Talk-in on S22, ample free car parking, bar and restaurant available. **Frank (0952) 598173**.

***September 28/29:** The RSGB HF Convention will be held at the usual venue, more details later.

September 29: The Harlow & District ARS will be holding their rally at the Harlow Sports Centre. The main hall provides a large and varied selection of traders, both old and new to the event, the studio upstairs will also have some traders along with the Bring & Buy. Entrance. Entrance £1, children under 14 and OAPs half price. **Liz G0MDL**. Tel: (0277) 364742 evenings & weekends only.

September 29: The North Wakefield Radio Club Annual Rally will be held at Outwood Grange School, Wakefield. **Richard Reisch G4GCX**. Tel: (0532) 622139.

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

October 6: The Horncastle Amateur Radio, Electronics & Computer Fair will be held at the Horncastle Youth Centre, adjacent to the A128 Lincoln to Skegness main road. There is room for parking and all rooms are on one level making it suitable for those with mobility difficulties. Doors open from 1030 to 1700, 1000 for the disabled.

October 6: The Blackwood Amateur Radio Rally will be held at the Oakdale Community College, Blackwood, Gwent. **Brian Matthews**. Tel: (0495) 243858.

October 13: The Armagh Radio Rally will be held in Gosford House Hotel, Markethill. **T. Hall**. Tel: (0861) 523454.

***October 25/26:** The Leicester Amateur Radio Show will be in the Granby Halls, Leicester.

***November 2/3:** The 5th North Wales Radio & Electronics Show will be held at the Aberconwy Conference Centre, Llandudno. The rally open at 10am with the entrance fee at £1, OAPs 50p and children under 14 free of charge. **Siggy Ferguson GW0DYH**. Tel: (0492) 532459 (day). **Tony Wilkinson GW4PVU**. Tel: (0492) 49121 (evenings).

November 10: The Barnsley & District ARC will be holding their first radio rally at Willowgarth High School, Brierley Road, Grimethorpe, Barnsley. **Ernie G4LUE (0226) 716339**.

November 24: The West Manchester Radio Clubs 'Winter Rally'. All details as August Rally. Admission £1. **Dave G1100** on (0204) 24104 evenings only.

November 28: The Greater London Amateur Radio & Computer Show will be held at Harrow Leisure Centre, Christchurch Avenue, Harrow, Middlesex. Doors open from 10.30am to 4.30pm.

LOWE ELECTRONICS LTD

OPEN DAY INVITATION - Saturday Sept 7th

Once again, the annual Lowe Electronics Open Day will soon be upon us; on Saturday September 7th to be exact. As those that have come to them in the past know, it is a bumper occasion when our friends and customers from near and far converge on Matlock to see what makes the company tick, to have a good day out and give us the opportunity to meet you in person.

You will find all the latest gear from the stables of Kenwood and others, much of which will be wired up for you to try out; which is what you would expect from the sole appointed UK distributor. But there is much more. We will have Short Wave Magazine here to talk with you; there will be the hugely popular free car boot sale where you have the opportunity to sell off all that stuff lying in the corner of the shack; you can collar the workshop staff on technical queries; there will be steam engines and ... much more!

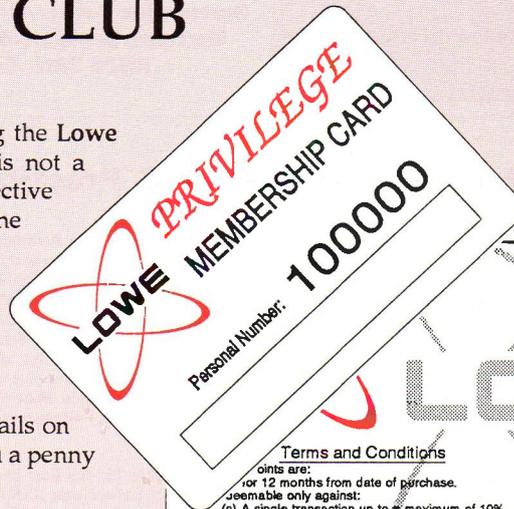
We always look forward to this day and very much hope you will be able to make it. We usually have special offers on the day and, God willing, the weather will be better than it is today as we write this. It had better be!

PRIVILEGE CLUB

On 1st August, we are launching the **Lowe Electronics Privilege Club**. It is not a credit scheme but a simple and effective way for us to be able to reward the loyalty of our customers.

The question is: "Can you afford NOT to be a member of the Lowe Privilege Club?!"

Phone, Fax or write to us for details on joining the club. It won't cost you a penny and it will save you many.



Terms and Conditions
Points are:
1. Valid for 12 months from date of purchase.
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(a) A single transaction up to a maximum of 10%.
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Full written Terms & Conditions on request.

Thursday 1st August

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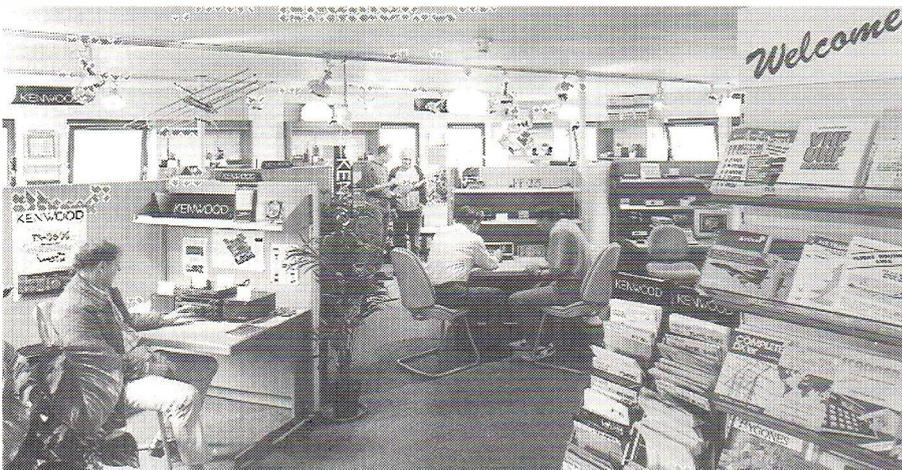
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Privilege Points

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of Manager

REVOLUTION IN MATLOCK SHOWROOM!



Well... almost. We have completely rebuilt the showroom at Matlock which now offers the most comprehensive and comfortable surroundings for looking at and trying out the equipment. With nicely private operating positions, with aerials galore to use, this is undoubtedly the finest place in the UK to come and try out the last word in amateur radio. Open six days a week, every week. Do call in soon and see it for yourself.

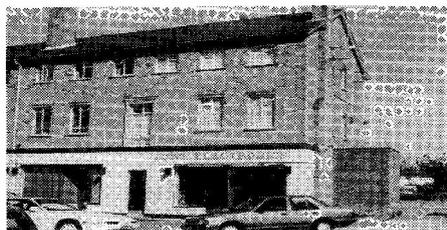
HEAD OFFICE & MAIL ORDER: Chesterfield Road, Matlock, Derbyshire DE4 5LE

Buy locally - Trust technically Look to Lowe

Lowe Electronics has nine centres across the country. Each one is managed by an enthusiastic licenced radio amateur and supported by a fully equipped workshop and team of knowledgeable RF engineers at Matlock. When buying sophisticated electronic equipment, there is no greater reassurance than being able to deal locally with a company you can trust technically.

This month we are highlighting our centres at Bournemouth & Cumbernauld.

BOURNEMOUTH



Our Bournemouth Centre has been open for 7 years and for that time has been managed by Colin G3XAS who is a keen HF mobile operator. It carries a very broad range of products for licenced radio amateurs, short wave listeners and airband enthusiasts.

It has an immaculate showroom where the service is the same whether you come for a PL-259 or a TS-950SD. A range of rigs for HF/VHF/UHF is ready and waiting for you to come and try out and specific equipment can be made ready for demonstration with minimal notice.

The location is particularly well-sited for VHF/UHF demonstrations and there is plenty of road parking without the dreaded yellow lines! The coffee is brewed on the premises, it's good and it's free.

If you have not visited the Centre before, give Colin a call and he will be pleased to give you directions and a warm welcome when you arrive.

Lowe Electronics Ltd,
27 Gillam Rd, Northbourne, Bournemouth BH10 6BW
Tel: 0202 577760 Fax: 0202 593882
Managed by Colin G3XAS
(Closed on Mondays at present)

CUMBERNAULD



The new Lowe Centre at Cumbernauld has only been open for a few weeks. We looked for a new location that was easy to find and where our customers could park without any problems.

We have found a marvellous site in the main foyer of Cumbernauld Airport, which is signposted directly from the A80. Quite apart from the superb noise-free site and excellent 'take off' in all senses, there is a fully licenced bar and restaurant just up the stairs from our showroom where you can have a cup of coffee while you read the brochures and the family watch the aeroplanes just outside the windows.

We have the full range of amateur radio equipment, receivers, scanners, books and airband radios plus a complete range of accessories for pilots and aircraft enthusiasts. To make it complete, we are also open 7 days a week. Sim Weir, our centre manager, will be only too pleased to welcome all his visitors both old and new and show them round.

Lowe Electronics Ltd,
Cumbernauld Airport Foyer, Cumbernauld.
Tel: 0236 721004 Fax: 0236 738322
Managed by Sim GM3SAN

BARRY (S WALES)

Lowe Electronics Ltd
251 Holton Road, Barry
S Glamorgan CF6 6HT
Tel: 0446 721304
Fax: 0446 735662
Managed by Ceri GW0JCB

CAMBRIDGE

Lowe Electronics Ltd
162 High Street, Chesterton
Cambridge CB4 1NL
Tel: 0223 311230
Fax: 0223 315099
Managed by Tony G4NBS

LONDON (HEATHROW)

Lowe Electronics Ltd
6 Cherwell Close, Langley
Slough, Berks SL3 8XB
Tel: 0753 545255
Fax: 0753 545277
Managed by Tom G6PZZ

BRISTOL

Lowe Electronics Ltd
Unit 6, Ferry Steps Ind Estate
Bristol BS2 0XW
Tel: 0272 771770
Fax: 0272 772500
Managed by Tony G4CYE

DARLINGTON

Lowe Electronics Ltd
56 North Road
Darlington DL1 2EQ
Tel: 0325 486121
Fax: 0325 381485
Managed by Hank G3ASM
(Closed on Mondays at present)

LONDON (MIDDLESEX)

Lowe Electronics Ltd
223/225 Field End Road
Eastcote, Middlesex HA5 1QZ
Tel: 081-429 3256
Fax: 081 868 2676
Managed by Fred G4RJS

Telephone: 0629 580800 (4 lines) Fax: 0629 580020

shortwave magazine

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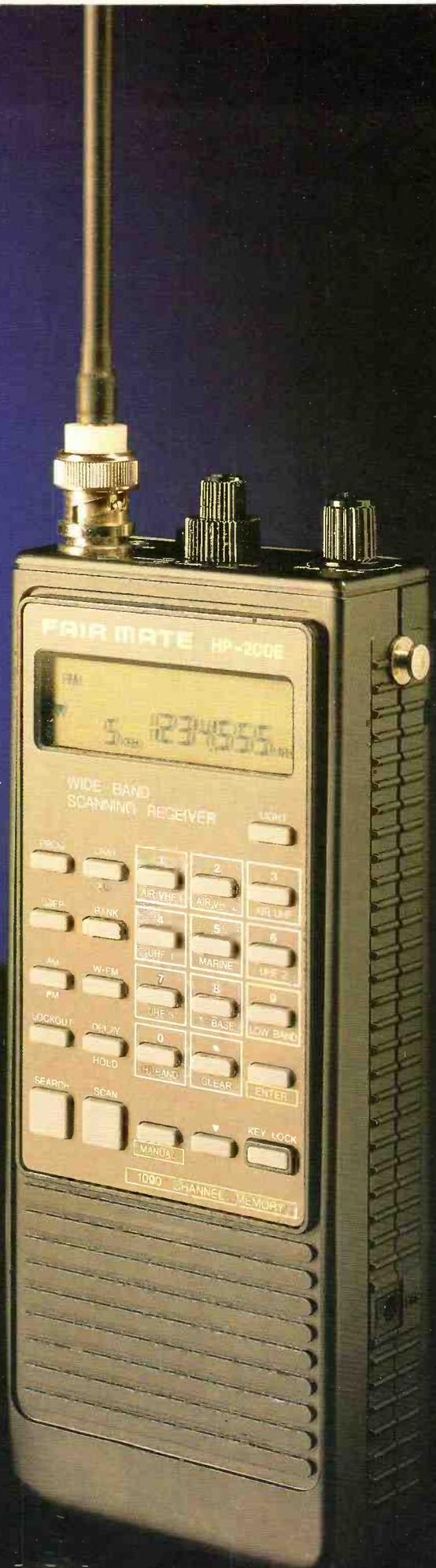
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Frequency Selection

The MVT-7000 features several tuning options designed to give maximum versatility. Perhaps the simplest is direct frequency entry via the key pad. This is just a case of typing the frequency followed by ENTER. Once a frequency has been selected, you can step up and down with the UP and DOWN arrow buttons. If these are held depressed for more than about a second, the frequency changes at twenty steps per second. An alternative is to use the rotary tuning control on the top panel. This is a twenty position control, with each step increasing or lowering the frequency, depending on the direction of rotation.

The frequency steps used can be set to 5, 10, 12.5, 25, 50 or 100kHz, so should cover most requirements. Once the steps have been set, they are used for all operations including the search modes.

Memories

The main advantage that scanners have over simple receivers is the provision of operator programmable memories. The MVT-7000 is equipped with two hundred main memories. These are arranged in ten banks of twenty, for the convenience of the operator. The advantage with this configuration is that you can group frequencies together for easier retrieval. An example of this would be to put all your air band frequencies in one group and marine in another. By doing this it becomes very easy to swap between different areas of interest.

In addition to the simple storing and retrieval of memories, you could transfer a frequency from memory to manual mode. This technique made it very easy to search around a preset frequency using the rotary tuning control.

Scanning Modes

The MVT-7000 features three scanning modes that should meet the requirements of most operators. The basic scan mode encompasses all 200 channels and is simply a sequential scan. The scan

Specification

Frequency Coverage	8 - 1300MHz
Frequency Steps	5, 10, 12.5, 25, 50 & 100kHz
Modulation	a.m., narrow f.m., wide f.m.
Sensitivity	n.f.m. 0.5µV 12dB SINAD (1µV 1-1.3GHz) w.f.m. 0.75µV 12dB SINAD
	a.m. 0.5µV 10dB S/N
Channels	200 (10 banks)
Search Bands	10 (reprogrammable)
Scan Rate	15 channels/second
Search Rate	20 steps/second
Antenna	50Ω BNC
Power Supply	4 x NiCads (4.8V), Charger 12V d.c.
Audio Output	130mW (8R)
Power Consumption	160mW (full power), 95mA (standby)
Size	64.4 (w) x 159 (h) x 40mm (d)
Weight	330g

direction can be changed at any time by using the up and down arrow keys. The second scan mode restricts the scan to a preset number of memory banks. There are no limits on the combination of banks scanned, so this was very flexible. The final, and most specialised, scan mode is the programme scan. With this mode you can build you own specialised scan using any of the 200 hundred memories.

The only limitation is that a maximum of ten memories can be included in the scan. I found this particularly useful for pulling out and scanning the frequencies used by my local airport.

With all the scan modes there was the facility to lock out individual channels. The only confusion was that the manufacturers have chosen to call this PASS instead of the more common LOCK-OUT.

The MVT-7000 has a couple options that can be set to determine the action taken when a signal is detected. The first is called DELAY and causes the receiver to pause for four seconds after the signal disappears. This is useful for keeping track of two way signals, such as those on the air band. The second choice is called SKIP and causes the search or scan to

continue after five seconds, regardless of the state of the signal.

To help avoid the frustrations caused by unmodulated carriers, the MVT-7000 includes an AF SCAN mode. When activated this causes the receiver to ignore silent channels during scan or search operations.

Searching

This is probably one of the most important tools of a scanning receiver. It's the search that's used to discover new frequencies. The search modes provided on the MVT-7000 are very well thought out. There are a total of ten search bands that are pre-set with most of the popular bands. Included among these are Air, Amateur and Marine bands. The versatility of this mode is further enhanced as you can re-programme any of these search bands. As with the scanning functions, the search direction can be changed at any time by using the up and down arrow buttons.

Performance

I started the performance assessment by putting the MVT-7000 through a few tests

in the lab. This began with a simple check of the tuning accuracy. The review model showed good results with the worst error showing as +2kHz at 250MHz. The sensitivity was next to be measured and I used the magazine's normal standard of taking all readings as e.m.f./2 for 12dB SINAD. The a.m. sensitivity returned a worst case of 0.5µV at 27MHz reducing down to 0.4µV through the main part of the frequency range. Narrow f.m. showed similarly good performance, ranging from 0.4µV at 75MHz down to 0.25µV at 250MHz. The wide f.m. also produced a good figure at 0.6µV. This high sensitivity is fine when using the telescopic antenna, but can cause a few problems if an external antenna is used. The very nature of most scanners is that the front end is wide open to signals other than the wanted signal. This can cause all manner of intermodulation problems. The manufacturers have provided some help in the form of a switchable attenuator. This is invaluable when using external antennas.

I also took the opportunity to check out the selectivity of the MVT-7000. The a.m. selectivity proved to be on the wide side with a -6dB point at ±9.5kHz and -60dB at ±12.5kHz. The narrow f.m. results were much better with -6dB at ±4.4kHz and ±8.2kHz.

The distortion of the recovered audio is important to the overall intelligibility of the signal and I recorded the following results: 0.66% (a.m.), 1.3% (n.f.m.) and 0.71% (w.f.m.). The maximum audio output exceeded the specification, producing 165mW into 8Ω at 10% distortion.

The measured performance was backed up by the perceived on-air results. The sensitivity was certainly very high, particularly on narrow f.m. This did cause one or two intermodulation problems, mainly from a local high power broadcast station. However, I did find the attenuator to be very effective, reducing spurious to a minimum.

The audio quality was well adjusted for speech communications and there was plenty of output power for portable use. The low a.m. distortion was particularly helpful for air band use. ■

Summary

The Yupiteru MVT-7000 is a very attractive portable scanner with a fine overall performance. The wide frequency coverage combined with a well thoughtout range of features should make it a popular choice with listeners.

The MVT-7000 currently costs £289.00 and can be obtained from **Nevada Communications, 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (0705) 662145.** My thanks to Nevada for the loan of the review model.

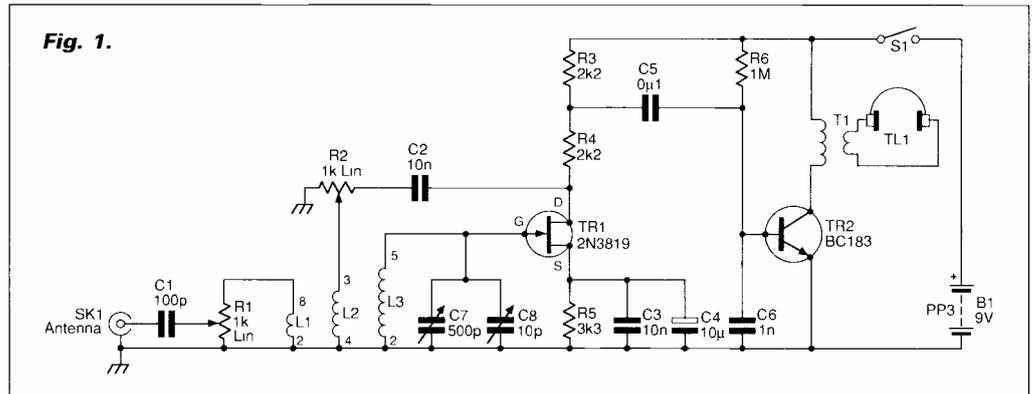
Continuing Along the Right Lines Part 4

George Dobbs G3RJV continues his series for the beginner with some of the constructional details of a tuned radio frequency receiver that is capable of quite a respectable performance on the short wave bands.

The SWM TRF receiver is the most complex radio built, so far, in this series. It is a complete short wave receiver capable of surprisingly good results for such a small circuit. It requires some operating skill but the rewards should far exceed the cost and effort in building the receiver. The complete circuit appears in Fig 1. It may look complex let us go through the path of a radio signal.

The signals from the antenna enter the receiver through C1, which isolates the input from the antenna. The value of 100pF is chosen to allow the r.f. signals to pass without loading the input circuits too much. Potentiometer R1 works as a potential divider to provide a simple form of RF GAIN control. The amount of signal reaching the rest of the receiver depends upon the setting of this control. It may seem odd to want to **reduce** the signal, but this receiver is capable of high gain and very strong signals can swamp the regeneration effect.

The input tuned circuit is made up of three windings L1, L2 and L3 on the same coil former and two variable capacitors: C7 and C8. L1 inductively couples the signal to the tuned winding L3, providing more isolation between the antenna and the input circuits. L2 couples the positive feedback to the input to provide the regeneration effect - see later. The tuned circuit is L3 tuned by C7 and C8. The large value capacitor C7 provides the coarse tuning and C8, a small value, provides the fine tuning or bandspread. The tuned signal appears at the Gate of the f.e.t. TR1. R5 'raises' the Source of the f.e.t. off the 'ground' or negative side of the supply. This puts a small voltage onto the source to provide the correct working conditions for TR1. Resistor R5 is decoupled by C3 and C4, that is they take all the r.f. and a.f. signals that appear at the source down to 'ground', leaving the source with just a d.c. voltage.



The signal passes through TR1, which acts as a detector putting the audio signal on the Drain. This signal still has an r.f. component. R3 and R4 convert this signal into a voltage and C2 takes a portion of the signal back to L2. If too much of the r.f. signal gets to L2, TR1 will oscillate and the signals will be masked by a high-pitched squeal. Another potentiometer R2, acting as a potential divider, controls the amount of signal which is fed back to L2. This is usually called the REGENERATION control and its use is the key to the successful use of a t.r.f. receiver.

The audio signal from TR1 appears as a voltage across R3 and R4, which act as a potential divider. Capacitor C5 couples half of this signal (enough) to the audio amplifier TR2. Capacitor C6 decouples the r.f. signal present at this point by taking it to ground. The high value resistor, R6, puts a suitable working voltage onto the base of TR2 to allow it to operate as a high gain audio amplifier.

The amplified audio signal appears as a voltage across the primary winding of transformer, T1. The secondary winding matches the audio signal to a low impedance to

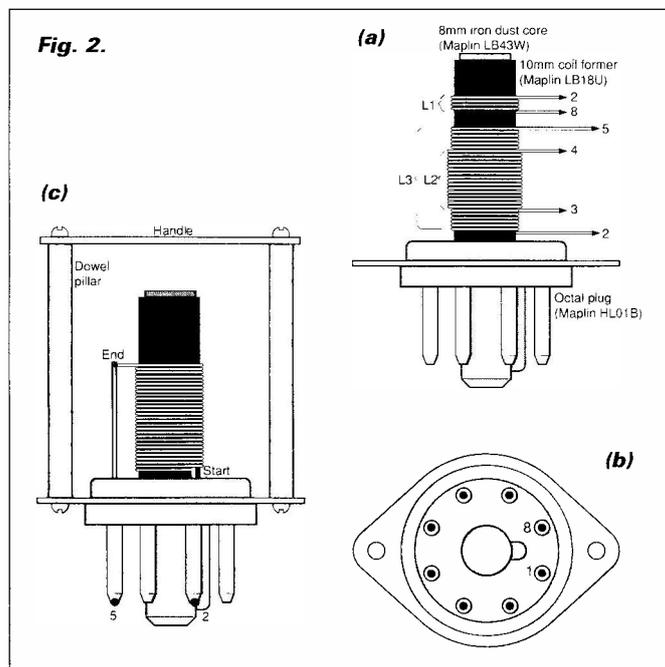
drive a pair of "Walkman" headphones. The whole receiver is powered by a 9V PP3 battery switched on and off by SW1.

Winding the Coils (inductors)

Following what we call in our household, 'the Walnut Whip principle' - saving the best bits until last - the first part of building the receiver will be the winding of the coils. This is probably the most tricky and tedious part of the work. The inductor system used in the receiver is shown in Fig. 1. as three coil windings on a common former.

The range of frequencies covered by the receiver is governed by the inductance of the tuned winding (L3) and the capacitive range of the variable capacitors (C7 and C8). In more sophisticated short wave receivers it would be usual to switch a series of tuned inductors to give several tuning ranges. This would usually be called the 'Bandswitch' or in the older days of radio, the 'Wavechange' switch. To avoid the complication of switching, the SWM TRF uses plug-in coils to select two tuning ranges. This was very common in early short wave receivers.

Unfortunately, it is not easy to obtain plug-in coils these days and the receiver requires the coils to be hand-wound and mounted on a plug-in base. The plug-in coils here



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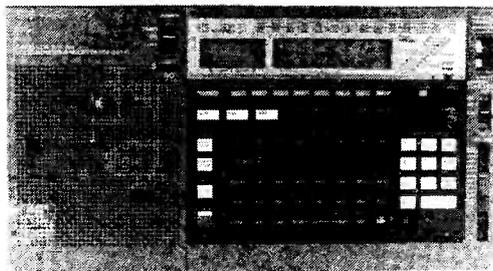
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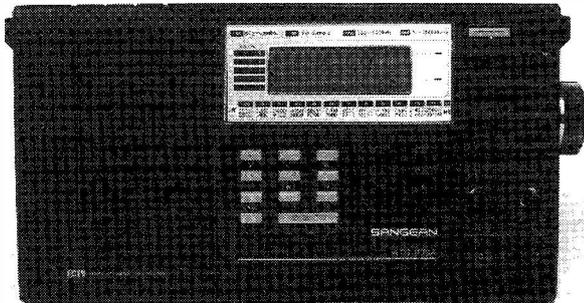
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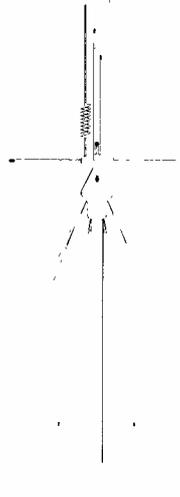
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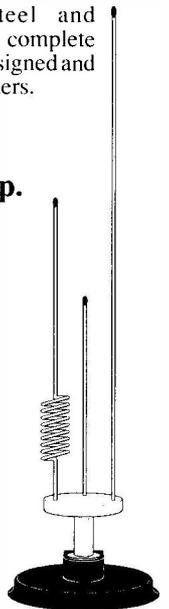
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follow closely an article in *SWM*, July 1990 which described the making of coils to replace the once popular range of 'Denco' plug-in coils. Their construction is not difficult but does require a little patience and some careful soldering.

Octal Plugs

The appearance and making of the coils is shown in **Fig 2**. The former is a 10mm Coil Former (Maplin LB18U or similar) with an iron dust core (Maplin LB34W or similar). The former is mounted on an Octal plug (Maplin HL018 or similar) which can be plugged into an Octal socket (Maplin HL00A or similar). The mail order part numbers are given but these formers are often available as surplus items and valved equipment fans may well have Octal sockets. Octal based valves were common in the 1950s and 60s and it is possible to knock the glass top off a defunct Octal valve and use the base as the Octal plug. Take care, of course, with the bits of glass envelope.

The 10mm coil formers have a 'T style' base plate. I found the easiest way to mount the former onto the base was to remove this base plate and using a Junior Hacksaw, I cut off each section of the 'T' in turn. I made the saw cut in line with the side of the former leaving the bottom of the former cylinder intact with the squared off remains of the 'T' base. I was then able to file the remains of the base until it formed a rather loose push fit into the hole in the centre of the Octal base. A small amount of Araldite epoxy adhesive, applied to the push fit and left to cure, gave a firm mounting for the former.

The arrangement of the three windings on the former is shown in **Fig.2.(a)**. L3, the tuned winding is made first at the bottom of the former. L1, the antenna coupling winding, is wound above L3, and spaced by about 2mm from L3. The feedback winding, L2, is wound over the top of L3. The numbers of turns and the gauge of the enamelled copper wire are shown in **Table 1**.

Making the windings does require some care. It is important to remove the enamel from the ends of the wire before soldering. Many enamelled wires are sold as 'self-fluxing' - i.e. they should take solder directly. But I still carefully scrape the enamel off the portion I wish to solder until I see clean shining copper, then apply the

Coils

Coil former 10mm Maplin LB18U or similar (2 off); Iron dust core Maplin LB34W or similar (2 off); Octal plug Maplin HL018 (2 off); Enamelled copper wire 28s.w.g. (0.375mm) Maplin BL39N, Marco CBL/ECW/28; Enamelled copper wire 22s.w.g. (0.71mm) Maplin BL27E, Marco CBL/ECW/22; Bee's Wax; Materials for handles.

Table 1. Coil details

Range	L1	L2	L3	Wire
4-14MHz	4t	8t	15t	28s.w.g.
10-30MHz	2t	4t	6t	22s.w.g.

Formers are 10mm dia. with iron dust core. L2 is wound on over L3.

soldering iron tip to this bare copper and melt solder over the surface. This is called 'tinning' the surface and I 'tin' most surfaces before I make the final solder joint. This might be considered a 'belt and braces' approach, but experience has taught me that the commonest fault in radio construction is poor soldering.

Good Coverage

There are two coils to be made for the ranges 4 to 14MHz and 10 to 30MHz. These provide a good coverage of the short wave spectrum. The quoted frequency ranges are nominal since, with home-wound inductors, it is very difficult to reproduce exact values of inductance. The windings are all close-wound, i.e. the turns are laid neatly side by side along the winding. Throughout the winding operation it is a good idea to keep the wire as tight as possible. The beginning and end of each winding must be secured to prevent the windings coming loose.

Fig.2.(a) shows the windings with a number at each end. These numbers correspond to the pin numbers on the Octal base. The standard numbering order for an Octal base is shown in **Fig.2.(b)**. Usually these numbers are marked on the plugs and on the bases. This

order of numbering and the placement of wires must be followed. The feedback action of L2 to L3 depends upon the windings being in the correct phase (the right way around). These numbers are also shown on the circuit diagram, **Fig. 1**, of the complete receiver.

Pin Numbers

Fig.2.(c) shows a method that may be adopted to secure the windings. Stiff copper wires are soldered in the base pins and stand up alongside the former to provide pillars to secure the ends of the windings. Any stiff copper wire (18 or 20s.w.g. tinned wire is ideal) will serve the purpose. The diagram shows the example of winding L3 for the 4-14MHz range coil.

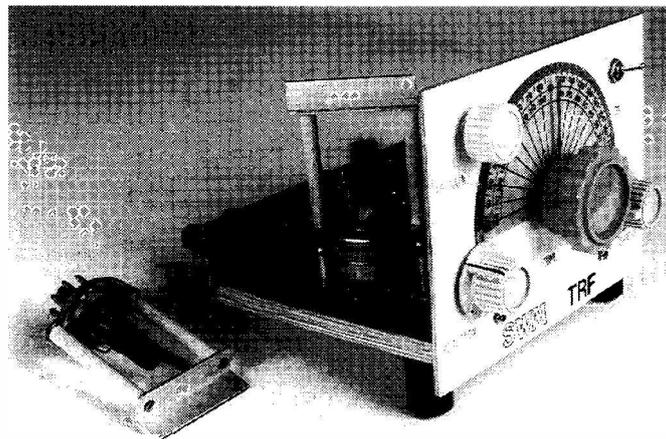
The method is simple. Solder a short wire into pin 2 of the coil base and a longer wire into pin 5. The wire in pin 5 can be made the length of the former and trimmed at the end. A bared and tinned end of the 28s.w.g. wire is soldered to the wire from pin 2. Push the wire from pin 5 down to allow access to the former. Keeping the wire taut, begin winding, and counting, turns onto the former. The turns must be laid neatly side by side as the coil ascends the former. Keep your thumb ready for when the phone rings and clamp it

down on the windings any time you pause in the process. When the winding is complete cut the wire off the reel and hold the top end down with a small piece of sticky tape. Bend the longer wire (from pin 5) back into the vertical position. Scrape the enamel from the end of the wire, tin the wire and wrap it tightly around the wire from pin 5. Solder the winding to the upright wire and the winding is completed.

Now comes the finishing touch to the winding. Some people like to secure the windings of a home-made coil with a layer of sticky tape but I have always found this rather bulky and messy. The best method, by far, is to use bee's wax. In fact I use bee's wax for securing all kinds of items in electronic construction. The operation is simple. Using the tip of the soldering iron I melt a little bee's wax onto the winding. Then using a swift action, I rotate the former and lightly stroke the soldering iron tip up and down the winding. The bee's wax should run along the winding and form a thin layer which secures the turns. The bee's wax does no harm to the soldering iron bit as it burns away very quickly.

The above process can be repeated for the other windings, beginning with L2. This winding is a little more tricky as the wire must be threaded through the wire pillars which hold L3. This requires a little more care, although the bee's wax does help because the turns adhere to the thin layer of wax. Wind L2 centrally over L3 and add L1 as the final winding operation. The whole process can be repeated for the winding of the higher frequency coil (10-30MHz) although this is wound with 22s.w.g. wire, which is quite stiff. In practice I found it possible to wind this coil without the wire pillars, using the stiffness of the coil wire to provide the support.

It can be helpful to add a simple handle to aid the insertion and removal of the coils. **Fig.2.(c)** shows one method of providing a handle. Two pillars are made from thin wooden dowel rod. A top plate, made from aluminium or another suitable material is drilled to match the hole spacings of the Octal base. Small wood screws hold the base and the handle at either end of the dowelling pillar. No doubt other ingenious methods could be devised to aid the coil changing operation. ■



50 Countries on the 144MHz Band Part 2

This month, P.E.W. Allely GW3KJW looks at auroral propagation.

The sun is an active star, powered by its own thermo-nuclear fusion, but does not generate its energy at a constant rate. It seems to follow an 11-year cycle of activity, the most active years in the cycle corresponding with an increase in auroras, both visible and radio. During these active phases, the sun develops gigantic power surges resulting in solar flares leaping thousands of miles out from the surface of the sun. The matter, in the form of gas nuclei, is hurled out at velocities approaching the speed of light away from the sun into space. It is fortunate that our own atmosphere forms such an effective shield, protecting us from the worst of these violent radiation storms.

However, the earth has a strong magnetic field surrounding it and reaching out into space. As the orbit of the earth passes through the radiation storm, the particles, mostly electrically charged protons, are deflected by the magnetic field to spiral down the force lines to the magnetic poles. The North Magnetic Pole is sited approximately 77°N and 105°W in Queen Elizabeth Island in Northern Canada, whilst the South Magnetic Pole is approximately 65°S and 140°E, south of Australia, off the Adelaide Coast of Antarctica, as shown in **Fig. 2.1**.

When these rapidly moving particles strike the molecules of oxygen, nitrogen and other gases in our atmosphere, at a height of several hundred

kilometres above the earth, the molecules become excited and emit energy in the form of light. Oxygen atoms emit both green and red light, nitrogen atoms violet, blue or red and the incoming particles are believed to be a weak source of red and yellow.

Curtain

The auroral curtain so formed, although closing down the h.f. bands, has an important property for the v.h.f. enthusiast. Through ionisation it reflects v.h.f. radio signals, although the quality of the reflected signal is considerably degraded by phase changes and Doppler shifts. Remember the curtain is moving constantly, but signals are discernible and long distance

contacts can be made. Signals transmitted as f.m. will be impossible to decipher, but single sideband is copyable, although transmissions will sound badly distorted to the listener unfamiliar with the distinctive tones. Many a listener, on hearing auroral signals, has believed that he was listening to a badly modulated signal and tuned away or switched off in disgust. On sideband the signals are difficult to describe, they must be experienced first hand, but can be picturesquely likened to listening to a gaggle of whispering giants. There is a distinctive hiss in the modulation and the background noise is greatly enhanced. On c.w. the signals, although perfectly readable

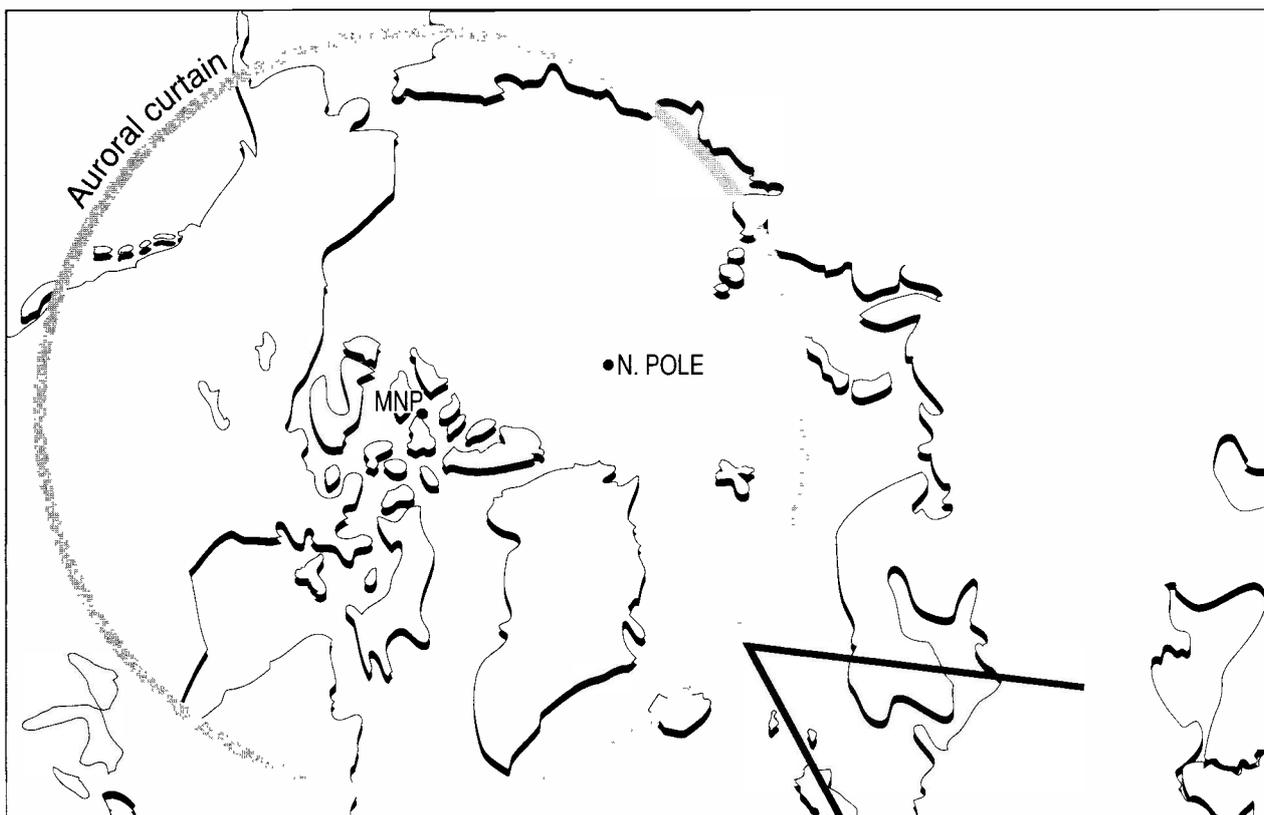


Fig. 2.1: Showing the optimum auroral path between UK and Ukraine, note the heading from the UK is east of magnetic north.

Fig. 2.2: Radio propagation warnings.

Callsign	Frequency	Propagation Forecast	Geophysical Alert
WWV Fort Collins, Colorado	2.5, 5, 10, 15, 20 & 25MHz	15th minute of each hour voice transmission	19th minute of each hour
WWVH Kekaha, Kauai, Hawaii	2.5, 5, 10, 15 & 29MHz		46th minute of each hour by voice transmission
JJY Tokyo	2.5, 5, 10 & 15MHz	10th minute of each hour in Japanese. Warning of propagation then sent in Morse 'N' - normal, 'U' - unstable, 'W' warning	

and often extremely strong do not have a pure note. Far from it, they have a rasping buzzing note unlike anything else and instantly recognisable as auroral.

The auroral curtain forms and intensifies in an oval band around some 20° of latitude from each magnetic pole. Its height varies but the curtain can stretch from about 150 to 400km above the earth's surface, and its intensity varies from second to second.

It is through the presence of these auroral curtains that many long distance contacts can be made. The trick with auroral propagation is not to point your antenna at the distant station but to a point on the curtain where it will be reflected back to the distant station. Obviously, both stations must be pointing at the aurora and it is odd to hear signals, say from Italy, coming in from an auroral heading of about 30°E. As the intensity varies, the peak reflecting area of the aurora tends to wander a few degrees and beams will have to be adjusted to get the full advantage.

Seasonal Patterns

Auroras can occur at any time of the day or night and seem to have two distinct peak phases, one in the early afternoon and the second after midnight. Auroras follow seasonal patterns, being most common around the spring and autumn equinox, but can and do happen in every month. The more northerly the listener (that is closer to the magnetic pole) the more intense the aurora, and the greater the chance of hearing that elusive country not previously logged on 144MHz, or indeed on 430MHz, as propagation is feasible on the latter band.

Signs of Aurora

Now, what signs are there that an aurora is likely to occur or is, in fact, happening? The most obvious, although the most unlikely for the majority of us, indication is the magnificent sight of an aurora lighting up the northern sky. If you see it you will hear it on your receiver and its intensity will be great.

Advance warnings of auroras occurring are quite reliable, the basic cause, the solar flares are observed by terrestrial observers and by various satellites specifically programmed to watch the sun. The early warning of intense solar activity is not only of interest to radio communicators, but also to power engineers. Strong auroras in Canada and Sweden have induced power surges and shut down high voltage power supply lines. These solar flare warnings are published as matters of scientific interest in the broadsheet newspapers.

Intense solar flares can cause a radio blackout of the h.f. bands. Don't immediately assume that your antenna has fallen down, start looking on v.h.f. The aurora, if it is going to happen, normally takes place some 24 to 36 hours after the solar flare, the time taken for the earth to orbit into the emitted particles. A check on v.h.f. may show that, although there are no auroral tones to be heard when beaming northwards, strong solar noise like 'frying eggs'

Abbreviations

c.w.	continuous wave (Morse)
f.m.	frequency modulation
h.f.	high frequency
MHz	megahertz
v.h.f.	very high frequency

seems to be emanating from the direction of the sun. When this noise is strong, I have found that an aurora takes place within the next two days.

Short Term

A short-term forecasting service is provided on a 24-hour basis by the GEC-Marconi Research Centre, Great Badow, Essex. The recorded service can be obtained by dialling (0245) 73331 and asking for extension 3152, additionally some national frequency standard transmissions also give warnings of disturbed radio conditions, see Fig. 2.2.

An interesting method of finding possible solar activity is to look at the growth of sunspots. My method is exceedingly simple and haphazard, but works. All I do is to blank off one lens of my binoculars, then point the other at the sun obtaining an image that I project onto a piece of white card. I find that with careful focusing, I can achieve a projected disc some 200mm in diameter that shows up groups of spots quite clearly. **I need hardly emphasise how dangerous it is to look directly at the sun. Remember, your eyesight is far more important than attempting to predict radio conditions.**

Should the aurora be taking place without your knowledge, tuning your receiver should reveal this fact. At the bottom end, the knowledgeable will be calling CQ A. Higher up

sideband operators will be calling CQ Aurora, and they will not necessarily be calling on 144.300MHz. Bear in mind the apparent distortion on the modulation and the raucous Morse tones. Further up the band, again in the beacon section, you may be rewarded by hearing the Lerwick Beacon GB3LER and others, plus the usual state of southern beacons coming in from the north with auroral tones. It is a waste of time, in my opinion, to listen for any f.m. transmissions except to pick up information of unusual conditions having been noted by the person sending the f.m. transmission.

The range of the contacts is finite, the distance is dependent on the reflective height of the curtain, the strength of the transmission, the distance from the curtain and the angle by which the signals are reflected. A glance at Fig. 2.1 should show why most auroral contacts from the British Isles are made with a beam heading east of north. I would be fascinated to know if any UK amateur had contacted Iceland via a pure auroral propagation on 144MHz. I have not heard of it happening, and it appears that the auroral curtain is actually sitting on, or just south of Iceland. It is a matter of conjecture of how v.h.f. radio signals can pass through an ionised curtain.

More northerly situated v.h.f. listeners (that is north in respect of the Magnetic North Pole.) will have greater chances of hearing the minor auroras. Indeed some will find that due to the geographical position, i.e. living on the northern slopes of the Highlands, the propagation of auroral signals may be the only way to hear long distance stations. ■

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Short Wave Magazine, August 1991

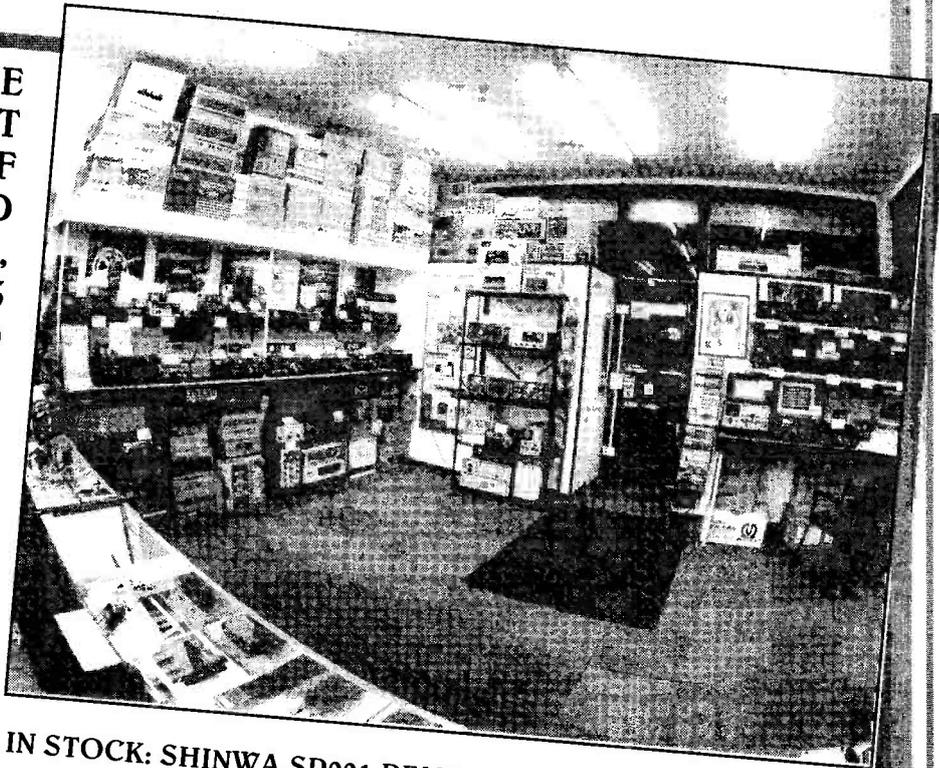
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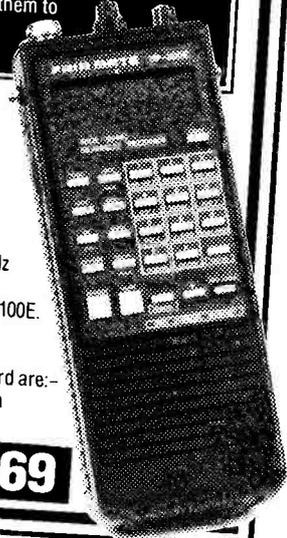
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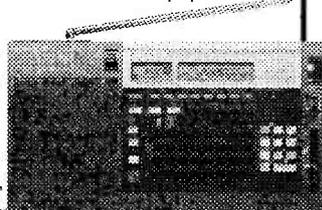
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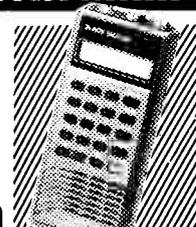
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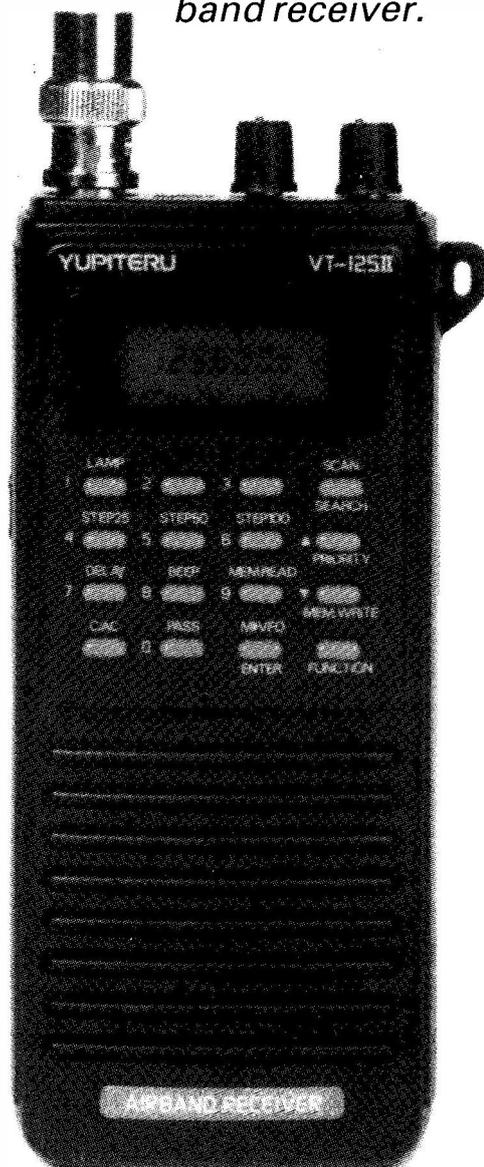


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Yupiteru VT-125 UK Airband Receiver

John Waite reviews one of the latest releases from Nevada - a hand-held air band receiver.



Of all the v.h.f. bands, the air band is the one that generally attracts the most attention. Because of this, there has always been a great demand for air band receivers. For the aircraft enthusiast, portability is also an important consideration if the receiver is to be used at airports. The VT-125UK fits neatly into this market with its diminutive size of 57 (W) x 127 (H) x 36mm (D).

Being designed primarily for portable use, the VT125UK is supplied ready for use and requiring no hidden extras. Power was provided by three AA size NiCad cells that were mounted in a neat battery compartment. I was very impressed that the NiCads were supplied - many manufacturers leave the user to provide their own. The capacity of the batteries was very well matched to the demands of the receiver giving a claimed ten hours continuous operation from each charge. There was even a warning of impending battery exhaustion by the word BATT appearing in the display.

Charging the batteries could be achieved in a number of ways. Perhaps the simplest is to use one the cheap and readily available five hour NiCad charging units. Alternatively, the NiCads can be charged via the external power socket on the VT-125UK. This socket accepts 12V d.c. as the external power source. This supply can be derived either from the optional a.c. adaptor or the car connector. The car connector comprised a standard cigarette lighter plug and lead that could be used with any 12V car electrical system. The a.c. adaptor, on the other hand, was a conventional unit with the transformer and rectifier mounted around the plug. With both the external power options, NiCad charging was set to take fifteen hours for a full charge.

Although NiCad operation is likely to be the preferred method, you could use conventional dry batteries. This is handy if the NiCads run out while operating portable, as AA size dry cells can be bought from a wide range of shops.

The antenna connection was a straightforward BNC connector mounted on the top panel. This provided a good mounting for the supplied rubber antenna. An additional advantage, of course, is that external antennas can easily be connected via this socket. Well positioned external antennas generally give a much greater range than any system mounted on the receiver. This is particularly appropriate when operating at home or in a car.

The only other external connection was a 3.5mm speaker socket on the top panel. This was designed primarily for use with external headphones or earphone. When operating portable, particularly near airports, headphone operation is very important. This is because of the limited output available from the internal speaker. Headphone operation also avoids disturbing other people. An earphone was provided with the VT-125UK but users may find a pair of lightweight headphones to be more effective.

Clear Instructions

The manual supplied with the VT-125UK was very professionally produced as a small booklet with thirty glossy pages. The operational details were covered in a logical sequence with very good use of step-by-step diagrams to illustrate most operations. There was also a handy key-by-key explanation that provided a useful reference. This well structured approach of the manual extended to the operation of

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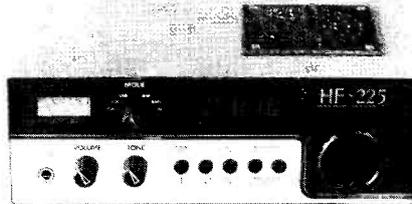
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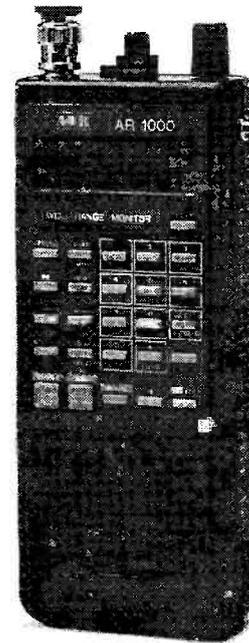
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the receiver. I found I was easily able to use most of the facilities before I had read the manual.

Digital Keypad

The front panel is dominated by the digital keypad that is used to provide control of most of the features. The most obvious use is for manual frequency selection. In this mode you simply type in the frequency followed by ENTER. If you entered a frequency outside the range of the VT-125uk the word error appears on the display so there can be no doubt. Also if you make a mistake you can hit the cancel button to start again. This was a useful addition as with many scanners you have to scroll the incorrect digit which can be time consuming. In its supplied configuration, each key press is registered with a beep from an internal sounder. Although handy for confirming a key press, it could become irritating when operating in a quiet area. Fortunately, the manufacturers had thought of this and provided a means of silencing the beep.

Once a frequency had been selected, you can step up and down using a couple of buttons on the keypad. If these buttons are held depressed for more than one second, the frequency changes at twenty steps/second. This is very handy for rapid frequency changes.

This manual tuning mode can also be used to select frequencies for storage in the thirty internal memories. Once stored these can either be recalled manually or by using the scanning option. There is also provision to alter the size of the frequency steps. The options available are 25, 50 and 100kHz giving a very useful range.

Options such as the step size are accessed by pressing the FUNCTION button first. This changes the keypad to its secondary range of options. To differentiate between the main and secondary options, the functions are printed in different colours.

One great aid to portable operation is the provision of a KEY LOCK switch. As the name implies this disables the keypad so avoiding accidental detuning, etc.

Digital Display

The liquid crystal display is used as the main means of communication between the receiver and operator. In addition to frequency and mode information, the display includes a bargraph signal strength meter. This is handy for finding the best position for reception of a particular signal. The only trouble I had with the display is the size of the characters. The frequency readout characters were approximately 3mm high which isn't too bad. However the auxiliary information such as mode, frequency step, etc are a tiny 1mm high. I have 20/20 vision and found the small text difficult at times, so if your vision is at all impaired you may have a problem. A simple solution was to use a magnifier. I actually tried this with a very cheap, toy magnifier and it proved to be very effective. The reason for the success is that the small text is actually very well defined.

For operation in difficult lighting conditions, there is a very good backlight. This is enabled from the keypad and switches the light on for approximately five seconds.

Scanning

The VT-125uk includes a very useful scanning option that enables the thirty internal memories to be scanned. Starting the scan is by a single key press, so could hardly be any easier.

The scanning rate of the VT-125uk is extremely fast at twenty channels per second. This means that all channels can be scanned every one and a half seconds. This speed is of great benefit with the short transmission durations that are so common on the air bands.

The scan mode is completed with the addition of

Summary

I found the VT-125II to be a very attractive and capable air band receiver. Its small size is bound to make it very attractive to operators who like to listen on location. The display problem I highlighted needs to be kept in proportion as not being too serious. The magnifier solution I suggested is actually quite practical and very effective.

The technical performance of this receiver was well up to the standard required for its intended use.

The Yupiteru VT-125II costs £179.00 and is available from **Nevada Communications, 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (0705) 662145.**

My thanks to Nevada for the loan of the review model.

Specification

Frequency Range	108 - 142MHz
Frequency Step	25/50/100kHz
Modulation	Amplitude Modulation
Sensitivity	< 0.5µV for 10dB S/N
Memories	30 user programmed
Scan/Search Speed	20 channels/steps per second
Antenna Impedance	50Ω
Power Supply	3.6V d.c (3 x UM3 NiCad) 12V d.c External
Speaker	60mW (8Ω)
Current Consumption	45mA standby, 95mA at maximum output
Temperature Range	0 - 50°C
Dimensions	57.2 (w), 127.5 (h), 35.5mm (d)
Weight	207g (excluding antenna)

options to lock-out unwanted memories and to pause on any signal.

Complementing the scanning, is a very effective search option. This searched through the entire 108 to 142MHz frequency range at twenty steps per second, giving a complete search in one minute fifteen seconds. The only problem I encountered was a very strong spurious signal on 132.725MHz that stopped the search every time.

The final option associated with scanning is the priority frequency. When activated, the priority frequency is monitored every five seconds regardless of the current mode. One unusual point about this mode is that the priority frequency does not have to be stored in one of the normal memories. One of the main uses of the priority is to keep an eye on, say, a local ground frequency while scanning a range of related airport frequencies.

Performance

The on-air performance was very good indeed, the supplied antenna proving perfectly adequate for portable use. I also took the opportunity to try the VT-125uk with my external discone antenna. The results were

again very good and I was able to receive Heathrow control from some eighty miles away. There was some image break-through from a very strong f.m. broadcast station but this was not serious.

For some more conclusive test I moved into the lab. The sensitivity was first to be examined and the measured result was 0.5µV for 12dB SINAD at 120MHz. This was actually better than the specification, which used 10dB S/N as the reference. The bandwidth is another important parameter where a compromise is required between fidelity and selectivity. The VT-125uk returned ±4.45kHz at -6dB and ±13.14kHz at -60dB. This was just about right for air band operation. I also checked the accuracy of the frequency readout which showed a maximum error of +2.8kHz at 120MHz.

One area where many receivers fall down is the a.m. distortion. I have seen some otherwise fine receivers completely spoiled by a lack of attention to this area. The VT-125uk showed very low distortion with the best attainable being an excellent 0.68%. The maximum audio output also exceeded the specification producing some 80mW into 8Ω. ■

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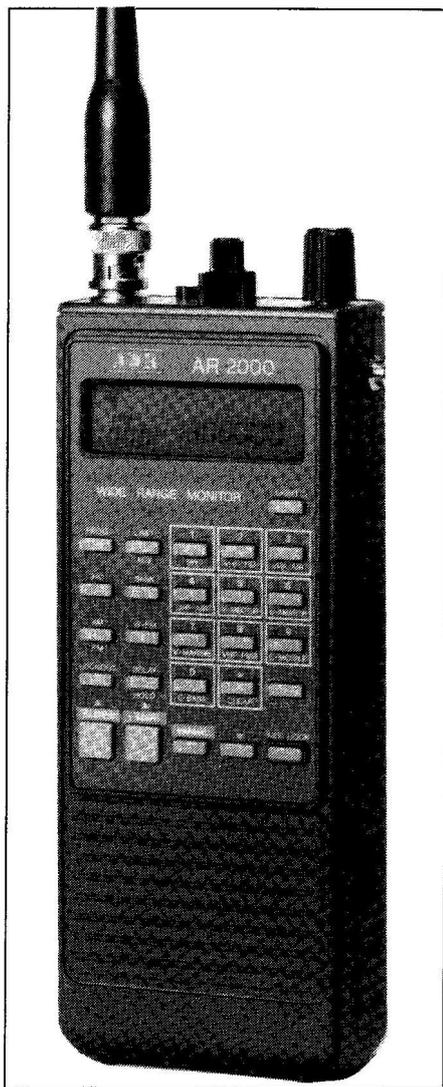
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to the well proven AR1000). There are 1000 memories and 10 search banks. An internal rechargeable NiCad battery is now included to permit operation away from the home and car. The AR2800 covers 500 kHz to 600 MHz and 800 MHz to 1300 MHz.

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AR2500 and AR2800 Base - mobile scanning receivers featuring coverage from shortwave to microwaves. All mode operation AM, FM (narrow), FM (wide) and built-in BFO for USB, LSB and CW. Massive memory storage backed up permanently with an EEPROM so no battery is required. Operation is from a nominal 13.8V DC supply (power supply included). SSB is used by many services especially on shortwave (including Amateur band and oceanic airband) to extend the operational coverage of their transceivers. It's inclusion on these receivers isn't just an added bonus but a positive asset. The BFO allows selection of either side-band and the fine shift control ensures the very best audio quality. The *choice* between the AR2500 and AR2800 is difficult. Although both models look similar on the outside (being housed in a strong plastic cabinet), their design concept is radically different inside the cabinet. The **AR2500** was conceived in the USA where listeners desire **computer control** via the **RS232** port at a budget price, IBM-PC based software should be available in the autumn. The AR2500 has a massive memory capacity (*Elephant memory*) and fast *turbo speed* search and scan. There are 1984 memories (62 banks x 32 ch) and 16 search banks. The AR2500 covers 5 MHz to 550 MHz and 800 MHz to 1300 MHz. The **AR2800's** strong point is superior SSB/CW receive performance and versatility, Amateur band CW reception is of a crisp and clean tone. The dream of listening to long distance communications from your home (with an external aerial) is now a reality. The AR2800 is *user friendly* and employs a conventional memory channel and search bank layout (similar

AR2800



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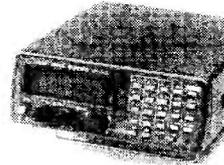


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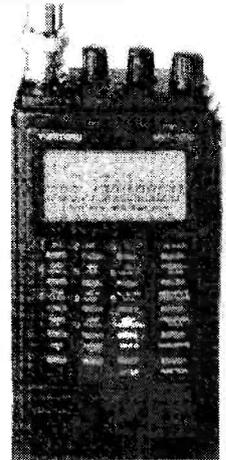
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Discovery of the Ionosphere

The ionosphere is the vital ingredient of long-distance radio communications. F.C. Judd G2BCX describes the events leading up to its discovery almost 70 years ago.

Without the ionosphere there would be no long distance, half-way round the world, propagation of radio signals on low, medium as well as high frequencies up to a little over 30MHz. The ionosphere is a totally invisible encirclement of rarefied air, outside the lower atmosphere and extending to over 400km above the earth's surface. Since the realisation of its existence over 80 years ago and first proof of that existence by measurement (circa 1925) the ionosphere as we know it today has been divided into finite 'regions' or 'layers'.

The Realisation

After Marconi had demonstrated in December 1901 that wireless waves could be transmitted across the Atlantic Ocean, other pioneers of wireless, such as A.E. Kennelly, Oliver Heaviside and J Erskine-Murray, proclaimed that this was only possible because of some form of 'reflecting surface' or 'conducting layer', above the normal atmosphere, that 'bent' the waves around the earth. They did not follow the actual surface of the earth for long distances as was first thought. There were others who believed that reflecting or conducting layers above the earth did not exist at all. One scientist, Lord Rayleigh, stated that while radio waves, like light waves, could be 'refracted' i.e. bent round a curved surface for a relatively short distance, as in Fig. 1, this could not possibly account for the great distance covered by Marconi's transmissions between Newfoundland and the UK.

There was also much discussion arising from lectures given by Marconi himself. First he explained that the great distances covered were due to the effect of sunlight on his transmitting antennas, Obviously not the



reason. Later he became concerned with what he called 'day and night effect'. The 'day effect' he claimed was when transmission distance was only a little over a quarter of that obtained at night. (Note: His transmissions were in the

region 300 to 400 metres). The 'effect' was right but there was no plausible explanation as to why. Other notable scientists were of the opinion that some part of the upper atmosphere became 'ionised' by the sun's rays and thus formed a

'conducting layer' that reflected the wireless wave back to earth. Much nearer the truth but not proved either mathematically or by actual measurement.

The Heaviside Layer

Just before WWI, there was further discussion by other scientists such as W.H. Eccles, Lee de Forest and L.F. Fuller about the nature and effective height of a conducting layer, if such really existed. Although in 1912, Eccles suggested it be called the 'Heaviside Layer' others referred to it as *the upper atmosphere, the upper conducting layer, the far upper regions or the ionised upper atmosphere*. After the war, the term 'Kennelly-Heaviside Layer' was used by some, but the majority still called it the 'Heaviside Layer'. Even by the early 1920s there was still argument as to what this layer really consisted of, how high it was, how did it reflect wireless waves, etc.

In 1925 Heaviside stated that it was almost certain that above the normal atmosphere, was a region, or regions, where ions of molecular size were formed daily by sunlight, as others had already assumed for a considerable time. It was probably at a

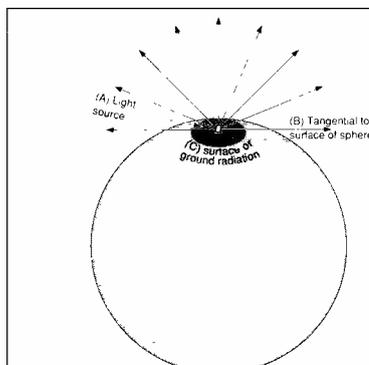


Fig. 1: Illustration of the theory by Lord Rayleigh. Source of light on a sphere (r) radius with the directions of 'light' radiation in the vertical plane. Note the very small amount along the surface of the sphere due to refraction.

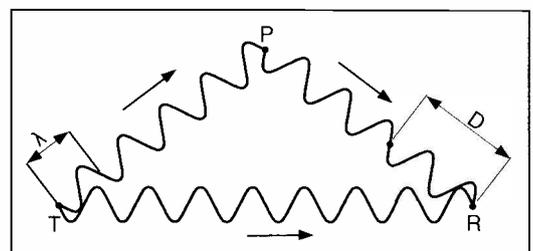


Fig. 2: Radio waves arriving at a receiving point (R) from a transmitter (T) via two different paths. If the indirect path (TPR) is longer, or shorter by a half-wavelength with reference to the direct path (TR), then phase cancellation of the total received signal will occur. If the paths (TPR) and (TR) are each a whole number (n) wavelengths than both the direct and indirect signals from (T) will arrive at (R) in phase.

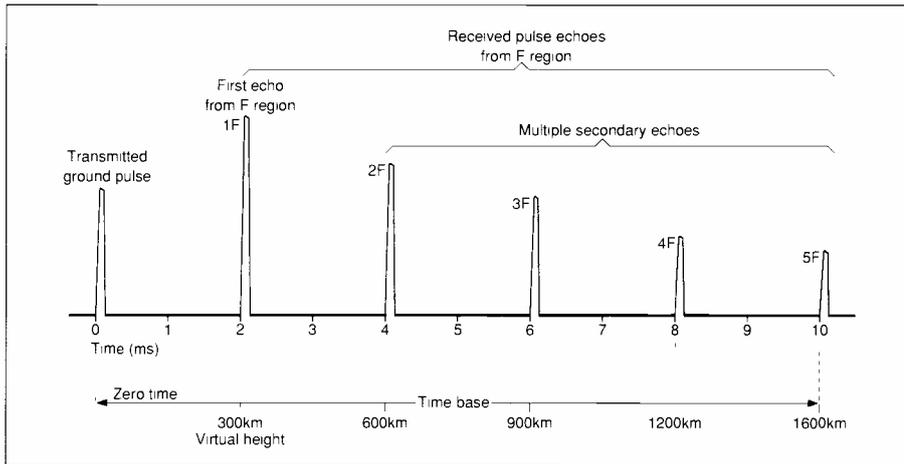


Fig. 3: How 'echoes' from an ionised region are 'timed' by using pulse transmission and an oscilloscope with a calibrated time base. In this example the primary echo from the F region indicates a virtual height of 300km. Time taken from transmitted pulse to travel up and back = 200ms.

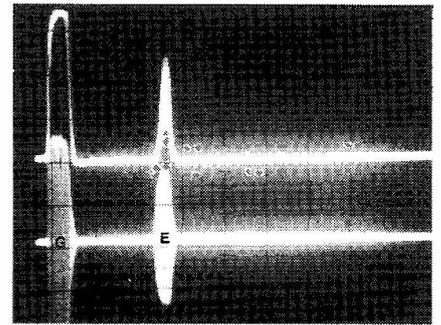


Fig. 4: Photo from c.r.t. display. Lower trace: (G) transmitted (ground) pulse. (E) direct echo from F region at virtual height 350km. Upper trace: Rectified version of r.f. signals shown on lower trace. Transmit/receive frequency 6.5MHz, p.r.f. 35Hz/sec.

meeting of the then British Radio Research Board in the Autumn of 1926 that the question was raised of agreeing on a term to designate the entire atmospheric region where ionised particles undoubtedly accounted for the phenomena. It was R.A. Watson-Watt who suggested the term 'ionosphere', which would be analogous with 'stratosphere' and 'troposphere', etc.

E.V. Appleton

Professor Appleton had been thinking on the same lines. He wrote. "For the ionised part of the atmosphere, I think the terms 'ionosphere' or 'electrosphere' might be useful". However, there was still no real proof of the true nature of this region. Did it consist of a number of separate regions or layers and if so, how were they formed and at what heights above the earth's surface?

In an article published in *Wireless World*, 7 January 1931, Appleton stated: "practically all the phenomena we experience in wireless transmission can be attributed to the fact that wireless signals travel from one station to another by more than one route.... There is usually a direct line of transmission... from sender to receiver but very often a greater part of the signal we hear is due to waves which have made a trip to the upper

regions of the atmosphere and back". He also pointed out that waves that make this journey arrive at the place of reception a fraction of a second after those that have travelled along a direct but shorter path or what we now refer to as a ground-wave.

The Appleton - Barnet Experiment

Appleton and another scientist named Miles Barnet, had carried out experiments to prove the previously mentioned theory. They found that when the waves arrived 'in-phase' they added and when in 'anti-phase' they subtracted. It was considered that if the path difference (D), as in Fig. 2, between that of the ground wave and that of the reflected wave, was a whole number of wavelengths (n), the waves would add. If it was a whole number plus or minus a half-wavelength, then they would subtract. However, it was concluded that further experiments were necessary to prove that those already carried out were valid. On 11 December 1924, Appleton and Barnet used a BBC transmitter at Bournemouth and set up a receiver at Oxford. The experiment involved changing wavelengths but revealed that the height of the 'reflecting' medium to be about 100km. We now know this to be the 'E' region. (Sporadic-E clouds also form at this height.)

The Pulse Technique (circa 1931)

The wavelength change method proved to be slow and tedious so Appleton began to use the 'pulse technique' developed by Two American scientists. With this method, short pulses of radio waves were timed for the journey to one of the other regions and back to earth so that the height of the region, or more correctly the 'virtual height' could be established with great accuracy, Fig. 3. The pulse transmission method is still used today by ionospheric laboratories, such as the Rutherford Appleton Laboratory at Chilton in Oxfordshire.

The Ionospheric Regions

Perhaps the most important discovery made by Professor Appleton was the existence of another region above the 'E' layer. This he

called the 'F' region and that is the major medium for long distance propagation of radio waves over a frequency range of approximately 1 to 30MHz. There are in fact two 'F' regions, F1 and F2, but during periods of low ionisation these merge to become what is commonly called the 'F' region with a virtual height of between 200 and 400km above the surface of the earth, (see Fig. 4).

There is also the 'D' region, discovered later, and which, if strongly ionised, can cause 'radio blackouts' i.e., the prevention of transmitted h.f. signals from reaching the F region and signals from a distance, otherwise reflected by the F region, from reaching the earth. The virtual height of the 'D' region is about 50km. But why D, E and F? These were the designations given by Appleton who thought that if other regions were discovered these could be A, B, C or G, etc. ■

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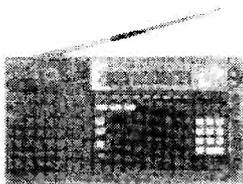
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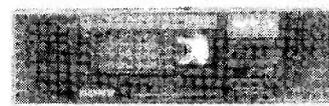


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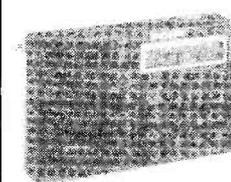
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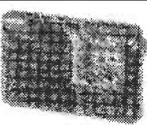
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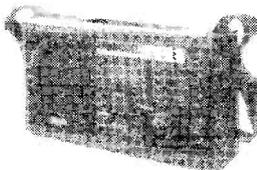
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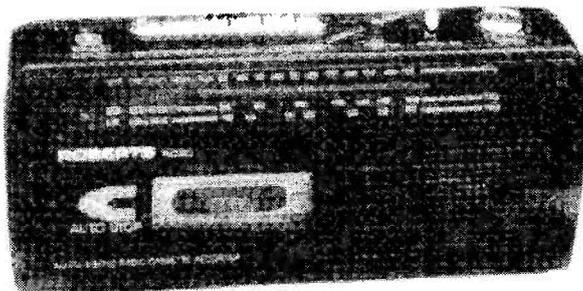
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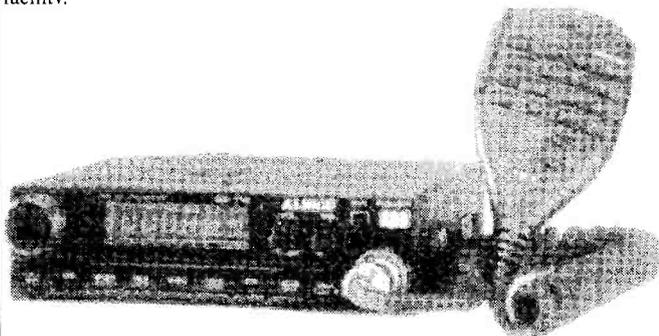
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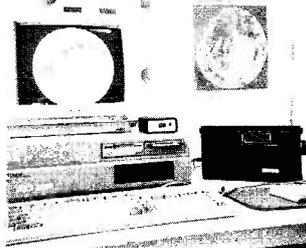
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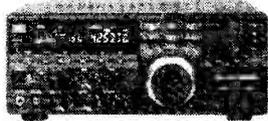


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Educational Software for Basic Electronics Part 7

After a break in the July issue, J. T. Beaumont G3NGD resumes this series with programs to explain power calculations, the concept of electrons and how the quantity of electricity is measured.

The first program this month is about power measured in watts. The program starts by showing how to transpose the formulae:
 $W = V \times I$ or $W = V^2/R$ or $W = I^2 \times R$
 in terms of watts, volts, amperes and resistance using triangles.

When this has been understood, the student can perform power calculations selected from the following options:
 A: Calculate power given voltage and current
 B: Calculate power given voltage and resistance
 C: Calculate power given current and resistance
 D: Calculate voltage given power and current
 E: Calculate current given power and voltage
 F: Calculate current given power and resistance
 G: Calculate resistance given power and voltage
 H: Calculate resistance given power and current

The Concept of Electrons

This program, which is a 'self-learning tutor', is intended to be used in conjunction with the next program (The Quantity of Electricity).

This program, when RUN, simply explains with the aid of an animated screen, what electricity is!

The topics explained are: electrons and atoms, conductors and insulators,

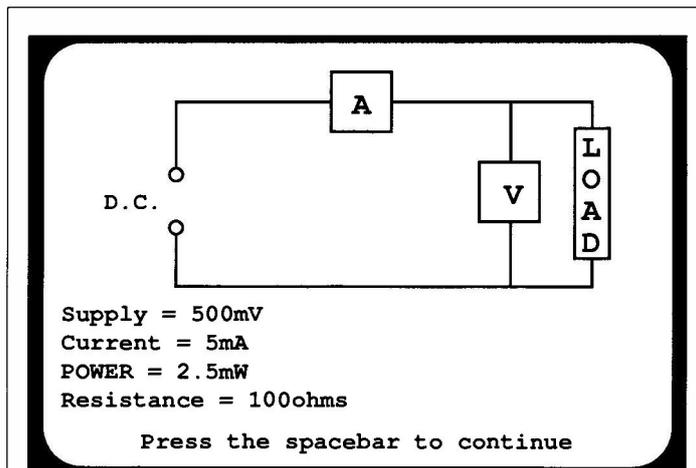


Fig. 7.1.

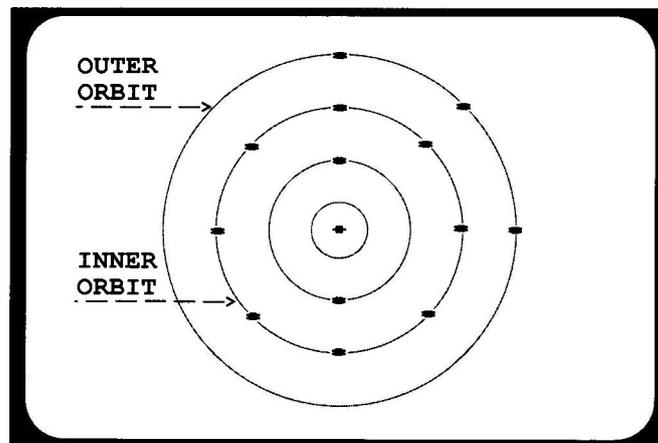


Fig. 7.2.

The Quantity of Electricity

This is called the:
Coulomb

This is determined by the number of **ELECTRONS**. As we can gather, there are millions of electrons flowing round the circuit.

Since the electron is small, we collect a 'Quantity' of electrons and call this 'Quantity' a **COULOMB**

There are approx. 6.27 Million Million Million Electrons in a Coulomb

Press the spacebar to continue

Fig. 7.3.

the difference between electron flow and conventional current flow.

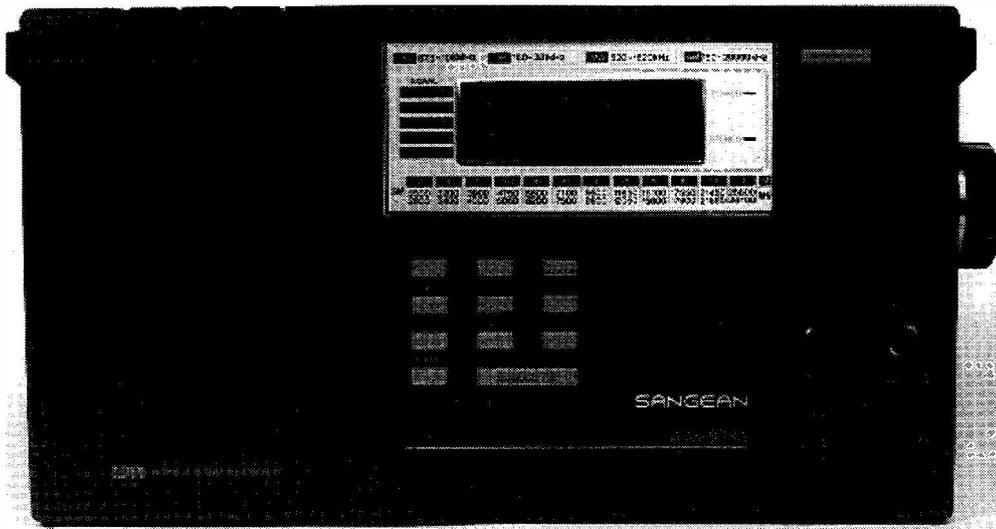
The Quantity of Electricity

This program is also a 'self-learning tutor', and is a follow-on from the previous program (The Concept of Electrons).

This program explains that a number of electron make up a coulomb, and when one coulomb of electricity flows in an electrical circuit for one second, then one ampere of current flows. Transposition of the formula $Q = I \times t$ is explained using the triangle method. (Note: the mathematical way to transpose formulae will be explained later).

The program then continues to explain electromotive force (e.m.f.) and also potential difference (p.d.).

Finally, the student can perform calculations regarding coulombs, voltage and time. As this program will be used at the introduction to an electronics course, I have assumed that students will not understand 'Exponent Format'. (This is explained in the next part of the series). With this in mind, the field format (@%) of the computer has been changed and the answers are all shown to six decimal places.



A Sanguine Sangean

The Sangean AT-803 has the disadvantage of requiring an expensive battery change fairly often if one doesn't use a separate mains supply. The obvious answer is, of course, to use NiCad rechargeable batteries.

Cheap NiCads are in plentiful supply from surplus dealers and at rallies, so I have been in the habit of installing NiCads in all my battery powered equipment together with a constant current circuit and a d.c. input connector. In this way, the NiCads need never be removed from the equipment and they can be recharged *in situ* from a 12-30V d.c. supply. Even that little gem of a m.w./v.h.f. receiver, the Saisho RQ2500, has room to accommodate this system.

There is a possible snag, though. NiCads have a nominal voltage of 1.2V against the 1.5V of expendable dry cells, but I have yet to find a situation where this loss of voltage could not be tolerated. Even so, in many cases, an extra cell can be squeezed into the equipment to retain the design voltage. The circuit shown in Fig. 5 can be used in practically every NiCad charging situation, only the type of transistor and the value of R2 are changed depending on the charging

current needed. When dealing with AAA, AA and PP3s, a couple of BC108s are adequate. Only when dealing with the heavy stuff, commercial C, D and F cells does one have to think in terms of power transistors and heatsink. Plastics power transistors are ideal as their pins can be soldered to a small board carrying the other four components and the mounting hole of the power device used to secure the whole assembly in the equipment. This method has been used to civilise my '803.

The following instructions, which include the fitting of an extra cell, relate to the Sangean AT803A. They may well equally apply to the other receivers mentioned at the beginning of the article, but there could be differences in board layouts and cabinet mouldings that would require

Table 1

Cell type	Capacity (Ah)	Charge rate (mA)	R2 (Ω)
AAA	0.18	11	56
AA	0.50	31	22
C	1.2	75	8.2
C*	2.2	140	4.7
D	1.2	75	8.2
D*	4.0	250	2.2
F	7.0	435	1.5
PP3	0.11	7	82

Fig. 1:

- R1 1.0kΩ
- R2 1.5Ω
- D1 1N4001
- TR1 BFX88 or similar
- TR2 TIP32
- B1 Extra D NiCad
- B2 NiCad pack - in receiver
- SK1 d.c. connector

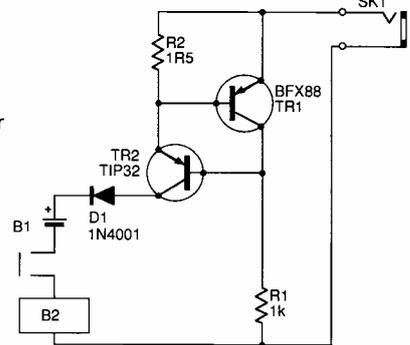
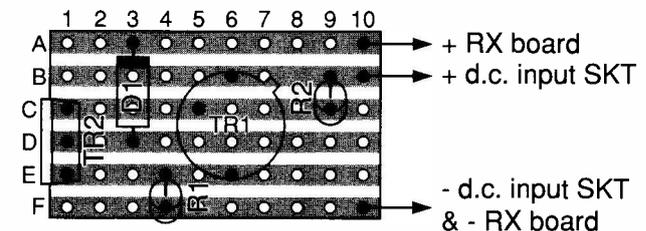


Fig. 2.



a different physical approach to the fitting. The principles, however, are the same.

First, assess the situation. Remove the six self-tapping screws holding the back of the set, not forgetting the short one hiding in the left hand side of the battery compartment, and gently remove the back, disconnecting the lead to the whip antenna.

The Sangean ATS-803, together with its clones, the Tandy DX440, Matsui MR4099, Tatung TMR7602 and others, has been on the market for some time now and represents excellent value for money, the performance being much better than the price tag would suggest. Bill Wilson explains how to fit rechargeable batteries into this popular set.

Construction

The modification is scarcely worth a circuit PC board, a tiny scrap of stripboard is perfectly adequate to support the five components (see Fig. 2). The choice of DC socket is a personal one, I use a 2.5mm jack socket simply because it is small and needs only a single-hole fixing. The power transistor and board is bolted to a strip of aluminium to act as a heatsink (see Fig. 3). This strip is drilled to allow it to be slipped over the two pillars which are moulded into the bottom of the cabinet.

The audio board is situated over the speaker and it can be unclipped from the case to reveal quite a large space under it - it looks as if it may have been indented for a mains transformer and associated circuitry. Refer to Fig. 4 and cut the track indicated, connect four flexible leads, two to the extra D cell, two to the charging circuit. Install the d.c. input socket at the side of the set and take two wires from this to the stripboard. While you have the drill in your hands, it's a good idea to make a couple of holes in the bottom of the case near where the heatsink will end up. The new assembly can now be slipped over the two pillars, the new D cell dropped on top - it should fit exactly - and the audio board refitted to its clips.

The two memory batteries can now be discarded and the battery compartment fitted

out with NiCads. The memory batteries are now superfluous as the NiCads are not removed for recharging. Remember to reconnect the whip antenna lead before refitting the back of the case.

If you are feeling adventurous and your 803 is out of guarantee, you might like to delve right down to the lowest stratum of p.c.b.s until you come to the one carrying the keypad right against the front panel. According to the circuit diagram in the handbook, there is a space for a diode, one can see it clearly marked on back of the board D405. If you fit a 1N914 diode, or similar, into this space, the v.h.f coverage should now extend down to 76MHz, useful for listening to the 'mid-Europeans' during periods of lift conditions. I must admit that I 'chickened-out' when I got as far as trying to remove or turn that last board!

The same basic charging circuit can be used for other types of NiCads. Table 1 gives values of R2 for various charging rates. Use an appropriate transistor for TR2, or just use a TIP31/32 for any charger. Any p.s.u. giving 12-30V, or a car battery, can be used for powering the charger. In the case of the Sangean, it will have to be capable of delivering 400mA.

Even allowing for the purchase of new NiCads, the system will soon pay for itself.

Fig. 3: Heatsink for TIP32 transistor.

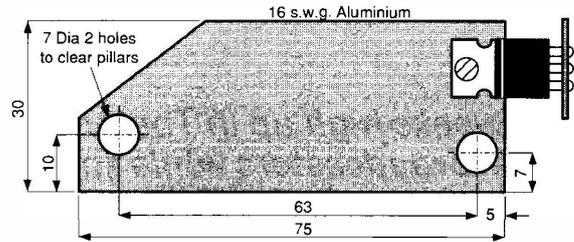


Fig. 4.

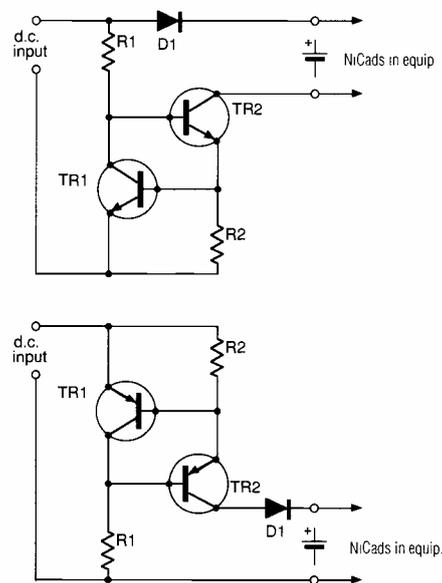
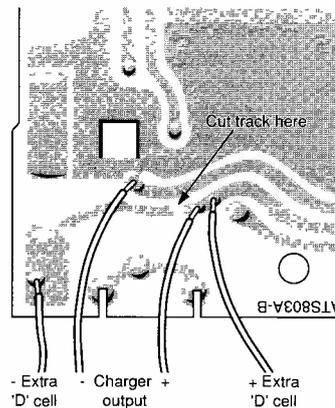


Fig. 5.

TR1 BC108, BFY51 or equivalent pnp
TR2 BC108, BFY51, TIP31 or equivalent pnp depending on charging circuit

R1 1kΩ
R2 See Table 1
D 1N4001

DXing in Ecuador

part 1

Two weeks high up in The Andes visiting radio stations, listening to exotic tropical broadcasters while soaking up the Andean sights and culture sounds idyllic. Dick and Peggy Ganderton took eight SWM readers on the trip of a lifetime to Quito, Ecuador, home of radio station HCJB.

One of the most popular short wave broadcasters is HCJB, The Voice of the Andes, located 9300ft up in the Andes. When we first relaunched *SWM* as a magazine for the listener, HCJB, in the form of Andrew Steele, was there giving advice and practical help with planning on the broadcasting side. Over the four and a half years since then *SWM* has forged strong ties with the UK end of HCJB's operation and it was inevitable that sooner or later the idea of organising a readers' trip to Quito would emerge.

HCJB have experience of organising trips to see their operations in Ecuador, but these have been primarily concerned with showing Americans just what their support, or potential support, is doing. The idea of hosting a party of British short wave radio enthusiasts was something entirely different!

A year of planning between *SWM* and HCJB in Bradford and Quito, went into turning the idea of a Listeners' Holiday into a successful reality. The

staff of HCJB's English Service in Quito, led by John Beck, were really enthusiastic about the whole idea and arranged a programme that combined radio with a more conventional tourist itinerary. This was felt to be important as it was hoped that by catering for the non-radio person we would encourage wives to accompany their radio-mad husbands. This worked as, originally two couples, besides Peg and myself, booked, although one couple had to cancel just a couple of weeks before the start of the trip.

Breakfast and a Bullfight

Ecuador is a long way from the UK - the total journey time amounted to 30 hours. Iberia flew us from Heathrow to Madrid where we waited in an almost deserted terminal building for the 0215 Iberia DC10 which would take us to Quito via Santa Dominica in the Caribbean and Lima in Peru. The things about the flight that stick in my mind

were having one of the two breakfasts accompanied by a film about a bullfight - with all the gory details - and the stewards refusing to let anyone have the blinds up to look at the superb views as we flew over the Amazon jungle and the Andes into Lima. We had to watch an out-of-focus, poorly colour-registered film with distorted sound - and to add insult to injury the aircraft landed ten minutes early so the film was switched off before it had finished!

John Beck and Andrew Steele met us at Quito airport. Quito is located in a long, narrow valley on the side of a volcano, so finding room for an airport capable of handling modern jets is, to say the least, difficult. Imagine Heathrow being sited in Regents Park and you would be close - the landing approach is spectacular as the plane flies between the mountains and over the city itself. The only hiccup of the entire holiday occurred at the airport. Iberia had managed to leave the Carlisle's two cases at Madrid, not to be seen again until a whole week later after having travelled via Heathrow and Miami! Fortunately, the English sense of humour prevailed and Reg and Wendy managed for the week by borrowing and doing some shopping.

Guest House

The coach took us to HCJB's own Guest House which was to be our home for the next two weeks. Guest House is a bit of a misnomer - it's more like a 3-star hotel. The programme had been arranged so as to give us all a couple of days of rest to allow us to acclimatise to the altitude and most evenings

were scheduled as rest/DXing throughout our stay. Most of the party had brought portable short wave radios with them and John Wilson, Technical Director of Lowe Electronics, when he heard about the trip insisted that we had to take a British designed and made set with us! I told John that the radio would have to be capable of operating half-way up a volcano as well as down in the steaming jungle and he came up trumps with a Lowe HF-225 in a leather carrying case and fitted with rechargeable batteries. Also installed were the active antenna and synchronous detection options, both of which proved to be very useful.

The first organised trip was a leisurely tour of HCJB's compound, just down the street from the Guest House. The size and depth of HCJB's operations in Ecuador started to become apparent as we looked around the printing works, the various language departments, the studios and the control rooms. The transmitters and antennas are remote from the studios, in the next valley and the link between the studios and transmitters is by a microwave link using a passive reflector on top of Pinchincho to lift the microwave signals over an intervening mountain! Then it was over the road to tour the Vos Andes Hospital, run by, of course, HCJB! I found it awkward being taken round a working hospital, but the patients and staff seemed to consider it normal!

Fantastic Sights

Throughout the entire trip we had the use of the same coach and Umberto, our driver, entered into the spirit and took



Ken MacHarg recording Saludos Amigos in Studio 9 at HCJB, Quito. In the background are (l - r) John Downing, Chris Mould and Reg Carlisle. Photo: Peggy Ganderton.

Table 1

Programme	Presenter	Time (UTC)	Day	Frequencies (MHz)
<i>Saludos Amigos</i>	Ken MacHarg	0730	Sunday	11.835, 15.270 & 17.790
<i>Saludos Amigos</i>	Ken MacHarg	1900	Sunday	15.270, 17.790 & 21.480
<i>HCJB Today</i>		1700	Monday	11.835, 15.270 & 17.790
<i>Happiness Is</i>	Dee Baklenko	0730	Tuesday	11.835, 15.270 & 17.790
<i>Happiness Is</i>	Dee Baklenko	1900	Tuesday	15.270, 17.790 & 21.480
<i>Ham Radio Today</i>	John Beck	0730	Wednesday	11.835, 15.270 & 17.790
<i>Ham Radio Today</i>	John Beck	1900	Wednesday	15.270, 17.790 & 21.480
<i>Happiness Is</i>	Dee Baklenko	0730	Thursday	11.835, 15.270 & 17.790
<i>Happiness Is</i>	Dee Baklenko	1900	Thursday	15.270, 17.790 & 21.480
<i>DX Party Line</i>	Rich MacVicar	0730	Saturday	11.835, 15.270 & 17.790
<i>DX Party Line</i>	Rich MacVicar	1900	Saturday	15.270, 17.790 & 21.480

Notes: HCJB's experimental s.s.b. transmissions on 21.455 & 25.950MHz also carry these programmes. The details given above are for the European releases. Times to other parts of the world differ. Full programming details can be obtained by sending an s.a.e. to HCJB UK, 131 Grattan Road, Bradford, West Yorkshire BD1 2HS if you are in the UK or one IRC to HCJB, Casilla 17-01-00691, Quito, Ecuador, South America if you live anywhere else.

the coach, with us in it, to places which other coaches could not reach. At least, that is how it seemed to us. The coach turned up outside the Guest House, we all got in and Umberto took us off to see some more fantastic sights. Continuing with the easy start to the trip, we went on a tour of old Quito. Quito is a special city in the eyes of the United Nations and the old colonial part is being renovated, with a UN grant, so that it retains its character.

As I mentioned earlier, HCJB had organised a busy itinerary with visits to their own facilities and to several other broadcast stations in Ecuador being interspersed with tourist type activities. During the trip we went to the studios several times and sat in on a live transmission of *HCJB Today* with presenter Jim Allen who interviewed most of us during the programme. Ken MacHarg records his weekly programme *Saludos Amigos* for transmission at different times to North America, Europe and other places around the world.

We all crowded into Studio 9 in Quito and took part in one of Ken's recording sessions. I was intrigued to find out that he doesn't use a script, yet he managed to finish on time. Some friendly barracking took place when Ken was unable to pronounce Gloucestershire, coming up with something akin to 'Gloucestershya'. None of us, though, could help Ken

with some unpronounceable place in Africa. We didn't hear the programme when it was transmitted as we were all asleep at the time, Quito being on BST - 6 hours. But I was told that it sounded good. A lot of preparation goes into programmes like *Saludos Amigos* with hundreds of readers' letters to be sorted and sifted, suitable interviews to be taped, the 'jingles', interest snippets and music got ready to be played at exactly the right moment.

This religious broadcasting is obviously big business in the States with cassettes being available, with the backing music on one side and a rehearsal with singer on the other, for almost any religious song you care to name. During a show one of the HCJB missionaries will come into

the studio with one of these tapes and sing as it is played - instant full orchestra! Various organisations, such as the Salvation Army, provide cassettes of interesting items, put into a religious context, which can be used to make a programme more interesting. Later on we spent some further time in the studio with John Beck recording a series of short interviews on matters related to short wave listening and amateur radio. John will be using these during the next few weeks in his regular weekly programme *Ham Radio Today*.

We met other members of the English Service at HCJB who's names will probably be familiar to regular listeners to HCJB. Dee Baklenko, who presents *Happiness Is* and the Canadian who lives and

breathes short wave listening - Rich MacVicar. Just describe a snippet of what you heard, on roughly what frequency and when and Rich will instantly tell you the station, frequency, who owns it and probably the colour of the carpet in the studio, with a famous Rich MacVicar joke thrown in for good measure - "Old fishermen never die - they just smell that way". Rich puts his DXing knowledge to good use in presenting his weekly *DX Party Line* programme.

Evening DXing

The evenings were mostly spent at the Guest House, when the Lowe HF-225 was removed from its leather case, the mains power unit plugged in and we listened around the bands for whatever we could find. The high level of QRM seriously hindered any serious listening up to around 7MHz so we tended to opt for the higher frequency bands. The antenna used was either the built-in active antenna with its whip or a 10m length of flex strung around the upstairs lounge. We spent numerous hours trying to 'go up the Amazon' with Dick Moon's article in the May '91 *SWM*. We never did succeed - but Rich MacVicar did! My main interest was to see how the HF-225 behaved itself and I will have more to say about it next time. Suffice it to say for now that it acquitted itself with honours. ■



Dee Baklenko pours another cup of coffee during our teatime visit to the English Service at HCJB, Quito. Geoffrey Rees is seated behind her. Photo: Peggy Ganderton.

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propagation

by Ron Ham
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The sun was really active again in May when **Ted Waring** (Bristol) counted 12 sunspots on the 1st, 25 on the 9th, 20 on the 14th and 15 on the 20th. Patrick Moore (Selsey) made drawings of the large sunspot groups that he observed at 0925 on May 13, **Fig. 1**, and 0855 on the 27th, **Fig. 2**. Both of these were around during periods of ionospheric disturbance, which is no surprise after seeing the associated peaks in solar flux on **Neil Clarke's** (Ferrybridge) computer printout, **Fig. 3**.

While surveying the sun's disc with his spectroheliograph, **Cmdr Henry Hatfield** (Sevenoaks) located 2 sunspot groups, 13 filaments, 7 quiescent prominences and two faint spray prominences at 1128 on May 1; 2gps, 11fs and 6qps at 1415 on the 20th; 2gps, 6fs and 10 small qps at 0938 on the 27th and 3gps, 15fs and 4 small qps at 0850 on June 4. Henry's radio telescopes recorded individual bursts of solar noise, at 136MHz, on June 1 and 2 and at 1297MHz on May 30, 31, June 1 and 2. Increases in general noise level at 136MHz were observed on May 28, 30, 31 and June 2. Noise storm conditions occurred for various periods on each of the latter four days.

Ted Owen (Maldon) found the 28MHz band almost dead on May 2 and **Fred Pallant** (Storrington) just heard two American beacons. Fred found

similar conditions on the 17th and, despite checking the band several times on the 23rd, he heard nothing except the UK beacon, GB3RAL. **Ern Warwick** (Plymouth) reports that the 28MHz band was 'dead' when he checked around 0830 on the 5th, 1900 on the 13th and 1100 on the 16th. Ern also heard solar noise at 0850 on the 3rd, 1300 on the 16th and 1010 on the 25th.

Further to my report last time about the activity in April, **Rob Mannion** witnessed a radio-blackout, from Dayton, Ohio, on the 25th and 26th, on the h.f. broadcast bands and could not hear the BBC's World Service properly for a couple of days.

Auroral

Ron Livesey (Edinburgh), the auroral co-ordinator for the British Astronomical Association, received a reports of a 'big' and 'active' aurora, with 'up to overhead coronas' overnight on May 1/2, from observers in North Dakota and Wales. "This was the aftermath of the storm at the very end of April", said Ron.

Ern Warwick tells me that the German propagation beacon DK0WCY on 10.144MHz was giving weak auroral warnings when he checked its signals at 0820 on May 3, 1730 on the 25th, 0900 and 1400 on the 26th and 0820 on the

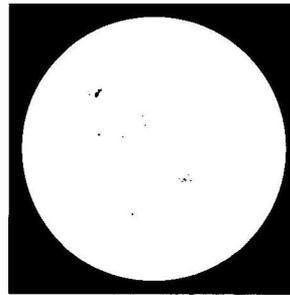


Fig. 1.

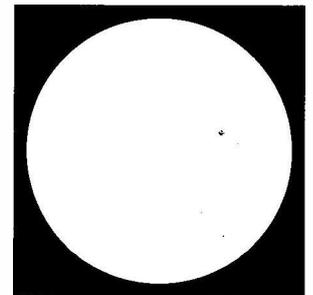


Fig. 2.

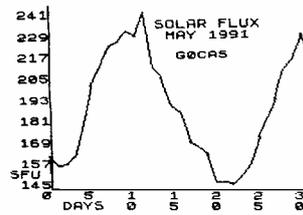


Fig. 3.

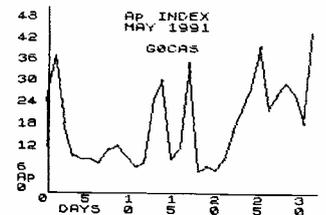


Fig. 4.

27th. **Doug Smillie** (Wishaw) heard the auroral effect, tone-A, on terrestrial signals on May 2, 13, 14, 23, 25, 26 and 31.

Magnetic

The daily variations in magnetic activity for May can be seen in the Ap index, **Fig. 4**, kindly supplied by Neil Clarke. Ron Livesey reports that the various magnetometers used by **Karl Lewis** (Saltash), himself, **Dave Pettitt** (Carlisle) and **Doug Smillie** each recorded storm conditions on the 24th and 25th.

Propagation Beacons

First my thanks are due to **Chris vanden Berg** (The Hague), **Gordon Foote** (Abingdon), **Henry Hatfield**, **Ted Owen**, **Fred Pallant**, **Ted Waring** and **Ern Warwick** for their 28MHz beacon logs from which I compiled our monthly chart, **Fig. 5**. **Gordon Foote** added T1A5ET on 28.220 and WJ9Z/B on 28.251MHz this time and reports that ZS6PW is now on 28.179MHz. He had a good day on May 21 when, between 1525 and 1836, he logged 12 beacons. **Ern Warwick** copied VK2RSY, on 28.262MHz, sending 'VK2RSY ITU DAY 17th MAY' at 0910 on May 15 and 'VK2RSY 80 YEARS OF WIA' at 0910 on the 22nd.

Tropospheric

The daily changes in atmospheric pressure, recorded at my home in Sussex, for the period April 26 to May 25 and some of the weather details associated with an opening can be seen in my 'DX Television' column elsewhere in this issue.

While in Lawrence Kirk on May 20, **George Garden** (Edinburgh) tuned through Band II and logged Radio Ulster for the first time at this location and later, high on Cairn O' Mounth he received 'plenty' of signal from BBC Radio York. While the pressure was really high, (30.5in - 1032mb), on the 22nd I heard Dutch and German broadcast stations in Band II as I did during a similar opening at 1030 on June 1. The previous day, **Andrew Jackson** (Birkenhead), using a Sony ST-S110 tuner, found German stations on four spots above 100MHz and the one on 100.5MHz, 'was in clear stereo' said Andrew.

Sporadic-E

I caught the end of an Es opening at 2200 on June 1 and counted 5 strong east European f.m. broadcast stations between 68 and 72MHz, the first for me in that region so far this season.

	April					May																										
	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
DF0AAB					x																											
DF0THD																																
DLOIGI			x	x	x	x																										
EA3JA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
HG5GEW					x																											
IY4M					x																											
KA1NSU																																
KC4DPC	x																															
KD4EC	x																															
KF4MS																																
KJ4X	x																															
LA5TEN																																
LU1UG																																
NX20	x																															
OK0EG																																
OH2TEN	x	x																														
PT7BCN																																
PT8AA																																
PY2AMI																																
SK5TEN																																
T1A5ET	x	x	x																													
VE3TEN																																
VK2RSY	x																															
VK5WI																																
VK6RWA	x																															
WA4DJS	x																															
WC8E	x																															
WJ9Z/B																																
W3VD	x																															
ZD8HF	x	x	x																													
ZL2MHF																																
ZS1LA	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
ZS5VHF	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
ZS6PW	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Z21ANB	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
4N3ZHK																																
5B4CY	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
5Z4ERR	x	x	x																													

Fig. 5.

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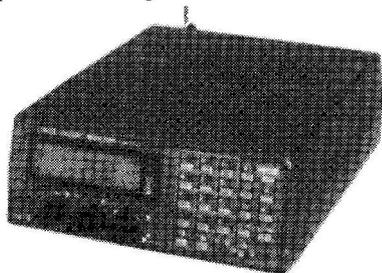
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Peter Rouse GU1DKD, Barcroft, Rohais de Bas, St Andrews, Guernsey, C.I.

I write this month's column hot on the heels of a visit to New York on Concorde. Before anyone suggests I am grossly overpaid (no comments from the Ed, please) I hasten to add that it was courtesy of British Airways and I was one of a press party in my other life as a television producer and reporter. However, I obviously went hot foot to the cockpit and quizzed the crew on communications. I learned that they only have to use h.f. (usually NAT-C...see below) for around two hours such is their speed. Using track 'Sierra Mike', which is the Concorde special routing, they work Shanwick for the first half of the journey and then Gander for the remainder before finally being passed to Moncton on v.h.f. before transition to the New York area control centre and deceleration to sub-sonic speed. I gathered a lot of information on the trip and I hope, in the near future, to write a full article on Concorde's routing and communications.

Meanwhile, this leads me nicely on to a look at the current north Atlantic tracks system, which now consists of five zones: NAT-A, NAT-B, NAT-C, NAT-D and NAT-E (the latest addition). In order to spread the load over the tracks, controllers use a fairly simple system based on where individual aircraft are registered. Note the descriptions that follow only apply to the north Atlantic (The south Atlantic is known as SAT). The system works like this:

NAT-A: Southern routes available to all aircraft.

Frequencies: 3.016, 5.598, 8.825, 13.306 and 17.946 MHz.

NAT-B: Central and northern routes for aircraft registered west of 30° west. Frequencies: 2.899, 5.616, 8.864, 13.291 and 17.946 MHz.

NAT-C: Central and northern routes for aircraft registered east of 30° west. Frequencies: 2.872, 5.649, 8.879, 13.306

and 17.946 MHz

NAT-D: Northern routes outside the organised track system available to all aircraft.

Frequencies: 2.971, 4.675, 8.891, 11.279, 13.291 and 17.946 MHz.

NAT-E: Northern and central routes for aircraft registered east of 30° west. Frequencies: 3.476, 6.628, 8.906, 11.309 and 17.946 MHz.

Within any given zone there will be a number of tracks. On the day I flew to New York the tracks were 'A' (military) to 'G' and 'Sierra Mike'. The actual routing of the tracks changes almost daily to allow for weather conditions, particularly the wind. 'Sierra Mike' rarely changes because Concorde flies so high (typically between 55 000 and 58 000 feet) that weather is not usually a problem. Incidentally, if you have not listened to aircraft routing across the Atlantic you may not be aware that traffic usually only goes in one direction at any given time. During the morning they all leave Europe and head for America and during the evening (our time) they send them all back our way.

Your Letters

Paul H. of Newbury has been listening to some of the so-called spy number stations mentioned recently. He is particularly intrigued by a station on 3.370 MHz which starts up at 1830 in the evenings and transmits for around four hours with occasional breaks using both a.m. and s.s.b.. The language is German and after very close listening he is convinced that the announcement consists of a tape which has been re-edited to restructure the sequences in which the number are sent.

Paul has several theories on how information is coded in these transmissions and thinks that decoding may be done using one-time de-coding sheets which would make the codes

virtually unbreakable. He also believes that the transmitter could even be in the south of England (now there's a new twist). Failing that he says the transmitter is in Continental Europe and if so, must be extremely powerful. Paul says there are reports that a British numbers station is definitely operating on 9.251 and 7.880 MHz although he has yet to log the station.

However, Paul has managed to log 'Air Force 2' for the first time. That is the United States Vice-President's aircraft and Paul logged it as Dan Quayle was flying to Czechoslovakia. He in fact logged it four days before the media reported the visit.

Paul also mentions that the hurricane season is now nearly upon us and that means we may soon hear from the NOAA (National Oceanographic and Atmospheric Administration) hurricane hunters operating in the Caribbean. These are aircraft that are deliberately flown into the heart of the hurricane to gather scientific data (I wonder if they check on the sanity of the crews as well). Paul mentions possible frequencies to check as 3.407, 5.562, 6.673, 8.876, 10.015, 11.898, 13.267 and 21.937 MHz and I have heard them on 9.020 MHz. Paul has also been trying to monitor the US customs patrols in the area as they operate substantial anti-drug trafficking operations but has had no luck so far. The only possible frequencies I can suggest are 3.123, 15.081 and 15.084 MHz for the air patrols and 11.195, 11.198 and 15.084 MHz for combined coast guard and navy air operations. US customs and DEA (Drug Enforcement Agency) are also believed to operate on 7.527, 11.076, 18.666 and 23.210 MHz. Callsigns to listen out for are 'Atlas' and 'Epic'.

Paul has been listening-out for the Arctic expedition mentioned last month but has had no luck so far. However, he has been able to add two frequencies for the Antarctic US Navy station.

This is a MARS (Military Affiliated Radio Service) facility that operates on 13.862 and 13.974 MHz using the callsign NNNOICE.

Paul has provided a lot more frequencies from his logs and I hope to include more of these in the near future.

Current News

Both Clark US Air Base and the Subic Bay US naval facility (headquarters of the US seventh Pacific Fleet) in the Philippines have been badly affected by the eruption of Mount Pinatubo. All but essential personnel have been evacuated at the time of writing. Ironically the future of the bases was already in question because the Philippine government was demanding an annual rent of £479 million. The American government has politely told Mrs Aquino's government that the demand is outrageous.

Listen out for Clark on 6.738, 8.993, 11.176, 1.3201, 18.002 and 23.227 MHz. The US Navy MARS station at Subic Bay has been known to work 4.820, 7.495, 11.403, 14.820 and 19.188 MHz.

QSL Cards

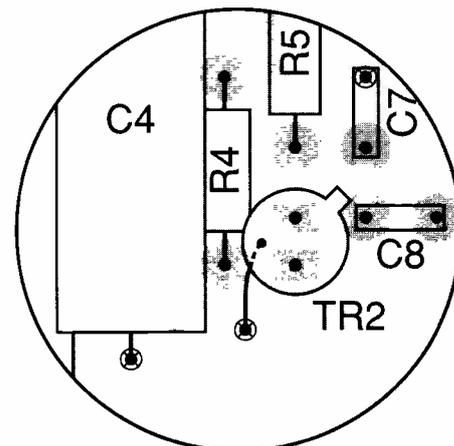
Peter Nicholson of Huddersfield has written to ask if I can include a few addresses for QSL cards each month. I see no reason why not, but I will rely on readers to come up with addresses as I have never personally collected these cards. I do know that individual military bases in the USA will QSL and USAF bases will respond with cards for aircraft based out of their fields (quite how you figure where a particular aircraft is based is another matter). I caution readers not to send reports to British stations (civil or military) as utility listening in this country is still frowned upon.

Bye for now...more SSB next month.

Errata

An Experimental VHF Receiver. June & July 91.

Just after Part 2, which contained the constructional information, was passed for press we discovered that the TIS43 unijunction transistor specified for TR2 is now almost impossible to obtain. The alternative is to substitute a 2N2646 unijunction transistor, available from Maplin Electronics as order code QR14Q or Electromail as part number 294-031. The case and lead configurations for the 2N2646 transistor are different to the TIS43 and the enlarged scrap view of the relevant section of the p.c.b. with the 2N2646 in place is shown here. Note also that the larger, axial lead, electrolytic capacitor labelled C9 in Fig. 2.1 is, in fact, C4 as shown in the enlarged scrap view and pins 3 & 6 of IC1 (not pin 5) are soldered on both sides of the p.c.b. The p.c.b. is correct and needs no modifications to accept the change of TR2.



NORTH AMERICA.

Gerry Dexter, RR4, Box 110, Lake Geneva WI, 53147 USA.

Here we are again with news about the short wave scene in the Western Hemisphere. Once again I have a variety of items to report, although some of it may amount more to the dreams and hopes of would-be broadcasters than to real world reality!

KNLS & the USSR

Let's start at the top of the map. New Life station KNLS at Anchor Point, Alaska provides us with yet another measure of how much things have changed in the USSR in recent years. The religious station says it now airs a religious programme over the USSR's All Union Radio Network on Tuesdays between 2105-2205. This is being carried on local channels as well as on short wave, although exact frequencies haven't been allocated yet.

USA Rebirths

Two short wave stations that have been silent for sometime may be back on the air soon, perhaps even now. Religious station KCBI in Dallas, Texas was on the air for only a year or so before its owners closed it down, apparently due to financial restraints. Now there are reports that the station is being purchased by yet another religious group. An operations schedule has been released that shows the station plans to be on the air at 0230 to 1400 using 9.915MHz and 1400 to 0230 on 15.375MHz.

Back in early 1989 we were hearing test broadcasts from a rather off-beat religious station using the call letters KJES and located in the tiny town of Vado, New Mexico. The station never really ran any actual programmes and left the air after a month or two. Now it, too, has released an operating schedule. KJES lists broadcasts for 1500-2200 on 9.665MHz, 0000-0200 on 11.730MHz and 2100-0000 on 11.755MHz, running a 50kW transmitter. The actual return of this one has not yet been noted by North American DXers.

Caribbean Beacon

The Caribbean Beacon, a medium wave and f.m. broadcaster on the island of Anguilla has been purchased by evangelist Dr Gene Scott and his University Network. Dr Scott says that he plans to add a short wave outlet as well, which would put a new radio country on the air.

Scott, incidentally, is said to be behind the attempt to buy KCBI. Scott's preachings are currently heard on KVOH shortwave that broadcasts from California, the Voice of Hope in Lebanon and WWCR in Tennessee, as well as on local stations and cable television.

WWCR, incidentally, has now put a

second 100kW transmitter on the air and now operates 24 hours per day. Additional frequencies are 7.435, 12.160 & 17.525MHz. In addition to the paid religious broadcasts WWCR airs a number of unusual programmes, including several produced by anti-Castro opposition groups and an expatriate station, Radio Newyork International.

Radio Miami? Not Yet!

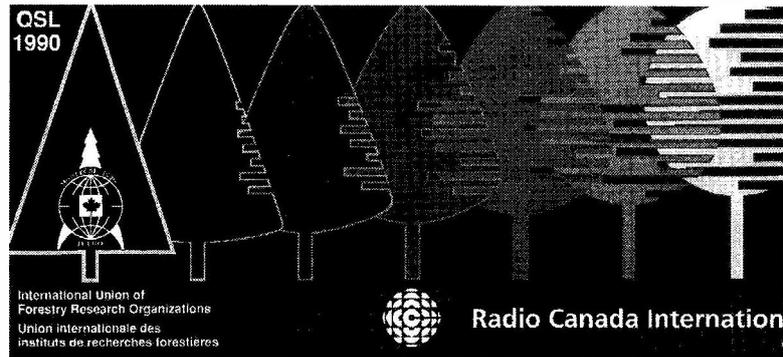
Radio Miami International, the station proposed by Jeff White, is still awaiting the go ahead from the Federal Communications Commission. Many s.w.l.s know of Jeff White through his work in creating the Radio Earth program and later the short-lived Radio Discovery in the Dominican Republic. While RMI waits on the FCC it is apparently arranging for the placement of those anti-Castro programs on such stations as WWCR and WHRI. Radio Miami International is also involved in putting a new station on the air from Honduras. This one would be called Radio Copan International and has plans to operate from 1200-2300 on 15.055 and 2300-0400 on 9.95MHz, using the call letters HRTW.

Other Central American News

Radio For Peace International had to rebuild both its studio/office building and its transmitter building after the installation was damaged by an earthquake, according to information sent by the station. Monies designated to be spent on a new transmitter had to be used for these construction projects instead. So the station is now trying to raise money to buy a fourth transmitter which would allow simultaneous transmissions on four frequencies. The station currently operates on 21.460MHz upper sideband during weekdays and a.m. mode on weekends. Both 13.670 and the newer 15.030MHz are on the air 24 hours per day. Earlier this year the station ran some brief tests using the narrowband f.m. mode.

Throughout most of the 11 years of El Salvador's guerilla war the FMLN opposition operated two clandestine stations on short wave: Radio Venceremos and Radio Farabundo Marti. But the government's Radio Nacional was almost totally inactive during that period. Now the two FMLN stations are active on local f.m. channels only and the government is planning to return Radio Nacional to short wave. No target date or frequencies have been announced but you might check the formerly used channels of 5.98 and 9.555MHz variable, just in case this one really does show up.

The Quaker Theological Seminary at Sicimula, Guatemala is planning to put a religious/educational station on



short wave. Again, no target date has been announced and, in fact, the group seems to still be in the process of raising the necessary funds to build. The station will likely to be a fairly low power affair and may well operate in the 90 or 60m band, where many of the Guatemalans are found.

HCJB's *DX Party Line* programme says the Guyana Broadcasting Corporation, inactive on short wave for quite some time, plans to resume broadcasting on its old 5.950MHz frequency. This station has never been a very easy catch, even in North America. Again, there's no indication as to when to expect this one to show up.

Incidentally, the *DX Party Line* programme on HCJB has been carrying much more information of interest to the experienced DXer of late and it's very much worth listening to each week.

You can look for Spanish National Radio's new relay station in Costa Rica to come on the air before too much longer. The start up is planned for January. The Costa Rican government's Radio Nacional will also be using this facility. No frequencies or schedule is available yet.

It's hard to say whether this will still be going on by the time you read this but, during the spring and early summer at least Radio Havana Cuba was conducting single sideband test broadcasts. These were airing between 0400-0600 on 5.965MHz. Reports on the tests were wanted, in care of DXers Unlimited, Radio Havana Cuba, PO Box 7026, Havana.

New Colombian

A Colombian station operating on

5.536MHz was spotted by DXers some months back, but remained unidentified until recently. The station is called Radio Ecos Especiales and is owned by a Protestant religious group. It signs on at 1000 and closes at 0400. The location is still uncertain but it may be in Bogota.

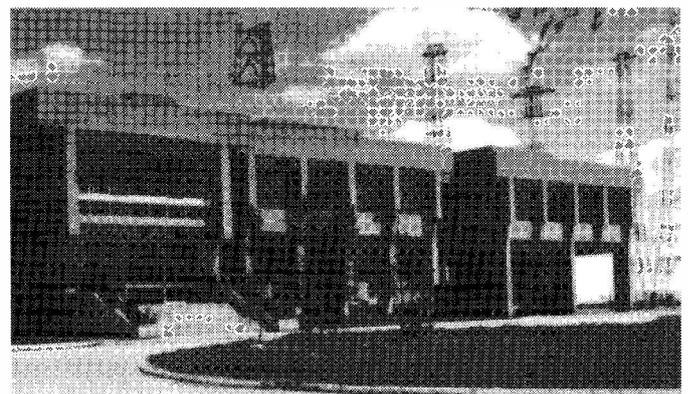
Next door in Venezuela, the government's Radio Nacional now seems to be maintaining a fairly stable schedule. Broadcasts of the international service are one hour in length and start at 1100, 1400, 1800, 2100, 0000 and 0300 Monday through Saturday, all on 9.54MHz. Each broadcast contains segments in Spanish, English, French and Creole. Reception reports go to PO Box 3979, 50700 Caracas, Venezuela.

A reminder that on Christmas Day this year, HCJB will celebrate 60 years on the air. As part of the celebration, the station is running a contest and two people will win trips to Ecuador. The requirements are just that you send a postcard with 'Happy 60th Birthday' on it, to reach the stations by December 15. The address is Casilla 691, Quito, Ecuador.

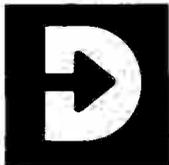
Saving RCI

The virtual demise of Radio Canada International has spurred cries of dismay throughout the world of short wave. If you wish to write a letter supporting the restoration of RCI, you should send it to the Coalition to Restore Full RCI Funding, c/o SCFPO local 675, 1250 de la Visitation, Montreal H2L 3B4, Canada.

That covers things for this time. I'll be back in three months with more of what's happening with short wave in the Americas.



Spanish National Radio should have its Costa Rican relay on the air sometime after the first of the year.



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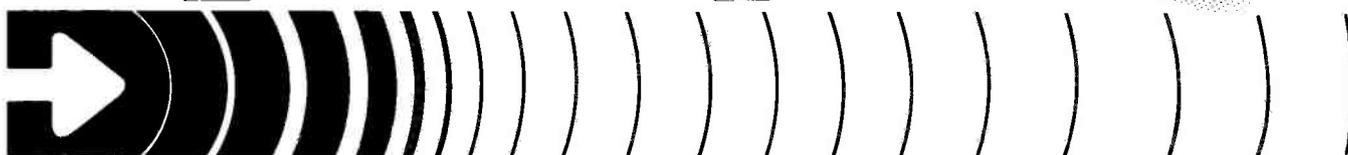
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SONY ICF SW7600 (see above)	£149
ICOM R1 (see above)	£399
ICOM R100	£499
AOR 1000 500kHz - 1300MHz	£269
AOR 2515	£575
AOR 3000	£695

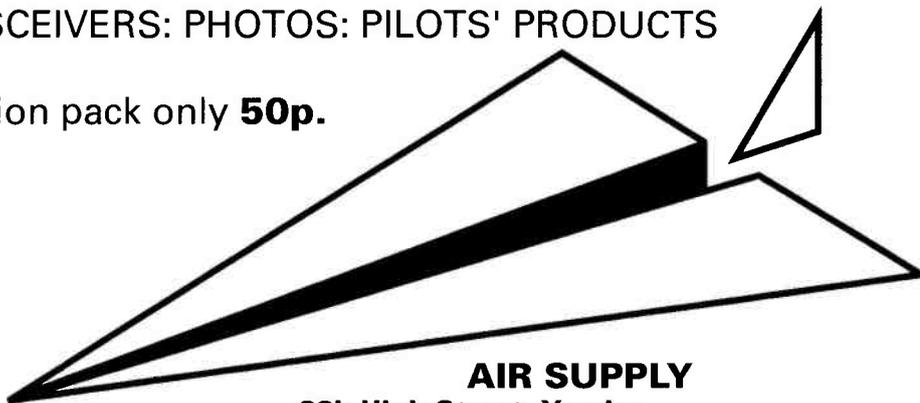


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satellite tv news

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

In the past I have referred to SNG (Satellite News Gathering) vehicles - mobile units that travel to news and sporting events and uplink their output via satellite back to the studio for 'live' and recorded inserts into programmes. Such mobile units are housed in purpose-built vehicles with their own generating equipment, though smaller mobile systems can be shipped, by air in flight cases, for assembly in an hour or less by one or two operators, though dish size tends to be about 1.5m or less for the smaller portable operation.

Each SNG unit has a Eutelsat 'registration number' for use over the Eutelsat system when uplinking material, that number is unique to that set of equipment. Often satellite enthusiasts will see these numbers, for example on Eutelsat II F2 10°E you may see 'UK1-34'. This refers to the Sky TV SNG unit that operates in the Ku low band with a 1.9m dish. One reader has kindly provided a list of most European Eutelsat registration numbers and these are listed below. The situation is further confounded with Intelsat having a different registration number for the same unit when it operates over the Intelsat system.

The Eutelsat numbers, accurate to March 1991, are given in the table below. Sometimes SNG vehicles are referred to as TES units (transportable earth stations).

The SIS (Satellite Information Services) horse racing feeds are currently seen most days, some in the 'clear' or in B MAC over Intelsat V F2 21°W, look on 11.135 and 11.175GHz horizontal. The bird is in inclined orbit (i.e. is ending its life and carries no orbital slot correction fuel) and signals will vary from good to nonexistent. Satellites that are unstable normally can be leased at attractive rates since the downlink operator will need to track the craft continually during programme times to maintain adequate signal quality. SIS provide horse racing outside broadcast feeds for the bookies shops and also BBC/ITV racing. The SIS bookies shop service is a compilation of several race meetings on a given day which is uplinked from London Teletop and comes back to earth from Intelsat VI-F427°W in addressable B MAC - though intended for betting

shops, any pub, racing stable or individual can subscribe to the service. On June 8, both SIS feeds over 21°W were in the clear.

Later on the same day, colour bar tests were logged on Eutelsat (ECS) II F2 11.005GHz horizontal with the 'Telegenic OB' caption, at 1900 hours there appeared the 'Mission Scotland' live OB from a very large religious gathering with a full service and address from 1920. Also on ECS 10°E earlier that afternoon were dramatic shots of cycle racing from the air, the OB uplink feed was carried over an 11.059GHz transponder to RAI HQ in Rome, the same OB material was downlinking as the RAI UNO programme service at 10.972GHz vertical. An unusual sighting during the morning of June 11 was a Sky News feed carried ex Moscow over the Gorizont 14°W 11.512GHz Luch transponder.

News

The saga of the Eurosport demise in May and return to the air over Astra 1B has been well documented so I'll not go over old ground again. Interesting to note that the TF1 origination may well be using up to 5 hours daily intake from the Swedish Agesta Earth Station - for a time the Eurosport apology captions seen over Astra 1A originated from the BBC TV Centre! Eurosport has also been seen downlinking on Kopernikus 123.5°E 11.547GHz vertical.

June 4 saw a loss of control on Astra 1B which went into a spin from 1156-1331CET producing periods of 3 minutes picture with 6 minutes loss! And Astra 1B is finding less than enthusiasm in Scandinavia on its vertical beam giving measured signal levels down by up to 15dB on the horizontal beam. It is thought that the vertical beam has been re-orientated to favour the Iberian Peninsula at the loss of Scandinavia.

Problems at the Kourou Space Centre with the launch delays of Astra 1B are thought to be the cause of an announced delay of launches by Ariane space vehicles with up to 6 weeks being suggested, this could have an unfortunate knock on effect since Matra Espace's Telecom 2A could be delayed and not be positional for the

Winter Olympics from Albertville, France in February 1992 - it had been planned that HDTV pictures from the Games would be transmitted over 2A. The bird will replace Telecom 1A, to be retired from September 1991.

Eutelsat have signed a contract with Arianespace for the launch of ECS II F5 from the French Guinea Space Centre at Kourou. It will have a 9 year life and be used for full time TV leases, telephony and 'occasional' traffic.

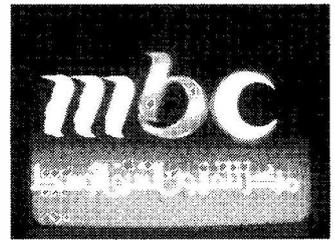
Happier satellite viewers in Switzerland, the Swiss government have up to recently charged dish owners approx £40 for the 'privilege' of enjoying satellite TV. A ruling by the European High Court of Justice advised that Switzerland were in breach of European legislation for charging a satellite licence fee in an attempt to frustrate viewers the free reception of such signals and violating the freedom of information. The Swiss PTT are now refunding already paid licence fees!

Bookings are now being taken by COMSAT for transponders aboard the new Intelsat K high powered satellite due for launch February 1992 over the North Atlantic path (this date may be delayed 6 weeks - see previously). 'K' will offer some 32 TV channels and footprint between mid-West USA, South America and into Europe giving quality reception on dishes on 1.8m.

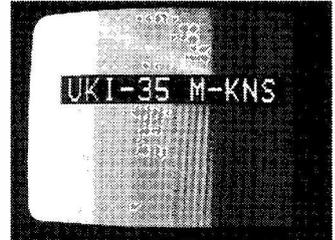
CLT - Luxembourg have advised that a new channel RTL-2 will be transmitted over Astra in the French language, offering a new film daily and news every 2 hours. Not aimed specifically at the French market, the channel will be seen on Belgian cable as the main audience initially.

There is media discussion about a new London Teletop to be opened later 1991 funded by France Telecom and Maxwell Communications for pan-European communications primarily for broadcasters, the transfer of TV programming between European sources and of USA originated programming to the same sources. Initially Eutelsat series II birds will be used for the new teletop routing.

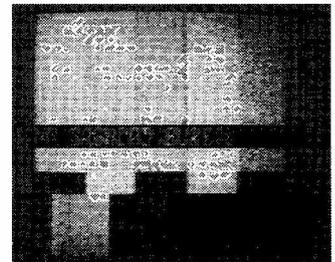
The new Hong Kong based BNN (Business News Network) will provide a 24 hour business news service across the Asian/Pacific region deriving programme input from Wall Street, the UK



Station logo for Middle East Broadcasting; Eutelsat II F1 13°E at 11.554GHz horizontal



Transportable earth station UK1-35 was at Milton Keynes for a BBC OB. Geoff Sarbutts.



SNG unit in operation during Gulf War, Intelsat 57°E at 10.990GHz horizontal, taken by Dr Helmut Vahrbruch, Germany using only a 900mm dish.

Stock Exchange and other World's main financial houses in conjunction with specialist programme producers such as BSKyB and Financial Times TV - the service is due to start Sept/October 1991. Also in Hong Kong, the Hutchinson Whampoa company has started test transmissions in C Band with a footprint extending into Egypt from Japan and from Mongolia down to the Philippines in the South, a 5 channel service is planned (4 in English and the 5th Chinese) in PAL and NTSC - depending on footprint - a total of 41 countries are covered from AsiaSat 1.

Finally for those enthusiasts now using or thinking of buying the Amstrad satellite system for their reception - an ideal way of starting in satellite reception cheaply, good news! Protel Satellite Systems Ltd., 25-27 Ballards Lane, North Finchley, London N12 8NP Tel 081-445 4441 have introduced a new LNB as a direct replacement for the Marconi types but featuring a very low noise figure of only 1.2dB and a typical 50dB gain - this will give a very marked improvement to reception on existing systems that may use the original blue cap LNB that has a rather high 1.8dB noise figure. If the larger 800mm Amstrad dish is used in conjunction with the new LNB and a tracking system then you're in business for many interesting signals across the Clarke Belt! Priced at £42.95 + VAT.

Ku lo = 10.05-11.7GHz; Ku hi 12.5-12.7GHz

AUT-1	Ku band lo/hi	PTT	Austria
SUI-1N, SUI-2N; SUI-4	Ku band lo/hi	PTT	Switzerland (NB SUI-4 was noted operating Tirana, March 91)
D1 to D10; D12 to D14	Ku lo/hi	DBP	Germany
E1 to E5	Ku	Telefonica	Spain
F7,8,12,13,15	Ku lo/hi	France Telecoms	France
UK1-1,16,17,20,21,23,35	Ku lo	BBC	UK
UK1-7,11,31	Ku lo	IBA/NTL	UK
UK1-3,4,5,8,9,10,12,13,14,15,18,19,27,28	Ku lo	British Telecom	UK
29,30, UK1-22,24,25	Ku lo	WTN/BAE Communication	UK (NB UK1-24,25 are BAE trucks using 2.6m offset parabolics)
UK1-26,32	Ku lo/hi	Uplink Ltd	Croydon UK
UK1-34	Ku lo	Sky-TV	U.K
ITA-1,9,17,18,19,20	Ku lo	Telepazio	Italy
21,30 ISR-1	Ku lo	Bezeq	Israel
HOL-1	Ku hi	PTT/NL	Holland
HOL-2	Ku lo	PTT/NL	Holland
SWE-1, SWE-2	Ku lo	Televerket Radio	Sweden (NB SWE-2 Comlink Skybus, Scansat)

amateur bands round-up

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

We start this time with a *cri de coeur* from **Colin Bates** of Marston Magna, who is suffering a frustrating lack of DX reception on 1.8/3.5/18/21/28MHz, although the other bands are passable. Overhead power lines are near-by, but away from the antenna. The receiver is an R2000 with various add-ons for the digital modes tacked on the output, and the antenna some 49m at 4m up. A KX3 a.t.u. is available but doesn't seem to make any improvement. What to do - other than chucking the lot in the dustbin?

This a glorious demonstration of the need to join the local club! First, one could take the receiver to a local club member for a direct side-by-side comparison, which would prove the receiver OK. Next, one of the local transmitters could be persuaded to put his rig on the s.w.l.'s antenna and a.t.u. thus proving-out both a.t.u. and antenna. Once the a.t.u. settings are logged for each band, and side-by-side comparisons made you have also eliminated 'conditions' in that if the a.t.u. puts power effectively up the antenna, but nothing is audible, then clearly the band is dead!

At that stage, the other club member takes his rig home and gets on the air; Colin follows him from band to band and frequency to frequency by way of a land-line link. If that shows the s.w.l. station up badly, one is left with a few alternatives. 1: the power-lines are soaking-up the signals. 2: the existing antenna is putting its major lobes into useless places or 3: the receiver isn't being operated to best advantage. For 1 and 2 a change to a vertical may help since a vertical gives all-round coverage and will be less likely to couple to the power line. For 3 I can only suggest practice, but at least Colin is near to a world-class s.w.l. club member. Last of all, there is the receiver i.f. bandwidth. If this is too wide, so as to cater for the broadcast stations, it would improve by adding an i.f. filter or even an a.f. one, though the latter is a bit late in the chain unless the op is very skilled.

So - I hope I have saved a reader from giving up!

ILA

Many short wave listeners are members of the International Listeners Association. Details from ILA, 1 Jersey Stree, Hafod, Swansea SA1 2HF. This group specialises in the listening scene, regardless of band or mode, and is well worth a sub.

Letters

Now to **Dennis Sheppard** (Earl Shilton) who has had a change of receiver to a Braun T1000 - a rare bird in this country - after his FR50B 'made smoke signals'! Dennis has a 49m doublet in the air and the pickings include on 28MHz,

ZS6VB, D44BS, CX4CR, PY1AQT, KP4AZG, T120R, VK6NHX, AP5HQ, FR5DX, YC0SBV, ZS4AE, TU2VC, C53GS, 5U7NU, D68JL, OA4CAN, CE1LGD, TR8KMJ, 5Z4LL, 9J2BO but nothing after May 20. 7MHz yielded CM6CP, CE4MAD, PY2VIK, HJ3PIX, YS1AG, ZL2JR, ZL2SN, ZL2APW, TI2VR & VP8CEM. On 3.5MHz, a string of ZLs, VE3CUD, 7X2BK, 4J1BS, & C07QP, while on Top Band he found LY1BYK, RB3MM, UB5KEI & RB5VQ.

Gerald Bramwell (Greater Manchester) sent in what he neatly describes as 'a rather bleak list' noting how conditions have been down. On Top Band and 3.5MHz, there were only Europeans to be heard, but on 7MHz he noted UZ0AXX, UA9CDDPYs, ZS6AC, CX1TE & 4X4VF. Turning to 14MHz, many E coast Ws, VO's, VE, YV, PYs, LUs, CP5AG, CP6AF, HK6BDX, CE9GEW, CE's, ZP5CGL, JY3ZH, JAs, 9K2YA, 5T5HH, VP2EE, J39BA, TA2D0, VK4MZ, KC6PUU/DU1, TU4DP, 7Z1IS, PY2LG, 9K2ZM, 5U7SA, XE3VV, TJ1GG, OD5ZZ, CN8CC, EA8ACA, HH2JR, VE1RAV/P/4U in YK-land, FM5DN, Y11BGD, JR1BLX, UQ9RS. On 18MHz Gerald noted Ws & CP1FQ, TA/N1GNF, J73GE, A92BE, CE3BFZ, YV5DTA, OA4CAN & 5B4JE, while 21MHz offered VE3OSY, W0CG, KA1DWW, K4PVZ, N2LWD, W1/G3IZQ, KN4JD, assorted Asiatic Russians, Europeans, lots of Central & S. Americans, JF2VHS, HI3ADJ, TJ1BJ, PT7BI, 4X4AD, ZD8XX & PZ1AR. Turning to 24MHz I see Europeans plus 4X4MS, CE3GX1 & LU7MHZ. That leaves 28MHz for Europeans again, plus LU6AJ, LU4ACJ, PY50C, PY1CWV/P/2.

A most interesting first letter from P. Clarke (Eccles) who has a Sangean AT5 803A, Panasonic DR48, an FL3 filter and some 40m of wire running north-south fed via a home-brew a.t.u. built from a SWM design. Additionally, there is a 14MHz beam in the loft. This arrangement has copied VKs, ZLs, JAs and so on, and a log is being created to keep a record. On a different tack, Mr Clarke notes that as he is in the top flat of three and colour TV interference is a bind in the evenings. It seems to be mains-borne as when a receiver is run off batteries the noise drops from S9 to S2. What to do? It sounds as though the first move is to obtain a suitable mains filter and fit it as close to the receiver as possible. Secondly, coil up the surplus mains lead into a choke. Thirdly, re-orient the antenna input to reduce the noise as far as possible. Fourthly, if at all possible, check that the TV sets have properly installed coaxial connectors on their antenna leads, and solder if necessary (TV installers never seem to take the few seconds to do the job correctly!). Finally, coil up surplus mains lead on the TV sets, persuade them to get rid of any multi-way mains adapters on safety grounds as well as for your benefit(!) and check the mains plugs have

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CFM	QSO WITH	DATE	TIME	MHZ	MODE	RST	RMX
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RIG: SOMMERKAMP

FL/FR DX 500 130W

ANT: 24B

PSE QSL TNX

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QSL card received by GB2PW, special event station operated by Practical Wireless in June '84.

live and neutral on the correct pins.

Robert Watters (St. Austell) uses the FRG-7700 and FRT-7700 a.t.u. to an end-fed wire some 20m long and 8m high running almost N-S. Robert reckons the best bands for him were 14 and 21MHz. On the former, Robert noted 4K4/UA0KBZ and C3/LX1KC, OD5ZZ working HL11UA, VP2VM, VK2QK, 9K2HA, KK4WW/UB5, 4F6PC, 9K2YA working 7Z1TS, U9U/PA0JTL & CE1DMA. On 21MHz the list includes HF0POL working JR9LKE, C30EAU, C53BG, Z21GZ, HE7VC, JH1XYR, VE8CB, VS1BH, ED4RSA, 9Y4PM, PY7RD, YV5CMI working VU2TTC, CX5DY, PS5C, S92LB working OA4DX, HI3ADJ, 9X5HG, 9U5BZ, CE4LFO working VK4FHW & 9Y4SF. All were logged in the evening hours, and where the word 'working' is used, both ends of the QSO were clearly heard.

Taught to Listen

Help! Does anyone know of a source of SSTV software for the Amstrad PC1640? If so please pass the word on to **J. Scott**, 70 Montford Avenue, Kingspark, Glasgow G444PA. Mr Scott used to do the task with the Spectrum and G1FTU program. On a different tack there have been some alterations: the end fed wire has been increased to 30m length, a G5RV also put up, and a switch-box and a.t.u. added to cater for this expansion. Turning to the list, on 21MHz I see CT3M, 9K2/HB9CVN, ZP5LOB, JA7CDV, 4X4HQ, 4X6LD, 5B4ABR, PY2EYE, ZD8DX, PY3BD & KL7RA; 28MHz came up with OY9JD, TU2CI, DU1KT, & on 18MHz TU2XZ was logged.

A Training School is one supposes, the proper place to do a bit of learning, and apart from minor things like HNCs I am pleased to note that they had some 25 candidates for RAE...24 plus teacher! In this establishment, the lads and lasses are taught to listen, and to build bits (antennas in particular) for their listening posts, as a part of the syllabus. Listening on v.h.f. during the opening of May 21/23 resulting in the logging of PE1NFI, P17CIS (a c.w. beacon), ON2AEO, PA0FHV, PA3EJK, PA0GHB, FC1NZR, PE1EST, PE1NWP, GW3KJW, FC1MKG/M & DG6YGG. At h.f. I see - among many others - PW8NG (Porto Velho), CQ1CBI, PY2CYT, ZL4LG, LU2DJW, 9L1LA, T77G, 5Z4FS (QSL via DL2MFE), V85GA, A25/KF7G, VP5JM (YL Judy, QSL via W3HNNK), HR2BDS, 9K2DZ, JY3ZH, IG9/IT9SAZ (Lenos Is), VC2CWG, R1ATM (QSL via UZ1TWW),

HG5HGB, LU5AMP, CX4AAE, HF0POL (King George Is, S. Shetland), OD5PX (another YL), CX2PE, 3D2XV, 7X2DG, 7Q7MX, VE3AUM, S11SM (station of SM1ALN), CR8EEN, ZS6BGD, YL1WC, D44BS, PY1FC, YC2E, TK5IU, 4J1FS, KE6M, SV8YM, VQ9AY, YC0WWL and the usual JA and VK stuff.

Vince Cutajar is in Malta, where he specialises in the 18 & 24MHz bands. 18MHz gave 8P9BW, HV3SJ, PY0SK, PY0SR (both St Peter & St Paul Rocks), 9V1RH, ZF1EJ, 4U6ITU, ZC4DG, YS1AG, S15SM, GU/SP5ZK, S79KMB, 4J1FS, UG6LQ, YS1RRD, UL8PA, 3A2LZ & TI2CCC; for 24MHz it was ZD8DX, C56/DL80H, PY0SR (St Peter & St Paul again), SV5AZR, FK8FR, J37AJ, 4U6ITU, YS1AG, J88BS, FR5DX, N1GNF/TA, HF0POL, ET2A, YV5DTA, 3A2LZ & V51P.

E. H. Trowell (Sheppey) comments in a late letter that conditions have been pretty awful, but several batches of YCs have been noted: they are not prominent though, when conditions are good! Top Band yielded ON7BW on s.s.b. while c.w. gave with LY2ZQ. On 10MHz c.w. was noted from UH9YWA, NT2R, N4UB, YV1AD & HE9YBO. 18MHz c.w. found K3SEW, EA8AB & PJ2/PA0VDV; the main band of interest was 14MHz c.w., for PY4OD, YV4ABR, LU1PHC, LU8EKC, HZ1HZ, LU11CX, PY2GUL, LU6UA, TK/DF4RD, 3A2LF, VU2NBT, UZ9JWW, RZ9UA, NV1U/MM on the cargo ship *Jean Sykes* (c/s WLAH) of the West coast of Morocco. 24MHz c.w. was picked up from 9M2AX, while the loggings on 28MHz included ZS6BCR, IS0/DL6RAI, IS0DTY & LU5UL. On the QSL front, Ted mentions F05FO via F2BS, TK/DF4RD via DF2RD & 9V1YC goes to PO Box 1265, Singapore 9117. In conclusion, Ted hopes I don't get sunstroke, or blown away - the temperature in his neck of the woods was down below 50°F!

This is Summer

Another c.w. enthusiast is **Andrew Marriott** of Bath, who is mainly on 21MHz, where he booked in EX3FKW, 4K2PGO, 4J1FS, 9Y4SD, FY5FO, TI4SU, PJ2/PA0VDV, UH8AAQ, UI8DGN, UA0FDX (Sakhalin), JA7BXS, JH8GYV & Z22WV. On 18MHz K8XF/MM in mid-Atlantic was noted, plu T77C, 9H3UJ & W6UK. Commenting on conditions Andrew says, "I have noticed that conditions to N. America have worsened. Perhaps this is summer(!) conditions, magnetic storms, or have I really got my antenna plugged in??"



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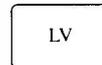
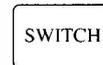
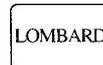
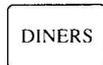
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dxtv round-up

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

I will start this time with a photograph which I recently dug out of my own archives. It is part of the introduction to *BBC Television News*, Fig. 1, which was taken with a simple box camera and 120 film at my parents' home in Worthing some 40 years ago. The set was a Mullard, 9in console with a sepia cathode ray tube and the signal came from London, across the South Downs, on 45MHz.

Like many other people at that time, my father objected to having such a 'horrible and unsightly thing' as an 'aerial' attached to the chimney so, I had no option but to mount a Belling Lee 'H' antenna on a 10m high, well guyed, wooden pole in the 'BACK'-garden. A large hole was dug in the lawn, the base of the pole was well painted to prevent rot and the massive beast was hauled upright with the aid of fellow-members of the Worthing and District Radio Club. Sunday morning 'aerial bashing' for our fellows was good fun especially when there was a multitude of opinions on how best the job should proceed. Those of us who were in the radio-trade dreaded the outbreaks of Sporadic-E during the summer months because it meant ruined pictures and irate customers while the event lasted, but now, many of us in the UK look forward to such disturbances to see some DX in this otherwise generally quiet part of the radio-frequency spectrum.

Band I

Although **Russ Burke** (Northampton) received pictures from Spain (TVE1) on May 12, the USSR on the 14th and a weather map from Hungary on the 16th,

the first real Sporadic-E opening for me came at midday on the 25th. Then, I saw test-cards, sometimes in colour, from three Norwegian regionals, Bagn, Gamlem and Melhus. Each of their digital clocks was indicating two hours ahead of UTC and at 1435 the signal from Melhus was so strong that it locked solid on my JVC 3060 portable, using its own telescopic rod antenna.

On that day, Russ was on holiday in Perranporth and, during the afternoon, with his Yoko receiver, saw a couple of unidentified programmes plus those Norwegian regional test-cards with Norge at the top and their local idents Bagn, Gamlem, Gulen and Melhus along the bottom. A full list of such stations appear in the *World Radio TV Handbook*, available from *Short Wave Magazine's* book service, price £18.80 inc p&p.

Simon Hamer (New Radnor) received pictures from Czechoslovakia (CST) on Ch. R1 (49.75MHz) and the USSR (TSS) on Chs. R1, 2 (59.25MHz) and 3 (77.25MHz), Finland (YLE1) and Iceland (RUV) on Ch. E4 (62.25MHz) and Denmark (DR) on Ch. E3 (55.25MHz), Norway (Gulen) on Ch. E2 (48.25MHz) and Sweden (SVT1) on Chs. E2, 3 and 4 on the 21st. Simon found signals from Scandinavia prominent again during a similar opening on the 25th when he added the Norwegian regionals Bagn, Hemnes, Kautineno and Koningsberg and Sweden's SVT-1 on each of the 'E' channels in Band I.

On June 1, he had a more varied haul with test-cards from Austria (ORF1) on Ch. E2A (49.75MHz), Czechoslovakia (CST), France (TDF), Germany (ARD/BR1), Hungary (MTV), Italy (RAI UNO), Portugal (RTP), Ro-

mania (TVR), Spain (TVE1&2), the USSR and Yugoslavia (JRT). Next day he added Italy and Switzerland (SRG1) to the season's score.

David Glenday (Arbroath) kindly sent a photograph of this test-card, Fig. 2, with a mention of Teletext at the bottom, that he received on 6 June 1989. **Andrew Jackson** (Birkenhead), using his newly installed 5-element antenna (WB5/FD), saw a Teletext page from Switzerland on the 30th, films from France on the 31st and, views of Italy and Venice from RAI-UNO, a film from Spain and cartoons, tennis and show-jumping from unidentified stations on June 2. Andrew would like to know the origin of 'a tennis match with a number 2 in the bottom right hand corner' on Ch. E2. Can any one help?

David Glenday received test-cards and/or programmes from Czechoslovakia (ST. Bratislava) and Poland (TVP1) on Chs. R1 and 2, Finland (YLE TV1) on Chs. E3 and 4, Norway (Hadsel & Steigen) on Chs. E4 and 2 respectively and Sweden (Kanal1 Sverige) on May 21, Finland and the USSR on the 22nd, Denmark (DR Danmarks Radio) on the 25th, Spain (TVE1&2) on the 29th and June 1 and 2 and Italy (RAI UNO) on Chs. 1a & 1b (53.75 & 62.25MHz) on the 1st and Portugal (RTP 1) on the 2nd. Toward midnight on the 1st, both David and I saw an unidentified film, with non-English subtitles, on Ch. R1. and I heard sound on 59.25MHz which I think was Italian on Ch. 1b.

Neil Purling (Hull), using a D100 converter into a Pye receiver, logged test-patterns from Finland and Sweden at 0922 and 0956 respectively on May 21 and at 1058 he watched the signal from Sweden 'floating' over that from

Finland. Next morning he saw a subtitled film on Ch. R1 which he thinks was MTV from Hungary and test-cards from the USSR (TSS) on Chs. R1 and 2.

At 1435 on the 25th, **Bob Brooks** (Great Sutton) received test-cards from Iceland (RUV Island) and Norway (NRK). He also saw the news and a clock caption from the USSR at 1900 on the 26th, test-cards from Sweden at 0750 on the 28th and Spain and Norway at 1010 and 2335 respectively on the 29th. **John Woodcock** (Basingstoke) found more activity in Band I during the morning of June 3 with pictures from Italy and Spain.

Weather

"Weather has been a bit rotten this past month - and a bit unusual, something no doubt reflected in the overall poor tropospheric activity for this time of year", wrote David Glenday on June 3. He explained, "In previous years I've noticed high pressure systems tending to sweep in from the Atlantic, across UK and then sitting over the North Sea and Germany-area for a few days giving excellent tropospheric reception, before slipping away to the east. This year, however, the same high pressure area seems to have stuck in the Atlantic for over 2 months now, making the occasional foray as far east as Norway or as far north as Iceland before returning to mid-Atlantic, but never drifting out of the way to the east across Europe; hence our regular stream of miserable northerly winds and resulting in little of the lovely moist air from the south of Europe (a catalyst for stunning tropospheric DX if ever there was one) from getting

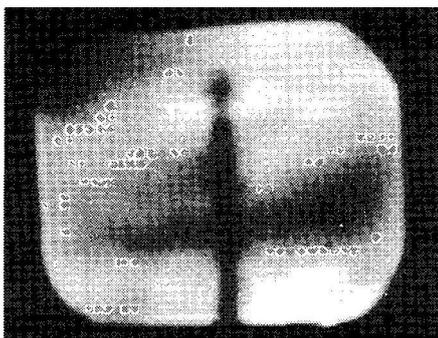


Fig. 1:

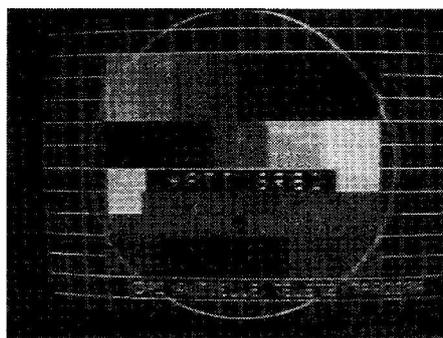


Fig. 2:



Fig. 3: Lahore.



Fig. 4: Jalandhar.

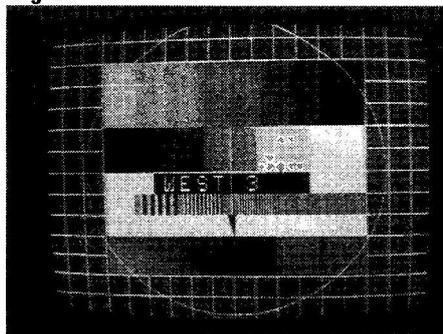


Fig. 5: Germany.

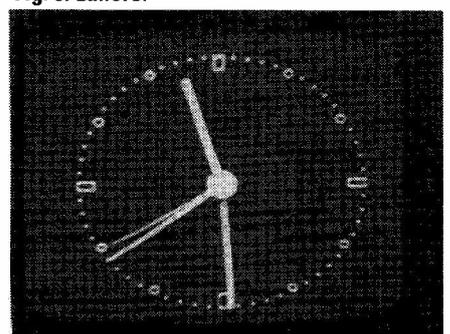


Fig. 6: Yugoslavia.

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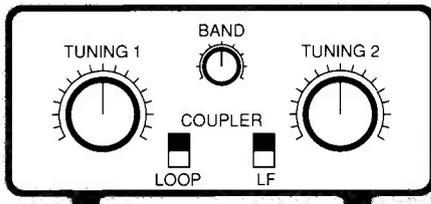


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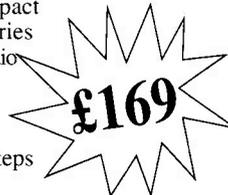
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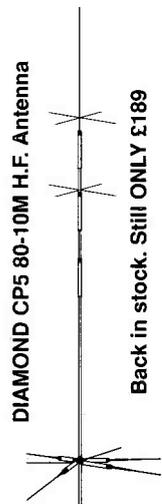
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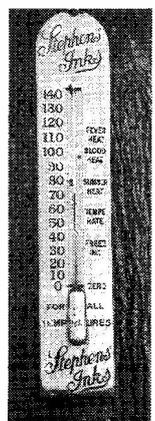
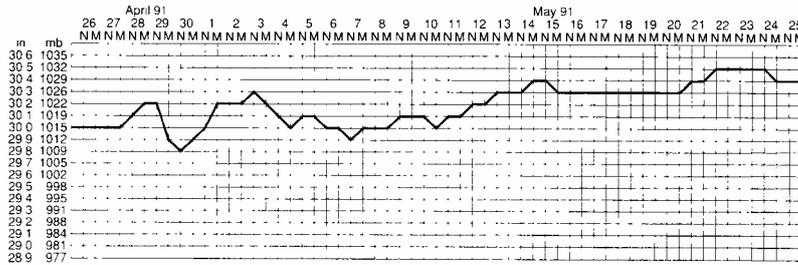
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Fig. 13.



here!" The slightly rounded atmospheric pressure readings for the period April 26 to May 25, Fig. 13, were taken at noon and midnight each day from my own barograph. David's barometer readings for the period April 28 to June 3 were predominantly high reaching 30.6 in (1036mb) on May 23 and 28 and falling to 30.0 in (1015mb) on the 10th.

A short but really warm spell accompanied the rising high pressure on May 20 and on the 21st, Joan and I visited Leonardslee Gardens, Sussex, and noted that their large outside thermometer, Fig. 14, around 1630 showed 72°F, while at home our maximum garden reading, at midday, was 75°F. "This was the hottest day so far for 1991", said the weather reporters and, although next day the temperature soared to 77°F the sky showed signs of a change. I don't suppose that worried the balloonist who was no doubt enjoying the evening flight! In addition to proving the temperature, I included the photograph of the Stephens' Inks thermometer, Fig. 14, mounted on a tree-trunk, because I think such an instrument is now rather rare.

Tropospheric Openings

Between 2000 and 2300 on May 22 there was some co-channel interference on the u.h.f. band. While DXing in Band III Lt. Col. Rana Roy (Meerut, India) experienced this in the form of lines during a tropospheric opening on February 9 while he watched a cartoon, Fig. 3, from Lahore on Ch. E5. Rana

also showed me how strong the pictures from Jalandhar, Fig. 4, can be in Meerut when this band is open.

From May 28 to 31 inclusive, David Glenday took advantage of the falling high pressure to receive pictures, often in good colour, from Denmark (DR), Germany (ARD1), Holland (NED1) and the Norwegian regionals Bjerkeim, Bokn, Lyngdal and Stord in Band III and Denmark (TV2), Germany (ARD1, DFF, HR3, NDR3, RB1, RTL+, SAT1, WDR1&3 and ZDF) and Holland (NED2&3) in the u.h.f. bands. At 1030 on June 1, I received a coloured test-card from Belgium (BRT TV1) and a programme caption from Germany's ZDF in Band III while Neil Purling, using his Band I dipole, saw unidentified transmissions, on Chs. E7 and E9, in Band III, at 1000 on the 31st.

Bob Brooks logged pictures in this band from Denmark at 1042 on the 28th and Norway at 1400 and France (Canal+) at 2225 on the 30th.

Between 1900 and 2000 on May 20, George Garden (Edinburgh) took his receiver and amplified loop antenna to a high spot on Cairn O' Mouth and found co-channel patterning on the Scottish ITV signal, on Ch.43, from Blackhill. He carefully orientated the antenna and with the loop horizontal he received a strong signal, as he thought from ITV Grampian, but, to his delight he found, by studying transmitter data and watching the local

news bulletins, that the signal was most likely coming from Keelyang Hill in the Orkneys. John Woodcock was particularly pleased with the Band III openings on May 31 and June 3 when, for the first time, his new TC930F receiver was able to produce cartoons and a football match from France. Simon Hamer's haul included Denmark, Germany (ARD1), Poland (TVP) and Sweden in Band III and the same with the addition of Germany's DFF, Hessen3, NDR3, RTL+, SAT1, SSV, WEST3 and ZDF in the u.h.f. bands on May 20. David Glenday logged WEST3, Fig. 5, under similar conditions at 0208 on 18 June 1989.

Andrew Jackson's new v.h.f. antenna proved its worth on the 31st when a good opening toward Germany gave him films, news and weather from ARD1 on most of their Band III channels. After this he naturally tuned through the u.h.f. scale on his set and logged a 'strong picture from FR3 [France] on Ch. L37 from Boulogne' and test-cards from Germany (ARD1 and ZDF) and Holland (PTT NED3) from Goes, Lopik, Roemond and Smilde. Next day Andrew found a test-card from Belgium (BRT TV1), a strong signal from France (Canal+) and a cartoon Masters of the Universe and a quiz-show from Germany's RTL+ and ZDF respectively, in Band III. In addition to Denmark on Ch. E8. Simon also found v.h.f. and u.h.f. signals predominant

from Germany on the 1st when he again logged their ARD/HR1, Hessen3, NDR1 and 3, RTL+, SSV, SAT1, West3 and ZDF idents.

Satellite TV

During the last two weeks of May, Les Jenkins (Godalming) with his 1m dish antenna, elevated 13°E, feeding his satellite TV converter, logged a clock caption from Yugoslavia (JRT Belgrade), Fig. 6, a sports logo, Fig. 7 and idents from Scandinavia, Fig. 8 and Spain, Fig. 9, coming from Eutelsat.

SSTV

On May 19, Henry Winter (Bristol) had a morning and evening session with his slow scan television receiver on the 14MHz band and copied pictures between 0900 and 0908 from Germany (Y49ZD), Spain (EA5CUV) and the USSR (RA9CUH) with 'CQ' captions and a QSO between RA2FB and UB5LAK. From 1805 to 1844 he added a Bulgarian (LZ10W) - Polish (SP6CPO) QSO and calling captions from the Russian stations UK3CNZ and UB5YD. During the month prior to June 10, John Scott (Glasgow) received SSTV signals between 14.227 and 14.234MHz which included pictures from Austria and Poland, an unidentified photograph, Fig. 10 and 'CQ' and '73s' captions from the USSR, Figs. 11 and 12.

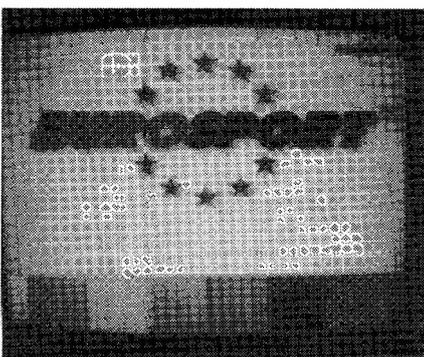


Fig. 7: Yugoslavia.



Fig. 8: Scandanavia.



Fig. 9: Spain via Eutelsat.

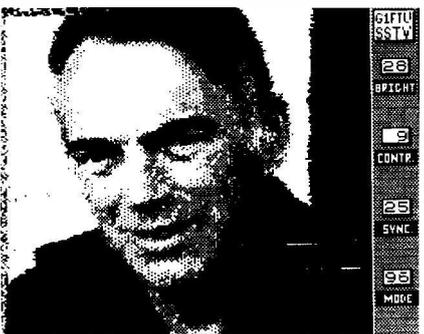


Fig. 10: Unidentified SSTV.



Fig. 11: USSR. TV.

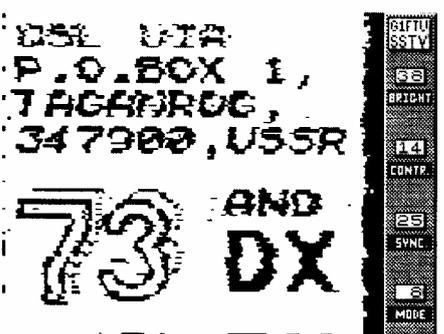


Fig. 12: USSR. SSTV.

Godfrey Manning G4GLM, SWM Editorial Office, Enefco House,
The Quay, Poole, Dorset BH15 1PP.

My appeal for grey or colourless labelling tape (June 'Airband') yielded results. To those readers who gave information or even supplied tapes, my grateful thanks. In one case the gentleman didn't let me know his address, so please let me pass on my thanks through this column.

Flying Faraway

Some luckier readers have been on interesting flights. Take **Paul Beaumont** (London) who flew from Gatwick to Port of Spain on BA255 (B.747) and then on to Georgetown, Guyana, on BW469 (MD-83). Timehri Airport, his destination, has two paved runways 06/24 and 10/28, with an n.d.b. and v.o.r. There are three other n.d.b.s in the country! The tower has 8.855MHz h.f. as well as 118.3MHz v.h.f. Mains electricity supply is erratic; standby batteries power the transceiver when needed. Even these fail and a signal lamp is available as a last resort. The country's weather radar is defunct, the weather bureau's FAX machine is out of paper and they can't afford any more. I know it has become something of an in joke to poke fun at Gatwick, but when one hears of the genuine plight of less fortunate places, it puts things in perspective.

Follow-Ups

On the subject of faraway places, the name of Evan Murray (Auckland, New Zealand) came up in June. **Dallas A. McKenzie** (London) is a NZ expat who doubts "...that NZ would have two who were interested in radio with the same name" so I have sent Dallas' letter on to Evan. I hope this story ends in the re-uniting of two long-lost friends, in which case, do tell the rest of us!

In June, I talked about the display Vulcan (XH558) and also some of those in civil ownership. **Norman Skinner** (Southend-on-Sea), Chairman of the Vulcan Memorial Flight Supporters' Club, has written with an alternative to the views that I expressed. He would like to see funds given to XL426, currently non-flying, as this would mean that 'all of the eggs are not in one basket'. Norman does point out the difficulties of obtaining CAA permission to fly these aircraft in civilian hands, so it seems clear to me that this is a genuine problem that XL426 would face. While XH558, supported by the Vulcan Association, remains with the RAF, there is no such difficulty but Norman questions what would happen if the RAF gave up the aircraft and it, too, became civilianised. This is unpredictable.

So we have two Vulcans (one flies, one requires restoration); they are each supported by different enthusiasts' associations. I'm sure that many readers have watched XH558 display. So over to you: what do you think?

Back to May now, and **David Oates** (Cardiff) updates the New York Volmet schedule which is more complex than the information I mentioned. A group of airport reports are transmitted every 5 minutes except for 20, 25, 50 and 55 minutes past the hour when Gander transmits instead. David is a welcome newcomer to the column, but an experienced s.w.l. who, a decade ago, would have delighted in receiving a.m. broadcasts on a Philips valved set. Those were the days!

Historical Section

In June, I referred to range beacons on airways in the mid-1940s. It turns out that there is rather more involved than with the present-day n.d.b.s to which I compared them, so I'm grateful to **R.F. Merrall** (Dunstable) for describing ranges in more detail. Each beacon radiated a pattern in four quadrants. The simplest case would be where the beacon was at the centre of a cross, but in fact angles of other than 90° between the arms of the cross were possible by altering the antenna arrangements. Of the four lobes (separated by the arms of the cross) those in the generally north-west and south-east directions from the beacon were modulated with didah, Morse letter A. The other two lobes (north-east and south-west) were modulated by dah-dit, Morse letter N. Along the four arms of the cross, the modulation seemed to merge into one continuous tone. If you knew your rough orientation from the beacon, the nearest arm could be found and you could then fly along this to overhead the beacon where the cone of silence would be encountered.

More on the Fw 200 Condor pictured in May. A comprehensive article - for which thanks - came from **Klaus Hirschelmann** (Mainz, Germany) and I'm passing it on to **Paul Hilton** (Newbury) who sent the original picture. The article is in German, and there is no originating reference. I've made notes down the side which I hope Paul will be able to decipher, and although the Fw 200 could make an article in its own right I will be content with just a summary here. Before any other readers send me untranslated foreign language articles, I can just about cope with German but that's my limit! I would not be able to translate any other language.

A chance meeting between a senior Lufthansa official and a Focke-Wulf designer, both of whom were on holiday at the time, led to the requirement for a reliable, safe, long-haul transport. In respect of performance the resulting Fw 200 was advanced for its time and was built remarkably quickly. The name, Condor, was selected as being the type of bird with the best gliding ability. Up to 30 pax could be carried up to 2000km. The first

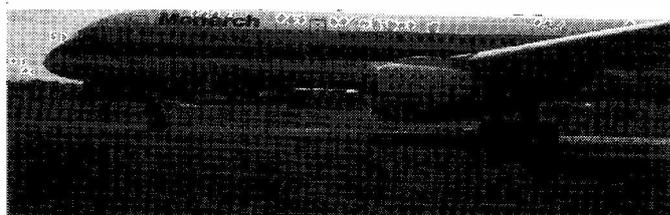


Fig. 1: Boeing 757-27ER G-MONK (24105) of Monarch at Luton.

example, D-AERE, flew in July 1937.

Saarland D-ADHR wasn't delivered until 27/6/38 and was the fourth airframe. Its first long range flight, via Salonika to Cairo, included a weather diversion and eventual (mistaken) landing at an RAF aerodrome close to the intended destination. On departure, a weather front forced an early return. Fine sand had blocked the hydraulics and the tail wheel couldn't be lowered. Slight damage on landing was eventually repaired. D-ADHR was finally lost in an accident in 1941.

Receiver Problems

Here are three examples of readers' queries, in this case to do with receivers. Please would all readers note that answers appear in this column but I regret I can't enter into direct correspondence individually.

When tuning 116-138MHz on his Icom IC-R1 scanner, **C.R. Grimm** (Salisbury) picks up short-wave stations in a variety of languages. These are of course spurious, as the broadcasts are not on v.h.f. The problem with the new wide-band scanners such as the IC-R1 is that they can be prone to receiving stations other than those tuned in, and a variety of mechanisms cause this. All receivers suffer from spurious reception to some extent but the problem will be that much greater on wideband synthesised equipment. I'm not sure where the stray signals are getting in to your receiver, especially as I believe it has an unscreened plastics case, but try to avoid overloading the receiver with big signals from an outdoor antenna. If you think your particular example of receiver is exceptionally bad, you must consult your dealer.

When in Buxton, **Dave Wright** receives BBC Radio 1 by tuning his Signal R532 receiver to 121.02MHz. This is probably explained by second channel (image) reception as the Sutton Coldfield transmitter has a relay at Buxton on 99.6MHz. Now, 121.02 - 99.6 = 21.42 which is nearly twice the 10.7MHz i.f. In fact there's a 20kHz error. Well, broadcasts are much wider band than communications transmissions. Also, you are hearing an f.m. station on an a.m. receiver which suggests slope detection is occurring, and this is only possible when the set is tuned to the edge rather than the centre of the signal. So, your receiver isn't coping with the exceptionally strong local signal that just happens to be on an unfavourable frequency.

Now on to the AR1000 of **Des Reed** (Malton). The instructions say that the radio may not be used when its charger is charging the internal battery. The

radio may be used from an 11-15V power source, though, and in this case the battery will charge! I don't know exactly what this confusing section of the instructions means, and I would expect the dealer to find out if he doesn't already know. My guess is that your charger doesn't have the capacity to supply enough current to simultaneously charge the battery and run the receiver. Even though it's inconvenient to change the cells over, I'd run from mains (via the necessary power supply) when at home and put the batteries in only for portable operation. Remember too that primary ('dry') cells mustn't be in the receiver when external power is applied; the radio will attempt to recharge these cells and damage will result.

NiCads do seem to be one of the deeper mysteries of modern radio. Mishandled, they will give far fewer cycles than expected and hence defeat their price advantage when compared to disposable alkaline cells. A simple rule is to fully charge at the C/10 rate where C is the amp-hour capacity of the cell. Discharge until the radio complains (some have low battery indicators) or until IV is measured across the cell. Only then should you fully recharge again. Partial discharges cause the memory effect problem where the cell refuses to give a full charge thereafter.

Finally, to answer your question about other things you can hear on a scanner, the frequencies in the long-wave table, leftmost column (June SWM page 63) are in kHz. Let me suggest *Scanners* (third edition) by Peter Rouse and available from our Book Service (see the 'Radio' section of the advert in this issue). Hope this all helps.

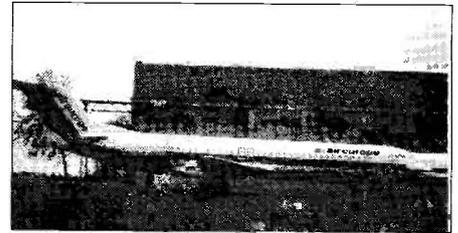
Your Questions Answered

What's Croughton? **R. Partridge** (Clacton-on-Sea) is wondering about this USAF-operated radio station which is 8km north-east of Upper Heyford air base. The published aeronautical information suggests that it is radio only (no runway), equipped with a tall mast, and operating on 3.067, 5.703, 6.750, 9.011, 11.176, 13.201 and 343.6MHz. Once again, readers are reminded that questions are always answered in this column, never by direct correspondence.

You Write

From Alicante, Spain **Paul Reed** sends some information about oceanic flights. I'm sorry I can't describe it all here, but most of your letter raises points that have been covered in vari-

Fig. 2: Fokker 100 PH-ZCL (11275) in storage at Cranfield after the demise of Air Europe.



ous previous editions of 'Airband,' Paul. I note that you want **Anne Reed** (Cheltenham) to see your detailed comments so I have passed the letter on (are you related?). Paul is well aware of the charter traffic at Alicante airport - it's local to him, after all. During the Gulf war he saw three contrails overhead close together. They were from B52s. Airliners don't fly in formation!

Frequency and Operational News

From the CAA, GASIL 5/91 states that the Benbecula v.o.r. will be on test (TST, 114.4MHz) and hence temporarily replaced by another beacon (BEN, 116.95MHz) although normal operation might resume soon after you read this.

Also, there is a proposal to reduce the size of the Heathrow Control Zone by bringing in the eastern boundary 2nm. The London City Special Rules Zone will still touch the Heathrow zone by virtue of a 2nm extension to its western edge. At Birmingham the Controlled and Special Rules airspace has been amended to deal with various problems that air traffic control were encountering. There is a new hold, BIRCH, and transition altitude becomes

4000ft. The changes are small but detailed so pilots should, as ever, consult their NOTAMS.

To give us an idea of a typical Concorde flight, **Cliff Burton** (Bicester) chronicles what would be a likely schedule (all times UTC). 1905 Depart J.F. Kennedy. 2025 Call Santa Maria 8.825MHz when at 40°W. 2045 Call Shanwick 8.825MHz at 30°W. 2118 Call London Airways 133.6MHz. 2225 Arrive Heathrow. Can anyone (perhaps a Stateside reader) tell us what frequencies are in use prior to passing 40°W?

Callsigns

Readers are always interested in callsigns so here are some as mentioned on page 161 of *Airstrip*, the journal of the Midlands Branch of Air-Britain (formerly Midland Counties Aviation Society). Why not join the Branch? The membership secretary is John Withers, 7 Nailers Drive, Burntwood, Staffordshire WS7 0ES.

Air Atlantique. Atlantic 31 is G-BBXX, 41 is G-BODY, 42 is G-SOUL, 43 is G-BPBG, 44 is G-HART. 100-149 are airshow charters. 150-199 are passenger charters. 300-399 are DC-3 freight

charters. 402, 404, etc., are G-EYES, G-EXEX and G-MPCU on government contract (e.g. anti-pollution); 410-499 are other flights by these aircraft. 406 is G-FIND. 600-699 are DC-6 charters.

Dollars Helicopters assign a callsign to each pilot, not to each aircraft.

G&B Aviation use Training 51 for G-FIGB, 52 for G-FIGA, 53 for G-BMVJ, 54 for G-BADW, 56 for G-GBLR, 58 for G-BGSX, and 59 for G-BDIM.

The next three deadlines (for topical information) are August 9, September 13 and October 18.

What is the Airband?

You immediately thought of pilots and controllers talking to each other on v.h.f. There's more to aeronautical radio than just that!

As low as 10.2kHz you'll find the Omega world-wide navigation system. NDBs (190-1750kHz) are even found in the medium waveband. These simple transmitters have Morse code identification which can be heard on an a.m. receiver (even a car radio). Around this part of the spectrum is also the Decca Navigator and any remaining Consol stations.

Upper sideband is used to modulate long-distance h.f. communications for both air traffic control and company operations purposes. Various frequencies are allocated in the 2-30MHz range. There are also pre-recorded VOLMET broadcasts.

75MHz is the spot frequency for marker beacons. Outer markers are modulated with 400Hz a.m. dashes; middle with 1300Hz a.m. alternating dots and dashes; inner/airways with 3kHz dots.

The v.h.f. navigation band, 108-117.95MHz contains v.o.r. beacons and i.l.s. localisers, all at 50kHz channel spacing. The modulation providing the navigational information is specialised but an a.m. receiver will still pick up the Morse ident. Some v.o.r.s also broadcast a t.i.s. reports, also on a.m.

VHF communications take place on 25kHz channels 118-136.975MHz a.m. and are air traffic control or company operations messages. There are also a.t.s., VOLMET and organised track system broadcasts. Some ground stations are equipped for direction-finding.

The military have some spot frequencies above 137MHz but also use 225-400MHz a.m. at 12.5kHz spacing for communications. Some ground stations are equipped for direction finding.

I.L.s. glideslopes are found at 329.15-335MHz with 150kHz spacing. 962-1213MHz encompasses d.m.e. (which can be part of TACAN).

Secondary surveillance radar interrogates on 1030MHz and receives the reply on 1090MHz. Just above 5GHz the new microwave landing system is becoming operational.

Aircraft themselves send out radio signals for navigation purposes. Radio altimeters typically work around 420-460MHz; Doppler might be on 8.8GHz and cloud-collision radar could be on 9.3GHz.

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PO Box 1000, Eastleigh, Hants SO5 5HB.

Sid Saunders writes to me from East Sussex to tell me how well the multi-band antenna I featured in the May 1991 column performs and to pass on an interesting design for a hand-held scanner stand. This is based on a clear plastics leaflet dispenser, the sort of thing you find in banks, post offices, travel agents and rail stations. Sid says that there are often surplus dispensers, which the staff are willing to part with for a donation in the charity box - if you ask politely enough.

With luck no further modifications will be required, just loop the scanner belt clip over the rear of the stand, step back and admire your handiwork. Because the stand is angled, the receiver is held in the correct position for you to view the frequency display and operate the controls without having to hold the case. If you are not quite so lucky you may have to partially cut away the front of the stand with a junior hacksaw in order to get your scanner to fit. A small hole drilled in the side of the stand will allow you to connect a d.c. power lead and any remaining space at the other side of the stand can be used as a convenient place for storing the supplied antenna or pens. The space under the scanner is ideal for mounting a cheap l.c.d. clock.

Sid was good enough to send me a dispenser which I have used successfully with a number of different scanners. The stand looks purpose made and has the correct centre of gravity so that it does not topple over when the receiver controls are used. A very useful accessory from what may otherwise have been considered scrap, and incidentally the first 'green' item to be featured in the column. Perhaps someone will suggest a novel antenna based on washing-up liquid bottles next (I think I may regret writing this!). Anyway, my thanks to Sid for passing on his idea.

Active Antennas

F. J. Martin from Kent has written to me regarding the performance of a Howes AA4 active antenna kit which he has been comparing against dipoles cut for specific frequencies. He feels that the dipoles give better performance than the active antenna and wonders if the kit is working correctly.

Although I have mentioned active antennas in previous columns there still seems to be some misconceptions amongst readers regarding their performance. So let's take a quick look at how they work.

An active antenna usually consists of an electrically short antenna element which has a specially designed amplifier stage connected to it. The amplifier serves two functions, it provides matching over a large frequency range between the antenna element and the receiver and secondly boosts signals to the level normally produced by a full sized antenna.

However, the small size of the active antenna means that its 'capture area' (the size of the actual antenna element which receives the signals) is much less than that of a full sized antenna so any received signals have to be amplified to a more usable level before they are passed on to the receiver.

This is where the problems start. All amplifier circuits generate a small amount of electrical noise. With modern electronic devices, most of this noise is produced by the thermal agitation of electrons within individual components. Although this is at a very low level, so too are the wanted signals which may only measure around one millionth of a volt (1 μ V). This does not matter too much on the short wave bands where naturally occurring radio noise is present at a fairly high level, but as we venture higher in frequency

this decreases to a point where it is no longer masking the amplifier noise. It is very difficult to reduce amplifier noise levels beyond a certain point without using expensive microwave transistors and complex circuit designs. For example, in radio astronomy where very much lower signal levels are encountered, amplifier stages are cooled with liquid nitrogen in order to minimise thermal noise - not the sort of project to be undertaken by the average listener.

Any additional amplification can also present problems within the receiver, usually when strong local signals are present. This can manifest itself in many different forms the most common of which is broadcast station breakthrough on frequencies well away from designated broadcast bands.

So the golden rules for active antennas are:

Consider one if you require a compact discreet antenna and wish to monitor a very wide range of frequencies or have a long cable run to the receiver. The performance on average is slightly better than that of a discone but not as good as a resonant half wave dipole.

Don't use one if you live near a transmitter site or in a major city and remember that most continuous coverage hand-held scanners do not have good enough strong signal handling characteristics when additional amplification is used.

Whilst we are on the subject of antennas, **C. Vasili** of London writes to ask me which antennas would be the most suitable for use with his Icom IC-R100. This has three different sockets one each for the frequency ranges 0.5-50MHz, 50-905MHz and 905-1800MHz. He already has a discone connected to the 50-905MHz socket, which will give reasonable results - bearing in mind that he is living in a very active area of the country, radio-wise. However the 0.5-50MHz band is a little more difficult as a lot depends on the amount of space available for wire antennae such as the popular G5RV design. In this instance, as the upper frequency limit is 50MHz I would suggest using one of the many h.f. active antennas available such as the Howes Communications AA2 kit, Dressler ARA-60 or Datong AD270 all of which give good results over this frequency range.

For the 905-1800MHz range I would suggest using an antenna which is designed to give extra gain on the most active frequencies in this part of the spectrum. You could consider one of the many collinear antennas designed for use in the 934MHz CB allocation and sold by companies such as Nevada or Sandpiper Communications.

Mr Vasili also asks about antennas for weather satellite reception on 136MHz. Crossed dipoles seem to be the most popular choice for this band.

These give omni-directional coverage and being horizontally polarised help to reject the vertically polarised paging transmissions found on 138MHz which can cause problems with high gain receive systems. Once again Sandpiper Communications can help.

Different v.h.f. and u.h.f. antennas are also mentioned in Peter Rouse's book *Scanners*, which is strongly recommended for new listeners and is available from the SWM Book Service.

SSB Reception

Dick Redhill of Coventry has been experiencing problems whilst trying to tune in s.s.b. transmissions on his modified Icom IC-R1. This has had a beat frequency oscillator (b.f.o.) circuit fitted, but Dick says that he cannot always make sense of the stations he is hearing, even if they are very strong. If he tunes to the same station on his main short wave receiver he can understand it perfectly. He wonders if there is a problem with the IC-R1.

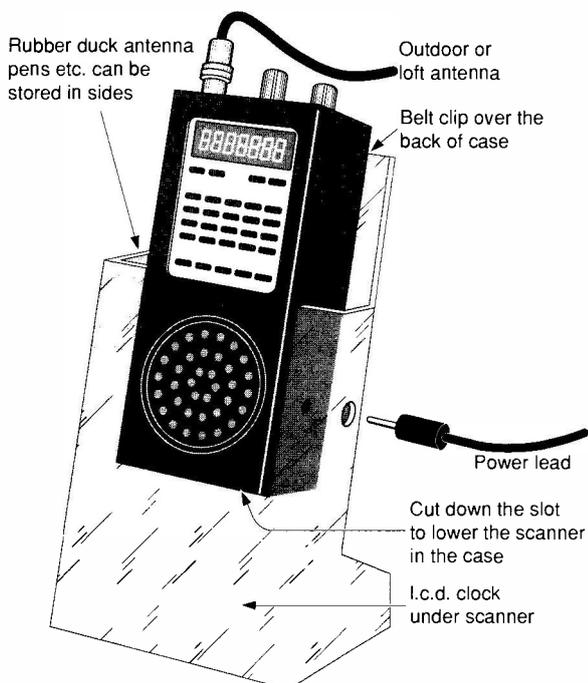
In order to answer this question, I think we need to look at the way a single sideband (s.s.b.) signal is generated and how a b.f.o. helps us to resolve it. In the early days of radio, amplitude modulation (a.m.) was the most popular method of speech transmission. This superimposed or modulated audio signals on to an r.f. (radio frequency) carrier wave. The strength of the transmitted signal varied with the audio signal. As the radio spectrum became more congested different ways of improving the efficiency of transmissions were investigated.

A normal a.m. transmission consists of two sidebands containing the audio information sitting each side of the r.f. carrier. The sidebands are in fact mirror images of each other and as such convey the same information.

If we could examine the total amount of power used in an a.m. transmission we would see that half of the power is in the carrier and one quarter of the power is in each sideband. So if we were able to transmit just one sideband we would only need a quarter of the power to obtain the same range as that of an a.m. signal.

Unfortunately in an a.m. receiver, the carrier is used as a reference signal permitting the demodulation of the sidebands. If we were to reproduce this reference signal within the receiver we could dispense with the carrier and just concentrate on the sideband information. This is what the b.f.o. does, it simulates the carrier that would normally have been transmitted in an a.m. signal.

In order to extract the audio from the sideband signal we have to ensure that the re-inserted carrier is at exactly the right frequency. If this is not correct the recovered audio will be shifted in pitch and in some instances com-



pletely inverted i.e. the high audio frequencies will become low ones and vice versa. In fact this technique is used in simple speech scramblers, so you can see how difficult it is to understand what is being said.

What I suspect is happening with Dick's receiver when he tries to tune in an s.s.b. signal is that he is not able to get the frequency exactly right. The smallest size of tuning step on the IC-R1 is 500Hz which means that if the wanted signal just happens to lie midway between a 500Hz step the audio will be shifted 250Hz higher or lower in frequency, making it difficult to understand unless you are particularly used to monitoring s.s.b. transmissions.

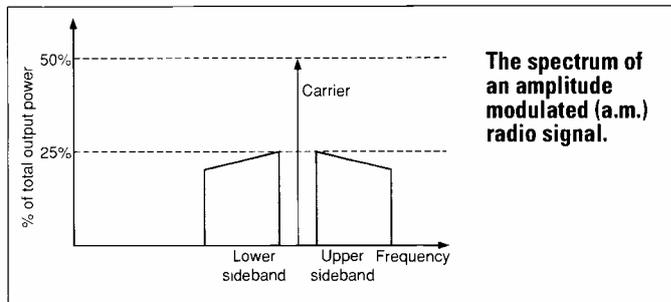
One other problem could be the i.f. filter bandwidth. In a dedicated short wave receiver this is designed to be just wide enough to let one s.s.b. signal through at a time. In a receiver originally designed for a.m. reception the filter bandwidth has to be much wider - remember it needs to let both sidebands and the carrier through. So when you are listening to s.s.b. signals you will probably hear more than one station at a time making it difficult to pick out the wanted one.

There is no real solution to this problem, but you should be aware that the IC-R1 was not originally designed to be an s.s.b. receiver so any s.s.b. reception is a bonus. You should find the performance perfectly acceptable on less crowded frequencies so stick to your main short wave receiver when chasing those elusive long distance stations.

Mobile Interference

Hopefully having solved any problems with cable borne interference in last month's column, we can now turn our attention to interference received directly via the antenna. This is usually the most difficult type to cure completely and even if you are successful with your own car you may still have problems with other passing vehicles. The main problems occur at frequencies in the low and mid v.h.f. range. This is because the amount of r.f. energy radiated by spark sources tends to diminish as the frequency increases.

These may take the form of metal screens around the ignition coil and distributor, screened spark plugs or suppressors and choke assemblies. All of which are available from main



The spectrum of an amplitude modulated (a.m.) radio signal.

Lucas dealers along with a very useful catalogue describing the many different types of suppressors available and how to use them. Most of these are designed for professional applications so be prepared for professional prices. Once again you need to judge how much of a problem any remaining interference is and whether or not it is worth dealing with.

There are one or two other interference sources you may find but most of these you may just have to live with. There is not much point in suppressing the horn, windscreen washers or indicators for example. However items such as the heater motor, windscreen wipers and electric fuel pump should be considered. Most of these can be cured with series connected chokes. In fact Lucas sell ready made suppression harnesses for many standard types so a quick look in their catalogue may prove worthwhile.

Finally, two really annoying types of interference you may come across manifest themselves as strong carriers spaced at regular intervals every few MHz, usually in the low to mid v.h.f.

range. These have either a regular ticking or buzzing type of modulation superimposed upon them and originate from the crystal controlled clock signals generated in either the car clock, alarm, cellular phone or engine management system. These can radiate for a considerable distance, in fact at one time I could tell if I was within a few hundred yards of a particular model of car by the very distinctive signal radiated from its engine management system. Unfortunately in these circumstances there is not that much you can do about it other than consult the manufacturer of the equipment causing the problem. This can sometimes be effective especially if they are already aware of the problem - unfortunately in many cases this is not so.

I hope that these notes have helped you to get the most from your mobile installation. If you have any other hints or tips relating to this subject why not drop me a line and share them with other readers

Until next month - Good Listening.

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SR006	Medium Wave AM Radio	Nov 90	3.34
SR005	R210 Converter	July/August	6.87
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Roger Barker of Boston has sent me some very high quality FAX images that he received using his ICS-FAX system. The main difference with his system is that the hard copy is obtained using PC Paintbrush IV+ with a Laserjet printer. Paintbrush offers several halftoning algorithms but Roger finds the one called 'Fattig' to be the most effective with Laserjet printers.

Next we have a plea for help from **Norman Wilby** of Newton Abbot. He recently bought a second-hand MBA Reader model R0, manufactured by AEA. The only problem was, the instructions were missing. This is causing Norman some difficulty as he is unable to use the full range of features. Can anyone help? If so, please drop me a line and I will forward the details to Norman.

A second plea for help comes from **Kevin Delve** of Barnstable. Kevin purchased a set of programs from the ASTUR stand at the RSGB Convention this year and found details of a very interesting FAX decoder. Inspired with this new project, he proceeded to build the hardware. However, he soon discovered that the program STFAX.TOS was also required. He sent off his membership fee to ASTUR, ordered the program and sat back in anticipation. You can imagine his despair when a letter arrived explaining that ASTUR had closed down and no more disks would be supplied. So the plea is simply - can anyone supply Kevin with a copy of the program STFAX.TOS? He is more than happy to refund postage, etc. If you can help please correspond via the address at the head of the column.

Klingenfuss New Releases

This month I've received three new editions from Joerg Klingenfuss - *Radioteletype Code Manual*, *Guide to Former Utility Stations* and *Guide to Fax stations*.

The most significant of these is the *Radioteletype Code Manual* as this has undergone several changes. The first and most noticeable is the change of typeface. The typeface used is the same as that on the latest *Guide To Utility Stations* and makes a tremendous improvement to the readability. Besides the change of typeface, the general layout has been improved resulting in a total transformation of this invaluable book. All the diagrams have been made much clearer and a few new ones added. The earlier editions used Roman numerals for the chapters with Latin for the sub-sections. In the new version, Latin numbers have been used throughout. This may sound like a minor point, but I found the old system to be confusing - perhaps I'm just getting old!

There are several additions to this edition, one of which is the inclusion of a few spectrum analyser displays. These are used to illustrate the

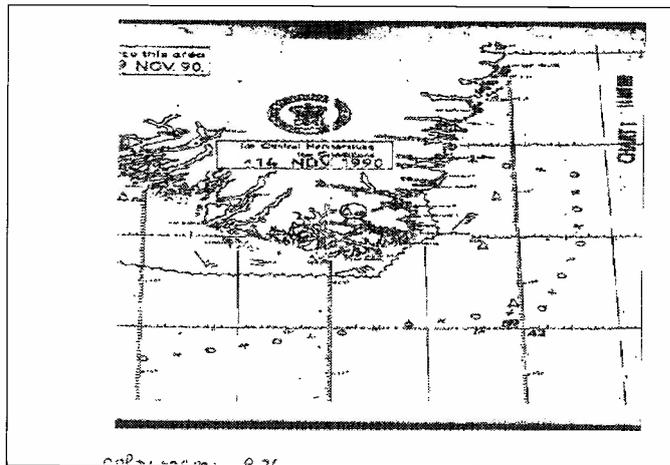
spectrums generated by a variety of RTTY signals. The standard RTTY section has also been expanded to include some handy flow charts. These are used to illustrate the various shift options in common use.

Another area to come in for enhancement is the vocabulary of Arabic words. This is helpful when translating from text received on a standard (Latin) decoder into English equivalents of Arabic text. For an example of this see last month's 'Decode'.

To summarise then, this latest (11th) edition of the *Radioteletype Code Manual* represents a significant improvement over previous editions. The eleventh edition of the *Guide to Facsimile Stations* follows similar lines to the earlier publications in this series. As with the *Radioteletype Code Manual*, the main change is the revised layout with a higher quality typeface. This makes the whole book much more readable. The rest of the book has undergone the usual annual updates to the frequency list and schedules. I also note that many of the sample charts at the rear of the book have been updated to include 1991 versions. The *Guide to Facsimile Stations* remains essential reading for serious FAX enthusiasts.

The final book to consider is the *Guide To Former Utility Transmissions*. I'm sure I can hear you saying - who wants an out-of-date frequency list? I've had this question posed to me at many rallies, so it's probably a good idea if I provide an answer here.

You will have no doubt noticed that all the frequency lists on the market undergo frequent re-issues. The reason for this is not simply a desire to sell more books, but a reflection of the state of the h.f. radio network. The frequency allocations are constantly changing, as are the services that operate on those frequencies. In order for the frequency list to remain anywhere near accurate, annual or biannual reissues are required. The question, of course, is what happens to frequencies that fall into disuse? The answer is that they often recur at a later date, but with a totally different transmission mode. A typical example would be a c.w. station that closes, but the frequency is re-used at a different location for an ARQ mode. If you could identify the previous user of the frequency, you would be well on the way to identifying the new user. The *Guide To Former Utility Transmission* contains some 8903 frequencies that have been withdrawn from the main *Guide To Utility Stations*. A practical example of this is the KUNA (KUwait News Agency) that closed down when Iraq invaded Kuwait. When this station re-opens it will probably be on its original frequency allocation so possession of the *Guide To Former Utility Transmissions* will enable easy identification.



Laserjet FAX image from Roger Barker.

I hope that you can now see that there is a real use for an out-of-date frequency list! I ought to add that the Klingenfuss book also lists stations by callsign and many stations that lacked clear callsign.

All the books I've described here are currently available from the *Short Wave Magazine Book Service*. My thanks to Joerg Klingenfuss for the supply of the review copies.

Photo Call

I think it's about time we put a few names to faces and published some photos of readers' shacks. If you would like to be included, just send me a good photograph as you can manage. Although we can handle transparencies, prints are preferable as they can be scanned straight in to the desktop publishing system. The print size doesn't matter and standard prints produced by High Street Mini Labs are perfectly adequate. Instead of just a shot of your shack, try to make sure you get at least a head and shoulders of yourself. Please send the photos, with your station details, to the address at the head of the column, once they have been used, the photos can be returned. This also applies to any original QSL cards you may like to send in..

HI/LO Tones

A letter from **Patrick Scott** of Fulham has prompted me to give an explanation of meaning of high and low tones. Patrick has been told that transmissions using high tones cannot be decoded by the ERA Microreader. Patrick will no doubt be pleased to hear that his fears are unfounded. So let's move on to explain just why.

The term high and low tones originates from amateur radio and refers to the generation of RTTY signals. You will no doubt recall from earlier columns, that RTTY and other data signals are transmitted by switching a trans-

mitter between a pair of closely spaced radio frequencies. Typical spacings or shifts are 170, 400 and 850Hz. Commercial transmissions generate these signals by a system called frequency shift keying. In this system, the transmitted frequency is switched between the two alternatives directly by the data signal. This makes for a much simpler transmitter when compared to one that has to handle speech signals.

When we look at the amateur radio RTTY enthusiast, the situation is somewhat different. Most amateurs these days buy factory-built transceivers that are primarily set-up for speech communications using s.s.b. (single sideband). From this you can see that the amateur faces a different set of problems to the commercial operator - how to create a frequency shifted signal with an s.s.b. transmitter. Fortunately, this is not too difficult, thanks to the way s.s.b. signals are generated. If you apply a single audio tone to a s.s.b. transmitter, a single output frequency is produced that is proportional to the frequency of the audio tone. If we were to apply an audio signal that alternated between two tones, the transmitter would follow with two radio frequencies. The important point is that the spacing between the tones would remain the same. Another way to think of the process is that the output from the transmitter is the carrier frequency plus the audio frequency (u.s.b.).

If, for example, we wanted to produce a RTTY signal with a shift of 170Hz, we would have to send two audio frequencies that were 170Hz apart. It's in the choice of these frequencies that the confusion has arisen. Because development of this system occurred simultaneously in different parts of the world, the result is two standards. The two standards for amateur RTTY are, 1275/1445Hz or 2125/2295Hz. The term high and low tones is just a simple way of differentiating between these two standards.

Generally, the high tones are used

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in North America, while low tones are common in Europe. This division is somewhat fuzzy because most Japanese transceivers fitted with a RTTY option, operate to high tones. Having described the origins of the term, we can now explore the effect it has at the receiver. If you think back to the earlier part of this section, you will remember that the reason tones were used was simply to create a frequency shift signal. So there is no real difference between a true f.s.k. signal and one generated via an s.s.b. transmitter. In practice the true f.s.k. signal is normally of a higher quality due to the short comings of practical s.s.b. transceivers.

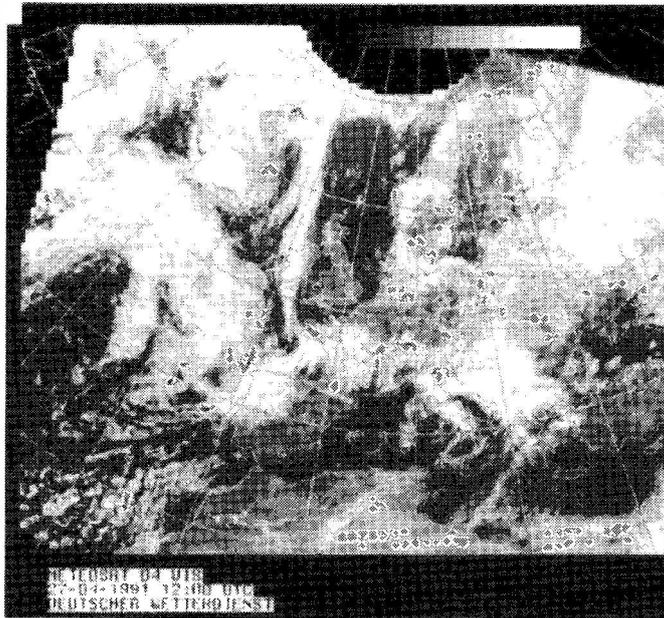
The only way short wave listeners are affected by high/low tones is when using the RTTY option on some receivers or when using certain decoders. A simple way to tell if your receivers RTTY option is set for high or low tones is to try to resolve a standard s.s.b. signal while switched to RTTY. If the signal is unresolvable with much high frequency energy, you are set for high tones. If, on the other hand the signal sounds rounded and muffled with a lack of high frequencies you are set for high tones.

When it comes to checking out the decoder the best bet is to examine the instruction book as the tone information should be included. If you need to test, tune into a strong RTTY signal and with the receiver set to u.s.b. centre the signal on the tuning display. Now switch to RTTY on the receiver and try to centre the tuning again. If you can't, the decoder and receiver are operating to different standards. Some receivers and decoders can be switched or modified to work on a different standard. However, you will have to speak to your local dealer for specific advice.

Canberra and Darwin Meteo

Jan Nieuwenhuis from The Netherlands has sent me the latest schedule from this popular Meteo station. The schedule was received direct from the Bureau of Meteorology in May. So without more ado, here's the detail.

Canberra:
2.6280Hz (AXM31) 1100-2100UTC (May - July), 1700-2000UTC August - October
5.1MHz (AXM32), 11.03MHz (AXM34), 13.92MHz (AXM35), 0000-2400UTC
20.469MHz (AXM37) 0000-2400UTC (November - April)
The schedule is transmitted at 0115UTC
Darwin: 5.775MHz (AXI32), 7.535MHz (AXI33) 1100-2300UTC
10.555MHz (AXI34) 0000-2400UTC
15.615MHz (AXI35), 18.06MHz (AXI37) 2300-1100UTC
The schedule is transmitted at 0030UTC.
If you receive any interesting schedules, please send me a copy so I can relay the information via the column.



Laserjet FAX image from Roger Barker.

Admiralty List Of Radio Signals

Having mentioned these publications on many occasions, several readers have written wanting to know how to get hold of a copy. I contacted our local branch of Kelvin Hughes and managed to put together the following details:

NP281 (1) *Radio Signals Vol 1 Part 1 Coast Radio Stations 0040-3960, Europe, Africa and Asia.*

NP281 (2) *Radio Signals Vol 1 Part 2 Coast Radio Stations 4005-7585, Philippine Is. Indonesia, Australia, The Americas, Greenland and Iceland.*

NP282 *Radio Signals Vol 2 Electronic Position Fixing Systems and Radio Time Signals*

NP283 *Radio Signals Vol 3 Radio Weather Services and Navigational Warnings.*

NP284 *Radio Signals Vol 4 Meteorological Observation Stations*

logical Observation Stations

NP286 (1) *Radio Signals Vol 6 Part 1 vessel Traffic Services, Port Operations and Pilot Services, Stations A1000-B7950*

NP286 (2) *Radio Signals Vol 6 part 2 As Part 1 but Stations C1000-H4235.*

All books are priced £16.00 except for Vol 4 which is £8.00. Post and packing is £3.00 for UK delivery and orders should be sent to:

Kelvin Hughes Ltd., Central Mail Order, Royal Crescent Road, Southampton, Hants SO9 1WB. Cheques should be made payable to Kelvin Hughes. If you prefer to order by phone, I understand they take most of the major credit cards. The hot line for mail order is 0703 223772.

Frequency List Updated

Readers who have taken advantage of my frequency list offer will no doubt have noticed that there were a few

gaps where callsigns, etc. were missing. I've been intending to correct this situation for some time, but prevented by pressure of work. However, I have finally managed to find time and the new list is now available. There are very few new frequencies, as the main object of the list is to provide a quick reference of popular frequencies. For a more comprehensive list you'll still need to invest in one of the commercial books.

If you would like to receive a copy of my list, just send three first class stamps to the address at the head of the column.

Whilst sorting out my list, I came upon several loggings that I was unable to confirm through any of my reference books. It would be very helpful if readers could keep an ear open to see if these stations are still current.
7.72MHz, RTTY, 50, 425, FDY, 1229UTC, French Air
7.9115MHz, RTTY, 75, ?, ?, 1950UTC, AFP Hong Kong
9.2415MHz, FAX, 60, 352, DYN, 2305UTC, Buenos Aires
10.295MHz, ARQ, 100, 170, FSB71, 1730UTC, Interpol Paris
11.0275MHz, RTTY, 50, ?, 9PL, 2315UTC, Kinsasa Air Zaire

The following are a selection of the loggings received from readers this month. The format is the usual; Frequency, speed, shift, callsign, time and notes.

10.1237MHz, FEC-A, 96, 200, DCF42, 0558UTC, German Press
3.2315MHz, FAX, 60, 352, ?, 2145UTC, Press Pix
4.5705MHz, FAX, 120, 576, DHJ51, 1804UTC, Greleng Meteo
6.6786MHz, Packet, 300, 200, ?, 2108UTC, UNID
7.845MHz, RTTY, 50, 400, SOH284, 2056UTC, PAP Warsaw
9.114MHz, RTTY, 50, 400, HGG31, 1028UTC, MTI Budapest
9.133MHz, RTTY, 50, 260, ?ZWW6, 0755UTC, ATTA Tirana
9.43MHz, RTTY, 50, 500, ZAT, 0807UTC, English News
14.367MHz, FAX, 120, 576, BAF8, 1940UTC, Beijing Meteo
16.8665MHz, RTTY, 75, 850, GYA, 2044UTC, RN London
16.9285MHz, CW, -, -, VIX6, 2038UTC, RAN Canberra
16.971MHz, FAX, 60, 576, JJC, 0854UTC, Japanese newspaper
18.264MHz, RTTY, 50, 440, XVN48, 0553UTC, VNA Hanoi
18.4399MHz, RTTY, 50, 450, ?, 1255UTC, Arabic + English KUNA?
23.5229MHz, 120, 576, JMH6, 1720UTC, Tokyo Meteo

If you would like a copy of the frequency list, send three 1st or 2nd class stamps (or 2 IRCs for overseas readers) to the address at the head of the page and I will dispatch the list as soon as possible.

Abbreviations

ARQ	Automatic ReQuest repeat
c.w.	continuous wave (Morse)
FAX	facsimile
f.s.k.	Frequency Shift Keying
h.f.	high frequency
Hz	hertz
MHz	megahertz
QSL	verification of a contact
RSGB	Radio SOciety of Great Britain
RTTY	Radio TeleTYpe
s.s.b.	single sideband
u.s.b.	upper sideband
UTC	Universal Co-ordinated Time (=GMT)

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

For several years, the Russians have launched new oceanographic satellites each summer. These have included COSMOS 1602 in September 1984, COSMOS 1766 in July 1986, COSMOS 1869 in July 1987, OKEAN 1 in July 1988, OKEAN 2 (late launch) in Feb 1990 and now OKEAN 3 whose signals I (and no doubt others) picked up during the early hours of June 6.

All of these satellites transmit their telemetry on 137.40MHz, but not continuously because of power constraints. Unlike the usual meteorological satellites, the OKEAN series also has a sideways looking radar scanner and a microwave sounder. The radar sees through cloud, and so images from this scanner show land and under-water rock formations.

The orbit of OKEAN 3 is significantly different from the previous OKEANs having its plane separated by 90° from OKEAN 2, which is itself separated from OKEAN 1 by 60°. This suggests that the new satellite is not a replacement and so can be expected to be used as well as OKEAN 2, and I have recorded telemetry from both satellites. A letter from **R E Hogben** of Dover also reported seeing good a.p.t. similar to OKEAN 2. It is not too difficult to construct 'dummy' elements for new METEOR and NOAA satellites because they remain transmitting, allowing one to adjust the orbital elements of similar satellites to get a good fit. Producing 'dummy' elements for OKEAN 3, however, is extremely difficult since there may be only one pass in a day or two - so I did not attempt the feat! A friend made some enquiries for me and within a few days I received the elements and these were added to my database for inclusion in the Keplers requested by *SWM* readers.

Current Weather Satellites

Last month, I gave details of the NOAA 12, METEOR 3-4 and METEOSAT 5 satellites, all of which had just started operations. METEOR 3-4 has so far proved to be a reliable provider of good a.p.t. and has remained transmitting both visible and infra-red imagery. NOAA 12 started transmitting infra-red pictures on June 19 around 1800UTC. **Mr A W Rhead** of Stewarton in Ayrshire was one of a number of *SWM* readers who picked up the new METEOR 3-4 transmissions. **Bob Warriner** of Lancing noticed that his software would not synchronise, but he found his OKEAN software worked to some extent. I found that the NOAA software also synchronised with the new METEOR, and received the upgrade not long after.

METEOR 2/19 had been providing good a.p.t. on 137.85MHz for several weeks, but was switched off in early June and replaced by METEOR 2/20, which regular monitors will know is still transmitting without the phasing

bars or grey scale. This means that it can only be viewed using a framestore since software has no means of synchronising the picture. METEOR 2/18 came on on June 19 using 137.30MHz.

METEOSAT 5

Peter de Jong wrote from Holland to send more pictures and to ask about METEOSAT 5. I have not received any further information about the problems with this new METEOSAT, neither have I seen any details on the METEOSAT 4 administration broadcasts which are transmitted from 0218UTC and again every three hours (see **Fig. 4** from Peter).

Satellite Groups

If you run computer predictions for all weather satellites over a period of a few days, patterns quickly emerge showing how some are grouped together. You can see that NOAAs 9 and 11 are in similar orbits (northbound during the afternoon) separated by a few hours, and every couple of months the Americans switch off NOAA 9 to avoid its signal interfering with that of NOAA 11. This lasts for about 5 weeks but NOAA 9 can still be heard during this time by tuning into its beacon (137.77MHz).

NOAAs 10 and 12 form a similar pair (northbound passes during the evening) and by early June I expected NOAA 10 to be switched off, giving priority to NOAA 12. However, on June 6 the reverse happened and NOAA 12 was switched off! It was still transmitting two visible light images so this would explain matters.

By running predictions over the following days to see when the satellites would separate, I estimated that NOAA 12 would come back on approximately June 12 and it did so at

Fig. 2: Spain and the eastern Atlantic from Les Gibson.

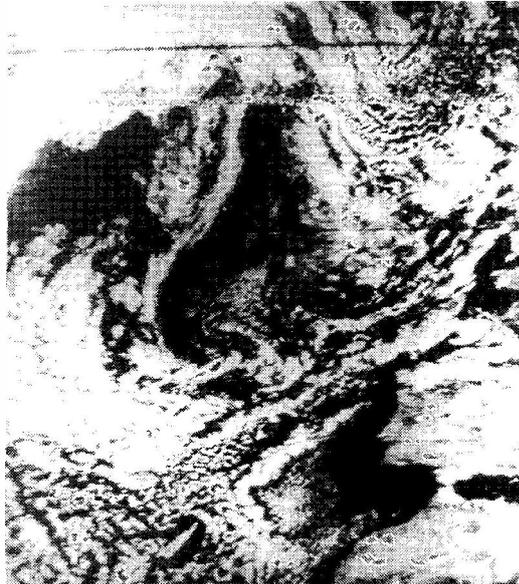


Fig. 1: Spain and Europe using original a.p.t. hardware from Les Gibson.



0843UTC on June 13, still with two visible images.

GOES 2

If you point your METEOSAT dish or Yagi over to your western horizon you may hear the GOES transmission. I have been monitoring poor signals from GOES for several weeks now but some people have written telling me that they cannot hear any signal at all, and so curiosity led me to look at its orbit. I have several of the GOES satellites included on my program, which has a facility to 'fast forward' the satellite and so I looked at the elevation of GOES 2 as seen from the UK. To my surprise the position changes considerably during 24 hours and this explains the signal variations.

GOES 2's elevation starts at about 1° around 0830UTC and increases to about 10° by 1530UTC. It continues to increase to a maximum of some 16° by about 2100UTC after which it slowly declines to about 10° by 0200UTC and back to a miserly 1° the same morning at about 0830UTC. This process repeats each day and so there is obviously a much better chance of hearing GOES during the mid-evening time. I hope this helps!

Maplin Receivers

I have received many letters from readers suffering paging transmitter interference with their Maplin receivers. Paging has affected all weather satellite receivers in the past but some manufacturers have modified their circuit designs to minimise it.

Just before the last edition of *SWM* went to press I received a letter from **MA Brighton**, the Customer Technical Services Manager, who explains that Maplin do not suffer from any paging problems at Rayleigh and so have not had any interference to filter. He asks whether readers who have developed modifications which have proved effective, could contact him. He also says that very few customers have complained to them of this interference. This looks like a good opportunity for readers to help Maplin to solve the problem, and so if users could contact Mr Brighton at Maplin this would be appreciated.

Martelec

Chris Pretty of Martelec Communication Systems is setting up a field test programme for volunteers to test his new receiver for susceptibility to the paging interference. Because I now suffer badly from this I have offered to put it through its paces, and report on the results! Chris adds that he is "somewhat alarmed at the vast number of people suffering interference, mostly from pagers".

Other Satellites

Like many people with scanners I leave mine running while I do other work, but it keeps stopping, either on interference or satellites! This has happened frequently during our summer months because the long hours of daylight mean that we can hear those satellites which only transmit in sunlight.

A few years ago I heard a transmission on 137.56MHz which I traced to the all-British satellite UK 6 which was coming on when it entered sunlight. It can take a long time to trace these transmissions but it is very interesting when they can be identified. UK 6 re-entered the atmosphere many

months ago - so what a surprise I had when on May 15 I heard a similar signal once more on 137.56MHz!

This was easily confirmed by recordings made during the next few days and I heard it live as well. I sent in my monthly log of recordings to **Geoffrey Falworth** of Penwortham who produces the specialist publication *Satellite News* and he was able to locate Kepler elements for two satellites launched back in the early seventies - called X3 and X4. Both were British satellites using the same frequency, and X3 was the only British satellite to be launched by a British rocket - a Black Arrow launched from Woomera in Australia on 28 October 1971. The predictions for X3 fitted perfectly and have allowed me to monitor this spacecraft during later weeks. The satellite was not supposed to be operating after twenty years and there are no known v.h.f. stations able to command it or check its data.

Another regular transmission is that on 136.11MHz which comes from MOS 1 and MOS 1B, the Japanese Marine Observations Satellites. Sert 2 can occasionally be heard on 136.23MHz. Other puzzles are still being analysed. My thanks to Des Watson of RIG for providing me with Kepler elements to assist with identification.

Letters

Several readers have written about their own development work for predicting satellite pass times, often modifying programs to run on specific computers. **BA Hills** of Bournemouth has an Atari Mega ST computer and has been modifying a program written originally for the BBC, which he tells me is now providing accurate data using NOAA 10 and 11 information from Weatherwatch UK (see later paragraph). **Les Gibson** of Bristol is a retired school master who must be one of the most experienced weather satellite hardware people to have written to me. He built equipment at home back in 1971 when the ESSA satellites were in operation and has recently renewed his interest in this field.

Les has rebuilt the hardware, which still works after 20 years and sent me some pictures to prove it! This also illustrates the fact that the a.p.t. signal format is essentially unchanged since it was devised. His screen is a cathode ray tube from a redundant 12in television with slightly modified circuitry! That is a great achievement, Les.

From France came a letter from **Esmond Aguila F6GOV/G4KBJ** of Mouvaux who retired some years ago and has developed a serious interest in radio, already decoding FAX transmissions. Esmond is proposing to start setting up a satellite receiving station using a '386SX' computer and wondered whether METEOSAT or the polar orbiters would provide the best

route. My suggestion to Esmond was that the continuous transmissions from METEOSAT perhaps give more data per pound (£)!

Independence

Recommending hardware is not easy because any decision to purchase equipment requires a close look at the uses planned for it. 'Info in Orbit' is designed to keep readers up-to-date with developments in the field of weather satellites, and this will often mean referring to various computer systems. It is my intention to maintain independence from all manufacturers whilst at the same time encouraging them to send me details of their latest products for mention or review. Not all suppliers do this!

I have received one or two products which I felt needed modifications to improve their effectiveness, and have suggested this to the manufacturers accordingly. With editorial approval I hope to be able to review all major software releases aimed at the weather satellite market. As previously mentioned I welcome any comments and suggestions from the readers of this column.

Letters Continued

The purchase of a computer for satellite use is being considered by many people who are looking at, and perhaps confused by, the extremely wide choice of equipment and wondering which machine to buy. Without doubt it is always worth spending time doing research before committing hard earned cash. I could easily write an article on this topic alone.

BD Berman of Burton on Trent asks for my opinion on the relative merits of Commodore Amigas fitted with memory extension, compared with '286' computers, being those fitted with the 80286 processor. The market for business software seems to start with the 8086 processor but the '286' is now considered by computer journalists to be the realistic start, and satellite software is unlikely to require more than this for a long time.

It is quite possible to use other computers, and to run well designed software to produce good quality pictures, and several correspondents have told me of their success (or problems) with various machines, including the Amiga. A visit to one of the suppliers of Amiga software for satellite use will show that this computer can be used effectively for such applications, as can other machines.

My own purchase of a 286 was governed not by satellite needs but by business requirements, though I can now run all 'IBM' satellite software to test for readers of this column!

Derrick Darlow of Stroud has a Cirkit wxsat receiver and a portable XT

computer and asked whether this combination could be used. The Cirkit receiver should be able to hear signals if a suitable antenna is connected. For test purposes a dipole can be used and the receiver tuned to one of the NOAA frequencies and left powered up. This receiver has a squelch fitted and so could be left in automatic record mode though for a first try I would want to wait nearby! The portable computer could probably run satellite predictions software because it is an 'IBM' clone but its CGA monitor (colour graphics adapter) has very low resolution and would not be suitable for displaying pictures.

John Dimond writes from South Africa to say that he has taken up satellite monitoring as a retirement hobby and asks whether I might write a bit for beginners. We did publish some notes on this topic a few months ago but I shall look at this again in view of the number of similar requests from correspondents.

Lester Jones of Merseyside sent me a dot matrix print-out from his equipment showing a good set of grey levels for his system. The Balearic Islands are clearly seen, as are the Alps. I think that Lester uses the Technical Software decoding system.

Kepler Elements

I now receive over a dozen letters each week just requesting Kepler elements, so this is more effective than publishing relatively old elements in *SWM*. My file of Keplers is up-to-date thanks to some very helpful friends at Goddard Space Flight Centre and any

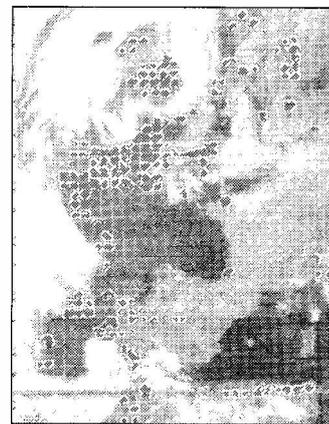


Fig. 3: NOAA 11 picture showing Spain and Europe from Lester Jones.

changes that occur in the operating weather satellites are included in the data that I send out. Please remember to include an s.a.e. with your request for either Keplers or replies. Thank you also for your kind comments regarding my job searching - it is sadly evident that many of you are in a similar position.

Weatherwatch UK

This is a telephone service providing information on the current NOAA satellites; Tel: (0256) 381448. **The number should only be used outside office hours**, e.g., evenings or weekends.

RIG

Some changes to the committee of the Remote Imaging Group took place recently, with Mark Clarke becoming the new treasurer and Reverend James Brown taking over the collection of contributions for the magazine. RIG chairman Henry Neale G3REH hopes that the quarterly magazine may be published more regularly with the next one hopefully ready by August.

Frequencies

NOAAs 9, 11 a.p.t. on 137.62MHz (beacons on 137.77MHz)
 NOAAs 10, 12 on 137.50MHz (beacons on 136.77MHz)
 METEOR 2-20 on 137.85MHz
 METEOR 3-4 and 2-18 on 137.30MHz
 OKEAN 2, 3 on 137.40MHz occasionally
 FENGYUN 1-2 was on 137.80MHz

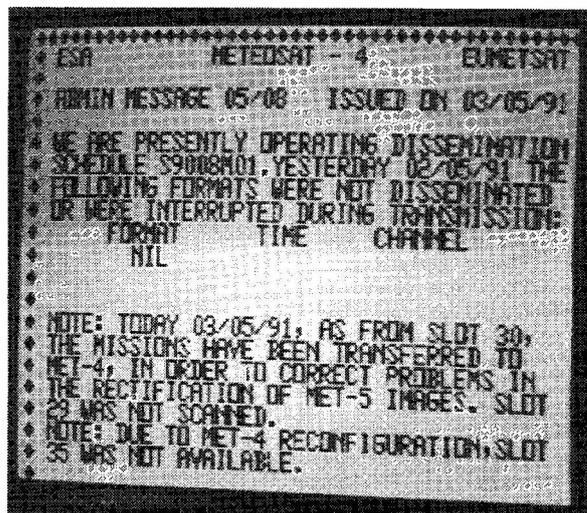
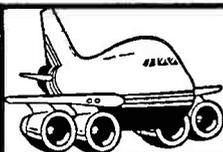


Fig. 4: METEOSAT-4 administration message from Peter de Jong.



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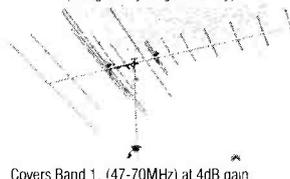
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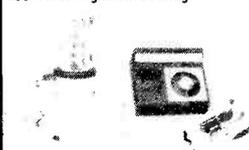
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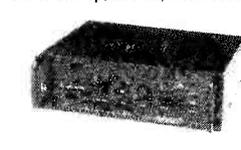
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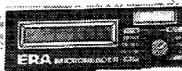
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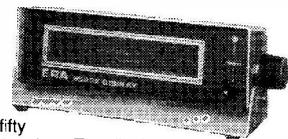


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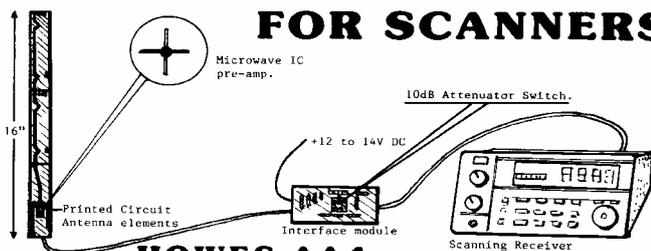


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Brian Oddy G3FEX, Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

The BBC has decided to close its s.w. operation at Daventry, Northamptonshire. The World Service programmes that are currently transmitted from Daventry will be transferred to the Woofferton transmitting station in Shropshire, where facilities are being released as a result of a reduction in the Voice of America's requirements. Woofferton has been operated by the BBC for the transmission of VoA programmes under an agreement dating back to 1943.

The transfer of the Daventry s.w. operation will commence in April 1992 and it is anticipated that it will be completed by the end of that year.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Un-

Medium Wave DX Chart

Freq kHz	TX Location	Country	Power kW	DXer
520	Wurzburg	Germany	0.2	C*
531	Ain Beida	Algeria	600	H*
531	Leipzig	Germany	100	L
531	Oviedo	Spain	10	L
540	Wavre	Belgium	150/50	B, D, H, L, P
540	Conamara	Ireland (S)	2	E
549	Bayreuth	Germany	200	D*, L, P
558	Valencia	Spain	20	K*
567	Berlin	Germany	100	K*
567	Tullamore	Ireland (S)	500	B, L, P
576	Stuttgart	Germany	500	L
585	Orf Wien	Austria	600	D*
585	Paris	France	8	L, P
585	Madrid	Spain	200	D, K*
585	Dumfries	UK	2	J
594	Frankfurt	Germany	400	H, L
594	Muge	Portugal	100	D
603	Newcastle	UK	2	B, K*
612	Athlone	Ireland (S)	100	B, D, L
612	Lerida	Spain	10	C*
621	Wavre	Belgium	80	B, D*, H, L, P
639	La Coruna	Spain	100	L
648	Orfordness	UK	500	B, H, L
657	Wrexham	UK	2	B
666	Bodenseesender	Germany	300/180	K*
675	Logic	Holland	120	B, D, H, L, P, Q
684	Sevilla	Spain	250	D, N*
711	Rennes 1	France	300	L, P
720	Lisnagarvey	Ireland (N)	10	K*
720	Lots Rd London	UK	0.5	B, L
747	Flevo	Holland	400	B, D*, H, L, P
756	Brunswick	Germany	800/200	B*, D*
756	Redruth	UK	2	B, L
765	Dakar	Senegal	400	N*
765	Sottens	Switzerland	500	B*
774	Enniskillen	Ireland (N)	1	B*, K*
774	Valencia	Spain	50	K*
783	Burg	Germany	1000	N*
801	Munich	Germany	420	B*, D
810	Westerglen	UK	100	B*, D
819	Batra	Egypt	450	N*
819	Toulouse	France	50	B*
828	Corca Dhuibhne	Ireland (S)	1	E
846	Rome	Italy	540	D*, N*
855	Berlin	Germany	100	K
864	Paris	France	300	D, L, P
873	Frankfurt	Germany	150	D, K*, M*
882	Washford	UK	70	B, D, G, H, L, P
891	Algiers	Algeria	600/300	K*
900	Milan	Italy	600	K*
918	Madrid	Spain	20	K*
927	Wolvertem	Belgium	300	B, D, H, L
936	Bremen	Germany	100	D, K*
945	Toulouse	France	300	D
954	Dobrochov	Czechoslovakia	400	D
963	Tir Chonail	Ireland (S)	10	E
972	Hamburg	Germany	300	K*
972	Nikolayev	USSR	500	D
981	Alger	Algeria	600/300	K*
980	Berlin	Germany	300	D
990	Redmoos	UK	1	K*
999	Hoyerswerda	Germany	20	K*
999	Madrid	Spain	20	D
1008	Flevo	Holland	400	A, B, D, H, L, P
1017	Wolfshiem	Germany	600	D, K*
1044	Dresden	Germany	250	D, K*
1053	Zaragoza	Spain	10	K*
1062	Kalundborg	Denmark	250	D
1071	Brest	France	20	A, L
1080	Katowice	Poland	1500	D
1089	Weimar	Germany	20	K*
1098	Bratislava	Czechoslovakia	750	D

less otherwise stated, all logs were compiled during the four week period ending June 8.

In future, listeners in many parts of the UK will find it more difficult to hear the broadcasts on 252kHz from Algeria, Finland and the USSR because Atlantic 252 is now operating 24 hours a day from Clarkstown, S. Ireland. Although the power of the transmitter is reduced to 100kW at night, I am informed by **Bob Ellis** (Matlock) that the perceived level of audio is maintained by processing the modulating audio signal to reduce the dynamic range, i.e. to decrease the ratio of the quiet to loud passages. This technique, which is used by some broadcasters, involves compressing the audio and then limiting it to ensure that the peaks of the signal do not over-modulate the transmitter. Unless carefully controlled, it

results in the demodulated audio sounding unnatural and sideband 'splatter' on adjacent channels.

By using a directional antenna ahead of a receiver, it may be possible to 'null-out' Atlantic 252 and receive the co-channel broadcasts from other countries, also those on adjacent channels if the splatter is troublesome. It is worth noting that the null points of a spiral wound loop are deeper than other types. In Lytham St. Annes, **Neil Wheatley** used the null of the ferrite rod antenna in his portable to good effect when logging Tipaza, Algeria on 252, but he found the co-channel interference still heavy and was unable to receive Lahti, Finland.

MW Transatlantic DX

In Grimsby, **Jim Willet** found the con-

ditions to be rather poor. The signals from S. America were inaudible and he had difficulty in identifying some of the signals from the USA, Canada and the Caribbean area. The strongest signal came from CJYQ in St. John's, NF on 930kHz, which peaked S10333 at 0120. At that time, he also heard the Caribbean Beacon, Anguilla on 1610, rated S10222. Later, he heard eight broadcasts from Canada and the USA, all rated S10222 or less. At 0540 he logged Greenville R, Antigua (ZDK) on 1100 as S10222.

Four broadcasts from New York were received by **Tim Shirley** in Bristol. The first became audible on 1010 at 2315 and proved to be WINS. Later, he heard WHDH in Boston, 850 and WOGL in Philadelphia, 1210. He picked up four broadcasts from E. Canada, including CKLM in Montreal, 1570, which resumed operations in March with a reduced power of 10kW.

Other MW DX

The sky wave signals from some stations in Algeria have reached the UK after dark. In Morden, **Sheila Hughes** picked up the Arabic broadcasts from Ain Beida on 531 (600/300kW) at 2320, rated 33333. In Co. Down, **Eddie McKeown** logged Algeron 891 as 34243 at 2157 and Algiers 981 as 31333 at 0007. Several low power transmissions from Spain have also been received here, see chart.

MW Local Radio DX

Most DXers prefer to search for the ground wave signals from local radio transmitters during daylight, because the sky wave signals from many of the stations in Europe reach the UK at considerable strength after dark. Nevertheless, it is worth checking the band after dark because some of the local signals may only reach a location via sky wave paths. **Francis Hearne** (Bristol) has found that ILR Isle of Wight Radio and ILR Invicta Sound (Coast AM) both become audible on 1242kHz around 2200UTC. The sky wave component of both signals has also been reaching Co. Down around 0000UTC.

Short Wave Reports

The flares from the surface of the Sun have been much more intense than expected. Their effects have severely disturbed the ionosphere and frequently disrupted the h.f. bands. The level of background noise during these events has risen substantially and very high level bursts of solar noise have been evident. Further disturbances can be expected.

The solar activity has had a detrimental effect on propagation in the 25MHz (11m) band. Daily variations in the reception of R. Australia via Darwin on 25.750 (Eng to Asia, Middle East

Freq kHz	TX Location	Country	Power kW	DXer
1098	RNE-5	Spain	10	K*
1107	Munch	Germany	40	K*
1116	Bar	Italy	150	D*
1125	La Louviere	Belgium	20	L
1125	RNE 5	Spain	10	K*
1125	Llandrindod Wells	UK	1	A, C, K*
1134	Zadar	Yugoslavia	1200	D*, K*, L
1143	Stuttgart	Germany	10	D*
1143	Dublin	Ireland (S)	?	A, C, K
1161	Stara Zagora	Bulgaria	500	K*
1161	F. Int	France	200	D*, K*
1179	Solvesborg	Sweden	600	C*, D*, K, Q*
1188	Kuurne	Belgium	5	L
1188	Szolnok	Hungary	135	D*, K*
1197	Munich	Germany	300	D*
1197	Bournemouth	UK	0.5	A, L
1206	Bordeaux	France	100	D*, K*
1233	Melnik	Czechoslovakia	400	D*, K*
1233	Al Khatisah	Qatar	100	I
1242	Marseille	France	150	D*
1251	Marcali	Hungary	500	D*, K*
1251	Huisberg	Netherlands	10	K*
1260	Rhodes	Greece	500	K*, N*
1260	Valencia	Spain	20	K*
1269	Neumunster	Germany	600	D*, K*
1278	Strasbourg	France	300	D*
1278	Dublin/Cork	Ireland (S)	10	K*
1278	Odessa	USSR	150	K*
1287	Litomyss/Liblice	Czechoslovakia	300/200	A, D*
1296	Orfordness	UK	500	H, K*, P
1314	Kvitsoy	Norway	1200	D*, K, L
1323	Zyri	Cyprus	50	N*
1323	Leipzig	Germany	150	D*
1332	Rome	Italy	300	A
1341	Lisnagarvey	Ireland (N)	100	A, B, D, F*
1350	Nancy/Nice	France	100	D*
1377	Lille	France	300	A, B, D*, H, K, L, P
1386	Kaliningrad	USSR	500	D*
1395	Lushnje	Albania	1000	A, C*, D*, K*, O*, Q
1404	Brest	France	20	A, D*, K, L
1413	Zaragoza	Spain	20	A, B, D*
1422	Heusweiler	Germany	1200/600	D*, K
1440	Marnach	Luxembourg	1200	A, D*, L
1467	Monte Carlo	Monaco	1000/400	A, D*, H
1476	Wien-Bisamberg	Austria	600	D*
1485	Bournemouth	UK	2	A
1494	Clermont-Ferrand	France	20	A
1494	Leningrad	USSR	1000	C*, D*
1503	Stargard	Poland	300	D*, H*, O*
1512	Wolvertem	Belgium	600	A, D*, H*, K, L, O*, Q
1521	Kosice	Czechoslovakia	600	D*
1530	Rome	Italy	150/450	D*, K*, Q
1539	Mainflingen	Germany	700	D*
1557	Nice	France	300	A
1566	Sarnen	Switzerland	300	D*
1593	Langenberg	Germany	400/800	A, D*, K
1602	R. Onteniente	Spain	2	A
1602	Vitoria	Spain	10	D*

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

DXers.

- A: Darren Beasley, Bridgwater
- B: Noel Carrington, Sutton in Ashfield.
- C: Jim Cash, Swanwick
- D: Ron Galliers, N. London
- E: Simon Hearne, New Radnor
- F: Francis Hearne, Bristol.
- G: Paul Hilton, Newbury.
- H: Sheila Hughes, Morden.
- I: Rhoderick Ilman, Thumrat, Oman.
- J: Cyril Kellam, Sheffield.
- K: Eddie McKeown, Co. Down.
- L: George Millmore, Wootton I.O.W.
- M: David Minter, Portland.
- N: Dick Moon, George, S. Africa
- O: Chris Shorten, Norwich
- P: Phil Townsend, E. London.
- Q: Ted Walden-Vincent, Gt. Yarmouth.

long medium & short

0900-1100) have been noted in the UK. Some mornings their signal has rated SIO333, as quoted by **Ted Walden-Vincent** in Gt.Yarmouth, but quite often it has been inaudible. The Arabic broadcasts from the Voice of the UAE in Abu Dhabi on 25.690 usually reach the UK at SIO455, as noted at 0800 by **Kenneth Buck** in Edinburgh, but they too have been weak or inaudible at times.

In Canada, **Alan Roberts** (Quebec) also noted considerable variations in reception, with only six days of good conditions. On average, he logged the Voice of the UAE 25.690, RNI Oslo 25.730, DW via Julich 25.740 and R.Moscow 25.780 as SINPO 15111. Slightly better, RFI Paris 25.820 rated 25333 at 1250. The strongest signals came from HCJB in Quito, Ecuador 25.950 (u.s.b.+ p.c. 24hrs) that usually peaked 45555 at 1510.

Some of the **21MHz (13m)** signals from R.Australia have reached the UK. Their broadcast to Asia via Carnarvon 21.775 (Eng 0100-1000) was rated 33333 at 0715 by **Bill Griffith** in W.London; to C/SE.Asia via Darwin 21.525 (Eng 0100-0800) 14431 at 0720 by **Darren Beasley** in Bridgwater; to SE.Asia, Middle East via ? 21.720 (Eng 1100-1330) 44433 at 1150 by **Darran Taplin** in Brenchley; to C.Pacific, W.USA via Shepparton 21.740 (Eng 0030-0730) 34533 at 2300 by **David Edvardson** in WallSEND.

Among the 13m broadcasts to Europe reported were R.Japan via Moyabi, Gabon 21.575 (Eng 0700-0800), rated SIO434 at 0700 by **Cyril Kellam** in Sheffield; R.Pakistan, Islamabad 21.520 (Eng 0800-0845) 45444 at 0800 by **Roy Patrick** in Derby; HCJB Quito, Ecuador 21.455 (u.s.b.+ p.c. 24hrs) 33333 at 0830 by **Mike Smith** in Cambridge, SIO444 at 1420 by **Bill Clark** in Rotherham and 25444 at 1900 by **John Robertson** in Alnwick; RCI via Sackville, Canada 21.545 (Eng, Fr 1400-1530), heard at 1400 in Bristol and noted as 'good' at 1504 by **Charles Beanland** in Gibraltar; WCSN Scotts Corner, 21.670 (Eng 1430-1600) SIO444 at 1437 by **Philip Rambaut** in Macclesfield; UAE R.Dubai 21.605 (Ar, Eng 0615-1640, also to N.Africa) SIO444 at 1600 by **Alf Gray** in Birmingham; WYFR via Okeechobee, 21.615 (Eng, Ger, It 1600-1900) SIO344 at 1600 by **Phil Townsend** in E.London; WSHB Cypress Creek, 21.780 (Eng 1800-2000, also to USA) 23322 at 1945 by **Jim Cash** in Swanwick; RFPi Costa Rica 21.460 (Eng 2000-2200) SIO433 at 2040 by **Bryan Kimber** in Hereford; VOFC Taipei, Taiwan 21.720 (Eng 2200-2300) 44444 at 2200 in Morden.

Also logged were the BBC via Tsang Tsui, Hong Kong 21.715 (Eng to E.Asia 0300-0900) 34333 at 0835 by **Ron Galliers** in N.London; SRI via Schwarzenburg 21.695 (Eng to Pacific areas 1000-1030) 21221 at 1005 in Co.Down; R.Moscow, USSR 21.690 (Eng to ?-?) SIO333 at 1357 by **Julian Wood** in Elgin; RFI via Issoudun 21.770 (Eng, Fr to SE.Asia

1400-1600) 44333 at 1435 by **Rhoderick Illman** in Thumrait, Oman; BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 0900-1615) SIO444 at 1555 in Gt.Yarmouth; BSKSA Riyadh, Saudi Arabia 21.505 (Ar to N.Africa ?-1700) SIO444 at 1555 by **John Coulter** in Winchester; WCSN Scotts Corner, 21.640 (Eng to S.Africa 1800-2000) SIO555 at 1855 in Edinburgh; R.Nederlands via Bonaire, Ned.Antilles 21.685 (Eng to C/S.Africa 1830-1925) 54344 at 1905 by **Chris Shorten** in Norwich; RNI Oslo 21.705 (u.s.b. Norw to S.America? 2000-2030) 35553 at 2005 by **John Parry** in Northwich.

The **17MHz (16m)** broadcasts from Radio New Zealand Int., Wellington have been attracting the attention of many listeners. Their 100kW transmission from Rangataiki, N.Island on 17.770 (Eng to Pacific areas 2200-0730) was rated 33443 at 0620 and 34533 at 2205 in WallSEND. Some of the 16m broadcasts from R.Australia have also reached our shores. Their transmission to Pacific areas via Shepparton 17.715 (Eng 2200-0530) was rated SIO433 at 0250 in Hereford; to S.Asia via Carnarvon 17.630 (Eng 1430-1800) SIO455 at 1540 in Edinburgh.

In the early morning, R.Pyongyang, N.Korea 17.765 (Eng, Kor to SE.Asia 0400-0550) was rated 33333 at 0440 by **Alan Smith** in Northampton; DW via ? 17.875 (Eng to W.Africa 0600-0650) 44344 at 0600 in Norwich; R.Japan via Yamata 17.890 (Jap, Eng to Oceania 0600-0800) SIO433 at 0700 in Sheffield; Africa No.1, Gabon 17.630 (Eng, Fr to W.Africa 0700-?) 44444 at 0900 in W.London; KHBI Saipan, N.Mariana Islands 17.555 (Eng to E.Asia 0800-1000) SIO121 at 0955 in Macclesfield.

Later, RCI via Sackville 17.820 (Eng to Europe 1400-1429) rated SIO222 at 1402 in Elgin; Voice of UAE, Abu Dhabi 17.855 (Ar to Europe 0600-1900) SIO444 at 1420 in Rotherham; RFI via Issoudun 17.620 (Fr, Eng to Africa 0800-1700) 32232 at 1515 by **David Minter** in Portland; R.Pakistan, Islamabad 17.725 (Eng to E.Africa 1600-1630) 43343 at 1605 in Oman; RSA Johannesburg, S.Africa 17.790 (Eng to W.Africa 1700-1800) 54544 at 1700 in Brenchley; Vatican R, Rome 17.710 (It, Fr, Eng, Sp to Africa 1730-1800) 54344 at 1758 in Swanwick; HCJB Quito, Ecuador 17.790 (Eng to Europe 1900-2000) 22222 at 1905 in Co.Down and as 'fairly good' at 1931 in

Dxers:

- A: Darren Beasley, Bridgwater.
- B: Noel Carrington, Sutton-in-Ashfield.
- C: Jim Cash, Derby.
- D: Ron Galliers, N.London.
- E: Francis Hearne, Bristol.
- F: Paul Hilton, Newbury.
- G: Sheila Hughes, Morden.
- H: Cyril Kellam, Sheffield.
- I: Eddie McKeown, Co.Down.
- J: George Millmore, Wootton, IOW.
- K: David Minter, Portland.
- L: John Parry, Northwich.
- M: Philip Rambaut, Macclesfield.
- N: Tim Shirley, Bristol.
- O: Phil Townsend, E.London.
- P: Ted Walden-Vincent, Gt Yarmouth.
- Q: Jim Willett, Grimsby.

Local Radio DX Chart

Freq kHz	Station	BBC ILR	Power kW	Dxer
558	Spectrum R.	I	7.50	B,C,D,F,G,H,J,M,N*,Q
585	R.Solway	B	2.00	C,I*,M,N
603	Invicta Snd(Coast)	I	0.10	D,G,J,M
603	R.Gloucester	B	0.10	C,F,J,M,N
630	R.Bedfordshire	B	0.20	B,C,D,F,G,J,M,N
630	R.Cornwall	B	2.00	J,N
657	R.Clywd	B	2.00	C,D,F,G,I*,J,M,N
657	R.Cornwall	B	0.50	J
666	DevonAir R.	I	0.34	F,G,J
666	R.York	B	0.80	B,C,G,M
729	BBC Essex	B	0.20	C,D,F,G,J,O
738	Hereford/Worcester	B	0.037	C,D,J,M
756	R.Cumbria	B	1.00	I*
756	R.Shropshire	B	0.63	C,G,J,M
765	BBC Essex	B	0.50	C,D,F,G,M
774	R.Kent	B	0.70	D,J
774	R.Leeds	B	0.50	C,M
774	Severn Sound (3CR)	I	0.14	M
792	Chiltern R.	I	0.27	C,D,G,H,J,M,O
801	R.Devon	B	2.00	C,F,I*,J,M
819	Hereford/Worcester	B	0.037	C,J,M
828	Chiltern Radio	I	0.20	D,E,F,G,O
828	R.WM	B	0.20	B*,C,M
828	2CR	I	0.27	E,J
837	R.Furness	B	1.00	I*,M
837	R.Leicester	B	0.45	B*,C,D,G,J,O
855	R.Devon	B	1.00	J
855	R.Lancashire	B	1.50	B*,C,D,M
855	R.Norfolk	B	1.50	D,G,H,O
873	R.Norfolk	B	0.30	B,C,G,J,M,O
936	GWR (Brunel R.)	I	0.18	G,J
945	R.Trent (GEM-AM)	I	0.20	B,C,J,M
954	DevonAir R.	I	0.32	G,J
954	R.Wyvern	I	0.16	C,M
990	WABC (Nice & Easy)	I	0.09	B,M
990	R.Devon	B	1.00	G,J
990	Hallam R.(C.Gold)	I	0.25	C
999	R.Solent	B	1.00	F,G,J
999	R.Trent (GEM-AM)	I	0.25	B,C,M
1017	WABC (Shrewsbury)	I	?	A,B,C,M
1026	R.Cambridgeshire	B	0.50	B,C,D,F,G,O
1026	R.Jersey	B	1.00	A,G,J
1035	R.Kent	B	0.50	A,D,J,O
1035	R.Sheffield	B	1.00	B,C,M
1035	West Sound	I	0.32	I
1107	R.Northampton	B	0.50	C,G,J,J
1116	R.Derby	B	1.20	B,C,I*,M
1116	R.Guernsey	B	0.50	A,G,J
1152	BRMB (Xtra-AM)	I	3.00	A,C
1152	IBC (L Talkback R)	I	23.50	G*,J
1152	Piccadilly R.	I	1.50	M
1152	R.Broadland	I	0.83	I*
1161	GWR (Brunel R.)	I	0.16	A
1161	R.Sussex	B	1.00	J,K
1161	R.Tay	I	1.40	I*
1161	Viking R.(C.Gold)	I	0.35	B,C,M
1170	Ocean Sound (SCR)	I	0.12	F,G,J
1170	Signal R.	I	0.20	B,C,M
1170	Swansea Sound	I	0.58	A
1242	Invicta Snd(Coast)	I	0.32	D,E*,G,I*
1242	Ile of Wight R.	I	0.50	A,E*,F*,J,K
1251	Saxon R.	I	0.76	G,I*
1260	GWR (Brunel R.)	I	1.60	A,F,G,I*,J
1260	Leicester (GEM-AM)	I	0.29	C,G
1260	Marcher Sound	I	0.64	I*,M
1260	R.York	B	0.50	B
1278	Pennine R.(C.Gold)	I	0.43	M
1305	R.Hallam (C.Gold)	I	0.15	B,C,M
1305	Red Dragon (Touch)	I	0.20	A,I*,J
1323	R.Bristol	B	0.63	A,C,I*
1323	Southern Snd (SCR)	I	0.50	G,J,O
1332	Hereward R.	I	0.60	B,C,G,I*,L,M,O
1332	Wiltshire Sound	B	0.30	A,F,G,J
1359	Essex R.(Breeze)	I	0.28	G
1359	Mercia Snd(Xtra-AM)	I	0.27	B,C,M
1359	Red Dragon (Touch)	I	0.20	A,E
1359	R.Solent	B	0.85	J
1368	R.Lincolnshire	B	2.00	B,C,M
1368	R.Sussex	B	0.50	G,J,O
1368	Wiltshire Sound	B	0.10	A,F,J
1413	Sunrise R.	I	0.125	G,J,O
1431	Essex R.(Breeze)	I	0.35	A,G,O
1431	Radio 210	I	0.14	F,G,J
1449	R.Cambridgeshire	B	0.15	A,B,C,I*
1458	GLR	B	50.00	A,E*,F*,G*,J
1458	GMR	B	5.00	M
1458	R.Cumbria	B	0.50	I*
1458	R.Devon	B	2.00	A
1458	Radio WM	B	5.00	A,B,C,E*
1475	C'ty Snd(1st Gold)	I	0.50	A,C,F,G*,J
1485	R.Humberside	B	1.00	B,C
1485	R.Merseyside	B	1.20	M
1485	R.Oxford	B	0.50	A,F,J
1485	R.Sussex	B	1.00	J
1503	R.Stoke-on-Trent	B	1.00	A,B,C,M
1521	R.Mercury	I	0.64	A,F,G*,J,O
1521	R.Nottingham	B	0.50	B,C,M
1530	Pennine R.(C.Gold)	I	0.74	B,C,L,M
1530	R.Essex	B	0.15	G,O
1530	R.Wyvern	I	0.52	A,I*,J
1548	Capital R. (Gold)	I	97.50	B,G,J,P
1548	R.Bristol	B	5.00	A,J
1548	R.City (City Talk)	I	4.40	M
1548	R.Hallam (C.Gold)	I	0.74	C
1557	Chiltern R.	I	0.76	A,C
1557	Ocean Sound (SCR)	I	0.50	A,F,J
1557	R.Lancashire	B	0.25	M
1584	Gatwick	I	?	F,G,J
1584	Heathrow	I	?	F,G
1584	R.Nottingham	B	1.00	B,C,M
1584	R.Shropshire	B	0.50	A
1602	R.Kent	B	0.25	F,G,I*,J,O

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

long medium & short

Gibraltar; BBC via Ascension Island 17.880 (Eng to W/E.Africa 1900-2030) 32323 at 2015 in N.London; VOFC Taipei via Okeechobee, 17.750 (Eng to Europe 2000-2300) 43333 at 2200 in Morden; VOA via Tinang, Philippines 17.820 (Eng to E.Asia 2200-0000) SIO333 at 2200 in Bristol; Voice of UAE, Abu Dhabi 17.855 (Eng to USA 2200-0000) 45444 at 2200 in Derby; VOFC Taipei via Okeechobee, 17.750 (Eng to Europe 2200-2300) 43333 at 2200 in Morden.

The **15MHz (19m)** band is used by many broadcasters to reach European listeners. They include R.Japan via Yamata 15.325 (Eng 0700-0800), rated 43333 at 0730 in Norwich; RCI via Sackville, Canada 15.315 (Eng 1400-1429) SIO444 at 1405 in Winchester; RNB Brasilia, Brazil 15.265 (Eng, Ger 1800-?), heard at 1848 in Gibraltar; RCI via Sackville, Canada 15.325 (Eng 1900-1959) SIO444 at 1920 in Edinburgh; RAE Buenos Aires, Argentina 15.345 (Ar, Eng, It, Fr, Ger 1800-2300 Mon-Fri, Sp 1800-0000 Sat/Sun) 31221 at 1925 in Bridgwater; Voice of Vietnam, Hanoi 15.010 (Fr, Sp, Eng, Ger 1800-2130) SIO333 at 1930 in Gt.Yarmouth; R.Damascus, Syria 15.095 (Ger, Fr, Eng 1805-2105), heard at 2005 by **Don Phillips** in Bridlington; WWCR Nashville, 15.690 (Eng, Sp 1200-0000) 44444 at 2030 in W.London; R.Korea, Seoul 15.575 (Eng 2030-2130) 32232 at 2038 in Swanwick; SLBC Colombo, Sri Lanka

Tropical Bands Chart

Freq MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2035	LO
2.325	ABC Tennant Creek	Australia	2110	D
3.210	R.Mozambique	Mozambique	1820	R
3.215	R.Orange	S.Africa	2130	N
3.240	TWR	Swaziland	2100	N
3.255	BBC via Maseru	Lesotho	2100	N
3.270	SWABC 1, Namibia	SW.Africa	2100	E,N
3.295	Reykjavik	Iceland	2300	G
3.305	R.Zimbabwe	Zimbabwe	0350	R
3.315	AIR Bhopal	India	2335	J
3.315	SLBS Freetown	Sierra Leone	2100	N
3.320	R.Orion	S.Africa	1920	K,N
3.325	FRCN Lagos	Nigeria	1920	K,N
3.355	R.Botswana	Gabarone	2230	F
3.365	GBC Radio 2	Ghana	1920	C,E,F,J,K,M,N,Q,R
3.380	R.Malawi	Malawi	0350	J
3.400	Reykjavik	Iceland	1918	J
3.905	AIR Delhi	India	1456	I
3.915	BBC Kranji	Singapore	1925	J
3.955	BBC Daventry	France	1940	F,G,H,J,S
3.965	RFE Paris	France	2130	F,H,J
3.970	WfE Munich	W.Germany	0355	J
3.980	VOA Munich	W.Germany	2110	F,H,J
3.985	R.Beijing, China	via SRI Berne	2100	H
3.985	SRI Berne	Switzerland	1915	F,H,J
3.995	DW Cologne (Julich)	W.Germany	2130	F,H,J
4.000	Bofoussam	Cameroon	1925	K
4.040	R.Moskva 2 (Vladivost)	USSR	2110	H,J
4.220	PBS Xinjiang	China	2200	J,N
4.500	Xinjiang	China	2245	E
4.600	R.Baghdad	Iraq	2200	N
4.650	R.Santa Ana	Bolivia	0022	R
4.680	R.Nac. Espejo	Ecuador	0500	R
4.735	Xinjiang	China	2200	E,J,N
4.750	R.Bertoua	Cameroon	1920	K
4.760	R.Moscow (Dushanbe)	USSR	2343	J
4.765	Brazzaville	Pep.Rep.Congo	1943	B,E,F,H,J,K,M
4.770	FRCN Kaduna	Nigeria	1943	F,G,J,K
4.770	R.Mundial, Bolivar	Venezuela	0030	R
4.780	RTD	Djibouti	0300	R
4.785	R.Baku	USSR	2015	F
4.795	R.Douala	Cameroon	1947	F,K
4.800	NBS Lesotho	Maseru	1900	K,O,R
4.810	R.Yerevan 2	USSR	2125	F,H,J
4.815	R.diff TV Burkina	Duagadougou	1912	K,R
4.820	La Voz Evangelica	Honduras	0327	B,P
4.820	R.Moskva 4 (Khanty-M)	USSR	2030	F,K
4.825	V of Selva	Peru	0030	R
4.825	R.Moscow	USSR	2030	F,J,K
4.830	Gaborone	Botswana	1911	K

DXers:

A: Kenneth Buck, Edinburgh.
B: Noel Carrington, Sutton-in-Ashfield.
C: John Coulter, Winchester.
D: Ron Galliers, N.London.
E: Paul Hilton, Newbury.
F: Simon Holland, Douglas, IOM.
G: Sheila Hughes, Morden.
H: Eddie McKeown, Co.Down.
I: George Millmore, Wootton, IOW.
J: John Hash, Brighton.
K: Fred Pallant, Storrington.
L: Roy Patrick, Derby.
M: Tim Shirley, Bristol.
N: John Stevens, Largs.
O: Phil Townsend, E.London.
P: Neil Wheatley, Lytham St.Annes.

15.120 (Eng 1830-2130) 44433 at 2100 in Alnwick; WCSN Scotts Corner, 15.610 (Eng 2000-2200) SIO433 at 2109 in Macclesfield; Voice of Israel, Jerusalem 15.640 (Eng 2130-2200) 44444 at 2130 in Morden; WINB Red Lion, 15.185 (Eng 2002-2245) SIO333 at 2200 in Herford.

There are many 19m broadcasts to other areas. Those noted came from the BBC via Limassol, Cyprus 15.590 (Eng to Middle East 0400-0730), rated 34543 at 0515 in Wallsend; RFO Papeete, Tahiti 15.170 (Fr, Tah to SE.Pacific 1600-0930) 33233 at 0643 in Northampton; R.Australia via Shepparton 15.240 (Eng to S.Pacific areas 2200-0930) 45444 at 0657 by **John Nash** in Brighton; Voice of Malaysia, Kajang 15.295 (Eng to SE.Asia 0555-0825) SIO222 at 0745 in Grimsby; VOFC Taipei, Taiwan 15.270 (Chin to SE.Asia

Long Wave DX Chart

Freq kHz	TX Location	Country	Power kW	DXer
153	Donebach	Germany	500	A,B,D*,E,F,G,H*,I,K,M,N,O
153	Brasov	Romania	1200	A,M*
162	Allouis	France	2000	A,B,D*,E,F,G,H*,I,K,M,N,O
171	Kaliningrad	USSR	1000	A,E,H*,I,K,O
171	Moscow	USSR	500	D*,F
177	Oranienburg	Germany	750	A,B*,D*,G,H*,I,K,O
183	Saarouis	Germany	2000	A,B*,D*,E,G,H*,I,K,O
189	Motala	Sweden	300	A
198	Droitwich	UK	500	B,D*,E,G,H*,I,O
198	Westerglen	UK	50	A,F
207	Munich	Germany	500	A,D*,E,G,H*,I,K,O
207	Vatnsendi	Iceland	100	F
207	Azilal	Morocco	800	K*
216	Roumoules	Monaco	1400	A,B*,D*,E,G,H*,I,K,O
216	Oslo	Norway	200	A,H*
225	Konstantinow	Poland	2000	A,B*,C,D*,E,G*,H*,I,J,K,O
234	Junjlinster	Luxembourg	2000	A,B,D*,E,F,G,H*,K,O
243	Kalundborg	Denmark	300	A,B,D*,E,G,I,K,O
252	Tipaza	Algeria	1500	B,F*,G*,H*,I,K*,P
252	Atlantic 252	S.Ireland	500	A,D*,E,F,G*,H*,I,J,K,L,N*,O
261	Burg	Germany	200	E,F*,I,O
261	Moscow	USSR	2000	A,F*,K,M
270	Topolna	Czechoslovakia	1500	A,B*,D*,G*,H*,I,K,O
279	Minsk	USSR	500	A,K*

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

0900-1000) SIO333 at 0900 in Sheffield; BFBS via Cyprus 15.670 (u.s.b. Eng to Middle East) 33333 at 1030 in Cambridge; R.Sweden via Horby 15.270 (Eng to Middle East, Africa 1830-1900) 23422 at 1830 in Thumrait, Oman; R.Nederlands via Talata Volon, Madagascar 15.570 (Eng to C/S.Africa 1830-1925) 41322 at 1835 in Co.Down; R.Sofia, Bulgaria 15.330 (Eng to ? 2030-2100) 53344 at 2040 in Portland; Voice of the UAE, Abu Dhabi 15.305 (Eng, Ar to N.Africa?) 35444 at 2200 in Derby; R.Australia via Shepparton 15.320 (Eng to Asia 2030-0800) 34333 at 2207 in N.London.

Good reception over long distances has been noted in the **13MHz (22m)** band on some days. The signals to Pacific areas from R.New Zealand Int. on 13.785 (Eng 1800-2200, Sun to Fri) were rated SIO454 at 1900 by **Simon**

DXers:

A: Charles Beanland, Gibraltar.
B: Jim Cash, Swanwick.
C: Bill Clark, Rotherham.
D: Antonio De Abreu-Teixeira, Durham.
E: David Edwarsdon, Wallsend.
F: Ron Galliers, N.London.
G: Bill Griffith, W.London.
H: Sheila Hughes, Morden.
I: Rhoderick Ilman, Thumrait, Oman.
J: Eddie McKeown, Co.Down.
K: Fred Pallant, Storrington.
L: John Parry, Northwich.
M: Roy Patrick, Derby.
N: Don Phillips, Bridlington.
O: Tim Shirley, Bristol.
P: Alan Smith, Northampton.
Q: Ted Walden-Vincent, Gt.Yarmouth.
S: Julian Wood, Elgin.

Freq MHz	Station	Country	UTC	DXer
4.830	R.Tachira	Venezuela	0045	E,F,J
4.835	RTM Bamako	Mali	2031	A,C,E,F,J,K,N
4.845	R.Bucaramanga	Colombia	2300	D
4.845	ORTM Nouakchott	Mauritania	2031	E,F,J,K
4.850	R.Yaounde	Cameroon	2031	F,J,K,N,R
4.865	PBS Lanzhou	China	2055	F,H
4.865	V of Cinaruco	Colombia	0103	E,F
4.870	R.Cotonou	Benin	1910	K
4.875	R.Roraima, Boa Vista	Brazil	0100	R
4.885	R.Clube do Para	Brazil	0432	E
4.885	Voice of Kenya	Kenya	1840	K
4.890	ORTS Dakar	Senegal	2045	F,K
4.895	R.Bare, Manaus	Brazil	0450	R
4.895	R.Moscow (Kalinin)	USSR	0250	G
4.905	R.Nat.N'djamena	Chad	1910	F,K
4.910	R.Zambia, Lusaka	Zambia	1955	K
4.915	R.Ghana, Accra	Ghana	2047	C,F,K,N
4.915	Voice of Kenya	Kenya	1910	K
4.920	ABC Brisbane	Australia	1911	K,R
4.930	R.Haiti 4VEH	Haiti	0225	R
4.930	R.Moscow	USSR	2120	H,J
4.934	Voice of Kenya	Kenya	2014	F,J,K,O
4.940	SLBC Eng. Comm. Sce.	Sri Lanka	1613	I
4.940	R.Kiev 2	USSR	1938	F,H,J,K,O
4.945	R.Illimani, La Paz	Bolivia	0450	R
4.950	R.Nac.Luanda	Angola	1910	K
4.955	R.Marajoara, Belem	Brazil	0416	E,P
4.960	R.Baku	USSR	1912	F,K,O
4.975	R.Uganda, Kampala	Uganda	1912	K
4.980	Ecos del Torbes	Venezuela	2315	O
4.990	FRCN Lagos	Nigeria	2110	C,E,F,G,J,N,R
4.990	R.Ancash, Huaraz	Peru	0350	R
5.000	YVTO Caracas	Venezuela	0300	P,R
5.005	R.Nacional, Bata	Eq.Guinea	1913	A,F,K,M,N
5.010	R.Garoua	Cameroon	1913	K
5.012	ZBC R-1	Zimbabwe	0250	R
5.030	R.Los Andes	Peru	0112	R
5.035	R.Bangui	C.Africa	1957	F,J,K
5.035	R.Alma Ata	USSR	2200	N
5.045	R.Cultura do Para	Brazil	2315	H,J,M
5.047	R.Togo, Lome	Togo	2014	A,F,G,K,N,R
5.050	AIR Aizawal	India	0050	R
5.050	SBC Singapore	Singapore	1500	O
5.055	Faro del Caribe	Costa Rica	0425	G,P
5.055	RFO Cayenne(Matoury)	French Guiana	0220	J,R
5.060	PBS Xinjiang	China	2300	N
5.065	R.Candip, Buma	Zaire	1914	K
5.260	R.Alma Ata 2	USSR	2200	N
5.290	R.Moskva 1	USSR	1530	O

long medium & short

Hamer in New Radnor. Strong signals from R.Australia via Carnarvon have often arrived here. Their broadcast on 13.745 (Eng to S.Asia 1530-2100) was 45444 at 1800 in Derby and on 13.705 (Eng to Asia 2100-2300) as 44444 at 2230 in Morden.

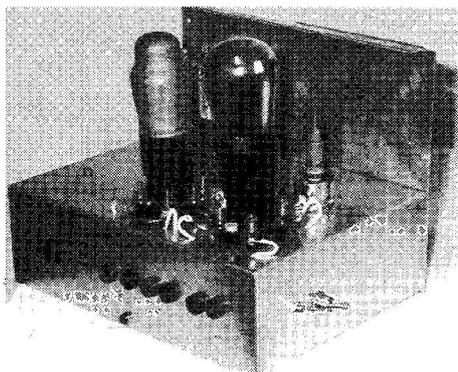
Also reported were RFPi Costa Rica 13.680 (Eng to ?), SIO222 at 0640 in Grimsby; WSHB Cypress Creek, 13.760 (Eng to Australia 0800-1000) 43444 at 0902 in Bridgwater; SRI via Schwarzenburg 13.685 (Eng to Pacific areas 1000-1030) 43344 at 1002 in Co.Down; UAE R.Dubai 13.675 (Ar, Eng to Europe 1600-2100) 53343 at 1610 in Norwich; KHBI Saipan, N.Mariana Islands 13.625 (Eng to S.Asia 1400-1800) SIO111 at 1740 in Macclesfield; DW via Julich 13.780 (Eng to W.Africa 1900-1950) 34433 in Oman; RCI via Sackville, Canada 13.650 (Eng to Europe 1900-1959) SIO455 at 1930 in Edinburgh; BBC via Woofferton, UK? 13.660 (Ar to N.Africa 2000-2100) 54444 at 2000 in Swanwick; SRI via Schwarzenburg 13.635 (Port, Eng, Sp to Africa 2030-2200) SIO444 at 2100 in Birmingham; R.Austria Int. via Moosbrunn 13.730 (Ger, Sp to S.America 2200-0000) 33233 at 2200 in N.London; Voice of the UAE, Abu Dhabi 13.605 (Ar, Eng to N.Africa 2200-0000) 44544 at 2310 in Wallsend; WHRI Noblesville, 13.760 (Eng to USA, Europe 1600-0000) SIO444 at 2345 in Rotherham.

The **11MHz (25m)** broadcasts to Europe include HCJB Quito, Ecuador 11.835 (Cz, Sw, Ger, Fr, Eng 0500-0830), rated 55544 at 0702 in Brighton; TWR Monte Carlo, Monaco 11.655 (Eng 0855-0935) 55555 at 0855 in W.London; R.Finland via Pori 11.755 (Eng 1400-1430) 54554 at 1420 in Swanwick; R.Pakistan, Islamabad 11.570 (Eng, Ur 1700-1900) 54444 at 1715 in Brenchley; RNE via Noblejas 12.035 (Sp 1000-2145) SIO332 at 1735 in Gt.Yarmouth; R.Sofia, Bulgaria 11.660 (Eng 1830-1900) 45544 at 1845 in Alnwick; Voice of Israel, Jerusalem 11.605 (Eng 1900-1930, also to USA) SIO344 at 1900 in E.London; AIR via Aligarh 11.620 (Hi, Eng 1845-2230) SIO433 at 1905 in Birmingham; R.Damascus, Syria 12.085 (Eng 2005-2105, also to USA) 45344 at 2035 in

Co.Down; R.Yugoslavia, Belgrade 11.735 (Eng 2100-2145) 33443 at 2100 in N.London.

Among those noted to other areas were TWR Bonaire, Ned.Antilles 11.930 (Eng to C.America, USA 0255-0430) SIO544 at 0400 in Hereford; RHC Havana, Cuba 11.760 (Eng to USA 0400-0600) 43433 at 0503 in Northampton; Voice of the Mediterranean, Malta 11.925 (Eng to N.Africa 1400-1600), heard at 1400 in Bridlington; RFI via Beijing, China 11.910 (Eng to Asia? 1400-1500) 42442 at 1450 in Bridgwater; KSDA Agat, Guam 11.980 (Eng to S.Asia 1600-1700) SIO445 at 1600 in Bristol; R.Australia via Shepparton 11.910 (Eng to Pacific areas 1330-2000) 43333 at 1630 in Norwich; KTWR Agana, Guam 11.650 (Eng to S.Asia 1445-1700) SIO332 at 1650 in Rotherham; VOA via Tinang, Philippines 11.920 (Eng to Africa 1600-2000) 43433 at 1700 in Oman; R.Zanzibar, Dole 11.734 (Sw to E.Africa 1500-1830) SIO444 at 1800 in New Radnor; R.Beijing via Mali 11.500 (Eng to E/S.Africa 2030-2130) SIO444 at 2120 in Macclesfield; RCI via Sackville, Canada 11.730 (Eng to Caribbean 2300-2330) 33433 at 2330 by **Robin Harvey** in Bourne; R.Nac.Amazonas, Brazil 11.780 (Port to E/S.America 0800-2300) 43333 at 2230 by **Antonio De Abru-Teixeira** in Durham; Voice of Greece, Athens 11.645 (Eng to S.America 2235-2245) 44444 at 2235 in Morden; R.Globo, Rio de Janeiro, Brazil 11.805 (Port to E/S.America 0900-0400) SIO344 at 2305 in Grimsby.

Some days, good DX reception has been noted in the **9MHz (31m)** band from ABC Brisbane 9.660 (Eng to E.Australia 1845-1400), rated 32333 at 0619 in Northampton; R.New Zealand Int, Wellington 9.700 (Eng to Pacific areas 0730-1210) SIO333 at 0800 in Sheffield; HCJB Quito, Ecuador 9.745 (Eng to S.Pacific areas 0730-1130) 43444 at 0800 in W.London; R.Australia via Shepparton 9.770 (Eng, Viet to SE.Asia 1230-1530) 44444 at 1450 in Norwich; R.Veritas, Palauig 9.615 (Chin to C.Asia 1500-1555) SIO433 at 1530 in Hereford; R.Australia via Carnarvon 9.860 (Eng to S.Asia 1800-2100) SIO444 at 1830 in Grimsby; Voice of Vietnam, Hanoi 9.840 (Viet, Eng, Fr, Sp to Europe 1700-0000)



Ron Pearce of Bungay built this O-V-I receiver.

Transatlantic DX Chart

Freq kHz	Station	Location	UTC	DXer
USA				
660	WFAN	New York, NY	2330	B
710	WOR	New York, NY	0030	B
850	WHDH	Boston, MA	0115	B,C
1010	WINS	New York, NY	2315	B,C
1030	WBZ	Boston, MA	0240	C
1050	WEVD	New York, NY	0600	B
1210	WOGL	Philadelphia, PA	0415	B
1520	WWKB	Buffalo, NY	0230	C
Canada				
590	VOCM	St.John's, NF	0210	B,C
620	CKCM	Grand Falls, NF	0230	C
650	CKGA	Gander, NF	0315	B
750	CBGY	Bonavista Bay, NF	0530	C
930	CJYQ	St John's, NF	0120	C
940	CBM	Montreal, PQ	2130	B
1410	CIGD	Pt.Hawkesbury, NS	0400	C
1570	CKLM	Level, PQ	(?)	B
C. America & Caribbean				
1100	ZDK Granville R	St.Johns, Antigua	0540	C
1570	Atlantic Beacon	Turks & Caicos IIs	0155	A
1610	Caribbean Beacon	The Valley, Anguilla	0130	A,C
South America				
720	R.Club Penambuco	Brazil	0027	A
740	R.Soc.de Bahia	Salvador, Brazil	0034	A
1000	R.Record	Sao Paulo, Brazil	0115	A

DXers:

A. Dick Moon, George, S.Africa. B. Tim Shirley, Bristol. C. Jim Willett, Grimsby

43332 at 2100 in Bourne; AIR via New Delhi 9.910 (Eng to Pacific areas 2045-2230) SIO454 at 2135 in Edinburgh; R.Nac del Paraguay 9.735 (Sp to S.America 44343 at 2230 in Durham; WGSN Scotts Corner, 9.850 (Eng to W.Africa 0000-0200) 54444 at 0000 in Portland.

The **7MHz(41m)** logs included some signals from distant places: WHRI Noblesville, USA 7.315 (Eng to USA 0000-1100), rated 44344 at 0120 in N.London; WWCR Noblesville, 7.520 (Eng to USA 0000-1200) 43343 at 0458 in Northampton; Voice of Nigeria, Lagos 7.255 (Eng, Fr, Ha to C/W.Africa 0500-2200) SIO322 at 0510 in Hereford; RTV Mali, Bamako 7.285 (Fr, Eng to W.Africa 0600-0000) SIO333 at 0610 in Grimsby; KTBN Salt Lake City, 7.510 (Eng to USA 0100-1500) 23332 at 0645 in Brighton; R.Japan via Yamata 7.410 (Jap, Eng to S/E.Asia 1600-1800) 32432 at 1740 in Oman; CPBS-1 Beijing, China 7.935 (Chin 1855-2230) SIO333 at 1855 in Gt.Yarmouth; AIR via Aligarh 7.412 (Eng to Europe 1845-1945) 33333 at 1914 in Co.Down; R.Korea, Seoul 7.550 (Kor, Ar, Eng to Middle East, Africa 1700-2130), heard at 2030 in Bridlington.

Many of the broadcasts in the **6MHz (49m)** band are intended for European listeners. They include R.Riga, Latvia 5.935 (Eng 0600-0630 Sun, 1730-1800 Sat), 34434 at 0600 in Alnwick; RIAS Berlin, Germany 6.005 (Ger 24hrs) 55555 at 0600 in W.London; R.Austria via Moosbrunn 6.155 (Eng, Fr, Eng, Sp 0400-2300) SIO333 at 0730 in Bristol; R.Netherlands via Flevo 5.955 (Eng 1130-1225) 55545 at 1140 in Portland; RFI via Allouis 6.175 (Eng 1600-1700), heard at 1630 in Bridlington; VOA via Woofferton, UK 6.040 (Eng 1700-2200) SIO333 at 1726 in Gt.Yarmouth; R.Polonia, Warsaw 6.135 (Eng 1830-1855) 54434 at 1830 in Swanwick; R.Finland via Pori 6.120 (Eng 1830-1900) 54444 at 1835 in Norwich; Voice of Turkey, Ankara 5.980 (Tur 1800-2200) SIO444 at 1937 in Winchester; RCI via Daventry, UK? 6.170 (Eng 1930-1959) SIO111 at 1958 in Elgin; R.Pyongyang, N.Korea 6.576 (Eng 2000-2100, also to Middle East, Africa) 42443 at 2045 in Bridgwater; R.Kiev, Ukraine 5.960 (Eng 2100-?) 44444 at 2100 in Morden; R.Sweden via Karlsborg 6.065 (Eng 2200-2230) 44444 at 2200 in N.London.

Those to other areas include BBC via Antigua, W.Indies 5.975 (Eng to C.America 2130-0430), rated SIO333 at 0030 in Grimsby; R.Nederland via Bonaire, Ned.Antilles 6.165 (Eng to W.USA 0330-0425) 44344 at 0333 in Northampton; R.Ghana, Accra 6.130 (Eng, Fr to W.Africa 1845-2100) SIO222 at 1915 in Hereford; King of Hope, Lebanon 6.280 (Eng to Middle East, SE.Europe), noted as 'good' at 1931 in Gibraltar and 33333 at 2115 in Derby; R.Nacional do Amazonas, Brazil 6.183 (Port to E/S.America 0800-?) 33333 at 2230 in Durham; CKZN St.John's, NF 6.160 (Eng to E.USA/Canada 0930-0500) 23333 at 2330 in Cambridge.

Station Addresses

BBC Radio Sheffield, Ashdell Grove, 60 Westbourne Road, Sheffield S10 2QU. ILR Brunel Radio, P.O.Box 2000, Bristol BS99 7SN.

Radio Nacional de Paraguay, Oliva Y Alberdi, Asuncion, Paraguay.

KOH Lebanon, High Adventure Broadcasting Network, Box 7466, Van Nuys, CA 91409, USA.

Radio CKGA, Box 730, Gander, Newfoundland A1V 1X2.

Radio WWKB, 695 Delaware Avenue, Buffalo, NY 14209, USA

Equipment Used

Charles Bealand Gibraltar Sangean AT5 803 - a.t.u. - r.w.
 Darren Beasley, Bridgwater Philips D2935 - hexagon loop a.t.u. - 10m wire
 Kenneth Buck, Edinburgh Lowe HF 225 - r.w. in left or loop
 Noel Carrington, Sutton on Avon Philips 27999 - a.t.u. - 65W antenna
 Jim Cash, Sarneck Kenwood RS500 - trap dipole
 Bill Clark, Rotherham Sony ICF SW6600 - r.w.
 John Coulter, Winchester Yaesu FRG 7 - r.w.
 Antonio De Abru-Teixeira, Durham Sony ICF SW7600 - 9.5m wire
 David Edwardson, Wallsend The R600 - inverted V trap dipole
 Ron Galters, London Philips D2935 - a.t.u. - 30m wire
 Al Gray, Birmingham Coddar CR70 - PR30 - a.t.u. - ex Army whip
 Bill Griffith, London Matsui MR4099 - 25m wire or Sony ICF 2002
 Simon Hamer, New Radnor Grundig S1400 or Sony ICF 2001D - loops
 Robin Harvey, Bourne Matsui MR4099 - s.w. loop
 Francis Heame, Bristol Sharp GFAS cassette radio - r.w.
 Simon Holland, Douglas HM Sangean AT5 803A - built in whip
 Sheila Hughes, Morden Sony ICF 7600DS - loop or Panasonic DR48 - 15m wire
 Rhoderick Ilman, Thurmat, Oman Sony ICF 7600DS - whip or 23m wire
 Cyril Kellam, Sheffield Sony ICF 7600DS - AN 1 or 5m wire
 Bryan Kimber, Horeford Realistic SX190 or Zenith R7000 - 20m wire
 Eddie McKean, Co Down Tatung TMR7602
 George Millners, Wootton IOW Tatung TMR7602 - loop or Racal RA171 - v.l.f. converter - r.w.
 David Minter, Portland Tatung TMR7602 - 30m wire
 John Nash, Brighton Kenwood RS500 - Datong AD370
 Fred Pallant, Storrington Tng R2000 - r.w. in left
 John Pany, Northwich Realistic DX 402 - 30m wire
 Roy Patrick, Derby Lowe HF 125 - 4m wire
 Don Philips, Bridlington Yaesu FRG 8800 - a.t.u. - r.w.
 Philip Rambaunt, Macclesfield Int Manne Radio R700M - r.w.
 Alan Roberts, Quebec, Canada Lowe HF 225 - 11m dipole
 John Robertson, Alnwick Lowe HF 225 - r.w.
 Tim Shirley, Bristol Icom R 71E or 710 8600 - loop or r.w.
 Chris Shorten, Norwich Matsui MR 4099 - 10m wire
 Alan Smith, Northampton Matsui MR4099 - a.t.u. - vertical dipole
 Mike Smith, Cambridge Lowe HF 225 - a.t.u. - r.w.
 John Stevens, Largs Hammerlund HG 180 or Icom R 70 - loop or r.w.
 Darren Taplin, Brenchley Yaesu FRG 7700 - FRA 7700 or FRT 7700 - Zepp
 Phil Townsend, London Lowe SBX 30 or Cedar CR 70A - PR40 - a.t.u. - r.w.
 Ted Walden, Wincen Gt Yarmouth Grundig Satellit 1400L - r.w.
 Neil Wheatley, Lytham St Annes Sangean AT5 803 - built in antennas
 Jim Willett, Grimsby RCA AR77 - 4m loop or Trio 9F 580S - a.t.u. - X dipole
 Julian Wood, Elgin Kenwood R2000 - Yaesu FRT 7700 a.t.u. - 5m wire

watching brief

Andy Emmerson G8PTH
71 Falcutt Way, Northampton NN2 8PH

This time I promised to describe the equipment you need to receive or transmit ATV, so here we go. Because the techniques are somewhat different between 70cm and 24cm I shall treat them separately. Also, there will be some deliberate simplifications in this article: it is aimed primarily at newcomers to ATV. If you think you know better, well so do I, but I wanted to keep things simple to start with!

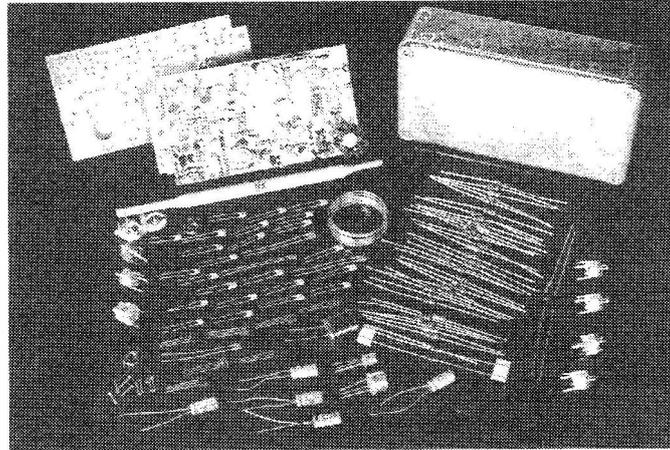
Fixed or Mobile

Most ATV transmitting is from people's home QTHs, where a spare room or cupboard is made into a combined TV studio and radio shack. Modern video equipment can be very compact but some people go to town with a mini-studio. More commonly a single ex-surveillance camera mounted on a wall-bracket and focussed on the operating position is enough. The antenna, like any other ham antenna, may be on the roof or on a separate tower or mast, but height is important. The 70cm and 24cm Yagis generally look not dissimilar to normal TV antennas, so they are not too conspicuous, and if you already have antennas for these bands you're laughing. Transmitting ATV does not normally cause interference to normal TV reception - it shouldn't do, nor of course are you allowed to!

Some amateurs take their equipment out and about - most of it runs off 12V and can be powered from battery belts or a car battery. Special lightweight 'creepy-peepy' video transmitters can be built from (American) kits to transmit the output of a hand-held camera back to a base station; these are the video equivalent of a 'walky-talky' radio of course!

ATV Outdoors

Portable operation comes into its own at fetes and carnivals, when amateurs often set up a TV and radio 'special event station'. ATV has also been used on disaster relief exercises to give the



Television transmitters can be built from kits. This example is a low-powered one costing around £35: if you're handy with a soldering iron you can make your own and save a lot of money.

officials a better view of what's going on. Several times a year there are TV fundays and contests when amateur stations try to contact as many other stations as possible, and some individuals and clubs take their equipment to as high a location as possible in order to give their signals a boost.

Apart from special event stations some ATVers take their video and transmitting gear to country fairs, sports events and the like, in order to help by providing video facilities to assist the public service officials. A couple of amateurs have mounted small cameras in radio-controlled helicopters and buggies - the views transmitted back from these unusual vantage points are most amazing! Cameras and transmitters have also been taken aloft in light aircraft and hot air balloons, as well as aboard trains, on canal barges and in cars.

Joining In

If we start with 70cm, receiving amateur transmissions is not difficult. Most modern TV sets and nearly all video recorders tune the 70cm band; for those other sets which don't, an upconverter as made by Microwave Modules will move 70cm up to Channel 36 or thereabouts. You do need a high-gain, wide-band antenna (e.g. J-Beam MBM48) and good quality cable (UR-67 or H100 at least), and a rotator is also essential so you can swing the antenna in the direction of the person who is transmitting.

If you intend transmitting as well you will need a transmitter: one of the Fortop or Microwave Modules ones, which put out 15 to 20W, is ideal. Neither is made now but second-hand examples are easily found at rallies and you should be able to pick one up for around £100. Mast-head pre-amps are useful if they are low-noise and of reasonable gain. Another desirable add-on is a linear amplifier but you can't just use any old 70cm p.a. Most solid-state examples are horribly non-linear and are of no use for ATV; the best is the EDL432 model by Polar and later by SOTA. It uses a 2C39 valve and is superb: look out for these at bring-and-buy stalls.

Microwaves

In many areas the amateur television activity has migrated to 24cm, in the microwave region. Frequency modulation is used here - special techniques and apparatus! Well, we used to think they were special but now they are used in satellite television they have become quite commonplace. A spin-off is the fact that a satellite TV receiver (the set-top box) makes a near-ideal ATV receiver since its range is 900-1700MHz (which of course includes the 24/23cm ATV band). It's worth making the effort, though, to add a good pre-amp because this does make a difference. This band is also where the television repeaters are, in on 24cm and out on 23cm. The groups who operate the repeaters have, I suppose, a

vested interest in stimulating activity and it is from them that you will get the best-value equipment (transmitters, pre-amps and aerials). See the advertisements by the Severnside and Sussex Repeater Groups in each issue of *CQ-TV*, the magazine of the British Amateur Television Club.

Join Our Club

There is an active club for ATVers, the British Amateur Television Club (BATC). It was founded in 1949 and now has over 2500 members spread across the world. The club has a friendly atmosphere and organises a convention each year; it also publishes an excellent 100-page magazine which comes out four times a year. This alone is worth the subscription money of £9 a year. The BATC also publishes handbooks and supplies printed circuit boards and specialist components at favourable prices. For further information send a stamped addressed envelope to Dave Lawton GOAND, 'Grenehurst', Pinewood Road, High Wycombe, Bucks HP12 4DD.

There are also a number of supporters clubs for the ATV repeaters around the country: your local amateur radio club should have details if you are near one of the TV repeaters.

Don't forget to send off for the booklet *TV for Amateurs*, which will tell you how to build your own TV station and get on the air. Send £1.75 to BATC Publications, 14 Lilac Avenue, Leicester LE5 1FN.

Andy Emmerson's column will appear on a quarterly basis. In the intervening two issues this page will be taken up by Brian Oddy's 'Long Wave Maritime Beacons' column followed by Andy Cadiers' column 'Off the Record' reporting on Pirate Stations. This is in response to the numerous requests from readers who are interested in finding out what is going on - which stations are legitimate and which are pirates.

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INDEX TO ADVERTISERS

AC Electronics	32	ERA	62	KW Communications	52	Rapid Results College	61
AOR UK	27	East Surrey College	53	Lake Electronics	61	Raycom	47
ASK Electronics	31	Elliott Electronics	28	Lee Electronics	23	Rylands F G	70
Aerial Techniques	61	Flightdeck	61	Link Electronics	53	SRP Trading	14
Air Supply	44	Flying Shop, The	24, 28	Loutronics	28	Sigma UK	28
Alyntronic	32	Garex	38	Low Electronics		Solid State Electronics	32
Arrow Radio	32	Garibaldi	53	Cover iii, 8, 9, 56		South Midlands	
Audio Video Care	57	HS Publications	57	Martin Lynch	19	Communications	13
Aviation Hobby Centre	53	Holdings Amateur	70	Mauritron	70	Stephens James	40
Billington Valves	70	Hooker, Alan Communications	32	Nevada Communications		Talent Computers	43
Chevet Books	53	Howes. CM Comms	62	Cover ii, 20, 21		Technical Software	62
Cirkit Distribution	23	ICS Electronics	24	PW Publishing	70	Timestep Electronics	53
Colomor Electronics	70	Icom (UK)	Cover iii	RGW Electronics	24	Waters & Stanton	49
Comar	38	J. & P. Electronics	57	RSGB	71		
DPR Marketing & Sales	38	Javation	40	Radio Research	61		
Datong	43			Radio Shack	71		
Dewsbury Electronics	57						
Dressler Communications	44						

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FOR SALE Kenwood R5000 receiver with VC-20v.h.f. converter, boxed as new, £700. ERA Microreader MkII unused, £100. Dressler ARA30 active antenna, only used indoors, £95. Ansy. Tel: (0202) 422919 6-9pm pny please.

FOR SALE PC HF-FAX and PC SWL, £125. MM2001 RTTY demodulator, £40. Reason for sale - upgraded system. Prefer to demo. **WANTED** 9600 scanner and FT-767 70cm module. Paul. Tel: (0745) 833847 after 6pm or weekends. Abergle, N. Wales.

FOR SALE Realistic 2006 scanner, 25-1300MHz, 6 months old, mint, under guarantee, boxed with manual, £235. Roy. Tel: (0244) 350000 ext 2188 daytime. (0244) 345974 evenings. Chester.

FOR SALE Icom IC-R72 receiver, boxed and unused, perfect condition, 30kHz-30MHz, b.f.o., etc., £475. Tel: 081-785 7314 evenings only.

FOR SALE Spectrum 48K computer, J&P FAX decode program, £60 both. ERA Microreader, £50. Vega 242 s.w. broadcast radio, £10. Steeplestone portable airband radio SAB9, £10. Buyer collects. Tel: 041-620 2178 Glasgow.

FOR SALE Kenwood R5000, Dressler ARA-30 active antenna, SP-430 external speaker, £650. Pocom AFR2010 RTTY/c.w. decoder, two months old, including regulated p.s.u., £500. Reasonable offers accepted. Tel: (0442) 255891 after 6pm. Hemel Hempstead.

FOR SALE Lowe HF-225 communications receiver - a.m./f.m. detector - NiCad batteries, whip antenna, keypad, case, external loudspeaker, as new, £400. Tel: (0695) 28945.

FOR SALE JIL SX-400 scanner, JIL RF-1030 s.w. converter complete with manuals. ALSO power supply (Icom headphones, external speaker), ARA-1500 active antenna. All in immaculate condition, £500 will separate. Tel: 091-548 5586.

EXCHANGE unused Canon EOS-10 plus APO zoom, etc., outfit for NRD-525, Icom R-71 or Kenwood 5000 with cash adjustment. Tel: (0752) 407664 mornings or after 6pm. Plymouth.

FOR SALE LOWE SRX30 receiver, 200kHz-30MHz plus f.m. with manual, excellent condition, £165. Also Midland CB transceiver, 40 channel 3001 with manual, never used, £60. D.J. Rockliffe. Tel: 021-445 5360.

FOR SALE AOR1000 MkII scanner, mint condition, boxed with accessories, £190. **EXCHANGE** for ERA Microreader plus cash. **FOR SALE** SEM audio multi-filter, as new, £80. Tel: (0923) 672346 Watford.

FOR SALE ERA Microreader MkII V30 firmware, under guarantee, £125. SEM h.f. to v.h.f. converter, mint condition. £40. Tel: (0344) 360113 E. Berkshire.

FOR SALE Raca RA17 MkII in good condition, £100. Also Panasonic DR49, general coverage receiver, no o.m. ferrite rod and needs slight attention, £100 o.n.o. Michael Sargeant. Tel: (0204) 652078 Bolton.

FOR SALE Sony ICF PRO80 boxed with all accessories, manuals, case, etc., immaculate condition, approximately ten months old, little used, £195. Mac. Tel: (0327) 842285.

WANTED Sony ICF SW1 system or preferably receiver only for reasonable price (student). Can collect within 50 miles of London. Tel: 071-252 7817 6pm to 9pm Sunday to Thursday inclusive.

FOR SALE Communications receiver Icom IC-R70, 0-30MHz comes with Yaesu FRA-7700 active antenna, boxed both in first class condition, £375. L.B. Rogers, 156 Franklin Avenue, Tadley, Hants.

FOR SALE Yaesu FRG-8800 as new condition, YXL forbids any new kit until this is sold, so £475 o.v.n.o. Mike. Tel: (0602) 440833 during working hours. Nottingham.

FOR SALE Sony PRO-80 hand-held receiver with airband and 8-way tuning, 150kHz-108MHz & 115-223MHz, boxed as new, £220. Tel: (0483) 770890. Woking.

FOR SALE 934MHz Delta 1 pre-amp and mobile antenna, £250. 934MHz handset and d.c.-d.c. converter, £300. Tel: (0452) 503006.

FOR SALE Icom IC R71 h.f. receiver, £500. AR2002 (MX8000) scanner, £275. ARI1000 hand-held scanner, £150. All excellent condition, boxed. Raca RA17L h.f. receiver, excellent condition, £175. **WANTED** Signal 353 late model, HF-225, ICF2001D. Tel: (0582) 668848. Luton, Beds.

FOR SALE Hallicrafter S-38B h.f. valved receiver 0.15-30MHz a.m./c.w. with bandspread case rusty but working 115V a.c. Also Philips Sagitta a.m./f.m. receiver made in Germany. Offers please. Tel: (0273) 685738 evenings. Brighton.

FOR SALE Sony ICF-SW7600 i.w., m.w., s.w. and f.m. stereo, u.s.b., i.s.b. immaculate, boxed with all accessories including adaptor and case, still under guarantee, £95. Tel: 082-84 362 after 6pm.

FOR SALE PRO34 scanner, good order with charger and cigar lighter plug, all boxed, £150 of offer. Tel: (0203) 349336 daytime.

FOR SALE Yaesu FRG-7700 receiver, complete with FRT-7700 tuner and manuals, both in good condition and boxed for £250. Keith. Tel: (0443) 790447 evenings and weekends or (0495) 222020 ext 161 daytime. South Wales.

FOR SALE Trio R1000 0-30MHz u.s.b., i.s.b., c.w., a.m., good condition with Hamgera pre-selector, 3200 o.v.n.o. Tel: (0222) 709456. Cardiff.

FOR SALE Eddystone 770R need realignment, offers. Sony AIR7 hand-held, mint condition with NiCads, £125 o.n.o. Tel: (0686) 627108. Powys.

FOR SALE Sony 2001D portable communications receiver, £190. Tel: (0767) 314381. Bedfordshire.

FOR SALE Yupiteru MVT6000 plus power pack, £175. Downes. Tel: (0438) 367535. Stevenage.

FOR SALE Cheetah 87 telex, excellent condition and in full working order. Supply of paper included. Available for collection in Chiem, Surrey, £85 o.n.o. Tel: 081-642 5568 9am to 5pm weekdays.

FOR SALE Sommerkamp FR108 h.f. receiver, 80, 40, 20, 15, 10m bands, v.g.c., £160 o.n.o. plus h.f. converter, £30. Buyer collect. M. Mayer, 17 Kingsway, Nuneaton, Warwickshire CV11 5LP. Tel: (0203) 327611.

FOR SALE Yaesu FT-767GX, £1000. Yaesu FT-470 dual-band ahndie, lots of accessories, £500. Yaesu FT-470RH dual band, duplexer, antenna, mag-mount, £500. All items boxed and in excellent condition. Steve. Tel: (0322) 664292, Swanley, Kent.

Fill in the order form in **BLOCK CAPITALS** - up to a maximum of 30 words plus 12 words for your address - and send it, together with your payment of £2.30, to **Trading Post, Short Wave Magazine, Enefco House, The Quay, Poole, Dorset BH15 1PP**. If you do not wish to cut your copy of *SWM*, or do not wish to use the order form provided, you must still send the corner flash or your subscription number as proof of purchase of the magazine. Advertisements from traders, apparent traders or for equipment which it is illegal to possess, use or which cannot be licensed in the UK will not be accepted.

FOR SALE Eddystone 1650 RX with motorised pre-selector and desk-top cabinet, 31200. Limplex F2/OSC1 synchronous a.m. RX with Limplex loop antenna, £500. Both mint, no offers, s.a.e. for details. Stuart Senior, 78 Palace Road, London SW2 3JX. Tel: 081-674 6452.

FOR SALE Drake R7A 0-30MHz receiver, mint condition, all crystal filters and noise blanker fitted. A very superior quality unit with complete manuals. Tel: (0926) 313534. Leamington Spa.

FOR SALE/EXCHANGE Sony ICF-SW7600, latest model, unused, leather case, also KAM Kantronics all mode, TNC, mint. Require quality hand-held scanner or ICR-7000 receiver. Tel: (0202) 422273 after 6.30pm. Bournemouth.

FOR SALE Realistic PRO2004 desk-top scanner, excellent condition, £185 no offers. Tel: (0202) 422273 after 6.30pm. Bournemouth.

FOR SALE Signal R-535 (new version), NiCads, case, helical, as new, £225 o.n.o. Tel: (0379) 652043. Norfolk.

FOR SALE two Eddystone 770R, one Eddystone 730/1, one Heathkit GR64 each receiver with manual and spare valves. Prefer buyers examine and collect. Tel: (0384) 238055 evenings.

WANTED R1155 receiver with mains p.s.u. must be in working condition. Will collect. Hobbs. Tel: (0253) 873127. Lancs.

FOR SALE s.w. radios Selena v.g.c. 5 s.w. bands, i.w., v.h.f. Toshiba radio cassette recorder, 3 band equaliser, i.w., m.w., s.w., v.h.f., excellent condition, good working order, twin speakers. M. Allen, 636 Wordsworth Avenue, Parsons Cross, Sheffield 5 South Yorks S5 9JH. Tel: (0742) 464186.

FOR SALE NRD-525 receiver mint condition, 10 months old, still under guarantee, boxed with manual, carriage extra, £650. Tel: 081-570 5603.

FOR SALE Trio R-600 h.f. receiver, £190. Tatung TMR7602 h.f. receiver, £70. Both immaculate condition with manuals, etc. Reason for sale - want Icom R72 or Yaesu 8800. Simon Banbury. Tel: (0295) 261455.

FOR SALE Yaesu FRG-7700 receiver, FR7700 a.t.u. and FRV-7700 v.h.f. converter, £300 the lot. First to see will buy, very good condition. Mr K Ingram, 265 Town Street, Middleton, Leeds LS 10 3SE. Tel: (0532) 708213.

FOR SALE Fairmate HP-200E scanner, six months old, NiCads, charger, earphone, three antennas, £150. Would consider s.w. radio in exchange. Tel: (0753) 527530 Slough.

FOR SALE Icom R7000 base scanner, remote control, 200 memories, boxed with instruction manual and in mint condition, £750. Tel: (0229) 813126.

FOR SALE NRD-525 ECSS/synchronous tuning board with 4kHz filter plus matching filters for 'wide' and 'inter' positions to cure hiss, increase selectivity and ultimate rejection. High quality board made by Eskab Communications of Sweden. Full instructions for operation and installation, £150. Tel: 081-570 5603.

FOR SALE NRD-525 JRC receiver with v.h.f./u.h.f. converter, D-130N antenna, less than one year old, £750. Tel: (0380) 860280.

FOR SALE AOR 2002 scanner 25-1300MHz, a.m., f.m., w.f.m., excellent condition, £295. ICS-FAX program for IBM and clones, excellent FAX pictures, £60. Gorrill. Tel: 031-331 2755.

FOR SALE Bearcat 760XLT scanner, £180. Also Grundig Satellit 2000 shortwave receiver with s.b.s., £90. Tel: (05806) 2108.

FOR SALE circa 1920 Alfa suitcase MkV s.w. 'portable' rare, original, £65. Sony ICF-5900W double superhet probably Sony's best ever all band portable, £85. Telefunken 'Gavotte' 1950s all wave 'Magic Eye' superb, offers? Tony. Tel: (0342) 822780 Forest Row, after 8pm.

FOR SALE Icom IC-R100 communications receiver with s.s.b. mod, £410. Icom 2001 25-550MHz, £130. Signal R-535 u.h.f., v.h.f. receiver, £175. All items are in mint condition. Mr C Pritchard. Tel: (0480) 62093 St. Ives Cambs, after 7pm.

FOR SALE FT-1012D MkII (FT-227) 9bands with f.m., fan, mics, spare driver and p.a. valves, original carton, manuals, excellent condition, one careful owner, £400. GM3NVU, QTHR. Tel: 032-481 3349.

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THE HF-225 GENERAL COVERAGE RECEIVER



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Whatever you want to hear, wherever you want to hear it, the HF-225 will give you that gateway to the world.

Technically, the HF-225 distinguishes itself by having a low phase noise synthesiser which gives performance not far off that of "professional" receivers costing up to ten times the price. And that's not just advertising talk; it is really true. The receiver actually tunes in steps of 8Hz, which betters most other receivers and gives a smooth "VFO" feel when tuning. As one user has already commented: "If you tuned the HF-225 with your eyes closed, you would believe you had a £5,000 receiver on the table."

The HF-225 has a range of popular low-cost options; like a key pad for direct frequency entry which plugs into a rear panel socket, an active whip aerial, a rechargeable battery pack for portable use and an attractive carrying case which protects the receiver whilst in full operational use. The D-225 detector option is really something special because it gives true synchronous AM detection for dragging sensible programme quality out of a signal affected by selective fading distortion. The same option also gives narrow band (communications) FM.

Every listener these days appreciates a receiver which offers facilities for memorising favourite or regularly used frequencies and the HF-225 offers 30 memory channels for this purpose. Using the memories has been made particularly versatile because the operator can review the contents of the memories while still listening to the frequency he is using. Alternatively, in the "Channel" mode, he can tune through the memory channels using the main tuning knob, listening to each frequency as it appears on the display. Just like having a bank of single channel receivers under your control. Great for checking BBC World Service frequencies in a hurry.

Unlike most HF receivers on the market, the HF-225 comes complete with filters fitted for every mode - 2.2kHz, 4kHz, 7kHz and 10kHz. There is also a 200Hz audio filter for CW and if the D-225 detector is fitted, a 12kHz filter for FM. The correct filter for each mode is automatically selected by the receiver mode switch but further selection can be made by the user from the front panel and the receiver remembers which filter was used. True versatility and all built in - at no extra cost.

At the end of the day, what can the HF-225 offer you as a user? Let me quote Chris Williams who wrote from Massachusetts:

"I received my Lowe HF-225 about a week ago. Since then I have enjoyed many pleasant hours listening to it. As a past owner of receivers such as the Sony ICF-2010 and Grundig Satellit 650 and 500, I must say that none compares to your Lowe HF-225. Without question, for hour after hour listening, nothing compares. I especially like the Genie keypad. Why more receivers do not incorporate such intelligent ergonomics is beyond me."

That just about says it all, but on top of all the praise from users, the HF-225, following its launch, was voted "Receiver of the Year" by World Radio and TV Handbook.

Why don't you find out why the HF-225 opens that gateway to the world.

HF-225 30kHz-30MHz £429.00
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