short wave magazine

February 1991 £1.60 ISSN 0037 - 4261

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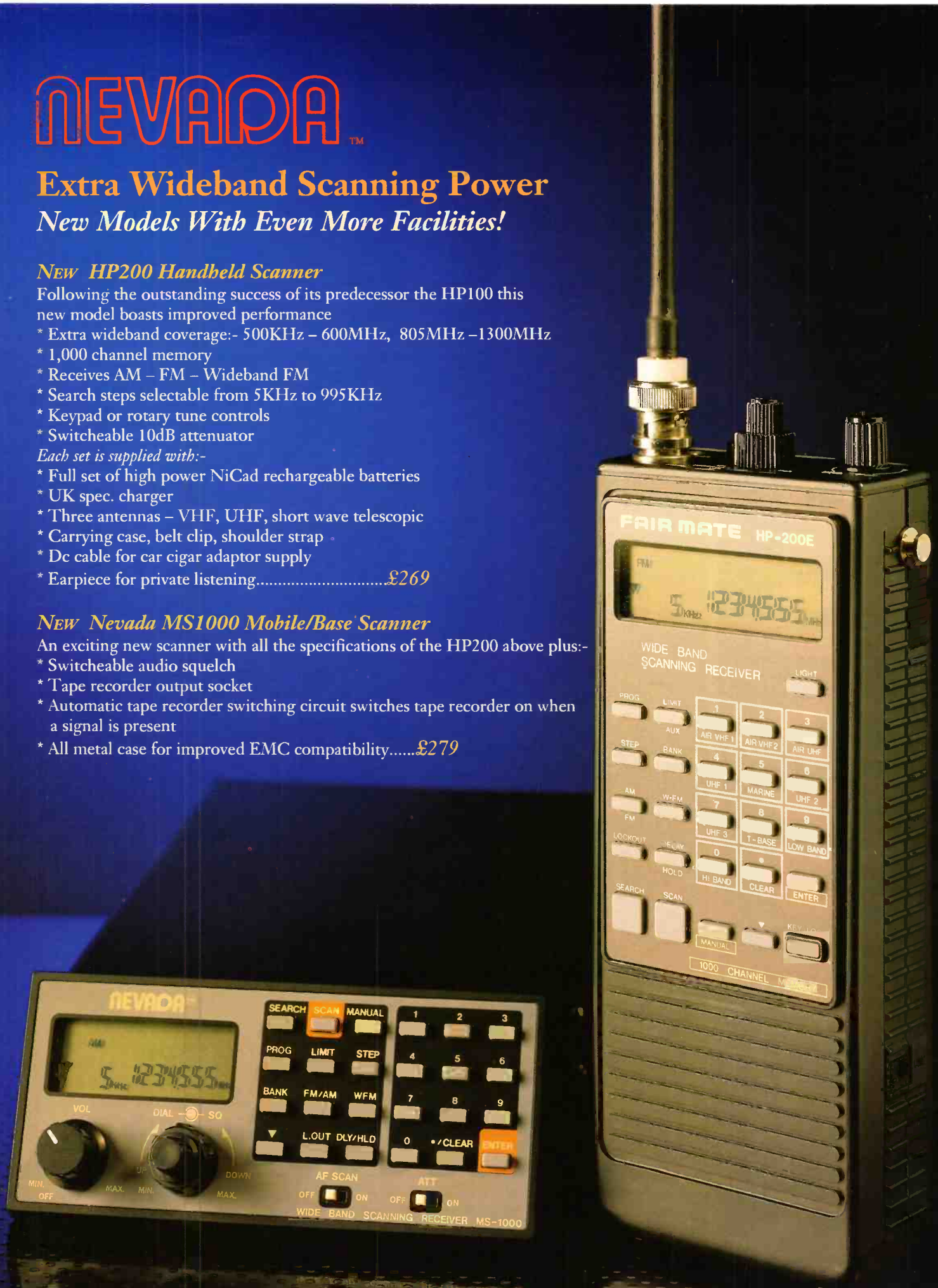

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short wave magazine

contents

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REGULARS

Cover This month Mike Richards G4WNC puts the latest Realistic scanner through its paces and gives us his verdict. The ERA Microreader is a very popular addition to the s.w.l.'s shack and Ian Chard give you some useful tips on how to get the best out of it for RTTY and Morse reception.

...GOOD LISTENING

letters

SWM SERVICES

Subscriptions

Subscriptions are available at £19 per annum to UK addresses £21 in Europe and £22 overseas. Subscription copies are despatched by Accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £32 (UK) and £37 (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 £1.65 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 £4.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Please state the year and volume number for which the binder is required. Prices include VAT where appropriate.

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

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

Dear Sir

Here is some additional information arising out of your September 1990 issue,

First, for my namesake, Mr Casey of Tipperary (page 15). In the excellent history of BBC Engineering, BBC Engineering 1922 - 1972 *by Edward Pawley, page 290, after mentioning the existence of a pre-war AIRMET service for civil airliners, the author goes on:*

"The AIRMET service was re-opened on 6th June 1946 on 245kHz using an RAC type 10E transmitter. On 1st June 1948 the frequency was changed to 248kHz but the service had to be closed down on 14th March 1950 as no channel was available for it under the Copenhagen Plan."

Later, sometime in the early sixties I think, I have a vague memory of being told by an elderly BBC engineer that when the old 25kW Daventry 5XX sender was 'demobbed' from the RAF it was used for the AIRMET service. At its closure 5XX was finally broken up after nearly a quarter of a century of existence. This seems probable, given that the post-war AIRMET could easily be heard on a simple domestic receiver with a rudimentary indoor antenna throughout England.

Personally, I remember the service well, although I do not recall any trumpet interval signal. It consisted of a spoken preamble, "Here are further details of the weather situation and the weather expected in the near future". Then there followed an ad lib *discussion of the synoptic situations (rather like Mr Fish on modern TV) followed by a recital of observations made, in those days, at various RAF stations up and down the British Isles (including the great flying boat base at Castle Archdale Northern Ireland, now defunct).*

A very similar service still exists today transmitted (I think) from RAF Upavon in s.s.b., known as RAF VOLMET easily heard here in Bordeaux on frequencies in the 4 and 11MHz band.

Next, for Ron Ham (page 48). Sefton Delmer's book Black Boomerang *is now rare (I have only a French translation myself). It is very interesting, given his own part in the doings of those days, but equally interesting are the numerous references to (and photos of)* Aspidistra *in the highly entertaining book* The Black Game *by Ellic Howe (Michael Jospeh 1982), which is well worth buying, borrowing or stealing!*

Because of his BBC connections, Mr Ham will probably know that Aspidistra *soldiered gloriously on throughout the cold war, used by the BBC for assorted language services to Europe. It was listed regularly in the* World Radio & TV Handbook *as 'Crowborough 600kW' until the early eighties when the new BBC transmitting site at Orfordness took over.*

Finally, I should like to say how much I enjoy SWM *each month. It strikes a fair balance between constructor and operators, between young lions and old codgers and between QRP and Bell-and-Whistle merchants. I am not surprised that the* Vintage Radio *magazine project failed, partially because I always felt it was not a commercial proposition and partially because (unlike this letter) looking back into the past can be too much of a good thing and it is the rising generation which must be attracted, in every way, towards the diverse world of radio.*

GERARD CASEY
BORDEAUX

editorial

The Gulf Crisis and other related news happenings have drawn the news media's attention to scanners and scanning. The daily newspapers have discovered that, as the UK's leading listening magazine, *Short Wave Magazine* is the only place to get real information about listening to any type of transmission. But then, you already knew that!

Subscribers' Club

If you are a subscriber to *Short Wave Magazine* you will know that you have become a member of the exclusive *SWM* Subscribers' Club. We have set this up to thank our valued subscribers for their support. Each month members receive details of competions and special offers that are available only to them. Last month the special offer was a digital multimeter - this month it is a chance to buy *SWM* binders at a reduced price. Overseas members have their own competions with extended closing dates so that they are not loosing out. You can become a member - but only by taking out a subscription to your favourite *Short Wave Magazine*. You will find a subscription form on Page 11. If you are a subscriber and haven't yet received details then please contact the Subscription Department here at Poole.

Radioline

Do you dial 0898 654676 each week? This is the number to dial for the *Short Wave Magazine* Radioline - the weekly hotline telephone 'magazine' giving you the latest news, info and propagation forecasts to enable you to make the most of your hobby. Radioline is updated each Sunday and costs you 44p per minute during peak telephone hours and 33p per minute at all other times. Dial Radioline regularly each week and you will be get the important news earlier.

letters

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

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

Dear Sir

I have been reading and enjoying your magazine since it changed to its present format in April 1987. You seem to have filled a gap that has been empty for many years, i.e. the need of the radio listener. You also manage to achieve a compromise between the needs of the technically minded and the needs of the newcomer, an achievement worthy of praise.

At the beginning of last year I introduced a friend of mine to the joys of SWling and, of course, SWM, *and it was a question put to me by him that has prompted me to write this letter. A lot of listeners, some newcomers and some not-so-newcomers (my friend and I included) use the 'Seen & Heard' columns as a guideline to the performance of the bands , our stations and equipment.*

The question I ask is short and simple:- Are reception reports included in this column confirmed or are people just tuning through the bands, WRTH, *etc. in hand, attributing things that they hear to stations allocated in the book? If the reports are confirmed then I stand in awe at the operators luck, persistance and patience and at what must be some of the finest and rarest collections of QSL cards in the business. If however they are not confirmed, then I think it unfair to publish reports which could possibly mislead people into thinking that their station or their operating skills are not up to the standard required to receive stations which, maybe, weren't there in the first place. I appreciate that the column must rely on the integrity of the individual reporter in order to function and so cannot be held responsible if people report incorrectly. A common mistake which is made all too often nowadays, is to assume that the station you are listening to is automatically the one listed in such books as the* WRTH, Passport to World Band Radio *or the* ILG. *Whilst these books do an admirable job in keeping up with current frequency schedules, people should remember that they can only be accurate at the time of printing, which, could be quite a considerable time before the publication hits the bookshelves and therefore they should treat them as they were intended to be treated ... as a* ***guide****!*

As you have pointed out so many times in your magazine, stations choose their operating frequencies with respect to the current conditions and are bound rigidly to , their own printed schedule, let alone schedules devised up to twelve months previous. People should remember this when they listen and always wait for some positive station identificationbefore entering the station in their log. The introduction at the begining of the WRTH *covers all of these points and is well worth a read.*

I am not in any way implying that the reporters tell lies, nor am I implying that they do not know what they're doing but like everything in life, If not nipped in the bud, a small misunderstanding made whilst learning can develop into a much larger misunderstanding later on. After all, there is little enough help and advice for newcomers, SWM *excepted, of course.*

CHRIS CARRINGTON
CHELLASTON, DERBY

It was comments such as these from readers that led us to change the format of 'Seen & Heard'. I know that Brian Oddy does spend a lot of his waking life listening and trying to verify the reports sent in by his readers. Obviously this is not always possible, but, in instances where the report has been queried, a valid QSL card has been produced.

Ed.

Dear Sir,

May I first of all say how pleased I am at the new layout in Short Wave Magazine, *which I think is a great improvement. It certainly makes it easier to find a particular feature,*

However, I am appalled at the use of such small print, which can surely only lead to annoyance on the part of your readers.

Take one example. Many of us will be very pleased to see Mike Richards has been allowed two full pages for his 'Decode' column, which seems to be growing in popularity. The terrible thing is the ridiculously small print in the first column on page 48 where the frequencies, etc. for MAP/RABAT are virtually unreadable.

Take another example. Peter Rouse's new 'SSB Utility Listening' column is excellent and up till now this information has only been regularly available in an American magazine. Why on earth spoil it by the terribly small type used in the most important part, namely the table of frequencies. I had to get an enlarged photocopy to make the table at all useable.

Of course, I do not like the smaller typeface used throughout the magazine, quite apart from the specific instances mentioned above. It seems almost amusing thet Dick Ganderton's leader is set in a LARGER type than the rest of the magazine, presumably because he wants his column to be easy to read!!!!

I notice that the advertisers have not had the size of their adverts reduced, but then I assume that it was realised they would create hell if they thought readers could not read their adverts with ease (and without a magnifying glass!)

I have read SWM *for so many yeras that it worries me greatly that so little thought should be given to the only people who really matter, namely the READERS. Unless the type size is increased I shall not renew my subscription when it runs out, even though it will be a sad day for me not to look forward to* SWM *each month.*

Please pretend you have never seen the magazine before and look at it with an open mind and honestly say to yourself "isn't the type a bit small?"

Kind regards and please give me a happy New Year by abandoning the tiny type.

P.A. FINN, MILFORD HAVEN

I am pleased that you like the new look *SWM* - one of the aims we had in mind was to make it easier and more pleasant to read. One of the major parts of my job as Editor is to listen to what my readers want and attempt to please them all. I like to think that one of the reasons behind the success of *SWM* is that I do just that. I can, therefore, assure you that I have taken note of what you, and other readers, have said about the new look.

Sometimes we experiment with different type sizes, weights, styles and leading in an attempt to get more onto the page, emphasise something or make it more attractive. Sometimes it works, sometimes it doesn't. If it doesn't then we look carefully at what went wrong and try to improve on it. This issue sees a change of printer and this may affect the way in which a particular style turns out. We will not find out until it is printed, by which time it is too late to do anything about it.

Advertisements are outside my control - an advertiser buys a given amount of space on a page and what he puts into that space - within the bounds of decency, etc., is up to him. I must admit though, that I am amazed at the amount some of them try to cram in by using very small type. **Ed.**

Dear Sir

Peter Laughton, in his 'Bandscan' obituary of Radio Berlin International, asked whatever happened to RBI commentator John Peet and his like?

Happily - for himself - John Peet never lived to see the destruction of the East German state, as he died of cancer in 1988. Just before his death, he completed a very lively memoir covering his life as a Spanish Civil War soldier, member of the colonial Palestine Police, Reuters correspondent and East German apologist.

This was published in 1989 as The Long Engagement: Memoirs of a Cold War Legend *by Fourth Estate, London. Alas, no mention is made of Peet's radio activities!*

JOHN GRIFFITHS
NEWCASTLE-UPON-TYNE

grassroots

rallies

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

February 3: The South Essex Amateur Radio Society will be holding their 6th mobile rally at Paddocks, Long Road, Canvey Island. This will be an all-day event featuring trade stands, Bring & Buy, RSGB Bookstall, Boot Sale, home-made refreshments. Doors open at 10am. There will be extensive free car parking and easy access to Paddocks. **Dave Speechley G4UVJ. Tel: (0268) 697978.**

***February 24**: The East Coast Amateur Radio and Computer Rally will be held at the Clacton Leisure Centre, Vista Road, Clacton-on-Sea. Doors open 10.30am. There will be major suppliers of radio and computer equipment, a large Bring & Buy plus auction, test bench facilities and ample car parking. There are sports facilities, swimming, a children's adventure playground as well as a bar and cafe, so bring the family.

February 24: The Bideford Bay ARC are holding their 4th Taw and Torridge Rally at Bideford, Devon in the BAAC Halls starting at 10.30am. Talk-in will be on S22. **John Denford G0GFK. Tel: (0237) 476402.**

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

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

March 17: The Wythall Radio Club will be holding their 6th annual radio rally at Wythall Park, Silver Street, Wythall, Worcs., which is on the A435 near Junction 3 on the M42 south-west of Birmingham. Doors open 11am. There will be three halls plus a marquee, trade stands, flea market, Bring & Buy, a bar and snacks will be available, talk-in on S22 and admission is 50p. **Chris Pettitt G0EYO. Tel: 021-430 7267.**

***March 24**: The RSGB VHF Convention will be held at Sandown Park Exhibition Centre, Esher, Surrey.

March 31: The Centre of England Amateur Radio Rally will be held at the Motorcycle Museum, Bickenhill, near the NEC Birmingham. Admission £1, OAPs 50p and children free, Concessionary rates to visit the museum, Bring & Buy, Talk-in on S22, bar and restaurant available. **Frank (0952) 598173.**

* Short Wave Magazine & Practical Wireless in attendance *

Acton, Brentford & Chiswick RC: 3rd Tuesdays, 7.30pm. Feb 19 - Meteorology & v.h.f./u.h.f. Propagation by G4WQO. Paul Truitt G4WQO, 071-938 2561.

Bardswell ARS: Thursdays, Bardswell Social Club, Bardswell Close, Brentwood. Joe Wentworth, 5 St Charles Road, Brentwood.

Braintree & DARS: 1st & 3rd Mondays, 8pm. Community Centre, Victoria Street, Braintree. Feb 4 - Discussion Evening. M J Andrews, (0376) 27431.

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

Bromsgrove ARS: 2nd & 4th Tuesdays, 8pm. Aston Fields Working Men's Club, Stoke Road, Astonfields, Bromsgrove. Feb 12 - Night on the Air, 26th - Antennas by G4ABS. J. Yarnall G1JLQ, (0527) 503024.

Bromsgrove & District ARC: 2nd Fridays. Avoncroft Museum of Buildings & Arts Centre, Bromsgrove. Trevor Harper, Bromsgrove 33173.

Chelmsford ARS: 1st Tuesdays, 7.30pm. Marconi College, Arbour Lane, Chelmsford. Feb 5 - Navico by G6PZZ. Roy Martyr, Chelmsford 353221 ext 3815.

Coventry ARS: Fridays, 8pm. Baden Powell House, 121 St Nicholas St, Radford, Coventry. Jan 25 - Annual Dinner, Feb 1 - Night on the Air, 8th - Quiz Night vs Tamworth ARS, 15th - Night on the Air, 22nd - The Indoor DF Competition. Neil, Coventry 523629.

Delyn RC: Alternate Tuesdays, 8pm. Daniel Owen Centre, Mold. Jan 24 - Amateur Satellites. What they are, What they do and How to Work Them, Feb 12 - MGR Communications, 28th - Open Forum to Prepare for AGM. Steve Studdart, Deeside 819618.

Derby & DARS: Wednesdays, 7.30pm. 119 Green Lane, Derby. Jan 30 - Night on the Air, Feb 6 - Junk Sale, 13th - Rig Testing Night, 20th - RF & Front Line Medicine by Alan G8SSL, 27th - Operating on Satellites by Alan Walmsley G2HIO. Richard Buckby, Ambergate 852475.

Hastings E&RC: 3rd Wednesdays, 7.45pm. West Hill Community Centre, Croft Road, Hastings. Fridays, 8.30pm. Ashdown Farm Community, Downey CLose, Hastings. Feb 20 - Juke Box Restoration. Reg Kemp, 7 Forewood Rise, Crowhurst.

Horndean & DARC: 1st Thursdays, 7.30pm. Horndean Community School, Barton Cross (Off Catherington Lane), Horndean. Feb 7 - Police Comunications Control by G4RLE. S. W. Swain, (0705) 472846).

Keighley ARS: Thursdays, 8pm. The Cricket Club, Ingrow, Nr Keighley. Jan 31 - AGM, Feb 7 & 14 - Natter Night, 21st - Visit to Menwith Hill at 7.30pm, 28th - Caribbean Experience by Julia Fearnside. Kathy Bradford, (0274) 496222.

Lothians RS: 2nd & 4th Wednesdays, 7.30pm. The Orwell Lodge Hotel, Polwarth Terrace, Edinburgh. Feb 13 - Air Traffic Control by J. MacBean, 27th - Test Equipment. P.J. Dick GM4DTH, QTHR.

Loughton & DARS: 2nd & 4th Saturdays, 7.45pm. Loughton Hall, Rectory Lane, Loughton, Essex. Jan 26 - Antennas and their Practicalities by Ray G0LWF, Feb 9 - Desk Top Publishing - how the newsletter is complied by G1DJI & G8DZH, 23rd - At the Speed of Light - Lasers Explained by G8DZH.

Mansfield ARS: 1st Thursdays, 8pm. The Polish Catholic Club, off Windmill Lane, Woodhouse Road, Mansfield. Feb 7 - Your Signals are 5 and 0 by G4ZZG. Mary G0NZA, (0623) 755288.

Mid-Warwickshire ARS: 2nd & 4th Tuesdays, 8pm. St John Ambulance HQ, 61 Emscote Road, Warwick. . Mike Newell. Kenilworth 513073.

No Airs & Graces RC: The Nautical College, Glasgow. A new club so contact Eddie GM0LKS, 041-885 0716.

Norfolk ARC: Wednesdays, 7.30pm. The Norfolk Dumpling, The Livestock Market, Harford, Norfolk. Jan 30 - Informal & Committee meeting, Feb 6th - Read Radio Evening, 13th - The Construction Business by Richard Irving G1UCR, 20th - Science for All by Arnold Tomalin G3PTB, 27th - The Firey Finger of God-Lightning by Alan Martindale G3MYA. Mike Cooke, (0362) 850591.

Plymouth RC: Tuesdays, 7.30pm. The Fredrick Centre, Plymouth. Jan 29 - Members Forum. G6ZHQ, (0364) 43433.

Rhyl & District ARC: Feb 4 - Computers in Amateur Radio, 18th - Quiz RAE Multiple Choice Questions. Edward Shipton, (0745) 336939.

South Bristol ARC: Wednesdays. Whitchurch Folkhouse Assoc, Bridge Farm House, East Dundry Rd, Whitchurch. Jan 30 - Top Band Activity Evening, Feb 6 - Video Evening, 13th - VHF Activity Evening, 20th - Computer Evening, 27th - Microwave Workshop. Len Baker, Whitchurch 832222.

South East Kent (YMCA) ARC: Wednesdays, 8pm. The YMCA, Leyburne Road, Dover. Jan 30 - Natter Night & Security Marking.

Southgate ARC: 2nd & 4th Thursdays. Winchmore Hill Cricket Club Pavillion, Firs Lane, Winchmore Hill, London N21. Jan 24 - Final Plans for the London AR Show, Feb 14 - AMSAT Communications by Ron Broadbent G3AAT, 28th - Antenna Noise Bridge Amnesty. Brian Shelton G0MEE. Tel: 081-360 2453.

Stoke-on-Trent ARS: Thursdays, 7.30pm. Sacred Heart RC Church Hall, Jasper Street, Hanley, Stoke-on-Trent. D. Wroe, (0782) 639476.

Stourbridge & DARS: 1st & 3rd Mondays. Robin Wood's Community Centre, Scotts Road, Stourbridge. Feb 4 - On Air & Natter Night, 18th - Constructors Competition. Dennis Body G0HTJ, QTHR.

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

Sutton & Cheam RS: 3rd Thursdays, 7.30. Downs Lawn Tennis Club, Holland Ave, Cheam. 1st Mondays in the Downs Bar. Feb 4 - Natter Night, 21st - Wireless Before Radio by Steve Cook G8CYE. John Puttock G0BWV, QTHR.

Thornbury & DARC: 1st & 3rd Wednesdays, 7.30pm. United Reform Church, Chapel Street, Thornbury. Feb 6 - Radio Investigation Service, 20th - HF Activity/Natter Night.

Todmorden & District ARS: 1st & 3rd Mondays, 8pm. The Queen Hotel, Todmorden. Feb 4 - AGM & Construction, 18th - Club Station on the Air. Mrs E Tyler, (0422) 882038.

Torbay ARS: Fridays, 7.30pm. ECC Social Club, Highweek, Newton Abbot. Feb 15 - AGM. Walt G3HTX, (0803) 526762.

Trowbridge 7 District ARC: 8pm. TA Club, Trowbridge. Feb 6 - Surplus Equipment Sale, 20th - Social Evening. G0GRI. (0380) 830383.

Verulam ARC: 2nd & 4th Tuesdays, 7.30pm. The RAF Association HQ, New Kent Road, St Albans. Feb 26 - UHF Compendium by Norman Fisher G8ATO.

West Kent ARS: 3rd Fridays, 8pm. The School Annex, Albion Road, Tunbridge Wells, Kent. Feb 15 - Local Radio Forthcoming Developments by Nigel Peacock.

Wimbledon & DARS: 2nd & last Fridays, 7.30pm. St Andrews Church Hall, Herbert Road, SW19. Feb 8 - General Activity Evening, 22nd - Radio Astronomy by George Epps. Chris Frost, 081-397 0427.

Wirral ARS: Wednesdays, 7.45pm. Ivy Farm, Arrowe Park Road, Birkenhead, Wirral. Feb 7 - President's Night with G3FOO, 20th - The Short Comings of the Battery by Bill Davies G4YWD.

Yeovil ARC: Thursdays, 7.30pm & Fridays, 7.30pm. The Recreation Centre, Chilton Grove, Yeovil. Jan 24 - Discussion Night, 31st - Natter Night, Feb 7 - A Simple a.t.u. by G3MYM, 14th - The 2-element Driven Beam by G3MYM, 21st - The 2-element Yagi by G3MYM, 28th - Natter Night. David Bailey G0NMM, QTHR.

junior listener

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

A word of explanation to start with this month. Because of the tight publishing deadlines around Christmas, I'm writing this before last month's issue is on sale! I know it's confusing, but it means that I haven't received any letters from you yet. I hope that by next month I will have a bumper batch of letters to feature! So, if you're interested in Pen Pals, need technical help or just want to send in your station details, please drop me a line. Don't forget, it's **your** column, so I need to hear from **you**.

SSB?

If you're interested in broadcast listening you may have noticed that some stations are changing their transmissions to s.s.b. Your next question is what is s.s.b.? Well s.s.b. stands for **single sideband** and is a method of transmitting the actual programme material. To understand s.s.b. we will first need to look at a standard a.m. (amplitude modulation) signal. This is produced by first generating a radio frequency carrier signal. The level, or amplitude, of this carrier is then varied in sympathy with the audio signal - music or speech - from the studio. When these two signals are combined at the transmitter the resulting signal can be shown as a carrier with sidebands above and below, as I've sketched in **Fig. 1**.

The important point about this signal is that half the power is concentrated in the carrier while the remainder is shared between the two sidebands. As it's only the sidebands that contain the music or speech, this is rather wasteful. In addition, the two sidebands contain the same information, except that one is 'upside-down'. It's clear from this that a.m. transmissions are an inefficient way of communicating, as well as taking up more of the valuable frequency spectrum. So it's no surprise to hear that the World Administrative Radio Conference (WARC) has recommended that all a.m. transmissions should cease by 2016.

Now let's see what happens with an s.s.b. transmission. You've probably guessed from the name that this mode involves the transmission of one single sideband instead of the two used with a.m. However, there is a further change in that the carrier is also missing. So the full description should be single sideband suppressed carrier. I have shown a representation of this in **Fig. 2**. and you can see that the spectrum saving is significant.

One other point we need to clarify is, which of the two sidebands should be used. The choice is between the upper and lower sidebands (u.s.b. or l.s.b.). There is no particular advantage in choosing either one - it's just a matter of convention. In the early days it was common practice to use lower sideband below 10MHz and upper sideband above 10MHz. However, it is now standard commercial practice to use upper sideband throughout the h.f. bands.

So far I have only covered the benefits of changing to s.s.b. signals. However, there are a few problems. The first is that this type of signal cannot be received on a standard a.m. receiver. If you want to hear what it sounds like, try tuning in to the amateur transmissions between 14.1 and 14.3MHz. You'll find that the transmission is severely distorted and pretty well unintelligible. Of course, there are many short wave receivers around that feature s.s.b. reception, but what about those that don't? Fortunately, all is not lost as there is a fairly simple technique for adding this mode to a standard a.m. receiver.

The main reason for the severe distortion is the missing carrier in the s.s.b. signal. The carrier is an essential part of the a.m. demodulating process. The answer is simple - add your own carrier. The way to do this is with a beat frequency oscillator (b.f.o.), a simple electronic circuit that can be mounted outside the receiver. The trick is that the b.f.o. operates at the receiver's intermediate frequency, typically 455kHz. All you normally have to do is place the b.f.o. next to the receiver. Sometimes though, you may have to run a trailing wire into the back of the receiver. There was a design for a b.f.o. in *Practical Wireless* Aug '85. Back copies of this magazine can be bought by sending £1.65 to the editorial offices in Poole. It's important to say that you want the 'Add-on BFO' article in the Aug '85 *Practical Wireless*.

Although using a b.f.o. lets you have a go at s.s.b. reception there are still a few problems. The main one is the stability of the receiver and b.f.o. If either of these drifts off frequency it will distort the reception in much the same way as when tuning into a signal. The best way to decode s.s.b. is with a system known as a 'product detector' and this is used by many of the better commercial receivers. With the general change to s.s.b. broadcasts I'm sure there will also be do-it-yourself mods for some of the more popular receivers. If you've got any good reception tips, drop me a line and I will do my best to print them in the column.

Amateur News

Are you interested in running your own transmitting station? If so, the new Amateur Novice Licence, being introduced by the Department of Trade and Industry, may fit the bill. Although the licence is available to all, it has a particular attraction for my readers as there is no minimum age. Added to this, there will be no licence fee for those under the age of 21. This is all good news that should help to foster a new interest in amateur radio.

As with the full Amateur Radio Licence, you are expected to be technically competent before your licence is issued. For the Novice Licence you have to complete a practical training course and pass a Novice Licence Examination. Then you can apply for a Class B licence that will allow operation on the allocated bands above 30MHz. For operation on the h.f. bands a Class A licence is required, for this you have to pass a Morse code test as well as the main examination. All the training courses and Morse tests will be run by the RSGB, so they are the people to contact for more information. Their address is: Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

Young Designer Award

Following on from last month, I've managed to get some more details of previous competitions. Last year's Junior Section was won by James Hackitt (14) of Newark who put together a design for a fire alarm unit. Second and third places were taken by John Henrys (14) of Castlecroft with a fridge/freezer alarm and Clive Parker (13) of Gateshead with electronically controlled curtains. To give you a broader picture, some of the best entries from previous years included a multi-core cable tester, a digital tyre pressure gauge, an electronic positioning device for ladders and a water level indicator and alarm for baths.

As you can see the range of ideas is quite wide. My latest information shows that the following schools have entered the Junior Section this year, The Grammar School, Kingston-upon-Hull; Amble Middle School, Morpeth; The Godolphin School, Salisbury.

Why not chase up your teacher and add your school's name to the list?

Abbreviations

a.m.	amplitude modulation
b.f.o.	beat frequency oscillator
h.f.	high frequency
kHz	kilohertz
l.s.b.	lower sideband
MHz	megahertz
s.s.b.	single sideband
u.s.b.	upper sideband

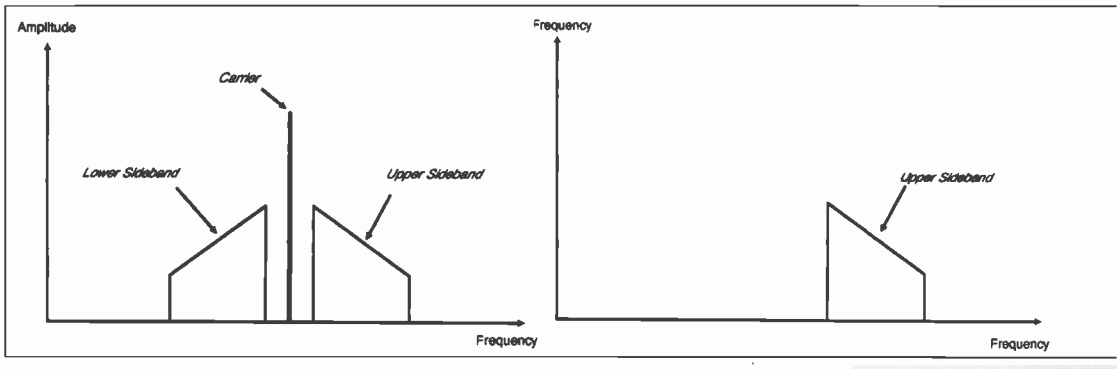


Fig. 1: An a.m. signal. **Fig. 2: An s.s.b. signal.**

news

BBC World Service News

The first fully digital BBC World Service programme was broadcast on December 15. *Let It Be - Liverpool* was an open-air concert given by Paul McCartney in June of last year. The 32-track digital recording was made by the McCartney organisation and supplied exclusively to the BBC on R-Dat tape. Digitally edited on audiofile and mixed back to R-Dat, it was broadcast from World Service's new continuity studio.

The BBC World Service is now making its first-ever broadcasts on specially allocated domestic wavelengths in Eastern Europe. Radio listeners in Prague and Bratislava have been able to hear a round-the-clock service of programmes on the frequencies allocated to the BBC by the authorities in Czechoslovakia. Transmissions should have also started by now in the city of Brno.

President Havel said that he hoped the rebroadcasts would give listeners easier access and create healthy competition for Czechoslovak radio, some of whose broadcasters will be coming to train with the BBC World Service.

The new f.m. service is a mix of BBC World Service programmes in Czech, Slovak and English, including English teaching programmes from the specialist World Service department BBC English.

EDXC Conference 1991

The European DX Council invite all DXers of the world, DX clubs and international broadcasting stations to celebrate the 25th Conference of the EDXC. The dates for the conference are May 17-20 and it will be held in Barcelona. The EDXC are trying to arrange discount airfares with Iberia Airlines, so for more details, contact: **EDXC 91, PO Box 1275, 08080 Barcelona, Spain**.

Small Size Ceramic Trimmers

STC Mercator have recently introduced two subminiature 100V d.c. ceramic trimmer ranges to their product lines.

The Tusonix Series 518 devices occupy less than 115 cubic millimetres but are well-built and have a capacitance range of 1-3pF to 7-40pF.

The Series 528 is a subminiaturised form of the industry-standard 538. The design enables very smooth tuning and terminals and other metal parts are non-ferrous and silver-plated to allow good conductivity and solderability. Capacitance ranges are 1-3pF to 6-22pF.

STC Mercator, South Denes, Great Yarmouth, Norfolk NR30 3PX. Tel: (0493) 84491.

FM Radio Stations in France

The first edition of *FM Radio Stations in France* has been issued by the Club Europeen de DX Radio TV. This 200-page handbook lists more than 4000 stations presented by 'departments', frequencies and names, operated by Radio France, FM Networks, independent firms or associations. The list is right up to date: 82% of data has been modified in 1990.

As the guide is in frequency order thoughout, it will provide the DXer or the listener with the most accurate information to identify French domestic radio stations. The price is 120FF in France or 130FF in Europe (postage inlcuded).

FM Radio Stations in France is available from:
Club Europeen de DX Radio TV, BP 114, 13652 Salon de Provence Cedex, France.

Eddystone User Group

The Eddystone User Group started out six months ago as a forum where Eddystone enthusiasts can exchange ideas, compare experiences, obtain technical help and locate spares. The group has grown considerably and become international. They now have members in France, Spain, Portugal, Germnay, Holland, Scandinavia, Canada, South Africa and the USA.

Success like this has meant changes and from being a photocopied newsletter each letter each two months, they are looking towards a commercially printed magazine, hopefully this year. Ideas, suggestions and short articles will be appreciated as no successful newsletter can be the work of one man (and his wife!). Each month a particular model will be featured, information from members, free members adverts for radio related items, hints and tips on various models serviced by the Editor, or members who write in and any sources of spares they hear about.

Photocopying and postage do not come free, this is a non-profit making group and time to produce the newsletter is given willingly so the annual cost is a nominal, £7.50 UK and £10 sterling abroad. All cheques payable to EUG.
Eddystone User Group, Moore Cottage, 112 Edgeside Lane, Waterfoot, Rossendale, Lancs BB4 9 TR.

Computer Show

The All Formats Computer Show will be held at the New Horticultural Hall in Westminster, London on February 2 and March 23. Admission is £3 with doors open between 10am and 5pm.

It is a source for hardware - including computers, monitors, keyboards, memory, disk drives, etc., software - from the latest games to business programs.

Details about the shows can be obtained from:
John Riding. Tel: (0225) 868100.

Joint Venture

A joint venture between Waters & Stanton and Maplin Electronics means that many of the Waters & Stanton products can now be seen under the 'Communications' section of the Maplin catalogue. Maplin customers are now able to order direct from Maplin Mail Order Service. All orders are fed to Waters & Stanton's computerised mail order system via Maplin and despatched the same day. This joint venture us seen as a means of expanding both compary's customer bases. Waters & Stanton have now taken over complete control of the distribution of the Alinco range of products in the UK.

Waters & Stanton have also moved into adjacent, larger, premises. This will provide customers with purpose-built demonstration areas with active h.f. and v.h.f. stations.

news

Hi-fi Speakers

Dali is a well-established Dahish hi-fi manufacturer and they have now appointed a UK dealer for the first time. There are several models available from the UK agents, The Dali 700, 300 and the Skyline.

The 700 is a slim, elegent loudspeaker. It has a combination of two tweeters as well as mid and woofer cones. They are available in white and black earl ash veneer or black laquer finish on request. These should retail at around £600 per pair.

The 300 is more conventional. It is a two-way, bass-reflex model incorporating a 6.5in cast chassis, polypropylene-coned woofer and a soft-dome tweeter. The price of the 300 is expected to be around £300 per pair.

For more details on the specifications of these speakers, contact:
CSE, 5 Lucas Grove,
North Tockwith,
North Yorkshire YO5 8QZ.
Tel: (0423) 358074.

TV Graphics Review.

This magazine features various forms of graphics used by radio and television services throughout the world, with particular emphasis on those transitted by the BBC over the past seven decades.

In forthcoming issues of this quarterly magazine, subscribers will be given details on test cards and identification symbols used since the 1940s. The next issue will cover Gibraltar and Malta.

The subscription rate for this unusual publication is £7.00.
Keith Hamer, 7 Epping Close, Derby DE3 4HR.
Tel: (0332) 513399.

ENLOG

ENLOG is a comprehensive, computerised, amateur radio log book and data base for the IBM PC and compatible computers. It is available on 3.5in or 5.25in IBM format diskettes, with full documentation. Features include: full colour 'pop-up' windows with menus, and monochrome compatibility for non-colour systems; immediate access to all information on any previously worked station; full listings (in standard log book format). The information includes callsign, operators name, locator, full details of all previous QSOs, records of QSL cards sent/received and comments. It automatically calculates and displays antenna bearing and distance from 4 or 6-figure Maidenhead locators. The main display includes 'real time' clock and current date.

ENLOG is available for £29.99 including VAT and UK postage. Please state the disk format required when ordering.
ENWARE Engineering Software,
49 Wimborne Road West,
Wimborne, Dorset BH21 2DQ.

Multi-Satellite Receiving System

The TechniSat ST-6000S is a German designed, state-of-the-art, multi-satellite receiving system, pre-programmed and complete with full do-it-yourself installation instructions, including a specially produced VHS videotape.

The complete system incudes a compact 100-channel stereo receiver/dish positioner, with full infra-red remote control and on-screen graphics; a 990mm aluminium parabolic dish, available in four colours; a very sturdy galvanised steel polar mount; a high quality low-noise-block-down converter with a noise figure of better than 1.3dB covering the 10.99 to 11.7GHz band; a fully solid state ferrite feed-horn polariser and a precision-made motorised dish actuator, connector and alignment aids.

The dishes are available in brick-red, dark green, slate-grey and beige. The dish, at 990mm, does not usually require local planning permission. The full-remote control facilities enable the dish to be positioned from the comfort of an armchair.

The fully operational Maplin satellite system can be seen in the Brighton, Bristol, Edgware, Nottingham, Reading and Southend stores.
Maplin Electronics, PO Box 3,
Rayleigh, Essex SS6 8LR.
Tel: (0702) 552911.

It's Party Time

The 4th Annual Winter SWL-Feast is scheduled for the week-end of March 22-24 at the Holiday Inn, Kulpsville, Pennsylvania, about 40 minutes from Philadelphia airport, by limo. The event isn't sponsored by any particular club or organisation and is open to all. Over its first three years, the event has built up an attendance of well over 100 last year and *SWM* readers are very welcome. For more information write to: **Winter SWL-Feast, PO Box 591, Colmar, PA 18915, USA.**

Lowe at Heathrow

Lowe Electronics have added another shop to their growing emporium empire. The new 'communications centre', as Lowe like to call it, is just 15m from the main A4 and 200m from the M4 access roundabout at Junction 5. To reach it, leave the M4 at J5 and take the A4 towards Heathrow Airport and London for about 300m. Turn first left at the lights into Sutton Lane, then first left again into Trent Road where you can park right outside with not a yellow line in sight.

The new 'centre' is a major departure for Lowe as not only will it be carrying all the Kenwood range, but also a selection from other manufacturers such a Icom and Yaesu so that you will be able to make a side-by-side comparison on the same antenna!

When you are ready to graduate to real listening Lôôk to Lowe

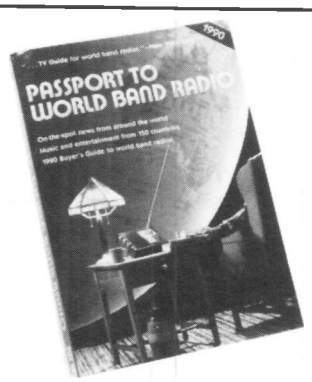
		Price	Carr.
R-2000	Kenwood HF communications receiver. 150kHz to 30MHz ...	**£595.00**	**£10.00**
Options			
DCK-1	12volt dc power kit	**£4.00**	**£1.00**
VC-10	VHF converter for 118 to 174MHz	**£161.94**	**£2.50**

R-5000	Kenwood HF communications receiver. 100kHz to 30MHz.....	**£875.00**	**£10.00**
Options			
DCK-2	12volt dc power kit.....	**£9.29**	**£1.00**
VC-20	VHF converter for 108 to 174MHz.....	**£167.21**	**£3.00**
VS-1	Speech synthesiser for R-5000...	**£32.26**	**£1.00**
YK88A-1	6kHz AM crystal filter.....	**£48.05**	**£1.00**
YK88C	500Hz CW filter.....	**£46.08**	**£1.00**
YK88CN	270Hz CW filter.....	**£54.64**	**£1.00**
YK88SN	1.8kHz SSB filter.....	**£46.74**	**£1.00**
SP-430	External speaker unit.....	**£40.81**	**£2.50**

NEWS FROM THE FAR-FLUNG CORNERS

Hottest news from AOR is the imminent arrival of the new AR-2800, which should start the jungle drums beating. It's a desk top/mobile scanning radio which will cover the frequency range from 500kHz to 600MHz and 805MHz to 1800MHz, and will handle all modes including SSB and CW. A further feature is the provision for fitting an internal re-chargeable battery pack which makes the AR-2800 a completely versatile receiver for all purposes. We will have further news on this exciting new receiver from AOR very soon. Keep in touch.

Also rumoured from JRC is a totally new HF receiver, tentatively called the NRD-535. A mock-up sample was shown on the JRC stand at a recent show in Tokyo, but it was just a box with no insides. As soon as we see a working sample we will let you know, but if the new radio is anything like JRCs other products, it will be an instant winner.



THE LISTENERS' BOOK OF THE YEAR 1991 – £12.95

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

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

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

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

FREE

Send four first class stamps to cover the postage and we will send you, by return of post, you FREE copy of "THE LISTENERS GUIDE" (2nd edition), a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will, I am sure, result in a "good read" but underneath the humour lies a wealth of experience and expertise. You will also receive detailed leaflets on our range of receivers and a copy of our current price list.

LOWE ELECTRONICS LIMITED

Chesterfield Road, Matlock, Derbyshire DE4 5LE Telephone 0629 580800 (4 lines) Fax 580020

26 YEARS IN SHORTWAVE
When it comes to know-how
Lôôk to Lowe

HF-225 – YOUR GATEWAY TO THE WORLD

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 synthesiser 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 low cost options which extend its appeal; such as a keypad for direct frequency entry, which simply plugs into a rear panel jack; an active whip aerial; a rechargeable battery pack for portable use; and an attractive carrying case which protects the receiver whilst allowing full operational use. The new D-225 detector option is really something special, because it gives true synchronous AM detection for dragging sensible programme quality out of a signal being affected by selective fading distortion. The same option also gives narrow band (communications) FM demodulation.

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 whilst still listening to the frequency he is using, or alternatively in the "Channel" mode, 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 last 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 Massachusets:—

"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 compare 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 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	**£425.00**
K-225 keypad controller	**£39.50**
D-225 Synchronous AM/FM detector	**£39.50**

JUST ANNOUNCED . . . The professional monitor receiver HF-235. Already in use by monitoring stations, and widely accepted as a new mid-price entry into this most demanding market.

For the past 26 years Lowe Electronics have specialised in seeking out the best in radio and bringing it to our customers. Those customers will also tell you that we have another speciality — looking after them. Whatever is best in radio, we sell. Whatever we sell, we back with really expert advice and service. We are pleased to represent the best companies in the receiver world, and in addition to **WIN**, we also distribute the **AOR** range and receivers from **Signal Communications**. For full information and a copy of our Airband Guide, simply send us four first class stamps and mention that you saw our ad. in "Short Wave Magazine". Happy listening.

Shops in **GLASGOW** Telephone 041-945 2626. **DARLINGTON** Telephone 0325 486121. **CAMBRIDGE** Telephone 0223 311230. **BARRY** Telephone 0446 721304. **LONDON (Heathrow)** Telephone 0753 45255. **LONDON (Middx)** Telephone 081-429 3256. **BOURNEMOUTH** Telephone 0202 577760. All branches are closed all day Monday.

Educational Software for Basic Electronics Part 2

Continuing with our course of programs, this month J.T. Beaumont G3NGD looks at l.e.d. displays and amplitude modulation.

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

The Seven-Segment Display - Program 3

The 'seven-segment display' is an opto-electronic device. It is used on digital multimeters, digital clocks and other electronic measuring devices. In these applications, seven light emitting diodes (l.e.d.s) are arranged as demonstrated in the program, **Fig. 2.1**. Each of the seven segments can be illuminated separately and, depending on the selection, can form any numeral or letter of the alphabet. The display demonstrated here is for counting in 'hexadecimal' (i.e. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F).

The purpose of this program is to show how the individual segments are arranged. In the classroom, teachers normally sketch these segments on the chalk-board. Using the computer saves time and also provides for quick answer checks during question time.

```
10  REM ********************************
20  REM *          Program P3            *
30  REM *    Seven-Segment Display       *
40  REM *  (c) PW Publishing Ltd 1990    *
50  REM ********************************
60  MODE1
70  *KEY10 OLD:MRUN:M
80  *FX200,1
90  VDU23;8202;0;0;0;
100 COLOUR 2
110 GCOL0,1
120 PRINT TAB(9,1);"SEVEN-SEGMENT DISPLAY"
130 PRINT TAB(0,27);"Input Number 0 to 9 OR a
Letter A to F"
140 PRINT TAB(6,29);"Input Letter ""Z"" to Finish"
150 PROC_Border
160 A$=GET$
170 IF A$="Z" OR A$="z"PROC_Finish:
PROC_Border.END
180 IF A$>="0" OR A$<="9" GOTO 200
190 IF A$<"A" OR A$>"F" GOTO 160
200 PRINT TAB(0,27);SPC(40)
210 PRINT TAB(0,28);SPC(5)
220 IF A$="0"PROC_A:PROC_B:PROC_C:
PROC_D:PROC_E:PROC_F
230 IF A$="1" PROC_B:PROC_C
240 IF A$="2" PROC_A:PROC_B:PROC_G:PROC_E:
PROC_D
250 IF A$="3" PROC_A:PROC_B.PROC_G PROC_C:
PROC_D
260 IF A$="4" PROC_F:PROC_G:PROC_B:PROC_C
270 IF A$="5" PROC_A:PROC_F:PROC_G:PROC_C.
PROC_D
280 IF A$="6" PROC_A:PROC_F:PROC_E:PROC_D:
PROC_C:PROC_G
290 IF A$="7" PROC_A:PROC_B:PROC_C
300 IF A$="8"
PROC_A:PROC_B:PROC_G:PROC_F:PROC_C:
PROC_D:PROC_E
310 IF A$="9" PROC_G:PROC_F:PROC_A:PROC_B:
PROC_C:PROC_D
320 IF A$="A" OR
A$="a"PROC_A:PROC_F:PROC_E:PROC_B.
PROC_C:PROC-G
330 IF A$="B" OR A$="b" PROC_F.PROC_E:
PROC_D:PROC_C:PROC_G
340 IF A$="C" OR A$="c" PROC_A:PROC_F.
PROC_E PROC_D
350 IF A$="D" OR A$="d"PROC_G:PROC_E:
PROC_D PROC_C PROC_B
360 IF A$="E" OR A$="e"PROC_A:PROC_G:
PROC_E:PROC_F:PROC_E:PROC_D
370 IF A$="F" OR A$="f" PROC_G:PROC_E.
PROC_F:PROC_A
380 PRINT TAB(5,29);"Press Space-bar twice to
RUN"
390 PROC_Border
400 B$=GET$
410 IF GET$=" " RUN
420 GOTO 400
430 END
440 DEF PROC_G
450 PLOT4,400,510
460 PLOT69,840,508
470 PLOT85,840,608
480 PLOT85,400,508
490 PLOT85,400,608
500 PLOT85,310,558
510 PLOT4,840,608
520 PLOT85,930,558
530 PLOT85,840,508
540 PRINT TAB(19,14),"g"
550 ENDPROC
560 DEF PROC_A
570 PLOT4,400,812
580 PLOT69,850,812
590 PLOT85,850,912
600 PLOT85,400,812
610 PLOT85,400,912
620 PLOT85,310,912
630 PLOT4,850,812
640 PLOT85,940,912
650 PRINT TAB(19,5);"a"
660 ENDPROC
670 DEF PROC_D
680 PLOT4,400,212
690 PLOT69,840,212
700 PLOT85,840,312
710 PLOT85,400,212
720 PLOT85,400,312
730 PLOT85,310,212
740 PLOT4,840,312
750 PLOT85,920,212
760 PRINT TAB(19,23);"d"
770 ENDPROC
780 DEF PROC_B
790 PLOT4,950,912
800 PLOT69,950,562
810 PLOT85,850,625
820 PLOT85,850,790
830 PLOT85,950,912
840 PRINT TAB(27,9);"b"
850 ENDPROC
860 DEF PROC_C
870 PLOT4,950,550
880 PLOT69,950,215
890 PLOT85,850,325
900 PLOT85,850,490
910 PLOT85,950,550
920 PRINT TAB(27,19);"c"
930 ENDPROC
940 OEF PROC_F
950 PLOT4,295,912
960 PLOT69,295,570
970 PLOT85,400,620
980 PLOT85,295,912
990 PLOT85,400,795
1000 PRINT TAB(10,9),"f"
1010 ENDPROC
1020 DEF PROC_E
1030 PLOT4,295,550
1040 PLOT69,295,220
1050 PLOT85,400,325
1060 PLOT85,295,512
1070 PLOT85,400,490
1080 PLOT85,295,550
1090 PRINT TAB(10,19);"e"
1100 ENDPROC
1110 DEF PROC_Border
1120 MOVE0,0·DRAW1279,0·ORAW1279,1023·
DRAW0,1023:DRAW0,0
1130 ENDPROC
1140 OEF PROC_Finish
1150 CLS:PRINT TAB(17,5);"Bye"
1160 PRINT TAB(6,15);"Boot the disk for Disk Menu"
1170 PRINT TAB(10,18);"or TYPE CHAIN ""MENU"""
1180 PRINT TAB(8,20);"and press the RETURN key."
1190 *FX200,2
1200 END PROC
```

Program 3.

Amplitude Modulated Carrier Wave - Program 4

It is necessary for students and teachers to be able to recognise and draw the shape of an amplitude modulated (a.m.) carrier wave, **Fig. 2.2**. This is not as straight-forward as at first it may seem, because the shape depends upon the percentage of modulation. Students studying on the 'Radio Amateurs Course' must be able to measure the percentage of modulation and understand that 'over modulation' (greater than 100%) will give excessive interference to radio stations using adjacent frequencies.

When the program is RUN, demonstrations of amplitude modulated waveforms can be selected, showing modulation levels of 50, 90, 100 and 120%. Another option shows how the percentage of modulation can be calculated.

Note for teachers: If a printer ROM is available, it is worth printing the waveforms onto hand-out sheets. It is difficult to sketch these on a chalk-board accurately, and students efforts are usually poor.

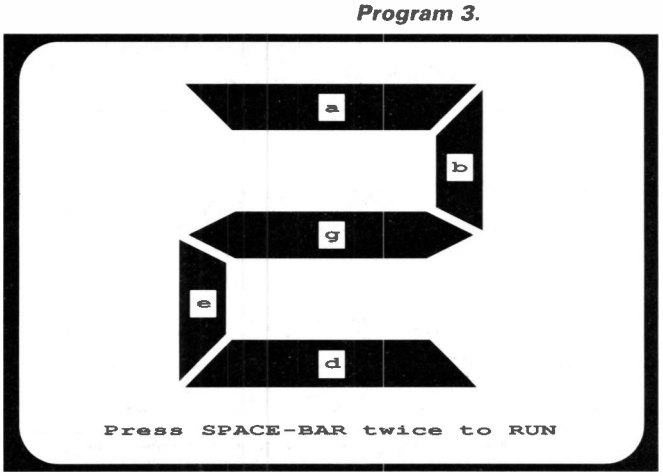


Fig. 2.1.

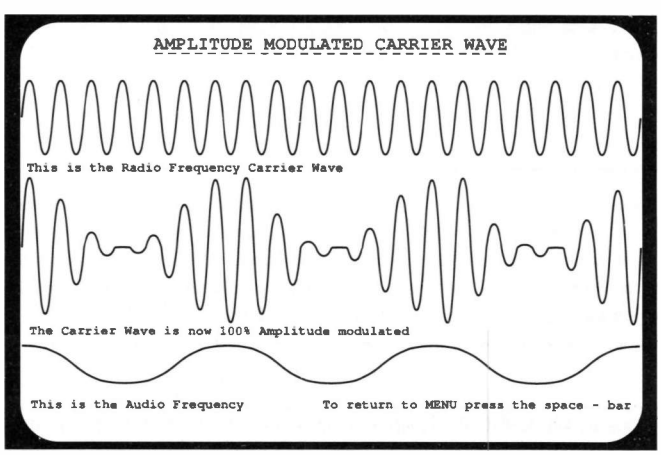


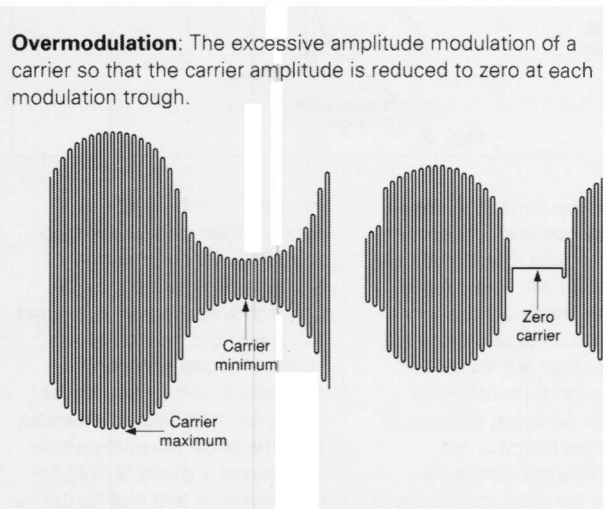
Fig. 2.2.

```
10  REM ********************************
20  REM *          Program P4            *
30  REM *    Modulated Carrier Waves     *
40  REM *    (c) PW Publishing Ltd 1990  *
50  REM ********************************
60  *Key10 OLD:MRUN:M
70  *FX200,1
80  *FX11,0
90  MODE 1
100 VDU23;8202;0;0;0;
110 VDU23,244,255,24,60,90,129,24,24,24
120 VDU23,245,24,24,24,129,90,60,24,255
130 VDU23,246,255,0,0,0,0,0,0,0
140 VDU23,247,0,0,255,24,60,90,129,24
150 VDU19,0,4,0,0,0
160 PRINT TAB(8,2);"Modulated Carrier Wave"
170 PRINT TAB(8,3);"-------------------"
180 PRINT TAB(7,6);"1.  50% modulated wave"
190 PRINT TAB(7,8);"2.  90% modulated wave"
200 PRINT TAB(7,10);"3.  100% modulated wave"
210 PRINT TAB(7,12); "4.  120% modulated wave"
220 PRINT TAB(7,14);"5.  Percentage Mobulation"
230 PRINT TAB(7,16), "6  To EXIT the program"
240 PRINT TAB (7,18); "-------------------"
250 PRINT TAB(7,20); "Input a number to select"
260 PROC_Border
270 *FX15,0
280 G$=GET$
290 MODE 0
300 VDU23;8202;0;0;0;
310 VDU19,0,4,0,0,0
320 IF G$<"1" OR G$>"6" THEN RUN
330 IO G$="1" CLS:PROC_50
340 IF G$="2" CLS:PROC_90
350 IF G$="3" CLS:PROC_100
360 IF G$="4" CLS:PROC_120
370 IF G$="5" CLS.PROC_Mod_percent
380 IF G$="5" GOTO 410
390 IF G$="6" PROC_Finish: Proc_ Border:END
400 PROC_modulated_wave
410 VDU29,0;0;
420 PROC_Border
430 PRINT TAB(42,30),"To return to MENU press the
space-bar"
440 *FX15,0
450 A$=GET$
460 IF A$=" " RUN
470 GOTO 450
480 END
490 DEF PROC_modulated_wave
500 PRINT TAB(22,1),"AMPLITUDE MODULATED
CARRIER WAVE"
510 PRINT TAB(22,2),"-------------------
-------"
520 PRINT TAB(5,11);"This is the Radio Frequency
Carrier Wave"
530 VDU29,0;800;
540 PLOT4,0,0
550 FOR X= 1 TO 1260 STEP 5
560 LET Y=carrier*SIN(X*2*PI*20/1260)
570 PLOT6,X,Y
580 NEXT X
590 PRINT TAB(5,30),"This is the Audio Frequency"
600 VDU29,0,150;
610 PLOT4,0,0
620 FOR X= 1 TO 1260 STEP 5
630 LET Y=audio*COS(X*2*PI*3/1260)
640 PLOT6,X,Y
650 NEXT X
660 PRINT TAB(5,24);"The Carrier Wave is now
";P;"% Amplitude Modulated"
670 VDU29,0;450,
680 PLOT4,0,0
690 FOR X= 1 TO 1260 STEP 5
700 LET Y=carrier*SIN(X*2*PI*201260)+audio*SIN
(X*2*PI*23/1260)+audio*SIN(X*2*PI*17/1260)
710 PLOT6,X,Y
720 NEXT X
730 ENDPROC
740 DEF PROC_50
750 LET carrier=100
760 LET audio=25
770 LET P=50
780 ENDPROC
790 DEF PROC_90
800 LET carrier=100
810 LET audio=45
820 LET P=90
830 ENDPROC
840 DEF PROC_100
850 LET carrier=100
860 LET audio=50
870 LET P=100
880 ENDPROC
890 DEF PROC_120
900 LET carrier=100
910 LET audio=60
920 LET P=120
930 ENDPROC
940 DEF PROC_Mod_percent
950 LET carrier=100 LET audio=25
960 VDU29,0;800,
970 MOVE 0,0 ORAW1279,0
980 MOVE0,95.ORAW1279,95
990 MOVE0,150.ORAW1279,150
1000 PLOT4,0,0
1010 FOR X= 1 TO 610 STEP 5
1020 LET Y=carrier*SIN(X*2*PI*20/600)
1030 PLOT6,X,Y:NEXT X
1040 VDU29,600;800;
1050 PLOT4,0,0
1060 FOR X=1 TO 700 STEP 5
1070 LET Y=carrier*SIN(X*2*PI*201260)+audio*SIN
(X*2*PI*23/1260)+audio*SIN(X*2*PI*17/1260)
1080 PLOT6,X,Y
1090 NEXT X
1100 PRINT TAB(28,14),"Change in
Carrier Amplitude"
1110 PRINT TAB(2,15),"The Depth of Modulation
= ---------- x 100"
1120 PRINT TAB(28,16),"Unmodulated
Carrier Amplitude"
1130 PRINT TAB(28,20),"= --  X 100 (%)"
1140 PRINT TAB(31,19),"B",TAB(31,21),"A"
1150 PRINT TAB(14,3),"B",TAB(16,2),CHR$(247),
TAB(16,3),CHR$(245)
1160  PRINTTAB(17,4),CHR$(246),CHR$(244);
CHR$(246),TAB(17,5),"  A ",TAB(17,6) "_",
CHR$(245),"_"
1170 PRINT TAB(9,25),"Which in this
case = --  x 100 = 50%"
1180 PRIN TAB(31,24),"1";TAB(31,26);"2"
1190 ENDPROC
1200 DEF PROC_BORDER
1210 MOVE0,0:DRAW1279,0.DRAW1279,1023
ORAW0,1023:DRAW0,0
1220 ENDPROC
1230 DEF PROC_Finish
1240 CLS PRINT TAB(17,5),"Bye"
1250 PRINT TAB(6,15),"Boot the disc for Disk Menu"
1260 PRINT TAB(10,18),"or TYPE CHAIN ""MENU"""
1270 PRINT TAB(8,20),"and press the RETURN key "
1280 *FX200,2
1290 ENDPROC
```

Disks for all the Educational Software programs will be available at a later date

Program 4.

Overmodulation: The excessive amplitude modulation of a carrier so that the carrier amplitude is reduced to zero at each modulation trough.



BASIC: The word BASIC is an acronym of Beginners All-purpose Symbolic Instruction Code and although less elegant and less powerful than other programming languages does still fulfil its two main objectives. BASIC is for beginners - it can be used quite quickly by people who are not, and who do not wish to be, computer professionals. BASIC is also all-purpose; it can be used for simple computational work, for problem-solving, for small business applications and for home computing.

BASIC began life in 1964 at Dartmouth College, America, where it filled a need for a simple computer language for beginners and has proved to be very popular since then.

Hexadecimal scale: The number scale that uses 16 digits. The letters A to F are used to represent the decimal numbers 10 to 15 in this scale. For example, the hexadecimal number A5 is the decimal number 165 ((16 x A) + 5 where A = 10).

STARTING OUT

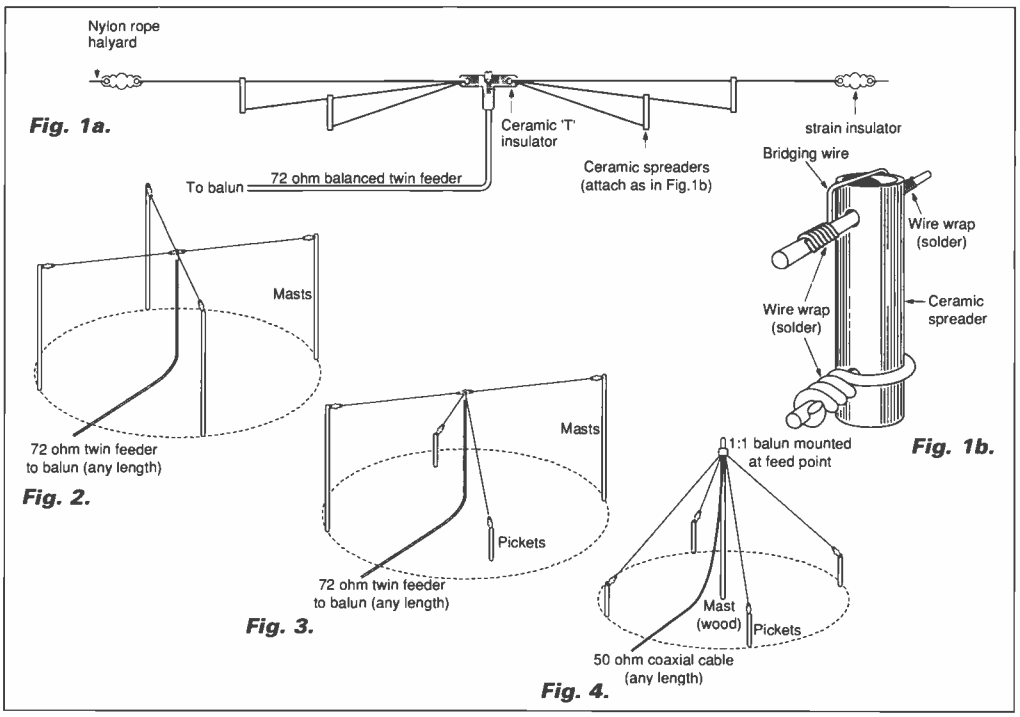
A simple dipole can be adapted for multi-band operation. So how is this achieved? Brian Oddy G3FEX explains.

A single dipole, or doublet antenna, will prove to be of limited use to most s.w.l.s since it can only be operated on the fundamental frequency to which it is cut, or on odd multiples of the fundamental. Some locations may allow several dipoles to be erected so that they are well clear of each other, but for most of us such a scheme must remain a figment of the imagination! Fortunately there are a number of methods of adapting a dipole so that it is capable of multi-band operation.

In Parallel

Perhaps the simplest approach is to connect several dipoles in parallel across the feed point of an existing dipole, each one added being resonant in a different band. A compact way of doing this is to suspend the ends of the additional wires from the arms of the existing dipole by means of insulating spreaders - see **Fig. 1a**. Because the dipoles are so closely spaced there will be some interaction between them, but the main effect of those that are not resonant at the frequency of reception will be to reduce the feed-point impedance of the one in use to a value of between 60 and 70Ω. Nevertheless, a satisfactory impedance match can still be obtained to a 72Ω balanced twin feeder.

The length of the spreaders, which have a hole at each end, is not critical - 150mm should be adequate for operation at h.f. A method of anchoring their upper ends to the arms of the dipoles and making off the wires to their lower ends is depicted in **Fig. 1b**. Be sure to clean the wires at the points of attachment with glass paper, so that the wire wraps can be soldered. In practice, this type of construction tends to be rather cumbersome and unsightly if more than four dipoles are suspended in this way. However, it will be possible to use the four dipoles on more than four bands, because each dipole can be operated at an odd multiple of the fundamental frequency to which it is cut - see last month's article. If space permits, additional masts can be used to support the ends of the dipoles added to the feed-point. Two dipoles erected in that manner are depicted in **Fig. 2**. This method offers the advantage that each dipole can be erected in a direction best suited for optimum reception from a particular area.



Inverted V

As an alternative, the arms of one of the dipoles can be tilted down towards the ground to form an inverted V dipole (**Fig. 3**). Such an arrangement will prove to be simple to erect and capable of good results. It will be found that the inverted V dipole is less directional than the horizontal dipole, which may be advantageous. Bringing the ends of the dipole into close proximity with the ground will result in an increase in end effect, consequently its resonant frequency will be lowered. For resonance at a particular frequency, the length of the arms will need to be 2 to 6% shorter than those for a horizontal dipole - the exact reduction required will depend upon the closeness of the ends to the ground and the angle between the arms at the apex. The angle between the arms also determines the impedance at the feed-point - the smaller the angle, the lower the impedance. Provided the angle is greater than 90° this effect can be ignored for receiving purposes. Although the apex is fixed by the height of the horizontal dipole, the angle between the arms can be set to between 90 and 120° by driving suitably positioned pickets into the ground and using nylon rope extensions from the strain insulators at the dipole ends to the pickets.

The best way to determine the resonant frequency of any antenna and the impedance at the feed-point is to use an antenna noise bridge* in conjunction with a calibrated receiver. Once the resonant frequency of the inverted V dipole has been established it will be possible to make adjustments to the length of the arms without the need to lower it because the ends are so near to the ground.

(*Antenna noise bridges are available ready made and in kit form from some of the advertisers in *SWM*).

A popular alternative is to erect all of the dipoles in the inverted V configuration and connect them to a single feed-point (**Fig. 4**). This method offers three advantages: first, only one wooden pole is needed to support the feed-point at a suitable height; second, the dipoles will occupy less space than their horizontal counterpart; third the angle of radiation from an inverted V dipole is likely to be lower than that of a horizontal one, especially at low heights, consequently there is often an improvement in long distance reception. It is important to use nylon ropes to guy the mast, as the stranded galvanised iron wire often used for the purpose will upset the performance of the dipoles. The impedance at the feed-point is likely to be nearer 50 than 72Ω, so a weather-proof 1:1 balun should be connected directly to the feed-point. Any length of 50Ω coaxial cable can then be run from the top of the mast to the receiver.

Extensions & Traps

Another simple idea is to install extension wires of suitable length between the strain insulators at each end of an existing dipole and the nylon rope halyard used to raise the

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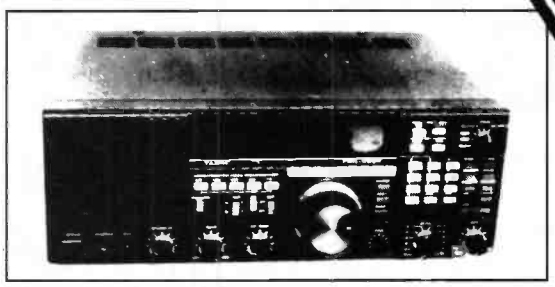

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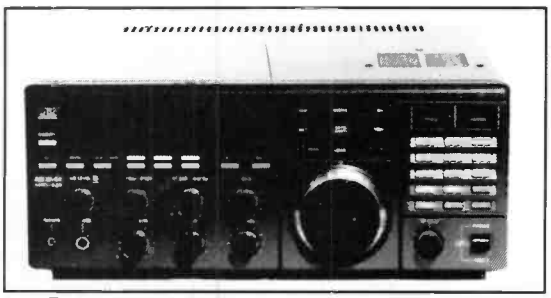

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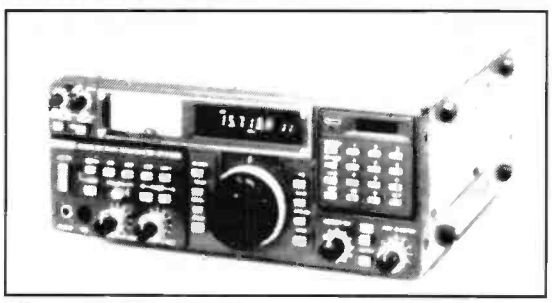

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Access

antenna - see **Fig. 5**. To change frequency it is necessary to lower the antenna and clip 'jumper' wires across the dipole insulators to short them out, thus bringing the additional wires into use and lowering the resonant frequency of the system. Having to lower the antenna each time a frequency change is required can be very inconvenient. To some extent this problem can be alleviated by installing the dipole in the inverted V configuration, since it may then be possible to reach the insulators from the ground. Unfortunately the crocodile clips attached to the jumper wires tend to corrode, so it will be necessary to replace them from time to time.

This idea can be taken a stage further by using parallel tuned circuits, called traps, to automatically switch into circuit the extension wires as the reception frequency is changed. Such an arrangement, called a trap dipole, is shown in **Fig. 6a**. In this arrangement, the two inner arms (A-A) form a dipole which is resonant in the highest frequency band (f1) of reception. The two parallel tuned circuits (L1/C1) are pre-tuned to resonate at the same frequency as the dipole, consequently they act as insulators because the impedance of a parallel tuned circuit is very high at resonance - see appendix, page 39, *SWM* Oct '89. The sections beyond L1/C1 are therefore inactive.

However, when reception is changed to the next lower frequency band (f2), the traps (L1/C1) no longer act as insulators, because they are not resonant. Instead, they present an inductive reactance, which is the electrical equivalent of a coil. The extension wires (B-B) plus the inductive reactance of L1/C1 and the arms of the dipole (A-A) form a loaded dipole which is resonant at f2 - see **Fig. 6b**. The traps (L2/C2) are pre-tuned to resonate at (f2), so they act as insulators and render the extension wires (C-C) beyond them inactive. Both sets of traps (L1/C1 & L2/C2) will be non-resonant if reception is changed to the next lower frequency band (f3), consequently they will act as loading coils. The extension wires (C-C) plus the inductive reactance of L2/C2 will be added to the extension wires (B-B) plus the inductive reactance of L1/C1 and the arms of the dipole (A-A) to form a loaded dipole resonant at f3 - see **Fig. 6c**.

If reception is attempted at a frequency (f4) which is higher than the resonant frequency of the inner dipole (A-A), then all of the traps will behave as a capacitive reactance and the sections will be linked together to form a dipole - see **Fig. 6d**. The effect of the reactances is electrically equivalent to shortening the sections B-B and C-C, consequently the resonant frequency of the overall system will be higher than that of a simple dipole of the same physical length. The effect will be less pronounced as the frequency of reception is raised, because capacitive reactance decreases with increasing frequency. By altering the L/C ratios of the traps and adjusting the length of the extension wires to ensure that fundamental resonance at f2 and f3 is maintained, it may be possible to arrive at a combination which will enable the overall system to be operated at an odd harmonic of the fundamental frequency to which it is resonant, i.e. f4 and obtain a low impedance at the feed-point.

Efficiency

The most important function of the traps is to provide a high isolating impedance at resonance. This implies that low-loss (high *Q*) coils will be required and that capacitive losses must be kept to a minimum. Provided the traps are carefully constructed, then the efficiency of a trap dipole can be almost as high as that of a simple dipole. Unfortunately, the requirement of high *Q* restricts the bandwidth of the antenna, because the high isolating impedance presented by the sharply tuned traps only exists at resonance. The length of the extension wires required for resonance in a particular band is best determined experimentally with the aid of an antenna noise bridge, because it is dependent upon the L/C ratio of the trap acting as a loading coil, also on the length/diameter ratio of the wire used for the antenna.

The impedance at the centre of a trap dipole is similar to that of a simple dipole, so a satisfactory match to a 72Ω balanced twin feeder can be obtained on all of the bands covered by the antenna provided it is erected horizontally at a suitable height above the ground - see graph on page 39, October '90 *SWM*. Owing to the weight of the traps, the glass or ceramic strain insulators used at the points of suspension on wires C-C must be robust. The 'T'-shaped strain insulator at the centre enables the weight of the twin feeder to be supported by the antenna, thereby avoiding strain on its connection to the feed-point. The feeder, which may be any length, should drop down at right angles to the line of the dipole to a convenient point in the garden, where it is attached to a wideband 1:1 balun. Any length of 75Ω coaxial cable can then be used to convey the signals from the balun to the receiver. Due to the inductive loading effect of the traps when they are non-resonant, the overall length of the trap dipole will be substantially less than a simple dipole cut for the lowest frequency of operation (f3). This may be a considerable advantage when space is at a premium.

A good way of making a trap is to mount an air-spaced coil and a fixed ceramic capacitor on a glass strain insulator, since it can then be easily installed between the sections of the antenna. Weather-proofing can be achieved by sealing the trap inside the type of plastic bottle used for washing up liquid. The combinations of inductance (L) and capacitance (C) which will resonate in a particular band can be determined by calculation, but they can also be ascertained experimentally with the aid of a dip oscillator. Commercially made traps, kits of parts, or complete trap dipoles are available from some of the advertisers in *SWM*. They are designed to cover either the h.f. broadcast bands or the h.f. amateur bands, so be sure to specify your requirement when placing an order. ■

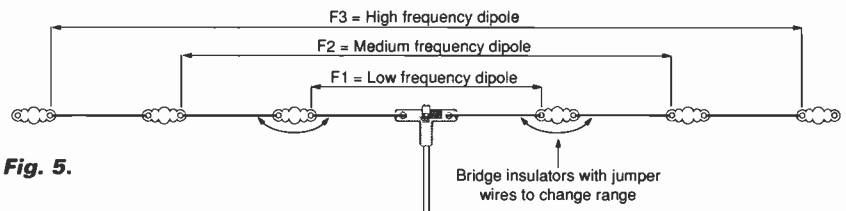

Fig. 5.

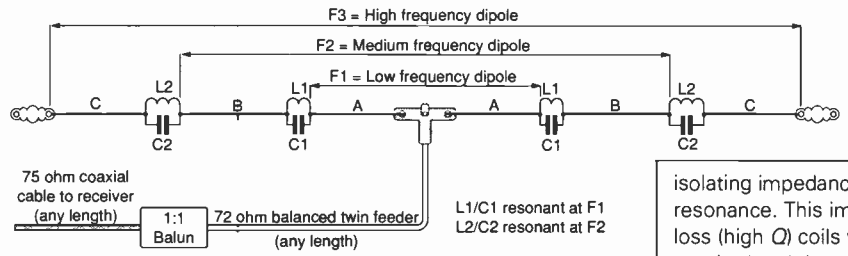

Fig. 6a.

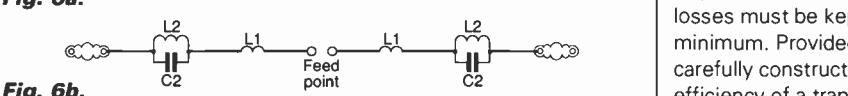

Fig. 6b.

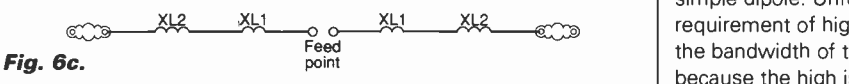

Fig. 6c.

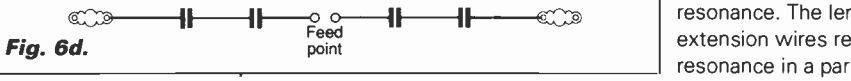

Fig. 6d.

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Using An ERA Microreader Mk II

If you are one of the many Microreader owners, you may find this tale by Ian Chard very useful, especially if you are new to data decoding.

Having familiarised yourself with your Microreader, you may well be encountering the most common problem associated with this unit - you just can't decode anything! I have had my unit for about two years and am still learning, so it does take a little practice and patience. What makes things worse is that not all 'RTTY' signals are readable. Many signals, especially subscription news agencies, military stations and other specialist stations, such as those used by INTERPOL, are encrypted. This can either be character-level scrambling, in which case there will be a steady stream of nonsensical characters, or bit-level scrambling that can include the removal of the start and stop bits, which will result in completely random gibberish.

Down to Basics

Assuming you have a unit connected up to a receiver and suitable 12V supply, switch everything on. Tune your receiver to 14.700MHz, an English language TASS frequency, and set the receive mode to s.s.b. (or f.s.k. if your receiver is expensive enough). Assuming the time is after 1300UTC, you should be hearing either a whistle or a two-tone warbling sound. You will need to be able to hear the signals as you are fine tuning, so connect an external speaker if required. Turn the selector knob on the front of the Microreader to the centre 'SHIFT' position (3 o'clock).

Keeping you eyes on the bargraph display, start to fine tune the signal. If it's a whistle, as you tune, a single bar should move across the bargraph. Try to get this bar so that it just lights the right-most yellow light, then tune slightly further. If it is a warbling sound, you will see two distinct bars on the display. Tune so that one bar is slightly left of the centre, and the other is at the right of the display.

Having tuned in the signal you will have to wait for some data. TASS transmits a test signal at 40 seconds past every full 10 minutes when idle. This test signal consists of the word 'TASS', sometimes the current Moscow time and a string of RYs. If you have tuned the signal correctly you will see RYRYRYRYRYRYRY... moving across the screen. If the signal is tuned 'backwards' (i.e. the two tones are the wrong way round) you will see SGSGSGSGSG instead. To resolve this problem, tune the signals so that the bars move from right to left and keep tuning in this direction until they reappear. You must tune **slowly** to align the signal properly. If you have followed this procedure properly, you should now be tuned to TASS Moscow and should see news items appearing. Remember that TASS tends to sit idle for about half an hour at a time before transmitting anything intelligible, so give it a chance.

Successful Decoding

Now that you have successfully decoded you first RTTY transmission, you will probably want to progress to something else, for example amateur RTTY transmissions. These use a different speed and tone separation from commercial stations like TASS. Whereas the standard for most commercial stations is 50 baud with 425kHz separation, amateur transmissions are around 45 baud with 170Hz separation. This makes the signals slightly harder to tune, but easier to read. Turn the selector knob one notch clockwise (so that it points at the 'T' of SHIFT) and tune your receiver around 14.090 to 14.100MHz. After listening for a bit, you should hear a transmission. Every transmission should start with RYRYRYRY... and most finish with PSE KKK (meaning 'please respond', K is used for the same reasons it is used in Morse). You want to try and tune the signal so that each tone lights one of the central yellow lights. Remember that you might have to reverse the signals as I mentioned before. I won't go into detail as regards the terminology and abbreviations used, because most of them are listed in the Microreader manual.

What Now?

You might want to invest in the *Guide to Utility Stations* by Klingenfuss at this point. This lists just about every known station in existence and although expensive, it's well worth it. It is available from the *SWM* Book Service, see page 65.

As you diversify to other signals on the band you will begin to be able to recognise different speeds and shift by ear. Remember that not every signal that sounds like RTTY uses the same code. The first thing you will notice is that some signals seem very fast. Don't bother trying to decode these. Many have a very wide shift (850Hz or above) and these can also be identified by ear. I have only ever managed to decode one 75 baud 850Hz shift signals with my Microreader, and that was over 18 months ago!

If you come across a situation where you think the signal is reversed, but you can't turn it round because there is interference on the other side of the signal, you can instruct the Microreader to reverse the tones by selecting '50 REVERSED' from the RTTY menu. Further details of how to select options from menus can be found in the Microreader manual.

Morse

One of the Microreader's most endearing features is its ability to decode Morse or c.w. As I have never been able to read Morse at over about 5 words per minute, I find this very useful. This mode is extremely easy to master.

First, select the CW AUTO position on the Microreader and tune to a Morse signal (still in s.s.b. made, or c.w. if you splashed out when you bought your receiver). Try to get the bar flashing in tie with the signal right in the centre of the display so that it lights the middle two green l.e.d.s. The middle shift l.e.d. will also flash, and this is a good indication of the level of interference behind a signal as this lights only when the signal level at a preset pitch rises above a certain level. Don't try to improve reception by advancing the volume control or turning up the gain on the back of the Microreader. You will only distort the signal with interference and throw your RTTY reception if you start mucking about with the gain control. I have never needed to use this control.

If you come across a signal that appears as E and T on the display then select CW SLOW. Always allow about three seconds for the Microreader to adjust to a new signal. If the signal seems abnormally fast, select CW FAST, but this normally takes longer to stabilise. Always reset it to CW AUTO when you have finished with that signal.

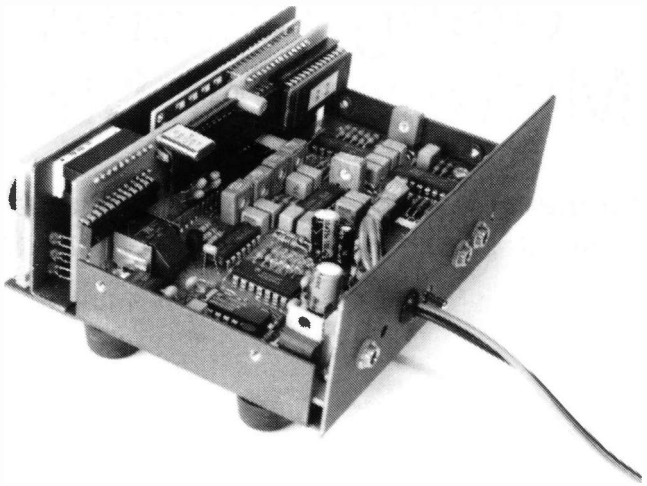
Another topic that seems to cause much confusion amongst Microreader users is the RS232 connection. Many, if not most, users will not have seen a data connection in this form before (3.5mm jack plug). The connection required varies from machine to machine, but a few common examples can be seen in **Figs. 1, 2, 3 & 4**.

Other computers with standard RS232 connections should be similar. If the computer has a 25-way connector, try the Atari ST connection first - if this doesn't work, then try the IBM PC. As far as I know, the ZX Spectrum connection is non-standard and should not be used with any other type of computer. Be especially careful with the Commodore Amiga as there are all sorts of signals coming out of its RS232 port.

To start with, set the Microreader to 1200 baud. Set your terminal program to 8 bits, no parity, 1 stop bit. It may take a few attempts for the terminal program to syncronise with the Microreader, resulting in a few errors (don't ask me why). There are all sorts of terminal programs available, or you could write your own, but bear in mind that the Microreader assumes that the computer is always ready to receive information and never stops. Please remember that if you decide to capture the information on disk, certain copyright restrictions may apply. I am no expert on this subject and would advise you to contact someone with knowledge in this areas if you are concerned.

I think I have covered everything in sufficient detail to enable you to operate you ERA Microreader Mk II sufficiently well to enable you to carry out general monitoring tasks. I've said it before and I'll say is again, it takes practice and experience to be able to pick out the unreadable signals from the ones worth decoding.

Finally, if there is anything still puzzling you that I haven't covered here, please write to me via th *SWM* Editorial Offices. Remember that I'm only a humble 'A' level student, so please allow me time to reply (about three weeks should be enough). ■



Sources of Computer Software

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Grosvenor Software, 2 Beacon Close, Seaford, East Sussex BN25 2JZ. Tel: (0323) 893378.

Fig. 1: IBM PC and compatibles (25-pin port).

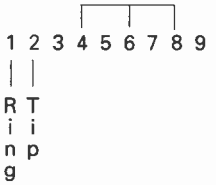

Fig. 2: IBM PC and compatibles (9-pin port).

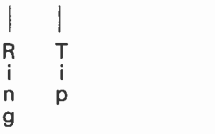

Fig. 3: Atari ST and Commodore Amiga.

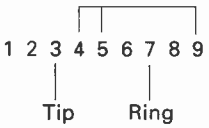

Fig. 4: ZX Spectrum with interface 1 (as yet untested).

abbreviations

c.w.	continuous wave (Morse)
Hz	hertz
l.e.d.	light emitting diode
MHz	megahertz
mm	millimetre
RTTY	Radio TeleTYpe
s.s.b.	single sideband
UTC	Universal Co-ordinated Time (=GMT)
V	volts

Another source of decoding frequencies is the list available from the 'Decode' author, Mike Richards. Send three first or second class stamps to the address at the head of the 'Decode' column requesting a frequency list.

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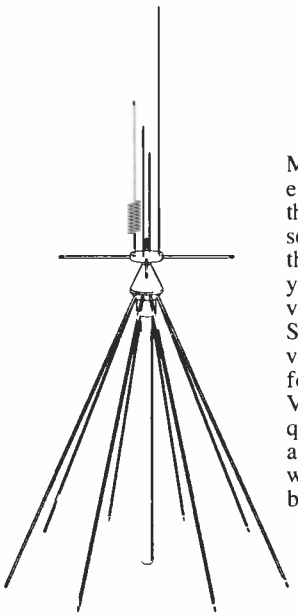

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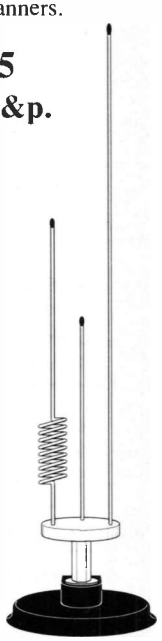

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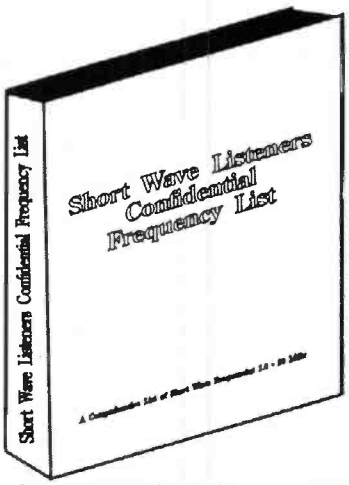

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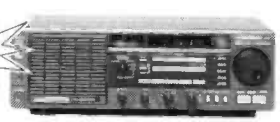

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Calibrating the Long Arm Loop

The Long Arm Loop (September 1987 SWM) was designed mainly for use with the older type of valved receiver and, if the set is in good working order, will give excellent results. George Millmore describes how to get more out of this useful antenna.

One drawback with most of these old, valved receivers is that the dials are calibrated in wavelengths (metres) and, on many, in 100m steps. This calibration was generally printed on a glass scale showing station names, with a slot showing where the station could be found and the pointer was behind the scale. Although this arrangement is adequate for a few known stations, it leaves a lot to be desired if one is using the set for DXing.

On some receivers, where the pointer runs in front of the scale, it is possible to fit another scale, and re-calibrate it in frequency. But unless it is a large scale, it is not easy and the calibration becomes too cramped at the h.f. end. Also, if the receiver is in good condition, any alteration could affect the value of the set in the future. By far the simplest way to overcome this is to calibrate the loop you use with the valved set.

The tuning capacitor of the Long Arm Loop can be placed in any convenient position, and it is a simple task to fit it to a panel. The panel can be of any size, within reason. The larger it is, the easier it is to calibrate, bearing in mind that the calibration is more cramped at the h.f. end of the scale. A useful size for the panel is about 220 by 180mm.

A typical arrangement for a panel mounted capacitor is shown in **Fig. 2**. The shaft on most tuning capacitors is not long enough without a coupler and extension. The coupler is also useful as it allows you to adjust the pointer to the zero position.

Drill a 15mm hole in the centre of the panel at a height to suit the tuning capacitor shaft. The mounting bracket can be modified to suit any type of tuning capacitor. Next, assemble the panel, base, support bracket and tuning capcitor. Temporarily fit the coupler to the shaft and, leaving about 2mm clearance from the front of the panel, mark the position of the pointer. Remove the extension shaft from the coupler and fix the pointer. The pointer is made with a piece of copper wire, (the earth conductor from a short length of 1.5mm 'twin & earth' lighting cable is ideal). Place in position and wind three turns tightly round the shaft using a pair of pliers. The pointer can now be soldered or glued to the shaft.

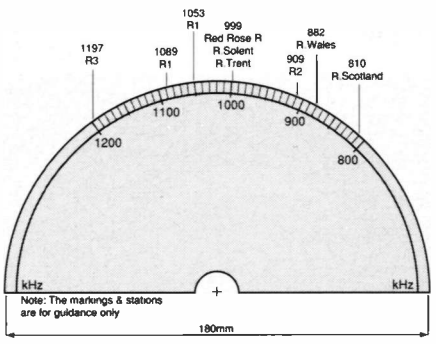
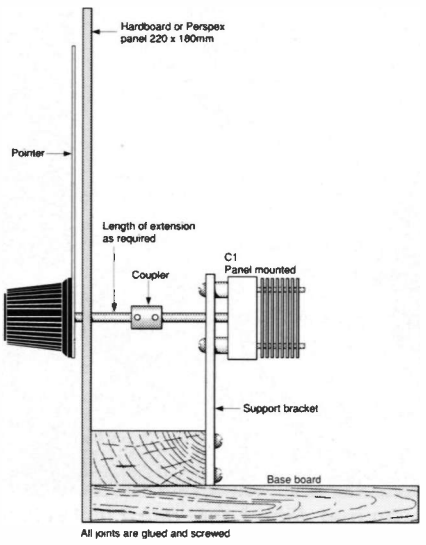


Fig. 1: How to mark out the dial.

Fig. 2: How the new dial is fitted.



The scale is made from white paper or thin card. You need to draw two semi-circles as shown in **Fig. 1**, but do not put any other markings on the scale at this stage. Place the scale over the panel and punch a hole for the shaft. Locate in position and secure to the panel with a suitable adhesive.

Replace the extension shaft and pointer and, with the tuning capacitor fully closed, zero the pointer at the l.f. end of the scale before tightening the coupler screws. The loop is now ready to be calibrated.

Start near the centre of the m.w. band frequency range - 1000kHz is a good place. There are at least three stations in the UK on 999kHz - Red Rose Radio, Radio Solent and Radio Trent. From this position work both ways on the scale using stations of known frequency, as shown in **Fig. 1**. Mark the scale in 100kHz steps and then in 10kHz steps. The completed scale should be accurate to within a few kHz.

Having calibrated the loop, the frequency to which the receiver is tuned can be read on the loop scale. For a professional finish, the panel can be recessed into a cabinet and acrylic sheet fitted over the front to protect the scale and pointer. ■

Abbreviations

DXing	searching for 'long distance' stations
h.f.	high frequency
kHz	kilohertz
l.f.	low frequency
m	metre
mm	millimetre
m.w.	medium wave

Useful Medium Wave Stations

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828	Chiltern Radio
828	Radio Aire(Magic 828)
828	Radio WM
828	2CR
837	Radio Cumbria
837	Radio Furness
837	Radio Leicester
855	Radio Devon
855	Radio Lancashire
855	Radio Norfolk
873	Radio Norfolk
936	GWR (Brunel Radio)
945	Radio Trent (GEM-AM)
954	DevonAir Radio
954	Radio Wyvern
990	Radio Aberdeen
990	Radio Devon
990	Hallam Radio (C.Gold)
990	Spectrum
999	Radio Solent
999	Radio Trent (GEM-AM)
999	Red Rose Radio
1026	Radio Cambridgeshire
1026	Radio Jersey
1035	Northsound Radio
1035	Radio Kent
1035	Radio Sheffield
1035	West Sound
1107	Moray Firth Radio
1107	Radio Northampton
1116	Radio Derby
1116	Radio Guernsey
1152	LBC (L.Talkback R)
1152	Metro Radio (GNR)
1152	Piccadilly Radio
1152	Plymouth Sound
1152	Radio Broadland
1152	Radio Clyde (Clyde 2)
1161	GWR (Brunel Radio)
1161	Radio Bedfordshire
1161	Radio Sussex
1161	Radio Tay
1161	Viking Radio (C.Gold)
1170	Ocean Sd.(C.Gold)
1170	Radio Orwell
1170	Signal Radio
1170	Swansea Sound
1170	TFM Radio (GNR)

The Boy Who Met John Logie Baird

When the Sevenoaks & District Amateur Radio Club visited the Chalk Pits Museum, it gave Joan Ham a chance to meet someone with an interesting story.

Les Smith of Petts Wood was amongst the club members who visited us at the Chalk Pits Museum on that day. It was at the age of just 12, whilst in Canada, that Les read an article by C.F. Jenkins, the American television pioneer. This fired his interest in television and he became 'a dabbler in mechanical TV'.

In 1927, having 're-invented the Nipkow disc', as he modestly put it, this 16-year-old boy sent his idea for a television system to John Logie Baird. Baird invited him to come to his studio/laboratory. He was with the great man for half-an-hour and although his memory of the event was naturally not detailed, the impression he retained of the transmitter was of 'large valves, knobs and things'. He saw the studio where the transmissions were made and recalls Baird as being 'a bit cagey' as he was experimenting with Noctovision - a system of seeing in the dark with infra-red. Another recollection was that the equipment was all rather a lash-up and the construction haphazard.

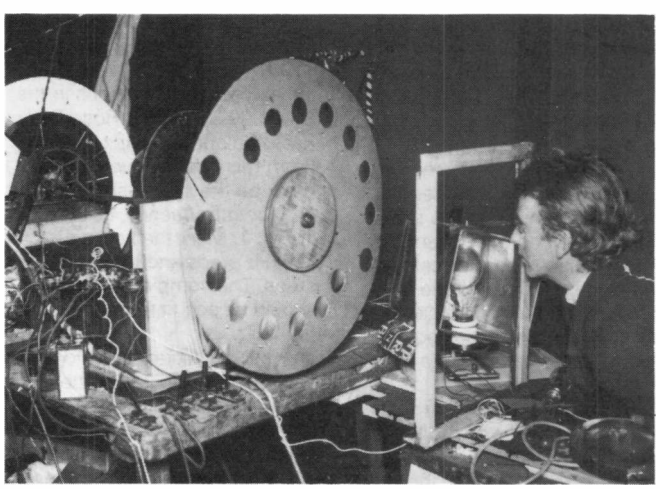
The result of the visit was that Baird offered Les Smith a job, which was turned down as he was already committed to something else. He could not help wondering at this point in the story, whether he should have accepted it after all!

Baird Junior Kit

His interest by now (1933) was firmly fixed. Les saw a competition in the magazine *Television* edited by H.J. Barton Chapple. He sent in an article on the Baird television scanning disc he had made. Les won First Prize, which turned out to be a Baird Junior Kit - a mechanical TV receiver in bits that had to be assembled!

During the war, he was in engineering, but the interest in mechanical television never left him. In 1980, he saw an article in *Hobby Electronics* on the subject by Doug Pitt who had started a club for low-definition television. Les joined the club, which holds a convention every year, and has written articles for their quarterly magazine.

Les Smith, who met John Logie Baird in 1927, visiting Chalk Pits Museum, Amberley, sixtytwo years later.
Ron Ham



Baird's transmitting station, March 1925.
Hulton-Deutsch Collection

Intolerable Flicker

It is not easy to appreciate the attractions of going back to the beginnings in today's world of superb colour TV, so I asked Les about this. He said that he is still experimenting and there is room for a great deal of improvement in these old systems.

One fault with the early transmissions was an intolerable flicker. He has submitted an idea to double the frequency of this at the receiving end, leaving the transmission unaltered. The early transmitting device was a selenium cell (photosensitive cells were not sensitive enough), but it was sluggish and there was a time-lag.

One line of experiment is to try to speed up the selinium cell. Another is to use solar cells for pictures. He is also experimenting with colour, using two instead of three basic colours.

Although all this sounded irresistibly like using the theory of rocket propulsion to invent a bicycle, I very much enjoyed the opportunity to talk to someone who had actually met the pioneer, John Logie Baird. Who knows, going back to the roots and climbing the evolutionary tree again may reveal unsuspected branches and unknown fruit ■

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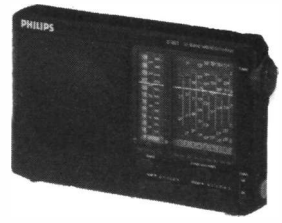

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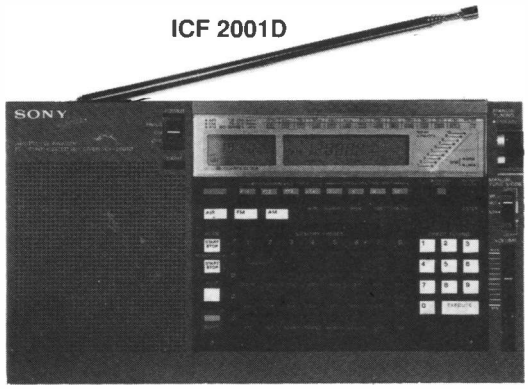

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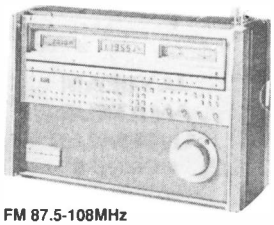

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Realistic PRO-2006 Scanner

Tandy have a long tradition in scanners, so new releases such as the PRO-2006 attract a lot of interest. Mike Richards takes a closer look at this scanner to see just how it shapes up.

The PRO-2006 is a full-featured desk-top scanner that boasts some 400 memories plus a.m. and f.m. coverage from 25 to 520MHz and 760MHz to 1.3GHz. This wide coverage ensures that all the main areas of interest are well covered. So let's take a more detailed look to see just how it performs.

Getting Going

The first thing to check out was the instruction manual as I've been caught before wasting time trying to operate without reading the manual. The manual was well presented as a half A4 size booklet of some 91 pages. However, as is common practice, the coverage was multi-lingual with 30 pages written in English. The manual was well up to the normal standard for Tandy, covering all the important areas in a clear and simple manner. All the connections were very well described with plenty of diagrams for clarity.

When it came to explaining the programming functions, the manual used a very clear system. Each key press was explained with a diagram showing the resulting display. This was an excellent system that should help the newcomer to get the best from the scanner.

The final sections of the manual included a selection of useful data such as birdie frequencies, help notes and full specifications.

With the instructions read and digested it was time to sort out the connections. The power was first and this turned out to be very simple as the PRO-2006 had a built-in 240V a.c. power unit. Because the PRO-2006 made extensive use of memories these needed to be backed-up when the mains was switched off. The battery used for this was a standard PP-3 9V unit that was fitted in a neat compartment on the rear panel. The expected battery life of this unit is about six months if alkaline batteries are used. The problem of battery changing was very well covered, as the memory contents were preserved for a few minutes even with both the mains and battery removed. Although the PRO-2006 was designed primarily for desk-top operation, there was an external d.c. power jack on the rear panel. This could be connected directly to a vehicle's 12V negative earth supply, so allowing mobile operation.

There were also two antenna options provided as standard.

The first was to use the supplied 670mm telescopic antenna. Because of the wide frequency coverage of the PRO-2006, the extension had to be adjusted in three stages for optimum performance. Although the telescopic antenna was handy, an external antenna should be used to get the best out of the PRO-2006. In the past, scanners have often been fitted with all manner of totally inappropriate antenna sockets. These have included audio phono and car antenna sockets. The problem with these sockets is that they all give high losses at v.h.f. and u.h.f. Thankfully this Tandy model used a good quality 50Ω BNC socket that provided low loss right up to the 1.3GHz upper frequency limit of the PRO-2066.

Other external connections included a headphone jack on the front panel and a standard external speaker jack on the rear panel. One other useful extra was a low level audio output that was designed to feed a tape recorder. The output level was approximately 600mV, so this may have to be reduced to suit many modern recorders with DIN standard inputs.

Layout

The main display unit dominated the front panel and comprised a backlit liquid crystal unit. This display was used to show all the status condition as well as the basic channel numbers and operating frequency.

To the side of the display was the main push-button control panel. This provided total control of all the modes. For ease of use it was split into two sections - one to control the operation whilst the other was used for programming.

The remaining controls on the front panel comprised two rotary controls for volume and squelch and a pair of push-buttons. These push-buttons provided display dimming and voice squelch. I'll cover the voice squelch in a bit more detail later.

Memories

This is the heart of all modern scanners, so it's worth spending a little time on this area. The PRO-2006 follows similar lines to other Tandy scanners, in that the memory channels are split into banks. This greatly eases the handling of large numbers of channels, enabling the operator to group related frequencies. The PRO-2006 groups its 400 channels into ten banks of 40 channels each.

With the memories playing such an important role, it is obviously important for them to be easily programmed. The procedure with the PRO-2006 was quite straightforward, you simply selected the channel, entered PROGRAM mode and typed in the frequency. You were also given the opportunity to program in a delay option. This caused the scanner to pause for two seconds after each transmission before resuming the scan. If you made a mistake during the process, there was a CLEAR key that let you start the entry again.

Besides the memory channels I've covered so far, there were ten temporary memories known as monitors. These were particularly useful as they could be used to hold frequencies found during search operations. These temporary memories could then be transferred to permanent memories at a later date.

Scanning

The PRO-2006 handles this area of its operation very competently and offers very few surprises. Scanning is enabled by a single button press and the strength of signal required to stop the scan is determined by the squelch control. One useful enhancement was the provision of a sound squelch that I mentioned earlier. This adds an extra level to the squelch control where the scan will only stop on a modulated carrier. This can be very useful for helping to avoid plain carriers and birdies.

Two other features directly associated with scanning are DELAY and LOCK-OUT. These are also channel specific, i.e. they have to be set independantly for each channel. The LOCK-OUT feature is simply a way of excluding any channel from the scan. The DELAY is very useful for pausing on a frequency between "overs". There was one very useful extra in the form of a lock-out review. Pressing this button caused all the locked-out channels to be displayed sequentially. You then had the option to unlock them if required. Besides being able to lock-out individual channels you could also turn banks of channels on or off. This was handy if, for example, you stored all the airband frequencies in one bank. You could then turn off all but that bank and so just scan the air band.

With 400 memory channels

Specification

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Modes	w.b.f.m., n.b.f.m. & a.m.	
Channels	400 in 10 groups of 40	
Sensitivity		
w.b. f.m.	3µV	25 - 520MHz
	3µV	760MHz - 1.1GHz
	10µV	1.1 - 1.3GHz
n.b.f.m.	25 - 520MHz	760MHz - 1.1GHz
	3µV	1.1 - 1.3GHz
a.m.	2µV	25 - 520MHz
	2µV	760MHz - 1.1GHz
	5µV	1.1 - 1.3GHz
IF Rejection	60dB	
Selectivity		
f.m. & a.m.	9kHz -6dB; 15kHz -50dB	
Wide f.m.	150kHz -6dB; 300kHz -50dB	
Scanning Rate	26 or 13ch./s	
Antenna	50Ω	
Audio power	1.3W nominal	
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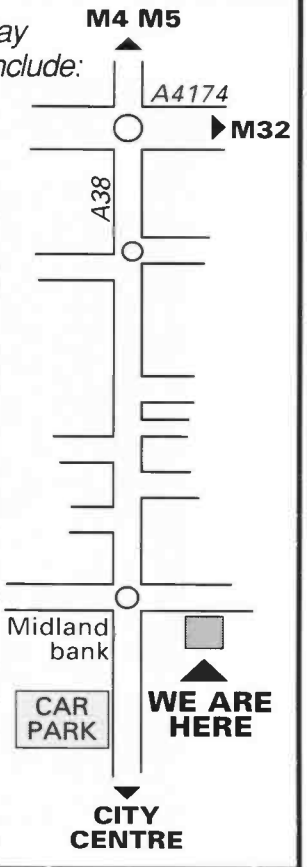

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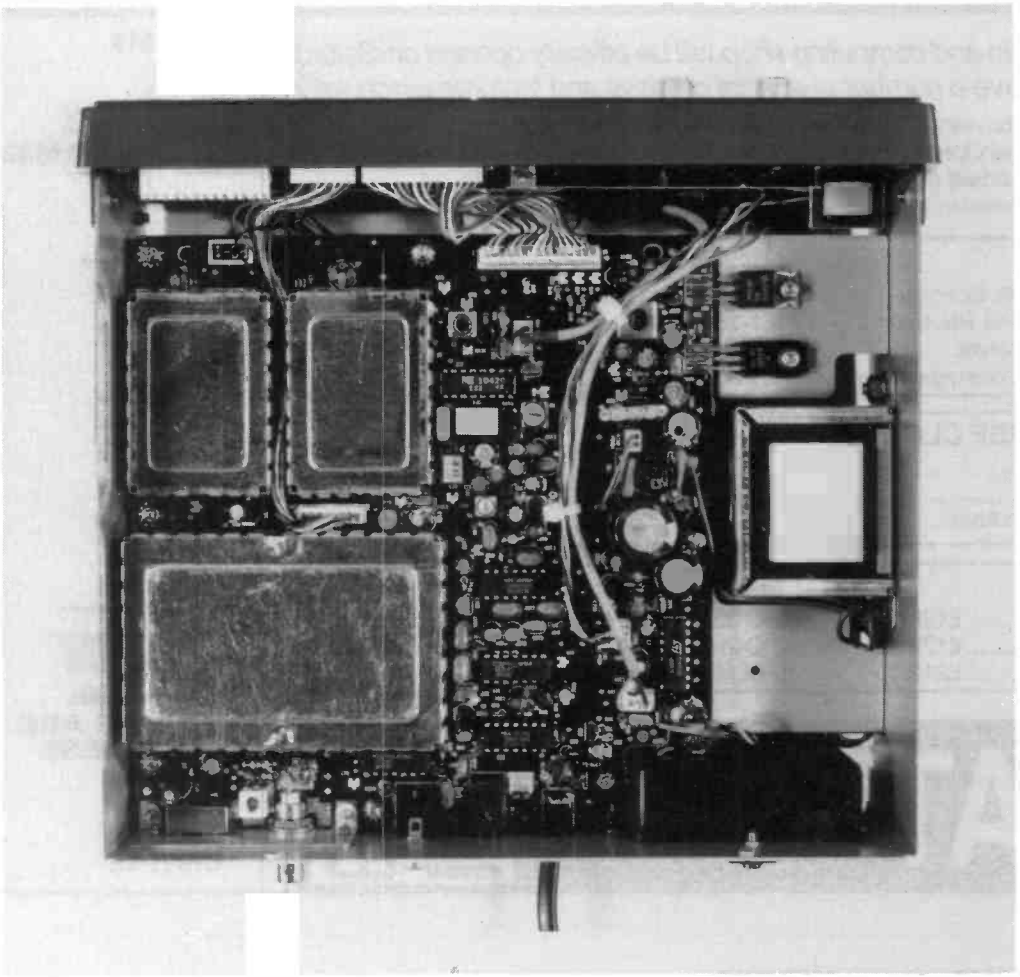


The high standard of workmanship inside the PRO-2006.

the scanning speed becomes important if the delay between scan cycles is to be kept reasonable. The PRO-2006 features two scanning speeds - 13 or 26 channels per second. This gives a total scan time of 15 seconds for all memories or 1.5 seconds for one bank which is pretty impressive.

Searching

One of the joys of scanning is finding new frequencies, so it's important that any scanner has adequate facilities for this. The most common system is to use a limit search. With this system you can set upper and lower frequency limits and the scanner will repeatedly search for activity within those limits. There was alsothe option to select one of three frequency steps for the search - 5, 12.5 or 50kHz steps. The direction of the search can also be reversed at the touch of a button, which is handy. It's during this operation that the MONITOR memories come into their own. These can be used to hold any interesting frequencies found during a search. To make searches even more convenient the PRO-2006 can store up to ten limit search ranges, these being stored against each memory bank.

There was one other search mode that I though was particularly useful. It was called DIRECT search and could be started from any memory channel. By using this mode you could search up or down from the memory frequency. The mode and frequency steps used were that of the original memory channel though these could be changed if required. This system gave great flexibility to the search options. As with the conventional limit search, any frequencies discovered with this system could be saved in the temporary monitor memories.

Performance

To give the PRO-2006 a fair review I tested it with several antenna systems. These included the supplied telescopic unit, Howes AA-4 and an SMC discone. I also took the opportunity to check the review model against the specification in the lab.

For the lab measurements I decided to stray from the signal to noise ratio criteria used by Tandy and use the more useful e.m.f./2 for 12dB SINAD measure. By using this system some degree of comparison can be made between different models. I must admit I was pleasantly surprised by the measured results on this receiver. The sensitivity was particularly good with a worst case of 0.5µV on a.m. and 0.3µV on n.b.f.m. The best sensitivity obtained was a creditable 0.2µV at 26MHz n.b.f.m. A particularly strong point with the sensitivity was that it was remarkably consistent from 25MHz right through to 520MHz.

Unfortunately test equipment for the upper frequency range was not available at the time of the review. However, the on-air tests showed good sensitivity at these higher frequencies.

The audio performance was also very good with an excellent w.b.f.m. distortion of 0.3% whilst n.b.f.m. and a.m. were 1.2% and 1.4% respectively.

Although lab results are important it's the on-air tests that really count. Here the PRO-2006 gave a very good performance with no real grumbles. The sound quality from the internal 77mm speaker was excellent for speech but music sounded extremely thin. I would strongly recommend the use of an external speaker for wide f.m. broadcast listening.

The scanning and searching modes performed exactly as expected with no oddities. I also thought that the fast, 26 ch/s, scanning rate was very effective.

Summary

The PRO-2006 was certainly a very smart and capable modern scanner. The facilities provided covered all the basic requirements with one or two useful extras. These facilities were also simple to use and comprehensive without being over complicated. This would make the PRO-2006 particularly attractive to the newcomer.

To sum-up I thought that the PRO-2006 was a good quality, no-nonsense scanner that should appeal to those who want a good work-horse.

The PRO-2006 costs £349.95 or less and can be obtained from all Tandy outlets. My particular thanks to **Link Electronics, 228 Lincoln Road, Peterborough PE1 2NE** for the loan of the review model. ■

scan: The term used to describe the type of operation where the receiver runs through frequencies that have been pre-programmed into the equipment memory channels by the user.

search: Often confused with scan, this is the other main feature on most receiviers or scanners. If you don't know the exact frequency that a particular service operates upon, but you have a rough idea, then use can be made of the search facility. The user programmes into the scanner the upper and lower frequency limits of the band to be searched and also the frequency step size that the receiver is to search with. The scanner then automatically searches over the set range and stops when a signal is detected.

Low Voltage Power

Having talked about accumulators in recent issues of SWM and PW, Ron Ham thought it was time to take a brief look at a few more uses and charging arrangements for these wet-cells.

Individual cells will only produce 2V, therefore to increase the voltage to 6 or 12V, as required for the lighting and ignition systems on motorcycles or cars. three or six of these are connected in series. (2V x 3 = 6V and 2V x 6 = 12V). These cells are fitted in one outer container to make a battery. When higher voltages of 24, 36 or 48V are needed for some aircraft, commercial vehicles and private lighting systems, it is usual to connect 2, 3 or 4 of the 12V batteries in series.

Although each cell has a 2V limit, the larger its physical size, the greater its capacity and longer its operational life. Another point to remember is that these cells produce direct current from identifiable negative (-) and positive (+) terminal and must be charged from a d.c. source. Early cars and motorcycles recharged their batteries direct from a fitted dynamo, but in recent years this has been replaced with an alternator. This feeds a rectifier to convert its a.c. output to the d.c. needed for charging.

Fig. 1: Ron attends the accumulators.

Portable Power

The high tension requirements, ranging between 200 and 400V for the radio receivers and transmitters fitted in aircraft and vehicles during WWII, were usually derived from rotary transformers driven from the on-board battery supply. By late 1945, many such sets were available on the surplus market and those among us who used them for portable work found it essential to have several car batteries available for immediate use, plus a stationary engine generator to recharge those that were rapidly drained by the high input current required by these power packs. You can see me at 17 years of age with an American army surplus petrol generator, attending to the accumulators at Worthing Radio Club's NFD station in 1947 in **Fig. 1**.

Private Plants

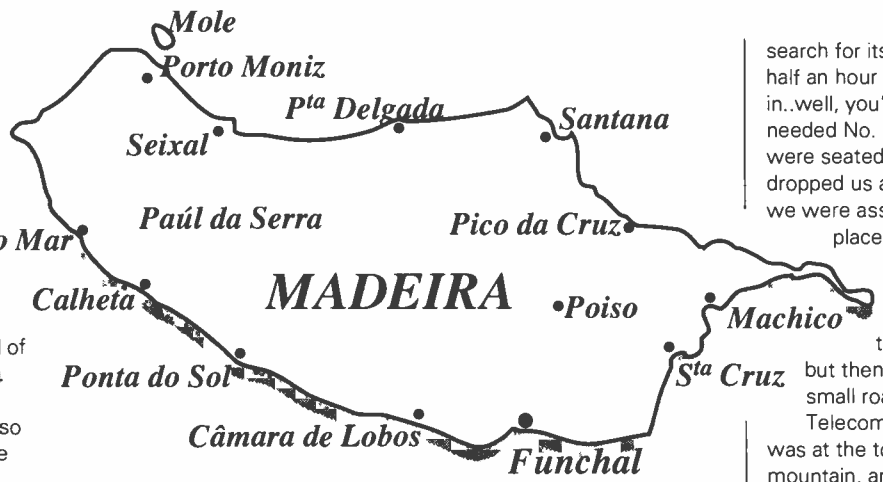
Large dynamos coupled to stationary engines, driven by oil and steam, were often used in the past to supply the low voltage electricity for the lighting in country houses where no public supply was available. Today, stationary engine enthusiasts often recreate distribution boards, with original components, to explain the work of these 'private plants' as seen in **Figs. 2 and 3**. These were displayed by outside exhibitors at the Amberley Chalk Pits Museum, Sussex, in October 1988 and May 1990 respectively. ■

Fig. 2: A beautifully restored distribution board, originally used to supply low-voltage lighting in country houses.

Fig. 3: The notice panel on this distribution board says it all! Another restored unit seen at Chalk Pits Museum.

Sunshine and Radio

Summer holidays seem so far away now, but many radio enthusiasts make use of their holidays to further their hobby. C.B. Searle G4LST recounts his experiences.



There were six of us, three licensees and our XYLs. In October 1989 we had had an enjoyable holiday together on a narrow boat on the canals in the Midlands, so it was not surprising to us when Les G5HD asked us if we would like to accompany them to the Island of Madeira for a two week break. We had taken a v.h.f./u.h.f. transceiver on the canal boat, so naturally it was decided to take radio with us to CT3, but this time it would have to be an h.f. rig.

The first step after booking with a tourist organisation, was to write to the Portuguese Authorities in Lisbon to obtain permission for the use of radio in Madeira. We had to send the cash to Lisbon and pick up the licence at the Office of Communications in Funchal, Madeira when we got there.

The third amateur, by the way, is more interested in construction work than in operating. He had decided not to apply for a reciprocal licence.

So far so good. Time went by rapidly and preparations were completed for the holiday side of the expedition. Les was to supply the radio, a TS-120V, and he prepared three simple dipoles that could be attached to the end of the length of coaxial cable for each of the 28, 21 and 14MHz bands. The rig, power supply and a battery box, with a rechargeable battery, plus the antennas and a power lead with large croc clips were carried in a ordinary shopping bag.

At the last minute, the tour company 'phoned saying that the flight (from Bristol Airport) had been changed from noon to 0800 hours. This was a blow, since we had to travel from North Devon and arrive by 0700 hours, necessitating leaving home at 0400 hours. However, we consoled ourselves by thinking of the extra four hours of holiday we would get.

It was fun and games at the security check in the airport. I had some tools in my pocket, and several UK coins in another, plus the house keys. "Too much metal," muttered the man with the search coil. I said "keys" and he passed me through. The bag with the radio gear in went through the X-ray, but they pounced on the bag that followed it, searched it, and were puzzled that they found nothing.

Everything else went like clockwork during the rest of the trip and we arrived in due course at the Hotel at Garajau, on the eastern outskirts of Funchal. This was not before noting the similarity between the driving of the mini-cab driver and that of the Yugoslav coach driver who nearly killed the two of us about three years ago. Overtaking, it seems is normal right up to a few yards before the next bend.

A mention of the hairpin bends seems appropriate at this point. The distance from the hotel to our favourite spot in the mountains is about 10km. As this spot is about 1300m a.s.l. and as the rocks are so precipitous over the bulk of the island, it follows that the road have to wind back on themselves in tight hairpin bends. Most roads seem to have a deep gully at the sides to cope with rainfall in the wet season, and while this channel generally has a 40° slope down from the road surface, some are vertical drops of about ten inches or so with no kerb to keep one out of them. This is very disconcerting to the passenger in the front seat, especially when the far side of the gully is just a low wall and then a near vertical drop of hundreds of metres!

After breakfast the next morning, the most important task was to locate the Office of Telecommunications, so as to pick up our licences. The address had been given to us as Pico da Cruz, and we found this on a map we had received from the Tour Operators. We marked this with a large asterisk, and we all took a bus into Funchal, the ladies going off to do some shopping.

Bus Rides

Les asked at the bus station which bus we should take, showing the map with the asterisk. "No. 2," we were told. After finding the place where this would come in we had an hour to wait. Eventually it arrived and we boarded. Again showing the map so we could take our tickets we were met with shaking of heads and waving of hands. This was not the right bus, we need No. 1. Again a search for its stop and a further half an hour wait...when it came in..well, you've guessed it, we needed No. 12. Eventually we were seated and the bus dropped us at the point which we were assured was the best place to alight, at the Lido. Well, the map didn't show any road running from there to the asterisk, but then maybe there was a small road not marked. The Telecommunications Office was at the top of a small mountain, and we could see no track going up. Les has to walk with a stick and normally can't go far without transport, but we walked further to the west where a road was shown going uo the hill approximately in the right direction. We struggled on with frequent stops as it was very steep and after an hour or so got somewhere near the place. Just then a bus came by, going our way, and it was a No. 12!

There was still a stiff climb, which we surmounted, but there didn't seem to be an entrance into the place, which was still a hundred feet or so higher than where we had reached. We attempted to ask at an army establishment there, again brandishing the map, but no, they didn't know of it. It transpired that the entrance was right next door to their camp but it looked like a building site. Leaving Les to rest, I went uphill to a filling station we could see to the north, and they directed me to a building with 106.5 painted on its wall. "Ask in there," they said, in passable English. Another 100 yards and I reached it. I was greeted inside by Hern CT3BX and was it a relief to speak to someone fluent in one's own native tongue! Hern was most helpful (as the Square Bashers had already discovered, see their report in *RadCom* Sept '89). He said that the staff in the Licence

Operating from the favourite spot at Poiso high above the sea. The dipole antenna is strung between the pole and a tree. G5HD's XYL is standing by the car.

Office would be at lunch and to come back at three o'clock, which we did after returning (by bus on a more direct route) to Funchal to explain to the XYLs why we weren't back at eleven o'clock. Surprisingly, they accepted our explanation. After that we returned to the Telecommunications Office, and all they did with our documents was to look at them and write something down on a pad.

Hire Cars

A couple of days later, though, there were two authorisation papers left at the hotel desk.

We arranged to hire two small cars, but decided not to take delivery of the vehicles until Saturday. So on Friday we worked with the radio, stringing the antenna from the roof of the hotel (with permission) to the pipe of a built-in sprinkler down in the grounds.

The XYLs in the meantime spent the day in the gardens spread out on sun-beds. Upstairs we had a useful number of contacts, but of course this was not intended to be a DXpedition, just a holiday. We logged 6W, HH, TU, LY, PY and three or four G stations. We were running only 10W, so a lot of stations we heard just couldn't hear us. In fact, the band was alive from all over the Atlantic borders and further afield and as the day wore on the direction of reception gradually changed.

Once the cars arrived we spent the time some days touring and a few days operating from up in the mountains. Our favourite spot was near a little place called Poiso, and was about a mile above sea-level. Take-off was excellent to G-land, there being no hills in the way. We found a long pole by the roadside, part of the rough fencing placed on some bends to stop vehicles pulling off the road. This we upended and lashed to a small pine tree after tying one end of the dipole to the upper end. We had a broomstick with us and supported the other end of the string with this and lashed it to a bush. This gave us a dipole about 3m above ground.

The first Sunday we set off to the hills, to a good site suggested to us by Hern. He said to go up to Portela, then we should see a TV tower to the east. By travelling on a dirt road we could reach the tower and attach our antenna to part of the structure thereby giving a good high point at one end, with a tree at the other. So far so good, but no sign of the dirt road. We remembered passing a road junction about a mile before, so Les and I retraced our steps and confirmed that there was a road there, going uphill in the general direction of the tower. We rejoined the other and then all went back to pick up the dirt road. We discovered there were two roads that met at that junction, but we decided that the first one looked as if it went the right way. It was tarmac at first, but then it deteriorate and, in fact, it looked as if it was being upgraded as we reached a mass of large jagged rock pieces, all about 100mm across, all roughly spherical and little tyres and wheels simply couldn't cope. It would have needed a tractor or perhaps a land Rover to make any progress, as it was on a gradient. We asked a bystander and gathered that the other road went to the tower. So we returned to the junction and took the other way. This, however, turned out to be wrong, and after a lengthy run, followed by a long pioneering walk, lead us to abandon all idea of reaching the lunch/operating site. So it was back to Portela and a spot nearby where we could pull off the road. That Sunday coincided with a contest and we gave a few points to contestants. Stations worked, apart from G, included OH, EC, TM, EA, LY, OQ, 4N, LA, SP, OK, YU, WB, KA, Y38, EC, AD, FV, PA, DK, NW, FF, SK, YT, L25, GM and C39. Subsequent trips led us to the Poiso site, which we stuck to thereafter.

Scribbling Paper

Every day the hotel management - or was it the tour operators? - slid a number of foolscap size papers of excellent quality under the room door advertising the entertainments for the day at the hotel, and the plain backs of these we found excellent as scribbling paper to take down the day's contacts in rough prior to entering in the log book when we returned to base.

We had four days of /P operating, spread through the two weeks, plus a day from the hotel at the start and again on the last day before departure, after the cars had been returned. Surprisingly, there were a number of contacts with G stations from the hotel, despite the range of mountains in between. The only pile-up we experienced was when Les went on c.w.

Last Day

Stations worked on this the last day of operating, were LU, G0EHQ (/M in a cement mixer!), ZS, N2, W3, HB, W4, N4, XM plus a number of other G stations. Many other stations were heard but we were not successful in working them. The total score for the whole period was more than 100 stations.

The map supplied to us had 'motor roads' marked in red ink, plus some other roads coloured pink but with no description. At first we dodged these as the red roads were not very good in general, so we assumed that the pink roads were terrible. On one day in the early part of the trip, we ventured on a pink road, as it cut off a big corner, and were amazed to discover that it had a superb surface. Thereafter we preferred pink roads, and in fact joked about the red roads, we even decided we could tell the colour of the road by its surface. The route around the island to the west and then north, we were told, had over 1000 hairpin bends in just 35 miles of distance (as the crow flies). The tour representative on our first day had mentioned an available trip round this part of the island and said it was a terrible road surface. When we went up to Porto Moniz in the north-west corner via the accused road, we found to our surprise that it was excellent, and as we returned via Paul da Serra, the pink road we had to use rapidly deteriorated and completely shattered our theory about coloured roads! The last eight miles down to Canhas was over large cobbles, and gave us a lengthy course of vibro-massage.

Overall, it was a memorable holiday, the hotel very comfortable and the food was excellent. ■

propagation

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

Ron Livesey (Edinburgh), using a refractor telescope with a solar projection screen, identified 4 active areas on the sun's disc on October 7, 9, 16 and 23; 5 on the 12th, 6 on days 10, 13 and 19 and 7 on the 14th. In Bristol, **Ted Waring** counted 20 and 24 sunspots on November 3 and 14 respectively. "The mean solar flux for October 1990 was 181 units with a high of 232 on the 15th and a low of 143 on the 31st," wrote **Neil Clarke GOCAS** (Ferrybridge). He enclosed his computer print-out, **Fig. 1**, showing the variations throughout the month.

It is almost certain that the numerous sunspots observed and drawn by **Patrick Moore** (Selsey) with his solar projection apparatus at midday on October 13, **Fig. 2**, were responsible for the high flux level on Neil's graph. While checking the 28MHz band, **Ern Warwick** (Plymouth) found some signals "slightly echoey" and the "band dropping out" on the 29th and echos on the beacon signals from WA4DJS, OH2TEN and NX20 on November 5, 7, and 13 respectively.

Cmdr. Henry Hatfield (Sevenoaks), using his spectrohelioscope, located two sunspot groups, ten filaments and seven small quiescent prominences on November 3; 5gps, 7fls and 8qps on the 6th; 2gps on the 23rd and 25th and 8fls and 7qps on the 30th. Cloud prevented Henry counting the filaments and quiescent prominences on the 23rd and 25th.

No doubt the groups of sunspots seen by Patrick Moore crossing the sun's disc between the 15th and 25th, **Fig. 3**, produced the high radio noise level recorded by Henry Hatfield on 136MHz on the 17th, 19th, 20th and 23rd. They indirectly caused the echos on the beacon signals from Australia (VK2RSY) on the 23rd, Italy (IY4M) on the 15th and 20th and North America (WA4DJS) on the 21st and 24th. Henry also recorded individual bursts of solar noise on 136MHz on the 24th and on 1297MHz on the 16th and 24th.

Auroral

Ron Livesey is the Auroral Coordinator for the British Astronomical Association. He received reports from observers ranging from Worcester, Isle of Man, through Scotland, to the Ocean Weather Ship *Cumulus* in the mid-Atlantic. They described auroral activity as 'glow' overnight on October 9, 11, 12, 14, 16 and 19; 'homogeneous arc or band' on the 10th and 29th; 'Rayed arc or band' on the 23rd; 'ray bundles' on the 9th and 20th and 'active, flaming or flickering' on the 9th, 20th, 29th and 31st. He also received reports that tone-A radio signals were heard by Tony Hopwood (Worcester) and Doug Smillie (Wishaw) on days 9, 10, 11, 20 and 23.

Magnetic

Neil Clarke described the geomagnetic field as, "mainly quiet to unsettled with the most active period on the 10th, 11th and 12th". His graph for October, **Fig. 4**, shows the 'Ap' index peaking at 44 on the 10th. Magnetometer operators Garry Hawkins (Bristol), Tony Hopwood, Karl Lewis (Saltash), Ron Livesey, David Pettitt (Carlisle) and Doug Smillie, between them found that the field was "most disturbed" on days 9, 10, 11, 14, 20, 23, 29 and 31.

Propagation Beacons

As usual my thanks are due to **Chris van den Berg** (The Hague), Henry Hatfield, John Levesley, **Ted Owen** (Maldon), **Fred Pallant G3RNM** (Storrington), Ted Waring and Ern Warwick for their 28MHz beacon logs covering the period October 26 to November 25. This valuable information enabled me to compile the chart in, **Fig. 5** and provide posterity with a record of the signals paths that were open on those days.

Fred Pallant says that the four South American beacons were often the first audible between 0800 and 0930 during the period. Ted Waring thinks he heard a new beacon, KF9N from Johnson City, on November 17. It seems that PT7AAC change call sign to PT7BCN as from the letter 'B' indicated on **Fig. 5**

Band II

Just before the high pressure of 30.4in (1029mb) began to fall on November 6, I tuned through Band II with my ex-military R216 v.h.f. communications receiver, fed by a chimney mounted dipole and counted 15 assorted continentals through the band in addition to BBC Radios Bristol, CWR and WM. I also heard the idents of Crown FM, London Greek Radio, Radio Maidenhead and RFM.

On the 7th and 8th, **Simon Hamer** (New Radnor) received stations in a north-eastern direction from Oenmark (DR1) from Arhus and Rangstrup, (DR2) from Alborg, Holsterbro and Rangstrup and (DR3) from Naestved and Rangstrup; Germany (AFN2, BFBS, DLF, Jugendradio, NDR1, 2 & 3, Radio Hamburg and WDR2&4), Norway (NRK1) from Skien and (NRK2) from Stord and Sweden's Radios Goteborg and Halland and SVR-P3. **George Garden** (Edinburgh) reports that on the 26th the, "clear blue skies and low cloud above the hills and the atmospheric pressure rising to 30.2in" encouraged him to take his receiver up on Cairn O' Mounth for a spot of DXing. He was rewarded with "very strong noise free stereo" signals from BBC Radio Newcastle and ILR Radio Borders and Radio Tay from Perth. These were so strong that ILR North Sound Radio from Aberdeen on a nearby frequency could not be heard.

A copy of my barograph recordings for the period October 26 to November 25 can be seen in 'OX Television' elsewhere in this issue.

Info

Francis Hearne (Bristol) tells me that Severn Sound now broadcasts only on 102.4 and 103.0MHz and there is a new station, Three Counties Radio on 774kHz. Francis learnt of this through the radio and television listings in a local paper and then, during the weekend of November 3 and 4, tuned the bands to hear it all for himself.

While driving to Laurencekirk on November 23, George Garden received the test transmissions from Central FM, around 96.7MHz and heard the announcer say that it would relay some of the programmes from Radio Borders. George added that "the small ILR transmission area near Stirling is now managed by Radio Forth in Edinburgh" and "BBC Radio 4 is now being transmitted from the old Meldrum transmitter" and can be received in Laurencekirk in noise-free stereo using a 5-element antenna and amplifier.

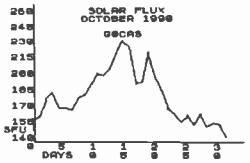


Fig. 1.

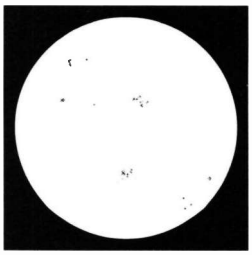


Fig. 2.


Fig. 3.

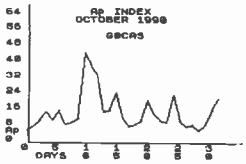


Fig. 4.

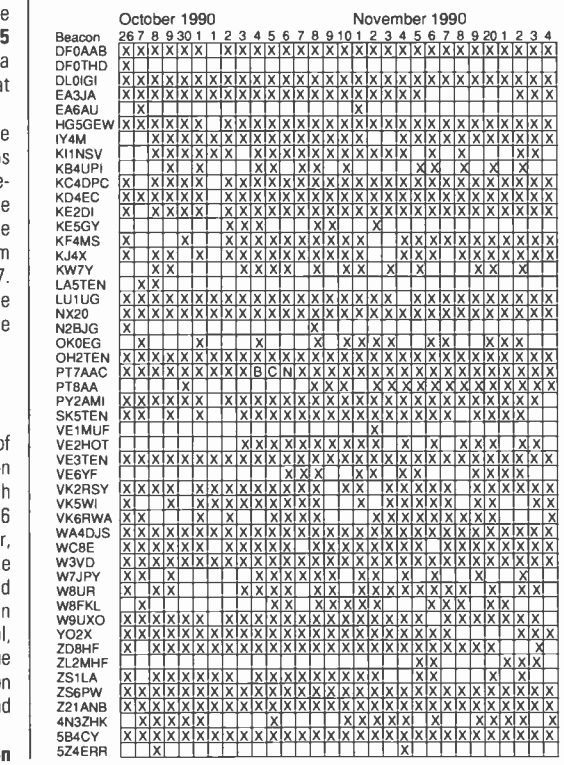


Fig. 5.

Abbreviations

Band II	87-108MHz
DXing	'long distance' listening
fls	filaments
gps	groups
in	inch
kHz	kilohertz
mb	millibar
MHz	megahertz
qps	quiescent prominences
v.h.f.	very high frequency

Notes

Sunspot: A disturbance of the solar surface that appeared as a relatively dark centre (*umbra*), surrounded by a less dark area (*penumbra*). Spots generally occur in groups and are relatively short-lived. With few exceptions, they are found in regions between 30°N and S latitude. Their frequency shows a marked period of about eleven years (*sunspot cycle*), they have intense magnetic fields and are sometimes associated with magnetic storms on the earth.

REMEMBER, NEVER LOOK AT THE SUN DIRECTLY AS THIS CAN CAUSE BLINDNESS, ALWAYS USE SPECIALIST EQUIPMENT.

ssb utility listening

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

This month we take a look at how h.f. is used during NASA's Shuttle launches. In a way this follows on naturally from our first article which concerned the frequencies used by the 'Desert Shield' forces in the Gulf because, as I write, one Shuttle has just deployed a low-orbit, spy satellite to provide pictures of the area.

NASA are still trying to catch up on the backlog of payloads that are sheduled to be put in orbit after Shuttle flights were suspended after the *Challenger* disaster. What is interesting about these launches is that just prior to and during the launch phases and at re-entry, h.f. communication is used and can be heard in the UK.

The h.f. communications fall into three broad categories: Transmissions between launch support services, re-broadcasts of Shuttle crew/ground controller conversations by certain amateur stations and direct transmissions from some satellites. This month we will concentrate on the Shuttle back-up services and we will examine the amateur involvement at a later date.

Listening to the count-down for a Shuttle launch is no longer the gripping stuff it used to be. There can be few people who have not at one time or another heard such events in news bulletins on television and so whatever excitement and tension they may once have generated has now been dulled by familiarisation.

However, hearing the live transmissions not only from the count-down announcer but also all the chit-chat between controllers, support ships, aircraft and tracking centres adds an entirely different dimension to the event. The casual short wave listener probably does not realise that the communications between all the different people and organisations involved in a launch are often *via* h.f. transmissions. Eavesdropping on these communications can provide a fascinating insight into what goes on behind the scenes and generate an excitement that can rarely be achieved whilst listening to the carefully vetted 'official' broadcasts.

Shuttle Flights

The data here has been extracted from *Spacenews* which originates from KD2BD in Wall Township, New Jersey, USA. Some of these frequencies should yield communications during launch and re-entry phases and as a general rule those between 5 and 15MHz can be heard in the UK at some stage during the day or night (do not forget the time difference as well). The services using those frequencies shown in **Table 1** include NASA, the US coast-guard, air force and navy. Do not be surpised to hear quite a few lady operators even on the ships.

No explanation of the abbreviations was supplied with the list but I assume that the following are true: ETR means External Tank Recovery, SRB is solid rocket booster and OCC is Operations Co-ordination and Control. SAR is known to be Search and Rescue (the frequency shown is in fact a world-wide SAR allocation and in the UK is used extensively by Navy helicopters).

Antennas?

Changing the topic, I have already been asked what is the best antenna to use for covering the entire m.f./h.f. spectrum. The simple answer is probably a steerable log periodic, but unless you own several acres of real estate and a lot of money you will probably have to settle for something smaller and cheaper. Amateurs are lucky in a way because most of their bands are harmonically related and so it is possible to design antennas which provide good multi-band performance (as opposed to broadband). Indeed hundreds of designs have been published and some of them can be adapted for general purpose listening. I use a full size G5RV which is fairly long but unobtrusive. They are cheap to buy or construct and the performance is remarkably good for such a simple device. However, I strongly urge the use of an antenna tuner. I also use a 1:1 balun where the ribbon feeder is connected to the 50Ω coaxial feeder. In the future we will take a more detailed look at antennas but if you want to know more in the meantime then *Out of Thin Air* and *Wires and Waves* from the *SWM* Book Service show dozens of practical designs and they are inexpensive.

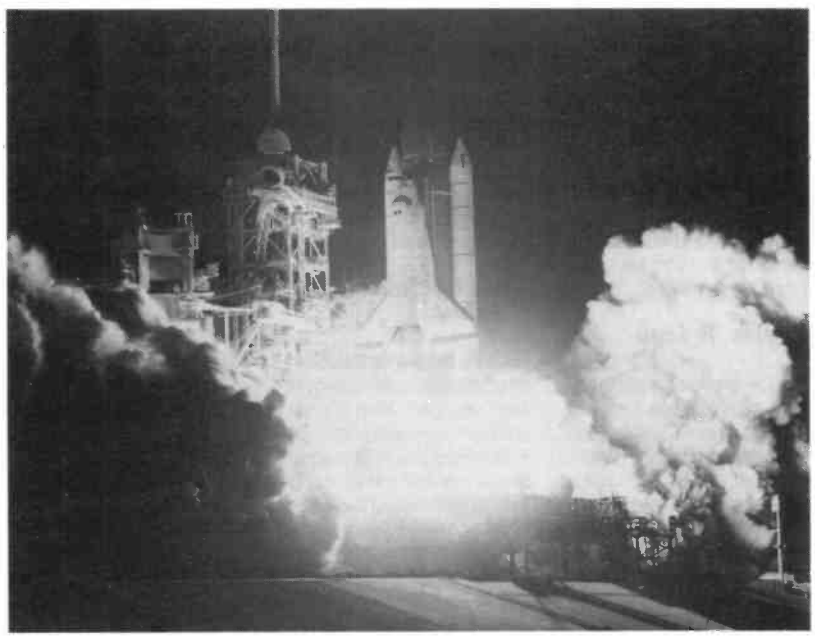
Any suggestions, frequencies and so forth should be sent to me at the usual address. Please note that correspondence should be strictly concerned with the column and you should avoid asking for advice or information that requires a personal reply - I am not a full-time writer who can deal with such mail as part of my working day.

The crew of *Atlantis* on their way to lift-off from Launch Pad 39A. Mission Commander Richard Covey (right) and Pilot Frank Culbertson Jr. lead Mission Specialists Robert Springer (left), Carl Meade and Charles "Sam" Gemar out of the Operations and Checkout Building.

Table 1.

2.405	Data Buoys	2.622	SRB Recovery (Primary)
2.664	Back-up Mission Audio	2.678	ETR Range Control
2.716	Navy harbour Cntl-Port Canaveral	2.764	SRB Recovery Channel
3.024	Coast Guard SAR (Primary)	3.187	SRB Recovery Ships Channel
4.376	Primary Recovery Zone SAR	4.510	SRB Recovery Ships Channel
4.856	Cape Radio/Leader	4.992	Cape Radio/Coast Guard Ships
5.180	NASA Tracking Ships	5.187	NASA Tracking Ships
5.190	ETR Primary Night Channel	5.350	Launch Support Aircraft
5.680	Launch Support Ships	5.810	ETR Secondary Night Channel
6.720	SAR Primary Atlantic	6.896	Cape Radio
6.837	Cape Radio	7.412	SAR Communications with Bahamas
7.461	Cape Radio/Launch Support A/C	7.525	NASA Ground Tracking Net
7.676	Launch Support Aircraft	7.765	SRB Recovery Ships
7.919	Data Channel	7.985	Data Channel
9.022	Launch Support Aircraft	9.043	Launch Support Aircraft
9.132	Launch Support Aircraft	10.305	Space Missile Tactical Net
10.310	Malabar-to-Ascension Is-MUX	10.780	ETR Primary Day Channel
11.104	Launch Support Ships	11.252	Launch Support Ships
11.407	SRB Recovery Ships	11.414	Cape Radio
11.548	Cape Radio	11.621	SRB Recovery Ships
13.227	Launch Support Aircraft	13.237	Data Channel
13.495	Data Channel	13.600	Malabar-to-Ascension Is-MUX
13.878	Launch Support Aircraft	14.937	Ascension Is-to-Malabar-MUX
18.009	Launch Support Ships	19.303	Launch Support Ships
19.640	Cape Radio	19.966	Ascension Is-to-Malabar-MUX
20.186	Launch Tracking Net	20.192	Malabar-to-Ascension Is-MUX
20.198	OCC Shuttle Mission Audio	20.390	ETR-Secondary Day Channel
22.755	Ascension Is-to-Malabar-MUX	23.413	Cape Radio

h.f. used at Kennedy Space Centre: 2.182 & 3.023 MHz



The Space Shuttle *Atlantis* soars through the night atop a pillar of flame and cloud. This is Space Shuttle Mission STS-38 lifting off from Kennedy Space Center on 15 November 1990 with a five-man crew on a classified mission for the US Department of Defense.

bandscan

America

Gerry L. Dexter
SWM Editorial Office, Enefco House, The Quay, Poole, Dorset BH15 1PP.

Goodbye KUSW! Rock and Roll, top 40, contemporary classics - whatever you choose to call the stuff, it was not a ticket to success for KUSW in Salt Lake City, Utah. The commercial station, owned by Carlson Communications, was sold last fall to California-based Trinity Broadcasting. Transfer of the licence was still awaiting FCC approval as I write this, but the KUSW call may well be gone from the short waves by the time you read this.

Trinity is a religious broadcasting organisation already active with programmes on cable TV and local radio. They also own several low-power TV stations. The schedules of the short wave stations are to be expanded to 24 hours of religious programming daily. I understand that programmes will be fed to Utah via satellite from Trinity's California HQ. The loss of KUSW is certainly a blow to those who hope to see the development of commercial short wave broadcasting in the United States. It's too bad that the only format that seems to work is commercial religion.

More Short Wave from Florida?

Mention was made last time of Radio Miami International and its plans for a Miami-based short wave station that would specialise in covering the Caribbean. The original application called for a power of 10kW. However, RMI later learned that there was little hope of getting a licence for a 10kW short wave transmitter,as the FCC requires a minimum of 50kW for short wave stations. There seems little chance that the FCC would grant a waiver to this rule, so extra funding was obtained for the increased cost of a 50kW transmitter and the application amended. Radio Miami International now believes its chances are very good and hopes to have something to celebrate sometime early this year.

Pirates Go Legit

Two former pirate station operators - both of whom have had run-ins with the FCC - have taken a different approach to getting on the air and, as a result, are now reaching a far larger audience than they did as pirates. Both are now broadcasting programmes over short wave station WWCR, Nashville, Tennessee. Radio Newyork International was the first to use WWCR and is certainly the best-known, even though its life as a pirate was very brief. This is the station that broadcast from the motor vessel *Sarah* off the coast of New York a couple of years ago, making something of a media splash in the process, what with boardings by the Coast Guard, sessions with lawyers and courts, etc. Radio Newyork International is on the air via WWCR on Mondays from 0100-0200UTC. Reception reports are QSLed and should be sent to PO Box 270, Flushing, NY 11352.

Some weeks later, WWCR began carrying Radio Free New York International, run by people who formerly operated one or two other pirate stations. This one is on Saturday nights (Sundays UTC), although the time seems not to have settles down yet. It was most recently reported at 0400. The address for this one is given as 1748 70th St., Brooklyn, NY 11204. WWCR uses 7.520MHz during the time both these broadcasts are on the air.

New from Chile...

Two new stations have come on air from Chile in recent months. The first is Radio Esperanza at Temuco, listed for 6.090MHz, but actually heard a bit lower - around 6.088-6.089MHz and being most often received in the 0700-0900 period, especially weekends. The address is Casilla 830, Temuco. The other station is Radio Triunfal Evangelica, a religious broadcaster operating from Santiago, using 5.825MHz, although so far not on a daily basis (not on Thursdays or Sundays). The schedule runs from 2200-0200, variable. Initially, the station used only 50W, which probably explains why it has not yet been reported in North America. But, according to reports, the power should be increase to 500W some months down the line, so it might well be hearable even in Europe.

...and the Dominican Republic

Radio Barahona, mentioned last time, has been heard again by at least one s.w.l. here. But the station's appearance on 4.390MHz seems to have again been a very brief one as checks by other listeners just a few days later found the frequency empty. This station may well be still in the testing stage or perhaps used only for special broadcasts. So, short wave broadcast signals from the Dominican Republic continue to be few and far between. Radio Clarin continues to be off the air and Radio Santiago (9.778MHz) operates only irregularly. The best chance of logging a Dominican Republic station is Radio Amanacer on 6.025MHz, scheduled with 1kW and running to 0300UTC.

Clandestine Curiosity

The anti-Colombian government station, Radio Latria Libre, operated by the ELN guerrilla group, continues its daily broadcasts from around 0030-0115, variable, along with a newly-added second airing at 1130, around 6.316MHz, but as low as 6.285MHz. Another station has turned up here recently, announcing as Del Pueblo Responde. It seems out to jam the Patria Libre broadcasts and perhaps aims to get a counter opinion on the air as well. Either way, following these two as they chase through the frequency region makes for some intriguing listening. Another note from Colombia is the reactivations of Radio Santa Fe, Bogota on 4.965MHz, one of the old-line Colombian short wave stations.

Ecuador - New & Old

A new short wave station on the air from the small town of Coca is Radio Cumando, using the call HCJQ7. It reportedly operates with 3kW on 3.332, though officially assigned 3.350 and runs between 1100-0300. We've not seen any reports of this one being logged in North America yet.

Venerable HCJB is now supplying a signal on what has to be one of the highest short wave frequencies currently in use for that purposes 25.950MHz. This is used for s.s.b. transmissions to Europe between 0030-0700. Regular listeners to this station's popular *DX Party Line* programme will have already 'met' the show's new host - Richard McVicar. *DX Party Line* is now heard only on Saturdays, though it runs to nearly 45 minutes instead of half-an-hour. It's on at 0737, 1007, 1907, 0037, 0237 and 0507UTC.

Still Waiting for High Adventure

High Adventure Ministries, which owns and operates KVOH short wave from California and the Voice of Hope in southern Lebanon had a set-back to its schedule for putting KHBN on the air from Guam. If the latest target date - January 1 - was met then we should have logged this newest religious broadcaster by now. We'd say, though, that the odds are even that it'll be spring or even later before KHBN gets going. Keep an ear on 9.830 and 9.840MHz, frequencies that KHBN is supposed to use. Programmes on this 100kW stations will be in Chinese initially, with other Asian languages to be added later.

VoA: Dance of the Transmitters

The shut-down of the VoA Monrovia relay due to the Liberian civil war, plus the extra transmitter time being devoted to broadcasts to the Gulf region has stretched VoA's facilities. To compensate, they are using some of the Radio Free Europe/ Radio Liberty facility at Gloria, Portugal. The most recent information I have shows this in use at 0300-0330 on 6.095, 15.160. 15.225, 17.810 and 17.865MHz. VoA's Greenville transmitters were recently doing some testing down at 8MHz. Another VoA site, in the Philippines, was the target of a guerilla bomb last September but there were no injuries and no interruption to operations.

Cuban Count-down

Those who combine short wave listening with a strong interest in international events may want to spend more time monitoring Radio Havana Cuba. While RHC celebrates its 30th anniversary on the air, more and more experts see its days as an official spokesman for the Castro government as numbered, now that Soviet aid has been cut-back and the island's economy continues to nose-dive. Radio Havana Cuba currently broadcasts English to Europe at 1900-2100 on 11.800 and 17.860MHz and 2200-2300 on 11.930MHz.

Good Prop Continues

Although the winter listening season is in full swing, s.w.l.s in North America continue to experience very good propagation conditions on the highest broadcast bands, at least most of the time. The high frequencies, even now, are holding up further into the evening hours than is the case when sunspot numbers are lower. Indonesian DX specialists report a good 'first season' last fall and look for another in the spring. Reception from Africa has often reached a quality that can only be described as spectacular in the late afternoon, local time.

Abbreviations

DX	'long distance'
FCC	Federal Communications Commission
kW	kilowatt
MHz	megahertz
NY	New York
PA	Pennsilvania
QSL	acknowledgement of contact
s.s.b.	single sideband
s.w.l.	short wave listener
TV	TeleVision
UTC	Universal Co-ordinated Time (GMT)
VoA	Voice of America
W	watts

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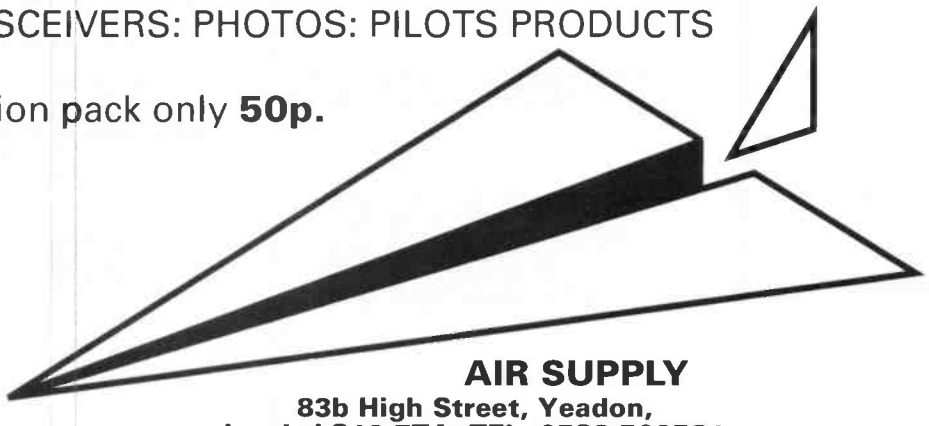

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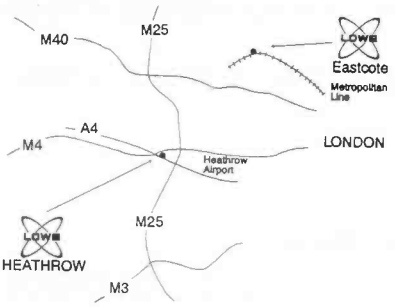

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satellite tv news

**Roger Bunney, 33 Cherville Street,
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Satellite television is now accepted into the domestic environment as yet another means of receiving home entertainment. Most readers will, I'm sure, be familiar with the white Amstrad dishes that have invaded many a street and building in the locality. As with short/medium wave radio (and in the 1960s with television), an active group of DXers has grown up to further exploit the distant reception of domestic transmitters operating in these bands. In the last few years, satellite television has established itself in the UK and mass production technology - mainly from the Far East - has brought down the price of microwave equipment to within the grasp of most folk. The advent of second generation 'higher tech' satellite receivers has meant that the earlier versions can be purchased relatively cheaply, either new from dealers as 'stock clear-outs' or as 'trade-in', second-hand gear.

It is, indeed, possible to receive many, many transmissions from geostationary satellites across the Clarke Belt on simple equipment and I intend to explain how to do just that. This column will cover those satellites transmitting fast-scan TV and **not** those dedicated to the amateur radio service. I will be pleased, of course, to receive **your** letters that relate to **your** equipment and experiences, but please enclose an s.a.e. if you expect a reply. My own time is limited and therefore I cannot undertake to resolve equipment faults, designs or modifications, time just will not allow it! Circuits are, of course, welcome from readers (though not of 'pirate decoders'!) provided that they are proven to work.

Personally Speaking

On a personal note, I have been TVDXing since 1962, previous to that a successful short wave DXer and have been active in the satellite field for the last 3-4 years. I was one of several TVDXers to construct equipment in 1975 to receive the Indian SITE (ATS-6) satellite transmissions at 860MHz (u.h.f.!). I've written on TVDX since the early 1970s and readers may be familiar with my TVDXing book published by Bernard Babani (publishing) Ltd. I'm not employed in satellite engineering or installation, so don't worry, this column will be essentially simple and straightforward each month.

Since we will be using small dishes, operation at C Band (3.7-4.2GHz) will not be covered in this column, other than general comments from any reader active in this field should they write in. C Band equipment generally calls for a dish around 2m diameter and above. Clearly this will not apply to 99% of readers. DBS (Direct Broadcasting by Satellite) at 11.7-12.5GHz employs high-powered birds, few are currently operational and will not - at this stage - concern us further. The satellite bands that we are covering will be the Ku band (10.9-11.7GHz) and Telecom (12.5-12.7GHz).

Equipment for the Ku band is commonly available. This is the band in which Astra 1A operates providing Sky TV (amongst other) services. It is not a designated TV broadcasting band but one intended for fixed telecommunication use. Television transmissions are used extensively in this band, intended for cable head-end reception, news feeds amongst broadcasters and industrial conferencing. With improvements in receiving technology, it is now possible to receive good quality video on dishes approaching 1m in diameter - Astra services can be worked down to 600mm. The Telecom band at 12.5-12.7GHz is used by several birds, primarily the French at this time. Again quality reception is possible at 1m diameter.

There are many books covering satellite television that have appeared in recent years, one book that I do thoroughly recommended is *Satellite Television Installation Guide* 2nd edition by John Breeds (ISBN 0-948251-99-9) covering all you need to know about installing a satellite system within Western Europe, the basic theory and practice. It is available, of course, from the *SWM* Book Service, see page 65.

Orbital Slot News

Yugoslavia should be up and running with a satellite TV service during 1991 called MP-RTVBG-SAT with programme material sourced from Radio Television Belgrade. At this time, no bird has been named as to transmission source, but Eutelsat II F1 must be favourite at 13°E. Whilst Turkey has indicated her satellite TV service should be operational by early 1993, uncertainty prevails in government circles as to selecting the country to supply the hardware, wishing to retain political grace and favour with the USA, UK and France. TURKSAT - once it is operational - will carry up to 16 Ku band transponders for both TV and telecommunications use - and with military facilities also carried.

Further to the south, Israel plans its own home constructed AMOS satellite for TV and general telecommunications use within the Ku band for launch via Arianspace rocket early 1993. The AMOS series will carry both spot beams and pan-European beam capability, Israel hopes to offer the craft on the open market, signals levels are such that dishes down to 800mm diameter in spot beam footprints can be used. In the Middle East theme, I have heard that 'Middle East broadcasting' is rumoured to start in February 1991 at 11.55GHz over Eutelsat II F1 13°E. Egypt and Bahrain are forming a consortium to provide a programme service over Arabsat 'shortly'.

Pakistan has recently joined the satellite club though with a very small offering - BADAR 1 is a 5kg craft that is in an inclined orbit circulating the globe every 95 minutes, the satellite was launched by a Chinese Long March rocket. Ka band radio is planned over a US planned satellite AFRISTAR in geostationary orbit at 12°W - when launched the craft will footprint both Africa and the Middle East with spot beams it's planned to start in 1993.

Radio from satellite prompts a mention of the Japanese radio project GIGA that has commenced digital sound transmissions from orbit over the BS-3a bird, though listeners still need a small dish to receive the signals that provide quality equal to compact disc. PanAmSat is planning an expansion of its satellite programme to encompass a second bird over the Pacific to provide trans-ocean communications between Asia, the Pacific Islands and the west USA coast. This follows its success with the PAS-1 bird at 45°W over the Atlantic.

Trouble too is brewing in the Pacific with Tonga who is claiming the right to provide satellite facilities via its claimed right to orbital slots, thus frustrating the Intelsat monopoly, the latter are lobbying the ITU to change the rules at a forthcoming conference to prevent small states such as Tonga from claiming satellite slots.

With German unification there is an enthusiasm to gain nationwide satellite coverage quickly and the policy for D2MAC has lost momentum, Germany opting for carriage of its satellite channels over the powerful Astra satellite (1A and the shortly launching Astra 1B) though using basic PAL. East Germany will be using PAL and the trend in neighbouring countries is to favour PAL as the future format, dual standard TVs are now on sale in Czechoslovakia, Poland and Hungary. Germany is thus considering dropping the use of their TV SAT2 at 19°W, which in turn will pressure the French in their aspirations with D2MAC over the TDF co-sited birds - which are suffering technical problems. It's feasible that the French will move the TDF birds to a slot around 5-8°W where their Telecom satellites currently operated from.

Important Iberian News

Important news for readers in the Iberian Peninsula that are watching BBC TV Europe, the channel will 'relaunch' in Autumn 1991 and change scrambling at that time from the present SAVE system to D2MAC/Eurocrypt. Incidentaly, the BRAVO cable channel has been seen down-linking its film offerings over Intelsat 27.5°W and on test using SAVE scrambling.

Now that Eutelsat II F1 us successfully operating at 13°E, the previous incumbent at 13°E - Eutelsat I F4 - has moved to 7°E and currently down-linking various Spanish feeds (cable mainly) plus occasional conferencing and VISNEWS feeds for European broadcasters. British Aerospace are often seen with their SNG (Satellite News Gathering) vehicles with test patterns idented such as 'BAE UK1 - 24', etc., though industrial conferencing is usually taken to BMAC. The former 7°E incumbent in turn os now operating (as from January) from 4°E (Eutelsat I F2) providing communications facilities in the mobile EUTELTRACS land mobile message exchange service.

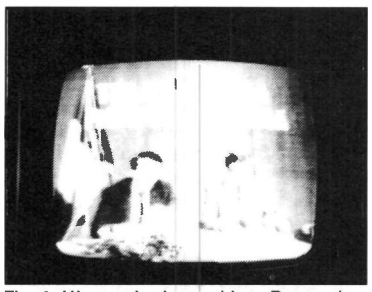


Fig. 1: History in the making, December 1989 and the Romanian Revolution. The output from Romanian TV was taken in its entirety over satellite news feeds.

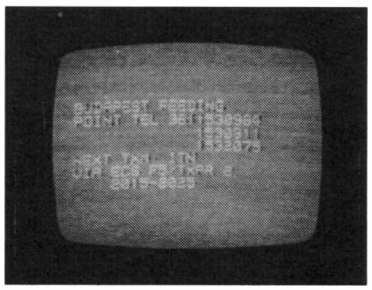


Fig. 2: The caption which preceeded a news insert uplinked from Hungary. This transmission was originally intended for ITN in London.

Fig. 3: Another example of a news feed, this time the *Financial News Network* transmitted *via* Intelsat VI F4 at 27.5°west.

amateur bands round-up

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

First, don't forget to make a regular weekly call to the *Practical Wireless* 'Wireless Line' for the hot news; what is noted there is the news that comes too late for my deadline.

W. H. Rees (South Godstone) enclosed a circuit he had for a pre-selector and asked about updating the devices (2N3819 f.e.t. and 2N3464 bipolar transistor) as the circuit was some ten years old. He wanted to combine it with my 'Listeners ATU'. Alas, I had to be somewhat discouraging insofar as the write-up made it all too clear that most of the gain derived from the incipient instability of the circuit! In fact, a pre-selector is an expensive way of degrading the performance of a decent receiver! It did, though, cause some thought when I spotted that an error had crept into the article - see Fig. 2 on p.19, December 1990 issue, where there should be a link between the top of the coil and the horizontal line just above. This will put the tuning capacitor across the entire coil.

Andy Nightingale (Wombourne), has an FRG-7700 plus a.t.u. coupled to a short length of wire. This is due to be replaced with some 25m of wire, plus, possibly a dipole of some sort. I would, for myself, prefer to go to say a half-sized G5RV or a multi-band trapped dipole. The half-sized G5RV, for instance, covers the bands from 7 to 30MHz (40m-10m) by itself and will handle the 3.5 & 1.8MHz bands (80 & 160m) by strapping the feeders together at the bottom and treating it as an end-fed wire against earth, using the a.t.u. to peak things up. Anyhow the existing set-up was doing OK with 21MHz (15m) yielding TU2JL, CT4KR, ES1WW, WB1DQC, 4X1BD, UZ1NWE, W2QJN, W2RCN, LY2BSA, EA8BU, W3JKM, W1IK, W4AMJ, W3AQC, W3ICU, plus the run-of-the-mill Europeans. Turning to 14MHz (20m), I see LY1BYC, K2JMY, WA2JVM, KA3DBQ, W1CKP & W2ING, plus Europeans. On 7MHz (40m) Andy tripped over a load of Europeans. Don't forget, on 7MHz, that N. America have a bigger band than us; 7.0-7.3MHz.

A few Gs on Top Band, and nothing much on 7MHz, says **Daniel Peake** (Burnage). On the other bands though, Daniel noted GX0BAA, G4VFU/MM, GB4RN, VE1ANJ & SV1AOZ on 3.5MHz; on 14MHz it was GB2SM, ZS9S, 4X6OW, ZS6AW, EA8BCN & ZB2JH/MM. Next, 18MHz yielded ZS5BH and on 21MHz the list includes 4X6WS, 4X6ZL, 3C1EA, HS1BV, A45GY/20, EA8BCN, EA8FM, V44KI, ZF1EJ, ZF1RC, 9L1SL, VP2EXX & K1MAN. That leaves 24MHz (12m) where UT5CK, 9H1NB, VE1MBU, 9H1MF & YB8HK were logged and 28MHz for AH2/P/EA7, 4X6ZL, TA3KA, TI2CC, & JY3ZH. The improved results partly derive from replacing the Sashio box by an AR88D, and by changing to a 30m sloping wire fed from one end.

Tracing a Friend

John Comino-James (Chinnor) wrote to me in hopes of tracing an old friend, a licensed amateur with whom he lost touch in the early sixties. In this case it was a simple matter of looking in the *1990 Call Book*, and passing on the information.

Now to **Vince Cutajar** (M'Scala, Malta) who sticks to 18 & 24MHz. Vince notes hearing, on 18MHz, UD7KWB, 4U1ITU, J73WA, TI5GLF, HP1XSO, FH8CB, LZ1WR, OT4AWR & ZS5BH. On 24MHz the list includes UD7KWB again, D44BS, 9J2WS, FT4XG, VP5VWB, CN2TU, 7Q7JA, UO5OLU, LA9UGA, OD5QX, JR2KDN, KE6FW, UM8MTA, GU4XGG, KP2A, 5V7DP, 3X1SG, UH3E/UA9TF, 8P9FF & C53GH.

Next, I must mention **Eric Masters,** from Welling, Kent, who remarks that he has the usual end-fed up aloft, but that he uses a counterpoise wire, a quarter-wave length long, without which he just does not 'get out' with his very QRP equipment. A good point this; I believe that radials above ground and insulated are more effective than buried radials, but either are infinitely more useful than the usual stake buried in the ground. Eric has the Lake DTR3 and sticks to 3.5MHz.

Next we turn to **Dennis Shepherd** in Earls Shilton. Dennis had changed to an end-fed inverted 'vee' after one of his masts snapped in a high wind. Later I heard he had changed again to centre-feeding still in the inverted 'vee' shape. Dennis notes that the mast in question had been up for ten years; in this time it had corroded inside to the point of failure. On 3.5MHz Dennis has VK2AVA, ZL4OO, JA6GIJ, HK0TU, VK6LK, JA4DNO, VS6CT, HR1RMG, HK4DHR, 6Y5IJ & NL7J in Alaska. On 7MHz he obtained ZL2ANR, T33R, KP2A, 9Q5TE, HJ5RIQ, CM2PJ, CM6PG, CO2OC, JA1UTS & JA5AQC. Not so much was logged on 14MHz, with just VK2AHJ, VK7EK & VK2DZ, nor on 24MHz where N6UXZ & 3X1SG were booked in. However, 28MHz showed with VK3GAW, VK5PB, HK0TU, JA8AHH, V31KX, TA3KB, TA3KA, XE1RFM, 6W/JA8RWU, TI2JJP, HR1KAF & plenty of W/K stations.

Due to space limitations the half-size G5RV of **Bill Williams** (Gloucester) has to be bent almost double; this antenna is connected to an FRG-7700/FRT-7700 combo. Bill has been listening since as far back as 1936, though I doubt he was using the same receiver! More likely a good old 0-V-1 - and it would be interesting to see how well it would cope with today's conditions. On 3.5MHz, Bill noted VK2AVA, VK3IO, VK6LK, VK8TM, W2EPR & W2HCW, on 14MHz there were BV2WC, KL7HFA, VK3AAL, VK5WR, VK6AU, ZL1ADQ & ZL1BVK; which leaves 28MHz where BV2FA, FT5BV, JA2TG & N5REY/MM in the Gulf were logged.

Mike Drew of Wrexham went on 24MHz for ZL3ADJ, JA2KSI, CU1AC, W0GBR, EA9TP, JL6FLL, JJ3LLT, 9H1GP, W1KFY, ZS1VX, ZS1ACY and a host of Europeans; 28MHz collected up 5N3OETP, TA5KA, SV5A, WB1ASV, KC6GFY/2, UM8MDX & LU3PDS. Going down in frequency to 21MHz there were CR1BI, CU2DX & NE3F to be shovelled in, and in 18MHz we note D44BC, YL2AG WA2DPK, W3YY, K2ANB & CU1AC. Finally, despite all the noise on 14MHz, Mike was able to make solid copy of QRP station NL7J in Soldotna, Alaska. He also copied SSTV from IQ1A.

Join a Club

A complete change of tack now; I have a nice long letter from **Dennis Egan** GW4XKE, discussing his visit to the Bridgend Rally to wave the RAFARS flag there. Dennis, as always, seems to have enjoyed himself and met up with pals from RNARS and RSARS, not to mention signing up new members and collecting up subs. The point I am coming to is that I feel the s.w.l. who has any hopes of taking and passing the RAE would be well advised to join a club somewhere. Yours truly happens to be a member of the Powys club based on Newtown, and after all these years I still get more out of club life than I put in. OK, so I'd get my leg pulled summat rotten' as the poet says, but membership of local, as well as national ones like RAFARS or G-QRP Club or whatever all bring us far more than we put in if we take our hobby at all seriously.

Back now to s.w.l.ing, and this time right to the Far North, not so far from John o' Groats in fact, to **D. Robertson**. On 7MHz (40m) s.s.b. produced ZD8Z, K4SXT/DU3, ZL2SQ, CE3OZC, CE4MAO, CN2LB, FS/KC1F, P40V, ZM2ZP, EA6FB, PJ1B, HI8A, RW0WR, JA2BAY, BY1PK, KL7RA & UZ9QWA. On 18MHz ZL2AAG & JAs were booked in while on 28MHz we see PJ1B, VS6WV, TM0E, CE3DNP, P40T, FS/KC1F & the inevitable gaggle of JAs.

Rubber-stamp

A.L.Taylor of Redcar notes that despite the 'glasnost' business, some Russian operators won't indulge in anything more than the 'rubber-stamp' QSO. He mentions hearing a YL operator from the Kiev region who refused to even discuss things like the rig and the weather. Incidentally, Allan notes that this was the first YL from behind the Iron Curtain he had come across in some forty years in the game - so he reckons he hasn't been at it long enough to hear more of them!

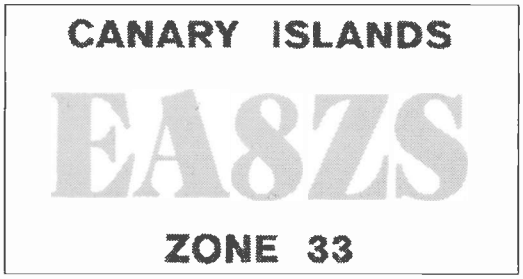
D. L. McLean of Yeovil is another OT. He heard ES5D on 24MHz and says he has a card in his collection received from ES5D confirming an s.w.l. report sent out as long ago as 1937. On 28MHz nothing was noted from the Pacific but most of the rest of the world was logged. On 24 MHz, apart from ES5D already mentioned, there were BV2FA, C53GH, EA9UA, FP/VE1KM, HV3SJ, KC7BL & N7HGH (both Nevada), KI6DL, NW7K & W0GAQ all in Idaho, W5SAL (New Mexico), WQ7B (Montana), VU2GHS & 9H1MF. On 21MHz, where the band has been open 0800-2000Z most evenings, the long path produced JA and VK around 0900, changing to short path between 1000-1200. N. Americans appeared from noon until 1900, when they were joined by the odd S. American; loggings included C56/OH7XM, CE2CC, CN15AMV, J5CVF, JAs, OA4QV, RA0AD, SV2RE/A & SV2UA/A both on Mount Athos, TQ0LER, UI8FM, V21AS, V29OA, V44KAZ, V44KI, VE7DGI, ZL1UFJ & 4K3BB. As for 14MHz, Don looked there between 1600-1900 when it was open to Asia and Africa; A43ND/20, BY1QH, KH0/JG1OUT, T33R (Banaba), TZ6PS, UH6E/RC2AR, VKs, VQ9CQ, VU2CVP, VU2GPD, W6ALQ (Montana), YB8RB, YK1AA, ZS8MI, ZS9/W6KG, 3B8CF, 4X6DW, 5H3DCX & 8J5ILY.

Ted Trowell (Sheppey) is still finding a lot of noise on Top Band, but he finds his G5RV is quieter on this band than the loaded vertical. This is often the way, with the vertical being best to transmit upon, while the horizontal is better for 'harking'. Indeed some amateurs have had much success listening with small shielded loops, making up for the loss of signal strength by way of a pre-amplifier on receive. The point here is that if a signal is being drowned out by high noise (static and whatever), then if a particular antenna knocks the noise down more than the signal, then you are, as it were, in profit in real terms. Perhaps we'll write something about this in a tutorial sometime. Anyway, Ted noted DJ2TI, CN5N, UZ1TWW, SM6CPY, GU3HFN, DL0KF, 4N4AE, OM5W, SN3A, CT1AOZ, EI7M, OY9JD, W4QM/MM, K1TM, UC2LEG, SM3BCS, HA8XX, T77C, SM5ADI & LY1BYK. The other main area of interest was 7MHz, where he managed K4CG, WW2Y, K1AR, N3EA, 9H3OA/4, SV9ADH (Crete), PJ2/ OH1WR & N4UB.

So - there you have it for another month. Since I started writing this piece the cold start to December has been replaced by gales and snow, so perhaps I'll go outside now, shake the snow off the antennas and decide whether to lower all the antennas, which only takes a few seconds. That way I won't wake up in a sweat in the middle of the night!

The **deadlines** (arrival dates here) for the next three months are: February 15, March 15 and April 25. Don't forget that I can take in reports of stations heard on **any** mode, and on **any** amateur band. If one of you folks out there were to send in a report covering 10GHz, no-one would be more pleased than yours truly.

'Bye now - see you next time round, and please let's have your letters: don't forget, it's **your** column - I only write it!



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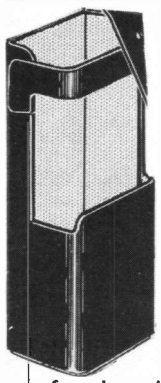

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dxtv round-up

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

It is well known that television signals in the upper v.h.f. Band III (175-230MHz) and even more so the u.h.f. Bands IV & V (471-856MHz) have a limited range, depending on transmitter power, of between 50 and 100km. Signals at these frequencies are almost line-of-site and can be attenuated by high buildings, high ground and even trees if they shield the receiving antenna. Therefore, it stands to reason that when we receive television pictures that originated hundreds of kilometres away, something special must have happened to cause it. That 'something' is a disturbance to the normal state of the troposphere which often coincides with the movement of a ridge of high atmospheric pressure.

Like many TV DXers, **David Glenday** (Arbroath) looks for pressure changes by keeping one eye on his barometer and the other on the newspaper or television weather maps. A good example is the map he received on his local television channel, **Fig. 1**, at 1900 on 4 October 1989. It shows a high pressure system of 1030mb (30.45in) moving to the east of the British Isles and a low of 990mb (30.25in) pushing from the west. On that day there was a tropospheric opening when David received u.h.f. pictures from Belgium, East Germany, Holland and Poland. Moving to the lower end of the television spectrum, smeary and distorted television pictures from afar are often received in Band I (45-68MHz) during the winter months via a disturbed 'F2' region of the ionosphere or very clearly through a random outbreak of Sporadic-E.

News From India

The first picture from India is the caption from Malaysia, **Fig. 2**, received by **Lt. Col. Rana Roy** (Meerut, India) on Ch. E2 (48.25MHz) in January 1989. Rana also received unidentified pictures from SE. Asia, on Ch. E2, in January and February 1990, **Figs. 3** and **4** respectively, and on Ch. A2 (55.25MHz) 525-line, **Fig. 5**, on September 1. Although Rana received pictures from Dubai TV and the USSR on Chs. E2 and R1 respectively on the 17th via Sporadic-E, he reports that, "The only type of DX we have been receiving here is the F2/TEP from SE. Asia".

Under these conditions he identified pictures from Bangkok TV, on the 15th, 16th, 17th, 20th, 22nd, 26th, 27th, October 8, 11th, 15th and 29th. Pictures from Thailand were seen on September 13, 15, 27, October 12, 13, 14, 20 to 25 and 28. The he saw further unidentified signals from South East Asia around Chs. E2 and E3 on September 13, 14, 19, 20, 23, 24, 25, 26, 27, October 8, 12, 13, 16, 17, 18, 26 and 27. In addition to distorted test-cards, he saw various programmes, some of which were very strong and in colour and others were weak and intermingled with co-channel interference.

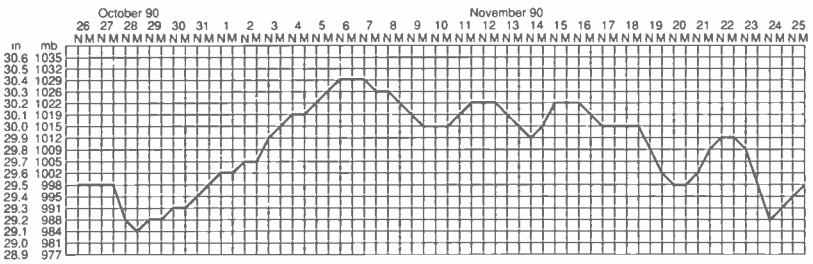


Fig. 13: Ron's barograph chart.

Rana logged adverts, the opening ceremony of the Asiad at Beijing, the Asian games, CNN news from Thailand where "a lady news-reader bowed with folded hands and then started reading the news" and snatches from a variety of films and plays. Rana said that Thai and Indonesian colleagues have confirmed that the large '3' he has seen and I have mentioned in this column, comes from the station in Bangkok which transmits on Ch. E2. He also told me that the Delhi station on E4 could not be seen in certain areas of the city due to high rise buildings, so it now transmits a 1kW signal on Ch. E5 to make up the loss.

Band I

John Woodcock (Basingstoke) logged faint pictures which he could not resolve, via 'F2' on November 4. At the low end of the band, he heard a variety of American and European utility stations at various times on days 10, 12, 13, 15, 16, 19, 20 and 21.

Simon Hamer (New Radnor) identified TSS/Chinese on Ch. C1 (49.75MHz) at 0800, via 'F2', on the 8th as well as Arabic subtitles at 0750, Australian on Ch. A0 (46.25MHz) and TSS/Chinese at 0947 on the 11th. He also found Sporadic-E activity when he logged pictures from Italy (RAI-UNO) and Spain (TVE1) between 1100 and 1400 on November 11. He also saw films from Italy on Chs. Ia and Ib and 'Frettir' (news) from Iceland (RUV) on Ch. E4 (62.25MHz) during the evening of the 12th. The 'jackpot' was a test-card from Zimbabwe (ZTV) on Ch. E2 on the 19th.

Also on the 19th **David Glenday** (Arbroath) logged a test-card from Spain's TVE-1 on Chs. E3 and 4.

Picture Archives

While tropospheric openings were in progress in 1989, David Glenday, using a Philips receiver, Triax BB grid 'bowtie' antenna and mast-head amplifier received u.h.f. Teletext displays from Belgium (BRT), **Fig. 6**, on June 15, Germany's NDR3, **Fig. 7**, on May 20 and 'WDR3' on June 18, **Fig. 8. Les Jenkins** (Godalming) sent a couple of Spanish captions, backed by colour-bars, **Figs. 9** and **10**, that he received from Eutelsat 1F2

Tropospheric

"While a high pressure system was lying to the west of Scotland, I tried the JVC TV while in the car near Dollar and received a satellite of Scottish ITV from the Callendar transmitter near Stirling," wrote **George Garden** (Edinburgh) on November 4. He continued, "This was discovered by trying the amplified loop in the vertical plane when the signal then appeared very much stronger - not bad for 0.1kW." Later that day, George used the JVC connected to his rotatable 'bow-tie' antenna and amplifier from his home in Edinburgh and found strong signals from Darvel not generally received there.

During the mild tropo-opening between November 6 and 9,

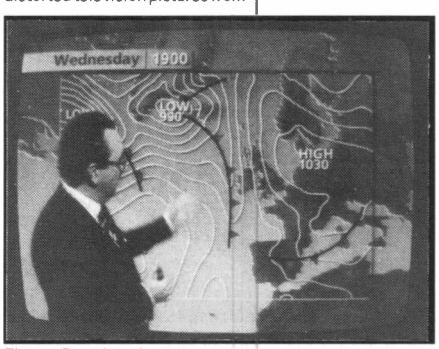


Fig.1: Scotland.

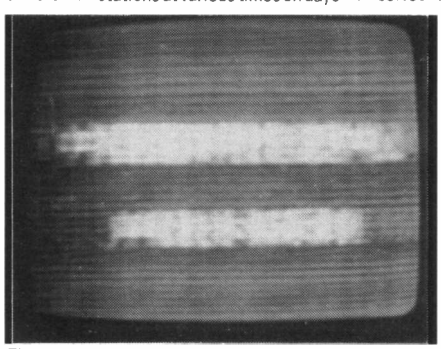


Fig. 2: Malaysia.

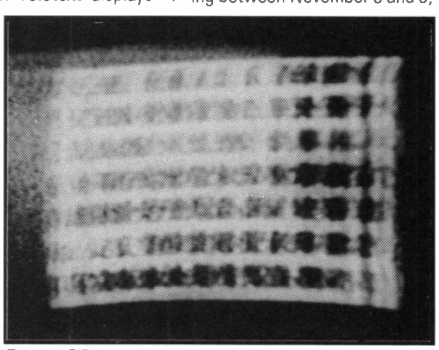


Fig. 3: SE Asia.

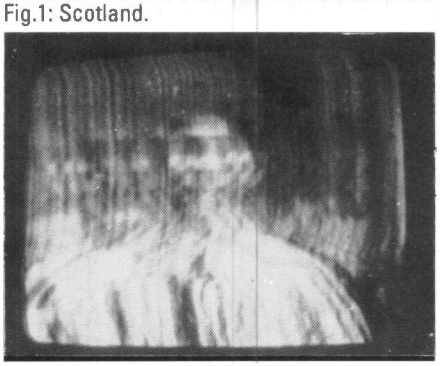


Fig.4: SE Asia.

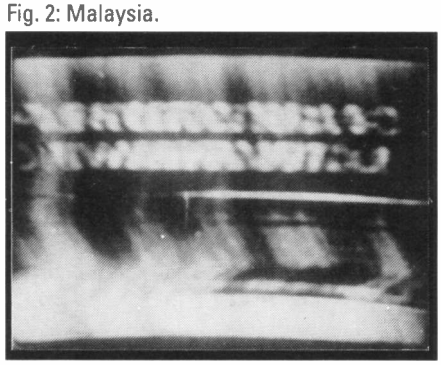


Fig. 5: SE Asia.

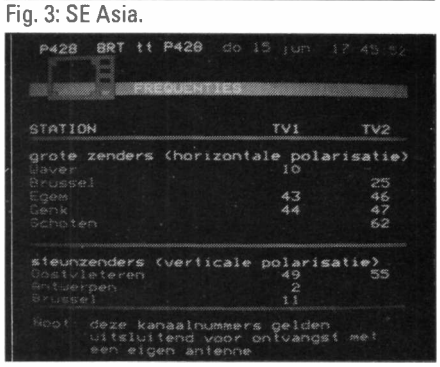


Fig. 6: Belgium.

John Woodcock received negative pictures from France in Band III. David Glenday received pictures from Denmark (DR) and Norway (NRK) in Band III and Belgium (BRT1 & 2), Denmark (TV2), France, Holland (NED1, 2 & 3) and Germany (SWF3 and ZDF), on several spots in the u.h.f. band.

At 1255 on the 6th I had a test-card 'bursting' through on Ch. E10, then there was a fair bit of co-channel interference on u.h.f. transmissions during the evening. At 0530 on the 7th and 30th, I watched the news in good colour from Anglia TV on Ch. 24 - not bad for a chimney-mounted dipole cut for Band II!

Simon Hamer had a super haul of tropospheric DX during the early November opening when he received pictures, often in colour from Denmark, Norway and Sweden (SVT1) in Band III and Denmark (TV2) and Sweden (SV2) in the u.h.f. bands on the 7th. In Band II, he saw Czechoslovakia (CST1), Denmark, Finland (YLE1 & 2), Germany (ARD/WDR1, BR1, DFF1, HR1 and SFB1,), Norway (NRK), Poland (TVP), Sweden (SVT1) and the USSR (TSS1. On the 8th he watched Czechoslovakia (CST2), Denmark (TV2), Germany (ARD/WDR1, BR2, DFF2, HR3, NDR1&3, RB1, RTL+, SAT1, SFB3, SSVC, SWF3, WEST3 and ZDF), Poland, Sweden (TV2) and the Russian news caption 'BPEMR', in the u.h.f. band. Finally, he saw Austria (ORF1) and Switzerland (+PTT/SRG1) in Band III as well as ORF2, +PTT/SSR1 and +PTT/TS1 in the u.h.f. band on the 9th.

The slightly rounded atmospheric pressure readings for the period October 26 to November 25, **Fig. 13**, were taken at noon and midnight from the recording chart on my own barograph. Tropospheric openings coincided with the declining high pressure between November 5 and 9 and, for the benefit of the weather buffs among you, I recorded 2.78in of rain at my home in November of which 1.85in fell between the 23rd and 25th. Morning frosts were visible on days 6, 8 and 28 and the humidity reached 83% on the 10th. The average noon pressure was 29.96in

SSTV

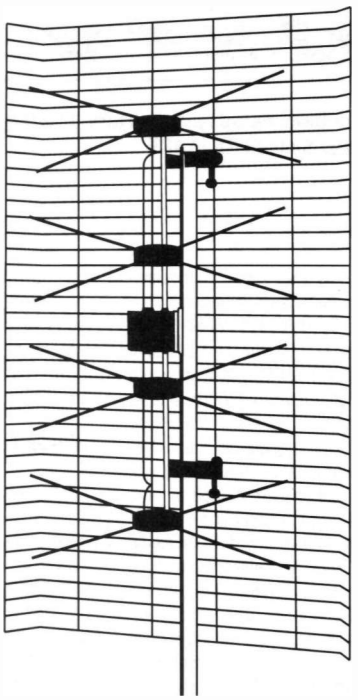
In Glasgow, **John Scott** uses a Kenwood R2000 communications receiver with a 20m long wire antenna and enjoys listening to broadcast stations and decoding RTTY, Morse and SSTV. For the latter he has a Spectrum plus 3 computer, G1FTU software and a Star IC10 printer for the hard-copy. Toward the end of last summer John received slow scan pictures from EA2JO in Spain, **Fig. 11** and copied a 'QTH' caption from Galdkao, a photograph of a house and a map showing Madrid, **Fig. 12**.

TVDX News

In Belgium, the BRT-2 TV service is now testing Nicam 728 digital stereo sound over the Schoten (Ch. E62) and Egem (Ch. E46) transmitters. They are using System G rather than the UK system I, so different subcarrier frequencies are used. Consequently stereo will not be heard on a UK standard receiver.

In the USSR, Moskva Ch. R3 is now carrying a three-hour programme compilation of the Super Channel each day. Currently it's carried in a single three hour slot once a week. MTV, the Music Channel, is also being screened in Moscow, though at this time for only 1 hour weekly. The programming will form part of the 'new' commercial TV block for the Soviet TV. Poland too is preparing for commercial TV with the main broadcaster carrying 50% of the share issue. Initially, the new commercial programme will be transmitted on 'local' u.h.f. stations, some nine tranmitters will be operational inthe first place.

German unification has meant profound changes to the East German radio and TV. The TV services DFF-1 and DFF-2 will be merged to provide a signle programme called OST 3 and carried over the exisitng DFF-2 u.h.f. transmitter network. OST-3 is currently operational though at the end of 1991, the service will cease. The main German channel ARD will be carried over all the previous DFF-1 transmitters, though with regional opt outs as specific times (when ARD itself has regional opt outs - usually early evening). The second German chain ZDF is to extend its service into the East German region with additional transmitters being constructed. By early Spring 1991, the following transmitters should be radiation: ZDF - Lobau Ch. E56, Cottbus Ch. E57 and Dresden Ch/ E59, all using PAL colour. The regional opt-out regions in (what was) East Germany have their studio centres at Rostock, Berlin, Dresden, Halle and Gera. Incidentally, postal codes change as well, East German regions will carry an '0' zip code and West German 'W' - for east and west respectively.



A typical u.h.f. bow-tie antenna.

millibar
A unit of pressure or stress. 1 bar = $10^5 N/m^2$ or pascals = 7509.07mm of mercury at 0°C and latitude 45°. 1millibar = $100N/m^2$ or $10^3 dyn/cm^2$. The standard atmospheric pressure is 1013.25mb.

Slow Scan Television
A system of image transmission and reception, using similar methods to broadcast television, but at a much slower rate. Scanning is usually sequential and a complete field may take several seconds to complete, the display being produced by a tube having a long-persistance screen. By adjusting picture rate and definition, it is possible to reduce the channel bandwidth to a value within 3kHz. The system is thus usable over normal radio speech links.

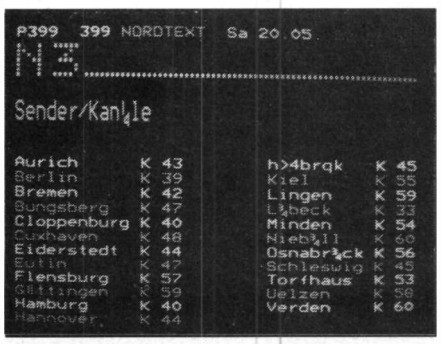


Fig.7: Germany.

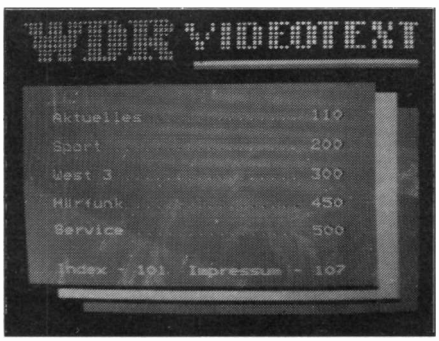


Fig. 8: Germany.

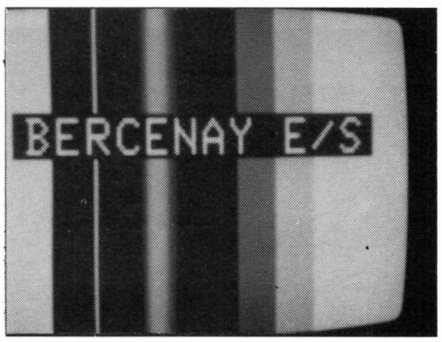


Fig. 9: Spain *via* Eutelsat 1F2.

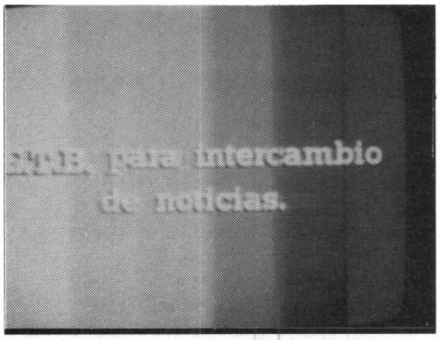


Fig.10: Spain *via* Eutelsat 1F2.

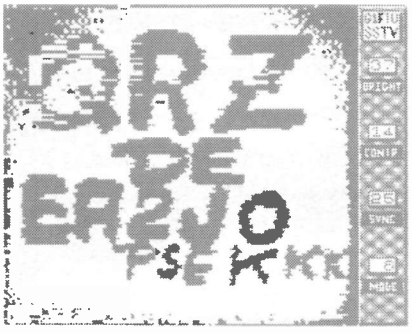


Fig. 11: Spain SSTV.

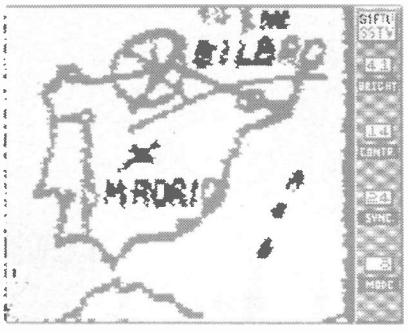


Fig. 12: Spain SSTV.

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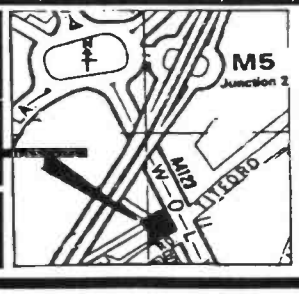

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EGNX-91-1 Vulcan B.2 XM575 at East Midlands Aeropark.
Christine Mlynek.

My review of the *Paper Aeroplane Pad* last month reminded me of some industry jargon that you might hear sometimes. What's a 'paper aeroplane' in this context? It means an aircraft that is still on the drawing board. A 'green aeroplane' gets its name from the colour of the zinc chromate primer in which it is painted (nasty stuff if you breath it in, and doesn't work well in cold temperatures). This aircraft really exists but hasn't been painted in its final livery - it might be on a ferry flight from the airframe factory to another site where it will be fitted out internally. Eventually, the aeroplane becomes a 'white tail' - finished, but unsold, waiting for a customer's logo to be applied.

Then again, different groups of people vary in their use of terminology. Have you noticed that *cognoscenti* (including, I hope, readers of this column!) refer to an 'aeroplane', unless they are American in which case they prefer 'airplane'? The ordinary passenger just calls it a 'plane'! All these terms exclude rotary wing aircraft (helicopters and autogyros). But there are other means of staying aloft including balloons and airships. See if you can classify all the types of 'flying machines' in this way. Where do gliders - like the ones in the *Paper Aeroplane Pad* - fit in?

Frequency & Operational News

Starting with the GASIL 11/90 from the CAA: Redhill Tower changes from 123.225 to 120.275MHz and Shipdham from 123.05 to 119.55MHz. From the same source comes AIC 95/1990, which announces the change from 130.15 to 122.75MHz of the Salisbury Plain DACS which has authority for danger areas EGD123, 124, 125, 126 & 128.

Have you noticed the changes to the holding point markings on taxiways? AIC 72/1990 explains these. At each holding point, a white-on-red sign will indicate the runway(s) that are being approached. The words 'HOLD' and (where relevant) 'CAT I' will be omitted as they are implied. If the holding point is designated by a letter (as in 'Taxi to holding point Alpha and call Tower 118.9') then that letter will appear as yellow on black (internally illuminated signs) or with the colours reversed in the case of external illumination. On the ground is a yellow pattern of two parallel, solid lines followed by two parallel broken lines. This looks like a combination of the familiar 'Stop' and 'Give Way' markings at road junctions.

When Cat II/III operations are in progress aircraft are flying the i.l.s. to much nearer the runway than usual or (Cat III) are making automatic landings guided by it. In this case taxying aircraft are held further from the runway so that their metal fuselages don't distort the i.l.s. radio beams. These holding points are marked with the appropriate weather minima category and, on the ground, there is a yellow, ladder pattern.

Dave Rennolds G0BXS (Milton-Under-Wychwood) has sent in his compilation of h.f. company operations frequencies (callsign in italics, frequencies in MHz, times presumably UTC):

Amman (Alia) 13.225

Bahrain (Falcon) 5.538 11.354 13.339 17.931

Beirut (Cedarbase) 10.093 13.356 17.965

Bombay (Air India) 13.351 17.916 21.949, [H24] 6.637 8.930 10.072

British Airways (Speedbird London) 5.535 8.921 10.072 13.333 17.922 21.946

Dharan 3.095 5.544 8.927

Malawi 8.933 13.339 17.931

Johannesburg (Springbok) [0430-1630] 8.933 17.925 21.943 [1630-0430] 5.532 8.933 11.354 13.330

Saudi Arabia (Jeddah) [0500-1600] 13.339 17.925 21.994 [1600-0500] 3.013 5.544 [H24] 8.927

Seychelles (Aviation Seychelles) 6.526 8.967 13.205 21.886

Sydney (Qantas) 21.970 [H24] 6.637 10.078 13.342 17.922

And now some Brazilian frequencies from M. Redgwell (Mitcham, Surrey) who is also a member of AETA, an enthusiasts' club based in Sao Paulo:

Lineas Aeras Paraguayas Ops 11.397

Met 10.057 13.225 13.357

Tam Commuter Ops 8.849 5.609

Trans Brasil Ops 8.952 11.339

Varig Ops 2.878 5.553 6.547 8.924 8.939 11.366 17.913

Vasp Ops 4.666 11.375 17.943

Also from M. Redgwell come the NASA Space Shuttle h.f. frequencies of 20.186, 20.189 & 20.380MHz.

Colin Frowen (15 Poveys Close, Burgess Hill, West Sussex, RH15 9TA) has updated his frequency lists which he kindly offers to any reader who cares to send him a s.s.a.e. (17p) at least 254 x 178mm.

Question Time

An interesting job is emergency call-out. **Capt. J. Jennings** (Halfpenny Green Airfield) does this work by helicopter and has the need to obtain the weather picture when travelling to the airfield by car. He favours RAF VOLMET (4.722MHz) though I wonder if the more easily received v.h.f. VOLMETs wouldn't give better coverage of the local area - for instance, Birmingham, East Midlands and Manchester. I know of no 'pager-sized' portable h.f. receiver but one of the small scanners might be suitable. The stability of the transmission will help with reception as it eliminates the need for fine retuning. My quick look round the market revealed the following shortlist: Sony ICF-2001D or PRO-80; Panasonic RF-B65D; and Icom R-100. The ICF-2001D has been reported by some readers as rather lacking in the v.h.f. department but that shouldn't matter in this case. Check with advertisers in the magazine for availablity and prices Other scanners covering h.f. don't have the essential ability to resolve s.s.b. Let us know which you choose and how you get on with it.

Captain Basil Wynbergen (Ealing, London) is puzzled about the spread of workload on airways at LATCC. At peak times, aircraft are passed from one geographical sector to another - each with its own frequency and controller. Late at night things go quieter and one controller can handle a greater area, possibly on two frequencies at a time. So that aircraft calling on one frequency don't double up with those calling on the other, each incoming call is relayed by being transmitted on the other frequency. This way, an aircraft listening to one of the two frequencies can hear all the traffic that the controller is working and will know not to interrupt a call while the controller is occupied on the other frequency.

Follow-Ups

Last October I asked for information on the Elliott AA 5665-1 Doppler controller. The original source has now been tracked down. This rare unit is for manually entering ground speed and drift angle if the real Doppler becomes unserviceable during a navigation training sortie. The aircraft type is still unknown but my first guess would be the RAF Dominie (an HS.125 variant) or the naval Jetstream.

I always hope that 'Airband' can be useful in many ways. Each month Chris and I read the column on to tape so that the visually handicapped can receive it *via* the *QTI Talking Newspaper*. **Geoff Halligey** (Bridgend, Mid Glamorgan) has written in regularly and now *QTI* listener **A.R. Peel** (Crawley, W. Sussex) thinks that they worked together in the '40s. Thanks to **Harry Longley G0JKT** (Lancaster) who runs *QTI* and enabled me to help put the two gentlemen in touch once again.

Now on to the exploits of Don Cameron and Gennadi Oparin and their Britain to Rus-

Abbreviations

AIC	Aeronautical Information Circular
BEA	British European Airways
CAA	Civil Aviation Authority
Cat	weather minima Category
DACS	Danger Area Crossing Service
GASIL	General Aviation Safety Information Leaflet
h.f.	high frequency
H24	available 24 hours a day
i.l.s.	instrument landing system
LATCC	London Air Traffic Control Centre
MHz	megahertz
n.d.b.	non-directional beacon
NASA	National Aeronautics & Space Administration
Qantas	Queensland and Northern Territories Air Service
QTI	Quotations of Technical Interest
s.s.a.e.	stamped self addressed envelope
s.s.b.	single sideband
UTC	Universal Co-ordinated Time
v.h.f.	very high frequency
v.o.r.	v.h.f. omni-directional radio range
VOLMET	VOLume METeorological report

EGNX-91-2 Those engine intakes are big enough to climb into!
Christine Mlynek.

sia balloon flight (December 'Airband'). You've probably seen the picture of this on page 16 of the January *PW*. Dave Rennolds confirms that Cameron is indeed the well-known balloon manufacturer. This flight was the first to link the two countries in this way and ended near Leningrad.

Historical Section

Mr. & Mrs. Hasman & Son (Leicester) are keen to know about the development of the airways system, back to 1955. If any readers can recommend a source book, please write in. Meantime I have looked up the oldest chart from my Museum library: 1966. For the Glasgow-Heathrow route only one north/south airway is on offer and that's A1 (Dean Cross n.d.b. to Pole Hill v.o.r.). After overflying the Manchester area, no doubt in contact with Preston Airways, the routing was probably *via* the Abeam Oldham reporting point, Lichfield n.d.b., then on to the Daventry v.o.r. Gaydon airfield would pass to starboard - then active with the V-force but now just a vehicle testing track. Finally the flight would arrive London *via* the Garston v.o.r. To the south the other London arrival point was the Epsom n.d.b. The Bovingdon, Lambourne & Ockham v.o.r.s didn't exist and the one at Biggin wasn't part of the London Arrivals pattern.

Well I remember endless Tridents coming from Garston, overflying my house on the way in to London Airport. They had red wings and the callsign Bealine. Remember BEA? Those were the days.

Please note the following changes to the deadlines and address for correspondence. The next three deadlines (for topical information) are February 15, March 15 and April 12. All correspondence to the address at the head of the column. To arrange a museum visit telephone 081-958 5113 on weekday evenings.

n.d.b.: These medium-frequency ground beacons are non-directional because it doesn't matter where you are - their reception is exactly the same from any direction. Don't let the name confuse you: the aircraft's receiver is designed for direction finding! A needle driven by the airborne automatic direction finder points to the direction in which the beacon lies.

d.m.e.: Distance measuring equipment (u.h.f.) is often found with a v.o.r. It tells the pilot how many nautical miles away the aircraft is from the beacon. Simple.

FIRST AID

I recently purchased a book called *Short Wave Listening Guide* by William Bander jr. and issued by Radio Shack, USA. In this book is an advert for a short wave radio, the Realistic DX360. I have been to the local dealers who sell Realistic goods and they say that they can't get this radio. Can anyone tell me where I can purchase this radio, please?
M. Allen, 636 Wordsworth Avenue, Parsons Cross, Sheffield S5 9JH..

I have recently purchased a CAT (Computer Aided Technology) Interface for my Yaesu FT-747GX. Could any readers please contact me if they use this system at all, but especially if they use it with an Amiga A500, as this is what I am trying to use. Also, if anyone has, or knows of any software available for the system, I would be grateful for any information passed on. I hope that somebody can help with this problem, as at the moment the transceiver is displaying CAT (i.e. it is receiving data), but is just not acting on it, which is very frustrating!
Steve Linkstead, Wedges Farmhouse, Bashurst Hill, Horsham, West Sussex RH13 7PE.

With reference to 'First Aid' in the December 1990 *SWM* and the filmstrip dial for the R-210 receiver.
I am sure that Mr Gerhert is right in his assumption that somewhere in a heavily fortified, underground bunker there are crates and crates of spare strips.
However, to his plea. I am not sure if it will work, but it's a hunch. I remember reading somewhere that the dial is a 1.524m (5ft) length of 70mm sprocketed film. Most amateur photographers will be aware that 35mm film is sprocketed but there is also a 70mm film which is sprocketed. I believe that certain professional cameras use this and certainly the wide screen projection system does. I have a shrewd suspicion that when the R-210 was made, the dial mechanism was used around an existing medium - 70mm sprocketed (or perforated) film.
If, say, a 2m length could be obtained (try Kodak or Ilford), it will either have an image on it or be fogged. The gelatine would have to be removed, I think hot water would do the necessary and one would be left with a length of clear sprocketed film. Assuming the dial sprockets and film perforations mate, it would be a fiddly job, but made simpler by the crystal markers, to pen in the frequency bands, using a p.c.b. marker pen.
Worth a try.
Mick Barber G7HUI

scanning

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

Norman Smith of Basingstoke has sent me details of an easy-to-build car cassette adaptor, similar to the Tandy unit I mentioned in the November column. The adaptor makes it possible to feed the audio signal from a hand-held scanner through a car cassette player, without having to perform any modifications to either piece of equipment. The advantage of this is that it makes use of the existing car speakers and provides additional amplification to overcome road noise. The Tandy unit is designed to allow a portable CD player to play through the car system. Because the unit has to provide high quality and provide a stereo signal, the cost is fairly high. However for our purpose, a mono signal with a limited frequency response should prove adequate. That eases the constructional requirements - and the cost.

The adaptor consists of a standard audio cassette with a small coil in place of the magnetic tape. The coil magnetically couples audio signals into the tape replay head of the cassette player. This technique is perfectly safe providing that the signal level is not too high and the coil and tape head are not allowed to touch each other. To make the adaptor you need a standard cassette tape (the type that is held together with small screws) and a magnetic earphone - not one of the personal hi-fi types but one of the older cheaper models. These are usually made from cream-coloured plastics and are often supplied with portable transistor radios, so you may find that you already have one somewhere.

The cassette is unscrewed and the 'guts' removed. The only bits you need to keep are the two case halves, plastics tape reels, fixing screws and the small felt pressure pad which is usually mounted on a small strip of spring metal. The magnetic earphone should be carefully dismantled and the plastics case and thin metal diaphragm discarded. This should leave the coil assembly mounted on a plastics former with a ceramic magnet surrounding it.

Carefully remove the magnet by cutting away the plastics moulding that was used to retain the metal diaphragm. This should now leave just the small coil assembly and connecting lead. This has to be glued into the cassette case just behind where the spring mounted felt pad is located. The coil is placed so that its centre lies just behind the felt pad, with the back plate vertical. The lead from the coil is run along the edge of the cassette case well away from the tape spools. The cable should be glued into place and lead out from the rear corner of the case. The felt pad and spring can be held in place with a spot of glue if required.

Some cassette players have an automatic end of tape shut-off mechanism. This is usually a mechanical system where an increase in the tape winding tension is sensed and used to eject the cassette. If your tape player operates in this way then don't worry about the next part. However, if this is not the case then the system is likely to be electronic. The most usual technique is to detect when one of the tape reels has stopped rotating. This is used to electrically operate the eject mechanism. In order to trick the system into believing that you are playing an ordinary tape, it is necessary to make sure that both tape reels rotate together. You can do this by refitting the two plastics tape reels and placing a suitably sized elastic band around them. It may require a little experimentation before you find the correct size, but try a few different types until both reels turn together freely.

First play a normal tape in order to find the correct volume setting on the car stereo. Next, put the adaptor in and connect it up to your scanner earphone socket. Tune to a local signal and turn up the volume on the scanner until you get the same volume level as before. Once this setting has been found only use the car stereo volume control to set the correct listening level. This will help to prevent overloading the car stereo and avoid distortion. Make a note of the setting so that you can find it again the next time you use the adaptor. I have built a couple of these units and found them to be a very useful accessory, especially if you want to temporally use a hand-held in a car. The cost of construction should be less than £2 even if you have to buy all the bits, so it shouldn't break the bank. My thanks to Norman for passing the details on to me.

Fig. 1:

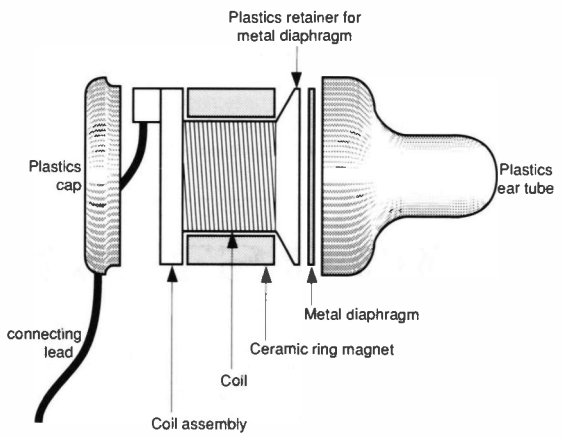


Fig. 2:

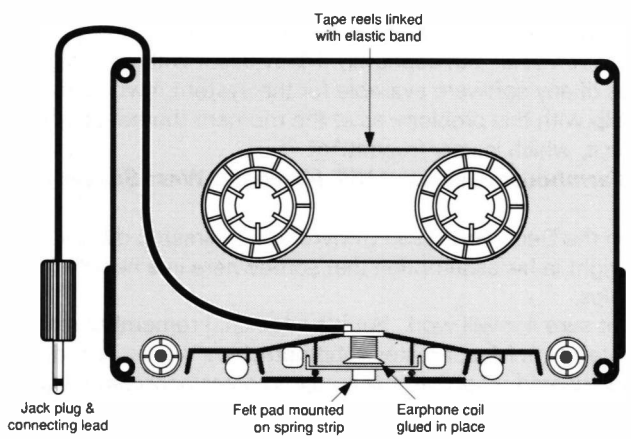
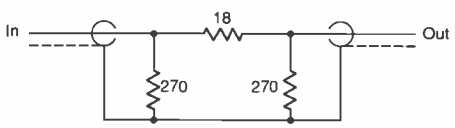


Fig. 3:



Pre-amp Problems

John Morley from Lancashire has been experiencing problems when he connects a pre-amplifier into his receive system. The problem only arises when he tries to use the pre-amp at the the antenna end of the coaxial cable. All he can then hear is what he describes as 'mush'. If he connects the pre-amp in circuit at the receiver end of the cable, it works perfectly. But in this position it does not give the best performance as it is not boosting the incoming signals before they pass down the cable to the receiver.

In his letter, John describes all the different permutations he has tried with the scanner, pre-amp and cable. He also mentions the fact that when the pre-amp was mounted at the antenna and he touches the case or connectors the performance improves dramatically. This is an important clue as it suggests that the pre-amplifier is oscillating, producing a strong signal which is overloading or 'blocking' the r.f. stages of the receiver. When he touches the case of the pre-amp, this probably changes the frequency of oscillation and hence the degree to which reception is affected. To understand the problem we need to look at what makes an amplifier stage oscillate.

In fact, an oscillator is a modified form of amplifier circuit, where a small proportion of the output signal is 'fed back' into the input. If the polarity of the signal is correct, the 'feedback' will become progressively larger each time it passes through the amplifier. This produces a self perpetuating signal, the frequency of which is determined by a frequency selective network. The purpose of this is to ensure that the feedback signal appears at the amplifier input at the right level and in the correct polarity or phase.

In John's case, a small proportion of the pre-amplifier output signal must be finding its way back into the pre-amp and causing it to oscillate. This could be happening in a number of ways but my first guess would be that if the pre-amp is mounted directly at the antenna then a small amount of the output signal must be leaking from the pre-amp output stage or cable and being picked up by the antenna.

If this doesn't make any difference, then the next thing that I would suspect is an impedance mismatch between the pre-amp and antenna, or connecting cable. If you are using a resonant antenna such as a dipole then try a more broad-band design such as a discone. This will present a more constant impedance to the

pre-amp over its full operating frequency range. Narrow-band antennas, such as dipoles, tend to exhibit strange impedances at frequencies other than those they are designed for. Under certain circumstances this can combine with stray inductance or capacitance in the amplifier circuit to produce a positive feedback network which results in oscillation.

This can also occur if the cable connected to the amplifier output is mismatched. Again a proportion of the amplifier output signal becomes present at the input and oscillation occurs, the frequency being partially determined by the length of the coaxial cable. One simple way of minimising this effect is to connect a resistive attenuator between the pre-amp output and the cable. This helps to ensure that the circuit is presented with a 50Ω resistive load rather than some indeterminate inductive or capacitive impedance which may form part of a tuned feedback network. Only a relatively small amount of attenuation should be required, 3dB being more than adequate in most cases. By placing the attenuator at the output of the pre-amp very little degradation of the amplified signal should occur. In addition the slight reduction in gain will also help to reduce any tendency towards receiver overload on strong local signals due to the additional gain of the pre-amp.

I hope that these ideas are of use to you John - let me know what results you obtain.

I Can't Hear Anything

W Gooding of Essex has written with a question which I get asked fairly frequently - why can't I hear anything with my scanner on frequencies between 25-87 or 760-1300MHz?.

The answer is usually because of the type of antenna being used. In most cases this tends to be a discone. Although this offers a wide frequency range it provides no real gain. Most discones give good results from 100 to 500MHz, but outside these limits the performance tends to fall off rapidly.

At the lower frequencies most activity tends to be in the 27MHz CB band, 28-30MHz amateur band or 30-41MHz American utilities band. Reception varies with propagation conditions and can be very infrequent at times. Many people have found CB base station antennas to give good results on these bands. Connecting one of these to a scanner in place of a discone often gives surprising results on what previously seemed a very quite range of frequencies.

Moving slightly higher up in frequency, the bands between 41-87MHz are used for a variety of purposes including military communications but as you would expect precautions are taken to minimise casual listening. The most commonly used frequencies in this band tend to lie either side of 49MHz where a whole range of type approved short range radio devices are permitted to operate without the need for a licence.

Most transmissions present at the top end of the frequency coverage of many scanners tend to be short distance point-to-point links, which tend to be difficult to find. Even the 934MHz CB allocation is relatively quiet. A lot of problems are caused to operators by the adjacent 935-950MHz cellular phone allocation. The large number of cells in use and the strength of the very local signals is usually enough to overload most CB equipment especially when it is connected to a high gain antenna, the use of which is essential if you want to receive signals from any distance. For this reason you should consider some form of directional beam antenna at these frequencies as discones simply do not give enough gain.

This brings up one very important point about scanners. Just because a receiver is capable of reception on certain frequency ranges it does not automatically follow that you will hear anything on them. Some frequencies are just not suitable for reliable communications and so tend not to be used for commercial purposes. The 30-50MHz band is a good example because the propagation conditions are such that during the summer months signals from European broadcasting stations are very strong at times and in the winter, American signals can often be heard. The rest of the time the band is very quiet, but it is difficult to use it commercially because of the interference present when conditions are good.

Most of the activity you can hear with a scanning receiver tends to lie between 85-470MHz. This is because it happens to be the most suitable range of frequencies for mobile communications. The propagation characteristics give reasonable base station coverage with a consistent range which is not affected by atmospheric or seasonal variations. This does not mean that frequencies outside this range are not used - it's just not quite so easy to find them, but that's half the fun.

That's all this time around - Good Listening.

decode

Mike Richards G4WNC
200 Christchurch Road, Ringwood, Hants BH24 3AS.

Ian Mason of Catrine, Ayreshire is an experienced utility listener who currently runs the Wavecom 4010 decoder. On the receiver front, he has a very powerful set-up with a Kenwood R-5000 and the impressive NRD-525. This is further enhanced by the addition of a Datong FL3 audio filter. Having a particular interest in FAX, one of the problems he has encountered is the limited life of printer ribbons. The obvious solution seemed to be to re-ink the ribbons, but this turned out to be fraught with problems. Ian tried many products on the UK market but felt that they didn't have the right lubricating properties.

The solution (excuse the pun!) was some ink from Universal Shortwave Radio in the States. Ian reports great success with this ink and it appears to have right lubricating qualities. One point I have noticed is that for best results with FAX, new ribbons should be avoided as they tend to be too wet. This causes the loss of some fine detail. If any of you have any experiences to relate regarding printer ribbons, drop me a line with the details.

Another question raised by Ian is what is meant by expressions like Epson and IBM compatible. Well these are terms used to indicate the range of facilities and commands for certain types of printer or computer. If you are interested in FAX you may well find that your decoder states the printer should be Epson FX-80 compatible. This means that you can connect any printer, so long as it accepts the same commands as an Epson model FX-80 printer. The reason Epson is used, rather than any other manufacturer, is simply because they became accepted as the market leader.

Confusing

As far as computers go, the situation is much the same with the IBM PC having been accepted as the standard office computer. The term IBM compatible is used to describe a computer that runs software designed originally for the IBM PC. Another term to watch is IBM clone, this means much the same as IBM compatible but you have to watch out because some 'clones' are not totally compatible - confusing isn't it!

Howard Butcher of Dalkeith has recently gained an interest in utility listening. His station currently comprises the popular Sony ICF-2001D receiver which feeds a Microreader MK2 decoder. The antenna for this system is a standard long wire, which in this case is approximately 30m long. Howard reports very good results from this set-up and has been regularly monitoring IRNA RTTY on 8.049MHz. On the c.w. front he has managed very successful copy from the American weather station on 4.0023MHz. Howard's next ambition is to pass the RAE so he is currently trying to get to grips with the Morse code - good luck.

Mr D. Newby of Hull is another Microreader user and he has recently invested in a serial printer. This enables him to keep a permanent record of some of the more interesting stations. The actual printer he uses is a second-hand Olivetti PR15 supplied by Procom Electronics. One of the problems with a printer can be the wasted paper while waiting for an interesting transmission. The solution is simple - just take the printer 'off line'. That way the unwanted data is disregarded, but useful data can be printed at the touch of a button. This only works with the Microreader because it takes no account of whether or not the printer is ready when it sends its data. With a conventional link between computer and printer this system would fail because the computer would save all the data until the printer came back on line.

David Murphy writes from Sale about his experiences with aeronautical monitoring. These h.f. RTTY transmissions contain details of flight plans and so can be very useful for identifying voice transmissions. The equipment in use comprises an ERA Microreader and an old Panasonic DR26 receiver. However, despite its age the receiver seems to perform very well judging by the log David sent me. Because of the complex nature of aeronautical RTTY transmissions he has developed a system where he records the transmission on a cassette recorder. This allows him to pause where necessary so he can write down all the important details.

Colin Bird of Swaffham has been a utility fan for some time and has recently joined the local radio club. He doesn't say which club it is, but they certainly sound like they're a very friendly bunch. Colin reports that they have all been very friendly and helpful - he has even got the bug for amateur radio and he hoping to study for the RAE next year.

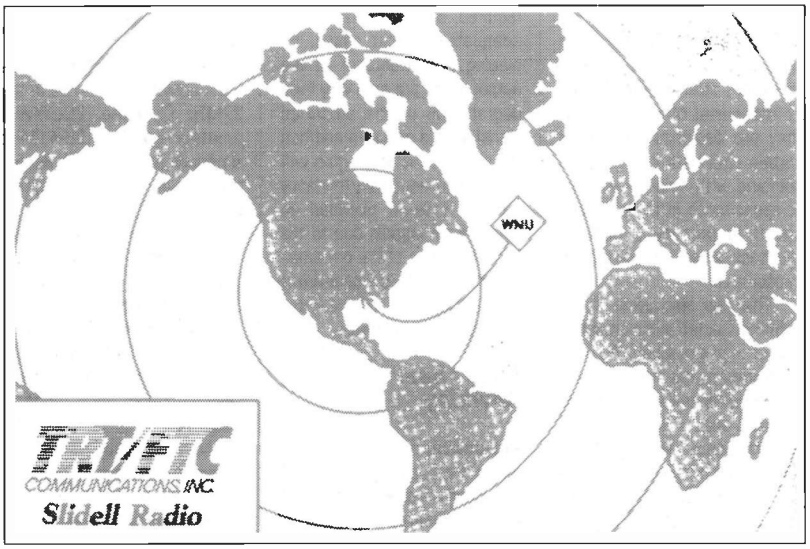


Fig. 1: QSL card from the Coastal Radio Station WNU.

Next comes a request for help from **Philip Mitchell** of Newbury. He currently runs a Lowe HF-125 receiver with a 30m long wire antenna. The problem lies with his Sirus computer as he would dearly like to use it to receive c.w., RTTY and FAX. I'm not aware of any radio software for this model, but as it runs CP/M 86 and MS-DOS1.25H there may be something available from the software library. The best place to try is the Pubic Domain Software Library, Winscombe House, Beacon Road, Crowborough, East Sussex TN6 1UL. If you know of any software for this computer, perhaps you would be kind enough to drop me a line so I can pass it on to Colin.

Gordon Beckett of Saltford has been a keen short wave listener since he received VK2ME on a home brew, single valve receiver at the age of 13. During his Wireless Operator service during the war he mastered c.w. and has been a keen fan ever since. However, until recently he has always regarded RTTY, FAX, etc as interference. Now that he has equipment to decode those modes, his opinion has changed somewhat and he is now an avid fan!

Bill Horner of Glasgow is another experienced listener with some 35 years of experience. Unfortunately Bill has been rather ill and this has prevented him taking up his ambition to become a licensed amateur. I would suggest that he contacts the RSGB before giving up, as they can sometimes make special arrangements for people with limited mobility.

Mr R. Hall of Mansfield has recently purchased an Amstrad PC-2086 computer and would like some advice about which program to choose to give coverage of RTTY, c.w. and FAX. There are in fact many options available, as the Amstrad is an IBM compatable machine. The most comprehensive is the Code-3 from Hoka that I reviewed in a recent *Short Wave Magazine*. This program covers almost all the modes in common use and provides some very sophisticated analysis modes. In the original package the manual was rather poor, but this has now been improved somewhat. I now use this program myself and can recommend it as being very comprehensive. If you are new to utilities I would strongly recommend that you keep to the simple modes like RTTY and c.w., exploring the others when you've built up some experience.

Other programs available include a very useful package from Grosvenor Software. The only point about this one is that it is designed with the amateur in mind so has transmit capabilities and some features that would be of little use to the listener. Comar Electronics on the Isle of Wight distribute the very successful PC-HF FAX program that enables FAX reception on the PC. They also sell PC-SWL that provides Morse, RTTY and FEC modes. The latest product on the market is the ICS-FAX which, as the name suggests, provides FAX reception facilities. I've just received a review copy of this so keep your eye on the magazine for the review.

I have had two letters from Amstrad PCW8256 users wanting to use these computers for RTTY, FAX, etc. It always seems such a waste that these computers have so little radio software available. The only source of RTTY software was a program that used to be supplied by BARTG. Although it was designed primarily for the radio amateur, the program was useful for the listener.

If you have written or bought radio software for the PCW8256 series please drop me a line and I'll print the details in the column.

Station Profile

This month I have a slightly unusual station to feature - the oceanic survey vessel *Tyro*. The details have come from **Jan Nieuwenhuis** who, in addition to being a keen listener, is the radio operator on the ship.

Let's start with a few details of the ship itself. The overall length of the *Tyro* is about 85m and she started life as a general cargo ship on the Holland - France - Ireland Line. The cargo carried varied from refrigerated cargo through livestock to cars and passengers.

In her current role as an oceanographic survey ship she carries only containers. These contain complete workshops and labatories for oceanographic research. She also has winches that are used for lowering underwater measuring equipment to depths of up to 6km!

Like most modern ships, her main communications are based around the Inmarsat satellite system that handles telephone, telex and FAX. However, the old h.f. based system is still in use. The details of this equipment are shown here:

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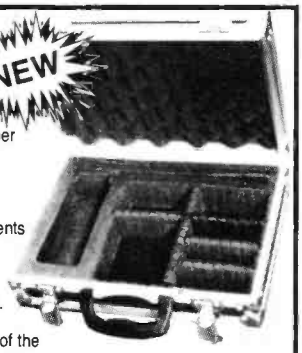

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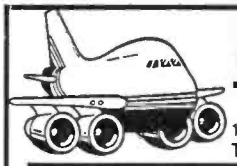

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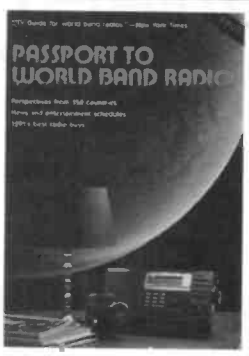

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Danmar HF1200 m.w. and s.w. transmitter (used for Telex and s.s.b.)

Danmar R201 m.w and s.w. receivers

Microlog Entor Sat Telex (SITOR-A) used with HF1200.

Koden FX759S l.w.,m.w. and s.w. FAX converter.

Besides all this, Jan uses a Drake R7 receiver and IBM compatible computer for personal reception of RTTY and FAX.

My thanks to Jan for supplying the data for this feature.

Standards?

A bit of an obscure title I know, but I think it's time we tried to pull together some standard names to describe the transmissions that we monitor. You may be thinking - what's the problem RTTY and FAX are not confusing. This is true, but when we start looking at some more complex modes life can get a little confusing. A simple example of this is the commonly used ARQ mode the amateur version of which is known as AMTOR. This gets called all manner of names such as: ARQ, SITOR, SPECTOR, CCIR476, Mode A, etc. What we need to do is select a name that accurately describes the mode and is unambiguous. It sounds simple but I can assure you it's not. Probably one of the best starting points is to use the technical definition. These comprise mainly CCIR recommendations and for AMTOR this would be CCIR recommendation 476-4 mode A.

The only problem I see is that there are a number of systems that are based on a CCIR recommendation but don't comply exactly. These variants would have to be indicated by a qualifier to the basic mode name. This could mean rather long mode names that would be a problem when used in frequency lists. One way around this would be to use just the CCIR recommendation number followed by a qualifying letter i.e. SITOR could become 476-4A. Although this would give a short and unique identification, it's not very readable! The answer could be to include a small panel in the column that would give the equivalents thus:

476-4A = AMTOR, SITOR, SPECTOR, ARQ Mode A.

Before I complile a complete list of modes, I would like to hear your comments on your preferred way on indicating the mode.

PC HF FAX Update

I reviewed this popular program some months ago and have been using it ever since. This period of extended use has brought to light a few weaknesses. I'm pleased to say these have now been corrected by John Hoot, the author of PC HF FAX.

The latest version is Ver 5.0 and is now available from Comar Electronics. I will give a fuller update once I have had time to evaluate it, but if you can't wait try contacting Comar direct. Details can be found in their regular advertisments.

Guide To Utility Stations 1991

I've just received my review copy of the very popular *Guide to Utility Stations*. I'll be doing a full review in the magazine, but I though I'd give you a brief insight into the main changes. The first point to note is the printing quality. Not only has the paper been dramatically improved, but a much clearer typeface has been used throughout. This makes the whole book far easier to use than previous editions.

Another important change is the inclusion of an extra chapter dealing specifically with the marine band frequency changes that are due to occur in July 90.

I think that if, like many readers, you just buy these guides occasionally then the 1991 edition is one not to miss.

Useful Addresses

Universal Shortwave Radio, 280 Aida Drive, Reynoldsburg, OH 43068, USA.

Hoka UK, 84 Church Street, Langford, Biggleswade, Beds SG18 9QA. TEl: (0462) 700644.

Grosvenor Software, 2 Beacon Close, Seaford, East Sussex BN25 2JZ.

Comar Electronics,1A Birmingham Road, Cowes, Isle of Wight PO31 7BH.

BARTG, Ann Reynolds, 169 Bell Road, Coventry CV6 7GW. Tel: (0203) 668491.

RSGB, Lambda House, Cranbourne Road, Potters Bar, Herts EN6 3JE.

Pubic Domain Software Library, Winscombe House, Beacon Road, Crowborough, East Sussex TN6 1UL

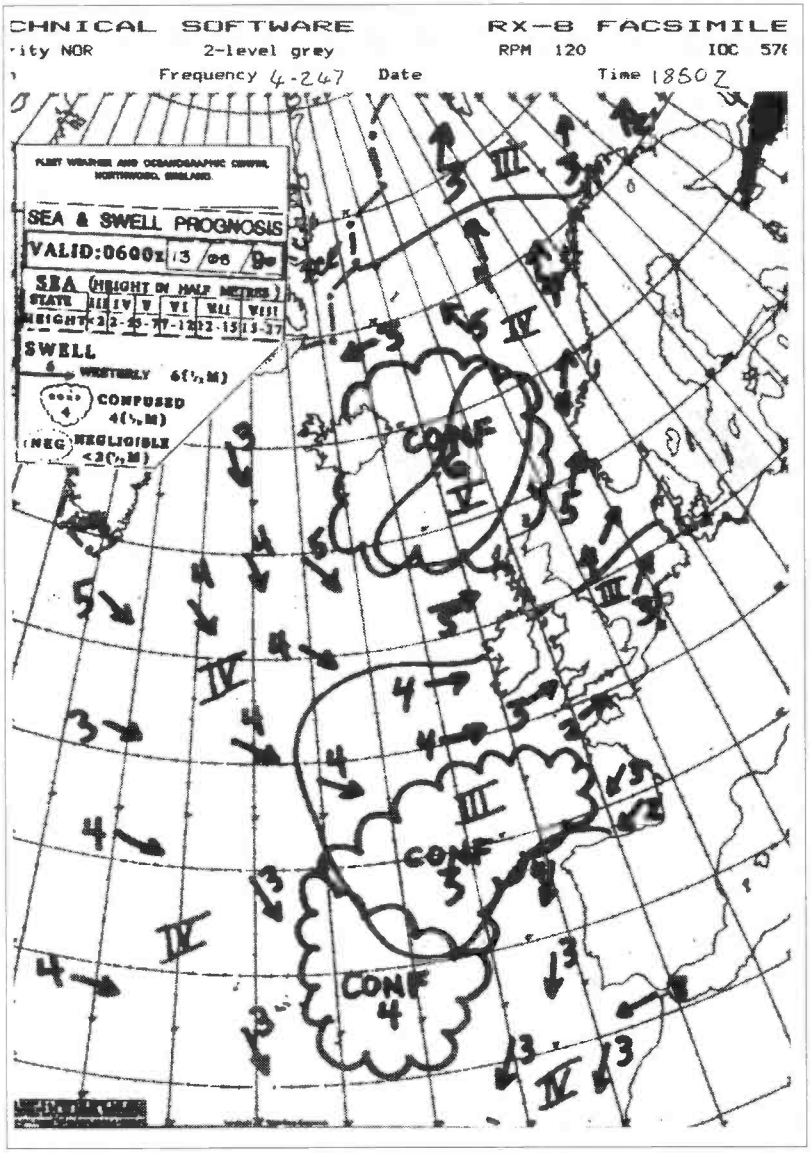


Fig. 2: Weather map from Northwood on 4.247MHz at 1850Z.

Gulf Update

It would appear that in the December column a few errors crept into my list of Gulf press stations. Just to get the record straight, here's a list of English news broadcasts from the area:

5.055 & 6.83MHz, Petra Amman, 50 baud, 1700 - 1900UTC
7.8MHz, Irna Tehran, 50 baud, 1500 - 1730UTC.
8.049MHz, Irna Tehran, 50 baud, 1900 - 2030UTC
8.1375MHz, AA Ankara, 50 baud, 1500UTC
9.463MHz, Petra Amman, 50 baud, 0800- 0900 & 1700UTC
9.965MHz, Ana Aden, 50 baud, 1800UTC
14.56MHz, Petra Amman, 50 baud, 0800UTC
15.02MHz, Sana Damascus, 50 baud, 1600UTC
18.04MHz, AA Ankara, 50 baud, 0700, 0800, 0900, 1000, 1300UTC
18.56MHz, 19.2MHz & 19.98MHz, Irna Tehran, 50 baud, 1000 - 1100UTC

My thanks to **Maurice Lloyd** of Blackpool for the corrections.

Frequency List

I've received another bumper pack of logs this month and have included a sample here. The format is the usual; frequency, mode, speed, shift, callsign, time and notes.

117.4kHz, FAX, 120, 576, DCF37, 1138UTC, Offenbach Meteo.
139kHz, FAX, 120, 352, DCF39, 1126UTC, DPA Frankfurt.
2.474MHz, RTTY, 75, -, PBC32, 1614UTC, DN Noordwijk.
4.4425MHz, RTTY, 50, -, RGC72, 1919UTC, Kiev Meteo SYNOP.
7.88MHz, FAX, 120, 576, DDK3, 1016UTC, Hamburg Meteo.
8.4948MHz, FAX, 120, 576, GZZ40, 1056UTC, RN London.
10.6MHz, RTTY, 50, -, XVN37, 1545UTC, VNA Hanoi.
11.497MHz, RTTY, 50, -, SOL349, 1400UTC, PAP Warsaw English news.
11.536MHz, RTTY, 50, -, HHF49, 0800UTC, KCNA Pyongyang.
12.315MHz, RTTY, 50, -, RVW57, 1350UTC, TASS Moscow English news.
15.935MHz, RTTY, 50, -, SUA291, 1605UTC, MENA Cairo English news.

info in orbit

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

The three NOAA satellites NOAAs 9, 10 and 11 continue to provide regular pictures of our variable British weather. The December snow was clearly seen during the midday passes of NOAA 11. NOAA 9 passes the UK late in the afternoon by which time we are in near darkness. You can hear the signal change as the visible section switches over to near infra-red when it approaches the North Pole which, of course, is in darkness for some months.

The Chinese FENGYUN 1B weather satellite operates slightly differently to the NOAAs in transmitting visible and infra-red even in darkness. That means that the night 'visible' pictures are blank.

Watching the Russian METEOR satellites going south is quite interesting. METEOR 3/3 came back on in late November and has been transmitting good quality infra-red pictures while in darkness and then switching to visible pictures as it crosses the terminator. Its operation is quite erratic though and sometimes it doesn't transmit infra-red at all. METEOR 2/16 has continued to send visible format pictures followed by the older type of 20 lines per minute infra-red, but I cannot decode this slow scan transmission.

I mentioned last month about METEOR 2/20 coming on around November 17 for regular transmissions at last, using 137.30MHz. It was launched some weeks ago, but after a few minutes of slow scan infra-red telemetry it was switched off and I hadn't seen it since. Just after writing the last article, I noticed to my horror that METEOR 2/18 was in an almost identical orbit and therefore might be transmitting and not 2/20! It was only noticed because occasionally I do a predictions run for each Russian weathersat to see if any changes have happened, and I noticed that the times for both satellites were identical.

As if by an act of providence, I had just received a new satellite tracking program to try out which, amongst a quantity of other features, shows the satellite footprint superimposed on a very good map of the world. Another option displays the satellite's view of earth below. This program deserves several paragraphs to review its superb features, but for the purposes of identifying whether 2/18 or 2/20 was responsible I monitored the next pass very carefully. The a.o.s. times differed by a matter of seconds so the view had to be the deciding factor!

I checked that the program (called INSTANT TRACK) had the very latest Kepler elements and then waited for a.o.s. Both satellites were travelling southbound out of the northern polar regions and would therefore be off until they hit sunshine. The program shows the terminator and I could follow the satellites as they crossed into sunlight barely 30 seconds apart! At exactly the right time one came on and within a few minutes the land crossings could be seen to correspond to METEOR 2/20. I was using my framestore to display the picture and my computer to display the ground track. I must admit to having felt elated at being able to positively identify the satellite despite such close timings. As the days elapsed since that time, the difference has become much more marked and there is now no ambiguity.

This program is designed to assist those people who want to monitor a number of satellites and it does have sections that can drive a steerable antenna as well. It is a fast program and ideally should be used with an ECD or VGA monitor for the best quality picture. It covers 200 satellites and you can use various options to update the Kepler elements. A wealth of information, such as current satellite height, Doppler change and a lot more is available at the touch of a key.

There are various types of display available for a selected satellite. The usual one showing the footprint tracking across the map of the world, a 'bird's eye view' display, an orbital movement indication, and finally the satellite's movement across a star background!

Ideally, I would like to get a second-hand computer to leave this program running all the time! It runs on PC computers and is available from Timestep Weather Satellite Systems Ltd, Wickhambrook, Newmarket CB8 8QA Tel: (0440) 820040, price about £25.

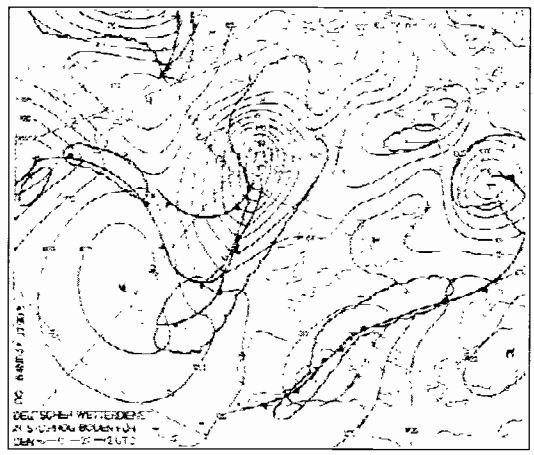


Fig. 1: METEOSAT WEFAX transmission from Andy Noctor.

Frequencies

NOAAs 9 and 11 transmit on 137.62MHz. NOAA 10 transmits on 137.50MHz. FENGYUN 1B transmits on 137.80MHz. METEORS may transmit on 137.30, 137.40 or 137.85MHz. OKEAN 2 transmits on 137.40MHz.

Letters

SWM has an international readership and student **Stanley Umoh**, who studies at a university in Nigeria, wrote to me asking for information on the design and construction of satellite receivers and dishes. He is wanting to build a METEOSAT receiving system as part of his degree studies. This is not an easy task because one cannot send copies of commercial receiver circuitry even if I had some designs. There are kits available, though, from the various advertisers in this magazine.

I do have a dish design somewhere, from when I built my own, but since that time commercial dishes can be obtained at reasonable cost and are more aesthetically pleasing!

A letter from **LJ Nosworthy** of Polegate told me about his early interest in radio back in 1930 when he used a Hallicrafters 'SkyRider' receiver and had a good collection of QSL cards until a bomb fell on the house. He has recently bought an AOR 1000 and a Sony discone antenna to resume s.w. listening and asked for some predictions to convince his wife that the signals were from satellites.

Several correspondents have requested Kepler elements in recent weeks and each set was despatched within a few days.

Interference to the 136MHz band suffered by some listeners has been experienced by a writer from Shalfleet. **Bert Bareham** has built his own receiver but lives only 2km from a television transmitter which may be causing problems. He fitted a pre-amp which seems to have improved matters. Bert asks about software for the Amstrad CPC464 computer for picture decoding. The only software that I have heard of for this machine is the Maplin unit which also requires hardware as well. He had wondered about building a framestore - its a long job Bert!

Another computer needing satellite programs is the Amstrad PCW8256 and a letter from **Chris Hilton G4UPZ** of Leicester asked me whether I knew of any. I would suggest contacting the PCW Computer User Group which might have a program to at least predict satellite passes. Chris has a Lowe HF-225 general coverage receiver which won't hear the weathersats but might pick up some of the 29MHz satellite transmissions. His AOR AR2002 v.h.f. receiver will pick up many satellites in the various bands but its rather narrow bandwidth will not provide a good enough signal for producing quality pictures.

SALYUT7

This large spacecraft/satellite combination should have re-entered the atmosphere a week or two before *SWM* publication date. It was originally going to be retrieved by the Russian *Buran* space shuttle but it seems that they were not ready in time.

FENGYUN 1B

One observant satellite listener, **B Berman** of Burton on Trent, asks whether there is a problem with the antenna on FENGYUN 1B because he has noticed the variations in signal strength as the craft passes over us. I think I forgot to mention that, just to be different, this Chinese satellite transmits left-circularly polarised signals instead of the standard right-circular polarisation used on all the other weathersats! I was puzzled about the fluctuations seen on most passes and then heard about an American noticing the polarisation change. If you try reversing one of the dipoles on a crossed dipole you should see an improvement. Mr Berman has sent me a list of other satellite signals that he noted during 1990 including some I haven't heard. The transmission on 136.11MHz appears to be from MOS-1B which is a Japanese Marine Observation satellite launched last February.

More Letters

Andy Noctor of Ventnor on the Isle of Wight built his own vertical dipole which gives excellent results and added a mast head pre-amp. He has an AT 286 PC running the PC GOES software and plans to upgrade the display to VGA in due course. He is using Maplin hardware to receive METEOSAT signals but does not comment favourably on this. He also seems to suffer from paging interference which comes from transmitters adjacent to 136MHz. Recent receivers have been modified by the careful selection of filters as was my own scanning receiver. You can recognise the interference which occurs approximately each minute and lasts several seconds. Andy has sent me several print-outs from his equipment featuring different satellites so I have selected a WEFAX map for **Fig. 1**.

You can see that **Fig. 2** is a screen photograph of mine showing Greenland as you may not have seen it before! METEOR 3/3 has a higher orbit than most and I can follow it for the length of the ice lands. The actual screen image is much better than the print suggests.

RIG

More readers have commented to me on the long delays between issues of the magazine of the Remote Imaging Group. I have also experienced some problems there and I hope that the committee will take some action soon. The address for those who don't know it is: Remote Imaging Group, Des Watson, Norton, Gote Lane, Ringmer, Nr Lewes, East Sussex BN8 5NX.

Picture Formats

There may be some confusion about FAX pictures and weather satellite pictures by those who are fairly new to the monitoring

of utility stations and satellite transmissions. There is scope for further confusion as well because some of the METEOSAT pictures are re-transmitted by utility stations in FAX format!

Automatic Picture Transmission

All the weather satellites transmit their pictures using a.p.t. format which means that the picture detail, the grey levels such as clouds, land and oceans are represented in the signal as amplitude modulation on the 2.4kHz sub-carrier, which itself frequency modulates the main r.f. carrier. This is an unusual form of signal modulation but has not changed since its use on the first weather satellites back in the sixties. With experience you can identify some types of picture content just by listening to the signal. A set of shower clouds gives a very recognisable 'crunchy snow' feel to the sound.

This means that the same equipment can be used to decode the American NOAA and GOES satellites, the Russian METEORS and oceanographic satellites, the Chinese FENGYUN, and ESA's METEOSAT transmissions.

The polar orbiting satellites transmit their pictures in a continuous form, give or take periods of eclipse in the case of the METEORS and when a transmitter is switched off for other purposes such as with NOAA 9.

METEOSAT a.p.t. transmissions, like those from GOES are in a similar format but with the difference that the transmissions are in four minute sequences. Being a geostationary satellite it broadcasts almost continuously each 24 hours according to a timetable. These frames begin by transmitting a 'start tone' and end with a 'stop tone'. This allows selected frames to be stored and animated for weather forecasting purposes.

These directly broadcasted pictures from the geostationary satellites are somewhat similar to terrestrially transmitted FAX pictures in having start and stop tones, each allowing equipment to recognise what is happening next. The difference ends here though because the FAX pictures broadcast by utility stations are of a different type and with different tones and characteristics. For more details on utility FAX broadcasts see Mike Richards' 'Decode' column in this magazine.

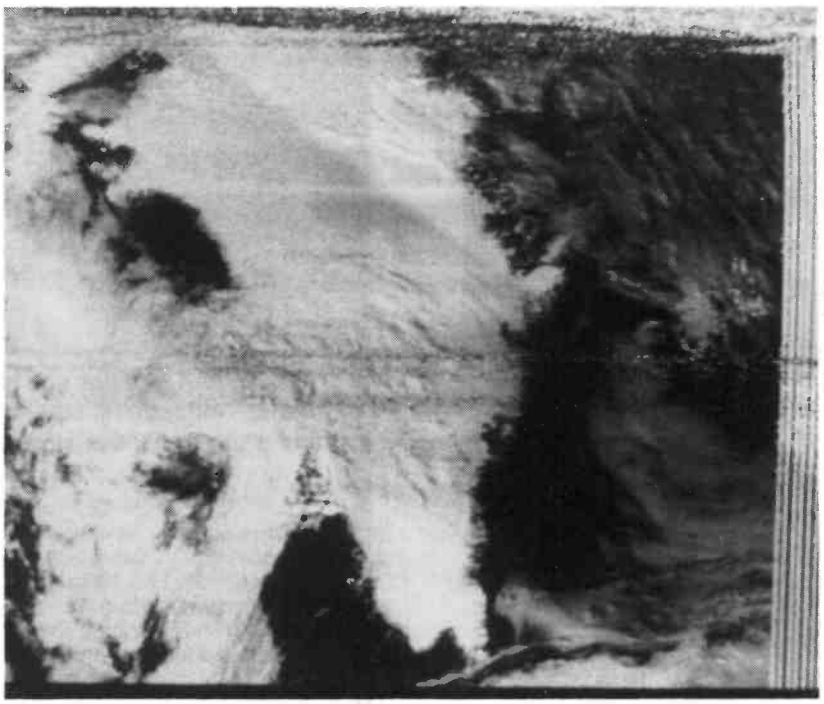


Fig. 2: Greenland in summer, a METEOR 3/3 view.

FAX

Some of METEOSAT's a.p.t. pictures are collected by the ground stations and re-broadcast in FAX format by the utility stations. This means that you cannot use satellite a.p.t. decoding hardware or software to decode FAX pictures. In practice you may get an image of sorts but it will be barely recognisable. My framestore has produced rather unusable images from these FAX transmissions while I was experimenting.

Consequently if you wish to decode both types of pictures, direct satellite and utility station transmissions, you will need two sets of hardware and software, and such equipment is advertised by various companies.

Computers

SWM reader **C Hewitt** of Battersea in London wrote to ask about hardware for decoding a.p.t. with his Amstrad 2086 computer. This machine runs IBM PC compatible programs of which there are several available for satellite work, though not all are advertised in *SWM*! I will write to the companies that produce this hardware and software and produce a summary in a future column.

I had a look in a local computer shop to see what the Amstrad 2086 has for a monitor and was pleased to note that it uses a VGA screen. This is a high resolution standard and is almost essential if you want to see everything that is there! I had to buy a new computer for other reasons and so I spent some time looking at what was available. I actually teach computer literacy and applications software and so I was fortunate in being able to look into specifications with some knowledge.

Before buying a computer you really do need to decide exactly what you wish to use it for and this helps you do work out what it should be able to do. I am storing lots of data for analysis and so a 40Mb hard disk was required. Allowing for current and future developments in satellite decoding requirements I wanted a fast machine and so decided on a 80286 processor. In the end I opted for a Solidisk Technology Ltd computer with a Tystar monitor. Yes, it set me back a bob or two!

My next decision was the upgrading of my a.p.t. decoding software. Some three years ago I bought an expensive unit after seeing a demonstration but sorry to say that was a mistake! Only later at home did I realise the previously unrecognised limitations of that system. That is why I gave a list of minimum requirements a few months back, for those considering the purchase of a new system.

Bugs

I was disappointed that the producers of that equipment did not follow up their system with improvements, etc., for those who had previously purchased from them, or even correct the bugs that I found! This leads me to wonder whether this column could be of service to readers experiencing trouble with equipment or manufacturers. I will talk to our esteemed editor about the feasibility of this idea!

In the end I purchased the VGASAT system together with the computer described above from Timestep Electronics after some rather searching questions! I am concerned that manufacturers should provide a reasonable support service and when Timestep agreed to fix any bug that I could find then that was a challenge. I hammered the 'animate' program (which deserves a review) but it did not break. My only criticism of it was its relatively small screen area used, but Timestep have agreed to look at that for the next release.

User Friendly

The software itself is extremely user friendly and when the METEOSAT schedules were changed last August I was able to update everything in a matter of minutes.

Correspondence is welcome and do feel free to say what sort of data or information would be of help. Also, I prefer to include your pictures rather than too many of my own and these will be returned without the need for an s.a.e. by way of thanks.

Doppler Effect: The effective change of frequency of a received signal due to the relative velocity of a transmitter with respect to the receiver. In space communications, the frequency shifts due to the Doppler effect may be significant when the velocity of the spacecraft relative to earth is high; the frequency shifts are used to determine the velocity of vehicles.

ESA: European Space Agency, formed in 1975 combining the activities of the European Space Research Organisation and the European Launcher Development Organisation. ESA, an intergovernmental agency, coOordinates European space activities and related technologies. In particular, it instigates and manages international space programs on behalf of its thirteen members states.

NASA: National Aeronautics & Space Administration responsible for civil space activities in the US, both research and development.

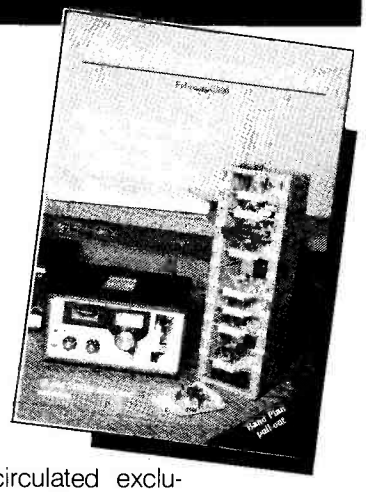
Abbreviations

a.o.s.	acquisition of satellite
a.p.t.	automatic picture transmission
ECD	enhanced colour display
ESA	European Space Agency
FAX	facsimile
kHz	kilohertz
km	kilometre
Mb	megabyte
MHz	megahertz
NOAA	National Oceanic & Atmospheric Administration
QSL	acknowledgement of contact
r.f.	radio frequency
s.a.e.	stamped addressed envelope
s.w.	short wave
v.h.f.	very high frequency
VGA	versatile graphical array

Other Useful Addresses

PC GOES software is available from Comar Electronics, 1A Birmingham Road, Cowes, Isle of Wight PO31 7BH. Tel: (0923) 200308.
Maplin Electronics, PO Box 3, Rayleigh, Essex SS6 8LR

'RAD COMM' for the Radio Amateur



'Radio Communication' is internationally recognised as one of the world's leading journals for the radio amateur and short-wave listener. Published monthly by the Radio Society of Great Britain, it is circulated exclusively to members of the Society and carries wide ranging and authoritative articles, technical reviews and data essential to those seeking to keep themselves briefed on the most up to date developments in the hobby. Regular columns cater for HF, VHF/UHF, microwave, satellite, data transmission and QRP enthusiasts. Regular constructional articles are supported by a PCB service.

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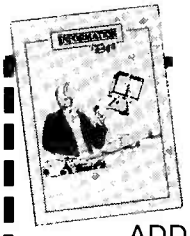

PLEASE SEND YOUR PACK

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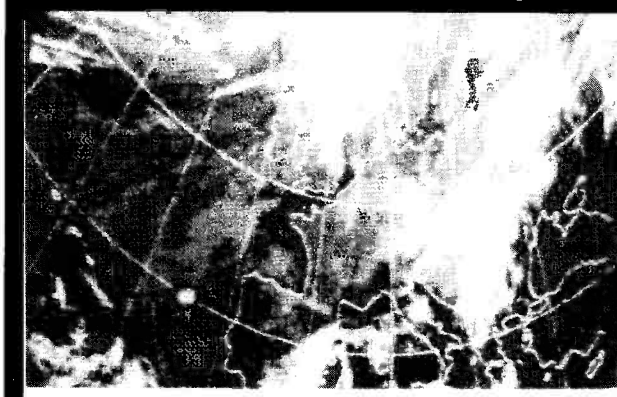
RSGB

PC HF FAX 5.0



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Access

long medium & short

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Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

All l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during November.

Deep fading has been noted at sunrise on the transmissions from Donebach, Germany (500kW) and Brasov, Romania (1200kW) on 153kHz by **Roy Hill** in West Kilbride. Although he has observed this effect before during the winter months, he has been unable to check if this happens at sunrise during the summer period. Reports from DXers who have noted similar effects would be welcome.

Although **Eddie McKeown** (Co.Down) has monitored the broadcasts on 216kHz for lengthy periods, he has been unable to obtain confirmation that they originate from Oslo, Norway. No doubt there is a language barrier, but some of the l.w. broadcasters seem to be reluctant to make station announcements! If you have any suggestions which may help Eddie and other DXers to overcome this difficulty, please send them along to me for publication in LM&S.

MW Transatlantic DX

The reception of any m.w. transatlantic signal in the UK during the early evening is very unusual. So it was no wonder that **Peter Dixon** (South Molton) was surprised to receive the broadcasts from VOCM in St.John's, NF 590kHz on November 25 at 1904UTC. That is about half an hour before their sunset! Another report of early reception came from **Tim Shirley** in Bristol. At 2030 on October 27, he picked up the broadcasts from WFAN in New York on 660kHz.

Writing from Co.Wexford, **Bart O'Brien** says, "My highlight this month was hearing CJYQ, NF on 930kHz and getting a QSL". **Leo Barr** heard CJYQ for the first time on November 6, he rated their signal in Sunderland as 23222 at 2327. **Roy Patrick** (Derby) often hears CJYQ around 2330 - a good tip for anyone wishing to try this aspect of our hobby for the first time. CJYQ were also noted in a first report from **John Cooper** in Hull, between 2350 and 0210 he logged eight stations in Canada, the USA and the Caribbean area.

Some of the broadcasts from the Caribbean area were logged by **Jim Willet** (Grimsby) between 0200 and 0300. Using a home-built 4m square loop ahead of his trusty RCA AR77 receiver, he rated most of them as SIO222. The most potent signals to reach him originated from CJYQ 930, rated SIO333 at 0150 and WQXR in New York 1560, rated SIO332/3 at 0220.

Medium Wave DX

Freq (kHz)	Station	Country	Power (kW)	DXer
531	Ain Beida	Algeria	600	I*,U*
531	Torshavn	Faroe Is.	5	F
531	Leipzig	Germany	100	I*,L*,M*,Q
531	Oviedo	Spain	10	L*,M
540	BRT-2 Wavre	Belgium	150/50	E*,I*,M,P,Q,S*
540	Sidi Bennour	Morocco	600	U*
549	Les Trembles	Algeria	600	M,U*
549	Bayreuth	Germany	200	I*,L*,M,Q
558	Espoo	Finland	100	H*,L*
558	Valencia	Spain	20	I*,L*,M
558	Cima di Dentro	Switzerland	300	U*
567	Berlin	Germany	100	I*,L*,M*
567	RTE-1 Tullamore	Ireland (S)	500	E*,G,I*,M,N,P,S*
576	Stuttgart	Germany	500	L*,M,S*,T*
585	RNE-1 Madrid	Spain	200	K*,L*,M,P,S*,T*,U*
594	Pleven	Bulgaria	250	M,U*
594	Frankfurt	Germany	400	L*,S*
603	Lyon	France	300	M
603	Sevilla	Spain	20	L*
603	BBC-R4 Newcastle	UK	2	L*
612	RTE-2 Athlone	Ireland (S)	100	E,I*,L*,M,N,P,S*
612	Sarajevo	Yugoslavia	600	U*
621	RTBF-1 Wavre	Belgium	80	E*,I*,L*,M,N,S*
621	Batra	Egypt	2000	U*
630	Vigra	Norway	100	L*,N
630	Timisoara	Romania	400	U*
639	Liblice	Czechoslovakia	1500	E,I*,L*,S*
639	La Coruna	Spain	100	I*,L*,M,U*
648	Palma de Mallorca	Spain	10	A*
648	BBC Orfordness	UK	500	E*,I,L,M
657	Burg	Germany	250	E,I
657	BBC-R.Wales Wrexham	UK	2	L*
666	Bodenseesender	Germany	300/180	I*,P,S*
675	Marseille	France	600	L*
675	Hilversum-3 Lopic	Holland	120	I*,L*,M,N,S*
684	RNE-1 Sevilla	Spain	250	I*,K*,L*,M,S*,U*
684	Beograd	Yugoslavia	2000	S*,T*
693	Berlin	Germany	250	A*,H*
693	BBC-R5 Droitwich	UK	150	A*,I*,T
702	Banska	Czechoslovakia	400	U*
702	Presov	Czechoslovakia	400	U*
702	Aachen/Flensburg	Germany	5	L*,N
702	Zamora	Spain	5	L*,M*
711	Rennes 1	France	300	I*,L*,M,N,P,S*
711	Heidelberg	Germany	5	L*,U*
720	Langenberg	Germany	200	N
720	BBC-R4 Lisnagarvey	Ireland (N)	10	A,N
720	Norte	Portugal	100	L*,U*
720	BBC-R4 Lots Rd London	UK	0.5	M
729	RTE-1 Cork	Ireland (S)	10	B*,L*
729	RNE-1 Alicante	Spain	10	N
729	Oviedo	Spain	50	L*,M*
738	Paris	France	4	M
738	Poznan	Poland	300	B*,H*,I*,N
738	RNE-1 Barcelona	Spain	250	L*,S*,U*
747	Hilversum-2 Flevo	Holland	400	A*,E,I,L*,M
756	Brunswick	Germany	800/200	E,L*,M
765	Sottens	Switzerland	500	L*,M,P,T*,U*
774	BBC-R4 Enniskillen	Ireland (N)	1	L*
774	RNE-1 Caceres	Spain	60	U*
774	RNE-1 San Sebastian	Spain	60	L*
774	RNE-1 Valencia	Spain	50	M
783	Burg	Germany	1000	E,L*,M
792	Prague	Czechoslovakia	60	U*
792	Limoges	France	300	L*,N*
792	Sevilla	Spain	20	L*,M,T*
801	Munich	Germany	420	S*
801	Castellon	Spain	5	L*
810	BBC-Scot.Westerglen	UK	100	E,L*,M,N*,S*,T*
819	Sud-Radio	Andorra	900	N*,U*
819	Bordeaux	France	20	M
828	Sumen	Bulgaria	500	U*
828	Hanover	Germany	100/5	H*,L*,P
837	Nancy	France	200	E*,L*,M,N*
837	R.Popular, Sevilla	Spain	10	S*
846	Rome	Italy	540	A*,M,P,S*,U*
855	Berlin	Germany	100	L*
855	Murcia	Spain	125	M,N*,U*
864	Santah	Egypt	500	U*
864	Paris	France	300	E*,L*,M,N*,S*
873	AFN via Frankfurt	Germany	150	E*,L*,M*,N*,R*,S*,U*
873	R.Ulster,Enniskillen.	UK	1	L
882	BBC-Wales Washford	UK	70	E,L*,M,S*,T
891	Algiers	Algeria	600/300	L*,M,N,U*
891	Hulsberg	Holland	20	M,N*
900	Milan	Italy	600	L*,M,N*,U*
909	BBC-R5 Westerglen	UK	50	T
918	R.Intercont. Madrid	Spain	20	M
927	BRT-1 Wolvertem	Belgium	300	E,L*,M,N*,S*
936	Bremen	Germany	100	L*,N*,S*
936	Lerida	Spain	2	N*
945	Toulouse	France	300	E,L*,M,N*
945	Riga	USSR	50	R*
954	RCE Madrid	Spain	20	N*
963	Pori	Finland	600	E,L*,M,N*,O*,S*,T*,U*
972	Hamburg	Germany	300	L*,M,N*,P,S*
981	Alger	Algeria	600/300	H*,I*,U*
990	SER R.Bilbao	Spain	10	L*
999	Hoyerswerda	Germany	20	L*
1008	Hilversum-5 Flevo	Holland	400	E,I,L*,M,P,S*
1017	Wolfsheim	Germany	600	E,L*,M,S*
1026	Graz-Dobl	Austria	100	U*
1035	Prog.3 Lisbon	Portugal	120	L*,U*
1044	Burg	Germany	250	L*,U*
1053	BBC-R1 Droitwich	Uk	150	T
1062	Kalundborg	Denmark	250	E,I*,L*,M*,S*,U*
1071	Brest	France	20	L*,M
1080	Katowice	Poland	1500	U*
1098	Bologna	Italy	60	U*
1107	AFN via Munich	Germany	40	C*,U*
1107	RNE-5 Barcelona	Spain	20	C*,L*,M*
1116	Bari	Italy	150	U*
1125	La Louviere	Belgium	20	L*,M
1125	Stara Zagora	Bulgaria	500	U*
1134	Valencia	Spain	10	L*,M
1134	Zadar	Yugoslavia	1200	C*,E,M,S*,U*
1143	Century R. Dublin	Ireland (S)	?	L,M
1143	Kaliningrad	USSR	150	C*,I*,P,R*
1152	Cluj	Roumania	950	U*
1161	Strasbourg (F.Int)	France	200	C*
1179	Solvesborg	Sweden	600	D*,E,L,M,O*,T*,U*
1188	Kuurne	Belgium	5	M
1188	San Remo	Italy	6	U*
1197	VOA via Munich	Germany	300	U*
1197	BBC-R3 Enniskillen	Ireland (N)	1.0	L*
1197	BBC-R3 Bournemouth	UK	0.5	M
1206	Bordeaux	France	100	E,M
1206	Wroclaw	Poland	200	I*,U*
1224	Vidin	Bulgaria	500	U*
1233	Melnik	Czechoslovakia	400	E,P,U*
1242	Marseille	France	150	C*
1251	Marcali	Hungary	500	E,U*
1251	Huisberg	Netherlands	10	L*
1260	VOA via Rhodos	Greece	500	U*
1260	Valencia	Spain	20	L*,M*
1269	Neuminster	Germany	600	L*,M,P
1278	Strasbourg	France	300	E
1278	RTE-2 Dublin/Cork	Ireland (S)	10	H,L*,M
1287	Litomysl/Liblice	Czechoslovakia	300/200	E,M,R,U*
1296	San Sebastian	Spain	5	L*,M
1296	BBC Orfordness	UK	500	E
1314	Kvitsoy	Norway	1200	E*,L*,M,Q,T*,U*
1323	R.Moscow via Leipzig.	Germany	150	L*
1332	Rome	Italy	300	E,P,U*
1341	Lakihegy	Hungary	300	U*
1341	BBC-Ulst.Lisnagarvey.	Ireland (N)	100	E*,M
1350	Nancy/Nice	France	100	E*,L*,M
1359	Berlin	Germany	250/100	L*,P
1368	Manx Radio, Foxdale	IOM	20	L,M
1377	Lille	France	300	E,L*,M
1386	Kaunas	USSR	1000	E*,I*,L*,M,P,U*
1395	R.Tirana via Lushnje.	Albania	1000	I*,L*
1404	Brest	France	20	M
1413	RCE Zaragoza	Spain	20	U*
1422	Heusweiler	Germany	1200/600	L*,M,P
1431	Dresden	Germany	250	L*,U*
1440	Marnach	Luxembourg	1200	A*,E*,L*,M,R,T*
1458	R.Tirana, Lushnje	Albania	500	J*,P
1467	TWR Monte Carlo	Monaco	1000/400	I*,L*,M,T*,U*
1476	Wien-Bisamberg	Austria	600	L*,U*
1485	BBC-R4 Carlisle	UK	1	H
1494	Clermont-Ferrand	France	20	M
1494	Leningrad	USSR	1000	T*
1503	Stargard	Poland	300	E,I*,L*,R
1503	Beograd	Yugoslavia	10	U*
1512	BRT Wolvertem	Belgium	600	I*,M*,O*,T*,U*
1521	Oviedo	Spain	5	L*
1530	Vatican Radio, Rome	Italy	150/450	L*,U*
1539	Mainflingen	Germany	700	L*,M,U*
1557	DW via Cyclops	Malta	600	U*
1566	Sarnen	Switzerland	300	U*
1575	Burg	Germany	250	L*,M,U*
1584	Pamplona	Spain	2	Q*
1593	Langenberg	Germany	400/800	L*,M,P,Q,T*
1593	Cartagena	Spain	2	U*
1602	R.Onteniente	Spain	2	K*,L*,Q*
1611	Vatican Radio, Rome	Italy	5	Q*,U*

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

DXers:
A: Ted Agombar, Norwich.
B: Leo Barr, Sunderland.
C: Darren Beasley, Bridgwater.
D: Robin Clark, Plymouth.
E: Ron Galliers, London.
F: Simon Hamer, New Radnor.
G: John Hepburn, Ashington.
H: Simon Holland, Douglas, IOM.
I: Sheila Hughes, Morden.
J: Rhoderick Illman, Thumrait, Oman.
K: Cyril Kellam, Sheffield.
L: Eddie McKeown, Co.Down.
M: George Millmore, Wootton IOW.
N: John O'Halloran, Harrogate.
O: Chris Shorten, Norwich.
P: Cliff Stapleton, Torquay.
Q: John Stevens, Largs.
R: Darran Taplin, Brenchley.
S: Phil Townsend, London.
T: Paul Weston, Kettering.
U: Jim Willett, Grimsby.

long medium & short

Other MW DX

Unusual propagation conditions enabled the sky wave signals from two stations in Algeria to reach the UK after dawn. Les Trembles 549 and Algiers 891 were logged at 0700 by **George Millmore** in Wootton, IOW. The signal from Algiers was also heard by **John O'Halloran** in Harrogate at 0715, rated as SIO222.

After dark, the sky wave signals from several stations in N.Africa reached the UK. In Douglas, IOM, **Simon Holland** heard Alger, Algeria on 981, whilst in Co. Down it was logged as 23232 at 2155. **Sheila Hughes** (Morden) rated Ain Beida, Algeria 531 as 32222 at 2045. In Grimsby, Sidi Bennour, Morocco 540 was logged as SIO322 at 2015; Batra, Egypt 621 as SIO221 at 2110; Santah, Egypt 864 as SIO222 at 2210.

MW Local Radio DX

Some DXers have difficulty in logging Airport Information R. from Heathrow or Gatwick because they share 1584kHz. A directional antenna may help in some areas, but careful listening can also provide a clue. Sheila Hughes was able to log both simultaneously when a man read a weather report and a woman detailed travel information!

Short Wave Reports

Although long distance reception in the h.f. bands has been rendered poor or even impossible some days by the effects of solar flares, in general it has been noted as good. From time to time, a high level of solar noise has also been evident, which has masked the weaker signals. Such effects are likely to continue.

The 25MHz (11m) band is now being used by R.Australia to reach their forces in the Gulf area. A report from **Rhoderick Illman** in Oman indicates that their transmission on 25.750 via Carnarvon? (Eng 0800-1000) rates SINPO 44444. It has also reached **Kenneth Reece** in Prenton at 44444, but there has been some co-channel interference from a pulsed transmission. Perhaps the BBC should consider using this band to reach our troops in the Gulf area because their broadcasts to W.Africa via Daventry, UK on 25.870 (Fr 1200-1245) are being received in Oman at 44444.

The broadcasts from R.HCJB in Quito, Ecuador on 25.950 can be received in the UK during much of the day. Their 30kW u.s.b. + pilot carrier transmission was rated 44333 at 0722 by **Ted Agombar** in Norwich, as 45544 at 1200 by **Peter Easton** and SIO354 at 1950 by **Kenneth Buck** both in Edinburgh.

Good reception of R.Australia's **21MHz (13m)** broadcasts to the Gulf via Carnarvon on 21.775 (Eng 1300-1500) has been noted in that area. A typical UK rating is SIO454 at 1415, heard by **Simon Hamer** in New Radnor, but at times there is co-channel interference. Some of their broadcasts to other areas have also been reaching the UK. Their signal to C.Asia via Darwin 21.525 (Eng 0100-0900) was rated as 23432 at 0832 by **Andy Cadier** in Folkestone, whilst those to S.Asia via Carnarvon 21.775 (Eng 0100-1300) were rated as 33323 at 0912 in Sunderland. Signals to E/C.Asia via Darwin 21.825 (Jap, Eng 1000-1230) were logged as SIO212 at 1212 by **Philip Rambaut** in Macclesfield.

There are many broadcasts to Europe during the day. Some noted were R.Japan via Moyabi, Gabon 21.690 (Eng, Jap 0700-0800), rated 54344 at 0715 by **Chris Shorten** in Norwich; UAE R.Dubai 21.605 (Ar, Eng 0600-1640) 55555 at 1600 by **John Nash** in Brighton, also 21.675 (Ar, Eng 1000-1400) 53553 at 1030 by **Darren Beasley** in Bridgwater; WCSN Scotts Corner, MN 21.780 (Eng 1400-1600) 44444 at 1415 on the IOW; RCI via Sackville, Canada 21.545 (Eng 1715-1730) 55454 at 1730 by **Ron Damp** in Worthing; WYFR via Okeechobee, FL 21.615 (Eng 1900-2000, also to Africa) SIO555 at 1930 in Harrogate; also 21.525 (Eng 2000-2300, also to Africa) SIO344 at 2000 in Edinburgh; R.HCJB Quito, Ecuador 21.480 (Eng 1900-2000) 54444 at 1951 by **Jim Cash** in Swanwick.

Some of the numerous broadcasts to other areas have also been heard here: VOA via a relay 21.600 (Eng to Gulf area 0455-?), noted as 44444 at 0455 in Oman; BBC via Tsang Tsui, Hong Kong 21.715 (Eng to C.Asia 0300-0900) 33333 at 0819 in Prenton; R.Finland via Pori 21.550 (Eng, Fin, Sw to E.Asia 0830-0957) SIO433 at 0900 by **Cyril Kellam** in Sheffield; BSKSA Riyadh, S.Arabia 21.505 (Ar to ? 0800-1700) 45444 at 0915 in Derby; SRI via Schwarzenburg, Switzerland 21.770 (Eng, Fr, Ger, It to E.Asia 1045-1300) 44444 at 1101 in Co. Down; R.Austria Int, Vienna 21.490 (Ger, Eng to E.USA 1100-1300) 33222 at 1249 by **Ron Galliers** in London; BBC via Limassol, Cyprus 21.470 (Eng to E.Africa 0900-1615) 33433 at 1300 in Edinburgh; BSBS via Daventry, UK? 21.735 (Eng to Gulf area 1330-1400) 32222 at 1330 by **Simon Clarke** in the Gulf area; RFI via Issoudun, France 21.770 (Eng, Fr to SE.Asia 1400-1600) 44334 at 1450 in Norwich; R.Portugal via San Gabriel 21.530 (Port, Eng to S.Asia, Middle East 1500-1630) 55555 at 1600 in Morden; R.Nederlands via Bonaire, Ned.Antilles 21.630 (Ar to N.W.Africa 1730-1825) SIO444 at 1817 by **John Coulter** in Winchester.

Much to the annoyance of listeners in the UK, the **17MHz (16m)** broadcasts from R.New Zealand Int, Wellington 17.675 (Eng 2111-0705 Mon-Sat; 0000-1110 Sun) are being marred by a co-channel interference from R.Moscow, which commences at about 0600. Earlier in the morning, however, it has been possible to receive their 100kW transmission from Rangataiki (N.Island) in the UK on some days. Typically their signal rates SIO343 at 2200 in New Radnor; 33333 at 0250 in Norwich; 24442 at 0458 by **David Edwardson** in Wallsend and 23322 at 0531 in Prenton.

The many broadcasters to areas outside Europe include R.Japan, Yamata 17.890 (Eng, Jap to SE.Asia 0500-1000), noted as 43333 at 0900 by **Alan Smith** in Northampton; KHBI Saipan, N.Mariana Islands 17.555 (Eng to SE.Asia 0600-?) SIO333 at 0907 in Macclesfield; R.Tashkent, USSR 17.740 (Eng, Ur, Hi to SE.Asia 1200-1500) 34333 at 1330 in Derby; R.Sweden via Horby 17.880 (Eng to USA 1530-1600) 52343 at 1547 in Swanwick; BSBS via Daventry, UK? 17.695 (Eng to Gulf area 1630-1700) 44444 at 1630 in the Gulf area; R.Denmark via RNI 17.755 (Eng to W.USA 1630-1700) SIO444 at 1630 in New Radnor; R.Australia via Carnarvon 17.630 (Eng to S.Asia 1300-1730) 54444 at 1650 in Worthing; R.RSA Johannesburg, S.Africa 17.790 (Eng to Africa 1700-1800) 43443 at 1708 by **Darren Taplin** in Brenchley; VOA via Bethany, USA 17.800 (Eng to Africa 1600-2200) 33333 at 1750 in Morden; RCI via Sackville, Canada 17.820 (Eng, Fr to Africa 1800-2000) 43333 at 1802 in Folkestone; KVOH Los Angeles, USA 17.775 (Sp, Eng to C.America 1200-0400) SIO243 at 1900 in Edinburgh; WCSN Scotts Corner 17.555 (Eng, Sp to S.America 2000-0000) 34343 at 2035 by **Cliff Stapleton** in Torquay and R.Nederlands via Bonaire, 17.605 (Eng, Du, Fr to W.Africa 1830-2125) SIO323 at 2120 by **Thomas Barnett** in Slough.

A few of the broadcasts to Europe stem from the Voice of Israel, Jerusalem 17.575 (Eng 1100-1130), rated 34323 at 1108 in London; R.Moscow, USSR 17.840 (Eng 0700-1800) 33343 at 1500 by **John Hepburn** in Ashington; Voice of Israel, Jerusalem 17.575 (Heb 0300-2215) SIO544 at 1550 in Harrogate;

Long Wave DX

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

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

DXers
A: Ted Agombar, Norwich
B. Kenneth Buck, Edinburgh.
C. Andy Cadier, Folkestone
D Robin Clark, Plymouth
E: Ron Galliers, London
F Roy Hill, West Kilbride
G: Simon Holland, Douglas, IOM
H Sheila Hughes, Morden.
I. Eddie McKeown, Co Down
J George Millmore, Wootton, IOW.
K Bart O'Brien, Co Wexford
L Fred Pallant, Storrington
M Tim Shirley, Bristol
N John Stevens, Largs
O: Phil Townsend, London

Transatlantic DX

Freq (kHz)	Station	Location	UTC	DXer
		USA		
570	WMCA	New York, NY	2330	F
660	WFAN	New York, NY	2030	F
880	WCBS	New York, NY	0140	B
890	WLS	Chicago, IL	0100	F
1010	WINS	New York, NY	0100	F
1130	WNEW	New York, NY	0110	B,G
1210	WOGL	Philadelphia, PA	0210	B,G
1440	WGIG	Brunswick, GA	0330	F
1470	WLAM	Lewiston, MA	0230	G
1560	WQXR	New York, NY	0220	G
		Canada		
550	CFNB	Fredericton, NB	2330	F
590	VOCM	St.John's, NF	1942	C
600	CFCF	Montreal, PQ	0500	F
680	CFTR	Toronto, ON	0330	F
930	CJYQ	St.John's, NF	2317	A,B,D,E,G
940	CBM	Montreal, PQ	0135	G
1110	CBD	St.John, NB	0150	B
1200	CFGO	Ottawa, ON	0030	F
1220	CKCW	Moncton, NB	0120	B
1410	CIGO	Pt.Hawkesbury, NS	0300	G
1570	CKLM	Lavel, PQ	0155	B,G
		C. America & Caribbean		
825	R.Paradise	Basseterre,St.Kitts	0200	G
930	R.Antilles	Plymouth, Monserat	0250	G
1100	ZDK Granville R	St Johns, Antigua	0200	G
1210	R Caraibes	Roseau, Dominica	0215	G
1390	XERUY R Univers'd.	Merida, Mexico	0200	F
1470	CMDP	R C'dad Bandera,Cuba.	0400	F
1555	R.Cayman	Grand Cayman	0255	G
1570	YSCZ Cadena Cus'n	El Salvador	0130	F
1580	VOA	Antigua	0255	G
1610	Caribbean Beacon	The Valley,Anguilla	0150	B,G

DXers
A: Leo Barr, Sunderland
B John Cooper, Hull
C. Peter Dixon, South Molton
D: Bart O'Brien, Co Wexford.
E Roy Patrick, Derby.
F: Tim Shirley, Bristol
G. Jim Willett, Grimsby

long medium & short

R.Pakistan, Islamabad 17.555 (Eng 1600-1630) SIO444 at 1615 on the IOW; WYFR Okeechobee 17.612 (Ar, Fr, Port, Eng 1600-2300, also to Africa) 23442 at 1633 in Brighton; RCI Sackville 17.875 (Eng 1930-2000) SIO444 at 1933 by **Neil Wheatley** in Lytham St Annes.

Good reception over long distances has been noted in the **15MHz (19m)** band. Although the broadcasts from R.New Zealand Int, Wellington on 15.485* are intended for listeners in Pacific areas (Eng 1800-2111 daily except Sat), some days they have reached the UK at quite remarkable strength. At best, they rated SIO444 at 1807 in Winchester. (*15.130 from 16/12/90). Potent signals from R.Australia via Shepparton on 15.240 have also been noted in the UK some mornings. Their transmission, which is beamed to listeners in S.Pacific areas (Eng 2200-1030?), was rated 34433 at 0502 in Wallsend and 55455 at 0843 by Robin Clark in Plymouth.

Among the many broadcasts to Europe noted in this band were VOA Europe 15.195 (Eng 0800-1000), noted as 'good' at 0800 in Bristol; RNE via Noblejas, Spain 15.240 (Sp 1055-2230) 33323 at 1058 in London; R.Romania Int, Bucharest 15.365 (Fr, Ger, Eng 1130-1400) 44333 at 1200 in Morden; RNB Brasilia, Brazil 15.265 (Eng, Ger 1800-2055), noted as 'fair' by **John Stevens** in Largs; RCI via Sackville 15.325 (Fr, Eng 1900-2000) SIO545 at 1930 in SLough; WWCR Nashville, USA 15.690 (Eng, Ger 1200-0100) 43434 at 1945 in Torquay; WYFR via Okeechobee 15.566 (Eng, Ger, It, Sp ?-2245) 44333 at 2015 in Co. Down; R.Korea, Seoul 15.575 (Ar, It, Eng, Sp, Port, Ger 1645-2300) 43223 at 2033 in Swanwick; R.Damascus, Syria 15.095 (Ger, Fr, Eng 1805-2130?) SIO555 at 2118 in Edinburgh; RAE Buenos Aires, Argentina 15.345 (Ar, Eng, Ger, Fr, It, Sp 1800-0000) SIO434 at 2130 in Sheffield; WSHB Cypress Creek 15.610 (Eng 2000-2200) 45554 at 2135 by John Parry Northwich; WINB Red Lion 15.145 (Eng 2248-2345, also to N.Africa) SIO323 at 2310 by **David Middlemiss** in Eyemouth.

Some of the broadcasts to other areas stem from R.Japan, Yamata 15.325 (Eng to Middle East 0700-0800), rated 33333 at 0711 in Prenton; R.Beijing, China 15.440 (Eng to Australia 0830-1025) 22322 at 0900 in Sunderland; BBC via Kranji, Singapore 15.360 (Eng to SE.Asia 0915-1115) SIO344 at 0930 in Harrogate; R.RSA Johannesburg, S.Africa 15.270 (Eng to E.Africa 1500-1800) SIO333 at 1543 in New Radnor; KHBI Saipan, N.Mariana Islands 15.610 (Eng to C.Asia 1600-1800) 44434 at 1617 in Brighton; R.RSA Johannesburg, S.Africa 15.365 (Fr to W.Africa 1800-2000) 54444 at 1800 in Norwich; SLBC Colombo, Sri Lanka 15.120 (Eng to ? 1830-?) 22432 at 1900 in Brenchley; Africa No.1, Gabon 15.475 (Fr, Eng to W.Africa 1600-2000) SIO344 at 1915 in Lythan St Annes; KUSW Salt Lake City 15.590 (Eng to NE.USA 1400-0300) 44333 at 2020 in Northampton; RFO Papeete, Tahiti 15.170 (Fr, Tah to SE.Pacific areas 1600-0930) SIO222 at 2200 in Grimsby; WCSN Scotts Corner 15.300 (Eng to W.Africa 2200-0000) 44434 at 2315 in Worthing; KSDA Guam 15.610 (Eng to SE.Asia 2300-0200) 35322 at 2330 in Bridgwater; VOA via Tinang, Philippines 15.290 (Eng to E.Asia 2200-0100) 42232 at 0030 by Robin Harvey in Bourne; R.HCJB Quito, Ecuador 15.155 (Fr, Eng to USA 0000-0300) 22222 at 0245 in Oman.

The broadcasts in the **13MHz (22m)** band during the morning include the Voice of Israel, Jerusalem 13.750 (Heb to E.Europe 0300-2215), rated 34444 at 0628 in Prenton; SRI via Sottens, Switzerland 13.685 (It, Eng, Ger, Fr to Australia, Pacific areas 0745-1030) 45334 at 0847 in London; R.Australia via Shepparton 13.705 (Eng to C.Pacific areas 0630-0900) 44434 at 0853 in Sunderland; ISBS Reykjavic, Iceland 13.830 (Ic to N.Atlantic 1230-1250) 45544 in Northwich; R.Jordan, Al Karanah 13.655 (Eng to Europe 1100-1315) 45444 at 1215 in Brighton.

Later, KSDA Agat, Guam 13.720 (Bur, Ta, Mal, Hi, Tel to SE.Asia 1400-1700), was rated 32333 at 1415 in Northampton; R.Moscow, USSR 13.705 (Eng to ?-1600) 54444 at 1455 in Norwich; KHBI Saipan, N.Mariana Islands 13.625 (Eng to SE.Asia 1200-1800) 35333 at 1500 in Bridgwater; R.Pakistan, Islamabad 13.665 (Eng to N.Africa, Middle East 1600-1630) SIO333 at 1620 in Edinburgh; R.Austria Int, Vienna 13.730 (Ger, Fr, Ar, Eng, Sp to S.Africa 1700-2100) SIO555 at 1750 in Harrogate; R.Australia via Carnarvon 13.745 (Eng to S.Asia 1530-1845) SIO454 at 1800 in New Radnor; RCI via Sackville 13.670 (Eng, Fr 1800-1900 Sat/Sun) SIO444 at 1830 in Winchester; UAE R.Dubai 13.675 (Ar, Eng 1605-2055) 54444 at 1917 in Swanwick; WYFR via Okeechobee 13.695 (Eng 1500-2300) 43434 at 2015 in Torquay; R.Baghdad, Iraq 13.660 (Eng to Europe 2100-2200) 44444 at 2104 in Folkestone; WCSN Scotts Corner 13.770 (Eng, Ger, Fr to Europe 2000-2200) SIO333 at 2115 by Alf Gray Birmingham; WHRI Noblesville, USA 13.760 (Eng to Canada, Europe 1700-0000) 54434 at 2300 in Worthing; R.Australia via Darwin 13.605 (Eng, Chin to C.Asia 2200-0100) 34333 at 2230 in Norwich.

Some of the **11MHz (25m)** broadcasts to Europe originate from R.HCJB Quito 11.835 (Eng 0700-0830), rated SIO444 at 0745 in Eyemouth; R.Cairo, Egypt 12.050 (Ar 0700-0000) 35333 at 0945 in Derby; R.Finland via Pori 11.755 (Eng 1500-1530) SIO555 at 1500 in Slough; R.Pakistan, Islamabad 11.570 (Eng 1700-?) 55545 at 1735 in Norwich; AIR via Aligarh 11.620 (Eng, Hi 1845-2230) 43434 at 2210 in Torquay; VOFC Taiwan via Okeechobee 11.915 (Eng 2200-2300) 54444 at 2215 by John Robertson in Alnwick; Voice of Israel, Jerusalem 11.605 (Eng 2230-2300) 33323 at 2236 in London; RCI via Sackville 11.945 (Eng 2200-

Equipment Used
Ted Agombar, Norwich: Grundig Satellit 400 + r.w
Thomas Barnett, Slough: Kenwood R2000 + r.w.
Leo Barr, Sunderland: Matsui MR4099 + r.w in loft
Darren Beasley, Bridgwater: Philips D2935 + loop or a.t.u. + 10m wire.
Kenneth Buck, Edinburgh: Lowe HF225 + r w in loft
Andy Cadier, Folkestone: Saisho SW500 + 40m wire
Jim Cash, Swanwick. Kenwood R5000 + trap dipole
Robin Clark, Plymouth. Saisho SW5000 + 16m wire.
Simon Clarke, Gulf area: Saisho SW 5000 + 1m wire.
John Cooper, Hull: Saisho SW5000 + Howe AA2 or a.t.u. + r.w.
John Coulter, Winchester: Yaesu FRG-7 + r.w.
Ron Damp, Worthing: Racal RA17 + chimney mounted whip.
Peter Dixon, South Molton: Lowe HF225 + 1m loop
Peter Easton, Edinburgh: Kenwood R5000 + trap dipole.
David Edwardson, Wallsend: Trio R600 + trap dipole.
Ron Galliers, London. Fairmate HP100E or Philips 752 + whip.
Ted Gould, London: Sony ICF7601L + built-in whip.
Alf Gray, Birmingham: Codar CR70 + PR30 + a.t.u. + Ex-Army whip.
Simon Hamer, New Radnor: Lafayette HE30 or Grundig S1400 + loop.
Robin Harvey, Bourne: Matsui MR 4099 + s.w. loop.
Francis Hearne, Bristol: Sharp GFA3 + r.w.
John Hepburn, Ashington: Selena Vega 215 + multi-band antenna.
Roy Hill, West Kilbride: Lowe HF-125 + motorised l.w. loop.
Simon Holland, Douglas IOM: Sangean ATS-803A + built-in whip.
Sheila Hughes, Morden: Sony ICF7600DS or Panasonic DR48 + 15m wire.
Rhoderick Illman, Thumrait, Oman: Sony ICF-7600DS + 23m wire
Cyril Kellam, Sheffield: Sony ICF-7600DS + AN-1 or 5m vertical wire.
Eddie McKeown, Co.Down: Tatung TMR 7602 + built-in whip.
David Middlemiss, Eyemouth: Yaesu FRG-7 + r.w.
George Millmore, Wootton, IOW: Tatung TMR 7602 + whip or loop.
John Nash, Brighton: Kenwood R5000 + Datong AD370.
Bart O'Brien, Co.Wexford: Sony ICF-2001D + hexagon loop.
John O'Halloran, Harrogate: Racal RA17 + a.t.u. + trap dipole.
Fred Pallant, Storrington: Trio R2000 + r.w in loft.
John Parry, Northwich: Realistic DX-400 + 33m r.w.
Roy Patrick, Derby: Lowe HF-125 + 44m wire.
Ron Pearce, Bungay: Eddystone 640 + r.w.
Philip Rambaut, Macclesfield: Int.Marine R.700M + r.w.
Kenneth Reece, Prenton: Icom R9000 or Kenwood R5000 + delta loop.
John Robertson, Alnwick: Ex-Army R210 + E/W r.w.
Tim Shirley, Bristol: Trio R600 + r.w or loop.
Chris Shorten, Norwich: Matsui MR4099 + 10m r.w.
Alan Smith, Northampton: Matsui MR4099 + a.t.u. + vertical dipole.
Cliff Stapleton, Torquay: Trio R1000 + dipole or 25m wire.
John Stevens, Largs: Hammarlund HQ 180 or Icom R70 + r.w.
Darran Taplin, Brenchley: Lowe HF225 + a.t.u. + 30m wire.
Phil Townsend, London: Lowe SRX-30 + a.t.u + r.w or loop.
Paul Weston, Kettering: Toshiba RT 8057 + 5 band tuner.
Neil Wheatley, Lytham St.Annes: Sangean ATS 803 + built-in whip.
Jim Willett, Grimsby: RCA AR77 + 4m loop or Trio 9R59DS + dipole.
David Wratten, Cambridge: Philips D2999 + loop.

Tropical Bands

Freq	Station	Country	UTC	DXer	Freq	Station	Country	UTC	DXer	Freq	Station	Country	UTC	DXer
2.420	R.Sao Carlos	Brazil	2300	O	4.775	RRI Jakarta	Indonesia	1517	D,I	4.930	R.Moscow	USSR	1830	C,H,I,K,P
2.560	Xinjiang	China	0038	D	4.785	RTM Bamako	Mali	2050	K,Q	4.935	Voice of Kenya	Kenya	1930	H,K,N,P
3.200	Vos 1, Fuzhou	China	2100	O	4.785	R.Baku	USSR	2020	K	4.940	R.Kiev 2	USSR	1932	C,F,J,K
3.205	AIR Lucknow	India	1730	O	4.790	Azad Kashmir R.	Pakistan	1900	Q	4.945	Caracol, Neiva	Colombia	0600	Q
3.210	R.Mozambique	Mozambique	2300	Q	4.790	R.Atlantida	Peru	0130	Q	4.958	R.Baku	USSR	0135	H
3.215	R.Orange	S.Africa	1930	K	4.790	TWR Manzini	Swaziland	1758	G,H	4.960	R.Baku 2	USSR	2015	K
3.230	R.Nepal	Kathmandu	0130	O	4.795	R.Douala	Cameroon	1814	G,Q	4.970	R.Rumbos, Caracas	Venezuela	0136	H,Q
3.230	ELWA Monrovia	Liberia	2200	Q	4.795	R.Moscow (Kharkov)	USSR	1500	B,C,F	4.975	R.Timbre, Sao Luiz	Brazil	0130	Q
3.270	SWABC 1, Namibia	S.W.Africa	1932	K	4.795	R.Peace & Progress	USSR	2201	J,P	4.975	R.Uganda, Kampala	Uganda	1932	H,K,P
3.290	SWABC 2, Namibia	S.W.Africa	1700	G	4.800	PBS Xinjiang	China	2315	J	4.980	PBS Xinjiang	China	0001	P
3.320	R.Orion	S.Africa	1930	K	4.805	R.Nac.Amazonas	Brazil	0215	Q	4.980	Ecos del Torbes	Venezuela	0139	C,D,H,M
3.330	R.Kigali	Rwanda	2026	K	4.805	Voice of Kenya	Kenya	0112	Q	4.985	R.Brazil Central	Brazil	0430	I,Q
3.365	GBC Radio 2	Ghana	1823	K,P	4.810	R.Yerevan 2	USSR	2056	I,K	4.990	AIR via Madras	India	2357	M,P
3.900	Hulunbei'er, Hailar	China	2214	I	4.815	R.diff TV Burkina	Ouagadougou	2200	Q	4.990	FRCN Lagos	Nigeria	2026	E,I
3.905	AIR Delhi	India	1534	I	4.820	R.Moskva 4 (Khanty-M	USSR	1840	H,K,P	4.990	R.Moscow (Yerevan)	USSR	2143	C,P
3.915	BBC Kranji	Singapore	1925	K,P	4.825	R.Moscow	USSR	2133	C	5.005	R.Nacional, Bata	Eq.Guinea	1930	K
3.940	PBS Hubei Wuhan	China	2300	Q	4.830	R.Tachira	Venezuela	2200	C,D,I	5.005	R.Nepal, Kathmandu	Nepal	1515	I
3.955	BBC Daventry	England	1935	A,E,F,J,P	4.832	R.Reloj	Costa Rica	0150	Q	5.010	R.Garoua	Cameroon	2142	K
3.955	R.Orion	S.Africa	2145	Q	4.835	RTM Bamako	Mali	1945	C,I,K	5.010	SBC Singapore	Singapore	1605	L
3.960	RFE/RL Munich	W.Germany	0330	J	4.845	ORTM Nouakchott	Mauritania	1940	C,H,I,K,M	5.015	R.Moskva4 (Ashk'd)	USSR	1739	C
3.965	RFI Paris	France	2355	F,H,J	4.850	R.Yaounde	Cameroon	2020	E	5.025	R.Rebelde, Habana	Cuba	0030	Q
3.970	RFE Munich	W.Germany	0340	J	4.850	Ulan Bator	Mongolia	0129	H	5.025	R.Uganda, Kampala	Uganda	2045	K
3.975	BBC Skelton	England	1835	G	4.850	R.Capital, Caracus	Venezuela	0230	Q	5.030	R.Catolica, Quito	Ecuador	0200	O
3.980	VOA Munich	W.Germany	1700	F	4.860	R.Moskva 2 (Chita)	USSR	2000	C,P	5.035	R.Bangui	C.Africa	2115	I,L
3.985	R.Beijing, China	via SRI Berne	2100	E,H	4.865	PBS Lanzhou	China	2148	D,I,Q	5.035	R.Alma Ata	USSR	0230	C
3.985	SRI Berne	Switzerland	2000	F,H,P	4.865	Caracol	Colombia	0441	C	5.040	R.Maturin	Venezuela	0230	E
3.995	DW Cologne (Julich)	W.Germany	2335	F,H,J	4.865	V of Cinaruco	Colombia	0704	D	5.047	R.Togo, Lome	Togo	1935	K
4.000	Bofoussam	Cameroon	2300	Q	4.870	R.Cotonou	Benin	2020	K	5.050	SBC Singapore	Singapore	2255	E
4.220	PBS Xinjiang	China	2320	D	4.880	SABC Radio 5	S.Africa	2300	Q	5.065	R.Candip, Bunia	Zaire	1830	E,H
4.460	R.Beijing	China	2155	H,I	4.885	R.Clube do Para	Brazil	0710	I	5.095	R.Caracol, Bogata	Colombia	0600	Q
4.470	R.Movima	Bolivia	0303	H	4.890	ORTS Dakar	Senegal	0400	Q	5.125	Taiwan 1, Beijing	China	0145	H
4.500	Xinjiang	China	0111	D,H	4.895	R.Moscow (Kalinin)	USSR	2230	C,F,J,P	5.256	RRI Sibolga, Sumatra	Indonesia	1605	I
4.735	Xinjiang	China	2320	D,H	4.905	R.Nat.N'djamena	Chad	2016	K	5.260	R.Alma Ata 2	USSR	0148	C,H
4.740	R.Afghanistan	via USSR	1750	H,K,Q	4.910	R.Zambia, Lusaka	Zambia	1930	K	5.275	WYFR Oakland, CA	via Taiwan	1559	I
4.750	R.Bertoura	Cameroon	1815	G	4.915	R.Nac.Macapa	Brazil	0300	Q	5.290	R.Moskva1 K'snoyarsk	USSR	2300	I,J
4.760	R.Moscow (Dushanbe)	USSR	1750	K	4.915	R.Ghana, Accra	Ghana	2150	K,M,P	5.440	PBS Xinjiang	China	1555	I
4.765	Brazzaville	PR Congo	1723	K,P	4.920	R.Quito	Ecuador	0430	Q					
4.770	FRCN Kaduna	Nigeria	1942	K,Q	4.930	RRI Surakarta,Java	Indonesia	1610	I					

DXers.
A: Ted Agombar, Norwich
B: Leo Barr, Sunderland.
C. Jim Cash, Swanwick.
D: David Edwardson, Wallsend.
E: Simon Holland, IOM
F: Sheila Hughes, Morden
G. Rhoderick Illman, Oman.
H: Eddie McKeown, Co Down
I: John Nash, Brighton.
J: John O'Halloran, Harrogate.
K: Fred Pallant, Storrington.
L: John Parry, Northwich.
M. Roy Patrick, Derby
N: Ron Pearce, Bungay.
O: Tim Shirley, Bristol
P: Darran Taplin, Brenchley.
Q: Jim Willett, Grimsby.

long medium & short

2300) 54444 at 2250 in Worthing.

Those to other areas include R.Nederlands via Bonaire 11.720 (Eng to USA 0330-0425) 34433 at 0406 in Prenton; RFO Papeete, Tahiti 11.826 (Fr, Tah to SE.Pacific areas 1600-0930), noted as SIO222 at 0430 in New Radnor; VOA Europe 11.740 (Eng to Gulf area 0800-1000) 43233 at 0810 by Robin Clark, Plymouth; R.DW via Antigua 11.865 (Sp to S.America 1100-1150) SIO444 at 1102 in Winchester; WSHB Cypress Creek 11.930 (Eng, Sp to C/S.America 1200-1400) 22232 at 1232 in Oman; Voice of Mediterranean, Malta 11.925 (Eng to N.Africa, S.Europe 1400-1600) SIO433 at 1440 by Ron Pearce in Bungay; KTWR Guam 11.650 (Eng to S.Asia 1445-1700) 22332 at 1500 in Sunderland; KSDA Agat, Guam 11.980 (Eng to S.Asia 1600-1700) 43533 at 1600 in Brighton; R.Beijing, China 11.575 (Eng to Africa 1700-1800) SIO454 at 1710 in Edinburgh; R.Austria Int, Vienna 12.010 (Eng to Africa 1730-?) 55444 at 1745 in Swanwick; Voice of Vietnam, Hanoi 12.020 (Fr, Eng, Russ, Viet, Sp 1600-2130) 25433 at 1924 in Folkestone; R.Australia via Carnarvon 12.000 (Eng to S.E.Asia 1800-2130) 32222 at 1930 in Morden; KNLS Anchor Point, Alaska 11.700 (Eng to E.Asia 2000-2100) 42443 at 2020 in Bridgwater; R.Beijing, China 11.515 (Eng, Ar to N.Africa 1900-2155?) 44434 at 2050 by **Ted Gould** in London; R.Globo, Rio, Brazil 11.805 (Port to S.America 0900-0400), heard at 2130 in Brenchley; RCI via Sackville, Canada 11.880 (Eng to Africa 2130-2200) SIO433 at 2145 in Birmingham; also 11.730 (Eng to Caribbean 2300-2330) SIO444 at 2300 in Sheffield; R.Tirana, Albania 11.825 (Eng to USA 2330-0000) SIO555 at 2330 (33); VOA via Tinang, Philippines 11.760 (Eng 2200-0100) SIO333 at 2345 by **Francis Heanre** in Bristol; R.Finland via Pori 11.755 Eng to USA 0000-0025) 22232 at 0010 in Bourne.

The **9MHz (31m)** broadcasts to Pacific areas from R.New Zealand Int, Wellington 9.700 (Eng 0705-1110) have reached the UK during some days. At best they rate SIO 444 at 0815 in Eyemouth. Some of the broadcasts from Australia have also reached the UK. ABC in Perth 9.610 (Eng to W.Australia 24hrs) was logged as SIO222 at 1030 in New Radnor. Radio Australia via Shepparton 9.580 (Eng to Pacific areas 0830-2100) was noted as 'good' at 1100 in Bristol and via Carnarvon? 9.860 (Eng to Pacific?) as SIO 322 at 1355 in Bungay and 33333 at 1705 in Oman.

The reports detailed some of the broadcasts to Europe: R.Finland via Pori 9.560 (Eng 0730-0745) SIO 333 at 0730 in Bristol; WCSN Scotts Corner 9.840 (Eng 0600-1000) 55545 at 0735 in Norwich; TWR Monte Carlo, Monaco 9.480 (Eng 0640-0825) 44444 at 0800 in Morden; IRRS Milan, Italy 9.815 (Eng 0900-?) 33343 at 0900 in Co. Down; R.Nederlands via Flevo 9.715 (Eng 1130-1225) SIO555 at 1220 in Birmingham; VOIRI Tehran, Iran 9.022 (Russ, Fa, Tur, Ger, Fr, Eng, Sp, Ar 1530-2230) SIO333 at 1601 in Macclesfield; R.Norway Int, Oslo 9.655 (Eng 1700-1730) 55455 at 1700 in Worthing; R.Denmark via RNI 9.655 (Da 1730-1800) 54434 at 1742 in Swanwick; Voice of Vietnam, Hanoi 9.840 (Eng, Russ, Viet, Fr, Sp 1600-2130) SIO444 at 1915 in Harrogate; R.Sophia, Bulgaria 9.700 SIO 433 at 1930 in Sheffield; Voice of Israel, Jerusalem 9.435 (Eng 2000-2030) 43434 at 2030 in Torquay; R.Cairo, Egypt 9.900 (It, Ger, Fr, Eng 1800-2245) 45444 at 2121 in Brenchley; AIR via Delhi, India 9.910 (Hi, Eng 2000-2230) 24333 at 2136 in Folkestone; RCI via Sackville 9.760 (Eng 2200-2300) SIO555 at 2235 in Lytham St Annes; Voice of Turkey, Ankara 9.685 (Eng, Tur 2200-0255) 44333 at 2350 in Bourne.

Also noted were a few of those to other areas: DW via Cyclops, Malta 9.565 (Eng to USA 0100-0150) 45344 at 0141 in London; R.Nederlands via Bonaire 9.590 (Eng to W.USA 0330-0425) 33333 at 0404 in Prenton; WSHB Cypress Creek, USA 9.455 (Eng, Sp C/S.America 0200-1200) 53333 at 0620 in Norwich; BBC via Antigua 9.640 (Eng to C.America 9.640 (0500-0815) 43433 at 0705 in Northampton; R.Beijing, China 9.945 (Viet to SE.Asia 1100-1555) 25432 at 1345 in Brighton; R.Pyongyang, N.Korea 9.977 (Kor, Eng, Fr to Africa, Middle East 1430-?) 32433 at 1746 in Bridgwater; KHBI Saipan, N.Mariana Islands 9.455 (Eng to E.Asia 2000-2200) SIO333 at 2030 Edinburgh; Voice of Turkey, Ankara 9.445 (Eng, Tur to USA 2200-0355) 54555 at 2207 in London.

The **7MHz (41m)** broadcasts to Europe include R.Polonia, Warsaw 7.290 (Eng 0630-0700) 44344 at 0655 in Plymouth; AWR Europe via Forli 7.230 (Sw, Sp, It, Eng, Ger 0630-1230) 34433 at 0854 in Prenton; BBC via Skelton, UK 7.325 (Eng 0700-2300) 55445 at 0925 in Norwich; R.Prague, Czechoslovakia 7.345 (Ger, Fr, Eng 0500-1300) 55555 at 1055 in Bridgwater; R.Tirana, Albania 7.120 (Fr, Eng 1800-1900) SIO444 at 1840 in Birmingham; AIR via Delhi 7.412 (Hi, Eng 1845-2230) 54344 at 2125 in Norwich; R.Vilnius, Lithuania 7.400 (Eng 2300-2330?) SIO555 at 2305 in Lytham St Annes.

Some of the **6MHz (49m)** broadcasts stem from the BBC via Antigua 5.975 (Eng to C.America 0430-0730) 53444 at 0655 in Northampton; BRT via Wavre 6.035 (Du, Eng, Fr, Ger to Europe 0700-0900) SIO444 at 0730 in Bristol; R.Sweden via Karlsborg 6.065 (Eng to Europe, Africa 1930-2000) 55555 at 1953 in Norwich; Voice of Lebanon, Beirut 6.550 (Ar, Eng, Fr to Middle East 24hrs) 54344 at 1958 in Plymouth; King of Hope, S.Lebanon 6.280 (Ar, Russ, Uk, Hung, Tur, Eng to Middle East, SE.Europe 0300-2200) 33222 at 2030 in Alnwick; R.Korea, Seoul 6.480 (Eng to Europe 2030-2128) 25322 at 2126 in Brighton; Vatican R, Rome 6.248 (Eng 2050-2110) 44444 at 2050 in Oman; CKZN (CBN) St.John's, NF 6.160 (Eng to E.Canada 0830-0405), heard at 0000 in Hull.

Local Radio DX

Freq (kHz)	Station	IBA BBC	Power (kW)	DXer	Freq (kHz)	Station	IBA BBC	Power (kW)	DXer
558	Spectrum R.	I	7.50	B*,E*,G,I*,L,O	1161	Viking R.(C.Gold)	I	0.35	H*
585	R.Solway	B	2.00	F,I	1170	Ocean Sd.(C.Gold)	I	0.12	G
603	Invicta Snd(Coast)	I	0.10	B,E*,G,L,O	1170	R.Orwell	I	0.28	L,O
603	R Gloucester	B	0.10	G,O	1170	Swansea Sound	I	0.58	H*
630	R.Bedfordshire	B	0.20	B,E*,G,L,N,O	1170	TFM Radio (GNR)	I	0.32	H*
630	R.Cornwall	B	2.00	G,H*	1242	Invicta Snd(Coast)	I	0.32	B,E*,F*,H*,L
657	R.Clwyd	B	2.00	G,O	1242	Isle of Wight R.	I	0.50	F*,G,J
657	R.Cornwall	B	0.50	H*	1251	Saxon R.	I	0.76	A*,H*,L,O
666	DevonAir R.	I	0.34	G,H*	1260	GWR (Brunel R.)	I	1.60	G,H*,L
729	BBC Essex	B	0.20	B,E*,G,I,L,O	1260	Leicester (GEM-AM)	I	0.29	N,O
738	Hereford/Worcester	B	0.037	O	1260	Marcher Sound	I	0.64	H*
756	R.Cumbria	B	1.00	F	1305	Red Dragon (Touch)	I	0.20	F*,G
756	R.Shropshire	B	0.63	G,O	1323	R.Bristol	B	0.63	H*
765	BBC Essex	B	0.50	B*,E*,G,L,O	1323	Southern Sound	I	0.50	G,L
774	R.Kent	B	0.70	B*,E*,G,L,O	1332	Hereward R.	I	0.60	H*,L,N,O
774	Severn Sound (3CR)	I	0.14	D*	1332	Wiltshire Sound	B	0.30	G,H*
792	Chiltern R.	I	0.27	B,E*,G,L,O	1359	Essex R.(Breeze)	I	0.28	L,O
801	R.Devon	B	2.00	G,H*	1359	Mercia Snd(Xtra-AM)	I	0.27	H*,O
819	Hereford/Worcester	B	0.037	F*,G,H*,O	1359	R.Solent	B	0.85	G
828	Chiltern Radio	I	0.20	B*,E*,L,N,O	1368	R.Lincolnshire	B	2.00	O
828	R.WM	B	0.20	I	1368	R.Sussex	B	0.50	E*,G,L
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855	R.Devon	B	1.00	F*,G	1431	Radio 210	I	0.14	G
855	R.Lancashire	B	1.50	H*	1449	R.Cambridgeshire	B	0.15	H*,L,O
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954	DevonAir R.	I	0.32	G,H*	1458	R Newcastle	B	2.00	H*
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990	Spectrum	I	?	E*,L,O	1485	R.Merseyside	B	1.20	F,H*
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999	R.Trent (GEM-AM)	I	0.25	L,N,O	1485	R.Sussex	B	1.00	E*,G,L
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1026	R.Cambridgeshire	B	0.50	L,O	1521	R.Nottingham	B	0.50	O
1026	R.Jersey	B	1.00	G,H*,I,J,L	1530	KCBC Kettering	I	0.025	N,O
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1161	GWR (Brunel R.)	I	0.16	G	1584	Gatwick	I	?	C*,E*,G,L
1161	R.Bedfordshire	B	0.10	N,O	1584	Heathrow	I	?	C*,E*,L
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1161	R.Tay	I	1.40	F*,H*,I*	1602	R.Kent	B	0.25	E*,F*,G,K,L

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

DXers:
A: Ted Agombar, Norwich.
B: Ron Galliers, London.
C: Simon Hamer, New Radnor.
D: Francis Hearne, Bristol.
E: Sheila Hughes, Morden.
F: Eddie McKeown, Co.Down.
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H: Bart O'Brien, Co.Wexford.
I: Tim Shirley, Bristol.
J: Cliff Stapleton, Torquay.
K: John Stevens, Largs.
L: Darran Taplin, Brenchley.
M: Phil Townsend, London.
N: Paul Weston, Kettering.
O: David Wratten, Cambridge.

Station Addresses

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Manx Radio, PO Box 219, Broadcasting House, Douglas Head, Douglas, Isle of Man.

Radio Free Europe/Radio Liberty, Oettingenstrasse 67, D-8000 Munich 22, Germany.

SLBC, PO Box 574, Torrington Square, Colombo 7, Sri Lanka.

The Caribbean Beacon, PO Box 690, Anguilla, British West Indies.

UAE Radio Dubai, External Service, PO Box 1695, Dubai, United Arab Emirates.

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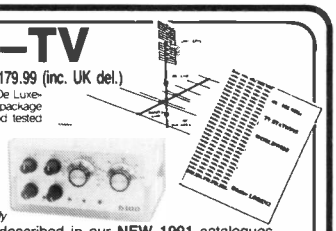

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