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Send in £2 now for our LATEST CATALOGUE with full details of our complete product range (includes a £2 voucher).
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.
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 280, after mentioning the existence of a pre-war AIRMET service for civil airliners, the author goes on:

"The AIRMET service was reopened on 6th June 1946 on 245kHz using an RAC type 10E transmitter. On 1st June 1948 the frequency was changed to 249kHz 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 relatively 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 VOLUMET 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 Joseph 1982), which is well worth buying, borrowing or stealing! Because of his BBC connections, Mr Ham will probably know that Aspidistra soldied 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 raison d'être which must be attracted, in every way, towards the diverse world of radio.

GERARD CASEY
BORDEAUX

Back Numbers and Binders
Limited stocks of most issues of SWM for the past five years are available at £1.85 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 are also welcome by telephone to Poole 665524. An answering machine will accept your order out of office hours.

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 competitions 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 competitions 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.
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, perseverance 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 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 to date, there is little enough help and advice for newcomers, such as the one given in these pages.

Sometimes we experiment with different type sizes, weights, styles and leading in an attempt to get more onto the page, emphasis 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 the first 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 of them try to cram in by using very small type.

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 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 was delighted that the reports tell lies, for I am implying that they do not know what they’re doing but like everything in life, if not nipped in the bud, a small misunderstanding can develop into a much larger misunderstanding later on. After all, there is little enough help and advice for newcomers, SWM excepted, of course.

CABRINGTON
CHELLASTON, DERBY

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CABRINGTON
CHELLASTON, DERBY

Dear Sir,
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, 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 want 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. 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, 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.

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P.A. FINN, MILFORD HAVEN

I appreciate that there is little enough help and advice for newcomers, SWM excepted, of course.

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 usable.

Of course, I do not like like the smaller typeface used throughout the magazine, quite apart from the specific instances mentioned above. It seems almost amusing that 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 advert 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 years 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?"

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Ed.
Sutton & Cheam RS: 3rd Thursdays, 7.30
Downton Lawn Tennis Club, Holland Ave, Cheam. 1st Mondays in the Downs Bar.
Feb 4 - Natter Night, 21st - Wireless Before Radio by Steve Cook (SBCYE. John Puttick B6GWV, OTHR.

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

Todmorden & District RS: 1st & 3rd
Thursdays, 8pm. The Queen Hotel, Todmorden Feb 4 - AGM & Construction, 18th - Club Station on the Air. Mrs E Tyler, (0422) 862038.


Trowbridge 7 District ARS: 8pm. TA

Verulam RS: 2nd & 4th Tuesdays,
7.30pm. The RAF Association HQ, New Kent Road, St Albans. Feb 26 - HF Compendium by Norman Fisher (SBAT).

West Kent ARS: 3rd Fridays, 8pm.

Wimbledon & DARS RS: 2nd & last

Wirral ARS: Wednesdays, 7.45pm. Ivy Farm, Arrow Park Road, Birkenhead, Wirral. Feb 7 - President’s Night with G3FRO, 20th - The Short Comings of the Battery by Bill Davies G4YWD.

Yeovil ARS: Thursdays, 7.30pm &

Club Secretaries:
Send all details of your club’s up-and-coming events to;
* ‘Grassroots’, Lorna Mower
Short Wave Magazine,
Enesco House, The Quay, Poole, Dorset BH15 1PP
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: "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. system."

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 2018.

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.

One 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.

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 will 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.

Abbreviations

a.m. - amplitude modulation
b.f.o. - beat frequency oscillator
h.f. - high frequency
k.hz - kilohertz
l.s.b - lower sideband
M.Hz - megahertz
s.s.b. - single sideband
u.s.b. - upper sideband

Back copies of this magazine can be printed them in the column.

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

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.

Jon Jones
PO Box 59
Fishponds
Bristol BS16 4LH

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

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**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.

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**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 throughout, 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 included).

FM Radio Stations in France is available from:

Club Europeen de DX Radio TV, BP 114, 13652 Salon de Provence Cedex, France.

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**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, Germany, 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.

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**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.

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**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 we seen as a means of expanding both company’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.
**Hi-fi Speakers**

Dali is a well-established Danish 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, elegant loudspeaker. It has a combination of two tweeters as well as mid and woofers 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 Townwith, North Yorkshire YO5 8QZ.
Tel: (0423) 358074

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**TV Graphics Review.**

This magazine features various forms of graphics used by radio and television services throughout the world, with particular emphasis on those transmitted 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

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**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 OSL 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.

**Multi-Satellite Receiving System**

**ENWARE Engineering Software,** 49 Wimborne Road West, Wimborne, Dorset BH21 2DQ

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**It's Party Time**

The 4th Annual Winter SWL-Feast is scheduled for the weekend 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

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**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 Treet 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

Look to Lowe

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

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

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 rechargeable 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 views, information.

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

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

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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 Massachusetts:—

"I received my Lowe HF-225 about a week ago. Since then I have enjoyed many pleasant hours listening to it. As a past owner of receivers such as the Sony ICF-2010 and Grundig Satellit 650 and 500, I must say that none 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
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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.
Fig. 2.1. Using the computer classroom, teachers normally demonstrate amplitude modulated waveforms by sketching them on a chalk-board. In the following programs, seven light emitting diodes (i.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.

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 (i.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.

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

Feature

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 educational software programs will be available at a later date

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

Brian Oddy G3FEX explains.

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 70 Ω. Nevertheless, a satisfactory impedance match can still be obtained to a 720 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
If not, why not contact SMC for information on our complete range of receivers and scanners.

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The AIR116-136MHa is a basic scanner with 20 memories. Modes of operation are VHF 116-136, AM 136-148 and FM 118-136. The AIRHANDY is a basic scanner with nine memories. Modes of operation are VHF 116-136, AM 136-148 and FM 118-136.

The ICFSW115 is the smallest shortwave radio. The ICFSW115 has a frequency entry keyboard and an 6-way tuning system. Tuning range 108MHz and 115-115kHz to 223MHz with VFO 80 frequency converter.

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Low receiver are available from Reg Ward. Some Icom receivers available from most branches.

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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 38, 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.
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73 from Dave G4KQH, Technical Manager.
Using An ERA Microreader Mk II

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 your 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 your 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 Klingenfuus 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 i.e.d.s. The middle shift i.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 synchronise 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 area 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 it 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 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).

---

**Abbreviations**

- **C.W.** continuous wave (Morse)
- **Hz** hertz
- **I.E.D.** light emitting diode
- **MHz** megahertz
- **mm** millimetre
- **RTTY** Radio TeleTYpe
- **S.S.B.** single sideband
- **UTC** Universal Time (=GMT)
- **V** volts

---

**Sources of Computer Software**

- **Technical Software**, Fron, Upper Llandwrog, Caernarfon LL54 7RF. Tel: (0286) 881886.
- **J&P Electronics Ltd.**, Unit 45, Meadowmill Estate, Dixon Street, Kidderminster DY10 1HH. Tel: (0652) 753893.
- **Comar Electronics**, 1A Birmingham Road, Cowes, Isle of Wight PO31 7BH. Tel: (0983) 200308.
- **Grosvenor Software**, 2 Beacon Close, Seaford, East Sussex BN25 2JZ. Tel: (0323) 893978.

---

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

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| Tip | Ring (may be pin 1 on some machines) |

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

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<thead>
<tr>
<th>1</th>
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**Fig. 3: Atari ST and Commodore Amiga.**

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

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<tbody>
<tr>
<td>Tip</td>
<td>Ring</td>
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<table>
<thead>
<tr>
<th>BAND</th>
<th>MODE</th>
<th>RECOMMENDED INCREMENT</th>
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<tr>
<td>118-136MHz (Air)</td>
<td>AM</td>
<td>12.5kHz</td>
</tr>
<tr>
<td>138-174MHz (VHF)</td>
<td>FM</td>
<td>5kHz</td>
</tr>
<tr>
<td>406-490MHz (UHF)</td>
<td>FM</td>
<td>12.5kHz</td>
</tr>
<tr>
<td>490-512MHz (UHF)</td>
<td>FM</td>
<td>12.5kHz</td>
</tr>
</tbody>
</table>

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### Project

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 capacitor. 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 need 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.

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 h.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

<table>
<thead>
<tr>
<th>Freq (kHz)</th>
<th>Station</th>
</tr>
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<tbody>
<tr>
<td>801</td>
<td>Radio Devon</td>
</tr>
<tr>
<td>819</td>
<td>Hereford/Worcester</td>
</tr>
<tr>
<td>826</td>
<td>Cheltenham Radio</td>
</tr>
<tr>
<td>828</td>
<td>Radio Liverpool (Mag B28)</td>
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<tr>
<td>829</td>
<td>Radio WM</td>
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<tr>
<td>828</td>
<td>2CR</td>
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<tr>
<td>837</td>
<td>Radio Cumbria</td>
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<tr>
<td>835</td>
<td>Radio Farness</td>
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<tr>
<td>837</td>
<td>Radio Leicester</td>
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<tr>
<td>845</td>
<td>Radio Devon</td>
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<tr>
<td>847</td>
<td>Radio Manchester</td>
</tr>
<tr>
<td>863</td>
<td>Radio Norfolk</td>
</tr>
<tr>
<td>866</td>
<td>GWR (Brunel Radio)</td>
</tr>
<tr>
<td>945</td>
<td>Radio Trent (GEM-AM)</td>
</tr>
<tr>
<td>954</td>
<td>DevonAir Radio</td>
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<tr>
<td>954</td>
<td>Radio Wyvyn</td>
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<tr>
<td>990</td>
<td>Radio Aberdeen</td>
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<tr>
<td>960</td>
<td>Radio Devon</td>
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<tr>
<td>990</td>
<td>Hallam Radio (C.Gold)</td>
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<tr>
<td>990</td>
<td>Spectrum</td>
</tr>
<tr>
<td>999</td>
<td>Radio Solent</td>
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<tr>
<td>999</td>
<td>Radio Trent (GEM-AM)</td>
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<tr>
<td>999</td>
<td>Red Rose Radio</td>
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<tr>
<td>1026</td>
<td>Radio Cambridgeshire</td>
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<td>Radio Jersey</td>
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<td>1035</td>
<td>NorthSound Radio</td>
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<td>West Sound</td>
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<td>1107</td>
<td>Moray Firth Radio</td>
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<td>Radio Northampton</td>
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<td>Radio Derby</td>
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<td>1116</td>
<td>Radio Guernsey</td>
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<tr>
<td>1152</td>
<td>CBC (L.Talkback R)</td>
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<td>1152</td>
<td>Metro Radio (GNR)</td>
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<td>1152</td>
<td>Piccadilly Radio</td>
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<td>1152</td>
<td>Plymouth Sound</td>
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<td>Radio Bradford</td>
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<td>1152</td>
<td>Radio Clyde (Clyde 2)</td>
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<td>1161</td>
<td>GWR (Brunel Radio)</td>
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<td>Radio Bedfordshire</td>
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<td>Swansea Sound</td>
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<tr>
<td>1170</td>
<td>TFM Radio (GNR)</td>
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</table>
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.

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 selenium 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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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-2006.

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.

To group related frequencies, the memory channels are split into banks. This greatly eases the handling of large numbers of channels, enabling the operator to group related frequencies. 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. 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. 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. 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.

**Review**

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.

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<td>IC-R1</td>
<td>0.1-1300MHz</td>
<td>£399.00</td>
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<tr>
<td>IC-R100</td>
<td>0.1-1856MHz</td>
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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 also the 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 thought that the fast, 26 ch/s, scanning rate was very effective.

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 discane, I also took the opportunity to check the review model against the specification in the lab

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 workhorse.

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 receivers 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.

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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. \((2V \times 3 = 6V\) and \(2V \times 6 = 12V\)). 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.

**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. 1: Ron attends the accumulators.**

**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 rechargeable battery, plus the antennas and a power lead with large croc clips were carried in a large croc clips were carried in an 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 up 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 Henr CT3BX and was it a relief to speak to someone fluent in one's own native tongue! Henr 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
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 XYL 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, TY 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, 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 road 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.

---

**Feature**

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.

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 *IP* 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 LK, G0EHO (JM in a cement mixer?!), ZS, N2, W3, H8, 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.
Ron Livesey (Edinburgh) has been using a refractor telescope with a solar projection screen, identifying 4 active areas on the sun's disc on October 7, 9, 16, and 23. He observed the highest flux level on Neil's graph, which was responsible for numerous sunspots observed throughout the month. The high radio noise level on Neil's graph, Fig. 2, were open on those days.

Northwards, John Livesey (Selby) has been producing the high flux level on Neil's graph. While driving to Laurencekirk on November 9, John Livesey received the test transmissions from Radio Borders. George added that he could not be heard.

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), Mark Lawes (Worcester) and Lin Lewis (Nottingham) have been monitoring these events.

Propagation Beacons
As usual my thanks are due to Chris van den Berg (The Hague), Henry Hatfield, John Livesey, Ted Owen (Maldon), Fred Pallant G3RNM (Storrington), Ted Waring and Ern Wardell. Their 28MHz beacon logs covering 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 103.5MHz and there is a new station, Three Counties Radio on 1574kHz. 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.

Abbreviations
- Band II: 87-108MHz
- DXing: 'long distance' listening
- FLS: filaments
- GPS: groups
- IN: inch
- kHz: kilohertz
- MB: millibar
- MHz: megahertz
- v.f. (v.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 30°S. Their frequency shows a marked period of about eleven years (sunspot cycle), they have intense magnetic fields and areas associated with magnetic storms on the earth.

REMEMBER, NEVER LOOK AT THE SUN DIRECTLY AS THIS CAN CAUSE BLINDNESS. ALWAYS USE SPECIALIST EQUIPMENT.
This month we take a look at how h.f. is used during NASA’s Space Shuttle launches. In a way this follows 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.

NASAastronauts still try to catch up on the backlog of payloads that are scheduled to be put in orbit after Shuttle flights were suspended after the Challenger disaster. Whatever interest there about these launches is that it is just prior to and during the launch phases and at re-entry, h.f. communications are used and can be heard in the UK.

The h.f. communications fall into three broad categories: Transmissions between launch support services and ground controllers, conversations by certain amateur stations and direct transmissions from some satellites. This month we will concentrate on the Shuttle back-up and centre on the Shuttle back-up and control ships on television and so what ever 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 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 as reved bulletins on television and so whatever excitement and tension they may once have generated has now been dulled by familiarisation.

Antennas?

Changing the topic, I have already been asked what is the best antenna to use for covering the entire hf. 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 5SW 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 Waves and Wires from the SWM Book Service show dozens of practical designs and they are inexpensive.

Any suggestion of 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.

The data here has been extracted from GUEXnews 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 surprised 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 GCC is Operations Co-ordination and Control. SAR is known to be Search and Rescue (the frequency shown is in fact a worldwide SAR allocation and in the UK is used extensively by Navy helicopters).

Table 1.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
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<tbody>
<tr>
<td>2.455</td>
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<td>2.684</td>
<td>Back-up Mission Audio</td>
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<td>2.715</td>
<td>Navy harbour Coordination Agreement</td>
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<td>3.024</td>
<td>Coastr Guard SAR (Primary)</td>
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<td>Primary Recovery Zone SAR</td>
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<td>ETR Primary Night Channel</td>
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<td>Launch Support Ships</td>
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<td>SAR Primary Atlantic</td>
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<td>SRB Recovery Ships</td>
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<td>Cape Radio</td>
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<td>Cape Radio/Launch Support NC</td>
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<td>13.237</td>
<td>Cape Radio</td>
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<td>Launch Support Aircraft</td>
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<td>18.039</td>
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<td>ETR-Secondary Day Channel</td>
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<tr>
<td>22.725</td>
<td>Ascension Is-to-Malabar-MUX</td>
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</tbody>
</table>

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

Gerry L. Dexter
SWM Editorial Office, Enetco 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 Carlton Communications, was sold last fall to California-based Trinity Broadcasting. Now it's back - and 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. The irony is that a shortwave-casting organisation already active with programmes on cable TV and local radio. They also own several low-power TV stations. The “office” of the shortwave 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 shortwave broadcasting in the United States. It's too bad that the only format that was 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 police and courts, etc. Radio New York International is on the air via WWCR on Mondays from 0100-0200UTC. Reception reports are G3SLd and should be sent to P.O Box 270, Rushing, 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 (Sun- days UTC), although the time seems not to have settled down yet. It's most recently reported at 0400. The address for this one is given as 1748 70th St., Brooklyn, NY 11204. WWCR/Russes 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 6.000MHz, 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 630, Temuco. The other station is Radio Triunfo Evangelica, a religious broadcaster operating from Santiago, using 5.825MHz, although so far not on a daily basis (not on Thursdays or Sundays). The station 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 increased 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 (3.778MHz) operates only irregularly. The best chance of logging a Dominican Republic station is Radio Amancio on 6.025MHz, scheduled with 1Kw and running to 0600UTC.

Clandestine Curiosity

The anti-Cuban government station, Radio Foro Miami, operated by the ELN guerrilla group, continues its daily broadcasts from around 0303-0115, variable, along with a newly-added second airing at 1130, around 8.316MHz, but as low as 6.285MHz. Another station has turned up here recently, announcing as Del Pueblo Republicano, seems cut to jam the Patria Libre broadcasts and perhaps aims to get a counter opinion on the air as well. Either way, following these two they have another broadcast which frequency migration makes for some intriguing listening. Another note from Colombia is the reactivations of Radio Santa Fe, Bogota on 4.955MHz, one of the old-line Colombian short wave stations.

Ecuador - New & Old

New on the short wave scene is the air from the small town of Coca is Radio Cumundo, using the call HCJ07. It reportedly operates on 2200-0200, using 3.850 and 8.095MHz, although no reports have yet been heard. As with others, there seems no doubt that these broadcasts are intended for special purposes, and can only be described as spectacular in the late afternoon, local time.

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 it 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 17.865MHz and 2200-2300 on 11.530MHz.

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 during the evening hours than in 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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tr>
<td>DX</td>
<td>long distance</td>
</tr>
<tr>
<td>FCC</td>
<td>Federal Communications Commission</td>
</tr>
<tr>
<td>kW</td>
<td>kilowatt</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>NY</td>
<td>New York</td>
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<tr>
<td>PA</td>
<td>Pennsylvania</td>
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<tr>
<td>QSL</td>
<td>acknowledgement of contact</td>
</tr>
<tr>
<td>UTC</td>
<td>Universal Co-ordinated Time (GMT)</td>
</tr>
<tr>
<td>VA</td>
<td>Voice of America</td>
</tr>
<tr>
<td>Watts</td>
<td>watts</td>
</tr>
</tbody>
</table>

Universal Time Simplified Listening

Universal Time (UTC) - a handy concept also known as world time or GMT is used to eliminate the potential complication of so many time zones throughout the world. It treats the entire world as a single zone and is announced regularly on the hour by many world band stations.

For example, if you're in New York and it's 8am EST, you will hear the time announced as “11 hours UTC.” A glance at your clock shows this is five hours ahead of your local time. You can either set your clock or use a separate clock for Universal Time. A growing number of world band radio comes with Universal Time clocks built-in and 24-hour UTC clocks are also widely available as accessories.

Passport to World Band Radio.

The shut-down of the VoA Morrovia 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 8.065, 15.163, 15.225, 17.810 and 17.865MHz. VoA’s Greenville transmitters were recently doing some testing down at 6MHz. Another VoA site, in the Philippines, was the target of a guerrilla bomb last September but there were no injuries and no interruption to operations.

International Shortwave Broadcasting.

The DX Party Line programme will be in the evening hours fol lowing these two as they move 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.

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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 1980s with television), an active group of DXers has grown up to 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 micro-wave 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-ins', 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 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 a 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, transmitted frequently from readers (though not of 'private decoders')! provided that they are proven to work.

Personally Speaking

On a personal note, I have been TVDXing since 1982, previous to that a successful short wave DXer and I 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 [AIS-8] satellite transmissions at 6060Mhz (u.f.f.). I've written on TVDX since the early 1970s and readers may be familiar with my TVDXing book published by Bernard Ballani (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 (3.7–4.25GHz) will not be covered in this column. Other than general comments from any reader active in this field, I should 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, fowever currently operational dish size is not - at this stage - concern us further. The satellite bands that we are covering will be the Ku band (10.9–11.7GHz) and Telekom (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 telecommunications use. Television transmissions are used extensively in this band, intended for cable headend reception, news feeds amongst broadcasters and industrial conferencing. With increasing interest in future 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 Telekom band at 12.5–12.7GHz is used by several birds, primarily the French at this time. Again that quality reception is possible at 1m dishes.

There are many books covering satellite television that have appeared in recent years, one book that I do thoroughly recommend to all satellite television installation Guide 2nd edition by John Breeds (ISBN 0-948251-59-9) covering all you need to know about installing a satellite TV service. It's a basic theory and practice. It is available, of course, from the SWMBook Service, see page 55.

Satellite Slot News

Yugoflag was due to start receiving satellite TV and telecommunications use during 1991 called MPRTVE-B 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 graces and favour with the USA, UK and France. TURSAT - 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 Ariane space rocket early 1993. The AMOS series will carry both spot beams and pan-European coverage, two satellites are 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-continental 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 is brewing in the Pacific with Tonga who is beginning 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 - the policy of D2MAC has lost momentum, Germany opting for carriage of its satellite channels over the powerful Astra satellite (1A and the shortly launching 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 TDV co-sited birds - which are suffering technical problems. It's feasible that the French will move the TDF birds to a slot around 5°E where their Telekom 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/ Europycrypt. Incidentally, the Bravo cable channel has been seen down-linking its film offerings over Intelsat 21°S and on test using SAVE scrambling.

Now that Eutelsat II F1 us successfully operating at 13°E, the previous incumbent at 13°E - Eutelsat 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 identified such as "BAE UK" - 24", etc., though industrial conferencing is usually taken to BMAC. The former 7°E incumbent in turn as row operating (as from January) from 4°E (Eutelsat 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.
Paul Essery G3XKE
PO Box 4, Newtown, Powys SY16 1ZD

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

W. H. Rees (South Godstone) encloses a circuit he had for a pre-1931 G3XKE plus about updating the devices (Z 3819 t.e, and Z 3464 bipolar transistor) as the circuit was some ten years old. He wanted to, for myself, professionals.

Next, 18MHz 4X6OW, ZS6AW, EA8BCN & VE1ANJ & SV1AOZ on 3.5MHz; GXOBAA, G4VFU/MM, GB4RN, Daniel Peake (Homage).

Nothing much on 7MHz, says 7.3MHz. Have a bigger band than us; 7.0-7.8MHz, on 7MHz, that N. America over a load of Europeans. Don't ans.

On 7MHz (40m) Andy tripped to 14MHz (20m), of-the-mill Europeans. Turning W3JKM, W1IK, W4AMJ, W4L5X, W7ZUJ, W9YD, W91TQ, and in 18MHz we noted QST1-A0Z, EI7M, OY9JD, W4QM/EA7, DLOKF, 4N4AE, 0M5W, SN3A, CE4MAO, CN2LB, FS/KC1F, and we'll write something about this on another occasion. The point here is that if a signal is being drowned out by high noise (statical and whatever), then if a particular antenna knocks the noise down more than the signal, then it will be in profit in real terms. Perhaps we'll write something about this in a future column.

Andy Nightingale (Wombourne) has made a long loop a couple of notes hear ing, on 18MHz, UJ7KB, 4U1ITU, J73WA, T15GLF, HPX1SD, HFB8C, L1WQR, OA4AAR & ZS5BH. On 24MHz, the list included: LV1AV, 4A5S, J73MR, KD1AR, UO5OLJ, LA0UGA, OD5GD, UQ2KN, K6FW, UMMAMTA, KG4KG, KP2A, SVDP7, X1S9, USHE, UA3FIH, 8P9HF & C5S9H.

Next, I must mention Eric Masters, from Wellin, Kent, who remarks that he has the usual end-fed up albat, but that he uses a counterpoise wire, a quarter-wave length, without which he just does not get on 14MHz. From the same area we note 4D4RC, YL2AG, WA4DKP, W3KY, K2ANU & C1UA. Finally, despite all the noise on 14MHz, Mike was able to make solid copy of the Hi-Fidelity Transmission.

Mike Drew of Wirral went on 24MHz for ZL3ADJ, DJ3XJ, DJ1W3, YL4EAB, DX1LUL, J73LLT, 9H1GP, W1KFY, 5N3OETP, 9J2WS, TW1KL, 5J2U, ZL2ANR, T33R, KP2A, 9Q5TE, 9J2WS, ZL3ADJ, DLOKF, 4N4AE, 0M5W, SN3A, CE4MAO, CN2LB, FS/KC1F, and we'll write something about this on another occasion. The point here is that if a signal is being drowned out by high noise (statical and whatever), then if a particular antenna knocks the noise down more than the signal, then it will be in profit in real terms. Perhaps we'll write something about this in a future column.

L. D. McLean of Yevoy is another. He heard SSTV from 24MHz and says he has a card in his collection received from ES8FA, 9H1MF, 9H1GP, W4QM/EA7, DLOKF, 4N4AE, 0M5W, SN3A, CT1AO2, E17M, DY5UD, W4DM/MM, KITM, UC2LEG, SM3BCS, HABXZ, 77TC, 3M5ADY & L1DRC, the other main area of interest was 7MHz, where he managed K4C, WW2Y, K1AR, N3EA, 9H30 A/4, SV9ADH, HI8A, RWOWR, JA2BAY, P4OV, ZM2ZP, EA6FB, PJ1B, 9Q5TE, 9J2WS, ZL3ADJ, DLOKF, 4N4AE, 0M5W, SN3A, CE4MAO, CN2LB, FS/KC1F, and we'll write something about this on another occasion. The point here is that if a signal is being drowned out by high noise (statical and whatever), then if a particular antenna knocks the noise down more than the signal, then it will be in profit in real terms. Perhaps we'll write something about this in a future column.

Join a Club

A complete change of tack now. I have a nice long letter from Dennis Gang Dominican Republic. He's writing about the subject of the column, and as national ones like RAIAR or G-QRP Club or whatever all brings us far more than we put in but on this hobby at all seri ously.

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The deadlines (arrival dates here) for most of these columns 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, and that if you have to send in a report, covering 1500-1900 UTC, no one would be more pleased than your truly.

Ted Trowell (Sheppey) is still finding a lot of noise on Top Band, but he finds his G5VRF is quieter on that band than any other. Although his is the vertical being best to transmit upon, while the horizontal is better for 'harking'. Indeed some amateurs have much success listening with small shielded loops, making up for the loss of signal strength by way of a pre-amplifier on receive.
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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-sight 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 from Belgium (BRT), Fig. 6, on November 90. It shows a high pressure system of 990mb (30.25in) pushing through to 1030mb (30.45in) moving to the lower end of the troposphere which often coincides with the movement of a ridge of high atmospheric pressure.

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, smears 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 outburst 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 15th and 29th, he saw various programmes, he identified pictures from Bangkok which transmits on Ch. E2. He also told me 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 (43.75MHz) at 0800, via 'F2', on the 8th as well as Arabic subtitles at 0700, Australian on Ch. A0 (46.25MHz) and TSS/Chinese at 0847 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. 1a and 1b and 'Trett' (news) from Iceland (RUV) on Ch. E4 (46.25MHz) 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 Phillips receiver, Triax 99 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.
John Woodcock received negative reports from France in Band III. David Glen day received pictures from Denmark (DR) and Norway (NRK) in Band III and Belgium (BRT 1 & 2), Denmark (TV2), France, Holland (NED 1, 2 & 3) and Germany (SWF3 and ZDF) on several spots in the UHF 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 Ch. E10, then there was a fair bit of co-channel interference on Ch. E59, all using PAL colour. For the latter he has a Spectrum plus Comaputer, GIFTS software and a Star IC10 printer for the hard copy. Toward the end of last summer John received slow scan pictures from EA2J0 in Spain, Fig. 11 and copied a '0TH' capture from GALDKAO, a photograph of a house and a map showing Madrid.

A typical UHF bow-tie antenna.

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, so different subcarrier frequencies are used. Consequently stereo will not be heard on a UK standard receiver.

In the USSR, Muskva 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' UHF stations, some nine transmitters will be operational in the first place.

German unification has meant profound changes to the East German region with additional transmitters being constructed. By early Spring 1991, the following transmitters should be in service: ZDF - Lobau Ch. E56, Cottbus Ch. E57 and Dresden Ch. E55, 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 to reflect this. East German regions will carry an 'O' zip code and West German 'W' for east and west respectively.

A unit of pressure or stress. 1 bar = 105N/m2 or pascals = 750.067mm of mercury at 0°C and latitude 45°. 1 millibar = 100N/m2 or 10dyne/cm2. 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 persistence 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.
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PUBLIC OFFERS

HP100E/AR1000

FAIRMATE HP100E

Since its launch a few months ago, this has become the UK's most popular scanning receiver. The HP100E covers 25 to 550 MHz and 800 to 1300 MHz with selectable channel steps in 5, 10, 12 1/2 or 25 kHz. You can also program channel steps in any multiple of 5 or 12 1/2 kHz up to 100 kHz. With 1000 memory channels arranged in 10 banks of 100 the scanning functions are really versatile.

Three modes are available - AM, WFM and NFM. This means you can also listen to your local FM radio station as well as Heathrow approach or your local VHF repeater.

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AOR AR3000 £740.00
Frequency & Operational News

Starting with the GASIL 11/90 from the CAA, Redhill Tower changes from 123.255 to 123.275 MHz and Shipdham from 123.03 to 123.185 MHz. From the same source comes AIC 95/1990, which announces the change from 130.15 to 122.75 MHz of the Salisbury Plain DACS which has authority for danger areas EGID13, 124, 125, 126 & 128.

have you noticed the changes to the holding point markings on taxiways? AIC 72/1980 explains these. At each holding point, a white-on-red sign will indicate the runway(s) that are being approached. The words 'HOL' 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 close 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 ILS to much nearer the runway than usual or (Cat III) are making automatic landings guided by it. In this case taxiways are held further from the runway so that their metal fuselages don't disturb the ILS radio beams. These holding points are marked with the appropriate weather minima category and, on the ground, there is a yellow, ladder pattern.

Dope Renowned G68KS (L'llon-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 21.945 (H24) 6.837 9.930 10.072 British Airways (Speedbird London) 5.535
Dharam 3.095 5.544 8.927
Sydney (Qantas) 21.970 (H24) 6.837 10.072 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 Aereas Paraguayas Ops 11.397
Met 10.057 13.225 13.337
Tam Communicat Ops 8.849 5.609
Trans Brasil Ops 8.952 11.339
Vasp Ops 4.666 11.375 17.943
Also from M. Redgwell are the NASA Space Shuttle h.f. frequencies of 20.186, 20.189 & 20.390 MHz.

Colin Frowen (15 Poveys Close, Burgess Hill, West SUSSEX RH15 9TA) has compiled. His frequencies 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 VOLUME 4.2224 MHz though I wonder if the more easily receivable 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 tuning. My quick look round the market revealed the following shortlist: Sony IC-F200D or PRO-80, Panasonic RF-B850B, and Icom R-100. The IC-2001D has now been reported by some readers as rather lacking in the h.f. department but that shouldn't matter in this case. Check with advertisers in the magazine for availability and prices. Other scanners covering h.f. don't have the essential ability to resolve frequencies can hear all the traffic while the controller is occupied with another frequency.

Follow-Ups

Last October I asked for information on the Elliott AA 5865-1 Doppler controller. The original source has now been tracked down. This rare unit is available for manually entering ground speed and a drift angle if the real Doppler becomes unserviceable during a navigation 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 tape so that the visually handicapped can receive it via the QTI Talking Newspaper.

Geoff Halligey (Briggend, Mid Gmagain) has written in regularlary and now QTJ listened to R.R. Peal (Cowley, W. Sussex) thinks that they worked together in the '40s. Thanks to Harry Longley (6GJKT) (Lancaster) who runs QTJ and enabled me to help put the two gentlemen in touch once again.

Now to the exploits of Don Cameron and Gennadi Oparin and their Britain to Russia.
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 Remnolds 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. 1956. For the Glasgow-Heathrow route only one north/south airway is on offer and that's Al (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 Abbe

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 & Oldham 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 Realine. 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 gelatin 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
N

orman Smith of Basingstoke has sent in details of an easy-
to-build car cassette adaptor, similar to the Tandy unit I men-
tioned 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 approach lies in the use of the existing car speakers and provides additional amplifi-
cation 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 purposes, a mono signal with a limited frequency response should prove adequate. That raises 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 port-
able transistor radios, so you may find that you already have one somewhere.

The cassette is unscrewed and opened. 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 mag-
net 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 re-
quired.

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 useful technique is to detect when one of the tape reels has stopped rotating. This is used to electrically operate the eject mecha-
nism. In order to trick the system into believing that you are play-
ing an ordinary tape, it is neces-
sary 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 the car stereo volume control to set the correct listening level. This will help to prevent over-
loading 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 adap-
tor. I have built a couple of these units and found them to be a very useful accessory, espe-
cially if you want to temporarily 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.

Pre-amp Problems

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

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 connec-\ttors the performance improves dramatically. This is an important clue as it suggests that the pre-
amp is oscillating, produc-
ing 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 fre-
quency of oscillation and hence the degree to which reception is affected. To understand the problem you need to look at what makes an amplifier stage oscil-
late.

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 fre-
quency 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 pro-
portion of the pre-amplifier out-
put signal must be finding its way back into the pre-amp and causing oscillation. This could be happening in a number of ways but my first guess would be that if the pre-amp was 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 dif-
ference, then the next thing that I would suspect is an impedance mismatch between the pre-amp and antenna, or connecting ca-
ble. 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

Fig. 1

Fig. 2

Fig. 3

Alan Gardener
PO Box 1000, Eastleigh, Hants S05 5HB.

Short Wave Magazine, February 1991
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 on frequencies from 100 to 500MHz, but outside these limits the performance tends to fall off rapidly.

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 quiet range of frequencies.

Moving slightly higher up in frequency, the bands between 41-87MHz are used for a variety of purposes including military communications and 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 62MHz 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 65-470MHz. 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.
Ian Mason of Catrine, Ayrshire is an experienced amateur radio operator who currently runs the Wavecom 40/10 decoder. On the receiver front, he has a very powerful set-up with a Kenwood R-9000 and the impressive DR26. The latter is 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 waste paper. 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 service. 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 transmissions. The actual printer he uses is a second-hand Olivetti PR15 supplied by Procom Electronics. One of the problems with a printer is that 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, which he mentioned in his letter to the Wangledale, is the limited life of printer ribbons like those used by Epson and IBM compatible. Well, these terms are used to indicate the range of commands and facilities that different modes provide. For example, the commands of a printer ribbon is limited to those that can be accepted by the Epson printer, so long as it accepts the same commands as an Epson 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 being the standard office computer. The term IBM in this context is used to describe a computer that runs software designed originally for the IBM PC. Another term to watch is IBM clone, this means machines that are the same as the IBM compatible but you have to watch out because some ‘clones’ are not totally compatible - confusing isn’t it.

Howard Butter of Dallkeith 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. He also has the IBM clone, this means the IBM PC having been accepted as the market leader. Because they became accepted so they were used, rather than any other model FX-80 printer. The reason is the limited life of printer ribbons, drop me a line so I can pass it on to Colen Gordon Butet of Saltford has a keen short wave listener since he received VK2ME on a home brew, single valve receiver at the age of 13. During his Wireless Operating 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 Homer 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 compatible machine. The most comprehensive is the Code-5 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. However, this program myself and can recommend it as being very comprehensive. If you are new to utilities I would strongly recommend that you begin with the simple modes like RTTY and c.w., then move on to being a keen listener. The program comes with a very useful package from Grovener 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 which 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 most suitable of this 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 laboratories 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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Microlog Entor Sat Telex (SITOR-A) used with HF1200.
Koden FX725S i.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, ARQ 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 definitions. 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 compiling a complete list of modes, I would like to hear your comments on your preferred way of indicating the mode.

PC HF FAX Update
I reviewed the 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 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 advertisements.

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 thought I'd give you a brief insight into the main changes. The first point to note is that the printing quality has 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.
Heka UK, 94 Church Street, Langford, Biggleswade, Beds SG18 9QA.
Tel: (0462) 720644.
Groover Software, 2 Beacon Close, Seaham, East Sussex TN25 2JZ.
Comar Electronics, 5A Birmingham Road, Cowes, Isle of Wight PO31 7BH.
BARTG, Ann Reynolds, 52 Bel Road, Coventry CV6 7GW. Tel: (0203) 668481.
RSGB, Lamba House, Cranbourne Road, Potters Bar, Herts EN6 3JE.
Public Domain Software Library, Winscombe House, Beacon Road, Crowthorne, East Sussex TNS6 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:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Callign</th>
<th>Modulation</th>
<th>Speed</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.059 &amp; 6.83MHz, Petra Amman, 50 baud, 1700 - 1900UTC</td>
<td>7.8MHz, Ima Tahran, 50 baud, 1500 - 1730UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.463MHz, Petra Amman, 50 baud, 1000 - 1200UTC</td>
<td>8.049MHz, Ima Tahran, 50 baud, 1900 - 2030UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1375MHz, AA Ankara, 50 baud, 1500UTC</td>
<td>9.965MHz, Ana Aden, 50 baud, 1600UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.463MHz, Petra Amman, 50 baud, 0900-1000 &amp; 1700UTC</td>
<td>14.56MHz, Petra Amman, 80 baud, 0800UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.965MHz, Ana Aden, 50 baud, 1600UTC</td>
<td>15.02MHz, Sana Damascus, 50 baud, 1600UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.56MHz, Petra Amman, 50 baud, 0800UTC</td>
<td>18.04MHz, AA Ankara, 50 baud, 0700, 0800, 0900, 1000, 1300UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.56MHz, Petra Amman, 50 baud, 0800UTC</td>
<td>18.56MHz, 19.2MHz &amp; 19.98MHz, Petra Amman, 50 baud, 1000 - 1100UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.02MHz, Sana Damascus, 50 baud, 1600UTC</td>
<td>18.56MHz, 19.2MHz &amp; 19.98MHz, Petra Amman, 50 baud, 1000 - 1100UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Modulation</th>
<th>Speed</th>
<th>Shift</th>
<th>Callign</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>117.4kHz</td>
<td>FAX, 120, 576, DCF37, 113UTC</td>
<td>Offenbach Metero</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>139kHz</td>
<td>FAX, 120, 352, DCF39, 1126UTC, DPA Frankfurt</td>
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<td></td>
<td></td>
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<td>2.474MHz, RTTY, 75, -</td>
<td>PBC32, 164UTC, DN Noordwijk</td>
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<tr>
<td>4.425MHz, RTTY, 50, -</td>
<td>RGG72, 1915UTC, Kiev Meteor SYNOP,</td>
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<td></td>
</tr>
<tr>
<td>7.88MHz</td>
<td>FAX, 120, 576, DCF3, 1016UTC, Hamburg Metro,</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>8.948MHz</td>
<td>FAX, 120, 576, GZ240, 1056UTC, RN London,</td>
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<tr>
<td>10.6MHz</td>
<td>RTTY, 50, -</td>
<td>XEN, 154UTC, VNA Hanoi</td>
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<tr>
<td>11.45MHz, RTTY, 50, -</td>
<td>SOL349, 1400UTC, PAP Warsaw English news</td>
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<td></td>
</tr>
<tr>
<td>11.53MHz</td>
<td>RTTY, 50, -</td>
<td>HHR49, 150UTC, IMA Tehran, 50 baud, 1000 - 1100UTC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.315MHz</td>
<td>RTTY, 50, -</td>
<td>RVW57, 1350UTC, TASS Moscow English news</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.95MHz</td>
<td>RTTY, 50, -</td>
<td>SU39, 1650UTC, MEC Cairo English news</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 appears south of the North Pole which, of course, is in darkness for some months.

The Chinese FENGYUN 1B weather satellite operates slightly higher than the TEOR satellites in transmitting visible and infra-red. In darkness that means that the night 'visible' pictures are faint. Watching the Russian ME-TEOR satellites going south is quite interesting. ME-TEOR 3/2 came back on in late November and has been transmitting good quality pictures visible in darkness and in near darkness and then switching to visible pictures as it crosses the terminator. Its operation is quite erratic though and sometimes it does not transmit infra-red at all. ME-TEOR 2/16 has continued to send visible format pictures followed by the older type of 30 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 telescope it was switched off and I hadn’t seen it since. Just after writing the last article, I noticed to my horror that ME-TEOR 2/16 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 weather satellite and the orbit changes have happened, and I noticed that the times for both satellites were identical.

As by 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 TRAC) 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 it is a useful tool for satellites as they crossed into sunlight by 30 seconds apart! At exactly the right time one came on and within a few minutes the cloud formations 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 rolled up, 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 ideal for use 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) 820404, price about £25.

**Frequencies**

NOAAs 9 and 11 transmit on 137.52MHz. NOAA 10 transmits on 137.55MHz. FENGYUN 1B transmits on 137.80MHz. ME-TEORS may transmit on 137.30, 137.40 or 137.65MHz. OKEAN 2 transmits on 137.40MHz.

**Letters**

SWIM has an international readership and student Stanley Ummoh, who studies at a university in Nigeria, wrote to me about a new satellite, SWIM, which is going to be launched. I have had some communications with him about 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 one myself, but since that time it has been modified so that commercial dishes can be obtained at reasonable cost and are more aesthetically pleasing. I received a letter from L. Norrisworth of Peelcaste, but had no 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 discnic antenna to upgrade his W.M.A. I asked him whether I knew of any. I do a predictions run for each Russian weather satellite and the orbit changes have happened, and I noticed that the times for both satellites were identical.

As by 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...
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 you 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 METEOSAT, 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 simultaneously 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 recognize 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.

**Computers**

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 recognizable. My framemate 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.

**User Friendly**

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 and 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 was fortunate in being able to look into specifications with some manufacturers.

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 40MHz 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 at home did I realise the previously unforeseen 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. I am sorry to inform you that they have agreed to look at that for the next release.

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**Experience Trouble**

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Receivers, aerials, etc., available separately.

COMAR ELECTRONICS
1A Birmingham Road,
Cowes, Isle of Wight. PO31 7BH
Tel: 0983 200308

Short Wave Magazine, February 1991
medium wave & short wave

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

Medium Wave DX

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<th>Power</th>
<th>Dist</th>
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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 VOMC in St John's, NF, on 598 kHz on November 25 at 19 UTC. That is about half an hour before their sunset. Another report came from Tim Shirley in Bristol. At 2030 on October 27, he picked up the broadcasts from WFNX in New York on 690 kHz.

Writing from Co.Wexford, Bart O'Brien says, "My highlight this month was hearing CVJO, NF on 880 kHz and getting a QSW. Leo Barlow heard CVJO for the first time on November 14, and he noted his signal in Sunderland as 23222 at 2327. Roy Patrick (Derby) often hears CVJO around 2330 - a good tip for anyone wishing to try this aspect of our hobby for the first time. CVJO were also noted in a first report from John Cooper in Hull, between 2230 and 0210 when he logged eight stations in Canada, the USA and the Caribbean area.

Some of the broadcasts from the Caribbean area were logged by Jim Walas (Grimsby) between 0200 and 0300. Using a home-built 4m square loop ahead of his trusty RCA AR77, he logged most of them as SI0222. The most powerful signal was from Jamaica, 100 W, on 1477 kHz, and ED112 was heard on 1575 kHz, 100 W, on the same day. Reports from DXers who have noted similar effects would be welcome.

Although Eddie McKeown (Co Down) has monitored the broadcasts on 216 kHz 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 I.W. broadcasters seem to be reluctant to make static 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 LMS&.
Long Wave DX

FREQ (kHz)  STATION  COUNTRY  POWER (kW)  DXER
--- --- --- --- ---
145 151 Thretain  Germany  300  B,E,F,J,K,L,M,*0*
131 Brasington  France  1200  B.E,H,U,L,M,*0*
107 Alouë  Sweden  2000  B,H,L,M,*U0*
217 Kamerunf  USSR  1000  B,H,L,M
71 Moscow  USSR  500  B
181 Sarrauw  Germany  2000  B,H,L,M,*,K
43 Miastra  Sweden  900  B
178 Turks  USSR  1000  B
198 BBC Dublin  UK  300  B,H,M
199 BBC Wellington  UK  50  B
197 Munich  Germany  1800  B,E,H,K,L
216 Ronalies  Mexico  1900  B
217 Oslo  Norway  2000  B,H
225 Kopenhagen  Denmark  2000  B,H,L,M
243 Junghornt  Luxembourg  1000  B
215 Agrots  USSR  1500  B,H,M
252 Atomic  252 S.Island  700  B,H,M*U0*
216 Moscow  USSR  1700  B,H,L,M,*0*
316 Topoja  Austria  1900  B,H,J,K,L
129 Moscow  USSR  3000  B,H,M
136 Manchur  USSR  2000  B,E,K,L
214 Kostant  Poland  1200  B,H,L,M
216 Junghornt  Luxembourg  1200  B,E,F,G,H,1*,J,K,L,M*,0*

Notes: *DXers marked ‘*’ were logged during darkness; all others were logged during daylight.

Long Wave DX

FREQ (kHz)  STATION  COUNTRY  POWER (kW)  DXER
--- --- --- --- ---
113 Thretain  Germany  600  B,E,F,G,H,U,J,K,L,M,0*
125 Brasington  France  5200  B,E,F,G,H,K,L,M,*0*
162 Alouë  Sweden  2000  B,E,H,J,K,L,U,M,0*
171 Kamerunf  USSR  1000  B,H,L,M,0*
174 Moscow  USSR  500  B
183 Sarrauw  Germany  2000  B,H,L,M,*,K
118 Miastra  Sweden  900  B
185 Turks  USSR  1000  B
198 BBC Dublin  UK  300  B,H,M
199 BBC Wellington  UK  50  B
197 Munich  Germany  1800  B,E,H,K,L
216 Ronalies  Mexico  1900  B
217 Oslo  Norway  2000  B,H
225 Kopenhagen  Denmark  2000  B,H,L,M
243 Junghornt  Luxembourg  1000  B
215 Agrots  USSR  1500  B,H,M
252 Atomic  252 S.Island  700  B,H,M*U0*
216 Moscow  USSR  1700  B,H,L,M,*0*
316 Topoja  Austria  1900  B,H,J,K,L
129 Moscow  USSR  3000  B,H,M
136 Manchur  USSR  2000  B,E,K,L
214 Kostant  Poland  1200  B,H,L,M
216 Junghornt  Luxembourg  1200  B,E,F,G,H,1*,J,K,L,M*,0*

Notes: *DXers marked ‘*’ were logged during darkness; all others were logged during daylight.

Transatlantic DX

FREQ (kHz)  STATION  LOCATION  UTC  DXER
--- --- --- --- ---
855 WDOCK  Moncton, NB  0255  F
390 WLM  St John NL  0142  E
193 WCRS  Montreal, PQ  0300  E
463 WCRS  Toronto, ON  0300  F
1200 WCGC  Cleveland, OH  0200  F
940 WOOG  Montgomery, AL  0200  F
1110 WISL  St Louis, MO  0200  F
1200 WSOX  Chicago, IL  0200  F
1410 WILM  Wilmington, NC  0200  G
1510 KDYM  Dallas, TX  0200  G

Notes: *DXers marked ‘*’ were logged during darkness; all others were logged during daylight.

Short Wave Reports

Although long distance reception in the h.f. bands has been rendered non-selective or impossible for some days by the effects of solar flares, in general has been noted as good. From time to time, a high level of solar noise has also been noted. The weaker signals have been marked with an asterisk. The effect is likely to continue.

The 25MHz (11m) band is now being used by R.Australia to reach its forces in the Gulf area. A report from Rhodes Nicoll in Doha indicates that their transmission on 25.750 via Carvarann in the UK on some days by the effects of solar flares, in general has been noted as good. From time to time, a high level of solar noise has also been noted. The weaker signals have been marked with an asterisk. The effect is likely to continue.

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- Eliminators, Holders, Connections

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- and TV, Data/Reference, Projects/DoIt,
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- Electronics, Audio, Digital Electronics,
- Computers

### CABLE AND WIRE
- Equipment Wire, Mains Cable, RF Cable,
- Audio Cables, Ribbon Cable, Enamelled
- Copper Wire, Accessories

### CAPACITORS
- Electrolytic, Ceramic, Foil, Variable,
- Trimmers

### COMPONENT PACKS

### COMPUTERS
- Amstrad 464/6128 Peripherals, Software,
- Computer Leads, Cable
- Adapters/Testers, Data Switches,
- PC Cards, Microcomputing Kits/
- Modules, Accessories

### CONNECTORS
- Audio, Servo, DC, RF, RF Adapters,
- IEC Mains, 13A Mains, Low Current,
- Terminal Blocks, PCB Ribbon,
- IDC Edge, 0.1" Pitch Edge, IC Sockets,
- Waterproof Sockets

### COUNTERS AND TIMERS
- LCD Modules Stopwatch

### CRYSTALS
- Crystals, Ceramic Resonators

### FILTERS
- Ceramic, Pilot Tone/and Birdie,
- LC Video Block, Helical, Crystal,
- Ceramic, RF Interference

### HARDWARE
- Equipment Cases, Aluminium Boxes,
- Plastic Boxes, Mounting Accessories,
- Knobs, Breadboards, Fuses,
- Fuseholders, Heatinks, DC Fans

### INDUCTORS
- Toko Coils, Fixed Inductors, Axial RF
- Chokes, Surface Mount Inductors,
- Moulded VHF Coils, Ferrite Materials,
- Dust Iron Toroids

### KITS AND MODULES
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- Systems, Aerial Amplifiers, AM Systems,
- HF Amplifiers, Signal Processors,
- 6m Systems, VHF Systems, Satellite
- Systems, UHF Systems, Audio
- Amplifiers, Audio Accessories, Cassette
- Systems, Home and Hobby, Radio
- Control Systems, RF Test Equipment,
- Signal Generators and Detectors,
- Time and Frequency Standards,
- Logic Probes, Digital Meters, Power
- Supplies, LCD Modules

### METERS
- Moving Coil
- PCBs & EQUIPMENT

### RESISTORS
- Carbon Film, Presets, Rotary Pots,
- Sliders, Multturn Pots, Precision Pots

### RELAYS
- Coaxial, PCB

### RIGS AND RECEIVERS
- 2m Systems, High Power
- HF ATUs, Accessories,
- Scanning Receivers

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- Series, 74LS Series TTL, Linear ICs,
- Prescalers ICs, Microprocessors
- Memories, Transistors, Diodes
- Regulators and Power Control ICs,
- Schottky Diode Balanced Mixers,
- LEDs, Mounted LEDs, Infra Red LEDs,
- 7 Segment LED Displays, Neon and
- Signal Lamps

### SPEAKERS/SOUNDERS
- Piezo Buzzers, Headphones,
- Loudspeakers, Microphones

### SWITCHES
- Key, DIL, Push Button, Contact,
- Code, Rotary

### TEST EQUIPMENT
- Oscilloscopes, Frequency Meters, Signal
- Generators, AF and RF Generators,
- Analogue Multimeters, Digital
- Multimeters, Multimeter Accessories,
- RF Power Measurement, Digital
- Thermometers, Logic Probe and Pulsers,
- DC Power Supplies, LCR Meters,
- Oscilloscope Probes, Test Leads,
- Calculators

### TOOLS
- Soldering Irons, Soldering accessories,
- Drills and accessories, Screwdrivers,
- General Tools, Static Protection,
- Service Aids

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- PCB Mounting, Chassis Mounting

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NRK Bergen Norway 1100 UTC 3000

RTI Yitzhak Israel 1100 UTC 3000

RKR Karachi Pakistan 1100 UTC 3000

RTV Dakar Senegal 1100 UTC 3000

SBC Singapore 1100 UTC 3000

SI 0544 1100 UTC 3000

SRI Berne Switzerland 1100 UTC 3000

[Table of frequencies and time slots for various broadcasters is presented here]

Equipment Used

Stevens, John: Grundig Satellit 400 + 25m wire.  
Wheatley, Neil: Sony ICF 7600 + built-in loop.

Tropical Bands

[Table of frequencies and time slots for various broadcasters is presented here]

Tropical Bands

[Table of frequencies and time slots for various broadcasters is presented here]
2360 54444 at 2250 in Worthing.

Those to other areas include Nederlands via Be. 11720
(Eng to USA 0330-0425) 34443 at 0405 in Preston; R.P. Parnell, Tajiti 11826 Fr, Tah to SE Pacific areas 1600-0300, noted as SI0222 at 0340 in New Redror; VOA Europe 11 700 (Eng to 117200 0900-1100) reached at 0810 by Robin Clark, Pymchurch; R.D.W via Antigua 11865 (Sp to S America 1400-1600) SI0433 at 1440 by Ron Pearce in Bahrain; KGWR Guam 11 6500 (Eng to S Asia 1450-1700) 22232 at 1500 in Sunderland; KSSA Agot, Guam 11 5900 (Eng to S Africa 1300-1700) 66233 at 1600 in Birmingham; R.G. Beijing, China 11 5155 (Eng to Africa 1700-1800) SI0544 at 1710 in Edinburgh; R.R. Amsterdam 11 2120 (Eng to Africa 1730-1754) 54444 at 1745 in Swannock; Voice of Vietnam, Hanoi 11 8400 (Eng, Russ, Viet, Fr, Sp 1600-2130) SI0444 at 1824 in Kolkata; R, R. Australia via Caronnave 12 0000 (Eng to S.E. Asia 1800-2130) 32222 at 1930 in Morden; KNRS Anchor Point, Alaska 11 6700 (Eng to E Australia, 0244334 at 0250 in Bridgewater; R. Beijing, China 11 5155 (Eng, Art to S Africa 1900-2157) 44444 at 2050 by Ted Gould in London; R. Globo, Rio, Brazil 11 6990, Pont to S America 0900-0400, heard at 2130 in Brenchley; RCI via Sackville, Canada 11 8880 (Eng to Africa 2130-2230) SI0443 at 2145 in Bromley; R. France during some days. At best they rate SI044 at 0815 in Eyemouth. Some of the broadcasts from Australia have also reached the UK. ABC ABC (or 11 of Eng to Australia 24hrs was logged as SI0222 at 1030 in New Redror. Radio Australia/Asia Shroperton 9 5800 (Eng to Pacific areas 0800-0900) has been noted as 'good at 1100 in Bristol and via Caronnave? 9 8600 (Eng to Pacific?) as SI0 322 at 1355 in Bungay and 33333 at 1705 in Oman.

The reports detailed some of the broadcasts to Europe. R Finland via Porto 9 5600 (0730-0745) SI0333 at 0730 in Bristol; WCSS Scots Corner 9 5400 (Eng 0600-1000) S5445 at 0735 in Norwich; TWR Monte Carlo, Monaco 9 4800 (0840-0825) 44444 at 0850 in Morden; IRSIR, Milan, Italy 9 815 (Eng 0900-1000) SI0333 at 0930 in Co. Down; R Nederlands via Fleva 9 715 (Eng 1100-1225) SI0555 at 1220 in Birmingham; VDIR tehran, Iran 09022 (Russ, Fr, Tur, Ger, En, Sp, Ar 1530-2230) SI0333 at 1600 in Macclesfield; R Norway Int, Oslo 9 8055 (Eng 1600-1700) S5455 at 1700 in Worthing; R Denmark via RNI 9 6700 (Eng 1730-1800) SI0444 at 2050 in Worthing.

The list continues with details of stations in SE Asia, S.Europe, the Caribbean, Africa and North America.

### Local Radio DX

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</table>

### Station Addresses

- British Forces Broadcasting Service, PO Box 1234, London W2.
- Marx Radio, PO Box 218, Broadcasting House, Douglas Head, Douglas, Isle of Man.
- SLBC, PO Box 574, Torrington Square, Colombo 7, Sri Lanka.
- The Caribbean Beacon, PO Box 690, Antigua, British West Indies.
- UAE Radio Dubai, External Service, PO Box 1695, Dubai, United Arab Emirates.

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